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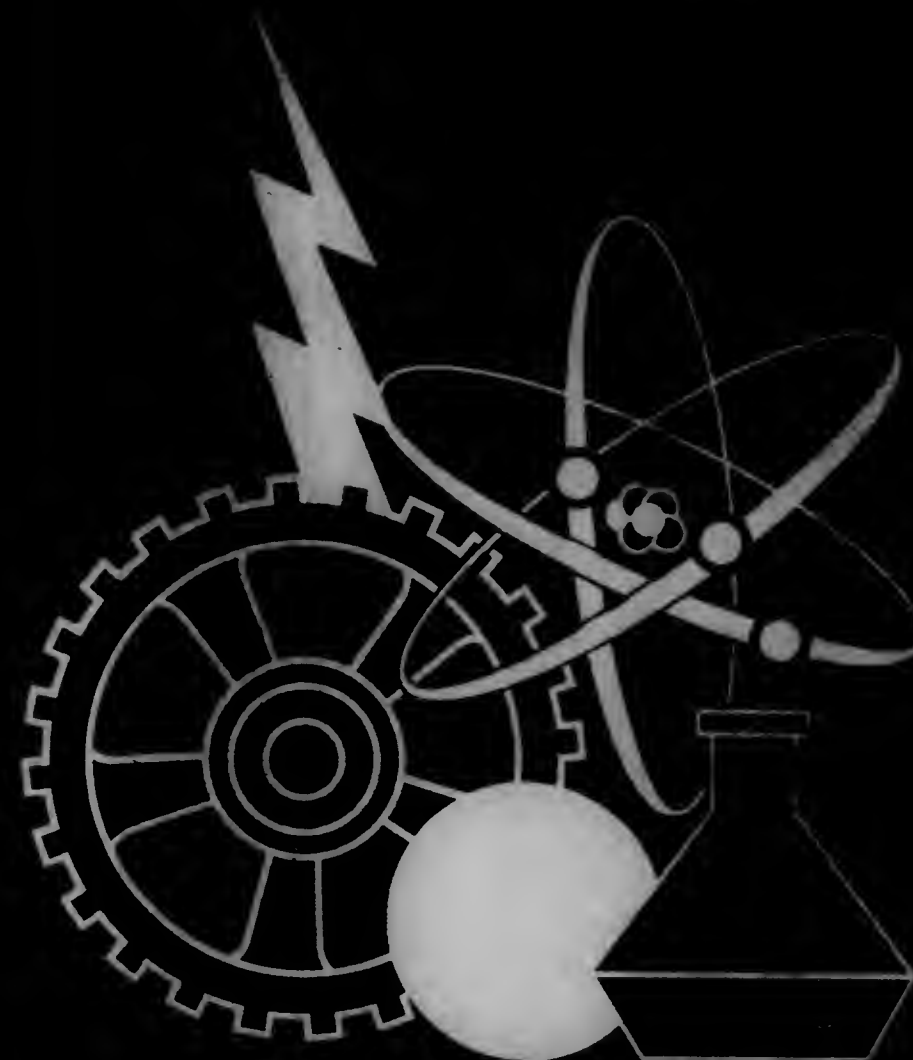
Vol. 1191 Number 4

# OFFICIAL GAZETTE

of the  
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

October 22, 1996



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

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UNITED STATES PATENT AND TRADEMARK OFFICE  
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CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1191 OG 93
Notice of Maintenance Fees Payable	1191 OG 93
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee	1191 OG 94
Reissue Applications Filed	1191 OG 101
Requests for Reexaminations Filed	1191 OG 101
Notice of Expiration of Trademark Registrations Due to Failure to Renew	1191 OG 102
Patent Term Extended Under 35 U.S.C. §156	1191 OG 104
Service by Publication	1191 OG 104
Change to Patent Practice and Procedure	1191 OG 105
Patent Certificates of Corrections	1191 OG 148
Summary of Final Decisions Issued by the Trademark Trial and Appeal Board	1191 OG 149
Special Boxes for Mail	1191 OG 150
Reference Collections of U.S. Patents Available for Public Use in	
Patent Depository Libraries	1191 OG 152
Patent Examining Corps	1191 OG 154
Condition of Trademark Applications	1191 OG 155
Reissue Patents Granted (35,353)	2335
Plant Patents Granted (9,664)	2339
Patents Granted	
General and Mechanical (5,566,389)	2341
Chemical (5,567,205)	2627
Electrical (5,567,863)	2821
Design Patents Granted (374,753)	3089
Index of Patentees	PI 1
Indices of Reissue, Reexaminations, Design and Plant Patents	PI 99
Classification of	
Patents (Including Reissues and Reexaminations)	PI 107
Designs and Plants Applications	PI 111
Geographical Index of Residence of Inventors	
Patents (Including Reissues and Reexaminations)	PI 113
Designs and Plants Applications	PI 115
Change of Address Form	PI 117
Subscription Order Form	PI 119

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## PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1190 O.G. 3, on September 3, 1996.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective July 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1187 O.G. 73, on June 25, 1996.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1996, and were announced in the *Official Gazette* at 1189 O.G. 62, on August 20, 1996.

The schedule of PCT fees (in U.S. dollars), effective October 1, 1996, is as follows:

#### International Application (PCT Chapter I) fees:

Transmittal fee.....	230.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed.....	680.00
— Corresponding prior U.S. national application filed.....	440.00
— Supplemental search fee, per additional invention (payable only upon invitation).....	200.00
European Patent Office as ISA.....	1585.00
International fees	
Basic fee.....	677.00
Basic supplemental fee (for each page over 30).....	13.00
Designation fee per country or region	
— For the first 11 national or regional offices designated.....	164.00
— For each designation in excess of 11 offices.....	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee.....	164.00
— Confirmation fee.....	82.00

#### International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:

Handling fee.....	207.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I.....	480.00

— Additional examination fee, per additional invention (payable only upon invitation).....	140.00
— USPTO was not ISA in PCT Chapter I	730.00
— Additional examination fee, per additional invention (payable only upon invitation).....	260.00

U.S. National Stage Fees	Small Entity	Regular
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#### Basic National fee

USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4).....	48.00	96.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4).....	350.00	700.00
USPTO was ISA but not IPEA.....	385.00	770.00
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office.....	520.00	1040.00
— Search report has been prepared by the European Patent Office or the Japanese Patent Office.....	455.00	910.00

#### Other National fees

— For each independent claim in excess of 3.....	40.00	80.00
— For each claim in excess of 20.....	11.00	22.00
— For each application containing a multiple dependent claim.....	130.00	260.00
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1).....	65.00	130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1).....	130.00	130.00

Sept. 10, 1996

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

#### Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on October 19, 1993 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,253,364 through 5,255,389  
Reissue Patents based on the above identified patents.



Attention is drawn to the patents which were issued on October 17, 1989 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,873,725 through 4,875,234  
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on October 15, 1985 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,546,491 through 4,547,902  
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1996, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$510.00  
By other than a small entity .....\$1,020.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$1,025.00  
By other than a small entity .....\$2,050.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$1,540.00  
By other than a small entity .....\$3,080.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) .....\$65.00  
By other than a small entity .....\$130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable .....\$680.00  
(2) unintentional .....\$1,600.00

Notice of Expiration of Patents  
Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED August 14, 1996  
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,181	06/697,143	06/17/86
(4,464,802)	(06/312,349)	(08/14/84)
Re. 33,634	07/404,918	07/09/91
(4,763,343)	(06/910,496)	(08/09/88)
4,464,801	06/465,778	08/14/84
4,464,803	06/372,805	08/14/84
4,464,811	06/418,713	08/14/84
4,464,812	06/544,848	08/14/84
4,464,831	06/347,420	08/14/84
4,464,833	06/413,873	08/14/84
4,464,862	06/429,913	08/14/84
4,464,872	06/427,543	08/14/84
4,464,874	06/439,064	08/14/84
4,464,875	06/420,183	08/14/84
4,464,877	06/320,201	08/14/84
4,464,878	06/324,761	08/14/84
4,464,893	06/387,833	08/14/84
4,464,898	06/332,934	08/14/84
4,464,901	06/413,640	08/14/84
4,464,904	06/496,080	08/14/84
4,464,907	06/500,269	08/14/84
4,464,920	06/437,362	08/14/84
4,464,924	06/440,339	08/14/84
4,464,929	06/303,912	08/14/84
4,464,934	06/413,410	08/14/84
4,464,940	06/397,305	08/14/84
4,464,949	06/366,512	08/14/84
4,464,959	06/401,759	08/14/84
4,464,965	06/441,014	08/14/84
4,464,971	06/314,376	08/14/84
4,464,974	06/381,930	08/14/84
4,464,976	06/356,553	08/14/84
4,464,980	06/272,530	08/14/84
4,464,991	06/345,761	08/14/84
4,464,994	06/393,719	08/14/84
4,465,003	06/558,384	08/14/84
4,465,007	06/437,315	08/14/84
4,465,041	06/324,149	08/14/84
4,465,044	06/348,294	08/14/84
4,465,053	06/526,717	08/14/84
4,465,056	06/266,466	08/14/84
4,465,060	06/366,255	08/14/84
4,465,067	06/418,981	08/14/84
4,465,084	06/460,270	08/14/84
4,465,088	06/467,759	08/14/84
4,465,093	06/414,829	08/14/84
4,465,105	06/423,265	08/14/84
4,465,106	06/350,527	08/14/84
4,465,112	06/369,886	08/14/84
4,465,115	06/478,300	08/14/84
4,465,117	06/284,712	08/14/84
4,465,119	06/298,328	08/14/84
4,465,123	06/363,940	08/14/84
4,465,131	06/439,759	08/14/84
4,465,137	06/392,415	08/14/84
4,465,142	06/325,128	08/14/84
4,465,144	06/468,218	08/14/84
4,465,153	06/228,496	08/14/84
4,465,154	06/244,235	08/14/84

Patent Number	Serial Number	Issue Date	4,465,459	06/336,974	08/14/84
4,465,157	06/414,736	08/14/84	4,465,462	06/489,190	08/14/84
4,465,158	06/359,431	08/14/84	4,465,474	06/450,738	08/14/84
4,465,159	06/474,617	08/14/84	4,465,475	06/447,968	08/14/84
4,465,169	06/336,003	08/14/84	4,465,478	06/434,223	08/14/84
4,465,172	06/296,943	08/14/84	4,465,487	06/384,189	08/14/84
4,465,173	06/272,066	08/14/84	4,465,498	06/395,623	08/14/84
4,465,175	06/429,930	08/14/84	4,465,500	06/422,042	08/14/84
4,465,176	06/407,369	08/14/84	4,465,504	06/350,520	08/14/84
4,465,191	06/388,312	08/14/84	4,465,507	06/366,422	08/14/84
4,465,192	06/400,405	08/14/84	4,465,511	06/551,886	08/14/84
4,465,195	06/345,802	08/14/84	4,465,513	06/538,474	08/14/84
4,465,212	06/400,373	08/14/84	4,465,516	06/474,047	08/14/84
4,465,213	06/450,290	08/14/84	4,465,522	06/500,163	08/14/84
4,465,217	06/364,571	08/14/84	4,465,526	06/422,368	08/14/84
4,465,221	06/425,723	08/14/84	4,465,528	06/395,907	08/14/84
4,465,229	06/436,742	08/14/84	4,465,530	06/415,999	08/14/84
4,465,230	06/397,554	08/14/84	4,465,531	06/442,582	08/14/84
4,465,233	06/389,951	08/14/84	4,465,532	06/549,470	08/14/84
4,465,242	06/395,036	08/14/84	4,465,535	06/531,317	08/14/84
4,465,252	06/483,137	08/14/84	4,465,536	06/373,247	08/14/84
4,465,258	06/324,460	08/14/84	4,465,537	06/379,631	08/14/84
4,465,259	06/383,594	08/14/84	4,465,540	06/250,949	08/14/84
4,465,260	06/313,801	08/14/84	4,465,546	06/413,929	08/14/84
4,465,261	06/389,953	08/14/84	4,465,547	06/537,059	08/14/84
4,465,269	06/445,147	08/14/84	4,465,548	06/423,422	08/14/84
4,465,270	06/421,393	08/14/84	4,465,553	06/551,898	08/14/84
4,465,272	06/412,991	08/14/84	4,465,561	06/467,153	08/14/84
4,465,273	06/361,238	08/14/84	4,465,562	06/347,147	08/14/84
4,465,281	06/451,868	08/14/84	4,465,566	06/400,198	08/14/84
4,465,285	06/398,232	08/14/84	4,465,572	06/466,944	08/14/84
4,465,289	06/344,529	08/14/84	4,465,576	06/475,948	08/14/84
4,465,294	06/282,784	08/14/84	4,465,577	06/480,935	08/14/84
4,465,298	06/345,109	08/14/84	4,465,578	06/442,309	08/14/84
4,465,299	06/431,755	08/14/84	4,465,584	06/474,902	08/14/84
4,465,300	06/445,724	08/14/84	4,465,585	06/363,559	08/14/84
4,465,302	06/409,547	08/14/84	4,465,597	06/291,439	08/14/84
4,465,303	06/387,427	08/14/84	4,465,603	06/445,742	08/14/84
4,465,311	06/426,171	08/14/84	4,465,604	06/502,786	08/14/84
4,465,317	06/312,924	08/14/84	4,465,608	06/391,504	08/14/84
4,465,319	06/306,911	08/14/84	4,465,615	06/411,709	08/14/84
4,465,326	06/448,859	08/14/84	4,465,615	06/488,763	08/14/84
4,465,334	06/432,104	08/14/84	4,465,622	06/385,872	08/14/84
4,465,335	06/316,987	08/14/84	4,465,632	06/398,729	08/14/84
4,465,336	06/433,756	08/14/84	4,465,633	06/441,360	08/14/84
4,465,337	06/330,264	08/14/84	4,465,640	06/386,725	08/14/84
4,465,338	06/355,072	08/14/84	4,465,641	06/390,864	08/14/84
4,465,339	06/334,498	08/14/84	4,465,646	06/441,961	08/14/84
4,465,340	06/242,161	08/14/84	4,465,647	06/343,081	08/14/84
4,465,350	06/348,183	08/14/84	4,465,653	06/259,686	08/14/84
4,465,351	06/328,681	08/14/84	4,465,659	06/400,310	08/14/84
4,465,354	06/424,741	08/14/84	4,465,664	06/316,288	08/14/84
4,465,356	06/402,813	08/14/84	4,465,670	06/401,144	08/14/84
4,465,357	06/355,834	08/14/84	4,465,673	06/456,781	08/14/84
4,465,358	06/366,341	08/14/84	4,465,674	06/529,828	08/14/84
4,465,358	06/379,947	08/14/84	4,465,684	06/323,153	08/14/84
4,465,361	06/439,151	08/14/84	4,465,687	06/381,280	08/14/84
4,465,364	06/403,611	08/14/84	4,465,688	06/393,647	08/14/84
4,465,370	06/279,215	08/14/84	4,465,691	06/469,454	08/14/84
4,465,375	06/259,080	08/14/84	4,465,692	06/455,197	08/14/84
4,465,378	06/448,054	08/14/84	4,465,694	06/328,268	08/14/84
4,465,382	06/239,727	08/14/84	4,465,696	06/455,018	08/14/84
4,465,389	06/417,571	08/14/84	4,465,698	06/374,142	08/14/84
4,465,390	06/481,708	08/14/84	4,465,700	06/487,303	08/14/84
4,465,391	06/350,971	08/14/84	4,465,703	06/399,715	08/14/84
4,465,397	06/291,319	08/14/84	4,465,705	06/466,142	08/14/84
4,465,398	06/341,991	08/14/84	4,465,709	06/389,681	08/14/84
4,465,399	06/346,186	08/14/84	4,465,715	06/277,972	08/14/84
4,465,400	06/335,811	08/14/84	4,465,716	06/384,354	08/14/84
4,465,417	06/310,814	08/14/84	4,465,720	06/365,578	08/14/84
4,465,433	06/458,654	08/14/84	4,465,728	06/372,528	08/14/84
4,465,434	06/372,913	08/14/84	4,465,729	06/482,182	08/14/84
4,465,440	06/511,694	08/14/84	4,465,732	06/494,837	08/14/84
4,465,442	06/331,798	08/14/84	4,465,733	06/534,653	08/14/84
4,465,445	06/327,057	08/14/84	4,465,734	06/374,907	08/14/84
4,465,454	06/480,017	08/14/84	4,465,735	06/422,464	08/14/84
4,465,457	06/308,139	08/14/84	4,465,736	06/435,184	08/14/84
4,465,458	06/387,686	08/14/84	4,465,739	06/434,150	08/14/84
			4,465,743	06/449,966	08/14/84



Patent Number	Serial Number	Issue Date	4,466,036	06/461,174	08/14/84
4,465,746	06/509,132	08/14/84	4,466,038	06/344,853	08/14/84
4,465,752	06/376,101	08/14/84	4,466,045	06/511,416	08/14/84
4,465,757	06/533,530	08/14/84	4,466,047	06/290,431	08/14/84
4,465,758	06/527,467	08/14/84	4,466,050	06/513,131	08/14/84
4,465,759	06/466,268	08/14/84	4,466,054	06/381,445	08/14/84
4,465,761	06/351,379	08/14/84	4,466,062	06/412,617	08/14/84
4,465,768	06/397,903	08/14/84	4,466,064	06/527,375	08/14/84
4,465,772	06/307,578	08/14/84	4,466,066	06/311,648	08/14/84
4,465,775	06/381,267	08/14/84	4,466,072	06/321,619	08/14/84
4,465,780	06/434,201	08/14/84	4,466,077	06/305,765	08/14/84
4,465,784	06/525,624	08/14/84	4,466,082	06/345,120	08/14/84
4,465,792	06/391,514	08/14/84	4,466,085	06/314,724	08/14/84
4,465,795	06/454,707	08/14/84	4,466,092	06/453,268	08/14/84
4,465,797	06/514,076	08/14/84	4,466,093	06/453,266	08/14/84
4,465,798	06/357,573	08/14/84	4,466,094	06/453,267	08/14/84
4,465,801	06/374,197	08/14/84	4,466,096	06/357,222	08/14/84
4,465,802	06/436,669	08/14/84	4,466,098	06/387,700	08/14/84
4,465,805	06/565,073	08/14/84	4,466,099	06/349,483	08/14/84
4,465,806	06/466,859	08/14/84	4,466,101	06/288,011	08/14/84
4,465,810	06/394,076	08/14/84	4,466,102	06/265,699	08/14/84
4,465,811	06/382,315	08/14/84	4,466,107	06/301,467	08/14/84
4,465,813	06/498,833	08/14/84	4,466,109	06/367,184	08/14/84
4,465,819	06/483,990	08/14/84	4,466,110	06/327,890	08/14/84
4,465,821	06/504,666	08/14/84	4,466,113	06/345,183	08/14/84
4,465,823	06/461,050	08/14/84	4,466,123	06/282,315	08/14/84
4,465,835	06/486,425	08/14/84	4,761,840	07/110,591	08/09/88
4,465,837	06/384,813	08/14/84	4,761,841	07/048,568	08/09/88
4,465,841	06/427,884	08/14/84	4,761,842	07/005,771	08/09/88
4,465,852	06/330,010	08/14/84	4,761,847	07/066,519	08/09/88
4,465,854	06/244,578	08/14/84	4,761,852	06/909,240	08/09/88
4,465,857	06/454,281	08/14/84	4,761,853	07/038,518	08/09/88
4,465,858	06/515,405	08/14/84	4,761,860	07/030,628	08/09/88
4,465,862	06/420,082	08/14/84	4,761,861	07/017,707	08/09/88
4,465,864	06/404,543	08/14/84	4,761,870	07/082,208	08/09/88
4,465,865	06/350,905	08/14/84	4,761,872	07/004,881	08/09/88
4,465,867	06/387,601	08/14/84	4,761,879	06/834,095	08/09/88
4,465,868	06/387,602	08/14/84	4,761,884	06/921,026	08/09/88
4,465,870	06/387,719	08/14/84	4,761,888	07/037,659	08/09/88
4,465,872	06/391,445	08/14/84	4,761,891	07/120,736	08/09/88
4,465,875	06/423,929	08/14/84	4,761,895	06/674,570	08/09/88
4,465,880	06/257,395	08/14/84	4,761,896	07/082,574	08/09/88
4,465,881	06/530,294	08/14/84	4,761,902	07/004,665	08/09/88
4,465,882	06/530,295	08/14/84	4,761,907	06/904,498	08/09/88
4,465,884	06/408,954	08/14/84	4,761,915	07/041,928	08/09/88
4,465,885	06/512,275	08/14/84	4,761,922	06/942,129	08/09/88
4,465,886	06/502,868	08/14/84	4,761,927	07/044,288	08/09/88
4,465,896	06/445,595	08/14/84	4,761,933	06/888,141	08/09/88
4,465,901	06/279,833	08/14/84	4,761,935	07/055,916	08/09/88
4,465,909	06/413,183	08/14/84	4,761,937	07/107,300	08/09/88
4,465,918	06/454,098	08/14/84	4,761,943	06/698,700	08/09/88
4,465,919	06/245,340	08/14/84	4,761,946	07/013,789	08/09/88
4,465,922	06/410,009	08/14/84	4,761,949	07/104,218	08/09/88
4,465,932	06/302,297	08/14/84	4,761,951	07/097,142	08/09/88
4,465,942	06/426,921	08/14/84	4,761,953	06/945,970	08/09/88
4,465,950	06/402,247	08/14/84	4,761,954	07/026,181	08/09/88
4,465,951	06/477,546	08/14/84	4,761,955	07/074,049	08/09/88
4,465,957	06/467,197	08/14/84	4,761,956	06/892,871	08/09/88
4,465,960	06/406,360	08/14/84	4,761,957	06/790,105	08/09/88
4,465,973	06/378,555	08/14/84	4,761,958	06/802,604	08/09/88
4,465,980	06/422,449	08/14/84	4,761,959	07/138,715	08/09/88
4,465,982	06/349,955	08/14/84	4,761,964	07/058,717	08/09/88
4,465,984	06/376,315	08/14/84	4,761,975	07/026,015	08/09/88
4,465,990	06/310,670	08/14/84	4,761,987	07/090,245	08/09/88
4,465,991	06/483,157	08/14/84	4,761,996	07/020,104	08/09/88
4,466,000	06/352,733	08/14/84	4,761,999	06/915,766	08/09/88
4,466,002	06/349,470	08/14/84	4,762,000	06/935,582	08/09/88
4,466,010	06/366,559	08/14/84	4,762,003	07/044,619	08/09/88
4,466,012	06/392,348	08/14/84	4,762,004	06/911,369	08/09/88
4,466,014	06/429,884	08/14/84	4,762,006	07/033,150	08/09/88
4,466,018	06/379,959	08/14/84	4,762,010	06/903,686	08/09/88
4,466,020	06/408,110	08/14/84	4,762,018	07/073,687	08/09/88
4,466,021	06/420,680	08/14/84	4,762,023	07/046,904	08/09/88
4,466,022	06/299,348	08/14/84	4,762,028	07/026,155	08/09/88
4,466,025	06/303,065	08/14/84	4,762,029	07/111,009	08/09/88
4,466,026	06/349,519	08/14/84	4,762,030	06/904,559	08/09/88
4,466,030	06/348,329	08/14/84	4,762,031	07/017,710	08/09/88
4,466,035	06/352,498	08/14/84	4,762,032	07/017,731	08/09/88
			4,762,033	07/011,264	08/09/88
			4,762,034		

Patent Number	Serial Number	Issue Date	4,762,285	07/042,843	08/09/88
4,762,039	06/905,800	08/09/88	4,762,286	07/105,506	08/09/88
4,762,040	07/038,360	08/09/88	4,762,287	07/015,275	08/09/88
4,762,041	07/017,529	08/09/88	4,762,290	07/074,709	08/09/88
4,762,045	07/026,782	08/09/88	4,762,292	07/009,147	08/09/88
4,762,047	06/945,809	08/09/88	4,762,294	07/094,824	08/09/88
4,762,048	06/917,546	08/09/88	4,762,295	06/934,909	08/09/88
4,762,062	07/024,856	08/09/88	4,762,298	07/028,934	08/09/88
4,762,063	07/006,179	08/09/88	4,762,299	07/056,699	08/09/88
4,762,065	07/093,831	08/09/88	4,762,302	07/078,682	08/09/88
4,762,069	06/929,011	08/09/88	4,762,303	07/002,748	08/09/88
4,762,072	06/916,424	08/09/88	4,762,306	06/808,812	08/09/88
4,762,074	06/878,744	08/09/88	4,762,311	07/078,514	08/09/88
4,762,084	07/030,828	08/09/88	4,762,324	07/007,097	08/09/88
4,762,087	06/931,088	08/09/88	4,762,327	07/020,898	08/09/88
4,762,089	06/806,665	08/09/88	4,762,331	06/925,302	08/09/88
4,762,090	06/907,110	08/09/88	4,762,332	06/875,135	08/09/88
4,762,095	07/050,391	08/09/88	4,762,334	07/116,166	08/09/88
4,762,097	06/946,992	08/09/88	4,762,336	07/054,788	08/09/88
4,762,102	07/102,678	08/09/88	4,762,343	07/096,046	08/09/88
4,762,105	06/850,149	08/09/88	4,762,346	07/075,777	08/09/88
4,762,107	06/557,392	08/09/88	4,762,352	06/934,891	08/09/88
4,762,108	07/028,315	08/09/88	4,762,354	06/929,993	08/09/88
4,762,111	06/888,955	08/09/88	4,762,356	06/938,712	08/09/88
4,762,117	07/021,461	08/09/88	4,762,358	07/036,194	08/09/88
4,762,118	07/078,711	08/09/88	4,762,367	07/006,791	08/09/88
4,762,119	07/078,712	08/09/88	4,762,368	07/026,859	08/09/88
4,762,120	07/059,199	08/09/88	4,762,369	07/013,216	08/09/88
4,762,132	06/851,837	08/09/88	4,762,374	07/026,043	08/09/88
4,762,134	06/891,561	08/09/88	4,762,376	07/032,341	08/09/88
4,762,135	06/798,337	08/09/88	4,762,377	06/945,098	08/09/88
4,762,137	06/788,774	08/09/88	4,762,380	06/875,448	08/09/88
4,762,141	06/772,812	08/09/88	4,762,388	06/712,404	08/09/88
4,762,146	06/886,873	08/09/88	4,762,390	07/021,829	08/09/88
4,762,153	07/003,557	08/09/88	4,762,395	07/150,481	08/09/88
4,762,154	07/029,204	08/09/88	4,762,401	06/858,959	08/09/88
4,762,157	07/061,802	08/09/88	4,762,402	07/040,086	08/09/88
4,762,160	06/899,015	08/09/88	4,762,413	06/769,965	08/09/88
4,762,161	07/004,928	08/09/88	4,762,414	06/850,493	08/09/88
4,762,172	06/877,038	08/09/88	4,762,420	07/030,176	08/09/88
4,762,178	07/099,649	08/09/88	4,762,426	06/943,418	08/09/88
4,762,179	06/892,814	08/09/88	4,762,431	06/856,528	08/09/88
4,762,180	07/012,094	08/09/88	4,762,440	06/874,858	08/09/88
4,762,182	06/941,145	08/09/88	4,762,453	06/917,652	08/09/88
4,762,183	06/917,110	08/09/88	4,762,462	07/124,599	08/09/88
4,762,185	07/000,561	08/09/88	4,762,465	07/033,087	08/09/88
4,762,187	07/079,024	08/09/88	4,762,467	06/944,630	08/09/88
4,762,188	07/012,683	08/09/88	4,762,468	07/086,925	08/09/88
4,762,190	07/093,555	08/09/88	4,762,474	06/835,111	08/09/88
4,762,191	06/870,715	08/09/88	4,762,477	06/913,349	08/09/88
4,762,193	07/005,577	08/09/88	4,762,482	07/104,400	08/09/88
4,762,199	06/935,526	08/09/88	4,762,486	07/025,752	08/09/88
4,762,205	07/051,594	08/09/88	4,762,491	07/050,903	08/09/88
4,762,206	06/930,738	08/09/88	4,762,492	07/056,240	08/09/88
4,762,229	07/069,108	08/09/88	4,762,496	07/014,434	08/09/88
4,762,230	06/916,687	08/09/88	4,762,497	07/029,340	08/09/88
4,762,234	07/036,908	08/09/88	4,762,498	06/474,846	08/09/88
4,762,238	06/835,196	08/09/88	4,762,501	06/904,913	08/09/88
4,762,241	07/011,007	08/09/88	4,762,502	06/921,552	08/09/88
4,762,245	07/028,014	08/09/88	4,762,503	06/903,033	08/09/88
4,762,246	07/087,676	08/09/88	4,762,525	07/062,142	08/09/88
4,762,247	07/004,885	08/09/88	4,762,532	07/072,200	08/09/88
4,762,248	07/048,905	08/09/88	4,762,539	06/924,918	08/09/88
4,762,249	06/405,642	08/09/88	4,762,546	07/037,492	08/09/88
4,762,250	06/796,765	08/09/88	4,762,548	06/764,290	08/09/88
4,762,253	07/081,774	08/09/88	4,762,550	07/085,026	08/09/88
4,762,254	06/924,245	08/09/88	4,762,554	06/928,925	08/09/88
4,762,256	06/932,746	08/09/88	4,762,557	07/103,977	08/09/88
4,762,257	06/926,883	08/09/88	4,762,559	07/079,428	08/09/88
4,762,261	06/915,636	08/09/88	4,762,563	06/948,470	08/09/88
4,762,264	07/095,485	08/09/88	4,762,565	06/925,334	08/09/88
4,762,266	07/028,498	08/09/88	4,762,576	06/426,475	08/09/88
4,762,268	06/858,623	08/09/88	4,762,579	06/937,001	08/09/88
4,762,269	06/866,597	08/09/88	4,762,582	06/810,828	08/09/88
4,762,273	07/046,064	08/09/88	4,762,586	07/074,077	08/09/88
4,762,280	06/905,000	08/09/88	4,762,596	07/087,835	08/09/88
4,762,282	07/036,921	08/09/88	4,762,600	07/074,833	08/09/88
4,762,284	06/879,292	08/09/88	4,762,605	07/008,655	08/09/88
			4,762,615	07/071,328	08/09/88

Patent Number	Serial Number	Issue Date			
4,762,616	06/943,356	08/09/88	4,762,893	06/812,376	08/09/88
4,762,617	07/003,667	08/09/88	4,762,902	06/809,591	08/09/88
4,762,623	06/930,572	08/09/88	4,762,905	06/735,635	08/09/88
4,762,627	07/030,657	08/09/88	4,762,909	07/099,946	08/09/88
4,762,628	06/838,986	08/09/88	4,762,910	06/897,384	08/09/88
4,762,636	07/017,381	08/09/88	4,762,911	06/891,656	08/09/88
4,762,637	06/931,361	08/09/88	4,762,917	06/765,080	08/09/88
4,762,642	07/059,658	08/09/88	4,762,922	07/070,286	08/09/88
4,762,649	07/009,435	08/09/88	4,762,927	06/884,649	08/09/88
4,762,651	07/054,181	08/09/88	4,762,932	06/869,615	08/09/88
4,762,653	06/925,470	08/09/88	4,762,933	06/886,492	08/09/88
4,762,661	06/721,350	08/09/88	4,762,934	06/567,569	08/09/88
4,762,662	06/793,501	08/09/88	4,762,938	07/103,120	08/09/88
4,762,669	07/050,833	08/09/88	4,762,943	06/880,070	08/09/88
4,762,670	06/741,523	08/09/88	4,762,944	07/025,339	08/09/88
4,762,672	06/787,390	08/09/88	4,762,948	07/071,306	08/09/88
4,762,673	07/004,016	08/09/88	4,762,961	07/088,918	08/09/88
4,762,676	06/752,272	08/09/88	4,762,964	06/912,226	08/09/88
4,762,684	07/003,046	08/09/88	4,762,967	07/069,134	08/09/88
4,762,685	06/919,167	08/09/88	4,762,974	07/004,647	08/09/88
4,762,686	06/872,118	08/09/88	4,762,975	07/120,679	08/09/88
4,762,692	07/013,885	08/09/88	4,762,981	07/022,410	08/09/88
4,762,693	07/039,792	08/09/88	4,762,991	07/056,582	08/09/88
4,762,694	07/088,525	08/09/88	4,763,001	06/904,243	08/09/88
4,762,707	06/736,334	08/09/88	4,763,007	06/811,705	08/09/88
4,762,711	06/833,102	08/09/88	4,763,011	06/768,759	08/09/88
4,762,715	07/110,648	08/09/88	4,763,040	06/945,111	08/09/88
4,762,721	06/859,060	08/09/88	4,763,042	06/736,474	08/09/88
4,762,722	07/070,666	08/09/88	4,763,049	07/058,916	08/09/88
4,762,723	06/877,799	08/09/88	4,763,050	07/064,263	08/09/88
4,762,729	07/126,884	08/09/88	4,763,051	07/110,644	08/09/88
4,762,730	06/903,511	08/09/88	4,763,063	06/759,627	08/09/88
4,762,733	06/844,109	08/09/88	4,763,078	06/844,517	08/09/88
4,762,734	06/934,362	08/09/88	4,763,082	07/046,533	08/09/88
4,762,735	07/129,506	08/09/88	4,763,090	07/135,344	08/09/88
4,762,739	07/033,025	08/09/88	4,763,101	06/718,951	08/09/88
4,762,743	07/080,042	08/09/88	4,763,109	06/815,547	08/09/88
4,762,747	06/891,655	08/09/88	4,763,113	06/910,921	08/09/88
4,762,754	07/111,544	08/09/88	4,763,126	06/926,896	08/09/88
4,762,776	07/074,706	08/09/88	4,763,129	07/026,611	08/09/88
4,762,790	06/823,859	08/09/88	4,763,132	07/083,895	08/09/88
4,762,793	06/840,856	08/09/88	4,763,134	06/898,262	08/09/88
4,762,795	06/868,620	08/09/88	4,763,149	07/094,095	08/09/88
4,762,797	06/849,600	08/09/88	4,763,151	07/050,093	08/09/88
4,762,799	06/775,563	08/09/88	4,763,157	07/091,617	08/09/88
4,762,800	06/604,080	08/09/88	4,763,165	06/838,336	08/09/88
4,762,808	07/064,641	08/09/88	4,763,166	06/910,665	08/09/88
4,762,810	07/017,818	08/09/88	4,763,169	07/079,176	08/09/88
4,762,811	07/006,510	08/09/88	4,763,171	07/076,822	08/09/88
4,762,814	07/080,843	08/09/88	4,763,172	07/002,231	08/09/88
4,762,818	06/860,311	08/09/88	4,763,175	06/782,000	08/09/88
4,762,820	06/835,487	08/09/88	4,763,188	07/117,917	08/09/88
4,762,822	06/763,918	08/09/88	4,763,190	06/880,241	08/09/88
4,762,824	06/892,807	08/09/88	4,763,202	06/915,486	08/09/88
4,762,831	06/874,182	08/09/88	4,763,207	06/941,205	08/09/88
4,762,832	06/943,532	08/09/88	4,763,210	07/033,272	08/09/88
4,762,835	06/942,436	08/09/88	4,763,211	06/769,320	08/09/88
4,762,839	06/866,226	08/09/88	4,763,215	07/028,033	08/09/88
4,762,840	06/892,771	08/09/88	4,763,224	07/019,243	08/09/88
4,762,842	07/105,412	08/09/88	4,763,226	07/052,924	08/09/88
4,762,843	07/075,002	08/09/88	4,763,232	07/064,018	08/09/88
4,762,844	06/795,056	08/09/88	4,763,233	06/943,745	08/09/88
4,762,851	06/802,907	08/09/88	4,763,239	06/870,185	08/09/88
4,762,852	06/895,881	08/09/88	4,763,246	06/765,379	08/09/88
4,762,858	06/925,456	08/09/88	4,763,252	06/714,443	08/09/88
4,762,859	07/113,023	08/09/88	4,763,263	06/943,783	08/09/88
4,762,860	06/863,628	08/09/88	4,763,275	06/831,653	08/09/88
4,762,863	07/084,096	08/09/88	4,763,276	06/842,173	08/09/88
4,762,870	07/037,485	08/09/88	4,763,283	06/817,834	08/09/88
4,762,876	07/084,912	08/09/88	4,763,284	06/831,979	08/09/88
4,762,878	07/022,446	08/09/88	4,763,285	06/897,994	08/09/88
4,762,879	07/043,422	08/09/88	4,763,288	06/815,471	08/09/88
4,762,881	07/001,874	08/09/88	4,763,290	06/855,247	08/09/88
4,762,883	06/730,613	08/09/88	4,763,297	06/860,559	08/09/88
4,762,884	07/040,428	08/09/88	4,763,298	07/003,495	08/09/88
4,762,885	06/911,456	08/09/88	4,763,311	07/115,843	08/09/88
4,762,887	07/003,512	08/09/88	4,763,319	06/864,782	08/09/88
			4,763,335	07/129,376	08/09/88
			4,763,337	07/106,547	08/09/88

Patent Number	Serial Number	Issue Date	5,136,976	07/427,662	08/11/92
4,763,339	06/903,485	08/09/88	5,136,977	07/523,528	08/11/92
4,763,346	06/879,245	08/09/88	5,136,984	07/811,255	08/11/92
4,763,348	06/853,225	08/09/88	5,136,985	07/758,026	08/11/92
4,763,350	06/744,343	08/09/88	5,136,989	07/698,464	08/11/92
4,763,351	06/726,619	08/09/88	5,136,993	07/643,892	08/11/92
4,763,352	07/125,159	08/09/88	5,136,994	07/685,625	08/11/92
4,763,354	07/055,124	08/09/88	5,137,008	07/618,682	08/11/92
4,763,360	06/908,449	08/09/88	5,137,011	07/805,361	08/11/92
5,136,727	07/706,221	08/11/92	5,137,012	07/681,041	08/11/92
5,136,729	07/669,474	08/11/92	5,137,015	07/659,730	08/11/92
5,136,731	07/722,498	08/11/92	5,137,018	07/474,445	08/11/92
5,136,732	07/732,489	08/11/92	5,137,020	07/619,519	08/11/92
5,136,736	07/706,563	08/11/92	5,137,021	07/619,494	08/11/92
5,136,742	07/543,345	08/11/92	5,137,022	07/553,435	08/11/92
5,136,744	07/646,356	08/11/92	5,137,024	07/591,753	08/11/92
5,136,745	07/555,170	08/11/92	5,137,029	07/588,985	08/11/92
5,136,748	07/688,133	08/11/92	5,137,030	07/415,646	08/11/92
5,136,756	07/788,586	08/11/92	5,137,035	07/496,584	08/11/92
5,136,758	07/542,890	08/11/92	5,137,043	07/694,507	08/11/92
5,136,767	07/609,395	08/11/92	5,137,044	07/597,362	08/11/92
5,136,775	07/725,240	08/11/92	5,137,051	07/350,473	08/11/92
5,136,779	07/752,199	08/11/92	5,137,052	07/830,073	08/11/92
5,136,780	07/708,066	08/11/92	5,137,053	07/735,791	08/11/92
5,136,784	07/624,077	08/11/92	5,137,054	07/806,236	08/11/92
5,136,785	07/805,888	08/11/92	5,137,066	07/640,244	08/11/92
5,136,786	07/729,410	08/11/92	5,137,071	07/382,600	08/11/92
5,136,787	07/770,485	08/11/92	5,137,078	07/522,136	08/11/92
5,136,791	07/619,765	08/11/92	5,137,079	07/633,512	08/11/92
5,136,795	07/815,415	08/11/92	5,137,085	07/538,828	08/11/92
5,136,797	07/702,362	08/11/92	5,137,086	07/748,671	08/11/92
5,136,798	07/632,164	08/11/92	5,137,087	07/741,859	08/11/92
5,136,799	07/654,038	08/11/92	5,137,091	07/539,809	08/11/92
5,136,802	07/712,699	08/11/92	5,137,096	07/763,330	08/11/92
5,136,804	07/327,616	08/11/92	5,137,097	07/606,087	08/11/92
5,136,806	07/565,017	08/11/92	5,137,098	07/754,237	08/11/92
5,136,815	07/637,651	08/11/92	5,137,100	07/642,218	08/11/92
5,136,816	07/602,278	08/11/92	5,137,104	07/825,806	08/11/92
5,136,819	07/649,076	08/11/92	5,137,106	07/707,498	08/11/92
5,136,821	07/604,806	08/11/92	5,137,107	07/492,764	08/11/92
5,136,822	07/413,548	08/11/92	5,137,110	07/574,857	08/11/92
5,136,823	07/640,549	08/11/92	5,137,114	07/783,358	08/11/92
5,136,830	07/666,573	08/11/92	5,137,125	07/630,617	08/11/92
5,136,847	07/722,040	08/11/92	5,137,129	07/709,361	08/11/92
5,136,854	07/706,328	08/11/92	5,137,134	07/599,009	08/11/92
5,136,869	07/678,855	08/11/92	5,137,147	07/785,989	08/11/92
5,136,870	07/478,698	08/11/92	5,137,150	07/591,265	08/11/92
5,136,876	07/481,912	08/11/92	5,137,151	07/799,705	08/11/92
5,136,881	07/568,127	08/11/92	5,137,153	07/696,436	08/11/92
5,136,886	07/609,723	08/11/92	5,137,154	07/783,807	08/11/92
5,136,892	07/764,883	08/11/92	5,137,157	07/569,193	08/11/92
5,136,893	07/518,383	08/11/92	5,137,158	07/723,764	08/11/92
5,136,896	07/723,843	08/11/92	5,137,160	07/593,312	08/11/92
5,136,902	06/646,563	08/11/92	5,137,162	07/663,453	08/11/92
5,136,905	07/651,729	08/11/92	5,137,165	07/773,558	08/11/92
5,136,908	07/737,454	08/11/92	5,137,167	07/596,522	08/11/92
5,136,911	07/519,504	08/11/92	5,137,169	07/622,933	08/11/92
5,136,920	07/620,278	08/11/92	5,137,175	07/486,591	08/11/92
5,136,928	07/582,182	08/11/92	5,137,177	07/667,713	08/11/92
5,136,932	07/664,211	08/11/92	5,137,179	07/480,666	08/11/92
5,136,933	07/642,863	08/11/92	5,137,183	07/562,584	08/11/92
5,136,934	07/678,237	08/11/92	5,137,186	07/692,682	08/11/92
5,136,936	07/792,673	08/11/92	5,137,188	07/592,337	08/11/92
5,136,938	07/560,635	08/11/92	5,137,190	07/804,103	08/11/92
5,136,941	07/591,235	08/11/92	5,137,200	07/720,230	08/11/92
5,136,942	07/347,427	08/11/92	5,137,202	07/731,107	08/11/92
5,136,943	07/821,994	08/11/92	5,137,210	07/507,749	08/11/92
5,136,947	07/675,751	08/11/92	5,137,212	07/756,043	08/11/92
5,136,952	07/616,907	08/11/92	5,137,214	07/550,733	08/11/92
5,136,953	07/502,874	08/11/92	5,137,217	07/668,990	08/11/92
5,136,954	07/580,816	08/11/92	5,137,222	07/642,317	08/11/92
5,136,957	07/684,988	08/11/92	5,137,224	07/705,338	08/11/92
5,136,959	07/648,992	08/11/92	5,137,229	07/642,212	08/11/92
5,136,963	07/698,276	08/11/92	5,137,232	07/630,074	08/11/92
5,136,964	07/506,592	08/11/92	5,137,233	07/756,347	08/11/92
5,136,965	07/806,256	08/11/92	5,137,238	07/621,234	08/11/92
5,136,971	07/634,475	08/11/92	5,137,243	07/702,753	08/11/92
5,136,973	07/533,365	08/11/92	5,137,252	07/810,724	08/11/92
			5,137,256	07/689,912	08/11/92
			5,137,262		



Patent Number	Serial Number	Issue Date	Patent Number	Serial Number	Issue Date
5,137,263	07/511,263	08/11/92	5,137,699	07/628,036	08/11/92
5,137,272	07/591,570	08/11/92	5,137,701	06/651,571	08/11/92
5,137,273	07/675,911	08/11/92	5,137,703	07/589,104	08/11/92
5,137,274	07/792,393	08/11/92	5,137,716	07/614,160	08/11/92
5,137,279	07/654,825	08/11/92	5,137,717	07/574,371	08/11/92
5,137,282	07/638,060	08/11/92	5,137,724	07/734,276	08/11/92
5,137,289	07/613,777	08/11/92	5,137,734	07/327,314	08/11/92
5,137,294	07/577,023	08/11/92	5,137,741	07/809,863	08/11/92
5,137,297	07/565,332	08/11/92	5,137,752	07/633,320	08/11/92
5,137,307	07/709,094	08/11/92	5,137,754	07/520,287	08/11/92
5,137,312	07/737,257	08/11/92	5,137,756	07/738,953	08/11/92
5,137,317	07/785,314	08/11/92	5,137,766	07/323,644	08/11/92
5,137,319	07/631,231	08/11/92	5,137,767	07/574,663	08/11/92
5,137,322	07/441,537	08/11/92	5,137,786	07/568,526	08/11/92
5,137,323	07/684,251	08/11/92	5,137,792	07/457,754	08/11/92
5,137,324	07/263,394	08/11/92	5,137,799	07/474,367	08/11/92
5,137,331	07/620,068	08/11/92	5,137,817	07/593,033	08/11/92
5,137,335	07/643,040	08/11/92	5,137,820	07/199,809	08/11/92
5,137,339	07/569,877	08/11/92	5,137,824	07/168,016	08/11/92
5,137,340	07/688,900	08/11/92	5,137,826	07/719,435	08/11/92
5,137,345	07/700,445	08/11/92	5,137,831	07/595,206	08/11/92
5,137,351	07/735,215	08/11/92	5,137,834	07/508,114	08/11/92
5,137,370	07/675,757	08/11/92	5,137,835	07/685,283	08/11/92
5,137,385	07/825,311	08/11/92	5,137,863	07/775,086	08/11/92
5,137,387	07/713,272	08/11/92	5,137,867	07/108,998	08/11/92
5,137,388	07/651,827	08/11/92	5,137,869	07/759,916	08/11/92
5,137,399	07/657,328	08/11/92	5,137,875	07/339,765	08/11/92
5,137,404	07/670,298	08/11/92	5,137,876	07/596,846	08/11/92
5,137,413	07/593,244	08/11/92	5,137,884	06/552,570	08/11/92
5,137,416	07/654,045	08/11/92	5,137,885	07/811,212	08/11/92
5,137,423	07/753,597	08/11/92	5,137,886	07/624,162	08/11/92
5,137,445	07/774,948	08/11/92	5,137,891	07/715,456	08/11/92
5,137,453	07/553,524	08/11/92	5,137,897	07/626,784	08/11/92
5,137,458	07/639,660	08/11/92	5,137,900	07/644,755	08/11/92
5,137,463	07/756,942	08/11/92	5,137,908	07/628,512	08/11/92
5,137,465	07/723,826	08/11/92	5,137,926	07/697,143	08/11/92
5,137,471	07/549,085	08/11/92	5,137,938	07/830,473	08/11/92
5,137,474	07/740,975	08/11/92	5,137,942	07/607,037	08/11/92
5,137,476	07/697,758	08/11/92	5,137,944	07/319,287	08/11/92
5,137,482	07/737,419	08/11/92	5,137,951	07/758,934	08/11/92
5,137,484	07/714,439	08/11/92	5,137,959	07/705,483	08/11/92
5,137,485	07/706,880	08/11/92	5,137,964	07/670,623	08/11/92
5,137,488	07/749,079	08/11/92	5,137,967	07/549,169	08/11/92
5,137,489	07/502,801	08/11/92	5,137,981	07/347,082	08/11/92
5,137,491	07/708,054	08/11/92	5,137,982	07/648,137	08/11/92
5,137,492	07/785,193	08/11/92	5,137,988	07/730,103	08/11/92
5,137,493	07/803,776	08/11/92	5,137,994	07/704,353	08/11/92
5,137,503	07/765,726	08/11/92	5,137,997	07/829,493	08/11/92
5,137,504	07/709,054	08/11/92	5,138,000	07/482,143	08/11/92
5,137,508	07/627,347	08/11/92	5,138,001	07/572,454	08/11/92
5,137,517	07/704,668	08/11/92	5,138,008	07/533,564	08/11/92
5,137,521	07/746,861	08/11/92	5,138,011	07/558,930	08/11/92
5,137,522	07/755,806	08/11/92	5,138,019	07/487,487	08/11/92
5,137,525	07/619,396	08/11/92	5,138,021	07/602,611	08/11/92
5,137,533	07/796,376	08/11/92	5,138,029	07/725,099	08/11/92
5,137,540	07/624,786	08/11/92	5,138,031	07/434,804	08/11/92
5,137,554	07/756,722	08/11/92	5,138,035	07/477,820	08/11/92
5,137,555	07/288,156	08/11/92	5,138,036	07/435,622	08/11/92
5,137,556	07/713,676	08/11/92	5,138,037	07/664,519	08/11/92
5,137,579	07/331,906	08/11/92	5,138,040	07/724,653	08/11/92
5,137,585	07/338,408	08/11/92	5,138,046	07/656,041	08/11/92
5,137,587	07/735,651	08/11/92	5,138,050	07/668,800	08/11/92
5,137,588	07/736,016	08/11/92	5,138,056	07/712,853	08/11/92
5,137,592	07/650,687	08/11/92	5,138,066	07/728,448	08/11/92
5,137,603	07/642,251	08/11/92	5,138,067	07/707,164	08/11/92
5,137,605	07/598,404	08/11/92	5,138,073	07/498,964	08/11/92
5,137,617	07/391,493	08/11/92	5,138,078	07/625,787	08/11/92
5,137,634	07/515,054	08/11/92	5,138,082	07/809,429	08/11/92
5,137,651	07/630,131	08/11/92	5,138,083	07/695,411	08/11/92
5,137,656	07/290,592	08/11/92	5,138,085	07/706,133	08/11/92
5,137,657	07/690,876	08/11/92	5,138,095	07/594,465	08/11/92
5,137,669	07/695,924	08/11/92	5,138,097	07/658,813	08/11/92
5,137,688	07/619,564	08/11/92	5,138,099	07/738,625	08/11/92
5,137,690	07/603,486	08/11/92	5,138,107	07/730,183	08/11/92
5,137,694	07/277,898	08/11/92	5,138,108	07/776,018	08/11/92
5,137,695	07/582,978	08/11/92	5,138,110	07/746,137	08/11/92
5,137,696	07/481,154	08/11/92	5,138,111	07/760,316	08/11/92
			5,138,116	07/505,381	08/11/92
			5,138,119	07/669,958	08/11/92

Patent Number	Serial Number	Issue Date
5,138,123	07/606,450	08/11/92
5,138,133	07/436,992	08/11/92
5,138,153	07/553,482	08/11/92
5,138,155	07/655,191	08/11/92
5,138,157	07/137,488	08/11/92
5,138,162	07/292,026	08/11/92
5,138,193	07/571,554	08/11/92
5,138,194	07/610,852	08/11/92
5,138,202	07/661,261	08/11/92
5,138,206	07/709,899	08/11/92
5,138,213	07/626,655	08/11/92
5,138,223	07/538,670	08/11/92
5,138,230	07/570,347	08/11/92
5,138,237	07/747,564	08/11/92
5,138,245	07/682,583	08/11/92
5,138,248	07/614,617	08/11/92
5,138,272	07/750,383	08/11/92
5,138,277	07/589,239	08/11/92
5,138,290	07/599,901	08/11/92
5,138,298	07/776,870	08/11/92
5,138,300	07/600,630	08/11/92
5,138,323	07/669,558	08/11/92
5,138,324	07/731,468	08/11/92
5,138,328	07/748,611	08/11/92
5,138,368	07/318,522	08/11/92
5,138,369	07/769,807	08/11/92
5,138,371	07/366,145	08/11/92
5,138,379	07/711,039	08/11/92
5,138,391	07/623,494	08/11/92
5,138,403	07/754,330	08/11/92
5,138,428	07/531,298	08/11/92
5,138,429	07/575,099	08/11/92
5,138,436	07/614,936	08/11/92
5,138,456	07/582,916	08/11/92
5,138,473	07/735,193	08/11/92
5,138,518	07/574,860	08/11/92
5,138,534	07/820,264	08/11/92
5,138,535	07/570,822	08/11/92
5,138,537	07/783,507	08/11/92
5,138,544	07/679,417	08/11/92
5,138,547	07/517,767	08/11/92
5,138,550	07/472,779	08/11/92
5,138,551	07/451,255	08/11/92
5,138,558	07/442,019	08/11/92
5,138,562	07/842,776	08/11/92
5,138,566	07/590,764	08/11/92
5,138,584	07/616,688	08/11/92
5,138,587	07/722,582	08/11/92
5,138,600	07/560,632	08/11/92
5,138,616	07/495,553	08/11/92
5,138,622	07/632,933	08/11/92
5,138,627	07/601,277	08/11/92
5,138,632	07/619,306	08/11/92
5,138,634	07/485,374	08/11/92
5,138,646	07/461,321	08/11/92
5,138,684	07/641,039	08/11/92
5,138,686	07/667,638	08/11/92
5,138,692	07/672,106	08/11/92
5,138,693	07/453,006	08/11/92

## Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

**5,086,993**, Re. S.N. 08/557,374, Nov. 13, 1995, Cl. 244/48, AIRPLANE WITH VARIABLE-INCIDENCE WING, Barnaby Wainfan, Owner of Record: *Freewing Aerial Robotics Corp.*, College Park, Md., Attorney or Agent: Linda T. Jaron, Ex. Gp.: 3104

**5,123,005**, Re. S.N. 08/667,484, June 24, 1996, Cl. 369/77.100, DISC LOADING MECHANISM IN A DISC PLAYER

FOR POSITIONING A DISC AND AN OPTICAL PICKUP WHILE REDUCING MECHANICAL SHOCKS TO THE TRAY, Tadao Kurosu, Owner of Record: *Sony Corp.*, Tokyo, Japan, Attorney or Agent: Ronald P. Kananen, Ex. Gp.: 2512

**5,130,427**, Re. S.N. 08/275,186, July 14, 1994, Cl. 544/182, (2R-2-[DI(2-PROPYL)PHOSPHONYLMETHOXY]-3-P-TOLUENESULFONYLOXY-1-TRIMETHYLACETOXPROPANE, IT'S PREPARATION AND USE, Petr Alexander, et. al., Owner of Record: *Ceskoslovenska Akademie VED Prague, Czechoslovakia*, Attorney or Agent: Max D. Hensley, Ex. Gp.: 1202

**5,142,492**, Re. S.N. 08/475,378, June 7, 1995, Cl. 365/51, SEMICONDUCTOR MEMORY DEVICE, Mitsuru Shimizu, et. al., Owner of Record: *Kabushiki Kaisha Toshiba, Kawasaki-Shi, Japan*, Attorney or Agent: Joseph M. Potenza, Ex. Gp.: 2511

**5,303,141**, Re. S.N. 08/631,802, Apr. 10, 1996, Cl. 364/149, MODEL GENERATION SYSTEM HAVING CLOSED-LOOP EXTRUSION NOZZLE POSITIONING, John S. Bat-chelder, et. al., Owner of Record: *Stratasys, Inc., Eden Prairie, Minn.*, Attorney or Agent: Daniel J. Polglaze, Ex. Gp.: 2306

**5,321,666**, Re. S.N. 08/660,977, June 12, 1996, Cl. 365/230, CONTROL CIRCUIT OF DYNAMIC RANDOM ACCESS MEMORY, Hidetada Fukunaka, et. al., Owner of Record: *Hitachi Ltd. Corp.*, Tokyo, Japan, Attorney or Agent: Frank Pietrantonio, Ex. Gp.: 2504

**5,358,630**, Re. S.N. 08/648,236, May 9, 1996, Cl. 208/120, REGENERATING ZEOLITE CRACKING CATALYSTS, Brent J. Bertus, et. al., Owner of Record: *Phillips Petroleum Co.*, Bartlesville, Okla., Attorney or Agent: Edward L. Bowman, Ex. Gp.: 1106

**5,396,450**, Re. S.N. 08/612,443, March 7, 1996, Cl. 365/51, DYNAMIC RANDOM ACCESS MEMORY DEVICE WITH THE COMBINED OPEN/FOLDED BIT-LINE PAIR ARRANGEMENT, Daisaburo Takashima, et. al., Owner of Record: *Kabushiki Kaisha Toshiba, Kawasaki-Shi, Japan*, Attorney or Agent: Gregory J. Maier, Ex. Gp.: 2508

## Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

**Re. 32,115**, Reexam. No. 90/004,372, Sept. 18, 1996, Cl. 235/381, SELF-SERVICE TERMINAL, Lawrence B. Lockwood, et. al., Owner of Record: *Inventor*, Attorney or Agent: Henri JA Charmasson, San Diego, Calif., Ex. Gp.: 2514, Requester: Owner

**4,508,376**, Reexam. No. 90/004,368, Sept. 16, 1996, Cl. 285/363, FLANGE TYPE DUCT JOINT ASSEMBLY AND SEAL ARRANGEMENT THEREFOR, Peter J. Arnoldt, Owner of Record: *Ductmate Industries, Inc.*, Pittsburgh, Pa., Attorney or Agent: George Raynovich, Jr., Buchanan Ingersoll, Pittsburgh, Pa., Ex. Gp.: 3501, Requester: Mez Industries, Inc., Baldwin Park, Calif., c/o Drummond & Duckworth, Newport, Calif.

**4,584,756**, Reexam. No. 90/004,369, Sept. 16, 1996, Cl. 029/525.02, FLANGE TYPE DUCT JOINT ASSEMBLY AND SEAL ARRANGEMENT THEREFOR, Peter J. Arnoldt, Owner of Record: *Ductmate Industries, Inc.*, Pittsburgh, Pa., Attorney or Agent: George Raynovich, Jr., Buchanan Ingersoll, Pittsburgh, Pa., Ex. Gp.: 3206, Requester: Mez Industries, Inc.,

Baldwin Park, Calif., c/o Drummond & Duckworth, Newport, Calif.

**4,662,661**, Reexam. No. 90/004,370, Sept. 16, 1996, Cl. 285/363, FLANGE TYPE DUCT JOINT ASSEMBLY AND SEAL ARRANGEMENT THEREFOR, Peter J. Arnoldt, Owner of Record: *Ductmate Industries, Inc., Pittsburgh, Pa.*, Attorney or Agent: S.J. Price & Associates Ltd., Pittsburgh, Pa., Ex. Gp.: 3501, Requester: Mez Industries, Inc., Baldwin Park, Calif., c/o Drummond & Duckworth, Newport, Calif.

**4,790,043**, Reexam. No. 90/004,364, Sept. 13, 1996, Cl. 008/151, PROCESS AND APPARATUS FOR APPLYING A CHEMICAL TO A TEXTILE SUBSTRATE, Joseph S. Chappell, Owner of Record: *Ciba Geigy Corp., Tarrytown, N.Y.*, Attorney or Agent: Kevin T. Mansfield, Ciba Geigy Corp., Tarrytown, N.Y., Ex. Gp.: 3405, Requester: Owner

**4,915,176**, Reexam. No. 90/004,366, Sept. 13, 1996, Cl. 166/371, METHOD OF TRANSPORTING A HYDRATE FORMING FLUID, Andre Sugier, et. al., Owner of Record: *Institut Francais du Petrole, Rueil Malmaison, France*, Attorney or Agent: Antonelli Terry & Wands, Washington, D.C., Ex. Gp.: 3506, Requester: Del S. Christensen, Shell Oil Co., Houston, Tex.

**5,022,688**, Reexam. No. 90/004,371, Sept. 16, 1996, Cl. 285/363, FLANGE TYPE DUCT JOINT ASSEMBLY AND SEAL ARRANGEMENT THEREFOR, Peter J. Arnoldt, Owner of Record: *Ductmate Industries, Inc., Monongahela, Pa.*, Attorney or Agent: George Raynovich, Jr., Buchanan Ingersoll, Pittsburgh, Pa., Ex. Gp.: 3501, Requester: Mez Industries, Inc., Baldwin Park, Calif., c/o Drummond & Duckworth, Newport, Calif.

**5,089,993**, Reexam. No. 90/004,357, Sept. 6, 1996, Cl. 365/063, MEMORY MODULE ARRANGED FOR DATA AND PARITY BITS, Joseph H. Neal, et. al., Owner of Record: *Texas Instruments, Inc., Dallas, Tex.*, Attorney or Agent: Kevin J. Meek, Baker & Botts, Dallas, Tex., Ex. Gp.: 2511, Requester: Owner

**5,182,109**, Reexam. No. 90/004,367, Sept. 13, 1996, Cl. 424/202.1, VACCINE PREPARATION COMPRISING A BACTERIAL TOXIN ADJUVANT, Shinichi Tamura, et. al., Owner of Record: *National Institute of Health, Tokyo, Japan; Kitasato Institute, Tokyo, Japan*, Attorney or Agent: Young & Thompson, Arlington, Va., Ex. Gp.: 1806, Requester: Owner

**5,228,132**, Reexam. No. 90/004,358, Sept. 6, 1996, Cl. 395/405, MEMORY MODULE ARRANGED FOR DATA AND PARITY BITS, Joseph H. Neal, et. al., Owner of Record: *Texas Instruments, Inc., Dallas, Tex.*, Attorney or Agent: Kevin J. Meek, Baker & Botts, Dallas, Tex., Ex. Gp.: 2309, Requester: Owner

**5,487,748**, Reexam. No. 90/004,365, Sept. 11, 1996, Cl. 606/182, BLOOD SAMPLING DEVICE, Jeremy Marshall, et. al., Owner of Record: *Owen Mumford Ltd., Oxford, UK*, Attorney or Agent: Young & Thompson, Andrew J. Patch, Arlington, Va., Ex. Gp.: 3309, Requester: Owner

#### Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

#### TRADEMARK REGISTRATIONS WHICH EXPIRED JUNE 17, 1996 DUE TO FAILURE TO RENEW

Reg. No.	Serial Number	Reg. Date
327,877	71/364,755	09/10/1935
327,893	71/365,056	09/10/1935
327,899	71/365,153	09/10/1935
327,957	71/364,385	09/10/1935
327,959	71/364,422	09/10/1935
327,965	71/364,520	09/10/1935
327,967	71/364,564	09/10/1935
327,980	71/362,532	09/10/1935
611,954	71/667,577	09/13/1955
611,957	71/672,756	09/13/1955
611,968	71/675,986	09/13/1955
611,971	71/680,440	09/13/1955
611,984	71/676,354	09/13/1955
611,988	71/677,759	09/13/1955
611,989	71/678,134	09/13/1955
611,992	71/678,555	09/13/1955
611,997	71/679,608	09/13/1955
612,008	71/677,010	09/13/1955
612,022	71/673,398	09/13/1955
612,025	71/681,547	09/13/1955
612,030	71/651,469	09/13/1955
612,038	71/677,750	09/13/1955
612,044	71/624,964	09/13/1955
612,051	71/666,913	09/13/1955
612,063	71/676,966	09/13/1955
612,065	71/659,581	09/13/1955
612,077	71/646,640	09/13/1955
612,086	71/675,568	09/13/1955
612,087	71/675,570	09/13/1955
612,089	71/675,785	09/13/1955
612,095	71/656,643	09/13/1955
612,104	71/672,262	09/13/1955
612,107	71/679,317	09/13/1955
612,108	71/679,443	09/13/1955
612,113	71/663,249	09/13/1955
612,117	71/667,450	09/13/1955
612,132	71/674,518	09/13/1955
612,149	71/676,666	09/13/1955
612,155	71/675,060	09/13/1955
612,156	71/676,299	09/13/1955
612,157	71/644,877	09/13/1955
612,179	71/664,452	09/13/1955
612,180	71/664,680	09/13/1955
612,181	71/672,583	09/13/1955
612,183	71/673,594	09/13/1955
612,189	71/663,368	09/13/1955
612,196	71/679,729	09/13/1955
612,204	71/662,738	09/13/1955
612,210	71/677,404	09/13/1955
612,215	71/668,213	09/13/1955
612,221	71/676,565	09/13/1955
612,225	71/676,836	09/13/1955
612,234	71/664,596	09/13/1955
612,244	71/675,532	09/13/1955
612,245	71/676,359	09/13/1955
612,247	71/648,278	09/13/1955
612,250	71/669,291	09/13/1955
612,251	71/676,683	09/13/1955
612,257	71/659,879	09/13/1955
612,259	71/660,924	09/13/1955
612,264	71/665,921	09/13/1955
612,280	71/675,324	09/13/1955
612,283	71/675,557	09/13/1955
612,285	71/676,063	09/13/1955
612,302	71/675,240	09/13/1955
612,307	71/656,229	09/13/1955
612,318	71/676,731	09/13/1955
612,320	71/669,644	09/13/1955
612,322	71/675,308	09/13/1955
612,327	71/655,948	09/13/1955
612,351	71/668,647	09/13/1955
612,341	71/678,176	09/13/1955
612,357	71/667,863	09/13/1955

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612,372	71/621,967	09/13/1955	1,019,965	73/036,206	09/09/1975
1,019,757	73/017,858	09/09/1975	1,019,977	73/005,120	09/09/1975
1,019,766	73/034,779	09/09/1975	1,019,980	73/016,925	09/09/1975
1,019,767	73/035,754	09/09/1975	1,019,981	73/016,930	09/09/1975
1,019,768	73/036,525	09/09/1975	1,019,984	73/019,153	09/09/1975
1,019,774	73/009,248	09/09/1975	1,019,988	73/023,867	09/09/1975
1,019,775	73/036,598	09/09/1975	1,019,989	73/024,771	09/09/1975
1,019,786	73/022,915	09/09/1975	1,019,991	73/025,084	09/09/1975
1,019,790	73/029,024	09/09/1975	1,019,992	73/025,462	09/09/1975
1,019,793	73/033,867	09/09/1975	1,019,995	73/031,929	09/09/1975
1,019,797	73/007,640	09/09/1975	1,019,996	73/032,154	09/09/1975
1,019,801	73/001,916	09/09/1975	1,020,008	73/039,854	09/09/1975
1,019,803	73/020,921	09/09/1975	1,020,011	73/040,854	09/09/1975
1,019,805	73/017,494	09/09/1975	1,020,021	73/007,001	09/09/1975
1,019,809	81/019,809	09/09/1975	1,020,023	73/014,334	09/09/1975
1,019,811	73/028,590	09/09/1975	1,020,026	73/027,621	09/09/1975
1,019,815	73/035,879	09/09/1975	1,020,027	73/027,623	09/09/1975
1,019,816	73/037,565	09/09/1975	1,020,029	73/033,444	09/09/1975
1,019,818	73/038,144	09/09/1975	1,020,030	73/042,679	09/09/1975
1,019,819	73/038,415	09/09/1975	1,020,032	73/042,710	09/09/1975
1,019,823	73/039,086	09/09/1975	1,020,033	73/043,338	09/09/1975
1,019,828	73/040,064	09/09/1975	1,020,035	73/018,873	09/09/1975
1,019,829	73/040,309	09/09/1975	1,020,040	73/043,957	09/09/1975
1,019,831	73/040,551	09/09/1975	1,020,041	73/043,987	09/09/1975
1,019,833	73/040,957	09/09/1975	1,020,047	73/026,324	09/09/1975
1,019,835	73/041,190	09/09/1975	1,020,048	73/031,439	09/09/1975
1,019,838	73/006,616	09/09/1975	1,020,053	73/013,605	09/09/1975
1,019,839	73/015,745	09/09/1975	1,020,055	73/037,480	09/09/1975
1,019,840	73/001,900	09/09/1975	1,020,057	73/000,176	09/09/1975
1,019,842	73/036,366	09/09/1975	1,020,058	73/000,535	09/09/1975
1,019,847	73/008,214	09/09/1975	1,020,061	73/012,862	09/09/1975
1,019,855	73/030,118	09/09/1975	1,020,074	73/017,108	09/09/1975
1,019,856	73/033,790	09/09/1975	1,020,075	73/022,920	09/09/1975
1,019,857	73/038,859	09/09/1975	1,020,079	73/038,714	09/09/1975
1,019,858	73/024,603	09/09/1975	1,020,080	73/038,938	09/09/1975
1,019,865	73/011,879	09/09/1975	1,020,081	73/043,599	09/09/1975
1,019,866	73/012,321	09/09/1975	1,020,088	73/032,694	09/09/1975
1,019,867	73/013,070	09/09/1975	1,020,094	73/034,068	09/09/1975
1,019,868	73/014,618	09/09/1975	1,020,097	73/031,809	09/09/1975
1,019,873	73/017,383	09/09/1975	1,020,098	73/031,842	09/09/1975
1,019,874	73/018,799	09/09/1975	1,020,099	73/032,000	09/09/1975
1,019,876	73/020,410	09/09/1975	1,020,107	73/005,971	09/09/1975
1,019,877	73/020,765	09/09/1975	1,020,108	73/007,309	09/09/1975
1,019,878	73/021,366	09/09/1975	1,020,111	73/026,281	09/09/1975
1,019,880	73/022,707	09/09/1975	1,020,112	73/027,041	09/09/1975
1,019,885	73/033,030	09/09/1975	1,020,115	73/034,612	09/09/1975
1,019,893	73/041,460	09/09/1975	1,020,117	73/035,148	09/09/1975
1,019,897	73/012,386	09/09/1975	1,020,119	73/037,369	09/09/1975
1,019,898	73/021,550	09/09/1975	1,020,122	73/040,781	09/09/1975
1,019,901	73/031,712	09/09/1975	1,020,125	73/043,219	09/09/1975
1,019,903	73/013,012	09/09/1975	1,020,128	72/443,548	09/09/1975
1,019,905	73/021,336	09/09/1975	1,020,131	72/450,191	09/09/1975
1,019,909	73/031,734	09/09/1975	1,020,135	72/432,641	09/09/1975
1,019,910	73/032,979	09/09/1975	1,020,138	72/451,416	09/09/1975
1,019,914	73/041,816	09/09/1975	1,020,140	72/463,639	09/09/1975
1,019,915	73/043,215	09/09/1975	1,020,143	72/447,553	09/09/1975
1,019,921	73/041,033	09/09/1975	1,020,144	72/447,554	09/09/1975
1,019,923	73/041,652	09/09/1975	1,020,158	72/458,583	09/09/1975
1,019,924	73/041,653	09/09/1975	1,020,161	72/440,281	09/09/1975
1,019,925	73/041,654	09/09/1975	1,020,164	72/434,416	09/09/1975
1,019,926	73/042,049	09/09/1975	1,020,165	72/447,719	09/09/1975
1,019,927	73/042,321	09/09/1975	1,020,166	72/447,748	09/09/1975
1,019,928	73/042,746	09/09/1975	1,020,169	72/429,774	09/09/1975
1,019,929	73/043,172	09/09/1975	1,020,170	72/450,178	09/09/1975
1,019,930	73/045,120	09/09/1975	1,020,171	72/459,984	09/09/1975
1,019,940	73/018,281	09/09/1975	1,020,179	72/462,362	09/09/1975
1,019,941	73/020,457	09/09/1975	1,020,184	72/433,207	09/09/1975
1,019,942	73/025,933	09/09/1975	1,020,185	72/446,350	09/09/1975
1,019,945	73/017,048	09/09/1975	1,020,187	72/446,733	09/09/1975
1,019,946	73/019,308	09/09/1975	1,020,190	72/454,113	09/09/1975
1,019,948	73/039,357	09/09/1975	1,020,191	72/457,320	09/09/1975
1,019,949	73/003,953	09/09/1975	1,020,194	72/459,165	09/09/1975
1,019,952	73/007,815	09/09/1975	1,020,198	72/441,828	09/09/1975
1,019,953	73/020,736	09/09/1975	1,020,200	72/465,909	09/09/1975
1,019,957	73/040,492	09/09/1975	1,020,201	72/426,595	09/09/1975
1,019,958	73/011,596	09/09/1975	1,020,202	72/436,356	09/09/1975
1,019,960	73/022,562	09/09/1975	1,020,208	72/409,832	09/09/1975
			1,020,209	72/439,389	09/09/1975



Reg. No.	Serial Number	Reg. Date
1,020,210	72/443,793	09/09/1975
1,020,213	72/456,608	09/09/1975
1,020,215	72/460,219	09/09/1975
1,020,218	72/443,798	09/09/1975
1,020,221	72/453,850	09/09/1975
1,020,223	72/464,399	09/09/1975
1,020,225	72/453,929	09/09/1975
1,020,226	72/454,736	09/09/1975
1,020,227	72/464,180	09/09/1975
1,020,229	72/458,999	09/09/1975
1,020,230	72/454,410	09/09/1975
1,020,233	73/039,533	09/09/1975
1,020,234	73/039,534	09/09/1975
1,020,235	73/006,880	09/09/1975
1,020,236	73/016,819	09/09/1975
1,020,242	73/012,675	09/09/1975
1,020,249	73/037,233	09/09/1975
1,020,251	72/464,344	09/09/1975

#### Patent Term Extended Under 35 U.S.C. § 156

An interim extension of the term of U.S. Patent No. 4,048,306 has been granted under 35 U.S.C. § 156(e)(2) for a period of one year from the second extended expiration date, September 13, 1996, of the patent. The patent was previously extended for one year under 35 U.S.C. § 156(d)(5). See 1167 OG 14, October 4, 1994. The patent was thereafter extended for an additional year under 35 U.S.C. § 156(e)(2). See 1182 OG 581, January 30, 1996. An application for patent term extension was filed by Eli Lilly and Company, on behalf of the patent owner Boehringer Ingelheim GmbH, based on approval of the product "DYNABAC®" by the Food and Drug Administration.

#### Patent Term Extended Under 35 U.S.C. § 156

An interim extension of the term of U.S. Patent No. 4,154,839 has been granted under 35 U.S.C. § 156(e)(2) for a period of one year from the original expiration date, November 2, 1996, of the patent. An application for patent term extension was filed by Bayer Aktiengesellschaft based on approval of the product "NISOCOR" ("Nisoldipine coat-core tablet") by the Food and Drug Administration.

#### Patent Term Extended Under 35 U.S.C. § 156

Certificates extending the terms of the following patents were issued on September 23, 1996.

U.S. Patent No. 4,275,063; Granted June 23, 1981, to Andrew M. Creighton; Original Expiration Date: June 23, 1998; Owner of Record: British Technology Group Limited; Title: Pharmaceutical Compositions; Classification: 514/252; Product Trade Name: ZINECARD™; Term Extended: Five Years.

U.S. Patent No. 4,307,100; Granted: December 22, 1981, to Nicole Langlois et al.; Original Expiration Date: August 20, 1999; Owner of Record: Centre National de la Recherche Scientifique (C.N.R.S.); Title: Nor Bis-indole Compounds Usable as Medicaments; Classification: 514/214; Product Trade Name: NAVELBINE®; Term Extended: 1,053 days.

U.S. Patent No. 4,739,101; Granted: April 19, 1988, to Jean-Pierre Bourgogne et al.; Original Expiration Date: April 27, 2007; Owner of Record: Fournier Innovation et Synergie; Title: METHOD FOR THE PREPARATION OF FIBRATES; Classification: 560/61; Product Trade Name: Lipidol®; Term Extended: 248 days.

U.S. Patent No. 4,753,935; Granted: June 28, 1988, to Peter H. Nelson et al.; Original Expiration Date: January 30, 2007; Owner of Record: Syntex (U.S.A.) Inc.; Title: Morpholinoc-ylesters of Mycophenolic Acid and Pharmaceutical Composi-

tions Classification: 514/233; Product Trade Name: CELLCEPT®; Term Extended: 824 days.

U.S. Patent No. 4,804,680; Granted: February 14, 1989, to Alexander C. Goudie et al.; Original Expiration Date: July 21, 2007; Owner of Record: Pfizer Inc.; Title: POLYCYCLIC ETHER ANTIBIOTIC; Classification: 414/460; Product Trade Name: AVIAX®; Term Extended: 237 days.

U.S. Patent No. 4,844,882; Granted: July 4, 1989, to Kenneth J. Widder; Original Expiration Date: December 29, 2007; Owner of Record: Molecular Biosystems, Inc.; Title: Concentrated Stabilized Microbubble-type Ultrasonic Imaging Agent; Classification: 424/9.52; Product Trade Name: ALBUNEX®; Term Extended: 220 days.

U.S. Patent No. 4,957,924; Granted: September 18, 1990, to Lilia M. Beauchamp; Original Expiration Date: August 4, 2008; Owner of Record: Burroughs Wellcome Co.; Title: Therapeutic Valine Esters of Acyclovir and Pharmaceutically Acceptable Salts Thereof; Classification: 514/262; Product Trade Name: VALTREX®; Term Extended: 323 days.

#### Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Leaf, Inc., Bannockburn, Ill., Reg. No. 719,752, for the mark "BRUNCH", Canc. No. 25,049.

Calculus, Inc., Minneapolis, Minn., Registration No. 1,286,555, for the mark "ABACUS AND DESIGN", Canc. No. 25,149.

The Californians, Inc., Orlando, Fla., Registration No. 1,809,269, for the mark "U.S. EAGLE AND DESIGN", Canc. No. 25,254.

The VCM Group, Inc., Prescott, Ariz., Reg. No. 693,472, for the mark "SILENT GIANT", Canc. No. 23,106.

The Murmurs, Metairie, La., Reg. No. 1,609,384, for the mark "THE MURMURS AND DESIGN", Canc. No. 23,001.

Thomas & Betts Corp., Bridgewater, N.J., Reg. No. 1,590,646, for the mark "DELTEC", Canc. No. 24,312.

Timothy A. Domenico, Marina Del Ray, Calif., Reg. No. 1,712,945, for the mark "FREEFALL PERFUME", Canc. No. 24,405.

Shelburne Shirt Co., Inc., New York, N.Y., Reg. No. 1,226,030, for the mark "PERSUADE", Canc. No. 24,706.

Ideal Industries, Ontario, Calif., Reg. No. 1,021,030, for the mark "IDEAL", Canc. No. 24,811.

Joseph S. Pickett & Sons, Inc., Dubuque, Iowa, Reg. No. 623,233, for the mark "E & B", Canc. No. 24,212.

The Cookie Man Co. Inc., Franklin Lakes, N.J., Reg. No. 1,068,646, for the mark "THE COOKIE MAN", Canc. No. 24,326.

Daniel E. Nienhauser, Dobbs Ferry, N.Y., Reg. No. 1,756,926, for the mark "I WEAR AND DESIGN", Canc. No. 24,379.

JEAN BROWN  
Technical Support Manager,  
Trademark Trial  
and Appeal Board, for  
ROBERT M. ANDERSON  
Deputy Assistant Commissioner  
for Trademarks

#### Service by Publication

A petition to cancel the registration identified below has been filed, and a copy of the petition together with the notice of institution of such proceeding is being sent to registrant at its last known address. Simultaneously therewith, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, or unless an answer or other response to the petition is filed within forty days after the mailing of the institution notice, or within an extension of time therefor, the cancellation will proceed as in the case of default.

The Suitery, LTD., Franklin Park, Ill., Reg. No. 1,187,741, for the mark "COSMO'S" and design, Canc. No. 25,334.

JEAN BROWN  
Technical Support Manager,  
Trademark Trial  
and Appeal Board, for  
ROBERT M. ANDERSON  
Deputy Assistant Commissioner  
for Trademarks

#### Department of Commerce Patent and Trademark Office

37 CFR Parts 1, 3, 5 and 7  
[Docket No. 960606163-6163-01]  
RIN: 0651-AA80

#### 1996 Changes to Patent Practice and Procedure

Agency: Patent and Trademark Office, Commerce.

Action: Notice of Proposed Rulemaking.

**Summary:** The Patent and Trademark Office (Office) is proposing to amend the rules of practice in patent cases to simplify the requirements of the rules, rearrange portions of the rules for better context, and eliminate unnecessary rules or portions thereof as part of a government-wide effort to reduce the regulatory burden on the American public. The procedure for filing of continuation and divisional applications would be simplified. Another type of simplification being proposed that would affect several rules is the acceptance of a statement that errors were made without deceptive intent, unaccompanied by any further showing of facts and circumstances. The naming of inventors would no longer be required on filing of the application in order to obtain a filing date, which would eliminate the need for certain petitions to correct inventorship.

**Dates:** Written comments must be received on or before November 25, 1996 to ensure consideration.

Comments will be available for public inspection after receipt and will be available on the Internet (address: regreform@uspto.gov). Commentators should note that since their comments will be made publicly available, information that is not desired to be made public, such as the address and phone number of the commentator, should not be included in the comments. A public hearing will not be conducted.

**Addresses:** Comments should be sent by mail message over the Internet addressed to regreform@uspto.gov.

Comments may also be submitted by mail addressed to: Box Comments - Patents, Assistant Commissioner for Patents, Washington, D.C. 20231, Attention: Jeffrey V. Nase or by FAX to (703) 308-6916. Although comments may be submitted by mail or FAX, the Office prefers to receive comments via the Internet. Where comments are submitted by mail, the Office would appreciate the comments to be electronically filed on a DOS formatted 3 1/4 inch disk along with a paper copy of the comments.

The comments will be available for public inspection in Suite 520, of One Crystal Park, 2011 Crystal Drive, Arlington, Virginia.

**For Further Information Contact:** Hiram H. Bernstein, by telephone at (703) 305-9285 or by mail addressed to: Box Comments - Patents, Assistant Commissioner for Patents, Washington, D.C. 20231 marked to the attention of Mr. Bernstein or by FAX to (703) 308-6916.

**Supplementary Information:** This proposed rule change seeks to implement President Clinton's program of reducing the regulatory burden on the American public, which program is supported by the Office as published in the *Official Gazette* on June 6, 1995. 1175 *Off. Gaz. Pat. Office* 19, 20 and 22. The proposed changes are directed towards: (1) simplification of procedures for filing continuation and divisional applications, establishing lack of deceptive intent in reissues, petition practice, and in the filing of papers correcting improperly requested small entity status; (2) elimination of unnecessary requirements, such as certain types of petitions to correct inventorship under § 1.48; (3) removal of rules and portions thereof that merely represent instructions as to the internal affairs of the Office more appropriate for inclusion in the Manual of Patent Examining Procedure (MPEP); (4) rearrangement of portions of rules to improve their context; and (5) clarification of rules to aid in understanding of the requirements that they set forth.

The Office is particularly interested in comments as to whether the proposed rules if adopted should be applied to already pending reissue oaths or declarations under the new proposed standards of § 1.175 as it is to be amended under the final rule and already pending petitions and papers under §§ 1.28(c)(2), 1.48 and 1.324 as they are to be amended under the final rule for such papers submitted prior to the effective date of any final rule change, i.e., should the advantages proposed by these suggested rule changes that are incorporated into the final rule be applied retroactively to papers submitted prior to the effective date of the final rule.

#### Discussion of Specific Rules

If Title 37 of the Code of Federal Regulations, Parts 1, 3, 5 and 7 are amended as proposed:

Section 1.4(d) paragraphs (1) and (2) would be amended to place the current subject matter of both paragraphs into paragraphs (d)(1)(i) and (ii) with a clarifying reference in paragraph (d)(1)(ii) to the submission of a copy of a copy.

Paragraph (d)(2) of § 1.4 would be amended so that the certifications set forth in the rule would be automatically made upon presenting any paper to the Office by the party presenting the paper and in an added paragraph (d)(3)(ii) identifying by the statute, 18 U.S.C. 1001 that sets forth the required standards of conduct. Sanctions would be set forth in a § 1.4(d)(3)(i) for violation of the certifications in § 1.4(d)(2) and for violations of the standards of conduct in § 1.4(d)(3)(ii).

The proposed amendments to § 1.4(d) would support proposed amendments to §§ 1.6, 1.8, 1.10, 1.27, 1.28, 1.48, 1.52, 1.55, 1.69, 1.102, 1.125, 1.137, 1.377, 1.378, 1.804, 1.805, (1.821 and 1.825 will be reviewed at a later date in connection with other matters), 3.26, and 5.4 that would delete the requirement for verification (MPEP 602) of statements of facts by applicants and other parties who are not registered to practice before the Office. The absence of a required verification has been a source of delay in the prosecution of applications, particularly where such absence is the only defect noted. The proposed change to § 1.4(d) would automatically incorporate required averments thereby eliminating the necessity for a separate verification for each statement of facts that is to be presented, except for those instances where the verification requirement is retained. Similarly, the proposed amendments to § 1.4(d) would support a proposed amendment to §§ 1.97 (§§ 1.637 and 1.673 will be reviewed at a later date in connection with other matters) that would change the requirements for certifications to requirements for statements. The oath or declaration under §§ 1.63 and affidavits under §§ 1.131 and 1.132 would not be affected. The requirement in § 5.25(a)(3) for a verified statement would be maintained, as the required explanation must include a showing of facts (evidence), not mere allegations, which will be weighed by the official deciding the petition for retroactive license. The statements in §§ 1.494(e) and 1.495(f) that verification of translations of documents filed in a language other than English may be required would be maintained, as such requirements are made rarely and only when deemed necessary (when persons persist in translations which appear on their face to be inaccurate, for example). The requirements for certification of service on parties in §§ 1.248, 1.510, 1.637 and 10.142 would be maintained.



Section 1.4 would also have a new paragraph (g) related to an applicant who has not made of record a registered attorney or agent being required to state whether assistance was received in the preparation or prosecution of a patent application. This is proposed to be transferred from § 1.33(b) for consistent contextual purposes.

Section 1.6 paragraph (c)(2) would be amended to remove the requirement that the statement be verified in accordance with the proposed change to § 1.4(d)(2).

Section 1.8 paragraph (b)(3) would be amended to remove the requirement that the statement be verified in accordance with the proposed change to § 1.4(d)(2).

Section 1.10 would be amended to remove the requirement for a statement that is verified. See comments to § 1.4(d). It is also proposed to clarify the section by substitution of "averaging to the fact" with "stating."

Section 1.14 would have the title and paragraphs (a) and (e) amended to replace the term "secrecy" by "confidence" to conform to the usage in 35 U.S.C. 122. Paragraph (a) of § 1.14 would have a reference to serial number changed to application number. Section 1.14 would also be amended to have paragraph (f) added to recognize the proposed change to § 1.47(a) and (b) that are also exceptions to maintaining pending applications in confidence by providing public notice of the prospective issuance of a pending application to nonsigning inventors.

Section 1.17 (and § 1.136(a)) would add a recitation to an extension of time fee payment for a reply filed within a fifth month after a nonstatutory or shortened statutory period for reply was set. Section 1.17(a) is specifically proposed to be subdivided into paragraphs (a)(1) through (a)(5), with paragraphs (a)(1) through (a)(4) setting forth the amounts for one-month through four-month extension fees proposed in Revision of Patent Fees for Fiscal Year 1997, 1186 *Off. Gaz. Pat. Office* 14 (May 7, 1996); 61 FR 19224 (May 1, 1996). Paragraph (a)(5) would provide the small and other than small entity amounts for the newly proposed fifth-month extension fee. Sections 1.17(b), (c) and (d) are proposed to be removed as unnecessary in view of proposed § 1.17(a)(1) through (a)(5).

Fee levels, as proposed by the Revision of Patent Fees for Fiscal Year 1997, were used in establishing the fifth-month extension of time fees for large and small entities for paragraph (a)(5) of § 1.17. A shortened statutory period for reply of one month may be set, thereby allowing a fifth month for reply within the six-month statutory period for response. Section 1.17(a) is being amended to recognize the availability of a fifth-month extension of time when a one-month or a thirty-day shortened statutory period is set (e.g., in a written requirement for restriction). The addition of a fifth-month would then also become available for replies with nonstatutory periods of time set, such as for replies to Notices to File Missing Parts of Applications.

Section 1.17(i), as proposed, would add a petition fee under § 1.59 for expungement and return of papers, delete the references to petitions under §§ 1.60 and 1.62 to accord a filing date in view of the proposed deletion of §§ 1.60 and 1.62, and to change "divisional reissues" to "multiple reissue applications." Moreover, § 1.17, as well as §§ 1.103, 1.112, 1.113, 1.133, 1.134, 1.135, 1.136, 1.142, 1.144, 1.146, 1.191, 1.192, 1.291, 1.294, 1.484, 1.485, 1.488, 1.494, 1.495, 1.530, 1.550, 1.560, (1.605, 1.617, 1.640, and 1.652 will be reviewed at a later date in connection with other matters), 1.770, 1.785, (1.821 will be reviewed at a later date in connection with other matters), and 5.3, would replace the phrases "response" and "respond" with "reply" for consistency with § 1.111.

Section 1.21(n), as proposed, would delete the reference to an improper application under §§ 1.60 or 1.62 in view of the proposed deletion of §§ 1.60 and 1.62.

Section 1.26(a) is proposed to be amended to better track the statutory language of 35 U.S.C. 42(d) by deleting "[m]oney" and "actual," adding "fee" and adding back language relating to refunds of fees paid that were not "required" that was inadvertently dropped in the July 1, 1993, publication of title 37 CFR, and from subsequent publications.

Section 1.27(a) through (d) would be amended to remove the requirement that a statement filed thereunder be "verified." See comments relating to § 1.4(d). Section 1.27(b) is proposed to be amended for clarification with the movement of a clause relating to "any verified statement" within a sentence.

Section 1.28(a) would be amended to remove the requirement for a statement that is "verified." See comments relating to § 1.4(d).

Section 1.28(a) would also be amended to provide that a new small entity statement would not be required for reissue or continued prosecution (§ 1.53(b)(3)) applications where small entity status is still proper and reliance is had on a reference to a small entity statement filed in a prior application or patent or a copy thereof is supplied.

Section 1.28(a) would be further amended to state that the payment of a small entity basic statutory filing fee in a nonprovisional continuing application, which claims benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) of a prior application or in a continuing prosecution application, or in a reissue application, wherein the prior application or the patent has small entity status, will substitute for the reference in the continuing or reissue application to the small entity statement in the prior application or in the patent, thereby establishing small entity status in such nonprovisional application.

Section 1.28(a) is also amended to require a new determination of continued entitlement to small entity status for continued prosecution applications filed under § 1.53(b)(3) and to clarify that the refiling of applications as continuations, divisions and continuation-in-part applications and the filing of reissue applications also require a new determination of continued entitlement to small entity status prior to reliance on small entity status in a prior application or patent.

Section 1.28(c) would have the requirement removed for a statement of facts explaining how an error in payment of small entity fees occurred in good faith and how and when the error was discovered. A fee deficiency payment based on the difference between fees originally paid as a small entity and the current large entity amount at the time of full payment of the fee deficiency will be deemed to constitute a belief by the party submitting the deficiency payment that small entity status was established in good faith and that the original payment of small entity fees was made in good faith. Any paper submitted under § 1.28(c) will be placed in the appropriate file without review after the processing of any check or the charging of any fee deficiency payment specifically authorized.

Section 1.33 would no longer provide that the required residence and post office address of the applicant can appear elsewhere than in the oath or declaration under § 1.63. Section 1.63(a)(3) would be amended to require that the post office address as well as the residence be identified therein and not elsewhere. Permitting the residence to be elsewhere in the application other than the oath or declaration, as in current § 1.33(a), is inconsistent with current § 1.63(c) that states the residence must appear in the oath or declaration. The requirement for placement of the post office address is proposed to be made equivalent to the requirement for the residence to eliminate confusion between the two, which often are the same destination and are usually provided in the oath or declaration. The reference in § 1.33(a) to the assignee providing a correspondence address has been moved within § 1.33(a) for clarification. Other clarifying language including a reference to § 1.34(b), use of the terms "provided," "furnished" rather than "notified," and "application" rather than "case," while "of which the Office" would be deleted.

Section 1.33(b) would be removed and the subject matter transferred to new § 1.4(g).

Section 1.41(a) (and § 1.53) would no longer require that a patent be applied for in the name of the actual inventors for an application for patent to receive a filing date. The requirement for use of full names would be moved to § 1.63(a) for better context. The requirement for naming of the inventor or inventors would be replaced with only a request that such names or an identifying name be submitted on filing of the application. The use of very short identifiers should be avoided to prevent confusion. Without supplying at least an identifying name that is specific the Office may have no ability or only a delayed ability to match any papers submitted after filing of the application and before issuance of an identifying Application number with the application file. Any identifier used that is not an inventor's name must be specific, alphanumeric characters of reasonable length, and must be presented in such a manner that it is clear to application processing personnel what the identifier is and where it is to be found. It is strongly suggested that applications filed without an executed oath or declaration under

§ 1.63 or 1.175 continue to use an inventor's name for identification purposes. Failure to apprise the Office of the application identifier being used will result in applicants having to resubmit papers that could not be matched with the application and proof of the earlier receipt of such papers where submission was time dependent.

Paragraph (a) of § 1.41 would also be amended to recite that the actual inventor or inventors of an application are set forth in an executed § 1.63 oath or declaration to correspond to the proposed change in § 1.53(b)(1)(iii). Hence, the recitation of the inventorship in an application submitted under § 1.53(d) without an executed oath or declaration for purposes of identification may be changed merely by the later submission of an oath or declaration executed by a different inventive entity without recourse to a petition under § 1.48.

Section 1.47 would be amended to provide for publication in the Official Gazette of a notice of filing for all applications submitted under this section rather than only when notice to the nonsigning inventor(s) is returned to the Office undelivered or when the address of the nonsigning inventor(s) is unknown. The information to be published includes: the Application number, filing date, invention title and inventors identifying the missing inventor.

Section 1.47 would also be amended for clarification purposes. A reference to an "omitted inventor" in § 1.47(a) would be replaced with "nonsigning inventor." Statements in §§ 1.47(a) and (b) that a patent will be granted upon a satisfactory showing to the Commissioner would be deleted as unnecessary. Section 1.47(b) is proposed to be amended to clarify that it applies only where none of the inventors are willing or can be found to sign the Declaration by substitution of "an inventor" by "all the inventors." The use of "must state" in regard to the last known address would be deleted as redundant in view of the explicit requirement for such address in the rule. The sentence in § 1.47(b) referring to the filing of the assignment, written agreement to assign or other evidence of proprietary interest would be deleted as redundant in view of the requirement appearing earlier in § 1.47(b) calling for "proof of pertinent facts."

Section 1.48 for inventorship corrections in an application (§ 1.324, for inventorship corrections in a patent, and § 1.175, for reissue declarations) would no longer require factual showings to establish a lack of deceptive intent. All that will be needed is a statement to that effect.

Section 1.48 would be amended in its title to clarify that the section is related to patent applications as opposed to patents.

Section 1.48(a) would not require correction of the inventorship if the inventorship or other identification under § 1.41 was set forth in error on filing of the application. Section 1.48(a) is proposed to be amended to apply only to correction of inventor or inventors from that named in an originally filed executed oath or declaration and not to the naming of inventors or others for identification purposes as is currently proposed under § 1.41. The statement to be submitted would be required only from the person named in error as an inventor or from the person who through error was not named as an inventor rather than from all the original named inventors so as to comply with 35 U.S.C. 116. The present requirement that any amendment of the inventorship under § 1.48(a) be "diligently" made would be removed. The applicability of a rejection under 35 U.S.C. 102(f)(g) against an application with the wrong inventorship set forth therein and any patent that would issue thereon is deemed to provide sufficient motivation for prompt correction of the inventorship without the need for a separate requirement for diligence.

A clarifying reference to § 1.634 would be added in § 1.48(a) for instances when inventorship correction is necessary during an interference and has been moved from § 1.48(a)(4) for improved contextual purposes.

The § 1.48(a)(1) statement would require a statement only as to the lack of deceptive intent rather than a statement of facts to establish how the inventorship error was discovered and how it occurred, since the latter is proposed to be deleted. Additionally, the persons from whom a statement is required now includes any person not named in error as an inventor but limits statements from the original named inventors to only those persons named in error as inventors rather than all persons originally named as inventors including those correctly named. The paragraph would be amended to remove the requirement

that the statement be verified in accordance with the proposed change to § 1.4(d)(2).

Section 1.48(a)(2) would be amended for clarification purposes to indicate the availability of §§ 1.42, 1.43 or 1.47 in meeting the requirement for an executed oath or declaration under § 1.63 from each actual inventor. Section 1.47 would only be applicable to the person to be added as an inventor (inventors named in an application transmittal letter can be deleted without petition). For those persons already having submitted an executed oath or declaration under § 1.63, a petition under § 1.183, requesting waiver of reexecution of an oath or declaration, may be an appropriate remedy. The requirement for an oath or declaration is maintained in § 1.48(a) notwithstanding its replacement in § 1.324 for issued patents by a statement of agreement or lack of disagreement with the requested change in view of the need to satisfy the duty of disclosure requirement in a pending application that is set forth in a § 1.63 oath or declaration.

Section 1.48(a)(4) would be amended to include a citation to § 3.73(b) to clarify the requirements for submitting a written consent of assignee, which is subject to the requirement under § 3.73(b), and to delete the reference to an application involved in an interference, which is being moved to § 1.48(a). Section 1.48(a)(4) would also be amended to clarify that the assignee required to submit its written consent is only the existing assignee of the original named inventors at the time the petition is filed and not any party that would become an assignee based on the grant of the inventorship correction.

Section 1.48(b) would also be amended to remove the requirement that a petition thereunder be diligently filed. The applicability of a rejection under 35 U.S.C. 102(f)(g) against an application with the wrong inventorship set forth therein and any patent that would issue thereon is deemed to provide sufficient motivation for prompt correction of the inventorship without the need for a separate requirement for diligence.

Section 1.48(b) would have a clarifying reference to § 1.634 added for instances when inventorship correction is necessary during an interference.

Section 1.48(c) would be amended so that a petition thereunder no longer need meet the current requirements of § 1.48(a), which are also proposed to be changed. A statement from each inventor being added that the inventorship amendment is necessitated by amendment of the claims and that the error occurred without deceptive intent would be required under § 1.48(c)(1) rather than the previous requirement of a statement from each original named inventor. The previous requirements under § 1.48(a) for an oath or declaration, the written consent of an assignee and the written consent of any assignee are retained, but are now separately set forth in §§ 1.48(c)(2) through (c)(4). The particular circumstances of a petition under this paragraph, adding an inventor due to an amendment of the claims that incorporates material attributable to the inventor to be added, is seen to be indicative of a lack of deceptive intent in the original naming of inventors. Accordingly, all that must be averred to is that an amendment of the claims has necessitated correction of the inventorship and that the inventorship error existing in view of the claim amendment occurred without deceptive intent. The current requirement for diligence in filing the petition based on an amendment to the claims would not be retained as applicants have the right, prior to final rejection or allowance, to determine when particular subject matter is to be claimed. Applicants should note that any petition under § 1.48 submitted after allowance is subject to the requirements of § 1.312, and a petition submitted after final rejection is not entered as a matter of right. The statement of facts must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

Section 1.48(c)(2) would clarify the availability of §§ 1.42, 1.43 and 1.47 in meeting the requirement for an executed oath or declaration under § 1.63. Section 1.47 would only be applicable to the person to be added as an inventor. For those persons already having an executed oath or declaration under § 1.63 a petition under § 1.183, requesting waiver of reexecution of an oath or declaration, may be an appropriate remedy.

Section 1.48(c)(4) would clarify that the assignee required to submit its written consent is only the existing assignee of the original named inventors at the time the petition is filed and not any party that would become an assignee based on the



grant of the inventorship correction. A citation to § 3.73(b) would be presented.

Section 1.48(d) would be amended by addition of "their part" to replace "the part of the actual inventor or inventors" and of "omitted" to replace "actual" to require statements from the inventors to be added rather than from all the actual inventors so as to comply with 35 U.S.C. 116. Section 1.48(d)(1) would also be clarified to identify the error to be addressed is the inventorship error. It is not expected that the party filing a provisional application will normally need to correct an error in inventorship under this paragraph by adding an inventor therein except when necessary under § 1.78 to establish an overlap of inventorship with a continuing application. Automatic correction of the inventorship is not possible as is the case for nonprovisional applications when an executed oath or declaration under § 1.63 with the correct inventorship is later filed; since an oath or declaration is not to be submitted in provisional applications, § 1.51(a)(2).

Section 1.48(d)(1) would be amended to remove the requirement that the statement be verified in accordance with the proposed change to § 1.4(d)(2).

Section 1.48(e)(1) would be amended to replace a requirement in provisional applications that the required statement be one "of facts" directed towards "establishing that the error" being corrected "occurred without deceptive intention," thereby requiring only a statement that the inventorship error occurred without deceptive intent. Paragraph (e)(1) would also be amended to remove the requirement that the statement be verified in accordance with the proposed change to § 1.4(d)(2). It is not expected that the party filing a provisional application would need to file a petition under this paragraph since the application will go abandoned by operation of law, § 1.53(e)(2), and the need to delete an inventor will not affect the overlap of inventorship needed to claim priority under § 1.78(a)(3) for any continuing application.

Section 1.48(e)(3) would be amended to clarify that the assignee required to submit its written consent is only the prior existing assignee before correction of the inventorship is granted and not any party that would become an assignee based on the grant of the inventorship correction and a reference to § 3.73(b) would be added.

Section 1.48(f) would be added to provide that the later filing of an executed oath or declaration would act to correct the inventorship without a specific petition for such correction and would be used to issue a filing receipt and process the application notwithstanding any inventorship or other identification name earlier presented.

Section 1.48(g) would be added to specifically recognize that the Office may require such other information as may be deemed appropriate under the particular circumstances surrounding a correction of the inventorship.

Section 1.51(c) covering the use of an authorization to charge a deposit account is proposed to be removed as unnecessary in view of § 1.25(b).

Section 1.52 paragraphs (a) and (d) would be amended to remove the requirement that the translation be verified in accordance with the proposed change to § 1.4(d)(2). Paragraphs (a) and (d) of this section would also be amended to clarify the need for a statement that the translation being offered is an accurate translation, as is also proposed in § 1.69 paragraph (b).

Section 1.53(b)(1), as proposed, would remove: (1) the phrase "in the name of the actual inventor or inventors as required by § 1.41," and (2) the sentence "[i]f all the names of the actual inventor or inventors are not supplied when the specification and any required drawing are filed, the application will not be given a filing date earlier than the date upon which the names are supplied unless a petition with the fee set forth in § 1.17(i) is filed which sets forth the reasons the delay in supplying the names should be excused." These proposed changes are consistent with the proposed change to § 1.41. Section 1.53(b)(1) (and § 1.41(a)) would no longer require that a patent be applied for in the name of the actual inventors for an application for patent to receive a filing date.

Section 1.53(b)(1), as proposed, would change (1) "[a] continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120, 121 or 365(c) and § 1.78(a)) may be filed under this section, § 1.60 or § 1.62" and (2) "[a] continuation-in-part application may also be filed under this

section or § 1.62" to (1) [a] continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120, 121 or 365(c) and § 1.78(a)) may be filed under this paragraph or paragraph (b)(3) of this section" and (2) "[a] continuation-in-part application must be filed under this paragraph, respectively. Upon the deletion of §§ 1.60 and 1.62, any continuation-in-part applications must be filed under § 1.53(b)(1), but a continuation or divisional application may be filed under §§ 1.53(b)(1) or (b)(3).

Section 1.53(b)(1), as proposed, would also add a new paragraph (b)(1)(i) expressly providing that any continuation or divisional application may be filed by all or by less than all of the inventors named in a prior application, and that a newly executed oath or declaration is not required pursuant to §§ 1.51(a)(1)(ii) and 1.53(d) in a continuation or divisional application filed by all or by less than all of the inventors named in a prior application, provided that one of the following is submitted: (1) a copy of the executed oath or declaration filed to complete (§ 1.51(a)(1)) the most immediate prior national application for which priority is claimed under 35 U.S.C. 120, 121 or 365(c), or (2) a copy of an unexecuted oath or declaration, and a statement that the copy is a true copy of the oath or declaration that was subsequently executed and filed to complete (§ 1.51(a)(1)) the most immediate prior national application for which priority is claimed under 35 U.S.C. 120, 121 or 365(c). The phrase "most immediate prior national application" is proposed rather than "prior application" to accommodate those situations in which the prior application was filed under current §§ 1.60 or 1.62, or where the prior application was itself a continuation or divisional application and filed with a copy of the executed oath or declaration from a prior application pursuant to § 1.53(b)(1)(i). As is currently the situation under §§ 1.60 and 1.62, the applicant's duty of candor and good faith including compliance with the duty of disclosure requirements of § 1.56 is continuous and applies to the continuation, divisional or continued prosecution (§ 1.53(b)(3)) application, notwithstanding the lack of a newly executed oath or declaration. Therefore, applicants should be informed of the intent to file a continuation, divisional or continued prosecution application with a copy of the proposed claimed supplied. New § 1.53(b)(1)(i), as proposed, would also reference § 1.53(d) for the filing of a continuation or divisional application without the concomitant submission of a newly executed oath or declaration or a copy of the oath or declaration for the most immediate prior national application for which priority is claimed under 35 U.S.C. 120, 121 or 365(c).

Section 1.53(b)(1), as proposed, would also add a new paragraph (b)(1)(i)(A) providing that the copy of the executed or unexecuted oath or declaration for the most immediate prior national application for which priority is claimed under 35 U.S.C. 120, 121 or 365(c) must be accompanied by a statement from applicant, counsel for applicant or other authorized party requesting the deletion of the names of the person or persons who are not inventors in the continuation or divisional application. Where the continuation or divisional application and copy of the oath or declaration from the prior application is filed without a statement from an authorized party requesting deletion of the names of any person or persons named in the prior application, the continuation or divisional application will be treated as naming as inventors the person or persons named in the prior application, taking into account any petition for correction of inventorship pursuant to § 1.48 in the prior application that has been granted prior to the filing of the continuation or divisional application. For situations where an inventor or inventors are to be added in a continuation or divisional application see paragraph (ii) under this section.

The statement requesting the deletion of the names of the person or persons who are not inventors in the continuation or divisional application must be signed by person(s) authorized pursuant to § 1.33(a) to sign an amendment in the continuation or divisional application. That is, such a statement must be signed by: (1) all of the inventors in the continuation or divisional application (see MPEP 714.01(a)), (2) the assignee of record of the entire interest in the continuation or divisional application in compliance with § 3.73(b) (see MPEP 324), (3) an attorney or agent of record, or (4) a registered attorney or agent acting in a representative capacity pursuant to § 1.34(a).

Section 1.53(b)(1)(i), as proposed, would add a new paragraph (B) providing that where the power of attorney or corre-

spondence address was changed during the prosecution of the prior application, the change in power of attorney or correspondence address must be identified in the continuation or divisional application.

Section 1.53(b)(1), as proposed, would add a new paragraph (ii) providing that a newly executed oath or declaration must be filed in a continuation or divisional application naming an inventor not named in the prior application. For situations where an inventor or inventors are to be added in a continuation or divisional application the Office will not require a petition pursuant to § 1.48, but will require only the newly executed oath or declaration naming the correct inventorship in the continuation or divisional application under § 1.53. For deletion of inventors in a continuation or divisional application see § 1.53(b)(1)(i) and (b)(3). New § 1.53(b)(1)(ii), as proposed, would also provide that a newly executed oath or declaration must be filed in a continuation-in-part application, which application may name all, more, or less than all of the inventors named in the prior application.

Section 1.53(b)(1)(iii), as proposed, would clarify that the inventorship is not set forth in an application until an executed oath or declaration is submitted therein in accordance with the proposed change to § 1.41(a). Where the inventorship was voluntarily set forth on filing an application without an executed oath or declaration pursuant to § 1.53(d) for purposes of identification, the actual inventorship of the application will be controlled by the later submission of an executed oath or declaration which may change what was originally identified as the inventorship without recourse to a petition under § 1.48 in accordance with the proposed change to § 1.41(a).

Section 1.53(b)(2), as proposed, would remove the phrase "in the name of the actual inventor or inventors as required by § 1.41" and the sentence "[i]f all the names of the actual inventor or inventors are not supplied when the specification and any required drawing are filed, the provisional application will not be given a filing date earlier than the date upon which the names are supplied unless a petition with the fee set forth in § 1.17(q) is filed which sets forth the reasons the delay in supplying the names should be excused." Section 1.53(b)(2) (and § 1.41(a)) would no longer require that a patent be applied for in the name of the actual inventors for an application for patent to receive a filing date.

Section 1.53(b)(2)(ii), as proposed, would change the phrase "treated as" to "converted to" for clarity.

Section 1.53(b)(3) is proposed to be added to provide for the filing of a continued prosecution application.

Section 532 of the Uruguay Round Agreement Act (Public Law 103-465, § 532, 108 Stat. 4809 (1994)) amended 35 U.S.C. 154 to provide that the term of patent protection begins on the date of patent grant and ends on the date 20 years from the filing date of the application. As any delay in the prosecution of the application will reduce the term of patent protection, reducing unnecessary delays in the prosecution of applications is a mutual interest of patent applicants and the Office.

An applicant in a nonprovisional application filed on or after June 8, 1995, must file a continuing application to obtain further examination subsequent to a final rejection or other final action. The current continuing practice under §§ 1.60 and 1.62 of processing an application filed thereunder with a new application number and filing date delays the examination of such continuing applications. Therefore, the Office proposes to eliminate this delay by: (1) not assigning a new application number to an application filed under § 1.53(b)(3), and (2) not processing the application filed under § 1.53(b)(3) with a filing date of the request for an application under § 1.53(b)(3). Rather, a continued prosecution application would retain the application number and the filing date of the prior application to which it relates for identification purposes thereby allowing examination to proceed without the delays that would be caused by the current need to assign to applications filed under §§ 1.60 and 1.62 a new application number and filing date as of the date the Rule 60 or 62 application was requested (submitted).

Section 1.53(b)(3), as proposed, would specifically provide that: (1) in a complete nonprovisional application (§ 1.51(a)(1)) filed on or after June 8, 1995, a continuation or divisional application that discloses and claims only subject matter disclosed in that prior complete application and names as inventors the same or less than all the inventors named in that prior complete application may be filed under this paragraph, and

(2) the filing date of the continued prosecution application, such as for continuity purposes under 35 U.S.C. 120 and § 1.78, is the date on which a request for an application under this paragraph, including identification of the prior application number is filed.

The specific reference to the prior application required by 35 U.S.C. 120 and § 1.78(a)(2) will be satisfied by a sentence that the continued prosecution application is a continuation or divisional, as appropriate, of prior application number ##/###/###, filed ##/##/##, now abandoned, notwithstanding that the so identified application number and filing date are also the application number and filing date assigned to the continued prosecution application under this paragraph. Where the continued prosecution application derives from a chain of § 1.53(b)(3) applications assigned a common application number and filing date, a sentence that the application is a continuation or divisional, as appropriate, of the common application number and filing date will constitute a specific reference (35 U.S.C. 120 and § 1.78(a)(2)) to each application assigned that application number and filing date. Since § 1.53(b)(3) is proposed to be limited to continuations and divisionals, the actual filing date of the request for an application under § 1.53(b)(3) will be relevant only to the copendency requirement of 35 U.S.C. 120 and § 1.78 and patent term *vis-a-vis* Public Law 103-465. Nevertheless, § 1.53(b)(3) is proposed to be limited to a continuation or divisional of a complete application filed on or after June 8, 1995, so as to avoid any dispute as to whether the application is subject to 20-year patent term as set forth in Public Law 103-465. That is, any continuation or divisional of an application filed prior to June 8, 1995, as well as any continuation-in-part, must be filed under § 1.53(b)(1).

Section 1.53(b)(3)(i)(A), as proposed, would provide that an application under § 1.53(b)(3) (a continued prosecution application) will use the specification, drawings and oath or declaration from the prior complete application and will be assigned its application number for identification purposes.

Section 1.53(b)(3)(i)(B), as proposed, would provide that the filing of a request for a continued prosecution application is a request to expressly abandon the prior application as of the filing date granted the application under § 1.53(b)(3).

Section 1.53(b)(3)(i)(C), as proposed, would provide that a continued prosecution application must be filed before the payment of the issue fee, abandonment of, or termination of proceedings on the prior application with the filing date of a request for a continued prosecution application being the date on which a request for a continued prosecution application including identification of the application number of the prior complete application is filed.

Section 1.53(b)(3)(ii)(A) and (B), as proposed, would provide that filing fee for a continued prosecution application is the statutory basic filing fee as set forth in § 1.16 and any additional fee due based on the number of claims remaining in the application after entry of any amendment accompanying the request for an application under this section and entry of any amendments under § 1.116 unentered in the prior application which applicant has requested to be entered in the new application.

In instances in which a continued prosecution application is submitted without the basic statutory filing fee or any additional claims fee due, the Office will continue to mail a "Notice of Missing Parts" under § 1.53(d)(1) and give the applicant a period of time within which to file the fee and to pay the surcharge under § 1.16(e) to prevent abandonment of the application (see § 1.53(d)(1)). Thus, the filing of a continued prosecution application without the basic statutory filing fee or any additional claims fee due will result in a delay in the initial processing of the application. An applicant, however, may eliminate or limit this delay by either filing the request for a continued prosecution application with the appropriate filing fee or not delaying the submission of the appropriate filing fee until the mailing of or expiration of the period for response to the "Notice of Missing Parts."

Section 1.53(b)(3)(iii), as proposed, would provide that if a continued prosecution application is filed by less than all the inventors named in the prior application, a statement must accompany the application when filed requesting deletion of the names of the person or persons who are not inventors of the invention being claimed in the continued prosecution application. Where an application is filed under § 1.53(b)(3)



without a statement requesting deletion of the names of any person or persons named in the prior application, the application will be treated as naming as inventors the person or persons named in the prior application, taking into account any grant of a petition correcting inventorship in the prior application pursuant to § 1.48. To correct the inventorship in the continued prosecution application, the Office will not require a petition pursuant to § 1.48 as the application is to be filed without a newly executed oath or declaration, but will require only a newly executed oath or declaration naming the correct inventorship in the continued prosecution application, which is similar to the requirements for correction of the inventorship in applications filed under § 1.53(b)(1) without a newly executed oath or declaration.

Section 1.53(b)(3)(iv), as proposed, would require that any new change be made in the form of an amendment to the prior application, and would provide that any new specification filed with the request for an application under § 1.53(b)(3) would not be considered part of the original application papers, but would be treated as a substitute specification in accordance with § 1.125. In the event that legislation mandating the 18-month publication of patent applications (e.g., H.R. 1733) is enacted, it will be necessary to amend proposed § 1.53(b)(3)(iii) to require a substitute specification in compliance with § 1.125 and drawings including only those changes to the prior application during the prosecution of the prior application.

Section 1.53(b)(3)(v), as proposed, would provide that the filing of a continued prosecution application will be construed to include a waiver of confidence by the applicant under 35 U.S.C. 122 to the extent that any member of the public who is entitled under the provisions of § 1.14 to access to, or information concerning either the prior application or any application filed under the provisions of § 1.53(b)(3) may be given similar access to, or similar information concerning, the other application(s) in the file wrapper.

Section 1.53(b)(3)(vi)(A) through (D), as proposed, would provide that the applicant is urged to furnish in the request for an application under § 1.53(b)(3) the following information relating to the prior application to the best of his or her ability: (A) title as originally filed and as last amended, (B) name of applicant as originally filed and as last amended, (C) current correspondence address of applicant, and (D) identification of prior foreign application and any priority claim under 35 U.S.C. 119.

Section 1.53(b)(3)(vii), as proposed, would provide that envelopes containing only requests and fees for filing an application under § 1.53(b)(3) should be marked "Box CPA."

Section 1.53(c), as proposed, would replace its current language with three paragraphs treating: (1) applications found to be improper or incomplete, (2) any requests for review of a notification that an application has been found to be improper or incomplete, and (3) termination of proceedings in an application for failure to timely correct a filing error or seek review of a notification that an application has been found to be improper or incomplete.

Section 1.53(c)(1), as proposed, would specifically provide that "[i]f any application filed under paragraph (b) of this section is found to be incomplete or improper, applicant will be so notified and given a time period within which to correct the filing error."

Section 1.53(c)(2), as proposed, would specifically provide that "[a]ny request for review of a notification pursuant to paragraph (c)(1) of this section, or a notification that the original application papers lack a portion of the specification or drawing(s), must be by way of a petition pursuant to this paragraph." "[a]ny petition under this paragraph must be accompanied by the fee set forth in § 1.17(i) in an application filed under paragraphs (b)(1) or (b)(3) of this section, and the fee set forth in § 1.17(q) in an application filed under paragraph (b)(2) of this section," and "[i]n the absence of a timely (§ 1.181(f)) petition pursuant to this paragraph, the filing date of an application in which the applicant was notified of a filing error pursuant to paragraph (c)(1) of this section will be the date the filing error is corrected."

Section 1.53(c)(3), as proposed, would specifically provide that "[i]f an applicant is notified of a filing error pursuant to paragraph (c)(1) of this section, but fails to correct the filing error within the given time period or otherwise timely (§ 1.181(f)) take action pursuant to paragraph (c)(2) of this section,

proceedings in the application will be considered terminated" and "[w]here proceedings in an application are terminated pursuant to this paragraph, the application may be returned or otherwise disposed of, and any filing fees, less the handling fee set forth in § 1.21(n), will be refunded" Section 1.53(c)(3), as proposed would not provide that proceedings in the application will be considered terminated for failure to timely respond to a notification that the original application papers lack a portion of the specification or drawing(s). Thus, the failure to timely seek review of a notification that the original application papers lack a portion of the specification or drawing(s) will not result in termination of proceedings in (or abandonment of) the application, but will simply result in such portion of the specification or drawing(s) not being considered part of the original disclosure of the application.

Section 1.53(d)(1), as proposed, would change "paragraph (b)(1) of this section" to "paragraphs (b)(1) or (b)(3) of this section," such that § 1.53(d)(1) would be applicable to applications filed under §§ 1.53(b)(1) and (b)(3), where § 1.53(d)(2) would be applicable to applications filed under § 1.53(b)(2) (i.e., provisional applications). While § 1.53(d)(1) addresses both the filing fee and the oath or declaration, the oath or declaration of an application under § 1.53(b)(3) will be the oath or declaration of the prior complete (§ 1.51(a)(1)) application. As such, an oath or declaration will not be required under § 1.53(d)(1) for a proper application under § 1.53(b)(3).

Section 1.53(d)(1), as proposed, would be further amended to add the phrases "including a continuation, divisional, or continuation-in-part application" and "pursuant to §§ 1.63 or 1.175, which may be a copy of the executed oath or declaration filed to complete (§ 1.51(a)(1)) the most immediate prior national application for which priority is claimed under 35 U.S.C. 120, 121 or 365(c), or a copy of an unexecuted oath or declaration, and a statement that the copy is a true copy of the oath or declaration that was subsequently executed and filed to complete (§ 1.51(a)(1)) the most immediate prior national application for which priority is claimed under 35 U.S.C. 120, 121 or 365(c), in a continuation or divisional application" for clarity and consistency with § 1.53(b)(1). A reference to submission of a copy of a Notice to File Missing Parts would be removed.

Section 1.54(b), as proposed, would add the phrase "unless the application is an application filed under § 1.53(b)(3)." To minimize application processing delays in applications filed under § 1.53(b)(3), as proposed, such applications will not be processed by the Office of Initial Patent Examination as new applications.

Section 1.55 paragraph (a) would be amended to remove the requirement that the statement be verified in accordance with the proposed change to § 1.4(d)(2).

Section 1.59 would be amended: by revising the title to indicate that expungement of information from an application file would come under this section, by revising the existing paragraph and designating it as paragraph (a)(1), and by adding paragraphs (a)(2), (b) and (c). Paragraph (a)(1) would retain the general prohibition on the return of information submitted in an application which has a filing date. The portion of the paragraph relating to the Office furnishing copies of application papers has been shifted to new paragraph (c). Paragraph (a)(2) would make explicit that information, forming part of the original disclosure, i.e., written specification, drawings, claims and any preliminary amendment specifically incorporated into an executed oath or declaration under §§ 1.63 and 1.175, will not be expunged from the application file.

Paragraph (b) of § 1.59 would provide an exception to the general prohibition of paragraph (a) on the expungement and return of information and would allow for such when it is established to the satisfaction of the Commissioner that the requested expungement and return is appropriate.

Paragraph (b) of § 1.59 is intended to cover the current practice set forth in MPEP 724.05 where the submitted information has initially been identified as trade secret, proprietary, and/or subject to a protective order and where applicant may file a petition for its expungement and return that will be granted upon a determination by the examiner that the information is not material to patentability. Any such petition should be submitted in response to an Office action closing prosecution so that the examiner can make a determination of materiality based on a closed record. Any petition submitted earlier than

close of prosecution may be returned unacted upon. In the event pending legislation for pre-grant publication of applications, which provides public access to the application file, is enacted, then the timing of petition submissions under this section will be reconsidered. A result of the proposed amendment to this section would be to have a petition to expunge decided under the instant rule by the examiner who determines the materiality of the information to be expunged rather than by the Office of Petitions under § 1.182, which prior to rendering a decision on the petition consults with the examiner on materiality of the information at issue.

Paragraph (b) of § 1.59 is also intended to cover information that was unintentionally submitted in an application, provided that: (i) the Office can effect such return prior to the issuance of any patent on the application in issue, (ii) that it is stated that the information submitted was unintentionally submitted and the failure to obtain its return would cause irreparable harm to the party who submitted the information or to the party in interest on whose behalf the information was submitted, (iii) the information has not otherwise been made public, (iv) there is a commitment on the part of the petitioner to retain such information for the period of any patent with regard to which such information is submitted, and (v) it is established to the satisfaction of the Commissioner that the information to be returned is not material information under § 1.56. Requests to return information that have not been clearly identified as information that may be later subject to such request by marking and placement in a separate sealed envelope or container shall be treated on a case-by-case basis. It should be noted that the Office intends to start electronic scanning of all papers filed in an application, and the practicality of expungement from the electronic file created by a scanning procedure is not as yet determinable. Applicants should also note that unidentified information that is a trade secret, proprietary, or subject to a protective order that is submitted in an Information Disclosure Statement may inadvertently be placed in an Office prior art search file by the examiner due to the lack of such identification and may not be retrievable.

Paragraph (b) of § 1.59 is also intended to cover the situation where an unintended heading has been placed on papers so that they are present in an incorrect application file. In such situation, a petition should request return of the papers rather than transfer of the papers to the correct application file. The grant of such a petition will be governed by the factors enumerated above in regard to the unintentional submission of information. Where the Office can determine the correct application file that the papers were actually intended for, based on identifying information in the heading of the papers, e.g., Application number, filing date, title of invention and inventor(s) name(s), the Office will transfer the papers to the correct application file for which they were intended without need of a petition.

Added paragraph (c) of § 1.59 retains the practice that copies of application papers will be furnished by the Office upon request and payment of the cost for supplying such copies.

Section 1.60 is proposed to be removed and reserved.

In the notice of proposed rulemaking entitled "Changes to Implement 20-Year Patent Term and Provisional Application" (20-Year Term Notice of Proposed Rulemaking) published in the *Federal Register* at 59 FR 63951 (December 12, 1994), and in the Patent and Trademark Office *Official Gazette* at 1170 *Off. Gaz. Pat. Office* 377 (January 3, 1995), § 1.60 was proposed to be removed due to the rule change to § 1.4(d), which permits the filing of a copy of an oath or declaration. The proposed removal of § 1.60 in the 20-Year Term Notice of Proposed Rulemaking, however, was withdrawn in the final rule to permit further study.

A continuation or divisional application may be filed under 35 U.S.C. 111(a) using the procedures set forth in § 1.53, by providing a copy of the prior application, including a copy of the oath or declaration in such prior application, as filed. The patent statutes and rules of practice do not require that an oath or declaration include a recent date of execution, and the Examining Corps has been directed not to object to an oath or declaration as lacking either a recent date of execution or any date of execution. This change in examining practice will appear in the next revision of the MPEP. As discussed *supra*, the applicant's duty of candor and good faith including compliance with the duty of disclosure requirements of § 1.56 is continuous and applies to the continuing application.

Sections 1.60(b)(4) and 1.62(a) currently permit the filing of a continuation or divisional application by all or by less than all of the inventors named in a prior application without a newly executed oath or declaration. To continue this practice, § 1.53 is proposed to be amended to provide that any continuation or divisional application may be filed by all or by less than all of the inventors named in a prior application, but where a newly executed oath or declaration is not submitted for a continuation or divisional application filed by less than all the inventors named in the prior application, the copy of the oath or declaration for the most immediate prior national application for which priority is claimed under 35 U.S.C. 120, 121 or 365(c) must be accompanied by a statement requesting the deletion of the names of the person or persons who are not inventors in the continuation or divisional application. A newly executed oath or declaration will continue to be required in a continuation or divisional application naming an inventor not named in the prior application, or a continuation-in-part application.

Section 1.60 is now unnecessary due to: (1) the rule change to § 1.4(d), (2) the proposed addition of § 1.53(b)(1)(i) to expressly permit the filing of either a newly executed oath or declaration, or a copy of the executed oath or declaration filed to complete pursuant to § 1.51(a)(1) the most immediate prior national application for which priority is claimed under 35 U.S.C. 120, 121 or 365(c), in a continuation or divisional application, (3) the proposed addition of § 1.53(b)(1)(i) to permit the filing of a continuation or divisional application by all or by less than all the inventors named in a prior application, using a copy of the executed oath or declaration filed to complete the prior application, and (4) the proposed addition of § 1.53(b)(3) to permit the filing of a continued prosecution application.

A new application containing a copy of an oath or declaration under § 1.63 referring to an attached specification is indistinguishable from a continuation or divisional application containing a copy of an oath or declaration from a prior application submitted pursuant to § 1.53(b)(1)(i), as proposed. Unless an application is submitted with a statement that the application is a continuation or divisional application (§ 1.78(a)(2)), the Office will process such a new application without requiring a new oath or declaration. Applicants are advised to clearly designate any continuation or divisional application as such to avoid the issuance of a filing receipt that does not indicate that the application is a continuation or division.

Section 1.62 is proposed to be removed and reserved.

In the proposed rulemaking entitled "Changes to Implement 18-Month Publication of Patent Applications" (18-Month Publication Notice of Proposed Rulemaking) published in the *Federal Register* at 60 FR 42352 (August 15, 1995), and in the Patent and Trademark Office *Official Gazette* at 1177 *Off. Gaz. Pat. Office* 61 (August 15, 1995), § 1.62(e) was proposed to be amended to require a substitute specification in compliance with § 1.125 and drawings where the application filed under § 1.62 is a continuation-in-part application. The 18-Month Publication Notice of Proposed Rulemaking proposed to digital image and/or optical character recognition (OCR) scan application material into an electronic data base, which data base would be used to publish the application (e.g., for producing copies of the technical contents of the application-as-filed). The 18-Month Publication Notice of Proposed Rulemaking indicated that as applications filed prior to the implementation of 18-month publication will not have been image- or OCR-scanned into the electronic data base, the technical contents of an application filed under § 1.62 in which the prior application was itself filed prior to the implementation of 18-month publication will not be contained in the electronic data base.

The solution proposed in the 18-Month Publication Notice of Proposed Rulemaking was for the Office to obtain the microfiche copy of the prior application for applications under § 1.62 which do not add additional disclosure (i.e., continuation or divisional applications) and image or OCR scan it into the electronic data base, and to amend § 1.62 to provide that, where the application adds additional disclosure (i.e., is a continuation-in-part application), a substitute specification in compliance with § 1.125 and drawings will be required.

The proposal in the 18-Month Publication Notice of Proposed Rulemaking to obtain the microfiche copy of prior continuation or divisional applications is now considered unfeasible. A



number of applications filed under § 1.62 derive from a chain of applications filed under § 1.62. The information pertaining to such an application's chain of prior applications contained within the Patent Application Location and Monitoring (PALM) system is not sufficiently comprehensive to readily and reliably indicate the prior application that contains a specification and drawings, and is not sufficiently reliable to avoid the occasional inclusion of an unrelated application in the chain of prior applications. This could result in the inadvertent publication of the specification and drawings of the wrong application.

In addition, the microfiche copy of the prior application may be a microfiche of sheets of specification and/or drawings on 8 and 1/2 by 14-inch paper, which paper size is not technically useable by the equipment which will be employed for pre-grant publication of patent applications. Attempts to reduce such sheets of specification and/or drawings to a paper size processible by pre-grant publication equipment results in electronic files which contain illegible text and figures. Moreover, the microfilming process under pre-grant publication differs from the previous microfilming process, and as such, the microfiche copy of such a prior application is sufficiently dissimilar from the microfiche copy of an application under pre-grant publication that it causes accurate technical date capture difficulties.

In the event that legislation mandating the 18-month publication of patent application is enacted, it will be necessary to require a substitute specification in compliance with § 1.125 and drawings including any changes to the prior application during the prosecution of the prior application or pursuant to § 1.62(e) to continue § 1.62 practice.

Section 1.62 is now unnecessary due to: (1) the rule change to § 1.4(d), (2) the proposed change to § 1.53(b)(1) to expressly permit the filing of either a newly executed oath or declaration, or a copy of the executed oath or declaration filed to complete pursuant to § 1.51(a)(1) the most immediate prior national application for which priority is claimed under 35 U.S.C. 120, 121 or 365(c), in a continuation or divisional application, (3) the proposed change to § 1.53(b)(1) to permit the filing of a continuation or divisional application by all or by less than all the inventors named in a prior application, using a copy of the executed oath or declaration filed to complete the prior application, and (4) the proposed addition of § 1.53(b)(3) to permit the filing of a continued prosecution application.

The Office currently receives a number of petitions requesting that an application filed under §§ 1.60 and 1.62 be accepted even though at the time of filing of the application, the application did not comply with all the requirements of §§ 1.60 or 1.62 due to inadvertent error on the part of the applicant. The examination of these improper applications under §§ 1.60 and 1.62 is delayed until a petition to accept the application is filed and granted. The large majority of the applications filed under § 1.60, however, complied at the time of filing with the requirements of § 1.53(b)(1), and the copy of the oath or declaration from the prior application is now acceptable as the oath or declaration for the application, regardless of whether the application is an application under § 1.53 or § 1.60. The removal of § 1.60 and simplification of § 1.62 will reduce the number of these types of petitions and will simplify the procedures for filing an application for both the Office and patent practitioners.

It is anticipated that, subsequent to the removal of §§ 1.60 and 1.62, applications purporting to be applications filed under §§ 1.60 or 1.62 will be filed until the deletion of §§ 1.60 and 1.62 become well known among patent practitioners. Applications purporting to be an application filed under § 1.60 will simply be treated as a new application filed under § 1.53 (i.e., the reference to § 1.60 will simply be ignored).

Applications purporting to be an application filed under § 1.62 will be treated as continued prosecution applications under § 1.53(b)(3), and those applications that do not meet the requirements of § 1.53(b)(3) (e.g., continuation-in-part applications or continuations or divisional of applications filed before June 8, 1995) will be treated as improper continued prosecution applications under § 1.53(b)(3). Such improper applications under § 1.53(b)(3) may be corrected by way of petition under § 1.53(b)(c) (and \$130 fee pursuant to § 1.17(i)).

Such a § 1.53(c) petition in a continuation or divisional application will be granted on the condition that the applicant file: (1) the \$130 petition fee, and (2) a true copy of the complete

application designated as the prior application in the purported § 1.62 application papers as filed, or, if the prior application was an application filed under § 1.62, a true copy of its most immediate parent application which contained a specification and drawings as filed. Such a § 1.53(c) petition in a continuation-in-part application will be granted on condition that the applicant file: (1) the \$130 petition fee, and (2) a true copy of the complete application designated as the prior application in the purported § 1.62 application papers as filed, or, if the prior application was an application filed under § 1.62, a true copy of its most immediate parent application which contained a specification and drawings as filed, and any amendments submitted during the prosecution of the prior application.

Section 1.63(a)(3) is proposed to be amended by requiring the post office address to appear in the oath or declaration and having the requirement from § 1.41(a) for the full names of the inventors placed therein.

Section 1.69, paragraph (b), would be amended to remove the requirement that the translation be verified in accordance with the proposed change to § 1.4(d)(2). Paragraph (b) of this section is also being amended to clarify the need for a statement that the translation being offered is an accurate translation, as is proposed for § 1.52, paragraph (a) and (d).

Section 1.78(a)(1)(ii), as proposed, would remove the references to §§ 1.60 and 62 in view of the proposed deletion of §§ 1.60 and 62.

Section 1.84, paragraph (b), is proposed to be amended by removing references to the filing of black and white photographs in design applications as unnecessary in view of the reference in § 1.152 to § 1.84(b).

Section 1.91 is proposed to be amended for clarification purposes by additionally reciting "Exhibits" as well as models. The section is proposed to be amended to state that a model, working model or other physical exhibit may be required by the Office if deemed necessary for any purpose in examination of the application. This language is moved from § 1.92.

Section 1.92 is proposed to be removed and reserved and the language, as stated above, transferred to § 1.91 for improved contextual purposes.

Section 1.97(c) through (e) are proposed to be amended by replacement of "certification" by "statement," see comments relating to § 1.4(d), and by clarifying the current use of "statement" by the terms "information disclosure." Section 1.97(e)(2) is further amended to replace "or" by "and" to require that: no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application and that no item of information contained in the information disclosure statement to the knowledge of the person signing the statement, after making reasonable inquiry, was known to any individual designated in § 1.56(c) more than three months prior to the filing of the information disclosure statement. The use of "and" rather than "or" is in keeping with the intent of the rule as expressed in the MPEP 609, page 600-91, that the conjunction be conjunctive rather than disjunctive. The mere absence of an item of information from a foreign patent office communication was clearly not intended to represent an opportunity to delay the submission of the item when known more than three months prior to the filing of an information disclosure statement to an individual having a duty of disclosure under § 1.56.

Section 1.101 is proposed to be removed and reserved as relating to internal Office instructions.

Section 1.102, paragraph (a), would be amended to remove the requirement that the showing be verified in accordance with the proposed change to § 1.4(d)(2).

Section 1.103, paragraph (a), would be amended by replacement of "response" with "reply" in accordance with the proposed change to § 1.111.

Section 1.104 is proposed to be removed and reserved as relating to internal Office instructions (the material of paragraph (c) would be present in the MPEP).

Section 1.105 is proposed to be removed and reserved as relating to internal Office instructions.

Section 1.108 is proposed to be removed and reserved as relating to internal Office instructions.

Section 1.111(b) is proposed to be amended to explicitly recognize that a reply must be reduced to a writing which must point out the specific distinctions believed to render the claims, including any newly presented claims, patentable. It is noted

that an examiner's amendment reducing a telephone interview to writing would comply with § 1.2.

In § 1.112 it is proposed to remove as being unnecessary the statement that "any amendments after a second Office action must ordinarily be restricted to the rejection, objections or requirements made in the office action" to reflect actual practice wherein an unrestricted right of entry exists prior to a final rejection and that an application or patent under reexamination be considered repeatedly unless a final action is rendered. It is proposed to amend the section for clarification purposes by addition of a reference to reconsideration "before final action."

Section 1.113(a), as proposed, would add "by the examiner" after "examination or consideration," change "objections to form" to "objections as to form" for clarity, and would replace "response" with "reply" in accordance with the proposed change to § 1.111.

Section 1.113(b), as proposed, would change "clearly stating the reasons therefor" to "clearly stating the reasons in support thereof" for clarity.

A new § 1.113(c) would be added to provide that the first action in an application will not be made final. See comments to §§ 1.116 and 1.191.

Section 1.115 is proposed to be replaced by new § 1.115 that would contain material to be deleted from §§ 1.117 through 1.119, 1.123 and 1.124. No change in substance is contemplated with the material of deleted sections being rearranged and edited for clarity and contextual purposes in the new section. The reference to "application" is intended to include reissue applications.

Section 1.116(a), as proposed, would limit amendments after a final rejection or other final action (§ 1.113) to those amendments cancelling claims or complying with any requirement of form set forth in a previous Office action, and would replace the phrase "any proceedings relative thereto" with "any related proceedings" for clarity.

Section 1.116(b), as proposed, would provide that any amendment not in compliance with § 1.116(a) must be submitted with a request for an application under § 1.53(b)(3) to ensure consideration of the amendment.

Under § 1.116, as proposed, amendments after final rejection or other final action would be limited to cancelling claims or complying with any requirement of form expressly set forth in a previous Office action. Currently, amendments after final which concern the merits of an application may, upon a showing of good and sufficient reasons why they are necessary and were not earlier presented, be entered and amendments after final which present rejected claims in better form for consideration on appeal may be entered. This procedure causes delays in the ultimate issuance of the application as a patent, since applicants will await a ruling on whether such amendment will be entered prior to deciding whether to obtain the entry of such amendment through the filing of a continuing application. In addition, the expedited handling of numerous amendments after final, and the expedited consideration of whether there is an adequate showing of good and sufficient reasons why an amendment after final concerning the merits of an application is necessary and not earlier presented, or whether an amendment after final presents rejected claims in better form for consideration on appeal, places a significant burden on Office resources.

Section 1.113(c), as proposed, would eliminate first action final practice, and, as such, would eliminate the necessity to submit an amendment after final simply to avoid a first action final in a continuing application. In view of this safeguard, and the delay and burden of the current practice for the treatment of amendments after final, § 1.116 is proposed to be amended to limit those amendments that may be presented as a matter of right after a final rejection or other final action. Put simply, the proposed elimination of first action final practice by the Office is the *quid pro quo* for the proposed strict limitation of after final practice. Persons submitting comments objecting to this proposed limitation of after final practice should frame such comments in the context that the proposed elimination of first action final practice by the Office is coupled to the proposed limitation of after final practice.

Section 1.116, as proposed, would not affect the authority of an examiner to enter in an application under final an amendment that places the application in condition for allowance, but does not strictly meet the requirements of § 1.116(a). That is, in instances in which the applicant and examiner agree on an

amendment that would place the application in condition for allowance, the examiner would retain the authority to enter the amendment, notwithstanding the requirements of § 1.116(a). Where, however, the applicant and the examiner do not agree on whether an amendment would place an application in condition for allowance, and the amendment does not meet the requirements of § 1.116(a), the applicant could not require the examiner to consider the amendment as a matter of right.

Section 1.117 is proposed to be removed and reserved as the subject matter was transferred to proposed § 1.115.

Section 1.118 is proposed to be removed and reserved and its subject matter transferred to proposed § 1.115.

Section 1.119 is proposed to be removed and reserved and its subject matter transferred to proposed § 1.115.

Section 1.121 paragraphs (a) through (f) are proposed to be replaced with paragraphs (a) through (c), which separately treat amendments in non-reissue applications (paragraph (a)), amendments in reissue applications (paragraph (b)) and amendments in reexamination proceedings (paragraph (c)). Paragraphs (a) and (b) each separately treat amendment of the specification (paragraphs (a)(1) and (b)(1)) and of the claims (paragraphs (a)(2) and (b)(2)). In comparing amendment practice to the specification for non-reissue and reissue applications: when making an amendment to the specification of a non-reissue application a copy of all previous amendments would not be required, whereas for reissue applications a copy of all previous amendments to the patent specification would be required. In comparing amendment practice to the claims for non-reissue and reissue applications: when making an amendment to the claims of a non-reissue application or when new claims are added, a copy of all pending claims, including original claims that have never been amended, would be required, whereas for reissue applications a copy of only claims that are being amended or added would be required.

Paragraph (a) of § 1.121 would relate to amendments in non-reissue applications and retains a reference to § 1.52. Paragraph (a)(1) would relate to the manner of making amendments in the specification other than in the claims. Paragraph (a)(1)(i) would require the precise point to be indicated where an amendment is made. Paragraph (a)(1)(ii) would allow amendments that are deletions only to be done by a direction to cancel rather than presenting the sentence(s), paragraph(s) and/or page(s) with brackets. This should be compared to cancellation of material from the patent specification in a reissue application (paragraph (b)(1)(iii)) or in a reexamination proceedings (§ 1.530(d)(1)(ii)) - by way of a copy of the rewritten material). Paragraph (a)(1)(iii) would require all other amendments, such as additions or deletions mixed with additions, to be made by submission of a copy of the rewritten sentence(s), paragraph(s) and/or page(s) to permit the examiner to more readily recognize the changes that are being made. Current practice does not require the marking of an amendment to the specification in non-reissue applications. A change in one sentence, paragraph or page that results in only format changes to other pages not being amended are not to be submitted. Paragraph (a)(1)(iv) would identify the type of markings required by paragraph (a)(1)(iii), single underlining for added material and single brackets for material deleted. The marking would also be required to be applied in reference to the material as previously rewritten and not as originally presented if that differed from the previous presentation.

Paragraph (a)(2) of § 1.121 would relate to the manner of making amendments in the claims of a non-reissue application. Paragraph (a)(2)(i)(A) would permit cancellation of a claim by a direction to do so or by simply omitting a copy of the claim when a complete copy of all pending claims are presented pursuant to paragraph (a)(2)(ii) of this section. Paragraph (a)(2)(i)(B) would permit amendment of a previously submitted claim, other than mere cancellation by submission of a copy of the claim completely rewritten with markings pursuant to paragraph (a)(2)(iii) of this section rather than continuing to permit requests that the Office hand-enter changes of five or less words, § 1.121(c)(2). Such rewriting would be construed as a direction that the rewritten claim be a replacement for the previously submitted claim. Paragraph (a)(2)(i)(C) sets forth that a new claim may only be added by the submission of a clean copy of the new claim.

Paragraph (a)(2)(ii) of § 1.121 would require that when a previously submitted claim is amended, or when a new claim



is added, applicant must submit a separate copy of all pending claims to include all newly rewritten claims, all newly added claims, all previously rewritten claims that are still pending and any unamended claims that are still pending. This would enable the examiner to more quickly identify the claims that must be reviewed for the next Office action and would enable the printer to have a current version of the allowed claims for printing should the application be allowed. Compare with amendment of claims in reissue applications wherein only a copy of an amended patent claim or added claim is required, paragraph (b)(2)(i)(A) of this section, but not of previous claims (patent and added claims) that are not currently being amended. Current practice does not require a complete copy of all pending claims but only those claims being amended or added.

Paragraph (a)(2)(iii) of § 1.121 would identify the type of marking required by paragraph (a)(2)(i)(B), single underlining for added material and single brackets for material deleted.

Paragraph (a)(2)(iv) of § 1.121 would provide that the failure to submit a copy of any previously submitted claim would be construed as a direction to cancel that claim.

Paragraph (a)(3) of § 1.121 would clarify that amendments to the original application drawings for non-reissue applications are not permitted and are to be made by way of a substitute sheet for each original drawing sheet that is to be amended.

Paragraph (a)(4) of § 1.121 would require that any amendment presented in a substitute specification must be presented under the provision of this section either prior to or concurrent with the submission of the substitute specification.

Paragraph (b) of § 1.121 would apply to amendments in reissue applications. Paragraph (b)(1) of § 1.121 would relate to the manner of making amendments to the specification other than in the claims in reissue applications. Paragraph (b)(1)(i) would require the precise point to be indicated where an amendment is made. Paragraph (b)(1)(ii) would require that all amendments including deletions be made by submission of a copy of the rewritten paragraph(s) with markings. A change in one sentence, paragraph or page that results in only format changes to other pages not being amended are not to be submitted. Compare to amendments to the specification other than in the claims of non-reissue applications wherein deletions are permitted, paragraph (a)(1)(ii) of this section. Paragraph (b)(1)(iii) sets forth that each amendment to the specification must include all amendments to the specification relative to the patent as of the date of the submission. Compare to amendments to the specification other than claims in nonreissue applications wherein previous amendments to the specification are not required to accompany the current amendment to the specification, paragraph (a)(1)(iii). Paragraph (b)(1)(iv) would define the marking set forth in paragraph (b)(1)(ii) of section. Paragraph (b)(2) of § 1.121 would relate to the manner of making amendments to the claims in reissue applications. Paragraph (b)(2)(i)(A) of § 1.121 would require the entire text of each patent claim that is being amended and of each added claim rather than continuing to permit requests that the Office hand-enter changes of five or less words, § 1.121(c)(2), but not of all pending claims, such as patent claims that have not been amended. Compare paragraph (a)(2)(ii). Additionally, provision would be made for the cancellation of a patent claim by a direction to cancel without the need for marking by brackets. Paragraph (b)(2)(i)(B) would require that patent claims not be renumbered. Paragraph (b)(2)(i)(C) would identify the type of marking required by paragraph (b)(2)(i)(A), single underlining for added material and single brackets for material deleted.

Paragraph (b)(2)(ii) of § 1.121 would require that each amendment submission set forth the status of all patent claims and all added claims as of the date of the submission, as not all claims (non-amended claims) are to be presented with each submission, paragraph (b)(2)(iv). The absence of submission of the claim status would result in an incomplete response, 35 U.S.C. 135.

Paragraph (b)(2)(iii) of § 1.121 would require that each claim amendment be accompanied by an explanation of the support in the disclosure of the patent for the amendment. The absence of an explanation would result in an incomplete response, 35 U.S.C. 135.

Paragraph (b)(2)(iv) of § 1.121 would require that each submission of an amendment to any claim (patent claim or added claim) requires copies of all amendments to the claims as of the date of the submission. A copy of a previous amendment

would not meet the requirement of this section in that all amendments must be represented, as only the last amendment will be used for printing.

Paragraph (b)(2)(v) of § 1.121 would provide that the failure to submit a copy of any added claim would be construed as a direction to cancel that claim.

Paragraph (b)(2)(vi) of § 1.121 would clarify that: 1) no reissue patent would be granted enlarging the scope of the claims unless applied for within two years from the grant of the original patent (additional broadening outside the two-year limit is appropriate as long as some broadening occurred within the two-year period), and 2) no amendment may introduce new matter or be made in an expired patent.

Paragraph (b)(3) of § 1.121 would clarify that amendments to the patent drawings are not permitted and that any change must be by way of a new sheet of drawings with the amended figures being identified as "amended" and with added figures identified as "new" for each sheet that has changed.

Paragraph (c) of § 1.121 would clarify that amendments in reexamination proceedings are to be made in accordance with § 1.530.

Section 1.121 as applied both to non-reissue and reissue applications does not provide for replacement pages whereby a new page would be physically substituted for a currently existing page. However, an applicant can direct that Page \_\_\_\_\_ be cancelled and the following inserted in its place. The wide availability of word processing should enable applicants to more easily submit updated material providing greater accuracy and thereby eliminating the need for the Office to hand-enter amendments. To that end, § 1.125 is proposed to be amended to provide that a substitute specification may be submitted at any point up to payment of the issue fee as a matter of right.

The proposed changes to § 1.121 relate in part to the method of presenting amendments in reissue and reexamination proceedings, that would more closely parallel each other. The Office seeks guidance on the usefulness of bringing reissue and reexamination proceedings in closer harmony. Currently, both practitioners and Office personnel must retain a working knowledge of these infrequently used but vital avenues for review of an issued patent. The Office has identified the following areas for possible harmonization and would like comments as to the appropriateness of these areas, identification of other suitable areas for consideration and specific means to achieve harmonization in the identified areas, e.g., whether a concept or practice in one area should be applied to the other area or a new practice for both should be started:

- Procedures for amending claims and the specification, § 1.121

- To utilize a reissue certificate (similar to a reexamination certificate) attached to a copy of the original patent as the reissued patent. This procedure would eliminate the need to reprint the entire reissued patent.

- Whether the special dispatch provisions of reexamination should be applied to reissue applications.

Section 1.122 is proposed to be removed and reserved as representing internal Office instruction.

Section 1.123 is proposed to be removed and reserved and its subject matter transferred to proposed § 1.115 for better context.

Section 1.124 is proposed to be removed and reserved and its subject matter transferred to proposed § 1.115 for better context.

Section 1.125 is proposed to be amended by addition of paragraphs (a) through (d). Paragraph (a) would retain the current practice that a substitute specification may be required by the examiner and would be clarified to note that if the legibility of the application papers shall render it difficult to consider the case, the Office may require a substitute specification.

Paragraph (b) of § 1.125 would provide for the right of filing a substitute specification in an application other than a reissue application, at any point up to payment of the issue fee, if it is accompanied by a statement that the substitute specification includes no new matter and does not introduce any amendments unless they have been submitted in accordance with the requirements of § 1.121(a) either prior to or concurrent with the submission of the substitute specification. In view of the proposed continued prosecution application under § 1.53(b)(3) and

the need to submit sentence, paragraph, and/or page changes under § 1.121(a), liberalization of the substitute specification requirements is desirable. The requirement for a lack of new matter statement being verified would be deleted. See comments to § 1.4(d).

Paragraph (c) of § 1.125 would clarify that a substitute specification is to be submitted without markings as to amended material.

Paragraph (d) of § 1.125 would not permit a substitute specification in reissue or reexamination proceedings as markings for changes from the patent are required therein.

Section 1.133, paragraph (b), would be amended by replacement of "response" with "reply" in accordance with the proposed change to § 1.111.

Section 1.134 would be amended by replacement of "response" with "reply" in accordance with the proposed change to § 1.111.

Section 1.135, paragraphs (a) and (c), would be amended by replacement of "response" with "reply" in accordance with the proposed change to § 1.111. Paragraph (b) is proposed to be amended to clarify that the admission of or refusal to admit any amendment after final rejection, and not just an amendment not responsive to the last Office action, shall not operate to save the application from abandonment.

Section 1.135, paragraph (c), is proposed to be amended to provide that a new "time period" under § 1.134 may be given if a reply to a non-final Office action is substantially complete but consideration of some matter or compliance with some requirement has been inadvertently omitted. This would replace the current practice whereby applicant may be given an opportunity to supply the omission through the setting of a "time limit" of one month that is not currently extendable. Generally, a new one month shortened statutory time period would be utilized enabling an applicant to petition for extensions of time under § 1.136(a). Where 35 U.S.C. 133 requires a period longer than one month, i.e., actions mailed in the month of February, a shortened statutory period of 30 days will be set. The setting of a time period for reply under § 1.134 rather than a time limit would result in the date of abandonment (when no further reply is filed) being the expiration of the new time period rather than, at present, the date of expiration of the period of reply set in the original Office action for which an incomplete reply was filed. Thus, the proposed amendment to paragraph (c) of § 1.135 would permit the refiling of a continuing application as an alternative to completing the reply, whereas the current rule only permits an applicant to complete the reply that was held to be incomplete.

Section 1.135, paragraph (c), is also proposed to be amended to remove an unnecessary reference to consideration of the question of abandonment and to clarify that the reply for which applicant may be given a new time period to reply to must be a "non-final" Office action.

Section 1.136, paragraph (a)(1), is proposed to be amended to recite the availability of a maximum of five (5) rather than four (4) months as an extension of time when only a one (1) month or 30 day shortened statutory period or a non-statutory period for reply is set. Paragraph (a)(1) is would also be amended by replacement of "respond" with "reply" in accordance with the proposed change to § 1.111.

Section 1.136, paragraph (a)(2), would be amended by replacement of "respond" with "reply" in accordance with the proposed change to § 1.111 and other clarification changes.

Section 1.136 is proposed to be amended by addition of paragraph (a)(3) that would now provide for the filing in an application a general authorization to treat any reply requiring a petition for an extension of time for its timely submission as containing a request therefor for the appropriate length of time. The authorization may be filed at any time prior to or with the submission of a reply that would require an extension of time for its timely submission, including submission with the application papers. Currently, the mere presence of a general authorization, submitted prior to or with a reply requiring an extension of time, to charge all required fees does not amount to a petition for an extension of time for that reply (MPEP 201.06 and 714.17) and under the proposed amended rule the submission of a reply requiring an extension of time for its timely submission would not be treated as an inherent petition for an extension of time absent an authorization for all necessary extensions of time. The Office will continue to treat all petitions

for an extension of time as requesting the appropriate extension period notwithstanding an inadvertent reference to a shorter period for extension and will liberally interpret comparable papers as petitions for an extension of time. Applicants are advised to file general authorizations for payment of fees and petitions for extensions of times as separate papers rather than as sentences buried in papers directed to other matters (such as an application transmittal letter). The use of individual papers directed only to an extension of time or to a general authorization for payment of fees would permit the Office to more readily identify the presence of such items and list them individually on the application file jacket thereby providing ready future identification of these authorizations.

Clarifying language is proposed for § 1.136(a)(3) to reflect current practice that general authorizations to charge fees are effective to meet the requirement for the extension of time fee for responses filed concurrent or subsequent to the authorization. However, a general authorization to charge additional fees does not represent a petition for an extension of time, which petition must be separately requested.

Section 1.137 is proposed to be amended by moving language presently codified, elsewhere to, *inter alia*, incorporate revival of abandoned applications and lapsed patents for the failure: (1) to timely reply to an Office requirement in a provisional application (§ 1.139), (2) to timely pay the issue fee for a design application (§ 1.155 paragraphs (b)-(f)), (3) to timely pay the issue fee for a utility or plant application (§ 1.316 paragraphs (b)-(f)), or to timely pay the full amount of the issue fee (§ 1.317 paragraphs (b)-(f)) (lapsed patents). Cites in parentheses reference where subject matter is contained in current rules.

Section 1.137(a), as proposed, would further move into paragraph (a)(3) the requirement that a petition thereunder be "promptly filed after the applicant is notified of, or otherwise becomes aware of, the abandonment." 35 U.S.C. 133 requires that "it be shown . . . that such delay was unavoidable." This requirement is regarded as requiring not only a showing that the delay which resulted in the abandonment of the application was unavoidable, but also a showing of unavoidable delay from the time an applicant becomes aware of the abandonment of the application until the filing of a petition to revive. See *In re Application of Takao* 17 USPQ2d 1155 (Comm'r Pat. 1990). The burden of continuing the process of presenting a grantable petition in a timely manner likewise remains with the applicant until the applicant is informed that the petition is granted. *Id.* An applicant seeking to revive an "unavoidably" abandoned application is expected to cause a petition under § 1.137(a) to be filed without delay (i.e., promptly upon becoming notified, or otherwise becoming aware, of the abandonment of the application). As such, the placement of the requirement that a petition pursuant to § 1.137(a) be filed promptly upon becoming notified, or otherwise becoming aware, of the abandonment of the application is appropriately located in paragraph (a)(3), since § 1.137(a)(3) includes the requirement for a showing of unavoidable delay.

The requirement that an applicant seeking to revive an application as "unavoidably" abandoned "promptly" file a petition under § 1.137 is regarded as a requirement that a petition pursuant to § 1.137(a) be filed without delay upon the applicant or his or her representative being notified of, or otherwise becoming aware of, the abandonment. Thus, under the current and proposed practice, the failure to file a petition under § 1.137(a) within three months of the date the applicant or his or her representative is notified of, or otherwise becomes aware of, the abandonment would generally be regarded as a failure to "promptly" file a petition pursuant to § 1.137.

Providing a time period based upon the date of abandonment during which a petition pursuant to § 1.137(b) must be filed to be timely, but providing no comparable time period within which a petition pursuant to § 1.137(a) must be filed to be timely, results in the misapplication of § 1.137 on the part of practitioners, which in turn results in an inordinate administrative burden to the Office. The Office is proposing to either: (1) eliminate the time period requirement for filing a petition pursuant to § 1.137(b), or (2) provide comparable time period requirements for filing either a petition pursuant to § 1.137(a) and/or § 1.137(b), which time period will be based upon the date of the first Office notification that the application had become abandoned or that the patent had lapsed. Interested



persons are advised to comment on each of these proposals, since, depending upon further consideration by the Office and the comments received in response to this notice of proposed rulemaking, either proposal may be adopted in the final rule.

Providing the period of "within one year of the date on which the application became abandoned" as the period during which a petition under § 1.137(b) may be timely filed has had the undesirable effect of inducing applicants, or their representatives, to delay the filing of a petition under § 1.137(b) until the end of this one year period. This deliberate delay in filing a petition under § 1.137(b), or use of this one year period as an extension of time, is considered an abuse of § 1.137(b). See *In re Application of S.*, 8 USPQ2d 1630, 1632 (Comm'r Pats 1988). In addition, § 1.137(b) was recently amended to require that any petition thereunder include a statement that the delay (i.e., the entire delay), and not merely the abandonment, was unintentional. See *Final Rule*, "Changes in Procedures for Revival of Patent Applications and Reinstatement of Patents," published in the *Federal Register* at 58 FR 44277 (August 20, 1993) and in the Patent and Trademark Office *Official Gazette* at 1154 Off. Gaz. Pat. Office 4 (September 14, 1993). As such, any intentional delay in filing a petition under § 1.137(b) is prohibited by the current terms of the rule.

Under current rules, in instances in which an applicant, or his or her representative, intentionally delays the filing of a petition under § 1.137(b) until the end of this one year period, but files a petition under § 1.137(b) within this one year period, the petition is timely under § 1.137(b)(4), but the statement that "the delay was unintentional" is not appropriate. In instances in which the filing of a petition under § 1.137(b) is intentionally delayed until the end of this one year period, and the applicant, or his or her representative, miscalculates the actual date of abandonment, or otherwise miscalculates the end of this one year period, the statement that "the delay was unintentional" is likewise not appropriate, but the petition is also barred by the terms of the rule. In addition, subsequent petitions under § 1.137(a) are, regardless of the original cause of the abandonment, barred due to the applicant's failure to cause a petition under § 1.137(a) to be "promptly filed after the applicant is notified of, or otherwise becomes aware of, the abandonment." See *Application of S.*, 8 USPQ2d at 1632.

Where the applicant deliberately permits an application to become abandoned (e.g., due to a conclusion that the claims are unpatentable (e.g., that a rejection in an Office action cannot be overcome), or that the invention lacks sufficient commercial value to justify continued prosecution), the abandonment of such application is considered a deliberately chosen course of action, and the resulting delay cannot be considered "unintentional" within the meaning of 37 CFR 1.137(b). See *In re Application of G.*, 11 USPQ2d 1378, 1380 (Comm'r Pat. 1989). Likewise, where the applicant deliberately chooses not to either seek or persist in seeking the revival of an abandoned application, the resulting delay in seeking revival of the application cannot be considered "unintentional" within the meaning of 37 CFR 1.137. The correctness or propriety of the rejection, or other objection, requirement, or decision, by the Office, the appropriateness of the applicant's decision to abandon the application or to not seek or persist in seeking revival, or the discovery of new information or evidence, or other change in circumstances subsequent to the abandonment or decision not to seek or persist in seeking revival, are immaterial to such intentional delay caused by the deliberate course of action chosen by the applicant.

The intentional abandonment of an application, or an intentional delay in seeking either the withdrawal of a holding of abandonment in or the revival of an abandoned application, precludes a finding of unavoidable or unintentional delay pursuant to § 1.137. See *In re Malague*, 10 USPQ2d 1477, 1478 (Comm'r Pat. 1988).

**Proposed elimination of the time period requirement for filing a petition pursuant to § 1.137(b):**

Under this proposal, an intentional delay in the filing of a petition under § 1.137(b) will not result in an untimely petition pursuant to § 1.137(b). The statement that "the delay was unintentional," however, will continue to be inappropriate. That is, where there is an intentional delay in the filing of a petition under § 1.137(b), the statement that "the delay was unintentional" will continue to be inappropriate (i.e., the applicant, or his or her representative cannot properly make this statement,

and thus cannot properly request revival of the application), but § 1.137(b) would no longer include an additional time period requirement. It is anticipated that the effects of prosecution delay due to abandonment on patent term under Public Law 103-465, and the proposed changes to § 1.137(c), will eliminate any incentive to intentionally delay the revival of an abandoned application.

An applicant, assignee, or his or her representative, desiring the revival of an application that has inadvertently or unintentionally become abandoned is expected to act without intentional delay in seeking revival of the application. The Office does not question whether there has been an intentional or otherwise impermissible delay when a petition pursuant to § 1.137 is filed within three months of the date the applicant is first notified by the Office that the application is abandoned. Where, however, there is a greater delay between the date the applicant is first notified by the Office that the application is abandoned and the filing of a petition pursuant to § 1.137(b), the Office may raise the question as to whether the delay was unintentional, and may require more than a mere statement that the delay was unintentional. The Office may question whether the delay was unintentional in instances in which an applicant fails to timely seek reconsideration of a decision refusing to revive an abandoned application (see § 1.137(d)).

Regardless of whether the time period requirement in § 1.137(b) is eliminated, applicants seeking revival of an abandoned application are advised to file a petition pursuant to § 1.137 within three months of first notification that the application is abandoned to avoid the question of intentional delay being raised by the Office or third parties seeking to challenge any patent issuing from the application.

While this proposal would permit revival pursuant to § 1.137(b) without regard to the period of abandonment, § 1.137(a) currently permits revival pursuant thereto without regard to the period of abandonment. In addition, the Office currently entertains petitions pursuant to § 1.183, albeit under strictly limited conditions, to waive the time period requirement in § 1.137(b).

Since an application may currently be revived pursuant to § 1.137 without regard to the period of abandonment, any current reliance upon the period of abandonment to ensure that the application will never issue as a patent is misplaced. Thus, the proposed elimination of the time period requirement in § 1.137(b) would not significantly decrease the relationship between the period of abandonment of an application and the likelihood that such application would ever issue as a patent.

In the event that the proposed elimination of the time period requirement for filing a petition pursuant to § 1.137(b) is adopted, public comment is also requested on the application of this rule change to applications that were abandoned prior to the effective date of this rule change. This provision could be made effective as to petitions filed on or after the effective date of the rule change, which would permit the revival pursuant to § 1.137(b) of applications abandoned for extended periods of time, provided that the entire delay was unintentional. This provision could also be made effective as to applications abandoned on or after the effective date, with the provisions of current § 1.137(b) being applied to applications abandoned prior to the effective date of the rule change. This provision could also be made effective as to applications abandoned within and/or having a petition to revive filed within a specified period preceding the effective date of the rule change.

**Proposed comparable time period requirements each of §§ 1.137(a) and (b) based upon the date of the first Office notification that the application had become abandoned or that the patent had lapsed:**

The Office is also considering amending each of §§ 1.137(a) and (b) to include an express requirement that a petition thereunder be filed within a time certain. Specifically, the Office is also considering amending § 1.137(a) to include the express requirement that a petition thereunder be filed within three months of the date of the first Office notification that the application had become abandoned or that the patent had lapsed and amending § 1.137(b) to include the requirement that a petition thereunder be filed within three months of the date of the first Office notification that the application had become abandoned or that the patent had lapsed, or within three months of the date of the first decision on a timely petition pursuant to § 1.137(a).

The "promptly filed" requirement in § 1.137(a) is the subject of various interpretations by applicants seeking revival pursuant to § 1.137(a). To avoid misunderstandings as to the timeliness with which the Office expects an applicant seeking revival pursuant to § 1.137(a) to file a petition thereunder, the Office is considering amending § 1.137(a) to include the express requirement that a petition thereunder be filed within a time certain. Providing a period during which a timely petition pursuant to § 1.137(a) and/or (b) may be filed based upon the date of the first Office notification that the application had become abandoned or that the patent had lapsed, rather than the date of abandonment or patent lapse, is considered a better measure of timeliness. In addition, providing such a period will reduce uncertainty as to the expiration of the period during which a timely petition pursuant to § 1.137(b), as well as § 1.137(a), may be filed.

Therefore, the Office is also considering basing the period during which a timely petition under § 1.137 (b), as well as § 1.137(a), may be filed on the date of notification of the abandonment, rather than the date of abandonment, and considers that a period of within three months of the date of the first Office notification that the application had become abandoned or that the patent had lapsed to be the appropriate period.

Under the appropriate circumstances, petitions under § 1.183 to waive any time period requirement in §§ 1.137(a) and/or (b) would be available. Waiver of any requirement of § 1.137 will, in accordance with § 1.183, be strictly limited to an "extraordinary situation" in which "justice requires" such waiver.

Section 1.137(a)(1), as proposed, would replace the phrase "a proposed response to continue prosecution of that application, or the filing of a continuing application, unless either has been previously filed" with "accompanied by the required reply, unless previously filed. In a nonprovisional application abandoned for failure to prosecute, the proposed reply requirement may be met by the filing of a continuing application. In an abandoned application or a lapsed patent, for failure to pay any portion of the required issue fee, the proposed reply must be the issue fee or any outstanding balance thereof."

Section 1.137(b)(1), as proposed, would likewise replace the phrase "Accompanied by a proposed response to continue prosecution of that application, or filing of a continuing application, unless either has been previously filed" with "accompanied by the required reply, unless previously filed. In a nonprovisional application abandoned for failure to prosecute, the proposed reply requirement may be met by the filing of a continuing application. In an abandoned application or a lapsed patent, for failure to pay any portion of the required issue fee, the proposed reply must be the issue fee or any outstanding balance thereof."

While the revival of applications abandoned for failure to timely prosecute and for failure to timely pay the issue fee are proposed to be incorporated together in § 1.137, the statutory provisions for the revival of an application abandoned for failure to timely prosecute and for failure to timely submit the issue fee are mutually exclusive. See *Brenner v. Ebbert*, 398 F.2d 762, 157 USPQ 609 (D.C. Cir.), cert. denied 393 U.S. 926, 159 USPQ 799 (1968). 35 U.S.C. 151 authorizes the acceptance of a delayed payment of the issue fee, if the issue fee "is submitted ... and the delay in payment is shown to have been unavoidable." 35 U.S.C. 41(a)(7) likewise authorizes the acceptance of an "unintentionally delayed payment of the fee for issuing each patent." Thus, 35 U.S.C. 41(a)(7) and 151 each require payment of the issue fee as a condition of reviving an application abandoned or patent lapsed for failure to pay the issue fee. Therefore, the filing of a continuing application without payment of the issue fee or any outstanding balance thereof is not an acceptable proposed reply in an application abandoned or patent lapsed for failure to pay any portion of the required issue fee.

The Notice of Allowance requires the timely payment of the issue fee in effect on the date of its mailing to avoid abandonment of the application. In instances in which there is an increase in the issue fee by the time of payment of the issue fee required in the Notice of Allowance, the Office will mail a notice requiring payment of the balance of the issue fee then in effect. The phrase "for failure to pay any portion of the required issue fee" applies to those instances in which the applicant fails to

pay either the issue fee required in the Notice of Allowance or the balance of the issue fee required in a subsequent notice. In such instances, the proposed reply must be the issue fee then in effect, if no portion of the issue fee was previously submitted, or any outstanding balance of the issue fee then in effect, if a portion of the issue fee was previously submitted.

These proposed changes to §§ 1.137(a)(1) and (b)(1) are necessary to incorporate into § 1.137 the revival of abandoned applications and lapsed patents for the failure to timely reply to an Office requirement in a provisional application, to timely pay the issue fee, or to timely pay the full amount of the issue fee.

Sections 1.137(a) and (b), as proposed, would each include a new paragraph, paragraphs (a)(4) and (b)(4), respectively, providing that any petition thereunder must be accompanied by any terminal disclaimer (and fee as set forth in § 1.20(d)) required pursuant to § 1.137(c), to include in §§ 1.137(a) and (b) an explicit reference to the terminal disclaimer requirement in § 1.137(c).

Section 1.137(c), as proposed, would change the phrase "any petition pursuant to paragraph (a) of this section" to "any petition pursuant to this section." As the period for the timely filing of a petition under § 1.137(b) would no longer be based upon the period of abandonment, administrative convenience no longer justifies not requiring, for all design applications and all other nonprovisional utility applications filed prior to June 8, 1995, a terminal disclaimer under § 1.137(c) for all petitions pursuant to § 1.137.

In addition, the phrase "not filed within six months of the date of abandonment of the application" is proposed to be removed from § 1.137(c). The only justification for the current six month limitation on the terminal disclaimer requirement in § 1.137(c) is administrative convenience in treating a petition pursuant to § 1.137(a) filed within six months of the date of abandonment. Since the date of abandonment is miscalculated in a significant number of instances, this provision of § 1.137(c) leads to errors in determining when a terminal disclaimer is required pursuant to § 1.137(c), and thus leads to delays in continuing prosecution of the abandoned application. In any event, administrative convenience is no longer considered an adequate justification for the effective different treatment that would result by operation of Public Law 103-465 of: (1) applications filed on or after June 8, 1995, except for design applications, and (2) applications filed prior to June 8, 1995 and all design applications.

Section 1.137(d), as proposed, would change "application" to "abandoned application or lapsed patent" to incorporate into § 1.137 the revival of lapsed patents.

Section 1.137(e), as proposed, would provide that the time periods set forth in § 1.137 may be extended under the provisions of § 1.136.

Section 1.137(f), as proposed, will expressly provide that a provisional application, abandoned for failure to timely reply to an Office requirement, may be revived pursuant to § 1.137(a) or (b) so as to be pending for a period of no longer than twelve months from its filing date. In accordance with 35 U.S.C. 111(b)(5), § 1.137(f), as proposed, will clearly indicate that "[u]nder no circumstances will a provisional application be regarded as pending after twelve months from its filing date." Sections 1.139(a) and (b) each currently provide that a provisional application may be revived so as to be pending for a period of no longer than twelve months from its filing date, and that under no circumstances will a provisional application be regarded as pending after twelve months from its filing date.

Section 1.139 is proposed to be removed and reserved and its subject matter added to § 1.137.

Section 1.142 would be amended by replacement of "response" with "reply" in accordance with the proposed change to § 1.111.

Section 1.144 is proposed to be amended for clarification purposes.

Section 1.146 is proposed to be amended for clarification purposes.

Section 1.152 is proposed to be amended by removing the prohibition against color drawings and color photographs in design applications. Section 1.152 would be amended to permit the use of color photographs and color drawings in design applications subject to the petition requirements of § 1.84(a)(2) inasmuch as color may be an integral element of the ornamental



design. While pen and ink drawings may be lined for color, a clear showing of the configuration of the design may be obscured by this drafting method. New technologies, such as holographic designs, fi eworks and laser light displays may not be accurately disclosed without the use of color.

The term "article" of § 1.152 would be replaced by the term "design" as 35 U.S.C. 171 requires that the claim be directed to the "design for an article" not the article, per se. Therefore, to comply with the requirements of 35 U.S.C. 112, first paragraph, it is only necessary that the design as embodied in the article be fully disclosed and not the article itself. The term "must" would be replaced by the term "should" to allow for latitude in the illustration of articles whose configuration may be understood without surface shading. Clarification language would be added to note that the use of solid black surfaces would be permitted for representation of the color black as well as color contrast and that photographs and ink drawings must not be combined as formal drawings in one application.

Section 1.154 paragraph (a) would be amended to clarify that a voluntary submission (see comments under § 1.152 relating to substitution of "design" for "article") may and should be made of "a brief description of the nature and intended use of the article in which the design is embodied." It is current practice for design examiners, in appropriate cases, to inquire as to the nature and intended use of the article in which a claimed design is embodied. The submission of such description will allow for a more accurate initial classification, and aid in providing a proper and complete search at the time of the first action on the merits. In those instances where this feature description is necessary to establish a clear understanding of the article in which the design is embodied, provision of the feature description would help in reducing pendency by eliminating the necessity for time consuming correspondence. Specifically, requests for information prior to first action would be avoided. Absent an amendment requesting deletion of the description it would be printed on any patent that would issue.

Sections 1.155(b) through (f) are proposed to be removed in view of the proposed amendments to § 1.137.

Section 1.163 is proposed to be amended to remove an unnecessary and outmoded reference to a "legible carbon copy of the original" specification for plant applications.

Section 1.165 is proposed to be amended by removing a reference to the artistic and competent execution of plant patent drawings which is unnecessary in view of the reference to § 1.84.

Section 1.167 is proposed to be amended by removing and reserving paragraph (b) as unnecessary in view of § 1.132.

Section 1.171 would no longer require an order for a title report in reissue applications as the requirement for a certification on behalf of all the assignees under concomitantly amended § 1.172(a) obviates the need for a title report and fee therefor. Section 1.171 is also proposed to be amended by deletion of the requirement for an offer to surrender the patent, which offer is seen to be redundant in view of § 1.178.

Section 1.172 is proposed to be amended to require that all assignees establish their ownership interest by submission of evidence of the chain of title or by specifying where such evidence is recorded in the Office.

Section 1.175 relating to the content of the reissue oath or declaration (MPEP 1414), as well as §§ 1.48 and 1.324 relating to correction of inventorship in an application and in a patent, respectively, are proposed to be amended to remove the requirement for a showing of a lack of deceptive intent based on facts and circumstances. As the Office no longer investigates fraud and inequitable conduct issues and a reissue applicant's statement of a lack of deceptive intent is normally accepted on its face (See MPEP 1448), the current requirement in § 1.175(a)(5) that it be shown how the error(s) being relied upon arose or occurred without deceptive intent on the part of the applicant appears to be unduly burdensome upon applicants and the Office, and is proposed to be deleted. This would apply to the initially identified error(s), under paragraph (a), and any subsequently identified error(s) under paragraph (b). An initial reissue oath or declaration would be required to be filed pursuant to § 1.175(a) limited to identification of the cause(s) of the reissue, and stating generally that all errors being corrected in the reissue application at the time of filing of the oath or declaration arose without deceptive intent. The current practice under § 1.175(a)(3) and (a)(5) of specifically identifying all

errors being corrected at the time of filing the initial oath or declaration would not be retained.

Paragraph (b)(1) of § 1.175 would require a supplemental reissue oath or declaration for errors corrected that were not covered by an earlier presented reissue oath or declaration, such as the initial oath or declaration pursuant to paragraph (a) of this section or one submitted subsequent thereto (a supplemental oath or declaration under this paragraph), stating generally that all errors being corrected which are not covered by an earlier presented oath or declaration pursuant to paragraphs (a) and (b) of this section arose without any deceptive intention on the part of the applicant. A supplemental oath or declaration that refers to all errors that are being corrected, including errors covered by a reissue oath or declaration submitted pursuant to paragraph (a) of this section, would be acceptable. The specific requirement for a supplemental reissue oath or declaration to cover errors sought to be corrected subsequent to the filing of an initial reissue oath or declaration is not a new practice, but merely recognition of a current requirement for a supplemental reissue oath or declaration when additional errors are to be corrected. However, the current practice of specifically identifying all supplemental errors being corrected in a supplemental reissue oath or declaration would not be retained. A supplemental oath or declaration under paragraph (b)(1) would be required to be submitted prior to allowance. The supplemental oath or declaration may be submitted with any amendment prior to allowance, paragraph (b)(1)(i), or in order to overcome a rejection under 35 U.S.C. 251 made by the examiner where there are errors sought to be corrected that are not covered by a previously filed reissue oath or declaration, paragraph (b)(1)(ii). Any such rejection by the examiner will include a statement that the rejection may be overcome by submission of a supplemental oath or declaration, which oath or declaration states that the errors in issue arose without any deceptive intent on the part of the applicant. A supplemental oath or declaration under paragraph (b) would only be required for errors sought to be corrected during prosecution of the reissue application. Where an Office action contains only a rejection under 35 U.S.C. 251 and indicates that a supplemental oath or declaration under this paragraph would overcome the rejection, applicants are encouraged to authorize the payment of the issue fee at the time the supplemental reissue oath or declaration is submitted in view of the clear likelihood that the reissue application will be allowed on the next Office action. Such authorization will reduce the delays in the Office awaiting receipt of the issue fee. Where there are no errors to be corrected over those already covered by an oath or declaration submitted under paragraphs (a) and (b)(1) of this section, e.g., the application is allowed on first action, or where a supplemental oath or declaration has been submitted prior to allowance and no further errors have been corrected, a supplemental oath or declaration under this paragraph, or additional supplemental oath or declaration under paragraph (b)(1), would not be required.

Paragraph (b)(2) would provide that for any error sought to be corrected after allowance, e.g., under § 1.312, a supplemental oath or declaration must accompany the requested correction stating that the error(s) to be corrected arose without any deceptive intent on the part of the applicant.

The quotes around lack of deceptive intent in § 1.175(a)(6) would be removed as the exact language would not be required. Section 1.175(a)(7), referencing § 1.56, is proposed to be removed as unnecessary in view of the reference to § 1.56 in § 1.63 that is also referred to by § 1.175(a). Section 1.175(b) noting the ability of applicant to file affidavits or declarations of others and the ability of the examiner to require additional information would be deleted as unnecessary in view of § 1.132 and 35 U.S.C. 132. A reference to § 1.53(b) would be inserted in newly proposed § 1.175(c) to clarify that the initial oath or declaration under § 1.175(a) including those requirements under § 1.63 need not be submitted (with the specification, drawing and claims) in order to obtain a filing date.

37 CFR 1.176 would be amended to permit the Office to require restriction between claims added in a reissue application and the original patent claims, where the claims added in the reissue application are separate and distinct from the original patent claims. This change is provided to deal with the added examination burden which results when new inventions are added via the reissue application. The Office would continue to not require restriction between original claims of the patent,

i.e., between claims that were in the patent prior to filing the reissue application. In order for restriction to be required between the original patent claims and the newly added claims, the newly added claims must be separate and distinct from the original patent claims. Restriction between multiple inventions in the newly added claims would also be possible provided the newly added claims are drawn towards separate and distinct inventions.

Section 1.177 is proposed to be amended to discontinue the current practice that copending reissue applications must be issued simultaneously unless ordered otherwise by the Commissioner pursuant to petition.

Section 1.177 is proposed to be further amended by creating paragraphs (a) through (d) to clarify when multiple reissue patents may be issued and the conditions that applicant must comply with in order to have the Commissioner exercise his or her discretion and authorize issuance of multiple reissue patents. The Commissioner has discretion pursuant 35 U.S.C. 251 to permit the issuance of multiple reissue patents for distinct and separate parts of the thing patented. The Commissioner will exercise his or her statutory discretion under the limited conditions set forth in paragraph (a) of this section. Absent compliance with the provisions of paragraph (a) of this section, as defined by paragraphs (b) and (c) of this section, the Commissioner will not exercise his or her discretion under the statute and will not permit the issuance of multiple reissue applications, as is set forth in paragraph (d) of this section.

The conditions for the Commissioner to exercise his or her discretion and permit multiple reissue patents to be issued for distinct and separate parts of the thing patented set forth in paragraph (a) of this section are as follows: (1) Copending reissue applications for distinct and separate parts of the thing patented have been filed, (2) Applicant has filed in each copending reissue application a timely demand by way of petition for multiple reissue patents, (3) The required filing and issue fees for each copending reissue application have been paid, and (4) The petition for multiple reissue patents is granted prior to issuance of a reissue patent on any of the copending reissue applications.

Paragraph (b) of § 1.177 would set forth the requirements of the petition provided for in paragraph (a)(2) of this section, which requirements are: (1) A request for the issuance of multiple reissue patents for distinct and separate parts of the thing patented, (2) The petition fee pursuant to § 1.17(i), (3) An identification of the other copending reissue application(s), (4) A statement that the inventions as claimed in the copending reissue applications are distinct and separate parts of the thing patented, and (5) A showing sufficient to establish to the satisfaction of the Commissioner that the claimed subject matter of the thing patented is in fact being divided into distinct and separate parts.

The "distinct and separate parts of the thing patented" means two things: (1) that the thing patented is being proposed to be divided into separate parts, i.e., the claims in the original patent are being separated into different reissue applications, and (2) that the divided claims are distinct as set forth in MPEP 802.01.

Items (4) and (5) are intended to cover those situations where the Commissioner can and has determined, based on material and/or information supplied by applicant, or otherwise, that the subject matter of the thing patented is in fact being separated into parts that are distinct.

The Commissioner intends to delegate the authority for decisions on the petitions required under this section to the Group Directors of the groups where the copending reissue applications are pending.

Paragraph (c) of § 1.177 would define the timeliness requirements for submission of the petitions set forth in paragraph (a)(1) of this section. When the copending reissue applications are filed at the same time, the petitions must be filed no later than the earliest submission of the reissue oath or declaration under § 1.175(a) for any of the copending reissue applications. When the copending reissue applications are filed at different times, the petitions must be filed no later than the earliest of: (1) payment of the issue fee for any of the copending reissue applications, or (2) submission of the reissue oath or declaration under § 1.175 in the later filed copending reissue application.

Paragraph (d) of § 1.177 sets forth that the Commissioner will not permit multiple reissue patents to be issued if the requirements of this section are not met.

It is contemplated that where the requirements of paragraphs (a) and (b) of § 1.177 are capable of being perfected, the Office will give a one-month time period for perfection, with extensions of time available under § 1.136(a). Where a first copending reissue application has issued, however, perfection would not be possible. It is not the intent of the Commissioner to provide any possibility of review by way of appeal to the Board of Patent Appeals and Interferences from his or her determination that the requirements of this section have not been complied with. Review of determinations on questions as to whether it has been established that the copending reissue applications are for distinct and separate parts of the thing patented will be by way of petition under § 1.181(a)(3) and subsequently to court as to whether the Commissioner, or his or her designate, has properly exercised the discretion provided by 35 U.S.C. 251 as is now proposed to be implemented in § 1.177.

The proposed changes are not intended to affect the type of errors that are or are not appropriate for correction under 35 U.S.C. 251, e.g., a patent granted on elected claims will not be considered to be partially inoperative by reason of claiming less than they had a right to claim and applicant's failure to timely file a divisional application is not considered to be the type of error that can be corrected by a reissue. MPEP 1402 and 1450.

Section 1.177 is also proposed to be clarified by a new more descriptive title in view of the substantive amendments and a reference to the statutory authority.

Section 1.181 is proposed to be amended by removing paragraphs (d), (e) and (g) as unnecessary and at most representing internal instructions.

Section 1.182 is proposed to be amended by providing that a petition under the section may be granted "subject to such other requirements as may be imposed" by the Commissioner, language similar to that appearing for petitions under § 1.183. The section would have removed as unnecessary a statement that a decision on a petition thereunder will be communicated to interested parties in writing.

Section 1.184 is proposed to be removed and reserved as representing internal instructions.

Section 1.191 would be amended, to provide for an appeal only after the claims of an applicant or a patent owner of a patent under reexamination are twice rejected, by deletion of appeal after having received a final rejection. The reference to a final rejection is deemed unnecessary in view of the proposed amendment to § 1.113 by addition of paragraph (c) prohibiting a first action final rejection. An appeal would not then be appropriate in any application including reissue and continued prosecution (§ 1.53(b)(3)) applications or in a patent under reexamination unless that application or that patent under reexamination in which an appeal is filed has been twice rejected, particularly in view of the elimination of first action final rejections. A second rejection need not be a final rejection for an appeal to be taken as is currently the practice. However, an applicant or patent owner of a patent under reexamination would not be able to appeal after a first action rejection in a continuation, divisional or continued prosecution application as no first action would be a final rejection and the only basis to appeal would be that the claims of an applicant or patent owner of a patent under reexamination have been twice rejected in the same application or the same patent under reexamination.

Section 1.191, paragraph (a), would be amended for conformance with the language of 35 U.S.C. 134 by replacement of "the claims of which have" by "whose claims have." Section 1.191 would also be amended by replacement of "response" with "reply" in accordance with the proposed change to § 1.111.

Sections 1.192, 1.193, 1.194, 1.196, and 1.197 are proposed to be amended to change "the appellant" to "appellant" for consistency. Paragraph (a) of § 1.192 would be amended by replacement of "response" with "reply" in accordance with the proposed change to § 1.111.

Section 1.193 would be amended in its title by addition of "and substitute brief" to more accurately reflect the section's contents. Section 1.193 would also be amended, by revision of paragraph (a) into paragraphs (a)(1) and (a)(2) and revision of paragraph (b) into paragraphs (b)(1) and (b)(2). Paragraph (a)(1) would retain the subject matter of current paragraph (a). Paragraph (a)(2) would specifically prohibit the inclusion of a new ground of rejection in an examiner's answer.



Paragraph (b)(1) would remove the current discretion under existing paragraph (b) of this section of the examiner to enter a new ground of rejection in an examiner's answer responding to an appeal in conformance with proposed paragraph (a)(2). Paragraph (b)(1) would require the examiner to reopen prosecution to enter any new ground of rejection. Reopening of prosecution would require entering of any previously submitted paper that has been refused entry.

Paragraph (b)(1) of § 1.193 would also provide appellant with a right to file a substitute appeal brief in compliance with § 1.192 in reply to an examiner's answer where the right to file a substitute appeal brief would not be dependent upon a new point of argument being present in the examiner's answer. The current practice of permitting reply briefs based solely on a finding of a new point of argument, as set forth in current paragraph (b), would be eliminated thereby preventing present controversies as to whether a new point of argument has been made by the primary examiner. Appellant would be assured of having the last submission prior to review by the Board. Upon receipt of a substitute appeal brief the examiner would either acknowledge its receipt and entry or reopen prosecution to respond to any new issues raised in the substitute appeal brief. Should the Board desire to remand the appeal to the primary examiner for comment on the latest submission by appellant or to clarify an examiner's answer, MPEP 1211, 1211.01, and 1212, appellant would be entitled to submit a substitute appeal brief in response to the reply by the examiner to the Board's inquiry, which reply would be by way of a substitute examiner's answer. The use of substitute appeal briefs and substitute examiner's answers is intended to provide the Board with a single most current paper from each party.

Paragraph (b)(2) of § 1.193 would provide that if appellant desires that the appeal process be reinstated in reply to the examiner's reopening of prosecution under paragraph (b)(1) of this section, appellant would be able to file a new appeal brief under § 1.192 and a request to reinstate the appeal. Amendments, affidavits or other new evidence would not be entered if submitted with a request to reinstate the appeal. Reinstatement of the appeal would constitute a new notice of appeal but no additional appeal fees would be required, since such fees have been previously paid. The intent of the rule change is to give appellant (rather than the examiner) the option to continue the appeal if desired (particularly under a 20 year term), or to continue prosecution before the examiner in the face of a new ground of rejection. Should an appeal brief be elected as the response to the examiner reopening prosecution based on a new ground of rejection under paragraph (b)(1) of this section, the examiner may under paragraph (a)(1) of this section issue an examiner's answer.

Section 1.194, paragraph (b), is proposed to be amended to provide that a request for an oral hearing must be filed in a separate paper.

Section 1.194, paragraph (c), is proposed to be amended to provide that appellant will be notified when a requested oral hearing is unnecessary, e.g., a remand is required.

Section 1.196, paragraphs (b) and (d), are proposed to be combined by amending paragraph (b) to specifically provide in paragraph (b) for a new ground of rejection for both appealed claims and for allowed claims present in an application containing claims that have been appealed rather than the current practice under paragraph (d) of recommending a rejection of allowed claims that is binding on the examiner. The effect of an explicit rejection of an allowed claim by the Board of Patent Appeals and Interferences is not seen to differ from a recommendation of a rejection and would serve to advance the prosecution of the application by having the rejection made at an earlier date by the Board of Patent Appeals and Interferences rather than waiting for the application to be forwarded and acted upon by the examiner. The current practice, that the examiner is not bound by the rejection should appellant elect to proceed under paragraph (b)(1) and an amendment or showing of facts not previously of record in the opinion of the examiner overcomes the new ground of rejection, is not proposed to be changed. A period of two months would now explicitly be set forth for a reply to a decision by the Board of Patent Appeals and Interferences containing a new ground of rejection pursuant to § 1.196(b), which would alter the one month now set forth for replies to recommended rejections of previously allowed claims. MPEP 1214.01, page 1200-28.

Extensions of time would continue to be governed by § 1.196(f) and § 1.136(b) (and not by § 1.136(a)).

The last sentence of paragraph (b)(2) of § 1.196 would be amended to clarify that appellants do not have to both appeal and file request for reconsideration where only a reconsideration of a portion of the decision is sought in that a decision on a request for reconsideration will incorporate the earlier decision for purposes of appeal of the earlier decision for which only a partial request for reconsideration may have been filed. Additionally it is clarified that decisions on reconsideration are final unless noted otherwise in the decision in that under some circumstances it may not be appropriate to make a decision on reconsideration final as is currently automatically provided for.

Section 1.196 would have a new paragraph (d) providing the Board of Patent Appeals and Interferences with explicit authority to have an appellant clarify the record in addition to what is already provided by way of remand to the examiner, MPEP 1211, and appellant's compliance with the requirements of an appeal brief, § 1.192(d). Paragraph (d)(1) would provide that an appellant may be required to address any matter that is deemed appropriate for a reasoned decision on the pending appeal. Such matters would include:

- (1) the applicability of particular case law that has not been previously identified as relevant to an issue in the appeal,
- (2) the applicability of prior art that has not been made of record, and
- (3) the availability of particular test data that would be persuasive in rebutting a ground of rejection.

Paragraph (d)(2) would provide that appellant would be given a time limit within which to reply to any inquiry under paragraph (d)(1) of this section. Time limits, unlike time periods for reply, are not extendable under § 1.136(a).

Section 1.197, paragraph (b), is proposed to be amended to provide a period of two months, rather than the one month currently provided, for the single request for reconsideration or modification of the Board decision as provided for in § 1.197(b).

Section 1.291, paragraph (c), is proposed to be amended by removing the blanket limitation of one protest per protestor and would provide for a second or subsequent submission in the form of additional prior art. Mere argument that is later submitted by an initial protestor would continue not to be entered and returned unless it is shown that the argument relates to a new issue that could not have been earlier raised. MPEP 1907(b). Although, later submitted prior art would be made of record by a previous protestor without a showing that it relates to a new issue, it should be noted that entry of later submitted prior art in the file record does not assure its consideration by the examiner if submitted late in the examination process. Accordingly, initial protests should be as complete as possible when first filed.

In view of the proposed change to § 1.291(a) of this section in the 18-Month Publication Notice of Proposed Rulemaking, discussed *supra*, e.g., at § 1.62 of the preamble, limiting the filing of protests to the issuance of patents to particular time periods (none after the notice of allowance is mailed, none after two months from publication or the filing of protests with a fee during the two-month period from publication where a notice of allowance has not been mailed), the restriction of protests by number is deemed unnecessary and is recognized as ineffective in that the current rule may allow for more than one protest to be filed on behalf of a party.

Section 1.291 paragraph (c) would be amended by replacement of "response" with "reply" in accordance with the proposed change to § 1.111.

Section 1.294 paragraph (b) would be amended by replacement of "response" with "reply" in accordance with the proposed change to § 1.111.

Section 1.304(a)(1) is proposed to be amended to replace "consideration" by "reconsideration," an error that resulted from mistyping when it first appeared in the Federal Register.

Section 1.312, paragraph (b), is proposed to have a reference to § 1.175(b) added in view of the proposed change in § 1.175(b) referencing § 1.312(b).

Section 1.313 paragraph is proposed to be amended by the addition of paragraph (c) informing applicants that unless written notification is received that the application has been

withdrawn from issue at least two weeks prior to the projected date of issue, applicants should expect that the application will issue as a patent. Once an application has issued, the Office is without authority to grant a request under § 1.313 notwithstanding submission of the request prior to issuance of the patent.

Sections 1.316(b) through (f) are proposed to be removed as they would be combined in proposed § 1.137.

Sections 1.317(b) through (f) are proposed to be removed as they would be combined in proposed § 1.137.

Section 1.318 is proposed to be removed and reserved as being an internal Office instruction.

Section 1.324 is proposed to be amended by creating paragraphs (a) and (b). The requirement for factual showings to establish a lack of deceptive intent would be deleted, with a statement to that effect being sufficient, paragraph (a).

As Office practice (MPEP 1481) is to require the same type and character of proof of facts as in petitions under § 1.48(a), a showing of diligence proposed to be deleted in § 1.48 would not be continued in either § 1.48 or § 1.324, which currently follows the requirements of § 1.48. The applicability of a rejection under 35 U.S.C. 102(f)(g) against a patent with the wrong inventorship set forth therein is deemed to provide sufficient motivation for prompt correction of the inventorship without the need for a separate requirement for diligence.

The parties set forth in 35 U.S.C. 256 are interpreted to be only the person named as an inventor or not named as an inventor through error. Accordingly, § 1.324 is proposed to be amended, paragraph (b)(1), to explicitly require a statement relating to the lack of deceptive intent only from each person who is being added or deleted as an inventor, as opposed to the current practice of requiring a statement from each original named inventor and any inventor to be added.

The current requirements for an oath or declaration under § 1.63 by each actual inventor would be replaced, paragraph (b)(2) of § 1.324, by a statement from the current named inventors who have not submitted a statement under paragraph (b)(1) of § 1.324 either agreeing to the change of inventorship or stating that they have no disagreement in regard to the requested change. Not every original named inventor would necessarily have knowledge of each of the contributions of the other inventors and/or how the inventorship error occurred, in which case their lack of disagreement to the requested change would be sufficient.

Paragraph (b)(3) of § 1.324 would require the written consent of the assignees of all parties who submitted a statement under paragraph (b)(1) and (b)(2) of this section similar to the current practice of consents by the assignees of all the existing patentees. A clarification reference to § 3.73(b) has been added.

Paragraph (b)(4) of § 1.324 states the requirement for a petition fee as set forth in § 1.20(b).

Section 1.325 relating to mistakes not corrected is proposed to be removed and reserved as unnecessary in that mistakes cannot be corrected unless a basis for their correction is found.

Sections 1.351 and 1.352 are proposed to be removed and reserved as unnecessary in that they are internal instructions.

Section 1.366, paragraph (b), would have the term "certificate" removed as unnecessary. Paragraph (c) would be clarified by changing "serial number" to "application number" which consists of the serial number and the series code (e.g., "08/"). Paragraph (d) would have the suggested requirements for the patent issue date and the application filing date removed as unnecessary in that the patent number is sufficient to identify the file and the change parallels an intended deletion of these dates from forms PTO/SB/45 and PTO/SB/47. The term "serial" would be removed from paragraph (d).

Section 1.377, paragraph (c), would be amended to remove the requirement that the petition be verified in accordance with the proposed change to § 1.4(d)(2).

Section 1.378, paragraph (d), would be amended to remove the requirement that the statement be verified in accordance with the proposed change to § 1.4(d)(2).

Section 1.425 would be amended by removing paragraph (a) and its requirement for: proof of the pertinent facts, which relates to the lack of cooperation or unavailability of the inventor for which status is sought and by deleting paragraph (b) and its requirements for: proof of the pertinent facts, the presence of a sufficient proprietary interest, and a showing that such action is necessary to preserve the rights of the parties or

to prevent irreparable damage. Additionally, the requirement that the last known address of the non-signing inventor be stated would be removed. The current requirements are thought to be unnecessary in view of the need for submission of the same information in a petition under 37 CFR 1.47 during the national stage. The paragraph to be added would parallel the requirement in PCT Rule 4.15 for a statement explaining to the satisfaction of the Commissioner the lack of the signature concerned.

Section 1.484, paragraphs (d) through (f), would be amended by replacement of "response" and "respond" with "reply" in accordance with the proposed change to § 1.111.

Section 1.485 paragraph (a) would be amended by replacement of "response" with "reply" in accordance with the proposed change to § 1.111.

Section 1.488, paragraph (b), would be amended by replacement of "response" with "reply" in accordance with the proposed change to § 1.111.

Section 1.492 proposed to be amended to add new paragraph (g).

Section 1.494, paragraph (c), would be amended by replacement of "response" with "reply" in accordance with the proposed change to § 1.111.

Section 1.495, paragraph (c)(2), would be amended by replacement of "response" with "reply" in accordance with the proposed change to § 1.111.

Section 1.510, paragraph (e), would be amended to replace a reference to § 1.121(f), in view of its proposed removal, with a reference to § 1.530(d) in view of its proposed revision.

Section 1.530 the title and paragraph (a) would be amended by replacement of "amendment" and "response" with "reply" in accordance with the proposed change to § 1.111.

Section 1.530, paragraph (d), would be replaced by paragraphs (d)(1) through (d)(6) removing the reference to § 1.121(f) in accordance with the proposed deletion of § 1.121(f). The manner of making amendments in reexamination proceedings under the current reexamination practice is governed by § 1.530(d)(1) through (d)(6). Paragraph (d) would apply to proposed amendments in reexamination proceedings. Paragraph (d)(1) would be directed to the manner of proposing amendments in the specification other than in the claims. Paragraph (d)(1)(i) would require the precise point to be indicated where a proposed amendment is to be made. Paragraph (d)(1)(ii) would require that all amendments including deletions be made by submission of a copy of the rewritten paragraph(s) with markings. A change in one sentence, paragraph, or page that results in only format changes to other pages not being amended are not to be submitted. Paragraph (d)(1)(iii) would require proposed amendments to the specification to be made by rewritten relative to the patent specification and not relative to a previous proposed amendment. Paragraph (d)(1)(iv) would define the markings set forth in paragraph (d)(1)(ii).

Paragraph (d)(2) of § 1.530 would relate to the manner of proposing amendment of the claims in reexamination proceedings. Paragraph (d)(2)(i)(A) would require that a proposed amendment include the entire text of each patent claim which is proposed to be amended, but not all pending claims, such as patent claims that have not been proposed to be amended. Additionally, provision would be made for the cancellation of patent or of a proposed claim by a direction to cancel without the need for marking by brackets. Compare with deletion of claims in reissue applications where only patent claims and not added claims may be cancelled by direction, paragraph (b)(2)(i)(A). Paragraph (b)(2)(i)(B) would prohibit the renumbering of the patent claims and require that any proposed added claims follow the number of the highest numbered patent claim. Paragraph (b)(2)(i)(C) would identify the type of markings required by paragraph (d)(2)(i)(A), single underlining for added material and single brackets for material deleted.

Paragraph (d)(2)(ii) would require the patent owner to set forth the status of all patent claims, of all currently proposed claims, and of all previously proposed claims that are no longer being proposed as of the date of submission of each proposed amendment. Compare with § 1.121(b)(2)(ii), which does not require the status of patent claims that were not amended or of added claims that were cancelled.

Paragraph (d)(2)(iii) of § 1.530 would require an explanation of the support in the disclosure for any proposed first-time amendments to the claims on pages separate from the amend-



ments along with any additional comments. The absence of an explanation would result in an incomplete reply, 35 U.S.C. 135.

Paragraph (d)(2)(iv) of § 1.530 would require that each submission of a proposed amendment to any claim (patent claims and all proposed claims) requires copies of all proposed amendments to the claims as of the date of the submission. A copy of a previous amendment would not meet the requirement of this section in that all amendments must be represented, as only the last amendment will be used for printing. A copy of a patent claim that has not been proposed to be amended is not to be presented.

Paragraph (d)(2)(v) of § 1.530 would provide that the failure to submit a copy of any proposed added claim would be construed as a direction to cancel that claim.

Paragraph (d)(3) of § 1.530 would clarify that: 1) a proposed amendment may not enlarge the scope of the claims of the patent, 2) that no amendment may be proposed in an expired patent, and 3) no amendment will be incorporated into the patent by certificate issued after the expiration of the patent.

Paragraph (d)(4) of § 1.530 would clarify that amendments proposed to a patent during reexamination proceedings will not be effective until a reexamination certificate is issued.

Paragraph (d)(5) of § 1.530 would provide the specifications that the form of papers must comply with in reexamination proceedings, e.g., paper size must be either letter size or A4 size (and not legal size).

Paragraph (d)(6) of § 1.530 would clarify that proposed amendments to the patent drawings are not permitted and that any change must be by way of a new sheet of drawings with the proposed amended figures being identified as "amended" and with proposed added figures identified as "new" for each sheet that has changed.

Section 1.550, paragraphs (a), (b), and (d), would be amended by replacement of "response," "responses" and "respond" with "reply" in accordance with the proposed change to § 1.111.

Section 1.560, paragraph (b), would be amended by replacement of "response" with "reply" in accordance with the proposed change to § 1.111.

Section 1.770 would be amended by replacement of "response" with "reply" in accordance with the proposed change to § 1.111.

Section 1.785 would be amended by replacement of "response" with "reply" in accordance with the proposed change to § 1.111.

Section 1.804, paragraph (b), would be clarified grammatically by changing "shall state" to "stating" and would be amended to delete the requirement that the statement be verified in accordance with the proposed change to § 1.4(d)(2).

Section 1.805, paragraph (c), would be amended by replacement of "verified" with "statement" in accordance with the proposed change to § 1.111 and removing unnecessary language noting that an attorney or agent registered to practice need not verify their statements.

Portions of Part 3 are proposed to be amended to incorporate Part 7 that is proposed to be removed and reserved.

Section 3.11(a) is proposed to be created for the current subject matter and a new paragraph (b) would be added citing Executive Order 9424 and its requirements by several departments and other executive agencies of the Government for forwarding items for recording.

Section 3.26 would be amended to remove the requirement that English language translation be verified in accordance with the proposed change to § 1.4(d)(2).

Section 3.27(a) is proposed to be added to include current subject matter and an exception for § 3.27(b) that would be added citing Executive Order 9424 and a mailing address therefor.

Section 3.31(c) is proposed to be added to require that the cover sheet must indicate that the document is to be recorded on the governmental register and if applicable that the document is to be recorded on the Secret Register and that the document will not affect title.

Section 3.41(a) is proposed to be added for the current subject matter and a § 3.41(b) added to note when no recording fee is required in § 3.41(b)(1) through (3) when it is required by Executive Order 9424.

Section 3.51 is proposed to be amended by removing the term "certification" as unnecessary in accordance with the proposed change to § 1.4(d)(2).

Section 3.58 is proposed to be added to provide for the maintaining of a Department Register to record Government interests required by Executive Order 9424 in § 3.58(a). New § 3.58(b) would provide that the Office maintain a Secret Register to record Government interests also required by the Executive Order.

Section 3.73(b) is proposed to be amended to remove the sentence requiring an assignee to specifically state that the evidentiary documents have been reviewed and to certify that title is in the assignee seeking to take action. The sentence is deemed to be unnecessary in view of the proposed amendment to § 1.4(d). Section 3.73(b) has been clarified by addition of a reference to an example of documentary evidence that can be submitted.

Section 5.1 is proposed to be amended by removing the current subject matter as being duplicative of material in the other sections of this part and to be replaced by subject matter proposed to be deleted from § 5.33.

Section 5.2(b) through (d) are proposed to be removed as repetitive of material in the sections following with § 5.2(b) being replaced with subject matter of the first sentence from § 5.7.

Section 5.3 would be amended by replacement of "response" with "reply" in accordance with the proposed change to § 1.111.

Section 5.4 is proposed to be amended by removing unnecessary subject matter from paragraph (a), eliminating, in paragraph (d), the requirement that the petition be verified in accordance with the proposed amendment to § 1.4(d)(2) and by adding the first sentence of § 5.8 to paragraph (d).

Section 5.5 is proposed to be amended by removing unnecessary subject matter from paragraph (b) and by replacing current § 5.5(e) with subject matter proposed to be removed from § 5.6(a).

Section 5.6 is proposed to be removed and reserved with the subject matter of § 5.6(a) being placed in proposed § 5.5(e).

Section 5.7 is proposed to be removed and reserved with the first sentence thereof being placed in proposed § 5.2(b).

Section 5.8 is proposed to be removed and reserved with the subject matter from the first sentence thereof being placed in proposed § 5.4(e).

Sections 5.11(b) and (c) are proposed to be amended to update the references to other parts of the Code of Federal Regulations.

Section 5.13 is proposed to be amended by removing the last two sentences which are considered to be unnecessary.

Section 5.14(a) is proposed to be amended by removing unnecessary subject matter and replacing "serial number" with the more appropriate designation "application number".

Section 5.15(a) is proposed to be amended by removing unnecessary subject matter and to update the references to other parts of the Code of Federal Regulations.

Section 5.16 is proposed to be removed and reserved as unnecessary.

Section 5.17 is proposed to be removed and reserved as unnecessary.

Section 5.18 is proposed to be amended to update the references to other parts of the Code of Federal Regulations.

Sections 5.19(a) and (b) are proposed to be amended to update the references to other parts of the Code of Federal Regulations.

Section 5.19(c) is proposed to be removed as unnecessary.

Section 5.20(b) is proposed to be removed as unnecessary.

Section 5.25(c) is proposed to be removed as unnecessary.

Section 5.31 is proposed to be removed and reserved as unnecessary.

Section 5.32 is proposed to be removed and reserved as unnecessary.

Section 5.33 is proposed to be removed and reserved and the subject matter added to § 5.1.

Part 7 is proposed to be removed and reserved as the substance thereof has been incorporated into Part 3.

#### Compilation of Inquiries to Public

The Supplementary Information portion and the preamble portion of § 1.137 request comments on the advisability of

applying retroactively provisions in the final rules to papers submitted prior to the effective date of the final rule changes.

The § 1.121 portion of the preamble requests comments regarding the advisability of harmonizing reissue practice with reexamination practice.

The § 1.137(b) portion of the preamble requests comments on alternatives as to the time period for submitting a petition thereunder.

#### Review Under the Paperwork Reduction Act of 1995

This proposed rule contains information collection requirements which are subject to review by the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995. The title, description and respondent description of each of the information collections are shown below with an estimate of each of the annual reporting burdens. The collections of information in this proposed rule have been reviewed and approved by, or are pending approval by the OMB under the following control numbers: 0651-0035, 0651-0033, 0651-0031, 0651-0016, 0651-0032 and 0651-0027. Included in each estimate is the time for reviewing instructions, gathering and maintaining the data needed, and completing and reviewing the collection of information.

With respect to the following collections of information, the Office invites comments on: (1) Whether the proposed collection of information is necessary for the proper performance of the Office's functions, including whether the information will have practical utility; (2) The accuracy of the Office's estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions used; (3) Ways to enhance the quality, utility, and clarity of the information to be collected; and (4) Ways to minimize the burden of the collection of information on respondents, including through the use of automated collection techniques, when appropriate, and other forms of information technology.

Notwithstanding any other provision of law, no person is required to respond to nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB control number.

OMB Number: 0651-0035

Title: Address-Affecting Provisions

Form Numbers: PTO/SB/82/83

Type of Review: Pending OMB approval

Affected Public: Individuals or Households, Business or Other Non-Profit, Not-For-Profit Institutions and Federal Government.

Estimated Number of Respondents: 44,850

Estimated Time Per Response: 0.2 hours

Estimated Total Annual Burden Hours: 8,970 hours

Needs and Uses: Under existing law, a patent applicant or assignee may appoint, revoke or change a representative to act in a representative capacity. Also, an appointed representative may withdraw from acting in a representative capacity. This collection includes the information needed to ensure that Office correspondence reaches the appropriate individual.

OMB Number: 0651-0033

Title: Post Allowance and Refiling

Form Numbers: PTO/SB/13/14/44/50-57; PTOL-85b

Type of Review: Pending OMB approval

Affected Public: Individuals or Households, Business or Other Non-Profit, Not-For-Profit Institutions and Federal Government.

Estimated Number of Respondents: 165,900

Estimated Time Per Response: 0.382 hours

Estimated Total Annual Burden Hours: 63,400 hours

Needs and Uses: This collection of information is required to administer the patent laws pursuant to Title 35 of the U.S. Code concerning the issuance of patents and related actions including correcting errors in printed patents, refile of patent applications, requesting reexamination of a patent, and requesting a reissue patent to correct an error in a patent. The affected public includes any individual or institution whose application for a patent has been allowed or who takes action as covered by the applicable rules.

OMB Number: 0651-0031

Title: Patent Processing (Updating)

Form Numbers: PTO/SB/08-12/21-26/31/32/42/43/61-64/67-69/91-93/96/97

Type of Review: Pending OMB approval

Affected Public: Individuals or Households, Business or Other Non-Profit Institutions, Not-For-Profit Institutions and Federal Government.

Estimated Number of Respondents: 364,000

Estimated Time Per Response: 1.779 hours

Estimated Total Annual Burden Hours: 647,720 hours

Needs and Uses: During the processing for an application for a patent, the applicant/agent may be required or desire to submit additional information to the Office concerning the examination of a specific application. The specific information required or which may be submitted includes: Information Disclosure Citations; Terminal Disclaimers; Petitions to Revoke; Express Abandonment; Appeal Notice; Small Entity; Petition for Access; Power to Inspect; Certificate of Mailing; Amendment Transmittal Letter; Deposit Account Order Form.

OMB Number: 0651-0016

Title: Rules for Patent Maintenance Fees

Form Numbers: PTO/SB/45/46/47/65/66

Type of Review: Pending OMB approval

Affected Public: Individuals or Households, Business or Other Non-Profit, Not-For-Profit Institutions and Federal Government.

Estimated Number of Respondents: 273,800

Estimated Time Per Response: .08 hours

Estimated Total Annual Burden Hours: 22,640 hours

Needs and Uses: Maintenance fees are required to maintain a patent in force under Title 35 of the U.S. Code. Payment of maintenance fees are required at 3 1/2, 7 1/2 and 11 1/2 years after the grant of the patent. A patent number and serial number of the patent on which maintenance fees are paid are required in order to ensure proper crediting of such payments.

OMB Number: 0651-0032

Title: Initial Patent Application

Form Number: PTO/SB/01-07/17-20/101-109

Type of Review: Currently approved through 9/98

Affected Public: Individuals or Households, Business or Other Non-Profit, Not-For-Profit Institutions and Federal Government.

Estimated Number of Respondents: 221,000

Estimated Time Per Response: 10.8 hours

Estimated Total Annual Burden Hours: 2,387,000 hours

Needs and Uses: The purpose of this information collection is to permit the Office to determine whether an application meets the criteria set forth in the patent statutes and regulations. The standard Fee Transmittal form, New Utility Patent Application Transmittal form, New Design Patent Application Transmittal form, New Plant Patent Application Transmittal form, Plant Color Coding Sheet, Declaration, and Plant Patent Application Declaration will assist applicants in complying with the requirements of the patent statutes and regulations, and will further assist the Office in processing and examination of the application.

OMB Number: 0651-0027

Title: Changes in Patent and Trademark Assignment Practices

Form Numbers: PTO-1618 and PTO-1619, PTO/SB/15/41

Type of Review: Currently approved through 9/98

Affected Public: Individuals or households and businesses or other for-profit institutions.

Estimated Number of Respondents: 170,000

Estimated Time Per Response: 0.5 hours

Estimated Total Annual Burden Hours: 85,000 hours

Needs and Uses: The Office records about 170,000 assignments or documents related to ownership of patent and trademark cases each year. The Office requires a cover sheet to expedite the processing of these documents and to ensure that they are properly recorded.

As required by the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), the Office has submitted a copy of this proposed rulemaking to OMB for its review of these information collections. Interested persons are requested to send comments



regarding these information collections, including suggestions for reducing this burden, to the Office of Information and Regulatory Affairs of OMB, New Executive Office Bldg., 725 17th St. N.W., rm. 10235, Washington, D.C. 20503, Attn: Desk Officer for the Patent and Trademark Office.

OMB is required to make a decision concerning the collections of information contained in these proposed regulations between 30 and 60 days after publication of this document in the Federal Register. Therefore, a comment to OMB is best assured of having its full effect if OMB receives it within 30 days of publication. This does not affect the deadline for the public to comment to the Office on the proposed regulations.

#### Other Considerations

This proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Order 12612, and the Paperwork Reduction Act of 1995, 44 U.S.C. 3501 *et seq.* It has been determined that this rulemaking is not significant for the purposes of Executive Order 12866.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration that the proposed rule change would not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The principal impact of these proposed changes is to reduce the regulatory burden on the public in filing patent applications and petitions therein.

The PTO has determined that this proposed rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

#### List of Subjects

##### 37 CFR Part 1

Administrative practice and procedure, Deceptive intent, Inventions and patents.

##### 37 CFR Part 3

Administrative practice and procedure, Inventions and patents.

##### 37 CFR Part 5

Administrative practice and procedure, Inventions and patents, licenses and exports, secrecy.

##### 37 CFR Part 7

Inventions and patents.

For the reasons set forth in the preamble, 37 CFR Parts 1, 3, 5 and 7 are proposed to be amended as follows, with removals indicated by brackets ( ) and additions are indicated by arrows (▶):

#### Part 1 - Rules of Practice in Patent Cases

1. The authority citation for Part 1 continues to read as follows: 35 U.S.C. 6 and 23, unless otherwise noted.

1a. Section 1.4 is proposed to be amended by revising paragraph (d) and by adding paragraph (g) to read as follows:

##### § 1.4 Nature of correspondence and signature requirements.

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(d)▶(1)◀ Each piece of correspondence, except as provided for in paragraphs (e) and (f) of this section, filed in a patent or trademark application, reexamination proceeding, patent file or trademark registration file, trademark opposition proceeding, trademark cancellation proceeding, or trademark concurrent use proceeding, which requires a person's signature, must either:

[(1)]▶(i)◀ Be an original, that is, have an original signature personally signed in permanent ink by that person; or

[(2)]▶(ii)◀ Be a copy, such as a photocopy or facsimile transmission (§ 1.6(d)), of an original ▶ or of a copy of a copy◀. In the event that a copy of the original is filed, the original should be retained as evidence of authenticity. If a question of authenticity arises, the Patent and Trademark Office may require submission of the original.

▶(2) By presenting to the Office any paper the party submitting such paper is certifying that to the best of the person's knowledge, information and belief, formed after an inquiry reasonable under the circumstances that:

(i) The paper is not being presented for any improper purpose, such as to harass someone or to cause unnecessary delay or needless increase in the cost of prosecution before the Office;

(ii) The claims and other legal contentions therein are warranted by existing law or by a nonfrivolous argument for the extension, modification, or reversal of existing law or the establishment of new law;

(iii) The allegations and other factual contentions have evidentiary support or, if specifically so identified, are likely to have evidentiary support after a reasonable opportunity for further investigation or discovery; and

(iv) The denials of factual contentions are warranted on the evidence, or if specifically so identified, are reasonably based on a lack of information or belief.

(3) Sanctions:

(i) Violations of paragraphs (d)(2)(i) to (iv) of this section after notice and reasonable opportunity to respond are subject to such sanctions as are deemed appropriate by the Commissioner including issuance of a Notice of Termination of Proceedings or return of papers; and

(ii) Whoever, in any matter within the jurisdiction of the Patent and Trademark Office knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact, or makes any false, fictitious or fraudulent statements or representations, or makes or uses any false writing or document knowing the same to contain any false, fictitious or fraudulent statement or entry, shall be subject to the penalties set forth in 18 U.S.C. 1001, and may jeopardize the validity or enforceability of the application or any patent issuing thereon.◀

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▶(g) An applicant who has not made of record a registered attorney or agent may be required to state whether assistance was received in the preparation or prosecution of the patent application, for which any compensation or consideration was given or charged, and if so, to disclose the name or names of the person or persons providing such assistance. Assistance includes the preparation for the applicant of the specification and amendments or other papers to be filed in the Patent and Trademark Office, as well as other assistance in such matters, but does not include merely making drawings by draftsmen or stenographic services in typing papers.◀

2. Section 1.6 is proposed to be amended by revising paragraph (e) to read as follows:

##### § 1.6 Receipt of correspondence.

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(e) *Interruptions in U.S. Postal Service.* If interruptions or emergencies in the United States Postal Service which have been so designated by the Commissioner occur, the Patent and Trademark Office will consider as filed on a particular date in the Office any correspondence which is:

(1) Promptly filed after the ending of the designated interruption or emergency; and

(2) Accompanied by a statement indicating that such correspondence would have been filed on that particular date if it were not for the designated interruption or emergency in the United States Postal Service. [Such statement must be a verified statement if made by a person other than a practitioner as defined in § 10.1(r) of this chapter.]

3. Section 1.8 is proposed to be amended by revising paragraph (b) to read as follows:

##### § 1.8 Certificate of mailing or transmission.

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(b) In the event that correspondence is considered timely filed by being mailed or transmitted in accordance with paragraph (a) of this section, but not received in the Patent and Trademark Office, and the application is held to be abandoned or the proceeding dismissed, terminated, or decided with prejudice, the correspondence will be considered timely if the party who forwarded such correspondence:

(1) Informs the Office of the previous mailing or transmission of the correspondence promptly after becoming aware that the Office has no evidence of receipt of the correspondence.

(2) Supplies an additional copy of the previously mailed or transmitted correspondence and certificate, and

(3) Includes a statement which attests on a personal knowledge basis or to the satisfaction of the Commissioner to the previous timely mailing or transmission. [Such statement must be a verified statement if made by a person other than a practitioner as defined in § 10.1(r) of this chapter.] If the correspondence was sent by facsimile transmission, a copy of the sending unit's report confirming transmission may be used to support this statement.

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4. Section 1.10 is proposed to be amended by revising paragraph (c) to read as follows:

##### § 1.10 Filing of papers and fees by "Express Mail" with certificate.

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(c) The Patent and Trademark Office will accept the certificate of mailing by "Express Mail" and accord the paper or fee the certificate date under 35 U.S.C. 21(a) (unless the certificate date is a Saturday, Sunday, or Federal holiday within the District of Columbia - see § 1.6(a)) without further proof of the date on which the mailing by "Express Mail" occurred unless a question is present regarding the date of mailing. If more than a reasonable time has elapsed between the certificate date and the Patent and Trademark Office receipt date or if other questions regarding the date of mailing are present, the person mailing the paper or fee may be required to file a copy of the "Express Mail" receipt showing the actual date of mailing and a statement from the person who mailed the paper or fee [averring to the fact] ▶ stating◀ that the mailing occurred on the date certified. [Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.]

5. Section 1.14 is proposed to be amended by revising paragraphs (a) and (e) and by adding paragraph (f) to read as follows:

##### § 1.14 Patent applications preserved in [secrecy] ▶ confidence◀.

(a) Except as provided in § 1.11(b) pending patent applications are preserved in [secrecy] ▶ confidence◀. No information will be given by the Office respecting the filing by any particular person of an application for a patent, the pendency of any particular case before it, or the subject matter of any particular application, nor will access be given to or copies furnished of any pending application or papers relating thereto, without written authority in that particular application from the applicant or his ▶ or her◀ assignee or attorney or agent of record, unless the application has been identified by [serial] ▶ application◀ number in a published patent document or the United States of America has been indicated as a Designated State in a published international application, in which case status information ▶,◀ such as whether it is pending, abandoned, or patented ▶,◀ may be supplied, or unless it shall be necessary to the proper conduct of business before the Office or as pro-

vided by this part. Where an application has been patented, the patent number and issue date may also be supplied.

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(e) Any request by a member of the public seeking access to, or copies of, any pending or abandoned application preserved in [secrecy] ▶ confidence◀ pursuant to paragraphs (a) and (b) of this section, or any papers relating thereto, must ▶:◀

(1) Be in the form of a petition and be accompanied by the petition fee set forth in § 1.17(i), or

(2) Include written authority granting access to the member of the public in that particular application from the applicant or the applicant's assignee or attorney or agent of record.

▶(f) Information as to the filing of an application will be published in the Official Gazette as required by § 1.47(a) and (b).◀

6. Section 1.17 is proposed to be amended by removing and reserving paragraphs (b) through (d) and revising paragraph (a) and (i) to read as follows:

##### § 1.17 Patent application processing fees.

(a) Extension fee▶ pursuant to § 1.136(a):◀ [for response within first month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) ..... \$ 55.00  
By other than a small entity ..... \$ 110.00]

▶(1) For reply within first month:

By a small entity (§ 1.9(f)) ..... \$ 55.00  
By other than a small entity ..... \$ 110.00

(2) For reply within second month:

By a small entity (§ 1.9(f)) ..... \$ 195.00  
By other than a small entity ..... \$ 390.00

(3) For reply within third month:

By a small entity (§ 1.9(f)) ..... \$ 465.00  
By other than a small entity ..... \$ 930.00

(4) For reply within fourth month:

By a small entity (§ 1.9(f)) ..... \$ 735.00  
By other than a small entity ..... \$ 1,470.00

(5) For reply within fifth month:

By a small entity (§ 1.9(f)) ..... \$1,005.00  
By other than a small entity ..... \$2,010.00◀

(b) ▶Removed◀ [Extension fee for response within second month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) ..... \$ 190.00  
By other than a small entity ..... \$ 380.00]

(c) ▶Removed◀ [Extension fee for response within third month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) ..... \$ 450.00  
By other than a small entity ..... \$ 900.00]

(d) ▶Removed◀ [Extension fee for response within fourth month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) ..... \$ 700.00  
By other than a small entity ..... \$1,400.00]

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(i) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph ..... \$ 130.00  
§ 1.12 - for access to an assignment record.



- § 1.14 - for access to an application.  
 § 1.53 - to accord a filing date, except in provisional applications.  
 § 1.55 - for entry of late priority papers.  
 ▶§ 1.59 - for expungement and return of information.◀  
 [§ 1.60 - to accord a filing date.  
 § 1.62 - to accord a filing date.]  
 § 1.97(d) - to consider an information disclosure statement.  
 § 1.102 - to make an application special.  
 § 1.103 - to suspend action in application.  
 § 1.177(a)◀ - for [divisional] ▶multiple reissue applications◀ [reissues to issue separately].  
 § 1.312 - for amendment after payment of issue fee.  
 § 1.313 - to withdraw an application from issue.  
 § 1.314 - to defer issuance of a patent.  
 § 1.666(b) - for access to an interference settlement agreement.  
 § 3.81 - for a patent to issue to assignee, [where the] assignment [was] submitted after payment of the issue fee.

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7. Section 1.21 is proposed to be amended by revising paragraph (n) to read as follows:

#### § 1.21 Miscellaneous fees and charges.

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- (n) For handling an incomplete or improper application under § 1.53(c) [ , § 1.60 or § 1.62] ..... \$ 130.00

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8. Section 1.26 is proposed to be amended by revising paragraph(a) to read as follows:

#### § 1.26 Refunds

- (a) [Money] ▶Any fee◀ paid by [actual] mistake or in excess ▶of that required◀ will be refunded, but a mere change of purpose after the payment of money, as when a party desires to withdraw an application, an appeal, or a request for oral hearing, will not entitle a party to demand such a return. Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amounts; amounts over twenty-five may be returned by check or, if requested, by credit to a deposit account.

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9. Section 1.27 is proposed to be revised to read as follows:

#### § 1.27 Statement of status as small entity.

- (a) Any person seeking to establish status as a small entity (§ 1.9(f) of this part) for purposes of paying fees in an application or a patent must file a [verified] statement in the application or patent prior to or with the first fee paid as a small entity. Such a [verified] statement need only be filed once in an application or patent and remains in effect until changed.  
 (b) ▶When establishing status as a small entity◀ [Any verified statement filed] pursuant to paragraph (a) of this section ▶, any statement filed◀ on behalf of an independent inventor must be signed by the independent inventor except as provided in § 1.42, § 1.43, or § 1.47 of this part and must aver that the inventor qualifies as an independent inventor in accordance with § 1.9(c) of this part. Where there are joint inventors in an application, each inventor must file a [verified] statement establishing status as an independent inventor in order to qualify as a small entity. Where any rights have been assigned, granted, conveyed, or licensed, or there is an obligation to assign, grant, convey, or license, any rights to a small business concern, a nonprofit organization, or any other individual, a [verified] statement must be filed by the individual, the owner of the small business concern, or an official of the small business concern or nonprofit organization empowered to act on behalf of the small business concern or nonprofit organization averring

to their status. For purposes of a [verified] statement under this paragraph, a license to a Federal agency resulting from a funding agreement with that agency pursuant to 35 U.S.C. 202(c)(4) does not constitute a license as set forth in § 1.9 of this part.

(c) Any [verified] statement filed pursuant to paragraph (a) of this section on behalf of a small business concern must (1) be signed by the owner or an official of the small business concern empowered to act on behalf of the concern; (2) aver that the concern qualifies as a small business concern as defined in § 1.9(d); and (3) aver that the exclusive rights to the invention have been conveyed to and remain with the small business concern or, if the rights are not exclusive, that all other rights belong to small entities as defined in § 1.9. Where the rights of the small business concern as a small entity are not exclusive, a [verified] statement must also be filed by the other small entities having rights averring to their status as such. For purposes of a [verified] statement under this paragraph, a license to a Federal agency resulting from a funding agreement with that agency pursuant to 35 U.S.C. 202(c)(4) does not constitute a license as set forth in § 1.9 of this part.

(d) Any [verified] statement filed pursuant to paragraph (a) of this section on behalf of a nonprofit organization must (1) be signed by an official of the nonprofit organization empowered to act on behalf of the organization; (2) aver that the organization qualifies as a nonprofit organization as defined in § 1.9(e) of this part specifying under which one of § 1.9(e)(1), (2), (3), or (4) of this part the organization qualifies; and (3) aver that exclusive rights to the invention have been conveyed to and remain with the organization or if the rights are not exclusive that all other rights belong to small entities as defined in § 1.9 of this part. Where the rights of the nonprofit organization as a small entity are not exclusive, a [verified] statement must also be filed by the other small entities having rights averring to their status as such. For purposes of a [verified] statement under this paragraph, a license to a Federal agency pursuant to 35 U.S.C. 202(c)(4) does not constitute a conveyance of rights as set forth in this paragraph.

10. Section 1.28 is proposed to be amended by revising paragraphs(a) and (c) to read as follows:

#### § 1.28 Effect on fees of failure to establish status, or change status, as a small entity.

- (a) The failure to establish status as a small entity (§§ 1.9(f) and 1.27 of this part) in any application or patent prior to paying, or at the time of paying, any fee precludes payment of the fee in the amount established for small entities. A refund pursuant to § 1.26 of this part, based on establishment of small entity status, of a portion of fees timely paid in full prior to establishing status as a small entity may only be obtained if a [verified] statement under § 1.27 and a request for a refund of the excess amount are filed within two months of the date of the timely payment of the full fee. The two-month time period is not extendable under § 1.136. Status as a small entity is waived for any fee by the failure to establish the status prior to paying, at the time of paying, or within two months of the date of payment of, the fee. Status as a small entity must be specifically established in each application or patent in which the status is available and desired. Status as a small entity in one application or patent does not affect any other application or patent, including applications or patents which are directly or indirectly dependent upon the application or patent in which the status has been established. ▶The refile of an application under § 1.53 as a continuation, division, continuation-in-part or continued prosecution application or the filing of a reissue application requires a new determination as to continued entitlement to small entity status for the refiled application or the reissue application.◀ A nonprovisional application claiming benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) of a prior application, ▶a continued prosecution application, or a reissue application◀ may rely on a [verified] statement filed in the prior application ▶or in the patent◀ if the nonprovisional application ▶, the continued prosecution application or the reissue application◀ includes a reference to the [verified] statement in the prior application ▶or in the patent◀ or includes a copy of the [verified] statement in the prior application ▶or in the patent◀ and status as a small entity is still proper and

desired. ▶The payment of a small entity basic statutory filing fee will substitute for the reference.◀ Once status as a small entity has been established in an application or patent, the status remains in that application or patent without the filing of a further [verified] statement pursuant to § 1.27 of this part unless the Office is notified of a change in status.

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- (c) If status as a small entity is established in good faith, and fees as a small entity are paid in good faith, in any application or patent, and it is later discovered that such status as a small entity was established in error or that through error the Office was not notified of a change in status as required by paragraph (b) of this section, the error will be excused (1) if any deficiency between the amount paid and the amount due is paid within three months after the date the error occurred or (2) if any ▶upon payment of the◀ deficiency between the amount paid and the amount due [is paid more than three months after the date the error occurred and the payment is accompanied by a statement explaining how the error in good faith occurred and how and when the error was discovered. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office]. The deficiency is based on the amount of the fee, for other than a small entity, in effect at the time the deficiency is paid in full.

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11. Section 1.33 is proposed to be amended by revising paragraph(a) to read as follows and to remove and reserve paragraph(b):

#### § 1.33 Correspondence ▶address◀ respecting patent applications, reexamination proceedings, and other proceedings.

- (a) [The residence and post office address of the applicant must appear in the oath or declaration if not stated elsewhere in the application.] The applicant [may also specify and] ▶, the assignee(s) of the entire interest (see §§ 3.71 and 3.73) or◀ an attorney or agent of record ▶(see § 1.34(b))◀ may specify a correspondence address to which communications about the application are to be directed. All notices, official letters, and other communications in the [case] ▶application◀ will be directed to the correspondence address or, if no such correspondence address is specified, to an attorney or agent of record (see § 1.34(b)), or, if no attorney or agent is of record, to the applicant [, or to any assignee of record of the entire interest if the applicant or such assignee so requests, or to an assignee of an undivided part if the applicant so requests, at the] ▶provided a◀ post office address [of which the Office] has been [notified] ▶furnished◀ in the [case] ▶application◀. Amendments and other papers filed in the application must be signed: (1) by the applicant, or (2) if there is an assignee of record of an undivided part interest, by the applicant and such assignee, or (3) if there is an assignee of record of the entire interest, by such assignee, or (4) by an attorney or agent of record, or (5) by a registered attorney or agent not of record who acts in a representative capacity under the provisions of § 1.34(a). Double correspondence with an applicant and [his] ▶an◀ attorney or agent, or with more than one attorney or agent, will not be undertaken. If more than one attorney or agent [be] ▶is◀ made of record and a correspondence address has not been specified, correspondence will be held with the one last made of record.

- (b) ▶[Reserved]◀

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12. Section 1.41 is proposed to be amended by revising paragraph (a) to read as follows:

#### § 1.41 Applicant for patent.

- (a) A patent [must be] ▶is◀ applied for in the name of the actual inventor or inventors. ▶The inventorship of an application is set forth in the oath or declaration that is executed in accordance with § 1.63.◀ [Full names must be stated, including the family name, and at least one given name without abbrevia-

tion together with any other given name or initial.] ▶For identification purposes, the name of the actual inventor or inventors should be supplied when the specification and any required drawing are filed. If the name of the actual inventor or inventors are not supplied when the specification and any required drawing are filed, the application should include an applicant identification consisting of alphanumeric characters.◀

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13. Section 1.47 is proposed to be revised to read as follows:

#### § 1.47 Filing when an inventor refuses to sign or cannot be reached.

- (a) If a joint inventor refuses to join in an application for patent or cannot be found or reached after diligent effort, the application may be made by the other inventor on behalf of himself or herself and the [omitted] ▶nonsigning◀ inventor. The oath or declaration in such an application must be accompanied by a petition including proof of the pertinent facts ▶,◀ [and] by the [required] fee ▶set forth in◀ [(§ 1.17(h))], ▶and [must state] the last known address of the [omitted] ▶nonsigning◀ inventor. The Patent and Trademark Office shall forward notice of the filing of the application to the [omitted] ▶nonsigning◀ inventor at said address. Should such notice be returned to the Office undelivered, or should the address of the omitted inventor be unknown, ▶and◀ notice of the filing of the application shall be published in the *Official Gazette*. The [omitted] ▶nonsigning◀ inventor may subsequently join in the application on filing an oath or declaration [of the character required by] ▶complying with◀ § 1.63. [A patent may be granted to the inventor making the application, upon a showing satisfactory to the Commissioner, subject to the same rights which the omitted inventor would have had if he or she had been joined.]

- (b) Whenever [an] ▶all the◀ [inventor] ▶inventors◀ [refuses] ▶refuse◀ to execute an application for patent, or cannot be found or reached after diligent effort, a person to whom [the] ▶an◀ inventor has assigned or agreed in writing to assign the invention or who otherwise shows sufficient proprietary interest in the matter justifying such action may make application for patent on behalf of and as agent for ▶all◀ the [inventor] ▶inventors◀. The oath or declaration in such an application must be accompanied by a petition including proof of the pertinent facts ▶,◀ [and] a showing that such action is necessary to preserve the rights of the parties or to prevent irreparable damage, [and by] the [required] fee ▶set forth in◀ [(§ 1.17(h))], ▶and [must state] the last known address of ▶all◀ the [inventor] ▶inventors◀. [The assignment, written agreement to assign or other evidence of proprietary interest, or a verified copy thereof, must be filed in the Patent and Trademark Office.] The Office shall forward notice of the filing of the application to ▶all◀ the [inventor] ▶inventors◀ at the [address] ▶addresses◀ stated in the application. Should such notice be returned to the Office undelivered, or should the address of the inventor be unknown, ▶and◀ notice of the filing of the application shall be published in the *Official Gazette*. [The] ▶An◀ inventor may subsequently join in the application on filing an oath or declaration [of the character required by] ▶complying with◀ § 1.63. [A patent may be granted to the inventor upon a showing satisfactory to the Commissioner.]

14. Section 1.48 is proposed to be revised to read as follows:

#### § 1.48 Correction of inventorship. ▶in a patent application◀.

- (a) [If the correct inventor or inventors are not named in a nonprovisional application through error without any deceptive intention on the part of the actual inventor or inventors.] ▶If the inventive entity is set forth in error in an executed § 1.63 or § 1.175 oath or declaration and such error arose without any deceptive intention on the part of the person named as an inventor in error or on the part of the person who through error was not named as an inventor, the application may be amended to name only the actual inventor or inventors.▶When the application is involved in an interference, the amendment



shall comply with the requirements of this section and shall be accompanied by a motion under § 1.634. Such amendment must be [diligently made and must be] accompanied by:

(1) A petition including a statement [of facts verified by the original named inventor or inventors establishing when the error without deceptive intention was discovered and how it occurred] from each person who is being added as an inventor and from each person who is being deleted as an inventor that the error in inventorship occurred without deceptive intention on their part;

(2) An oath or declaration by each actual inventor or inventors as required by § 1.63 or as permitted by §§ 1.42, 1.43 or 1.47;

(3) The fee set forth in § 1.17(h); and

(4) If an assignment has been executed by any of the original named inventors the, [The] written consent of [any] the assignee, see § 3.73(b). [When the application is involved in an interference, the petition shall comply with the requirements of this section and shall be accompanied by a motion under § 1.634.]

(b) If the correct inventors are named in [the] a nonprovisional application when filed and the prosecution of the application results in the amendment or cancellation of claims so that less than all of the originally named inventors are the actual inventors of the invention being claimed in the application, an amendment shall be filed deleting the names of the person or persons who are not inventors of the invention being claimed. When the application is involved in an interference, the amendment shall comply with the requirements of this section and shall be accompanied by a motion under § 1.634. Such amendment must be [diligently made and shall be] accompanied by:

(1) A petition including a statement identifying each named inventor who is being deleted and acknowledging that the inventor's invention is no longer being claimed in the application; and

(2) The fee set forth in § 1.17(b).

(c) If a nonprovisional application discloses unclaimed subject matter by an inventor or inventors not named in the application, the application may be amended [pursuant to paragraph (a) of this section] to add claims to the subject matter and name the correct inventors for the application. When the application is involved in an interference, the amendment shall comply with the requirements of this section and shall be accompanied by a motion under § 1.634. Such amendment must be accompanied by:

(1) A petition including a statement from each person being added as an inventor that the amendment is necessitated by amendment of the claims and that the inventorship error occurred without deceptive intention on their part;

(2) An oath or declaration by each actual inventor or inventors as required by § 1.63 or as permitted by §§ 1.42, 1.43 or 1.47;

(3) The fee set forth in § 1.17(h); and

(4) If an assignment has been executed by any of the original named inventors, the written consent of the assignee, see § 3.73(b).

(d) If the name or names of an inventor or inventors were omitted in a provisional application through error without any deceptive intention on their part [the part of the actual inventor or inventors], the provisional application may be amended to add the name or names of the [actual] omitted inventor or inventors. Such amendment must be accompanied by:

(1) A petition including a statement that the inventorship error occurred without deceptive intention on the part of the [actual] omitted inventor or inventors, which statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office; and

(2) The fee set forth in § 1.17(q).

(e) If a person or persons were named as an inventor or inventors in a provisional application through error without any deceptive intention on their part, an amendment may be filed in the provisional application deleting the name or names of the person or persons who were erroneously named. Such amendment must be accompanied by:

(1) A petition including a statement [of facts verified] by the person or persons whose name or names are being deleted [establishing] that the inventorship error occurred without deceptive intention on their part;

(2) The fee set forth in § 1.17(q); and

(3) [The written consent of any assignee.] If an assignment has been executed by any of the original named inventors, the written consent of the assignee, see § 3.73(b).

(f) If the correct inventor or inventors are not named on filing a nonprovisional application without an executed oath or declaration under § 1.63, the later submission of an executed oath or declaration under § 1.63 will act to correct the earlier identification of inventorship.

(g) The Office may require such other information as may be deemed appropriate under the particular circumstances surrounding the correction of inventorship.

15. Section 1.51 is proposed to be amended by removing paragraph (c).

#### § 1.51 General requisites of an application.

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(c) [Removed].

16. Section 1.52 is proposed to be amended by revising paragraphs (a) and (d) as follows:

#### § 1.52 Language, paper, writing, margins.

(a) The application, any amendments or corrections thereto, and the oath or declaration must be in the English language except as provided for in § 1.69 and paragraph (d) of this section, or be accompanied by a [verified] translation of the application and a translation of any corrections or amendments into the English language together with a statement that the translation is accurate. All papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly written, typed, or printed in permanent ink or its equivalent in quality. All of the application papers must be presented in a form having sufficient clarity and contrast between the paper and the writing, typing, or printing thereon to permit the direct reproduction of readily legible copies in any number by use of photographic, electrostatic, photo-offset, and microfilming processes. If the papers are not of the required quality, substitute typewritten or printed papers of suitable quality may be required.

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(d) An application may be filed in a language other than English. [A verified] An English translation of the non-English-language application, a statement that the translation is accurate, and the fee set forth in § 1.17(k) are required to be filed with the application or within such time as may be set by the Office.

17. Section 1.53 is proposed to be amended by revising paragraphs (b) through (d) as follows:

#### § 1.53 Application number, filing date, and completion of application.

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(b)(1) The filing date of an application for patent filed under this section, except for a provisional application under paragraph (b)(2) of this section or a continued prosecution application under paragraph (b)(3) of this section, is the date on which: a specification containing a description pursuant to § 1.71 and at least one claim pursuant to § 1.75; and any drawing required by § 1.81(a), are filed in the Patent and Trademark Office [in the name of the actual inventor or inventors as required by § 1.41]. No new matter may be introduced into an application after its filing date [(1.115(b)(1)) § 1.118]. [If all the names of the actual inventor or inventors are not supplied when the specification and any required drawing are filed, the application will not be given a filing date earlier than the date upon which the names are supplied unless a petition with the fee set forth in § 1.17(i) is filed which sets forth the reasons the delay in supplying the names should be excused.] A continuation or divisional application (filed under the condi-

tions specified in 35 U.S.C. 120, 121 or 365(c) and § 1.78(a)) may be filed under this paragraph or paragraph (b)(3) of this section [, § 1.60 or § 1.62]. A continuation-in-part application must [may also] be filed under this paragraph [section or § 1.62].

(i) Any continuation or divisional application may be filed by all or by less than all of the inventors named in a prior application. A newly executed oath or declaration is not required (§ 1.51(a)(1)(ii)) and paragraph (d) of this section in a continuation or divisional application filed by all or by less than all of the inventors named in a prior application, provided that one of the following is submitted: a copy of the executed oath or declaration filed to complete (§ 1.51(a)(1)) the most immediate prior national application for which priority is claimed under 35 U.S.C. 120, 121 or 365(c), or a copy of an unexecuted oath or declaration, and a statement that the copy is a true copy of the oath or declaration that was subsequently executed and filed to complete (§ 1.51(a)(1)) the most immediate prior national application for which priority is claimed under 35 U.S.C. 120, 121 or 365(c). See paragraph (d) of this section for the filing of a continuation or divisional application without the submission of a newly executed oath or declaration or a copy of the oath or declaration for the most immediate prior national application for which priority is claimed under 35 U.S.C. 120, 121 or 365(c).

(A) The copy of the executed or unexecuted oath or declaration for the most immediate prior national application for which priority is claimed under 35 U.S.C. 120, 121 or 365(c) must be accompanied by a statement requesting the deletion of the names of the person or persons who are not inventors in the continuation or divisional application.

(B) Where the power of attorney or correspondence address was changed during the prosecution of the prior application, the change in power of attorney or correspondence address must be identified in the continuation or divisional application.

(ii) A newly executed oath or declaration must be filed in a continuation or divisional application naming an inventor not named in the prior application. A newly executed oath or declaration must be filed in a continuation-in-part application, which application may name all, more, or less than all of the inventors named in the prior application.

(iii) The inventorship of an application is set forth in the oath or declaration that is executed in accordance with § 1.63.

(2) The filing date of a provisional application is the date on which: a specification as prescribed by 35 U.S.C. 112, first paragraph; and any drawing required by § 1.81(a), are filed in the Patent and Trademark Office [in the name of the actual inventor or inventors as required by § 1.41]. No amendment, other than to make the provisional application comply with all applicable regulations, may be made to the provisional application after the filing date of the provisional application. [If all the names of the actual inventor or inventors are not supplied when the specification and any required drawing are filed, the provisional application will not be given a filing date earlier than the date upon which the names are supplied unless a petition with the fee set forth in § 1.17(q) is filed which sets forth the reasons the delay in supplying the names should be excused.]

(i) A provisional application must also include a cover sheet identifying the application as a provisional application. Otherwise, the application will be treated as an application filed under paragraph (b)(1) of this section [§ 1.53(b)(1)].

(ii) An application for patent filed under paragraph (b)(1) of this section [§ 1.53(b)(1)] may be [treated as] converted to a provisional application and be accorded the original filing date provided that a petition requesting the conversion, with the fee set forth in § 1.17(q), is filed prior to the earlier of the abandonment of the [§ 1.53(b)(1)] application under paragraph (b)(1) of this section, the payment of the issue fee, the expiration of 12 months after the filing date of the [§ 1.53(b)(1)] application under paragraph (b)(1) of this section, or the filing of a request for a statutory invention registration under § 1.293. The grant of any such petition will not entitle applicant to a refund of the fees which were properly paid in the application filed under paragraph (b)(1) of this section [§ 1.53(b)(1)].

(iii) A provisional application shall not be entitled to the right of priority under § 1.55 or 35 U.S.C. 119 or 365(a) or to the benefit of an earlier filing date under § 1.78 or 35 U.S.C.

120, 121 or 365(c) of any other application. No claim for priority under § 1.78(a)(3) may be made in a design application based on a provisional application. No request under § 1.293 for a statutory invention registration may be filed in a provisional application. The requirements of §§ 1.821 through 1.825 regarding application disclosures containing nucleotide and/or amino acid sequences are not mandatory for provisional applications.

(3) In a nonprovisional application that is complete as defined by § 1.51(a)(1) and filed on or after June 8, 1995, a continuation or divisional application that discloses and claims only subject matter disclosed in and names as inventors the same or less than all the inventors named in that prior complete application may be filed as a continued prosecution application under this paragraph. The filing date of a continued prosecution application is the date on which a request for an application under this paragraph including identification of the prior application number is filed.

(i) An application filed under this paragraph:

(A) Will utilize the file jacket and contents of the prior application, including the specification, drawings and oath or declaration, from the prior complete application (§ 1.51(a)) to constitute the new application, and will be assigned the application number of the prior application for identification purposes.

(B) Is a request to expressly abandon the prior application as of the filing date of the request for an application under this paragraph, and

(C) Must be filed before the payment of the issue fee, abandonment of, or termination of proceedings on the prior application, or after payment of the issue fee if a petition under § 1.313(b)(5) is granted in the prior application.

(ii) The filing fee for a continued prosecution application filed under this paragraph is:

(A) The basic filing fee as set forth in § 1.16(a), and

(B) Any additional § 1.16 fee due based on the number of claims remaining in the application after entry of any amendment accompanying the request for an application under this paragraph and entry of any amendments under § 1.116 unentered in the prior application which applicant has requested to be entered in the continued prosecution application.

(iii) If an application filed under this paragraph is filed by less than all the inventors named in the prior application, a statement must accompany the application when filed requesting deletion of the names of the person or persons who are not inventors of the invention being claimed in the new application.

(iv) Any new change must be made in the form of an amendment to the prior application. Any new specification filed with the request for an application under this paragraph will not be considered part of the original application papers, but will be treated as a substitute specification in accordance with § 1.125.

(v) The filing of a continued prosecution application under this paragraph will be construed to include a waiver of confidence by the applicant under 35 U.S.C. 122 to the extent that any member of the public who is entitled under the provisions of § 1.14 to access to, or information concerning either the prior application or any application filed under the provisions of this paragraph may be given similar access to, or similar information concerning, the other application(s) in the file jacket.

(vi) In addition to identifying the application number of the prior application, applicant is urged to furnish in the request for an application under this paragraph the following information relating to the prior application to the best of his or her ability:

(A) Title of invention;  
(B) Name of applicant(s);  
(C) Correspondence address;  
(D) Identification of any priority claim under 35 U.S.C. 119, 120 and 121.

(vii) Envelopes containing only requests and fees for filing an application under this paragraph should be marked "Box CPA."

(c)(1) If any application filed under paragraph (b) of this section is found to be incomplete or improper, applicant will be so notified and given a time period within which to correct the filing error.

(2) Any request for review of a notification pursuant to paragraph (c)(1) of this section, or a notification that the original



application papers lack a portion of the specification or drawing(s), must be by way of a petition pursuant to this paragraph. Any petition under this paragraph must be accompanied by the fee set forth in § 1.17(i) in an application filed under paragraphs (b)(1) or (b)(3) of this section, and the fee set forth in § 1.17(q) in an application filed under paragraph (b)(2) of this section. In the absence of a timely (§ 1.181(f)) petition pursuant to this paragraph, the filing date of an application in which the applicant was notified of a filing error pursuant to paragraph (c)(1) of this section will be the date the filing error is corrected.

(3) If an applicant is notified of a filing error pursuant to paragraph (c)(1) of this section, but fails to correct the filing error within the given time period or otherwise timely (§ 1.181(f)) take action pursuant to paragraph (c)(2) of this section, proceedings in the application will be considered terminated. Where proceedings in an application are terminated pursuant to this paragraph, the application may be returned or otherwise disposed of, and any filing fees, less the handling fee set forth in § 1.21(n), will be refunded. [If any application is filed without the specification, drawing or name, or names, of the actual inventor or inventors required by paragraph (b)(1) or (b)(2) of this section, applicant will be so notified and given a time period within which to submit the omitted specification, drawing, name, or names, of the actual inventor, or inventors, in order to obtain a filing date as of the date of filing of such submission. A copy of the "Notice of Incomplete Application" form notifying the applicant should accompany any response thereto submitted to the Office. If the omission is not corrected within the time period set, the application will be returned or otherwise disposed of; the fee, if submitted, will be refunded less the handling fee set forth in § 1.21(n). Any request for review of a refusal to accord an application a filing date must be by way of a petition accompanied by the fee set forth in § 1.17(i), if the application was filed under § 1.53(b)(1), or by the fee set forth in § 1.17(q), if the application was filed under § 1.53(b)(2).]

(d)(1) If an application which has been accorded a filing date pursuant to [paragraph] paragraphs (b)(1) or (b)(3) of this section, including a continuation, divisional, or continuation-in-part application, does not include the appropriate filing fee or an oath or declaration by the applicant [,] pursuant to §§ 1.63 or 1.175, which may be a copy of the executed oath or declaration filed to complete, pursuant to § 1.51(a)(1), the most immediate prior national application for which priority is claimed under 35 U.S.C. 120, 121 or 365(c), or a copy of an unexecuted oath or declaration, and a statement that the copy is a true copy of the oath or declaration that was subsequently executed and filed to complete (§ 1.51(a)(1)) the most immediate prior national application for which priority is claimed under 35 U.S.C. 120, 121 or 365(c), in a continuation or divisional application, applicant will be so notified, if a correspondence address has been provided, given a period of time within which to file the fee, oath [,] or declaration and to pay the surcharge as set forth in § 1.16(e) in order to prevent abandonment of the application. [A copy of the "Notice to File Missing Parts" form mailed to applicant should accompany any response thereto submitted to the Office.] If the required filing fee is not timely paid, or if the processing and retention fee set forth in § 1.21(l) is not paid within one year of the date of mailing of the notification required by this paragraph, the application will be disposed of. No copies will be provided or certified by the Office of an application which has been disposed of or in which neither the required basic filing fee nor the processing and retention fee has been paid. The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section. If no correspondence address is included in the application, applicant has two months from the filing date to file the basic filing fee, oath or declaration and to pay the surcharge as set forth in § 1.16(e) in order to prevent abandonment of the application; or, if no basic filing fee has been paid, one year from the filing date to pay the processing and retention fee set forth in § 1.21(l) to prevent disposal of the application.

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18. Section 1.54 is proposed to be amended by revising paragraph(b) to read as follows:

**§ 1.54 Parts of application to be filed together; filing receipt.**

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(b) Applicant will be informed of the application number and filing date by a filing receipt, unless the application is an application filed under § 1.53(b)(3).

19. Section 1.55 is proposed to be amended revising paragraph (a) to read as follows:

**§ 1.55 Claim for foreign priority.**

(a) An applicant in a nonprovisional application may claim the benefit of the filing date of one or more prior foreign applications under the conditions specified in 35 U.S.C. 119(a) through (d) and 172. The claim to priority need be in no special form and may be made by the attorney or agent if the foreign application is referred to in the oath or declaration as required by § 1.63. The claim for priority and the certified copy of the foreign application specified in 35 U.S.C. 119(b) must be filed in the case of an interference (§ 1.630), when necessary to overcome the date of a reference relied upon by the examiner, when specifically required by the examiner, and in all other cases, before the patent is granted. If the certified copy is not in the English language, a translation need not be filed except in the case of interference; or when necessary to overcome the date of a reference relied upon by the examiner; or specifically required by the examiner, in which event an English language translation must be filed together with a statement that the translation of the certified copy is accurate. [The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.]

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20. Section 1.59 is proposed to be revised to read as follows:

**§ 1.59 Expungement of information or copy of papers in application file. [Papers of application with filing date not to be returned].**

(a)(1) Information [Papers] in an application which has received a filing date pursuant to § 1.53 will not be expunged and returned [for any purpose whatever], except as provided in paragraph (b) of this section. [If applicants have not preserved copies of the papers, the Office will furnish copies at the usual cost of any application in which either the required basic filing fee (§ 1.16) or, if the application was filed under § 1.53(b)(1), the processing and retention fee § 1.21(l) has been paid.] See § 1.618 for return of unauthorized and improper papers in interferences.

(2) Information forming part of the original disclosure, i.e., written specification, drawings, claims and any preliminary amendment specifically incorporated into an executed oath or declaration under §§ 1.63 and 1.175, will not be expunged from the application file.

(b) Information, other than what is excluded by paragraph (a)(2) of this section, may be requested to be expunged and returned to applicant upon petition under this paragraph and payment of the petition fee set forth in § 1.17(i). Any petition to expunge and return information from an application must establish to the satisfaction of the Commissioner that the return of the information is appropriate.

(c) If applicants have not preserved copies of any application papers, the Office will furnish copies upon request, at the usual cost, for any application in which either the required basic filing fee (§ 1.16) or, if the application was filed under § 1.53(b)(1), the processing and retention fee (§ 1.21(l)) has been paid.

21. Section 1.60 is proposed to be removed and reserved.

**§ 1.60 [Removed and Reserved]**

22. Section 1.62 is proposed to be removed and reserved.

**§ 1.62 [Removed and Reserved]**

23. Section 1.63 is proposed to be amended by revising paragraph(a) to read as follows:

**§ 1.63 Oath or declaration.**

(a) An oath or declaration filed under § 1.51(a)(1)(ii) as a part of an application must:

- (1) Be executed in accordance with either § 1.66 or § 1.68;
- (2) Identify the specification to which it is directed;
- (3) Identify each inventor by: full name, including the family name, and at least one given name without abbreviation together with any other given name or initial, and the residence, post office address and country of citizenship of each inventor; and
- (4) State whether the inventor is a sole or joint inventor of the invention claimed.

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24. Section 1.69 is proposed to be amended by revising paragraph (b) to read as follows:

**§ 1.69 Foreign language oaths and declarations.**

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(b) Unless the text of any oath or declaration in a language other than English is a form provided or approved by the Patent and Trademark Office, it must be accompanied by [a verified] English translation together with a statement that the translation is accurate, except that in the case of an oath or declaration filed under § 1.63 the translation may be filed in the Office no later than two months from the date applicant is notified to file the translation.

25. Section 1.78 is proposed to be amended by revising paragraph(a)(1) as follows:

**§ 1.78 Claiming benefit of [an] earlier filing date and cross-references to other applications.**

(a)(1) A nonprovisional application may claim an invention disclosed in one or more prior filed copending nonprovisional applications or international applications designating the United States of America. In order for a nonprovisional application to claim the benefit of a prior filed copending nonprovisional application or international application designating the United States of America, each prior application must name as an inventor at least one inventor named in the later filed nonprovisional application and disclose the named inventor's invention claimed in a least one claim of the later filed nonprovisional application in the manner provided by the first paragraph of 35 U.S.C. 112. In addition, each prior application must be:

- (i) Complete as set forth in § 1.51(a)(1); or
- (ii) Entitled to a filing date as set forth in § 1.53(b)(1) or (b)(3), [§ 1.60 or § 1.62] and include the basic filing fee set forth in § 1.16; or
- (iii) Entitled to a filing date as set forth in § 1.53(b)(1) and have paid therein the processing and retention fee set forth in § 1.21(l) within the time period set forth in § 1.53(d)(1).

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26. Section 1.84 is proposed to be amended by revising paragraph (b) as follows:

**§ 1.84 Standards for drawings.**

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**(b) Photographs.**

(1) Black and white. Photographs are not ordinarily permitted in utility [and design] applications. However, the Office will accept photographs in utility [and design] applications only after the granting of a petition filed under this paragraph which requests that photographs be accepted. Any such petition must include the following:

- (i) The appropriate fee set forth in § 1.17(h); and

(ii) Three (3) sets of photographs. Photographs must either be developed on double weight photographic paper or be permanently mounted on bristol board. The photographs must be of sufficient quality so that all details in the drawings are reproducible in the printed patent.

(2) Color. Color photographs will be accepted in utility patent applications if the conditions for accepting color drawings have been satisfied. See paragraph (a)(2) of this section.

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27. Section 1.91 is proposed to be revised to read as follows:

**§ 1.91 Models and exhibits not generally required as part of application or patent.**

Models and exhibits [were once required in all cases admitting a model, as a part of the application, and these models became a part of the record of the patent. Such models are no longer generally required (the description of the invention in the specification, and the drawings, must be sufficiently full and complete, and capable of being understood, to disclose the invention without the aid of a model), and will not be admitted unless specifically [called for.] required by the Office. A model, working model, or other physical exhibit may be required if deemed necessary for any purpose in examination of the application.]

28. Section 1.92 is proposed to be removed and reserved.

**§ 1.92 [Removed and Reserved]**

29. Section 1.97 is proposed to be amended by revising paragraphs (c) through (e) to read as follows:

**§ 1.97 Filing of information disclosure statement.**

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(c) An information disclosure statement shall be considered by the Office if filed after the period specified in paragraph (b) of this section, but before the mailing date of either:

- (1) A final action under § 1.113; or
- (2) A notice of allowance under § 1.311, whichever occurs first, provided the information disclosure statement is accompanied by either a [certification] statement as specified in paragraph (e) of this section or the fee set forth in § 1.17(p).

(d) An information disclosure statement shall be considered by the Office if filed after the mailing date of either:

- (1) A [a] final action under § 1.113; or
- (2) A [a] notice of allowance under § 1.311, whichever occurs first, but before payment of the issue fee, provided the information disclosure statement is accompanied by:

[(1) (i) A [certification] statement as specified in paragraph (e) of this section,

(2) (ii) a petition requesting consideration of the information disclosure statement, and

(3) (iii) The petition fee set forth in § 1.17(i)(1).

(e) A [certification] statement under this section must state either:

(1) That each item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement [,] or

(2) That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application [or] and, to the knowledge of the person signing the [certification] statement after making reasonable inquiry, was known to any individual designated in § 1.56(c) more than three months prior to the filing of the information disclosure statement.

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30. Section 1.101 is proposed to be removed and reserved.

**§ 1.101 [Reserved]**



31. Section 1.102 is proposed to be amended by revising paragraph (a) to read as follows:

**§ 1.102 Advancement of examination.**

(a) Applications will not be advanced out of turn for examination or for further action except as provided by this part, or upon order of the Commissioner to expedite the business of the Office, or upon filing of a request under paragraph (b) of this section or upon filing a petition under paragraphs (c) or (d) of this section with a [verified] showing which, in the opinion of the Commissioner, will justify so advancing it.

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32. Section 1.103 is proposed to be amended by revising paragraph (a) to read as follows:

**§ 1.103 Suspension of action.**

(a) Suspension of action by the Office will be granted for good and sufficient cause and for a reasonable time specified upon petition by the applicant and, if such cause is not the fault of the Office, the payment of the fee set forth in § 1.17(i)(1). Action will not be suspended when a ▶reply◀ [response] by the applicant to an Office action is required.

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33. Section 1.104 is proposed to be removed and reserved.

**§ 1.104 [Removed and Reserved].**

34. Section 1.105 is proposed to be removed and reserved.

**§ 1.105 [Removed and Reserved].**

35. Section 1.108 is proposed to be removed and reserved.

**§ 1.108 [Removed and Reserved].**

36. Section 1.111 is proposed to be amended by revising paragraph (b) to read as follows:

**§ 1.111 Reply by applicant or patent owner.**

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(b) In order to be entitled to reconsideration or further examination, the applicant or patent owner must [make request therefor in writing] ▶reply◀. The reply by the applicant or patent owner must ▶be reduced to a writing which◀ distinctly and specifically [point] ▶points◀ out the supposed errors in the examiner's action and must [respond] ▶reply◀ to every ground of objection and rejection in the prior Office action. ▶The reply must present arguments pointing out the specific distinctions believed to render the claims, including any newly presented claims, patentable over the applied references.◀ If the reply is with respect to an application, a request may be made that objections or requirements as to form not necessary to further consideration of the claims be held in abeyance until allowable subject matter is indicated. The applicant's or patent owner's reply must appear throughout to be a bona fide attempt to advance the case to final action. A general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references does not comply with the requirements of this section.

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37. Section 1.112 is proposed to be revised to read as follows:

**§ 1.112 Reconsideration ▶before final action◀.**

After [response] ▶reply◀ by applicant or patent owner (§ 1.111) ▶to a non-final action◀, the application or patent under reexamination will be reconsidered and again examined. The applicant or patent owner will be notified if claims are rejected,

or objections or requirements made, in the same manner as after the first examination. Applicant or patent owner may [respond] ▶reply◀ to such Office action in the same manner provided in § 1.111, with or without amendment. [Any amendments after the second Office action must ordinarily be restricted to the rejection or to the objections or requirements made. The application or patent under reexamination will be again considered, and so on repeatedly, unless the examiner has indicated that the action is final.]

38. Section 1.113 is proposed to be revised to read as follows:

**§ 1.113 Final rejection or action.**

(a) On the second or any subsequent examination or consideration ▶by the examiner◀ the rejection or other action may be made final, whereupon applicant's or patent owner's ▶reply◀ [response] is limited to appeal in the case of rejection of any claim (§ 1.191), or to amendment as specified in § 1.116. Petition may be taken to the Commissioner in the case of objections or requirements not involved in the rejection of any claim (§ 1.181). ▶Reply◀ [Response] to a final rejection or action must include cancellation of, or appeal from the rejection of, each rejected claim. If any claim stands allowed, the ▶reply◀ [response] to a final rejection or action must comply with any requirements or objections ▶as◀ to form.

(b) In making such final rejection, the examiner shall repeat or state all grounds of rejection then considered applicable to the claims in the case, clearly stating the reasons ▶in support thereof◀ [therefor].

▶(c) The first action in an application will not be made final.◀

39. Section 1.115 is proposed to be revised to read as follows:

**§ 1.115 Amendment.**

[The applicant may amend before or after the first examination and action and also after the second or subsequent examination or reconsideration as specified in 1.112 or when and as specifically required by the examiner. The patent owner may amend in accordance with 1.510(e) and 1.530(b) prior to reexamination and during reexamination proceedings in accordance with 1.112 and 1.116.]

▶(a) The applicant or the patent owner may amend the disclosure (e.g., specification, claims, drawings and abstract) of an application before final action as indicated in § 1.121, except for nonprovisional applications which are subject to § 1.53(b)(2). The patent owner may amend the patent in a reexamination proceeding in accordance with §§ 1.510(e) and 1.530(d).◀

(b)(1) No amendment shall introduce new matter into the disclosure of an application.

(2) If it is determined that an amendment filed after the filing date of the application introduces new matter into the disclosure, the claims containing the new matter will be rejected and deletion of the new matter in the description and drawings will be required.

(c) Claims may be amended by canceling particular claims, by presenting new claims, or by rewriting particular claims as indicated in § 1.121(b). If an amendment is in reply to an Office action note § 1.111.

(d) The disclosure must be amended when required to correct inaccuracies of description and definition, and to secure correspondence between the claims, the specification, and the drawing.

(e) No amendment to the drawing may be made except with permission of the Office. Permissible changes in the construction shown in any drawing may be made only by the submission of a substitute drawing by applicant. A sketch in permanent ink showing proposed changes in red, to become part of the record, must be filed for approval by the examiner and should be in a separate paper.

(f) To amend a clause that was previously amended, the clause should be wholly rewritten so that no interlineations or deletions shall appear in the clause as finally presented. Matter canceled by amendment can be reinstated only by a subsequent amendment presenting the canceled matter as a new insertion.◀

40. Section 1.116 is proposed to be amended by revising paragraphs (a) and (b) to read as follows:

**§ 1.116 Amendments after final action.**

(a) After ▶a◀ final rejection or ▶other final◀ action (§ 1.113) ▶,◀ amendments ▶are limited to◀ [may be made] cancelling claims or complying with any requirement of form ▶expressly set forth in a previous Office action.◀ [If amendments have been made. Amendments presenting rejected claims in better form for consideration on appeal may be admitted.] The admission of, or refusal to admit, any amendment after final rejection, and any ▶related◀ proceedings [relative thereto], shall not operate to relieve the application or patent under reexamination from its condition as subject to appeal or to save the application from abandonment under § 1.135.

(b) ▶Any amendment not in compliance with paragraph (a) of this section must be submitted with a request for an application under § 1.53(b)(3) to ensure its consideration.◀ [If amendments touching the merits of the application or patent under reexamination are presented after final rejection, or after appeal has been taken, or when such amendment might not otherwise be proper, they may be admitted upon a showing of good and sufficient reasons why they are necessary and were not earlier presented.]

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41. Section 1.117 is proposed to be removed and reserved.

**§ 1.117 [Removed and Reserved].**

42. Section 1.118 is proposed to be removed and reserved.

**§ 1.118 [Removed and Reserved].**

43. Section 1.119 is proposed to be removed and reserved.

**§ 1.119 [Removed and Reserved].**

44. Section 1.121 is proposed to be revised to read as follows:

**§ 1.121 Manner of making amendments.**

[(a) Erasures, additions, insertions, or alterations of the Office file of papers and records must not be physically entered by the applicant. Amendments to the application (excluding the claims) are made by filing a paper (which should conform to § 1.52) directing or requesting that specified amendments be made. The exact word or words to be stricken out or inserted by said amendment must be specified and the precise point indicated where the deletion or insertion is to be made.]

(b) Except as otherwise provided herein, a particular claim may be amended only by directions to cancel or by rewriting such claim with underlining below the word or words added and brackets around the word or words deleted. The rewriting of a claim in this form will be construed as directing the cancellation of the original claim; however, the original claim number followed by the parenthetical word must be used for the rewritten claim. If a previously rewritten claim is rewritten, underlining and bracketing will be applied in reference to the previously rewritten claim with the parenthetical expression "twice amended," "three times amended," etc., following the original claim number.

(c) A particular claim may be amended in the manner indicated for the application in paragraph (a) of this section to the extent of corrections in spelling, punctuation, and typographical errors. Additional amendments in this manner will be admitted provided the changes are limited to (1) deletions and/or (2) the addition of no more than five words in any one claim. Any amendment submitted with instructions to amend particular claims but failing to conform to the provisions of paragraphs (b) and (c) of this section may be considered nonresponsive and treated accordingly.

(d) Where underlining or brackets are intended to appear in the printed patent or are properly part of the claimed material and not intended as symbolic of changes in the particular claim, amendment by rewriting in accordance with paragraph (b) of this section shall be prohibited.

(e) In reissue applications, both the descriptive portion and the claims are to be amended by either (1) submitting a copy of a portion of the description or an entire claim with all matter to be deleted from the patent being placed between brackets and all matter to be added to the patent being underlined, or (2) indicating the exact word or words to be stricken out or inserted and the precise point where the deletion or insertion is to be made. Any word or words to be inserted must be underlined. See 1.173.

(f) Proposed amendments presented in patents involved in reexamination proceedings must be presented in the form of a full copy of the text of: (1) Each claim which is amended and (2) each paragraph of the description which is amended. Matter deleted from the patent shall be placed between brackets and matter added shall be underlined. Copies of the printed claims from the patent may be used with any additions being indicated by carets and deleted material being placed between brackets. Claims must not be renumbered and the numbering of the claims added for reexamination must follow the number of the highest numbered patent claim. No amendment may enlarge the scope of the claims of the patent. No new matter may be introduced into the patent.]

▶(a) Amendments in non-reissue applications: Amendments in applications excluding reissue applications are made by filing a paper, in compliance with § 1.52, directing that specified amendments be made.◀

(1) *Specification other than claims:* Amendments to the specification other than claims may only be made as follows:

(i) The precise point in the specification must be indicated where an amendment is to be made.

(ii) If the only changes to the specification are deletions, amendments may only be made by precise directions to delete.

(iii) Except as provided by paragraph (a)(1)(ii) of this section, amendments must be made by submission of a copy of the rewritten sentence(s), paragraph(s) and/or page(s) with marking pursuant to paragraph (a)(1)(iv) of this section.

(iv) Underlining below the subject matter added and brackets around the subject matter deleted are to be used to mark the amendments being made. If a previously rewritten sentence(s), paragraph(s) or page(s) is again rewritten, marking will be applied in reference to the sentence(s), paragraph(s) or page(s) as previously rewritten.

(2) *Claims:* Amendments to the claims may only be made as follows:

(i)(A) A claim may be cancelled by a direction to cancel the claim or by omitting the claim when submitting a complete copy of all pending claims as required by paragraph (a)(2)(ii) of this section.

(B) A previously submitted claim may only be amended, other than by cancellation pursuant to paragraph (a)(2)(i)(A) of this section, by submitting a copy of the claim completely rewritten with markings, pursuant to paragraph (a)(2)(iii) of this section, of the subject matter added and/or deleted. The rewriting of a claim in this form will be construed as directing that the rewritten claim be a replacement for the previously submitted claim; however, the previously submitted claim number followed by the parenthetical word "amended" must be used for the rewritten claim.

(C) A new claim may only be added by submitting a clean copy of the new claim. The numbering of any new claims added must follow the number of the highest numbered previously submitted claim.

(ii) Whenever a previously submitted claim is amended by rewriting pursuant to paragraph (a)(2)(i)(B) of this section or a new claim is added pursuant to paragraph (a)(2)(i)(C), applicant must submit a separate complete copy of all pending claims. Such separate complete copy must include all newly rewritten, all newly added, all previously rewritten claims that are still pending, and any unamended claims that are still pending. For all claims, other than those claims being newly rewritten, the copy must be submitted in clean form without markings as to previous amendments.

(iii) Underlining below the subject matter added and brackets around the subject matter deleted relative to the previously submitted claim are to be used to mark the amendments being made. If a previously rewritten claim is again rewritten, marking will be applied in reference to the claim as previously rewritten, and the parenthetical expression will be "twice amended,"



"three times amended," etc., following the original claim number.

(iv) The failure to include a copy of any previously submitted claim with the separate complete copy of all pending claims required by paragraph (a)(2)(ii) of this section will be construed as a direction to cancel that claim.

(3) *Drawings*: Amendments to the original application drawings are not permitted. Any change to the application drawings must be by way of a substitute sheet of drawings for each sheet changed submitted in compliance with § 1.84.

(4) Any amendment to an application that is present in a substitute specification submitted pursuant to § 1.125 must be presented under the provisions of § 1.121(a)(1) either prior to or concurrent with submission of the substitute specification.

(b) *Amendments in reissue applications*: Amendments in reissue applications are made by filing a paper, in compliance with § 1.52, directing that specified amendments be made.

(1) *Specification other than claims*: Amendments to the specification other than claims may only be made as follows:

(i) The precise point in the specification must be indicated where an amendment is to be made.

(ii) Amendments must be made by submission of the entire text of the rewritten paragraph(s) with markings pursuant to paragraph (b)(1)(iv) of this section.

(iii) Each submission of an amendment to the specification must include all amendments to the specification relative to the patent as of the date of the submission. This would include amendments to the specification of the patent submitted for the first time as well as any previously submitted amendments that are still desired. Any previously submitted amendments to the specification that are no longer desired must not be included in the submission.

(iv) Underlining below the subject matter added to the patent and brackets around the subject matter deleted from the patent are to be used to mark the amendments being made.

(2) *Claims*: Amendments to the claims are made as follows:

(i)(A) The amendment must include the entire text of each patent claim which is amended and of each added claim with marking pursuant to paragraph (b)(2)(i)(C) of this section, except a patent claim should be cancelled by a statement cancelling the patent claim without presentation of the text of the patent claim.

(B) Patent claims must not be renumbered and the numbering of any claims added to the patent must follow the number of the highest numbered patent claim.

(C) Underlining below the subject matter added to the patent and brackets around the subject matter deleted from the patent are to be used to mark the amendments being made. If a claim is amended pursuant to paragraph (b)(2)(i)(A) of this section, a parenthetical expression "amended," "twice amended," etc., should follow the original claim number.

(ii) Each amendment submission must set forth the status, as of the date of the amendment, of all patent claims and of all added claims.

(iii) Each amendment when originally submitted must be accompanied by an explanation of the support in the disclosure of the patent for the amendment along with any additional comments on page(s) separate from the page(s) containing the amendment.

(iv) Each submission of an amendment to any claim (patent claims and all added claims) must include all pending amendments to the claims as of the date of the submission. This would include amendments to the claims submitted for the first time as well as any previously submitted amendments to the claims that are still desired. Any previously submitted amendments to the claims that are no longer desired must not be included in the submission. A copy of any patent claims that have not been amended are not to be presented with each amendment submission.

(v) The failure to submit a copy of any added claim, as required by paragraph (b)(2)(iv) of this section, will be construed as a direction to cancel that claim.

(vi) No reissue patent shall be granted enlarging the scope of the claims of the original patent unless applied for within two years from the grant of the original patent, pursuant to 35 U.S.C. 251. No amendment to the patent claims may introduce new matter or be made in an expired patent.

(3) *Drawings*: Amendments to the original patent drawings are not permitted. Any change to the patent drawings must be

by way of a new sheet of drawings with the amended figures identified as "amended" and with added figures identified as "new" for each sheet changed submitted in compliance with § 1.84.

(c) *Amendments in reexamination proceedings*: Any proposed amendment to the description and claims in patents involved in reexamination proceedings must be made in accordance with § 1.530.

45. Section 1.122 is proposed to be removed and reserved.

§ 1.122 [Removed and Reserved].

46. Section 1.123 is proposed to be removed and reserved.

§ 1.123 [Removed and Reserved].

47. Section 1.124 is proposed to be removed and reserved.

§ 1.124 [Removed and Reserved].

48. Section 1.125 is proposed to be revised as follows:

§ 1.125 Substitute specification.

▶(a)◀ If the number or nature of the amendments ▶or the legibility of the specification◀ [shall] render it difficult to [consider the case, or to arrange the papers for printing or copying] ▶process an application◀, the Office may require the entire specification, including the claims, or any part thereof, to be rewritten in clean form incorporating all amendments.

▶(b)◀ A substitute specification for an application other than a reissue application may [not be accepted unless it has been required by the examiner or unless it is clear to the examiner that acceptance of a substitute specification would facilitate processing of the application. Any substitute specification] ▶be◀ filed [must be] ▶at any point up to payment of the issue fee if it is◀ accompanied by a statement that the substitute specification: (1) ▶includes no new matter◀, and (2) includes only amendments submitted in accordance with the requirements of § 1.121(a) either prior to or concurrent with submission of the substitute specification◀. [Such statement must be a verified statement if made by a person not registered to practice before the Office.]

▶(c)◀ A substitute specification submitted under this section must be submitted in clean form without markings as to amended material.

(d) A substitute specification under this section is not permitted in reissue applications or in reexamination proceedings.

49. Section 1.133 is proposed to be amended by revising paragraph(b) to read as follows:

§ 1.133 Interviews.

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(b) In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for ▶reply◀ [response] to Office actions as specified in § 1.111, § 1.135.

50. The undesignated center heading in Subpart B-National processing Provisions, following § 1.133 is proposed to be revised to read as follows:

TIME FOR ▶REPLY◀ [RESPONSE] BY APPLICANT;  
ABANDONMENT OF APPLICATION

51. Section 1.134 is proposed to be revised as follows:

§ 1.134 Time period for ▶reply◀ [response] to an Office action.

An Office action will notify the applicant of any non-statutory or shortened statutory time period set for ▶reply◀ [response]

to an Office action. Unless the applicant is notified in writing that [response] ▶a reply◀ is required in less than six months, a maximum period of six months is allowed.

52. Section 1.135 is proposed to be revised to read as follows:

§ 1.135 Abandonment for failure to ▶reply◀ [respond] within time period.

(a) If an applicant of a patent application fails to ▶reply◀ [respond] within the time period provided under § 1.134 and § 1.136, the application will become abandoned unless an Office action indicates otherwise.

(b) Prosecution of an application to save it from abandonment pursuant to paragraph (a) of this section must include such complete and proper action as the condition of the case may require. The admission of ▶, or refusal to admit, any amendment after final rejection, and any related proceedings,◀ an amendment not responsive to the last Office action, or refusal to admit the same, and any proceedings relative thereto, shall not operate to save the application from abandonment.

(c) When action by the applicant is a bona fide attempt to ▶reply◀ [respond] and to advance the case to final action, and is substantially a complete [response] ▶reply◀ to the ▶non-final◀ Office action, but consideration of some matter or compliance with some requirement has been inadvertently omitted, ▶applicant◀ [opportunity to explain and supply the omission] may be given ▶a new time period for reply under § 1.134 to supply the omission or to file a continuing application◀ [before the question of abandonment is considered].

53. Section 1.136 is proposed to be amended by revising the heading and paragraph (a) to read as follows:

§ 1.136 Filing of timely ▶replies◀ [responses] with petition and fee for extension of time and extensions of time for cause.

(a)(1) If an applicant is required to ▶reply◀ [respond] within a nonstatutory or shortened statutory time period, applicant may ▶reply◀ [respond] up to [four] ▶five◀ months after the time period set ▶and within the statutory period, if applicable,◀ if a petition for an extension of time and the fee set in § 1.17 ▶(a)◀ are filed [prior to or with the response], unless:

(i) Applicant is notified otherwise in an Office action,

(ii) The ▶reply◀ [response] is a reply brief submitted pursuant to § 1.193(b),

(iii) The ▶reply◀ [response] is a request for an oral hearing submitted pursuant to § 1.194(b),

(iv) The ▶reply◀ [response] is to a decision by the Board of Patent Appeals and Interferences pursuant to § 1.196, § 1.197 or § 1.304, or

(v) The application is involved in an interference declared pursuant to § 1.611.

(2) The date on which the [response, the] petition [,] and the fee have been filed is the date [of the response and also the date] for purposes of determining the period of extension and the corresponding amount of the fee. The expiration of the time period is determined by the amount of the fee paid. ▶A reply must be filed prior to the expiration of the period of extension to avoid abandonment of the application ( § 1.135), but in◀ [In] no case may an applicant ▶reply◀ [respond] later than the maximum time period set by statute, or be granted an extension of time under paragraph (b) of this section when the provisions of this paragraph are available. See § 1.136(b) for extensions of time relating to proceedings pursuant to §§ 1.193(b), 1.194, 1.196 or 1.197. See § 1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action. See § 1.550(c) for extension of time in reexamination proceedings and § 1.645 for extension of time in interference proceedings.

▶(3)◀ A paper may be submitted in an application with an authorization to treat any concurrent or future reply requiring a petition for an extension of time under paragraph (a) of this section for its timely submission as incorporating such petition for the appropriate length of time. An authorization to charge all required fees, fees under § 1.17, or all required extension of time fees will be treated as a constructive petition for an extension of time in any concurrent or future reply requiring

a petition for an extension of time under paragraph (a) of this section for its timely submission.◀

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54. Section 1.137 is proposed to be revised to read as follows:

§ 1.137 Revival of abandoned application ▶or lapsed patent◀.

(a) An ▶abandoned◀ application [abandoned for failure to prosecute] may be revived as a pending application ▶or a lapsed patent may be revived as a patent◀ if it is shown to the satisfaction of the Commissioner that the delay ▶in prosecution or payment of any portion of the required issue fee◀ was unavoidable. A petition to revive an ▶unavoidably◀ abandoned application ▶or unavoidably lapsed patent◀ must be [promptly filed after the applicant is notified of, or otherwise becomes aware of, the abandonment, and must be] accompanied by:

(1) A proposed response to continue prosecution of that application, or the filing of a continuing application, unless either has been previously filed;

▶(1)◀ The required reply, unless previously filed. In a nonprovisional application abandoned for failure to prosecute, the proposed reply requirement may be met by the filing of a continuing application. In an abandoned application or a lapsed patent, for failure to pay any portion of the required issue fee, the proposed reply must be the issue fee or any outstanding balance thereof;◀

(2) The petition fee as set forth in § 1.17(l); [and]

(3) A showing that the delay was unavoidable ▶and that the petition was promptly filed after the applicant was notified of, or otherwise became aware of, the abandonment or lapse; and◀ [The showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office.]

▶(4)◀ Any terminal disclaimer (and fee as set forth in § 1.20(d)) required pursuant to paragraph (c) of this section.◀

(b) An ▶abandoned◀ application [unintentionally abandoned for failure to prosecute] may be revived as a pending application ▶or lapsed patent may be revived as a patent◀ if the delay ▶in prosecution or payment of any portion of the required issue fee◀ was unintentional. A petition to revive an unintentionally abandoned application ▶or◀ lapsed patent must be ▶accompanied by:◀

▶(1)◀ The required reply, unless previously filed. In a nonprovisional application abandoned for failure to prosecute, the proposed reply requirement may be met by the filing of a continuing application. In an abandoned application or a lapsed patent, for failure to pay any portion of the required issue fee, the proposed reply must be the issue fee or any outstanding balance thereof;◀

(1) Accompanied by a proposed response to continue prosecution of that application, or filing of a continuing application, unless either has been previously filed;

(2) [Accompanied by the] The petition fee as set forth in § 1.17(m);

(3) [Accompanied by a] A statement that the delay was unintentional. [The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.] The Commissioner may require additional information where there is a question whether the delay was unintentional; and

(4) ▶Any terminal disclaimer (and fee as set forth in § 1.20(d)) required pursuant to paragraph (c) of this section.◀ [Filed either:

(i) Within one year of the date on which the application became abandoned; or

(ii) Within three months of the date of the first decision on a petition to revive under paragraph (a) of this section which was filed within one year of the date on which the application became abandoned.]

(c) ▶In all design applications and in all nonprovisional utility or plant applications filed before June 8, 1995◀ [In all applications filed before June 8, 1995, and all design applications filed on or after June 8, 1995, any petition pursuant to [paragraph (a) of] this section [not filed◀ within six months of the date of abandonment of the application,] must be accompa-



nied by a terminal disclaimer with fee under § 1.321 dedicating to the public a terminal part of the term of any patent granted thereon equivalent to the period of abandonment of the application. The terminal disclaimer must also apply to any patent granted on any continuing application entitled under 35 U.S.C. 120 to the benefit of the filing date of the application for which revival is sought.

(d) Any request for reconsideration or review of a decision refusing to revive an abandoned application or lapsed patent upon petition filed pursuant to paragraphs (a) or (b) of this section, to be considered timely, must be filed within two months of the decision refusing to revive or within such time as set in the decision.

(e) The time periods set forth in this section [cannot be extended, except that the three-month period set forth in paragraph (b)(4)(ii) and the time period set forth in paragraph (d) of this section] may be extended under the provisions of § 1.136.

(f) A provisional application, abandoned for failure to timely reply to an Office requirement, may be revived pursuant to paragraphs (a) or (b) this section so as to be pending for a period of no longer than twelve months from its filing date. Under no circumstances will a provisional application be regarded as pending after twelve months from its filing date.

55. Section 1.139 is proposed to be removed and reserved.

#### § 1.139 [Removed and Reserved]

56. Section 1.142 is proposed to be amended by revising paragraph (a) to read as follows:

#### § 1.142 Requirement for restriction.

(a) If two or more independent and distinct inventions are claimed in a single application, the examiner in [his] an Office action shall require the applicant in [his] a reply [response] to that action to elect [that] an invention to which [his] the [claim] claims shall be restricted, this official action being called a requirement for restriction (also known as a requirement for division). [If the distinctness and independence of the inventions be clear, such] Such requirement will normally be made before any action on the merits; however, it may be made at any time before final action [in the case at the discretion of the examiner].

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57. Section 1.144 is proposed to be revised to read as follows:

#### § 1.144 Petition from requirement for restriction.

After a final requirement for restriction, the applicant, in addition to making any reply [response] due on the remainder of the action, may petition the Commissioner to review the requirement. Petition may be deferred until after final action on or allowance of claims to the invention elected, but must be filed not later than appeal. A petition will not be considered if reconsideration of the requirement was not requested.

58. Section 1.146 is proposed to be revised to read as follows:

#### § 1.146 Election of species.

In the first action on an application containing a [generic] claim to a generic invention (genus) and claims [restricted separately to each of] to more than one patentably distinct species embraced thereby, the examiner may require the applicant in his or her reply [response] to that action to elect [that] a species of his or her invention to which his or her claim shall be restricted if no [generic] claim to the genus is [held] found to be allowable. However, if such application contains claims directed to more than a reasonable number of species, the examiner may require restriction of the claims to not more than a reasonable number of species before taking further action in the case.

59. Section 1.152 is proposed to be revised to read as follows:

#### § 1.152 Design drawings.

The design must be represented by a drawing that complies with the requirements of § 1.84, and must contain a sufficient number of views to constitute a complete disclosure of the appearance of the [article] design. Appropriate and adequate surface shading [must] should be used to show the character or contour of the surfaces represented. Solid black surface shading is not permitted except when used to represent the color black as well as color contrast. Broken lines may be used to show visible environmental structure, but may not be used to show hidden planes and surfaces which cannot be seen through opaque materials. Alternate positions of a design component, illustrated by full and broken lines in the same view are not permitted in a design drawing. Color photographs and color drawings will be permitted in design applications only after the granting of a petition filed under § 1.84(a)(2). Photographs and ink drawings must not be combined as formal drawings in one application. Photographs submitted in lieu of ink drawings in design patent applications must comply with § 1.84(b) and must not disclose environmental structure but must be limited to the design for the article claimed. [Color drawings and color photographs are not permitted in design patent applications.]

60. Section 1.154 is proposed to be amended by revising paragraph (a) as follows:

#### § 1.154 Arrangement of specification.

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(a) Preamble, stating name of the applicant, [and] title of the design, and a brief description of the nature and intended use of the article in which the design is embodied.

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61. Section 1.155 is proposed to be amended by removing paragraphs (b) through (f).

#### § 1.155 Issue and term of design patents.

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- (b) [Removed].
- (c) [Removed].
- (d) [Removed].
- (e) [Removed].
- (f) [Removed].

62. Section 1.163 is proposed to be amended by revising paragraph (b) to read as follows:

#### § 1.163 Specification.

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(b) Two copies of the specification (including the claim) must be submitted, but only one signed oath or declaration is required. [The second copy of the specification may be a legible carbon copy of the original.]

63. Section 1.165 is proposed to be amended by revising paragraph (a) to read as follows:

#### § 1.165 Plant Drawings.

(a) Plant patent drawings [should be artistically and competently executed and] must comply with the requirements of § 1.84. View numbers and reference characters need not be employed unless required by the examiner. The drawing must disclose all the distinctive characteristics of the plant capable of visual representation.

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64. Section 1.167(b) is proposed to be removed and reserved.

#### § 1.167 Examination

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(b) [Reserved].

65. Section 1.171 is proposed to be revised to read as follows:

#### § 1.171 Application for reissue.

An application for reissue must contain the same parts required for an application for an original patent, complying with all the rules relating thereto except as otherwise provided, and in addition, must comply with the requirements of the rules relating to reissue applications. [The application must be accompanied by a certified copy of an abstract of title or an order for a title report accompanied by the fee set forth in § 1.19(b)(4), to be placed in the file, and by an offer to surrender the original patent (§ 1.178).]

66. Section 1.172 is proposed to be amended by revising paragraph (a) to read as follows:

#### § 1.172 Applicants, assignees.

(a) A reissue oath must be signed and sworn to or declaration made by the inventor or inventors except as otherwise provided (see §§ 1.42, 1.43, 1.47), and must be accompanied by the written [assent] consent of all assignees, if any, owning an undivided interest in the patent, but a reissue oath may be made and sworn to or declaration made by the assignee of the entire interest if the application does not seek to enlarge the scope of the claims of the original patent. All assignees consenting to the reissue must establish their ownership interest in the patent to the satisfaction of the Commissioner. Ownership is established by submitting to the Office documentary evidence of a chain of title from the original owner to the assignee or by specifying (e.g., reel and frame number, etc.) where such evidence is recorded in the Office. Documents submitted to establish ownership may be required to be recorded.

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67. Section 1.175 is proposed to be revised to read as follows:

#### § 1.175 Reissue oath or declaration.

(a) [Applicants for reissue.] The reissue oath or declaration in addition to complying with the requirements of § 1.63, must also [file with their applications] include [a statement] statement(s) [under oath or declaration] as follows:

(1) [When] That the applicant [verily] believes the original patent to be wholly or partly inoperative or invalid [stating such belief and the reasons why].

(2) When it is claimed that such patent is so inoperative or invalid [by reason of a defective specification or drawing, [particularly specifying such defects].

(3) When it is claimed that such patent is inoperative or invalid [by reason of the patentee claiming more or less than [he] patentee had the right to claim in the patent, [distinctly specifying the excess or insufficiency in the claims.] and

[(4)] [Reserved]

[(5)] Particularly (2) stating [specifying at least one error relied upon, and how they arose or occurred] that all errors being corrected in the reissue application up to the time of filing of the oath or declaration under this paragraph arose without deceptive intention on the part of the applicant.

[(6)] (b)(1) For any error corrected not covered by the oath or declaration submitted under paragraph (a) of this section, applicant must submit a supplemental oath or declaration [stating] stating that every such error [said errors] arose [without any deceptive intention] on the part of the applicant. Any supplemental oath or declaration required by this paragraph must be submitted before allowance and may be submitted:

(i) With any amendment prior to allowance, or

(ii) In order to overcome a rejection under 35 U.S.C. 251 made by the examiner where it is indicated that the submission of a supplemental oath or declaration as required by this paragraph will overcome the rejection.

(2) For any error sought to be corrected after allowance, a supplemental oath or declaration must accompany the requested correction stating that the error(s) to be corrected arose without any deceptive intention on the part of the applicant.

(c) Other than as set forth in paragraphs (a)(2) and (b) of this section, an oath or declaration under this section need not specifically identify the error or errors that are being corrected.

[(7)] Acknowledging the duty to disclose to the Office all information known to applicants to be material to patentability as defined in § 1.56.

(b) Corroborating affidavits or declarations of others may be filed and the examiner may, in any case, require additional information or affidavits or declarations concerning the application for reissue and its object.

(d) The oath or declaration required by paragraph (a) of this section may be submitted under the provisions of § 1.53(d)(1).

68. Section 1.176 is proposed to be revised to read as follows:

#### § 1.176 Examination of reissue.

[An original claim, if re-presented in the reissue application, is subject to reexamination, and the] The entire reissue application will be examined in the same manner as original applications, subject to the rules relating thereto, excepting that division will not be required between the original claims of the patent. Applications for reissue will be acted on by the examiner in advance of other applications, but not sooner than two months after the announcement of the filing of the reissue application has appeared in the Official Gazette.

69. Section 1.177 is proposed to be revised to read as follows:

#### § 1.177 Multiple reissue applications [Reissue in divisions].

(a) The Commissioner [may] will pursuant to [in] his or her discretion, under 35 U.S.C. 251, [cause several] permit multiple reissue patents to be issued for distinct and separate parts of the thing patented [upon] if the following conditions are met: (1) Copending reissue applications for distinct and separate parts of the thing patented have been filed, (2) Applicant has filed in each copending application a timely demand [of the applicant] by way of petition for multiple reissue patents, (3) [upon payment of the] The required filing and issue [fee] fees for each [division] copending reissue application have been paid, and (4) Each petition for multiple reissue patents is granted prior to issuance of a reissue patent on any of the copending reissue applications.

(b) Each petition under paragraph (a) of this section must be accompanied by: (1) A request for the issuance of multiple reissue patents for distinct and separate parts of the thing patented, (2) The petition fee pursuant to § 1.17(i), (3) An identification of the other copending reissue application(s), (4) A statement that the inventions as claimed in the copending reissue applications are distinct and separate parts of the thing patented, and (5) A showing sufficient to establish to the satisfaction of the Commissioner that the claimed subject matter of the thing patented is in fact being divided into distinct and separate parts. [Each division of a reissue constitutes the subject of a separate specification descriptive of the part or parts of the invention claimed in such division; and the drawing may represent only such part or parts, subject to the provisions of §§ 1.83 and 1.84.]

(c) When the copending reissue applications are filed at the same time, each petition under paragraph (a) of this section, must be filed no later than the earliest submission of the reissue oath or declaration under § 1.175(a) for any of the copending reissue applications. When the copending reissue applications are filed at different times, each petition under paragraph (a) of this section must be filed no later than the earliest of: (1) Payment of the issue fee for any of the copending reissue applications, or (2) Submission of the reissue oath or declaration under § 1.175(a) in the later filed copending reissue application.



tion. [On filing divisional reissue applications, they shall be referred to the Commissioner. Unless otherwise ordered by the Commissioner upon petition and payment of the fee set forth in § 1.17(i), all the divisions of a reissue will issue simultaneously, if there is any controversy as to one division, the others will be withheld from issue until the controversy is ended, unless the Commissioner orders otherwise].

(d) Where the requirements of this section have not been complied with, the Commissioner will not permit multiple reissue patents to be issued.

70. Section 1.181 is proposed to be amended by removing paragraphs (d), (e) and (g).

#### § 1.181 Petition to the Commissioner.

(d) [Removed].

(e) [Removed].

(g) [Removed].

71. Section 1.182 is proposed to be revised to read as follows:

#### § 1.182 Questions not specifically provided for.

All cases not specifically provided for in the regulations of this part will be decided in accordance with the merits of each case by or under the authority of the Commissioner, subject to such other requirements as may be imposed [and such decision will be communicated to the interested parties in writing]. Any petition seeking a decision under this section must be accompanied by the petition fee set forth in § 1.17(b).

72. Section 1.184 is proposed to be removed and reserved.

#### § 1.184 [Removed and Reserved].

73. Section 1.191 is proposed to be amended by revising paragraphs (a) and (b) to read as follows:

#### § 1.191 Appeal to Board of Patent Appeals and Interferences.

(a) Every applicant for a patent or for reissue of a patent, or every owner of a patent under reexamination, any of whose claims have [the claims of which have] been twice rejected in a particular application or patent under reexamination [or who has been given a final rejection (§ 1.113)], may file an appeal, upon the payment of the fee set forth in § 1.17(e), from the decision of the examiner to the Board of Patent Appeals and Interferences by filing a notice of appeal and paying the fee set forth in § 1.17(e) within the time allowed for reply [response].

(b) The notice of appeal in an application or reexamination proceeding must identify the rejected claim or claims appealed, and must be signed by the applicant, patent owner or duly authorized attorney or agent.

74. Section 1.192 is proposed to be amended by revising paragraph (a) to read as follows:

#### § 1.192 Appellant's brief.

(a) Appellant [The appellant] shall, within [2] months from the date of the notice of appeal under § 1.191 in an application, reissue application, or patent under reexamination, or within the time allowed for reply [response] to the action appealed from, if such time is later, file a brief in triplicate. The brief must be accompanied by the requisite fee set forth in § 1.17(f) and must set forth the authorities and arguments on which the appellant will rely to maintain the appeal. Any arguments or authorities not included in the brief may

be refused consideration by the Board of Patent Appeals and Interferences.

75. Section 1.193 is proposed to be revised to read as follows:

#### § 1.193 Examiner's answer and substitute brief.

(a)(1) The primary examiner may, within such time as may be directed by the Commissioner, furnish a written statement in answer to [the] appellant's brief including such explanation of the invention claimed and of the references and grounds of rejection as may be necessary, supplying a copy to [the] appellant. If the primary examiner shall find that the appeal is not regular in form or does not relate to an appealable action, [he] the primary examiner shall so state [and a petition from such decision may be taken to the Commissioner as provided in § 1.181].

(a)(2) An examiner's answer may not include a new ground of rejection.

(b)(1) Appellant [The appellant] may file a [reply] substitute appeal brief [directed only to such new points of argument as may be raised in the] under § 1.192 to an examiner's answer, within two months from the date of [such answer] the examiner's answer. [The new points or argument shall be specifically identified in the reply brief. If the examiner determines that the reply brief is not directed only to new points of argument raised in the examiner's answer, the examiner may refuse entry of the reply brief and will so notify the appellant. If the examiner's answer expressly states that it includes a new ground of rejection, appellant must file a reply thereto within two months from the date of such answer to avoid dismissal of the appeal as to the claims subject to the new ground of rejection; such reply may be accompanied by any amendment or material appropriate to then new ground.] See § 1.136(b) for extensions of time for filing a [reply] substitute brief in a patent application and § 1.550(c) for extensions of time in a reexamination proceeding. The primary examiner may either acknowledge receipt and entry of the substitute appeal brief or reopen prosecution to respond to any new issues raised in the substitute appeal brief. A substitute examiner's answer is not permitted, except where the application has been remanded by the Board of Patent Appeals and Interferences for such purpose.

(2) Where prosecution is reopened by the primary examiner after an appeal brief has been filed, an appeal brief under § 1.192 is an appropriate reply by an applicant to the reopening of prosecution if it is accompanied by a request that the appeal be reinstated. If reinstatement of the appeal is elected, no amendments, affidavits (§§ 1.131 or 1.132) or other new evidence are permitted. If reinstatement of the appeal is not elected, amendments, affidavits and other new evidence are permitted.

76. Section 1.194 is proposed to be revised to read as follows:

#### § 1.194 Oral hearing.

(a) An oral hearing should be requested only in those circumstances in which [the] appellant considers such a hearing necessary or desirable for a proper presentation of [his] the appeal. An appeal decided without an oral hearing will receive the same consideration by the Board of Patent Appeals and Interferences as appeals decided after oral hearing.

(b) If appellant desires an oral hearing, appellant must file, in a separate paper, a written request for such hearing accompanied by the fee set forth in § 1.17(g) within two months after the date of the examiner's answer. If appellant requests an oral hearing and submits therewith the fee set forth in § 1.17(g), an oral argument may be presented by, or on behalf of, the primary examiner if considered desirable by either the primary examiner or the Board. See § 1.136(b) for extensions of time for requesting an oral hearing in a patent application and § 1.550(c) for extensions of time in a reexamination proceeding.

(c) If no request and fee for oral hearing have been timely filed by [the] appellant, the appeal will be assigned for consideration and decision. If [the] appellant has requested an oral hearing and has submitted the fee set forth in § 1.17(g), a day of hearing will be set, and due notice thereof given to [the]

appellant and to the primary examiner. A [Hearing] hearing will be held as stated in the notice, and oral argument will be limited to twenty minutes for [the] appellant and fifteen minutes for the primary examiner unless otherwise ordered before the hearing begins. If the Board decides that a hearing is not necessary, the Board will so notify appellant.

77. Section 1.196 is proposed to be amended by revising paragraphs (b) and (d) to read as follows:

#### § 1.196 Decision by the Board of Patent Appeals and Interferences.

(b) Should the Board of Patent Appeals and Interferences have knowledge of any grounds not involved in the appeal for rejecting any [appealed] pending claim, it may include in the decision a statement to that effect with its reasons for so holding, which statement shall constitute a new ground of rejection of the [claims] claim. A new ground of rejection shall not be considered final for purposes of judicial review. When the Board of Patent Appeals and Interferences makes a new ground of rejection [of an appealed claim], the appellant, within two months from the date of the decision, may exercise [any one] either of the following two options with respect to the new ground of rejection:

(1) The appellant may submit an appropriate amendment of the claims so rejected or a showing of facts relating to the claims so rejected, or both, and have the matter reconsidered by the examiner in which event the application will be remanded to the examiner. The [statement] new ground of rejection shall be binding upon the examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the examiner, overcomes the new ground [for] of rejection stated in the decision. Should the examiner [again reject the application] reject the claims, appellant [the applicant] may again appeal pursuant to §§ 1.191 through 1.195 to the Board of Patent Appeals and Interferences.

(2) The appellant may have the case reconsidered under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. The request for reconsideration [shall] must address the new ground [for] of rejection and state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which reconsideration is sought. Where request for such reconsideration is made, the Board of Patent Appeals and Interferences shall reconsider the new ground [for] of rejection and, if necessary, render a new decision which shall include all grounds of rejection upon which a patent is refused. The decision on reconsideration is deemed to incorporate the earlier decision for purposes of appeal, except for those portions specifically withdrawn on reconsideration, and is final for the purpose of judicial review, except when noted otherwise in the decision.

(d) Although the Board of Patent Appeals and Interferences normally will confine its decision to a review of rejections made by the examiner, should it have knowledge of any grounds for rejecting any allowed claim it may include in its decision a recommended rejection of the claim and remand the case to the examiner. In such event, the Board shall set a period, not less than one month, within which the appellant may submit to the examiner an appropriate amendment, a showing of facts or reasons, or both, in order to avoid the grounds set forth in the recommendation of the Board of Patent Appeals and Interferences. The examiner shall be bound by the recommendation and shall enter and maintain the recommended rejection unless an amendment or showing of facts not previously of record is filed which, in the opinion of the examiner, overcomes the recommended rejection. Should the examiner make the recommended rejection final the applicant may again appeal to the Board of Patent Appeals and Interferences.

(1) The Board of Patent Appeals and Interferences may require Appellant to address any matter that is deemed appropriate for a reasoned decision on the pending appeal.

(2) Appellant will be given a time limit within which to reply to the inquiry made under paragraph (d)(1) of this section.

78. Section 1.197 is proposed to be amended by revising paragraphs (a) and (b) to read as follows:

#### § 1.197 Action following decision.

(a) After decision by the Board of Patent Appeals and Interferences, the case shall be returned to the examiner, subject to [the] appellant's right of appeal or other review, for such further action by [the] appellant or by the examiner, as the condition of the case may require, to carry into effect the decision.

(b) A single request for reconsideration or modification of the decision may be made if filed within two months [one month] from the date of the original decision, unless the original decision is so modified by the decision on reconsideration as to become, in effect, a new decision, and the Board of Patent Appeals and Interferences so states. The request for reconsideration shall state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which reconsideration is sought. See § 1.136(b) for extensions of time for seeking reconsideration in a patent application and § 1.550(c) for extensions of time in a reexamination proceeding.

79. Section 1.291 is proposed to be amended by revising paragraph (c) to read as follows:

#### § 1.291 Protests by the public against pending applications.

(c) A member of the public filing a protest in an application under paragraph (a) of this section will not receive any communications from the Office relating to the protest, other than the return of a self-addressed postcard which the member of the public may include with the protest in order to receive an acknowledgment by the Office that the protest has been received. The Office may communicate with the applicant regarding any protest and may require the applicant to reply [respond] to specific questions raised by the protest. In the absence of a request by the Office, an applicant has no duty to, and need not, reply [respond] to a protest. The limited involvement of the member of the public filing a protest pursuant to paragraph (a) of this section ends with the filing of the protest, and no further submission on behalf of the protestor will be considered, except for additional prior art, or unless such submission raises new issues which could not have been earlier presented.

80. Section 1.294 is proposed to be amended by revising paragraph (b) to read as follows:

#### § 1.294 Examination of request for publication of a statutory invention registration and patent application to which the request is directed.

(b) Applicant will be notified of the results of the examination set forth in paragraph (a) of this section. If the requirements of § 1.293 and this section are not met by the request filed, the notification to applicant will set a period of time within which to comply with the requirements in order to avoid abandonment of the application. If the application does not meet the requirements of 35 U.S.C. 112, the notification to applicant will include a rejection under the appropriate provisions of 35 U.S.C. 112. The periods for reply [response] established pursuant to this section are subject to the extension of time provisions of § 1.136. After reply [response] by the applicant, the application will again be considered for publication of a statutory invention registration. If the requirements of § 1.293 and this section are not timely met, the refusal to publish will be made final. If the requirements of 35 U.S.C. 112 are



not met, the rejection pursuant to 35 U.S.C. 112 will be made final.

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81. Section 1.304 is proposed to be amended by revising paragraph(a) to read as follows:

**§ 1.304 Time for appeal or civil action.**

(a)(1) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (§ 1.302) or for commencing a civil action (§ 1.303) is two months from the date of the decision of the Board of Patent Appeals and Interferences. If a request for [consideration] ►reconsideration◄ or modification of the decision is filed within the time period provided under § 1.197(b) or § 1.658(b), the time for filing an appeal or commencing a civil action shall expire two months after action on the request. In interferences, the time for filing a cross-appeal or cross-action expires:

(i) 14 days after service of the notice of appeal or the summons and complaint, or

(ii) Two months after the date of decision of the Board of Patent Appeals and Interferences, whichever is later.

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82. Section 1.312 is proposed to be amended by revising paragraph (b) to read as follows:

**§ 1.312 Amendments after allowance.**

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(b) Any amendment pursuant to paragraph (a) of this section filed after the date the issue fee is paid must be accompanied by a petition including the fee set forth in § 1.17(i) and a showing of good and sufficient reasons why the amendment is necessary and was not earlier presented. ► For reissue applications, see § 1.175(b), which requires a supplemental oath or declaration to accompany the amendment.◄

83. Section 1.313 is proposed to be amended by adding a new paragraph (c) to read as follows:

**§ 1.313 Withdrawal from issue.**

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►(c) Unless an applicant receives written notification that the application has been withdrawn from issue at least two weeks prior to the projected date of issue, applicant should expect that the application will issue as a patent.◄

84. Section 1.316 paragraphs (b) through (f) are proposed to be removed.

**§ 1.316 Application abandoned for failure to pay issue fee.**

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- (b) [Removed].
- (c) [Removed].
- (d) [Removed].
- (e) [Removed].
- (f) [Removed].

85. Section 1.317 paragraphs (b) through (f) are proposed to be removed.

**§ 1.317 Lapsed patents; delayed payment of balance of issue fee.**

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- (b) [Removed].
- (c) [Removed].
- (d) [Removed].
- (e) [Removed].

(f) [Removed].

86. Section 1.318 is proposed to be removed and reserved.

**§ 1.318 [Removed and Reserved].**

87. Section 1.324 is proposed to be revised to read as follows:

**§ 1.324 Correction of inventorship in patent.**

►(a) Whenever through error a person is named in an issued patent as the inventor, or through error an inventor is not named in an issued patent and such error arose without any deceptive intention on his or her part, ◄ [Whenever a patent is issued and it appears that the correct inventor or inventors were not named through error without deceptive intention on the part of the actual inventor or inventors,] the Commissioner may, on petition [of all the parties and the assignees and satisfactory proof of the facts and payment of the fee set forth in § 1.20(b)], or on order of a court before which such matter is called in question, issue a certificate naming only the actual inventor or inventors. A ►petition◄ [request] to correct inventorship of a patent involved in an interference shall comply with the requirements of this section and shall be accompanied by a motion under § 1.634.

►(b) Any petition pursuant to paragraph (a) of this section must be accompanied by:

- (1) a statement from each person who is being added as an inventor and from each person who is being deleted as an inventor that the inventorship error occurred without any deceptive intention on their part;
- (2) a statement from the current named inventors who have not submitted a statement under paragraph (b)(1) of this section either agreeing to the change of inventorship or stating that they have no disagreement in regard to the requested change;
- (3) a statement from all assignees of the parties submitting a statement under paragraph (b)(1) and (b)(2) of this section agreeing to the change of inventorship in the patent; such statement must comply with the requirements of § 3.73(b); and
- (4) the fee set forth in § 1.20(b).◄

88. Section 1.325 is proposed to be removed and reserved.

**§ 1.325 [Removed and Reserved].**

89. Sections 1.351 is proposed to be removed and reserved.

**§ 1.351 [Removed and Reserved].**

90. Section 1.352 is proposed to be removed and reserved.

**§ 1.352 [Removed and Reserved].**

91. Section 1.366 is proposed to be amended by revising paragraphs (b) through (d) to read as follows:

**§ 1.366 Submission of maintenance fees.**

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(b) A maintenance fee and any necessary surcharge submitted for a patent must be submitted in the amount due on the date the maintenance fee and any necessary surcharge are paid and may be paid in the manner set forth in § 1.23 or by an authorization to charge a deposit account established pursuant to § 1.25. Payment of a maintenance fee and any necessary surcharge or the authorization to charge a deposit account must be submitted within the periods set forth in § 1.362(d), (e), or (f). Any payment or authorization of maintenance fees and surcharges filed at any other time will not be accepted and will not serve as a payment of the maintenance fee except insofar as a delayed payment of the maintenance fee is accepted by the Commissioner in an expired patent pursuant to a petition filed under § 1.378. Any authorization to charge a deposit account must authorize the immediate charging of the maintenance fee and any necessary surcharge to the deposit account. Payment of less than the required amount, payment in a manner other than that set forth in the filing of an authorization to charge a deposit account having insufficient funds will not constitute payment

of a maintenance fee or surcharge on a patent. The [certificate] procedures of either § 1.8 or § 1.10 may be utilized in paying maintenance fees and any necessary surcharges.

(c) In submitting maintenance fees and any necessary surcharges, identification of the patents for which maintenance fees are being paid must include the following:

- (1) The patent number, and
- (2) The [serial] ►application◄ number of the United States application for the patent on which the maintenance fee is being paid.

(d) Payment of maintenance fees and any surcharges should identify the fee being paid for each patent as to whether it is the 3 1/2-, 7 1/2-, or 11 1/2-year fee, whether small entity status is being changed or claimed, the amount of the maintenance fee and any surcharge being paid, and any assigned payor number[, the patent issue date and the United States application filing date]. If the maintenance fee and any necessary surcharge is being paid on a reissue patent, the payment must identify the reissue patent by reissue patent number and reissue application [serial] number as required by paragraph (c) of this section and should also include the original patent number[, the original patent issue date, and the original United States application filing date].

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92. Section 1.377 is proposed to be amended by revising paragraph (c) to read as follows:

**§ 1.377 Review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent.**

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(c) Any petition filed under this section must comply with the requirements of paragraph (b) of § 1.181 and must be signed by an attorney or agent registered to practice before the Patent and Trademark Office, or by the patentee, the assignee, or other party in interest. [Such petition must be in the form of a verified statement if made by a person not registered to practice before the Patent and Trademark Office.]

93. Section 1.378 is proposed to be amended by revising paragraph (d) to read as follows:

**§ 1.378 Acceptance of delayed payment of maintenance fee in expired patent to reinstate patent.**

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(d) Any petition under this section must be signed by an attorney or agent registered to practice before the Patent and Trademark Office, or by the patentee, the assignee, or other party in interest. [Such petition must be in the form of a verified statement if made by a person not registered to practice before the Patent and Trademark Office.]

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94. Section 1.425 is proposed to be revised to read as follows:

**§ 1.425 Filing by other than inventor.**

(a) If a joint inventor refuses to join in an international application which designates the United States of America or cannot be found or reached after diligent effort, the international application which designates the United States of America may be filed by the other inventor on behalf of himself or herself and the omitted inventor. Such an international application which designates the United States of America must be accompanied by proof of the pertinent facts and must state the last known address of the omitted inventor. The Patent and Trademark Office shall forward notice of the filing of the international application to the omitted inventor at said address.

(b) Whenever an inventor refuses to execute an international application which designates the United States of America, or cannot be found or reached after diligent effort, a person to whom the inventor has assigned or agreed in writing to assign

the invention or who otherwise shows sufficient proprietary interest in the matter justifying such action may file the international application on behalf of and as agent for the inventor. Such an international application which designates the United States of America must be accompanied by proof of the pertinent facts and a showing that such action is necessary to preserve the rights of the parties or to prevent irreparable damage and must state the last known address of the inventor. The assignment, written agreement to assign or other evidence of proprietary interest, or a verified copy thereof, must be filed in the Patent and Trademark Office. The Office shall forward notice of the filing of the application to the inventor at the address stated in the application.]

Where an international application which designates the United States of America is filed and where one or more inventors refuse to sign the request for the international application or could not be found or reached after diligent effort, the request need not be signed by such inventor if it is signed by another applicant. Such international application must be accompanied by a statement explaining to the satisfaction of the Commissioner the lack of the signature concerned.

95. Section 1.484 is proposed to be amended by revising paragraphs (d) through (f) to read as follows:

**§ 1.484 Conduct of international preliminary examination.**

\*\*\*\*\*

(d) The International Preliminary Examining Authority will establish a written opinion if any defect exists or if the claimed invention lacks novelty, inventive step or industrial applicability and will set a non-extendable time limit in the written opinion for the applicant to ►reply◄ [respond].

(e) If no written opinion under paragraph (d) of this section is necessary, or after any written opinion and the ►reply◄ [response] thereto or the expiration of the time limit for ►reply◄ [response] to such written opinion, an international preliminary examination report will be established by the International Preliminary Examining Authority. One copy will be submitted to the International Bureau and one copy will be submitted to the applicant.

(f) An applicant will be permitted a personal or telephone interview with the examiner, which must be conducted during the non-extendable time limit for ►reply◄ [response] by the applicant to a written opinion. Additional interviews may be conducted where the examiner determines that such additional interviews may be helpful to advancing the international preliminary examination procedure. A summary of any such personal or telephone interview must be filed by the applicant as a part of the ►reply◄ [response] to the written opinion or, if applicant files no ►reply◄ [response], be made of record in the file by the examiner.

96. Section 1.485 is proposed to be amended by revising paragraph (a) to read as follows:

**§ 1.485 Amendments by applicant during international preliminary examination.**

(a) The applicant may make amendments at the time of filing of the Demand and within the time limit set by the International Preliminary Examining Authority for ►reply◄ [response] to any notification under § 1.484(b) or to any written opinion. Any such amendments must:

- (1) Be made by submitting a replacement sheet for every sheet of the application which differs from the sheet it replaces unless an entire sheet is cancelled, and
- (2) Include a description of how the replacement sheet differs from the replaced sheet.

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97. Section 1.488 is proposed to be amended by revising paragraph (b) to read as follows:

**§ 1.488 Determination of unity of invention before the Inter-**



## national Preliminary Examining Authority.

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(b) If the International Preliminary Examining Authority considers that the international application does not comply with the requirement of unity of invention, it may:

(1) Issue a written opinion and/or an international preliminary examination report, in respect of the entire international application and indicate that unity of invention is lacking and specify the reasons therefor without extending an invitation to restrict or pay additional fees. No international preliminary examination will be conducted on inventions not previously searched by an International Searching Authority.

(2) Invite the applicant to restrict the claims or pay additional fees, pointing out the categories of the invention found, within a set time limit which will not be extended. No international preliminary examination will be conducted on inventions not previously searched by an International Preliminary Examining Authority, or

(3) If applicant fails to restrict the claims or pay additional fees within the time limit set for ▶reply◀ [response], the International Preliminary Examining Authority will issue a written opinion and/or establish an international preliminary examination report on the main invention and shall indicate the relevant facts in the said report. In case of any doubt as to which invention is the main invention, the invention first mentioned in the claims and previously searched by an International Searching Authority shall be considered the main invention.

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98. Section 1.492 is proposed to be amended by adding a new paragraph (g) to read as follows:

## § 1.492 National stage fees.

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▶(g) If the additional fees required by paragraphs (b), (c), and (d) are not paid on presentation of the claims for which the additional fees are due, they must be paid or the claims cancelled by amendment, prior to the expiration of the time period set for reply by the Office in any notice of fee deficiency.◀

99. Section 1.494 is proposed to be amended by revising paragraph (c) to read as follows:

## § 1.494 Entering the national stage in the United States of America as a Designated Office.

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(c) If applicant complies with paragraph (b) of this section before expiration of 20 months from the priority date but omits:

(1) A translation of the international application, as filed, into the English language, if it was originally filed in another language (35 U.S.C. 371(c)(2)) and/or

(2) The oath or declaration of the inventor (35 U.S.C. 371(c)(4); see § 1.497), applicant will be so notified and given a period of time within which to file the translation and/or oath or declaration in order to prevent abandonment of the application. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than the expiration of 20 months after the priority date. The payment of the surcharge set forth in § 1.492(e) is required for acceptance of the oath or declaration of the inventor later than the expiration of 20 months after the priority date. A copy of the notification mailed to applicant should accompany any ▶reply◀ [response] thereto submitted to the Office.

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100. Section 1.495 is proposed to be amended by revising paragraph (c) to read as follows:

## § 1.495 Entering the national stage in the United States of

## America as an Elected Office.

\*\*\*\*\*

(c) If applicant complies with paragraph (b) of this section before expiration of 30 months from the priority date but omits:

(1) A translation of the international application, as filed, into the English language, if it was originally filed in another language (35 U.S.C. 371(c)(2)) and/or

(2) The oath or declaration of the inventor (35 U.S.C. 371(c)(4); see § 1.497), applicant will be so notified and given a period of time within which to file the translation and/or oath or declaration in order to prevent abandonment of the application. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than the expiration of 30 months after the priority date. The payment of the surcharge set forth in § 1.492(e) is required for acceptance of the oath or declaration of the inventor later than the expiration of 30 months after the priority date. A copy of the notification mailed to applicant should accompany any ▶reply◀ [response] thereto submitted to the Office.

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101. Section 1.510 is proposed to be amended by revising paragraph (e) to read as follows:

## § 1.510 Request for reexamination.

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(e) A request filed by the patent owner may include a proposed amendment in accordance with [§ 1.121(f)] ▶§ 1.530(d)◀.

102. Section 1.530 is proposed to be amended by revising the heading and paragraphs (a) and (d) to read as follows:

## § 1.530 Statement and [amendment] ▶reply◀ by patent owner.

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(a) Except as provided in § 1.510(e), no statement or other ▶reply◀ [response] by the patent owner shall be filed prior to the determinations made in accordance with §§ 1.515 or 1.520. If a premature statement or other ▶reply◀ [response] is filed by the patent owner it will not be acknowledged or considered in making the determination.

\*\*\*\*\*

[(d) Any proposed amendment to the description and claims must be made in accordance with § 1.121(f). No amendment may enlarge the scope of the claims of the patent or introduce new matter. No amended or new claims may be proposed for entry in an expired patent. Moreover, no amended or new claims will be incorporated into the patent by certificate issued after the expiration of the patent.]

▶(d) Amendments in reexamination proceedings: Amendments in reexamination proceedings are made by filing a paper, in compliance with paragraph (d)(5) of this section, directing that specified amendments be made.

(1) Specification other than claims: Amendments to the specification other than claims may only be made as follows:

(i) The precise point in the specification must be indicated where an amendment is to be made.

(ii) Amendments must be made by submission of the entire text of the rewritten paragraph(s) with markings pursuant to paragraph (d)(1)(iv) of this section.

(iii) Each submission of an amendment to the specification of the patent must include all amendments to the specification relative to the patent as of the date of the submission. This would include amendments to the specification of the patent submitted for the first time as well as any previously submitted amendments that are still desired. Any previously submitted amendments to the specification that are no longer desired must not be included in the submission.

(iv) Underlining below the subject matter added to the patent and brackets around the subject matter deleted from the patent are to be used to mark the amendments being made.

(2) Claims: Amendments to the claims are made as follows:

(i)(A) The amendment must include the entire text of each patent claim which is amended and each proposed claim with marking pursuant to paragraph (d)(2)(i)(C), except a patent or proposed claim should be cancelled by a statement cancelling the patent or proposed claim without presentation of the text of the patent or proposed claim.

(B) Patent claims must not be renumbered and the numbering of any claims proposed to be added to the patent must follow the number of the highest numbered patent claim.

(C) Underlining below the subject matter added to the patent and brackets around the subject matter deleted from the patent are to be used to mark the amendments being made. If a claim is amended pursuant to paragraph (d)(2)(i)(A) of this section, a parenthetical expression "amended," "twice amended," etc., should follow the original claim number.

(ii) Each amendment submission must set forth the status, as of the date of the amendment, of all patent claims, of all claims currently proposed, and of all previously proposed claims that are no longer being proposed.

(iii) Each amendment when originally submitted must be accompanied by an explanation of the support in the disclosure of the patent for the amendment along with any additional comments on page(s) separate from the page(s) containing the amendment.

(iv) Each submission of an amendment to any claim (patent claims and all proposed claims) must include all amendments to the claims as of the date of the submission. This would include amendments to the claims submitted for the first time as well as any previously submitted amendments to the claims that are still desired. Any previously submitted amendments to the claims that are no longer desired must not be included in the submission. A copy of any patent claims that have not been amended are not to be presented with each amendment submission.

(v) The failure to submit a copy of any proposed claim will be construed as a direction to cancel that claim.

(3) No amendment may enlarge the scope of the claims of the patent or introduce new matter. No amendment may be proposed for entry in an expired patent. Moreover, no amendment will be incorporated into the patent by certificate issued after the expiration of the patent.

(4) Amendments made to a patent during a reexamination proceeding will not be effective until a reexamination certificate is issued.

(5) The form of replies, amendments, briefs, appendices and other papers must be in accordance with the following requirements. All documents, including any amendments or corrections thereto, must be in the English language. All papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly written either by a typewriter or mechanical printer in permanent dark ink or its equivalent in portrait orientation on flexible, strong, smooth, non-shiny, durable, and white paper. All printed matter must appear in at least 11 point type. All of the papers must be presented in a form having sufficient clarity and contrast between the paper and the writing thereon to permit the direct reproduction of readily legible copies in any number by use of photographic, electrostatic, photo-offset, and microfilming processes and electronic reproduction by use of digital imaging and optical character recognition. If the papers are not of the required quality, substitute typewritten or mechanically printed papers of suitable quality will be required. The papers, including the drawings, must have each page plainly written on only one side of a sheet of paper. The sheets of paper must be the same size and either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches). Each sheet must include a top margin of at least 2.0 cm. (3/4 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 2.0 cm. (3/4 inch), and a bottom margin of at least 2.0 cm. (3/4 inch), and no holes should be made in the sheets as submitted. The lines must be 1 1/2 or double spaced. The pages must be numbered consecutively, starting with 1, the numbers being centrally located above or preferably, below, the text.

(6) Drawings: The original patent drawing sheets may not be altered. Any proposed change to the patent drawings must

be by way of a new sheet of drawings with the amended figures identified as "amended" and with added figures identified as "new" for each sheet changed submitted in compliance with § 1.84◀

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103. Section 1.550 is proposed to be amended by revising paragraphs (a), (b) and (d) to read as follows:

## § 1.550 Conduct of reexamination proceedings.

(a) All reexamination proceedings, including any appeals to the Board of Patent Appeals and Interferences, will be conducted with special dispatch within the Office. After issuance of the reexamination order and expiration of the time for submitting any ▶replies◀ [responses] thereto, the examination will be conducted in accordance with §§ 1.104 through 1.116 and will result in the issuance of a reexamination certificate under § 1.570.

(b) The patent owner will be given at least [30] ▶thirty◀ days to ▶reply◀ [respond] to any Office action. Such ▶reply◀ [response] may include further statements in ▶reply◀ [response] to any rejections and/or proposed amendments or new claims to place the patent in a condition where all claims, if amended as proposed, would be patentable.

\*\*\*\*\*

(d) If the patent owner fails to file a timely and appropriate ▶reply◀ [response] to any Office action, the reexamination proceeding will be terminated and the Commissioner will proceed to issue a certificate under § 1.570 in accordance with the last action of the Office.

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104. Section 1.560 is proposed to be amended by revising paragraph (b) to read as follows:

## § 1.560 Interviews in reexamination proceedings.

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(b) In every instance of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the patent owner. An interview does not remove the necessity for ▶reply◀ [response] to Office actions as specified in § 1.111.

105. Section 1.770 is proposed to be revised to read as follows:

## § 1.770 Express withdrawal of application for extension of patent term.

An application for extension of patent term may be expressly withdrawn before a determination is made pursuant to § 1.750 by filing in the Office, in duplicate, a written declaration of withdrawal signed by the owner of record of the patent or its agent. An application may not be expressly withdrawn after the date permitted for ▶reply◀ [response] to the final determination on the application. An express withdrawal pursuant to this section is effective when acknowledged in writing by the Office. The filing of an express withdrawal pursuant to this section and its acceptance by the Office does not entitle applicant to a refund of the filing fee § 1.20(j)) or any portion thereof.

106. Section 1.785 is proposed to be amended by revising paragraph (d) to read as follows:

## § 1.785 Multiple applications for extension of term of the same patent or different patents for the same regulatory review period for a product.

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(d) An application for extension shall be considered complete and formal regardless of whether it contains the identification of the holder of the regulatory approval granted with respect



to the regulatory review period or express and exclusive authorization from the holder of the regulatory approval to rely on the regulatory review period for extension. When an application contains such information, or is amended to contain such information, it will be considered in determining whether an application is eligible for an extension under this section. A request may be made of any applicant to supply such information within a non-extendable period of not less than one [(1)] month whenever multiple applications for extension of more than one patent are received and rely upon the same regulatory review period. Failure to provide such information within the period for ▶reply◀ [response] set shall be regarded as conclusively establishing that the applicant is not the holder of the regulatory approval and is not expressly and exclusively authorized by the holder of the regulatory approval to seek the extension being sought.

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107. Section 1.804 is proposed to be amended by revising paragraph (b) to read as follows:

**§ 1.804 Time of making an original deposit.**

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(b) When the original deposit is made after the effective filing date of an application for patent, the applicant shall promptly submit a [verified] statement from a person in a position to corroborate the fact, [and shall state] ▶stating◀, that the biological material which is deposited is a biological material specifically identified in the application as filed, except if the person is an attorney or agent registered to practice before the Office, in which case the statement need not be verified].

108. Section 1.805 is proposed to be amended by revising paragraph (c) to read as follows:

**§ 1.805 Replacement or supplement of deposit.**

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(c) A request for a certificate of correction under this section shall not be granted unless the request is made promptly after the replacement or supplemental deposit has been made and:

(1) Includes a [verified] statement of the reason for making the replacement or supplemental deposit;

(2) Includes a [verified] statement from a person in a position to corroborate the fact, and [shall state] ▶stating◀, that the replacement or supplemental deposit is of a biological material which is identical to that originally deposited;

(3) Includes a [verified] showing that the patent owner acted diligently [-]▶;◀

(i) In the case of a replacement deposit, in making the deposit after receiving notice that samples could no longer be furnished from an earlier deposit, or

(ii) In the case of a supplemental deposit, in making the deposit after receiving notice that the earlier deposit had become contaminated or had lost its capability to function as described in the specification;

(4) Includes a [verified] statement that the term of the replacement or supplemental deposit expires no earlier than the term of the deposit being replaced or supplemented; and

(5) Otherwise establishes compliance with these regulations, except that if the person making one or more of the required statements or showing is an attorney or agent registered to practice before the Office, that statement or showing need not be verified].

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**Part 3 - Assignment, Recording, and Rights of Assignee**

109. The authority citation for Part 3 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6.

109a. Section 3.11 is proposed to be revised to read as follows:

**§ 3.11 Documents which will be recorded.**

▶(a)◀ Assignments of applications, patents, and registrations, accompanied by completed cover sheets as specified in §§ 3.28 and 3.31, will be recorded in the Office. Other documents, accompanied by completed cover sheets as specified in §§ 3.28 and 3.31, affecting title to applications, patents, or registrations, will be recorded as provided in this Part or at the discretion of the Commissioner.

▶(b)◀ Executive Order 9424 (3 CFR 1943 - 1948 Comp.) requires the several departments and other executive agencies of the Government, including Government-owned or Government-controlled corporations, to forward promptly to the Commissioner of Patents and Trademarks for recording all licenses, assignments, or other interests of the Government in or under patents or patent applications. Assignments and other documents affecting title to patents or patent applications and documents not affecting title to patents or patent applications required by Executive order 9424 (3 CFR 1943 - 1948 Comp.) to be filed will be recorded as provided in this Part.◀

110. Section 3.26 is proposed to be revised to read as follows:

**§ 3.26 English language requirement.**

The Office will accept and record non-English language documents only if accompanied by [a verified] ▶an◀ English translation signed by the individual making the translation.

Section 3.27 is proposed to be revised to read as follows:

**§ 3.27 Mailing address for submitting documents to be recorded.**

▶(a)◀ Except as provided in paragraph (b) of this section, documents◀ [Documents] and cover sheets to be recorded should be addressed to the Commissioner of Patents and Trademarks, Box Assignments, Washington, D.C. 20231, unless they are filed together with new applications or with a petition under § 3.81(b).

▶(b)◀ A document required by Executive Order 9424 (3 CFR 1943 - 1948 Comp.) to be filed which does not affect title and is so identified in the cover sheet (see § 3.31(c)(2)) must be addressed and mailed to the Commissioner of Patents and Trademarks, Box Government Interest, Washington, D.C. 20231.◀

111. Section 3.31 is proposed to be amended by adding paragraph (c) to read as follows:

**§ 3.31 Cover sheet content.**

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▶(c)◀ Each patent cover sheet required by § 3.28 seeking to record a governmental interest as provided by § 3.11(b) must:

(1) Indicate that the document is to be recorded on the governmental register, and, if applicable, that the document is to be recorded on the Secret Register (see § 3.58), and

(2) Indicate, if applicable, that the document to be recorded is not a document affecting title (see § 3.41(b)).◀

112. Section 3.41 is proposed to be revised to read as follows:

**§ 3.41 Recording fees.**

▶(a)◀ All requests to record documents must be accompanied by the appropriate fee. ▶Except as provided in paragraph (b) of this section, a◀ [A] fee is required for each application, patent and registration against which the document is recorded as identified in the cover sheet. The recording fee is set in § 1.21(h) of this [Chapter] ▶chapter◀ for patents and in § 2.6(q) of this [Chapter] ▶chapter◀ for trademarks.

▶(b)◀ No fee is required for each patent application and patent against which a document required by Executive Order 9424 (3 CFR 1943 - 1948 Comp.) is to be filed if:

(1) The document does not affect title and is so identified in the cover sheet (see § 3.31(c)(2));

(2) The cover sheet is filed in a format approved by the Office; and

(3) The document and cover sheet are mailed to the Office in compliance with § 3.27(b).◀

113. Section 3.51 is proposed to be revised to read as follows:

**§ 3.51 Recording date.**

The date of recording of a document is the date the document meeting the requirements for recording set forth in this [Part] ▶part◀ is filed in the Office. A document which does not comply with the identification requirements of 3.21 will not be recorded. Documents not meeting the other requirements for recording, for example, a document submitted without a completed cover sheet or without the required fee, will be returned for correction to the sender where a correspondence address is available. The returned papers, stamped with the original date of receipt by the Office, will be accompanied by a letter which will indicate that if the returned papers are corrected and resubmitted to the Office within the time specified in the letter, the Office will consider the original date of filing of the papers as the date of recording of the document. The [certification] procedure under either § 1.8 or § 1.10 of this [Chapter] ▶chapter◀ may be used for resubmissions of returned papers to have the benefit of the date of deposit in the United States Postal Service. If the returned papers are not corrected and resubmitted within the specified period, the date of filing of the corrected papers will be considered to be the date of recording of the document. The specified period to resubmit the returned papers will not be extended.

114. Section 3.58 is proposed to be added to read as follows:

**▶§ 3.58 Governmental registers.**

(a) The Office will maintain a Departmental Register to record governmental interests required to be recorded by Executive Order 9424 (3 CFR 1943 - 1948 Comp.). This Departmental Register will not be open to public inspection but will be available for examination and inspection by duly authorized representatives of the Government. Governmental interests recorded on the Departmental Register will be available for public inspection as provided in § 1.12.

(b) The Office will maintain a Secret Register to record governmental interests required to be recorded by Executive Order 9424 (3 CFR 1943 - 1948 Comp.). Any instrument to be recorded will be placed on this Secret Register at the request of the department or agency submitting the same. No information will be given concerning any instrument in such record or register, and no examination or inspection thereof or of the index thereto will be permitted, except on the written authority of the head of the department or agency which submitted the instrument and requested secrecy, and the approval of such authority by the Commissioner of Patents and Trademarks. No instrument or record other than the one specified may be examined, and the examination must take place in the presence of a designated official of the Patent and Trademark Office. When the department or agency which submitted an instrument no longer requires secrecy with respect to that instrument, it must be recorded anew in the Departmental Register.◀

115. Section 3.73 is proposed to be amended by revising paragraph (b) to read as follows:

**§ 3.73 Establishing right of assignee to prosecute.**

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(b) When the assignee of the entire right, title and interest seeks to take action in a matter before the Office with respect to a patent application, trademark application, patent registration, or reexamination proceeding, the assignee must establish its ownership of the property to the satisfaction of the Commis-

sioner. Ownership is established by submitting to the Office documentary evidence of a chain of title from the original owner to the assignee ▶(e.g., copy of an executed assignment submitted for recording, etc.)◀ or by specifying (e.g., reel and frame number, etc.) where such evidence is recorded in the Office. Documents submitted to establish ownership may be required to be recorded as a condition to permitting the assignee to take action in a matter pending before the Office. [In addition, the assignee of a patent application or patent must submit a statement specifying that the evidentiary documents have been reviewed and certifying that, to the best of assignee's knowledge and belief, title is in the assignee seeking to take the action.]

**Part 5 - Secrecy of Certain Inventions and Licenses to Export and File Applications in Foreign Countries**

116. The authority citation for Part 5 is proposed to be revised to read as follows:

Authority: 35 U.S.C. 6, 41, 181-188; 22 U.S.C. 2751 *et seq.*; 22 U.S.C. 3201 *et seq.*; 42 U.S.C. 2011 *et seq.*; 10 CFR 810.7; 15 CFR 770.10(j); 22 CFR 125.4.

116a. Section 5.1 is proposed to be revised to read as follows:

**§ 5.1 [Defense inspection of certain applications]▶Correspondence◀.**

[(a) The provisions of this part shall apply to both national and international applications filed in the Patent and Trademark Office and, with respect to inventions made in the United States, to applications filed in any foreign country or any international authority other than the United States Receiving Office. The (1) filing of a national or an international application in a foreign country or with an international authority other than the United States Receiving Office, or (2) transmittal of an international application to a foreign agency or an international authority other than the United States Receiving Office is considered to be a foreign filing within the meaning of Chapter 17 of Title 35, United States Code.

(b) In accordance with the provisions of 35 U.S.C. 181, patent applications containing subject matter the disclosure of which might be detrimental to the national security are made available for inspection by defense agencies as specified in said section. Only applications obviously relating to national security, and applications within fields indicated to the Patent and Trademark Office by the defense agencies as so related, are made available. The inspection will be made only by responsible representatives authorized by the agency to review applications. Such representatives are required to sign a dated acknowledgment of access accepting the condition that information obtained from the inspection will be used for no purpose other than the administration of 35 U.S.C. 181 - 188. Copies of applications may be made available to such representatives for inspection outside the Patent and Trademark Office under conditions assuring that the confidentiality of the applications will be maintained, including the conditions that: (1) All copies will be returned to the Patent and Trademark Office promptly if no secrecy order is imposed, or upon rescission of such order if one is imposed, and (2) no additional copies will be made by the defense agencies. A record of the removal and return of copies made available for defense inspection will be maintained by the Patent and Trademark Office. Applications relating to atomic energy are made available to the Department of Energy as specified in 1.14 of this chapter.]

▶All correspondence in connection with this part, including petitions, must be addressed to "Assistant Commissioner for Patents (Attention Licensing and Review), Washington, DC 20231."◀

117. Section 5.2 proposed to be amended by revising paragraph (b) and removing paragraphs (c) and (d) to read as follows:

**§ 5.2 Secrecy order.**

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(b) [The secrecy order is directed to the applicant, his successors, any and all assignees, and their legal representatives; hereinafter designated as principals.] ▶ Any request for compensation as provided in 35 U.S.C. 183 must not be made to the Patent and Trademark Office, but directly to the department or agency which caused the secrecy order to be issued. ◀

(c) A copy of the secrecy order will be forwarded to each principal of record in the application and will be accompanied by a receipt, identifying the particular principal, to be signed and returned.

(d) The secrecy order is directed to the subject matter of the application. Where any other application in which a secrecy order has not been issued discloses a significant part of the subject matter of the application under secrecy order, the other application and the common subject matter should be called to the attention of the Patent and Trademark Office. Such a notice may include any material such as would be urged in a petition to rescind secrecy orders on either of the applications.]

118. Section 5.3 is proposed to be amended by revising paragraph (c) to read as follows:

**§ 5.3 Prosecution of application under secrecy orders; withholding patent.**

\*\*\*\*\*

(c) When the national application is found to be in condition for allowance except for the secrecy order the applicant and the agency which caused the secrecy order to be issued will be notified. This notice (which is not a notice of allowance under § 1.311 of this chapter) does not require ▶ reply ◀ [response] by the applicant and places the national application in a condition of suspension until the secrecy order is removed. When the secrecy order is removed the Patent and Trademark Office will issue a notice of allowance under § 1.311 of this chapter, or take such other action as may then be warranted.

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119. Section 5.4 is proposed to be amended by revising paragraphs (a) and (d) to read as follows:

**§ 5.4 Petition for rescission of secrecy order.**

(a) A petition for rescission or removal of a secrecy order may be filed by, or on behalf of, any principal affected thereby. Such petition may be in letter form, and it must be in duplicate. [The petition must be accompanied by one copy of the application or an order for the same, unless a showing is made that such a copy has already been furnished to the department or agency which caused the secrecy order to be issued.]

\*\*\*\*\*

(d) [Unless based upon facts of public record, the petition must be verified.]

▶ Appeal to the Secretary of Commerce, as provided by 35 U.S.C. 181, from a secrecy order cannot be taken until after a petition for rescission of the secrecy order has been made and denied. ◀

120. Section 5.5 is proposed to be amended by revising paragraphs (b) and (e) to read as follows:

**§ 5.5 Permit to disclose or modification of secrecy order.**

\*\*\*\*\*

(b) Petitions for a permit or modification must fully recite the reason or purpose for the proposed disclosure. Where any proposed discloser is known to be cleared by a defense agency to receive classified information, adequate explanation of such clearance should be made in the petition including the name of the agency or department granting the clearance and the date and degree thereof. The petition must be filed in duplicate

[and be accompanied by one copy of the application or an order for the same, unless a showing is made that such a copy has already been furnished to the department or agency which caused the secrecy order to be issued].

\*\*\*\*\*

(e) [The permit or modification may contain conditions and limitations.] ▶ Organizations requiring consent for disclosure of applications under secrecy order to persons or organizations in connection with repeated routine operation may petition for such consent in the form of a general permit. To be successful such petitions must ordinarily recite the security clearance status of the discloses as sufficient for the highest classification of material that may be involved. ◀

121. Section 5.6 is proposed to be removed and reserved.

**§ 5.6 [Removed and Reserved].**

122. Section 5.7 is proposed to be removed and reserved.

**§ 5.7 [Removed and Reserved].**

123. Section 5.8 is proposed to be removed and reserved.

**§ 5.8 [Removed and Reserved].**

124. Section 5.11 is proposed to be amended by revising paragraphs (b) and (c) to read as follows:

**§ 5.11 License for filing in a foreign country an application on an invention made in the United States or for transmitting international application.**

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(b) The license from the Commissioner of Patents and Trademarks referred to in paragraph (a) of this section would also authorize the export of technical data abroad for purposes relating to the preparation, filing or possible filing and prosecution of a foreign patent application without separately complying with the regulations contained in 22 CFR Parts [121] ▶ 120 ◀ through 130 (International Traffic in Arms Regulations of the Department of State), 15 CFR [Part 379 (Regulations of the Bureau of Export Administration, Department of Commerce)] ▶ Parts 768-799 (Export Administration Regulations of the Department of Commerce) ◀ and 10 CFR Part 810 [(Foreign Atomic Energy Programs of the Department of Energy)] ▶ (Assistance to Foreign Atomic Energy Activities - Regulations of the Department of Energy). ◀

(c) Where technical data in the form of a patent application, or in any form, is being exported for purposes related to the preparation, filing or possible filing and prosecution of a foreign patent application, without the license from the Commissioner of Patents and Trademarks referred to in paragraphs (a) or (b) of this section, or on an invention not made in the United States, the export regulations contained in 22 CFR Parts [121] ▶ 120 ◀ through 130 (International Traffic in Arms Regulations of the Department of State), 15 CFR [Part 379 (Regulations of the Bureau of Export Administration, Department of Commerce)] ▶ Parts 768-799 (Export Administration Regulations of the Department of Commerce) ◀ and 10 CFR Part 810 [(Foreign Atomic Energy Programs of the Department of Energy)] ▶ (Assistance to Foreign Atomic Energy Activities - Regulations of the Department of Energy) ◀ must be complied with unless a license is not required because a United States application was on file at the time of export for at least six months without a secrecy order under § 5.2 being placed thereon. The term "exported" means export as it is defined in 22 CFR [Parts 121 through 130] ▶ Part 120 ◀, 15 CFR Part [379] ▶ 779 ◀ and ▶ activities covered by ◀ 10 CFR Part 810.

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125. Section 5.13 is proposed to be revised to read as follows:

**§ 5.13 Petition for license; no corresponding application.**

If no corresponding national or international application has been filed in the United States, the petition for license under § 5.12(b) must be accompanied by the required fee (§ 1.17(h)), if expedited handling of the petition is also sought, and a legible copy of the material upon which a license is desired. This copy will be retained as a measure of the license granted. [For assistance in the identification of the subject matter of each license so issued, it is suggested that the petition be submitted in duplicate and provide a title and other description of the material. The duplicate copy of the petition will be returned with the license or other action on the petition.]

126. Section 5.14 is proposed to be amended by revising paragraph (a) to read as follows:

**§ 5.14 Petition for license; corresponding U.S. application.**

(a) When there is a corresponding United States application on file, a petition for license under § 5.12(b) must include the required fee (§ 1.17(h)), if expedited handling of the petition is also sought, and must identify this application by [serial] ▶ application ◀ number, filing date, inventor, and title, but a copy of the material upon which the license is desired is not required. The subject matter licensed will be measured by the disclosure of the United States application. [Where the title is not descriptive, and the subject matter is clearly of no interest from a security standpoint, time may be saved by a short statement in the petition as to the nature of the invention.]

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127. Section 5.15 is proposed to be amended by revising paragraph (a) to read as follows:

**§ 5.15 Scope of license.**

(a) Applications or other materials reviewed pursuant to §§ 5.12 through 5.14, which were not required to be made available for inspection by defense agencies under 35 U.S.C. 181 and § 5.1, will be eligible for a license of the scope provided in this paragraph. This license permits subsequent modifications, amendments, and supplements containing additional subject matter to, or divisions of, a foreign patent application, if such changes to the application do not alter the general nature of the invention in a manner which would require the United States application to have been made available for inspection under 35 U.S.C. 181 and § 5.1. [This license also covers the inventions disclosed in foreign applications which have been granted a license under this part prior to April 4, 1984, and which were not subject to security inspection under 35 U.S.C. 181 and § 5.1.] Grant of this license authorizing the export and filing of an application in a foreign country or the transmitting of an international application to any foreign patent agency when the subject matter of the foreign or international application corresponds to that of the domestic application. This license includes authority:

(1) To export and file all duplicate and formal application papers in foreign countries or with international agencies;

(2) To make amendments, modifications, and supplements, including divisions, changes or supporting matter consisting of the illustration, exemplification, comparison, or explanation of subject matter disclosed in the application; and

(3) To take any action in the prosecution of the foreign or international application provided that the adding of subject matter of taking of any action under paragraphs (a)(1) or (2) of this section does not change the general nature of the invention disclosed in the application in a manner which would require such application to have been made available for inspection under 35 U.S.C. 181 and § 5.1 by including technical data pertaining to:

(i) Defense services or articles designated in the United States Munitions List applicable at the time of foreign filing, the unlicensed exportation of which is prohibited pursuant to the Arms Export Control Act, as amended and 22 CFR Parts [121] ▶ 120 ◀ through 130; or

(ii) Restricted Data, sensitive nuclear technology or technology useful for the production or utilization of special nuclear material or atomic energy, dissemination of which is subject to restrictions of the Atomic Energy Act of 1954, as amended,

and the Nuclear Non-Proliferation Act of 1978, as implemented by the regulations [for Unclassified Activities in Assistance to Foreign Atomic Energy Activities] ▶ of the Department of Energy for assistance to foreign energy activities ◀, 10 CFR Part 810, in effect at the time of foreign filing.

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128. Section 5.16 is proposed to be removed and reserved.

**§ 5.16 [Removed and Reserved].**

129. Section 5.17 is proposed to be removed and reserved.

**§ 5.17 [Removed and Reserved].**

130. Section 5.18 is proposed to be revised to read as follows:

**§ 5.18 Arms, ammunition, and implements of war.**

(a) The exportation of technical data relating to arms, ammunition, and implements of war generally is subject to the International Traffic in Arms Regulations of the Department of State (22 CFR Parts [121] ▶ 120 ◀ through [128] ▶ 130 ◀); the articles designated as arms, ammunition, and implements of war are enumerated in the U.S. Munitions List, 22 CFR [121.01] ▶ Part 121 ◀. However, if a patent applicant complies with regulations issued by the Commissioner of Patents and Trademarks under 35 U.S.C. 184, no separate approval from the Department of State is required unless the applicant seeks to export technical data exceeding that used to support a patent application in a foreign country. This exemption from Department of State regulations is applicable regardless of whether a license from the Commissioner is required by the provisions of §§ 5.11 and [5.15 (22 CFR 125.04(b), 125.20(b))] ▶ 5.12 (22 CFR Part 125) ◀.

(b) When a patent application containing subject matter on the Munitions List (22 CFR [121.01] ▶ Part 121 ◀) is subject to a secrecy order under § 5.2 and a petition is made under § 5.5 for a modification of the secrecy order to permit filing abroad, a separate request to the Department of State for authority to export classified information is not required (22 CFR [125.05(d)] ▶ Part 125 ◀).

131. Section 5.19 is proposed to be revised to read as follows:

**§ 5.19. Export of technical data.**

(a) Under regulations (15 CFR 770.10(j)) established by the [U.S.] Department of Commerce, [Bureau of Export Administration, Office of Export Licensing,] a [validated export] license is not required in any case to file a patent application or part thereof in a foreign country if the foreign filing is in accordance with the regulations (37 CFR §§ 5.11 through 5.33) of the Patent and Trademark Office.

(b) [A validated] ▶ An ◀ export license is not required for data contained in a patent application prepared wholly from foreign-origin technical data where such application is being sent to the foreign inventor to be executed and returned to the United States for subsequent filing in the U.S. Patent and Trademark Office (15 CFR 379.3(c)).

132. Section 5.20, paragraph (b), is proposed to be removed.

**§ 5.20 Export of technical data relating to sensitive nuclear technology.**

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(b) [Removed].

133. Section 5.25, paragraph (c), is proposed to be removed.

**§ 5.25 Petition for retroactive license.**

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(c) [Removed].

134. Section 5.31 is proposed to be removed and reserved.



§ 5.31 [Removed and Reserved].  
135. Section 5.32 is proposed to be removed and reserved.

§ 5.32 [Removed and Reserved].

136. Section 5.33 is proposed to be removed and reserved.

§ 5.33 [Removed and Reserved].

137. Part 7 is proposed to be removed and reserved.

Part 7 - [Removed and Reserved]

September 10, 1996

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

**Certificate of Correction  
For Week of October 22, 1996**

P. 09,457	5,405,516	5,483,014	5,505,956
P. 09,513	5,407,526	5,483,054	5,506,261
Re. 33,265	5,410,430	5,483,330	5,506,335
Re. 35,003	5,410,544	5,483,584	5,506,538
D. 319,417	5,410,927	5,484,148	5,506,636
D. 368,776	5,416,954	5,484,480	5,506,856
D. 369,421	5,417,693	5,484,481	5,506,997
D. 370,595	5,418,181	5,484,795	5,507,107
D. 370,669	5,422,178	5,484,798	5,507,869
5,028,530	5,426,502	5,484,948	5,507,963
5,045,880	5,432,963	5,484,983	5,508,212
5,068,326	5,434,794	5,485,108	5,510,202
5,106,998	5,436,128	5,485,259	5,510,613
5,114,027	5,436,134	5,485,877	5,510,646
5,117,031	5,436,550	5,487,112	5,511,437
5,144,498	5,439,535	5,487,515	5,512,232
5,155,508	5,439,928	5,487,867	5,512,800
5,171,892	5,440,004	5,488,410	5,513,402
5,192,252	5,442,680	5,489,089	5,513,834
5,208,148	5,445,815	5,489,256	5,513,913
5,227,717	5,446,620	5,489,520	5,513,946
5,228,242	5,446,684	5,490,310	5,514,064
5,239,632	5,452,288	5,490,424	5,514,396
5,240,721	5,453,116	5,491,534	5,514,613
5,242,639	5,453,207	5,491,915	5,514,614
5,264,563	5,453,588	5,492,996	5,514,615
5,267,096	5,455,138	5,493,672	5,514,658
5,292,184	5,457,016	5,494,239	5,515,038
5,302,298	5,458,366	5,494,759	5,515,086
5,314,852	5,458,535	5,494,855	5,515,210
5,320,661	5,459,276	5,494,989	5,515,798
5,336,541	5,462,422	5,495,077	5,515,834
5,338,480	5,462,675	5,495,191	5,515,923
5,341,173	5,463,006	5,495,299	5,516,103
5,342,289	5,463,777	5,497,881	5,516,298
5,348,931	5,464,767	5,498,036	5,516,406
5,350,440	5,464,861	5,499,934	5,516,749
5,352,280	5,466,182	5,500,318	5,516,771
5,356,797	5,467,964	5,500,363	5,516,927
5,358,649	5,469,674	5,500,535	5,517,054
5,361,343	5,470,293	5,500,756	5,517,224
5,361,789	5,471,926	5,500,775	5,517,475
5,362,489	5,474,458	5,500,900	5,517,519
5,368,035	5,474,753	5,501,182	5,517,556
5,370,506	5,478,844	5,501,273	5,518,758
5,379,231	5,479,037	5,501,441	5,518,944
5,382,527	5,479,571	5,501,815	5,519,081
5,388,354	5,479,945	5,502,138	5,519,408
5,394,232	5,480,878	5,502,479	5,519,430
5,394,651	5,480,934	5,503,037	5,520,229
5,395,433	5,481,095	5,503,538	5,520,928
5,395,672	5,481,150	5,503,753	5,521,119
5,399,244	5,481,542	5,503,828	5,521,168
5,399,596	5,481,700	5,504,265	5,521,398
5,401,357	5,482,053	5,504,271	5,521,421
5,401,740	5,482,601	5,505,653	5,521,752

5,521,819	5,527,798	5,531,244	5,538,331
5,522,284	5,528,118	5,531,283	5,538,576
5,522,299	5,528,298	5,531,520	5,538,647
5,522,444	5,528,519	5,531,935	5,538,731
5,523,095	5,528,558	5,532,142	5,538,780
5,523,245	5,528,742	5,532,483	5,538,824
5,523,416	5,528,909	5,532,630	5,538,945
5,523,474	5,529,034	5,532,819	5,539,613
5,523,632	5,529,418	5,533,305	5,540,226
5,523,811	5,529,483	5,533,563	5,540,563
5,523,861	5,529,743	5,533,645	5,540,655
5,524,069	5,529,845	5,533,818	5,540,999
5,524,305	5,529,932	5,534,078	5,541,142
5,524,876	5,529,960	5,534,396	5,541,186
5,525,267	5,530,078	5,535,938	5,542,385
5,525,308	5,530,211	5,536,383	5,543,403
5,525,366	5,530,266	5,536,389	5,543,416
5,525,640	5,530,274	5,536,505	5,543,949
5,525,678	5,530,399	5,536,738	5,544,383
5,526,144	5,530,528	5,536,809	5,544,668
5,526,203	5,530,577	5,537,285	5,545,212
5,526,251	5,530,628	5,537,465	5,545,620
5,526,495	5,530,680	5,537,540	5,545,886
5,527,395	5,530,951	5,537,562	5,546,677
5,527,418	5,530,964	5,538,089	5,546,715
5,527,440	5,531,062	5,538,128	
5,527,595	5,531,173	5,538,310	

**Summary of Final Decisions  
Issued by the  
Trademark Trial and Appeal Board  
August 12-16, 1996**

Date Issued	Type of Case <sup>(1)</sup>	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
8-13	EX	74/474,421	Conbraco Industries, Inc.	2(c)(1)	Refusal Affirmed		"COMPACTORQUE" (pneumatic actuators)		No
8-14	EX	74/507,865	Gander Mountain, Inc.	2(d)	Refusal Affirmed		"FOX RIVER FIFTY" (rifles)	"FOX" (in stylized lettering) (rifles and shotguns)	No
8-14	EX	74/421,364	Schwartz Textiles	2(d)	Refusal Affirmed		"TAG SPORT" (clothing, namely, sweaters, knit and woven tops and bottoms, shirts, pants, shorts, sweatshirts and socks)	"TAG COLLEGIATE" (tag design) (athletic jerseys, pants and shorts, wrestling singlets, warm-up suits for track, volleyball and basketball; baseball caps; etc., sold to institutional purchasers such as schools, park districts and professional teams)	No
8-16	EX	74/548,616	Komline-Sanderson Engineering Corp.	whether the matter asserted for registration has been used as a trademark for the goods recited in the application (i.e., the matter asserted for registration is a "mutilation" of the mark used on the goods)	Refusal Affirmed		"KOMLINE" (industrial installations, and municipal waste treatment installations, for the separation of liquids and solids)		No

(1) EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (S) = SUMMARY JUDGMENT; (R) = REQ. FOR RECONSIDERATION



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Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

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Box AF	Expedited procedure for processing amendments and other responses after final rejection.
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Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
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Box Missing Parts	Response to the Notice to File Missing Parts of Application and associated papers and fees.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent applications and associated papers and fees.
Box Patent Ext.	Applications for patent term extension and any communications relating thereto.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filing of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for <i>original</i> request papers <i>only</i> .
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications <i>prior</i> to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

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2900 Crystal Drive  
Arlington, Virginia 22202-3513

Box Designations	Explanation
Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOU) and extension requests.
Box TTAB FEE	Oppositions, cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions, and extension requests.
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Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor <i>except</i> communications relating to <i>pending litigation and disciplinary proceedings</i> ; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
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Arkansas	Little Rock: Arkansas State Library .....	(501) 682-2053
California	Los Angeles Public Library .....	(213) 228-7220
	Sacramento: California State Library .....	(916) 654-0069
	San Diego Public Library .....	(619) 236-5813
	San Francisco Public Library .....	(415) 557-4500
	Sunnyvale Center for Innovation, Invention and Ideas .....	(408) 730-7290
Colorado	Denver Public Library .....	(303) 640-6249
Connecticut	New Haven: Science Park Library .....	(203) 786-5447
Delaware	Newark: University of Delaware Library .....	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries .....	(202) 806-7252
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	Miami-Dade Public Library .....	(305) 375-2665
	Orlando: University of Central Florida Libraries .....	(407) 823-2562
	Tampa Campus Library, University of South Florida .....	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology .....	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System .....	(808) 586-3477
Idaho	Moscow: University of Idaho Library .....	(208) 885-6235
Illinois	Chicago Public Library .....	(312) 747-4450
	Springfield: Illinois State Library .....	(217) 782-5659
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	West Lafayette Stegsmund Engineering Library, Purdue University .....	(317) 494-2872
Iowa	Des Moines: State Library of Iowa .....	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University .....	(316) 689-3155
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	Boston Public Library .....	(617) 536-5400 Ext. 265
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	Big Rapids: Abigail S. Timme Library, Ferris State University .....	(616) 592-3602
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Mississippi	Jackson: Mississippi Library Commission .....	(601) 359-1036
Missouri	Kansas City: Linda Hall Library .....	(816) 363-4600
	St. Louis Public Library .....	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library .....	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln .....	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library .....	(702) 784-6500 Ext. 257
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1191 OG 153

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Ohio	Grand Forks: Chester Fritz Library, University of North Dakota .....	(701) 777-4888
	Akron - Summit County Public Library .....	(303) 643-9075
	Cincinnati and Hamilton County, Public Library of .....	(513) 369-6936
	Cleveland Public Library .....	(216) 623-2870
	Columbus: Ohio State University Libraries .....	(614) 292-6175
Oklahoma	Toledo/Lucas County Public Library .....	(419) 259-5212
	Stillwater: Oklahoma State University Center for International Trade Development .....	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College .....	(503) 768-6786
Pennsylvania	Philadelphia: The Free Library of .....	(215) 686-5331
	Pittsburgh: Carnegie Library of .....	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University .....	(814) 865-4861
Puerto Rico	Mayaguez General Library, University of Puerto Rico .....	(787) 832-4040 Ext. 3459
Rhode Island	Providence Public Library .....	(401) 455-8027
South Carolina	Clemson University Libraries .....	(803) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology .....	(605) 394-6822
Tennessee	Memphis & Shelby County Public Library and Information Center .....	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University .....	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin .....	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University .....	(409) 845-3826
	Dallas Public Library .....	(214) 670-1468
	Houston: The Fondren Library, Rice University .....	(713) 527-8101 Ext. 2587
	Lubbock: Texas Tech University .....	Not Yet Operational
Utah	Salt Lake City: Marriott Library, University of Utah .....	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University .....	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington .....	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University .....	(304) 293-2510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin .....	(608) 262-6845
	Madison .....	(414) 286-3051
Wyoming	Milwaukee Public Library .....	(307) 237-4935
	Casper: Natrona County Public Library .....	



# PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner  
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents  
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents  
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
<b>CHEMICAL EXAMINING GROUPS</b>		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100— JOHN E. KITTLE, Director	308-0661	11/10/94
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1235	07/25/94
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director	308-0651	09/22/94
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-2351	02/02/95
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	08/19/94
<b>ELECTRICAL EXAMINING GROUPS</b>		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	10/25/94
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	02/28/95
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300— BOBBY R. GRAY, Director	305-9600	11/11/93
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3800	08/29/94
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500— JANICE A. HOWELL, Director	308-0956	03/03/95
TELECOMMUNICATIONS, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	01/20/95
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	02/27/95
<b>MECHANICAL EXAMINING GROUPS</b>		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director	308-1113	06/07/94
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director	308-1148	11/17/94
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	07/03/95
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	06/02/95
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	11/07/94

\*A communication from the examiner should have been received in most applications filed prior to this date.

## Patents will Expire as Follows:

- (1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
- (2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
- (3) All design patents are granted for a term of 14 years from the date of the grant. However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

OCTOBER 22, 1996

# U.S. PATENT AND TRADEMARK OFFICE

1191 OG 155

## TRADEMARK OPERATION

Bruce A. Lehman, Commissioner  
Philip G. Hampton, II, Assistant Commissioner  
Robert M. Anderson, Deputy Assistant Commissioner  
David E. Becher, Director, Trademark Examining Office  
Condition of Trademark Applications as of September 1, 1996

Law Office	Oldest Date	
	New*	Amendment Filed
Law Office 101—Ron Williams, Managing Attorney, (703) 308-9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	10/29/96	07/01/96
Law Office 102—Myra Kurzbar, Managing Attorney, (703) 308-9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/15/96	03/14/96
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308-9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/04/96	07/15/96
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308-9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/07/96	06/03/96
Law Office 105—Thomas Howell, Managing Attorney, (703) 308-9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/28/96	06/03/96
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308-9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/07/96	03/25/96
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308-9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/19/96	04/15/96
Law Office 108—David Shallant, Managing Attorney, (703) 308-9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/15/96	04/19/96
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308-9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/14/96	06/10/96
**Collective Marks—Class 200		
**Certification Marks—Classes A & B		
Office of Trademark Services—Terror Simms, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use (ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126 Affidavits Under Sections 8 & 15 (All Classes)	02/20/96	—0—
Renewals (All Classes)	07/08/96	—0—
Section 12(c) Publications (All Classes)	03/20/96	—0—

## 1. \*\* Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305-8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. \* These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.



# REISSUES

OCTOBER 22, 1996

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,353

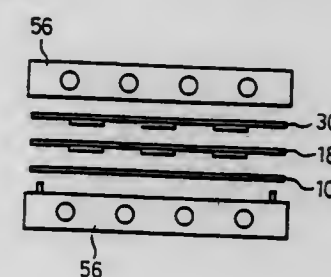
## PROCESS FOR MANUFACTURING A MULTI-LAYER LEAD FRAME

Masakuni Tokita; Akira Kobayashi; Shinichi Yamakawa; Mitsuharu Shimizu, and Norihiro Masuda, all of Nagano, Japan, assignors to Shinko Electric Ind. Co. Ltd., Nagano, Japan, and Intel Corporation, Santa Clara, Calif.  
Original No. 5,231,756, dated Aug. 3, 1993, Ser. No. 960,575, Oct. 13, 1992. Continuation of Ser. No. 701,182, May 16, 1991, abandoned. Application for reissue Sep. 28, 1994, Ser. No. 314,311

Int. Cl.<sup>6</sup> B32B 31/18; H05K 3/36

U.S. Cl. 29—830

12 Claims



1. A process for manufacturing a multi-layer lead frame for a semiconductor device comprising a lead frame body and at least one metal plane adhered to said lead frame body by means of an insulation tape piece, said process comprising the following steps of:

- forming a lead frame strip and at least one metal plane strip from metal strips, said lead frame strip comprising, a first supporting frame and a plurality of lead frame base longitudinally and continuously arranged, said metal plane strip comprising a plurality of said metal planes longitudinally and continuously arranged and connected to each other by connecting portions, and supported by said first supporting frame and having positioning means;
- forming at least one insulation tape strip from a resin strip providing adhesive layers on its respective surfaces, said insulation tape strip comprising a plurality of said insulation tape pieces longitudinally and continuously arranged and connected to another supporting frame via other connecting portions, said other supporting frame having positioning means;
- positioning said insulation tape strip with respect to said metal plane strip by their positioning means;
- punching said insulation tape strip to cut and remove at least one of said insulation tape pieces from said other connecting portions and provisionally adhering said insulation tape piece to at least one of said metal planes of said metal plane strip;
- positioning said metal plane strip with respect to said lead frame strip; and
- punching said metal plane strip to cut and remove said at least one metal plane from said connecting portions and laminating by heat-pressing in order to completely adhere to said metal plane to said at least one lead frame base of said lead frame strip.

Re. 35,354

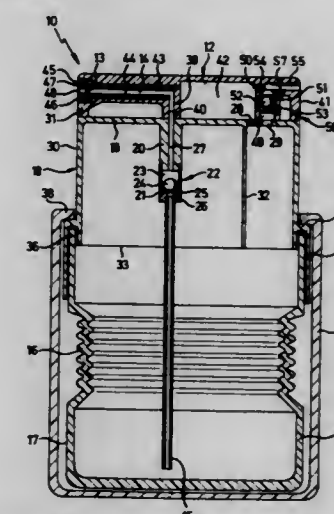
## PACK FOR FREE-FLOWING FILLER

Jens-Heinrich Kersten, Kamen-Heeren; Detlef Schmitz, Lunen, and Peter Runte, Unna-Hemmerde, all of Germany, assignors to Perfect-Valois Ventil GmbH, Dortmund, Germany  
Original No. 5,328,060, dated Jul. 12, 1994, Ser. No. 65,614, May 21, 1993. Application for reissue Apr. 7, 1995, Ser. No. 418,947  
Claims priority, application Germany, May 21, 1992, 42 16 915.1

Int. Cl.<sup>6</sup> B65D 37/00

U.S. Cl. 222—209

12 Claims



1. A pack having a handpump for dispensing free-flowing, filler having a filler container on which there is movably disposed, for the actuation of the pump, a dispensing head, which is provided with an outlet opening linked by a product duct and a lifting tube to the interior of the filler container, wherein a compression spring element forms an integral component part of the filler container and is effective, with a view to stretching the said container, in the longitudinal direction of the latter;

a carrier for the dispensing head is mounted in a seal-tight manner onto the opening of the filler container and is provided with a headplate on whose underside there is disposed, eccentrically to the principal axis of the filler container, a lifting tube nipple to which the upper end of the lifting tube is connected and whose product duct extends through the headplate;

assigned to the lifting tube nipple is a dispensing valve, which is open whenever the pressure in the filler container lies above the pressure of the external atmosphere;

the headplate is provided with a pass-through opening for operating air and with a pass-through opening for ventilating air, which are disposed eccentrically to the principal axis of the filler container;

the dispensing head is disposed in a seal-tight manner on the top side of the carrier, but so as to be rotatable between a closed position and an open position, and exhibits on its underside an inlet connecting socket with a product duct which, in the dispensing position of the dispensing head, is aligned with the product duct of the lifting tube nipple and which extends from the upper end of the inlet connecting socket radially outwards up to a dispensing opening in a contacting surface of the dispensing head;

an operating air duct in the dispensing head extends parallel to the radial product duct up to its dispensing opening;

a nozzle exhibits an outlet opening and is mounted onto the dispensing opening of the dispensing head, the nozzle being provided on its rear side with a centrifugal chamber, into



which the operation air duct opens out and which is connected to the outlet opening of the nozzle; ventilation duct in the dispensing head is aligned with the ventilation opening in the headplate of the carrier in the operating position of the dispensing head and is provided with a ventilation valve, which is open in the event of underpressure in the filler container.

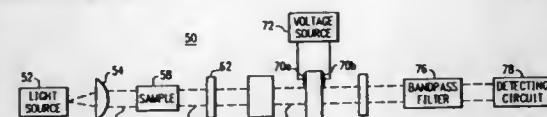
Re. 35,355

**METHOD AND ARRANGEMENT FOR MEASURING THE OPTICAL ABSORPTIONS OF GASEOUS MIXTURES**  
Fredrick M. Ryan, New Alexandria, and Milton S. Gottlieb, Pittsburgh, both of Pa., assignors to Rosemount Analytical Inc., La Habra, Calif.  
Original No. 4,998,017, dated Mar. 5, 1991, Ser. No. 345,863, May 1, 1989. Application for reissue Mar. 2, 1993, Ser. No. 25,280

Int. Cl. G01N 21/35

U.S. Cl. 250—343

31 Claims



25. An arrangement for measuring a property of a gas by its optical absorption characteristics, comprising:  
source of electromagnetic radiation;  
means for directing the electromagnetic radiation through the gas;  
an interferometric device filtering the electromagnetic radiation with a transmission spectrum having one or more spectral maxima, the interferometric device including an electro-optical element;  
means for applying an electric field to the electro-optical element;  
means for varying the electric field between two predetermined field strengths such that the spectral maxima shift to exhibit differing degrees of coincidence with absorption lines associated with the gas; and  
means for detecting an intensity of the electromagnetic radiation following passage through the gas and through the interferometric device, and determining therefrom a property of the gas.

Re. 35,356

**EEPROM CELL ARRAY WITH TIGHT ERASE DISTRIBUTION**

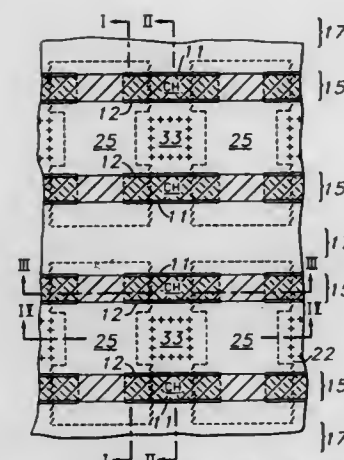
Manzur Gill, Saratoga, Calif., assignor to Texas Instruments Incorporated, Dallas, Tex.  
Original No. 5,264,718, dated Nov. 23, 1993, Ser. No. 925,282, Aug. 6, 1992. Continuation of Ser. No. 723,010, Jun. 28, 1991, abandoned. Application for reissue Mar. 17, 1995, Ser. No. 407,527

Int. Cl. H01L 29/68

U.S. Cl. 257—316

20 Claims

1. A pair of nonvolatile arrayed memory cells in a face of a semiconductor substrate of a first conductivity-type, each cell comprising:  
a source in said substrate, said source having a second conductivity-type opposite said first conductivity-type;  
two cell-isolation thick-field insulators, each said insulator having at least a first straight edge[,] and a second [straight] etched edge [parallel] perpendicular to said first straight edge[, and a third straight edge perpendicular to said second and third straight edges];  
a channel adjacent said source, said channel between said first edges of said two insulators;  
a stacked floating gate and control gate over said channel and over said first edges of said insulators, said stacked floating



gate and control gate having an edge parallel to said [third straight] second etched edges of said insulators and laterally displaced from the nearest said [third straight] second etched edges of said insulators; and  
a source line formed in said substrate adjacent to said source, said source line having said second conductivity-type, said source line abutting said second etched edges of [four of said insulators, said second etched edges perpendicular to said first edges] each of said insulators of each cell.

Re. 35,357

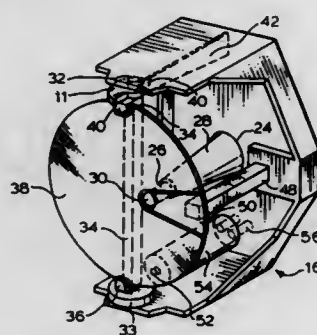
**DISPLAY ELEMENT WITH NOTCHED DISK**

John Browne, Oakville, Canada, assignor to Mark IV Industries, Ltd., Mississauga, Canada  
Original No. 5,055,832, dated Oct. 8, 1991, Ser. No. 385,453, Jul. 27, 1989. Continuation-in-part of Ser. No. 363,698, Jun. 9, 1989, abandoned. Application for reissue May 19, 1992, Ser. No. 885,654

Int. Cl. G09G 3/34

U.S. Cl. 345—84

23 Claims



19. A display unit for a graphic character matrix display assembly, comprising:  
a flat non-apertured display disk having a symmetry axis and light and dark opposite sides and a peripheral radial notch;  
a support for rotatably mounting said disk and for providing a dark background behind said disk;  
motive means on said support for rotating said disk substantially along the axis of symmetry of said disk between a display position exposing one of said sides of said disk, and a reverse position to expose the other side of said disk;  
a light source carried by said support and disposed adjacent said disk to project a light beam through said notch when said disk is in said display position;  
said disk having an imperforate edge portion arranged to block said light beam and to conceal said light source when said disk is in said reverse position.

Re. 35,358

**FASTENING BOLT ASSEMBLY WITH ANTI-ROTATION DEVICE AND PROVIDING BOTH AXIAL AND RADIAL HOLDING FORCES**

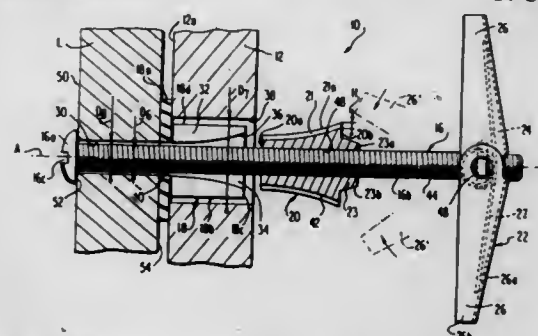
Jess L. Belser, East Hill Farm, R.R. 4, Box 844, W. Guilford, Vt. 05301

Original No. 5,224,807, dated Jul. 6, 1993, Ser. No. 968,367, Oct. 29, 1992. Continuation-in-part of Ser. No. 890,099, May 29, 1992, Pat. No. 5,163,796. Application for reissue Apr. 5, 1994, Ser. No. 223,036

Int. Cl. F16B 21/00

U.S. Cl. 411—342

14 Claims



8. A fastening bolt assembly providing both axial and radial holding forces for mounting an object having a hole passing therethrough to a vertical wall having opposite front and rear surfaces and having a blind hole passing therethrough alignable with the holes within the wall and within the object, respectively, said fastening bolt assembly comprising:

a flanged tubular bushing including a tubular body having an outer diameter on the order of said blind hole and a length approximately equal to the thickness of said wall and having an axial bore, a thin, radially enlarged flange on one end of said bushing having a diameter in excess of the diameter of the blind hole and acting as a stop when abutting against the wall front surface with the bushing tubular body inserted within said blind hole from the front surface towards the rear surface, a threaded bolt having a radially enlarged head at one end and a threaded shank extending axially therefrom and said threaded shank being insertable through said hole of said object, and through said flanged tubular bushing with the threaded shank having a shank diameter being less than that of the bore of said tubular bushing, said tubular bushing bore being flared outwardly in a direction away from said flanged end, a tubular expansion insert having an axial bore of diameter in excess of the diameter of said threaded shank and being slidably, concentrically mounted on said threaded shank of said bolt, having an outer periphery which is flared oppositely to that of the flared bore of the tubular bushing body and generally matching the same, and said tubular expansion insert being axially slidable into the flared bore of the tubular bushing, a wing structure having a tapped hole in the center thereof threaded on the shank of said threaded bolt, a pair of wings, means operatively coupling said wings to said wing structure for folding towards and away from each other on opposite sides of said threaded shank upon relative rotation of said threaded shank relative to said tapped hole from a position generally in line with each other and parallel to the axis of the fastening web to positions radially outwardly thereof such that the folding wings move axially on said threaded shank thereby forcing the expansion insert to move internally of the tubular bushing to radially expand the bushing and cause a radial frictional locking force to be exerted by the pair of wings against the rear surface of the wall and to exert an axially holding force on an object captured between the radially enlarged head of the bolt and the front surface of said wall, and, wherein said fastening bolt assembly further comprises means, responsive to positioning of said tubular expansion insert into the bore of said tubular bushing for preventing rotation of the wing structure with said bolt, during tightening down of the pair of wings against the rear surface of the vertical wall by rotating said bolt about said axis.

Re. 35,359

**AMINE SALTS OF AZO PIGMENTS BASED ON PYRAZOLONE DERIVATIVES**

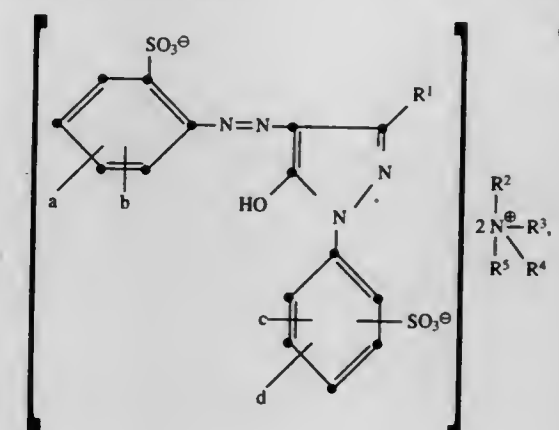
Stefan Hari, Reinach, and Georg Cseh, Posat, both of Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.  
Original No. 5,151,505, dated Sep. 29, 1992, Ser. No. 612,764, Nov. 13, 1990. Division of Ser. No. 207,414, Jun. 16, 1988, Pat. No. 4,992,495, which is a continuation of Ser. No. 20,059, Feb. 27, 1987, abandoned. Application for reissue Sep. 26, 1994, Ser. No. 312,209

Claims priority, application Switzerland, Mar. 10, 1986, 961/86

Int. Cl. C09B 29/03; 29/10; D06P 1/44; 5/00  
U.S. Cl. 534—728

5 Claims

1. A compound of formula I



wherein

[a and b are each —Cl.] a is —Cl and b is —Cl or —CH<sub>3</sub>,  
c and d are each independently of the hydrogen, —Cl or —CH<sub>3</sub>,  
R<sup>1</sup> is —CH<sub>3</sub>, and  
R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> are each hydrogen.

Re. 35,360

**REDUCTION OF MOLECULAR WEIGHT OF POLY(TETRAMETHYLENE ETHER) GLYCOL**

Suriyanarayan Dorai, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.  
Original No. 5,180,857, dated Jan. 19, 1993, Ser. No. 847,643, Mar. 10, 1992. Application for reissue Jun. 22, 1994, Ser. No. 263,842

Int. Cl. C07C 43/11

U.S. Cl. 568—617

22 Claims

1. A process for preparing poly(tetramethylene ether) glycols having reduced molecular weights, without significant conversion of said poly(tetramethylene ether) glycols to tetrahydrofuran, comprising:

(a) reacting, as a starting material, a poly(tetramethylene ether) glycol having a number average molecular weight in the range between about 1000 and 25000 with a [perfluorocarboxylic] perfluoroalkylcarboxylic acid [and an alcohol containing 1 to 3 carbon atoms], at a temperature of 100° C. to 250° C. for a reaction time of 0.1 to 8.0 hours under autogenous pressure to form a poly(tetramethylene ether) glycol ester said having a molecular weight lower than that of said poly(tetramethylene ether) glycol starting materials; (b) converting said lower molecular weight ester to a poly(tetramethylene ether) glycol by reaction with an alcohol or water; and (c) recovering from the reaction mixture a poly(tetramethylene ether) glycol having a number average molecular weight in the range between about 250 and 3500.



## PLANT PATENTS

GRANTED OCTOBER 22, 1996

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,664

### SHRUB ROSE PLANT NAMED 'POULANS'

Pernille Olesen, and Mogens Olesen, both of Fredensborg, Denmark, assignors to DeVor Nurseries, Inc., Watsonville, Calif.

Filed Mar. 31, 1995, Ser. No. 414,531

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—1

1 Claim

1. A new and distinct shrub rose plant variety, substantially as shown and described.

9,668

### IMPATIENS PLANT NAMED 'MICKY GINI'

Klara Dehan, Holon, Israel, assignor to Danziger - "Dan" Flower Farm, Post Beit Dagan, Israel

Filed Sep. 2, 1994, Ser. No. 299,618

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—87.6

1 Claim

1. A new and distinct cultivar of Impatiens plant named Micky Gini, as illustrated and described.

9,665

### SHRUB ROSE PLANT NAMED 'POULPYG'

Pernille Olesen, and Mogens Olesen, both of Fredensborg, Denmark, assignors to DeVor Nurseries, Inc., Watsonville, Calif.

Filed Mar. 31, 1995, Ser. No. 414,905

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—1

1 Claim

1. A new and distinct shrub rose plant variety, substantially as shown and described.

9,669

### ANTHURIUM PLANT NAMED 'NATHALIE'

Magdalena J. M. Van Rijn, Schipluiden, Netherlands, assignor to Van Rijn Plants, Am Schipluiden, Netherlands

Filed Aug. 2, 1995, Ser. No. 510,415

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—88.1

1 Claim

1. A new and distinct Anthurium plant named 'Nathalie', as herein described and illustrated.

9,670

### GUZMANIA PLANT NAMED 487-1

Herbert H. Hill, Jr., Lithia, Fla., assignor to Twyford International, Inc., Santa Paula, Calif.

Filed Jun. 15, 1995, Ser. No. 490,973

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—88.8

1 Claim

1. A new and distinct cultivar of Guzmania named 487-1, as illustrated and described.

9,666

### HELICHRYSUM PLANT NAMED 'HARVEST PEACH'

Rodolfo V. Bautista, Half Moon Bay, Calif., assignor to Bay City Flower Company, Inc., Half Moon Bay, Calif.

Filed Aug. 17, 1995, Ser. No. 514,459

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—68.1

1 Claim

1. A new and distinct hybrid plant variety of the Compositae family substantially as herein shown and described.

9,671

### ST. AUGUSTINEGRASS NAMED 'W-1'

James M. Holmes, Crystal Lake, Ill., assignor to Warren's Turf Group, Inc., Crystal Lake, Ill.

Filed Feb. 23, 1995, Ser. No. 393,440

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—90.1

1 Claim

1. A new and distinct cultivar of an asexually reproduced St. Augustinegrass plant, as shown and described, with a unique combination of characters including white stigmas, yellow anthers, an absence of leaf hairs, floret number per raceme, raceme length, leaf length, and internode length, having good turf performance, good winter hardiness, and a distinct DNA fingerprint.

9,667

### HELICHRYSUM PLANT NAMED HARVEST LEMON

Rodolfo V. Bautista, Half Moon Bay, Calif., assignor to Bay City Flower Company, Inc., Half Moon Bay, Calif.

Filed Aug. 17, 1995, Ser. No. 514,462

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—68.1

1 Claim

1. A new and distinct hybrid plant variety of the Compositae family substantially as herein shown and described.



# **PATENTS**

**GRANTED October 22, 1996**

## **ERRATA**

<b>For CLASS</b>	<b>See PATENT NO.</b>
2-169 .....	5,566,405
108-042 .....	5,566,609
175-426 .....	5,566,779
241-227 .....	5,566,902
241-261 .....	5,566,903
248-124 .....	5,566,911
463-058 .....	5,566,939
437-384 .....	5,566,943
463-060 .....	5,566,950
405-011 .....	5,567,076
405-045 .....	5,567,077
405-061 .....	5,567,078
405-080 .....	5,567,079
162-251 .....	5,567,262
510-527 .....	5,567,340
508-436 .....	5,567,341
508-287 .....	5,567,342
508-452 .....	5,567,344
508-486 .....	5,567,345
510-175 .....	5,567,348
510-135 .....	5,567,359
252-062 .....	5,567,400
536-023 .....	5,567,600
530-324 .....	5,567,678
556-479 .....	5,567,848
377-043 .....	5,568,071
335-216 .....	5,568,102
331-185 .....	5,568,103
335-216 .....	5,568,104
336-064 .....	5,568,111
348-589 .....	5,568,167
396-429 .....	5,568,211
396-320 .....	5,568,212
396-257 .....	5,568,213
396-411 .....	5,568,214
396-512 .....	5,568,215
396-515 .....	5,568,216
396-536 .....	5,568,217
396-529 .....	5,568,218

# ERRATA-CONTINUED

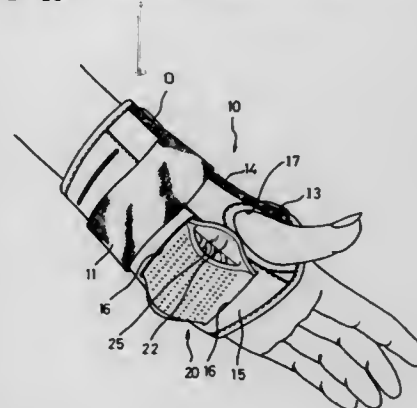
For CLASS	See PATENT NO.
396-281 .....	5,568,219
396-626 .....	5,568,220
396-630 .....	5,568,221
396-123 .....	5,568,222
396-123 .....	5,568,223
396-300 .....	5,568,224
386-046 .....	5,568,271
386-048 .....	5,568,272
386-107 .....	5,568,274
386-052 .....	5,568,275
386-020 .....	5,568,276

## PATENTS

GRANTED OCTOBER 22, 1996

### GENERAL AND MECHANICAL

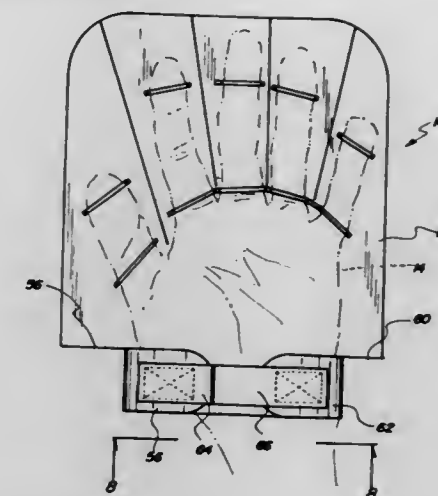
**5,566,389**  
**SHOCK ABSORBING WRIST GUARD**  
 Kao-ming Li, No. 1-14, Ma Tou Kou, Ma Kou Li, Ma Tou  
 Chen, Tainan Hsien, Taiwan  
 Filed Jun. 6, 1995, Ser. No. 486,134  
 Int. Cl.<sup>6</sup> A41D 13/08  
 U.S. Cl. 2-16 7 Claims



1. A shock-absorbing wrist guard for absorbing a shock, comprising a soft piece including two ear portions, a loop pile area connected on a portion of the soft piece, an envelope connected to another portion of the soft piece and defining a plurality of slots therein, a mediate portion between the loop pile area and the envelope, an opening defined in the mediate portion allowing a thumb of a user to pass therethrough, and a soft strip extended from one side of the loop pile area characterized in that a shock-absorbing means for absorbing a shock is received in the envelope for protecting the user's wrist, the shock-absorbing means comprising a flat plate, two wings extended from the flat plate, an arcuate portion bridged above a portion of the flat plate which is located between the two wings, thus defining a space region between the arcuate portion and the flat plate portion, a plurality of cushion elements being formed in the space region and connected between the arcuate portion and the flat plate portion which is between the two wings for absorbing an external reactive force transmitted through the arcuate portion.

**5,566,390**  
**HAND SHIELD**  
 Isobel E. Clancy, 8211 Osler Street, Vancouver, BC, Canada  
 Filed Jun. 12, 1995, Ser. No. 489,357  
 Int. Cl.<sup>6</sup> A41D 13/08

U.S. Cl. 2-16 1 Claim  
 1. A hand shield comprising:  
 a substantially rectangular cover web dimensioned so as to extend over and beyond a back and digits of a human hand, the cover web shaped so as to define a plurality of finger slits directed therethrough enabling an individual to individually articulate the digits of the human hand when the shield is worn;  
 plurality of digit loops secured to a lower surface of the cover web and being adapted to engage digits of a human hand, the digit loops comprise an inner thumb loop coupled to the lower surface of the cover web and positioned for reception of a thumb of a human hand; a first inner finger inner loop coupled to the lower surface of the cover web and positioned for reception of a first finger of the human hand; a second inner finger inner loop coupled to the lower surface of the cover web and positioned for reception of a second finger of the



human hand; a third inner finger inner loop coupled to the lower surface of the cover web and positioned for reception of a third finger of the human hand; a fourth inner finger inner loop coupled to the lower surface of the cover web and positioned for reception of a fourth finger of the human hand; an outer thumb loop coupled to the lower surface of the cover web and positioned for reception of an outer distal portion of a thumb of a human hand; a first outer finger loop coupled to a lower surface of the cover web and positioned for reception of an outer portion of a first finger of a human hand; a second outer finger loop coupled to a lower surface of the cover web and positioned for reception of an outer portion of a second finger of a human hand; a third outer finger loop coupled to a lower surface of the cover web and positioned for reception of an outer portion of a third finger of a human hand; and a fourth outer finger loop coupled to a lower surface of the cover web and positioned for reception of an outer portion of a fourth finger of a human hand;  
 the finger slits including a first finger slit directed into the cover web and between the thumb loop and the first inner finger loop so as to define a thumb web positionable over a posterior surface of a thumb of a human hand and a first web positionable over a posterior surface of a first finger of a hand; a second finger slit directed into the cover web and between the first inner finger loop and the second inner finger loop so as to define a second web positionable over a posterior portion of a second finger of a human hand; a third finger slit directed into the cover web and between the second inner finger loop and the third inner finger loop so as to define a third web positionable over a posterior portion of a third finger of a human hand; and a fourth finger slit directed into the cover web and extending between the third inner finger loop and the fourth inner finger loop so as to define a fourth web positionable over a posterior portion of a fourth finger of a human hand, wherein the cover web is shaped so as to define a first wrist slit directed therethrough defining a first wrist strap positioned for extension about a portion of a circumference of a human wrist; and a second wrist slit directed therethrough defining a second wrist strap positioned for extension about a portion of a circumference of a human wrist; and further comprising a first hook and loop patch secured to the first wrist strap, and a second hook and loop patch being secured to the second wrist strap, wherein the hook and loop patches can be cooperatively engaged to secure the straps circumferentially about a human



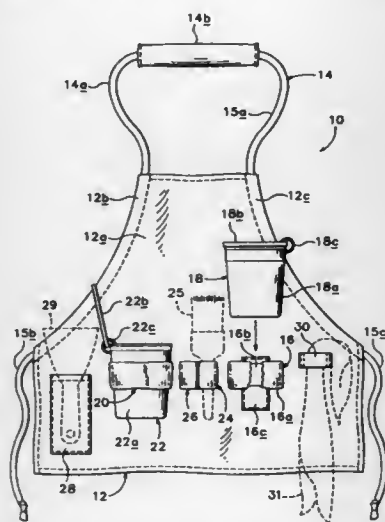
wrist of a human hand and the finger webs abut each other with an inner width less than an outer width.

5,566,391

**PAINTING APRON WITH ONBOARD PAINT SUPPLY**  
Dorothy N. Williamson, 5124 NE. 14th Pl., Portland, Oreg. 97211

Filed Jun. 30, 1995, Ser. No. 497,473  
Int. Cl.<sup>6</sup> A41B 13/10

U.S. Cl. 2—51



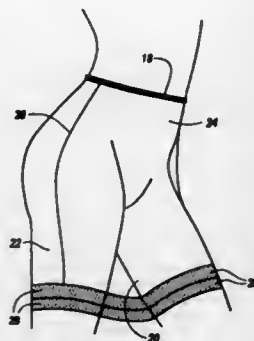
1. A painting apron system comprising:
  - a protective sheet of flexible, paint-imperious material, said protective sheet including a body surface configured to substantially cover a torso of a wearer;
  - a strap arrangement including one or more elongate straps which extend from said protective sheet to secure said protective sheet to the wearer;
  - a detachable container including a cup portion and a removable lid portion tethered to said cup portion; and
  - a mounting arrangement including an expandable loop secured to said body surface of said protective sheet, and configured to releasably receive said container and to hold said container adjacent said protective sheet.

5,566,392

**NO-SLIP UNDERCLOTHING**  
Brenda Dzelzkalns, 3524 Chatham Green Lane, #813, Arlington, Tex. 76014

Filed Dec. 5, 1994, Ser. No. 349,674  
Int. Cl.<sup>6</sup> A41B 9/00

U.S. Cl. 2—73



means for adjusting a length of the strap and for maintaining a desired length of the strap;

belt loop engaging elements disposed toward the opposite ends of the strap and adapted for being fastened to respective belt loops on a garment, the belt loop engaging elements being formed to surround the belt loops without penetrating the garment, each of the belt loop engaging elements comprising a single hook element having a substantially U-shaped portion shaped to engage the belt loop and an attaching portion for attaching the single hook element directly to the strap, the attaching portion comprising an opening formed in the single hook element, the opening having a width that is slightly larger than a width of the strap to receive a portion of the strap therein so as to allow the strap to move in a sliding manner within the opening, the opening being the only means connecting the strap to the single hook element; wherein the strap, the means for adjusting the strap and the belt loop engaging elements cooperate so that when the belt loop engaging elements are positioned on the belt loops, the strap pulls on the fastening elements to in turn pull the belt loops toward each other and thereby tighten the waist of the garment.

5,566,398

## HELMET REMOVAL DEVICE

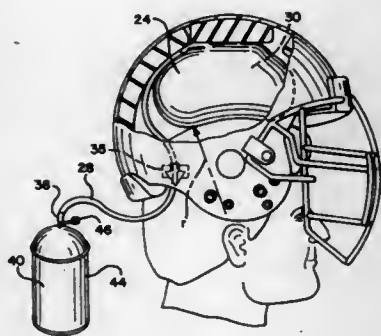
John C. Deagan, Long Grove, Ill., assignor to Safesport, Inc., Northbrook, Ill.

Continuation of Ser. No. 221,867, Mar. 31, 1994, Pat. No. 5,428,845. This application Mar. 14, 1995, Ser. No. 404,043

Int. Cl. A42B 3/04

U.S. Cl. 2—413

19 Claims



1. A device for removing a helmet from about the head of a wearer, the helmet configured to fit about the head of the wearer with a lower edge of the helmet extending below the ears of the wearer, the device comprising:

means adapted to be disposed between the helmet and head of the wearer, and expandable by inflation from a collapsed configuration to an expanded configuration to exert a generally downward directed force upon the head of the wearer for lifting the helmet upward from the head of the wearer so that the lower edge is generally above the ears of the wearer, wherein the means for lifting defines a chamber; and means in fluid communication with the chamber for inflating the means for lifting.

5,566,399  
HEAD IMPACT FORCE DIVERSION SYSTEM WITH LAYERED SHELL

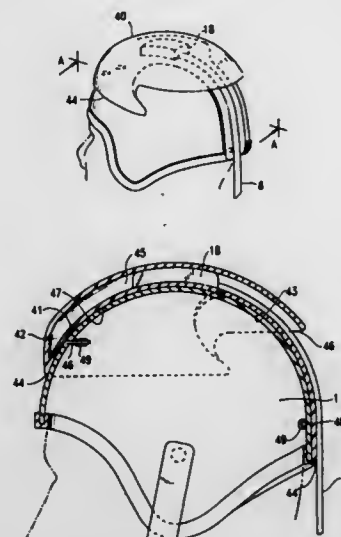
Rudolph Cartwright, #14 Lake Park Rd., Champaign, Ill. 61821, and John E. Lowe, 9000 S. Bennett, Chicago, Ill. 60617

Filed Nov. 14, 1994, Ser. No. 339,434

Int. Cl. A42B 3/04; A63B 71/10

U.S. Cl. 2—421

30 Claims



1. An apparatus for mounting upon a head and a torso of a human body for absorbing an impact force to said head and transferring that impact force to the torso, comprising:

- a) torso attachment means for mounting upon said torso;
- b) head protection means for mounting upon said head, said head protection means including a layered shell with at least one aperture defined therein said aperture opening toward the rear of the helmet; and
- c) transfer means, affixed at a second end to said torso attachment means, extending through the aperture defined in the layered shell of the head protection means and terminating at a first end having an expanded region, said first end being movably disposed within a cavity in the layered shell said cavity being located at the crown of the helmet and having a size greater than a size of the expanded region to permit movement of the expanded region within said cavity in forward rearward directions and in lateral directions transverse to said forward-rearward directions and rotationally about an axis perpendicular to said forward-rearward direction and in said lateral directions in response to head movements.

5,566,400

## FLAT-FOLDED DISPOSABLE MALE URINARY AID AND COMPACT PORTABLE DISPENSER THEREFOR

William Jones, 19015 Rosita St., Tarzana, Calif. 91356

Filed Mar. 22, 1994, Ser. No. 216,906

Int. Cl. A47K 11/12

U.S. Cl. 4—144.4

3 Claims

1. A method for preventing splashing of urine onto a toilet containing toilet water or about a toilet area by a male standing before the toilet and urinating into the toilet, comprising the steps of:

- a) providing a flexible, bio-degradable, elongated tubular element having an inlet and an outlet end,
- b) inserting the penis into the inlet end of said element,
- c) disposing the outlet end into the toilet water, and
- d) urinating directly into the tubular element.

5,566,402

## BIDET APPARATUS FOR TOILETS

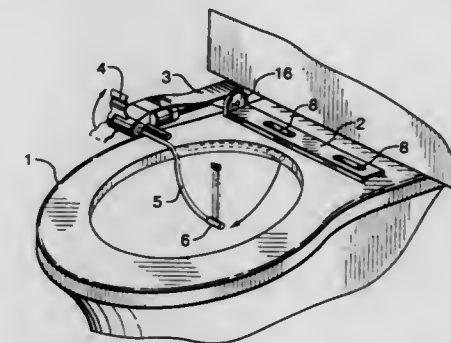
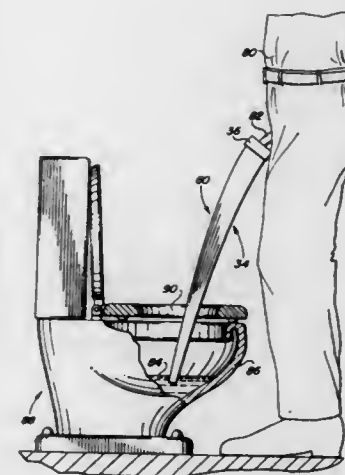
Mohammed T. S. Agha el-Rifai, Niagara-on-the-Lake, and Ian F. Norton, Toronto, both of Canada, assignors to Rim Innovation and Marketing Consultants Inc., St. Catharines, Canada

Filed Mar. 14, 1995, Ser. No. 403,940

Int. Cl. A47K 3/22

U.S. Cl. 4—420.4

2 Claims



5,566,401

## CLEANING MECHANISM OF A STOOL

Mitsuhiro Kishi, Ashikaga; Toyobiko Sunaoka, Tokyo, and Mikio Shimoyama, Ashikaga, all of Japan, assignors to Nikken Corporation, Tokyo, Japan

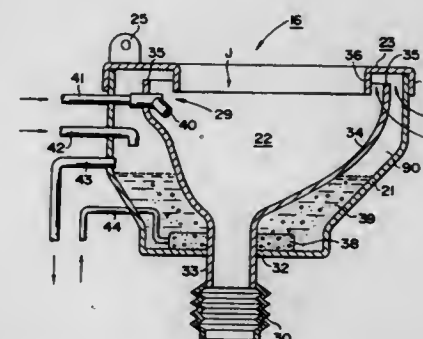
Filed Dec. 20, 1994, Ser. No. 359,476

Claims priority, application Japan, Dec. 21, 1993, 5-345326

Int. Cl. E03D 9/00

U.S. Cl. 4—300

19 Claims



1. A stool containing a cleaning mechanism comprising: an outer cover having a bottom part and an upper opening; an inner bowl accommodated inside said outer cover for receiving raw sewage therein, said inner bowl being spaced from said outer cover to define a space therebetween; said inner bowl including ejector means having at least one nozzle for jetting a flow of cleaning liquid along an inner periphery of said inner bowl to remove raw sewage therefrom;

a substantially ring-shaped upper cover having an inner peripheral surface which is disposed about an upper end of said outer cover, a lower surface which is spaced from an upper end peripheral edge of said inner bowl, and a central introduction hole through which raw sewage is introduced into said inner bowl, wherein cleaning liquid is interposed in the space between said outer cover and said inner bowl, said cleaning liquid being cleaning water mixed with a foaming material;

a liquid storage means containing said cleaning liquid, said space and said ejector means being in communication with said liquid storage means for receiving said cleaning liquid therefrom; and

an air discharge body provided inside said bottom part of said outer cover for receiving air supplied from outside and for spouting said air therefrom.

1. A bidet device for installation on a toilet bowl, said device comprising:

- a mounting bracket securable to the toilet bowl;
  - a body attached near one of its ends to one end of the mounting bracket, configured to extend partially along a side of the toilet bowl;
  - a lever arm at the distal end of the body, pivotally connected thereto to pivot between an operating position and a retracted position, said lever arm rotating a spray arm between an operating position where said lever arm is generally in a central position within said toilet bowl with a nozzle on the end thereof pointing generally upwardly, and a retracted position where said spray arm is positioned generally adjacent said bowl, said lever arm simultaneously rotating a valve to open said valve in said operating position and close said valve in said retracted position; and
  - a water supply connected to said valve to deliver water to said spray arm and nozzle via said valve, where said body is pivotally attached to said mounting bracket, for rotation about a lateral, horizontal axis, said device further comprising a peg projecting from said body to be located beneath a toilet seat,
- said device further comprising biasing means positioned to bias said body upwardly, such that when said toilet seat is raised, said biasing means rotates said body upwardly with said toilet seat, and when said toilet seat is lowered, it lowers said body with it by virtue of contact with said peg.

5,566,403

## SPA COVER LIFT APPARATUS

Marc S. Black, 3240 Val Verde Ave., Long Beach, Calif. 90808, and Jeffrey D. Black, 4281 Candleberry Ave., Seal Beach, Calif. 90740

Filed Sep. 6, 1994, Ser. No. 301,257

Int. Cl. E04H 4/06

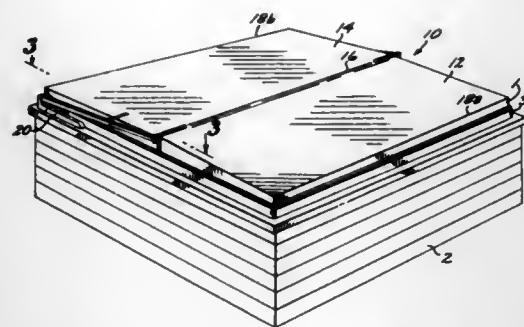
U.S. Cl. 4—498

7 Claims

1. An adjustable spa cover lifting apparatus for lifting a spa cover off of a spa comprising:

- a pair of lifting assemblies wherein each of said lifting assemblies includes:
- a mounting bracket;
- an adjustable lifting arm pivotally connected at one end to said mounting bracket;
- a stabilizer arm positioned at an intermediate point on said adjustable lifting arm;





a support member having proximate and distal ends, said proximate end being pivotally connected to said mounting bracket and said distal end being pivotally connected to said adjustable lifting arm; and  
a spa cover engagement assembly positioned on said adjustable lifting arm.

5,566,404

**SINK WITH WHEELCHAIR ACCESS**

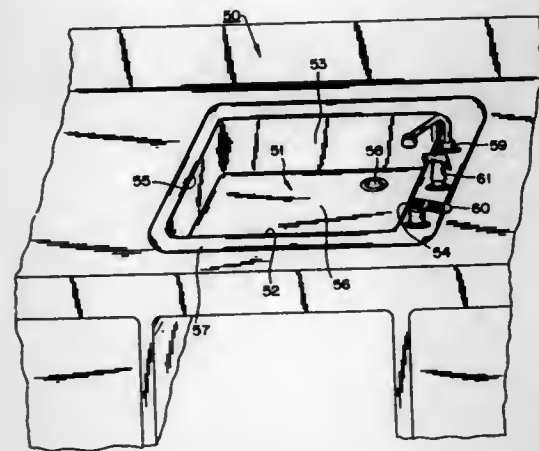
John Laughton, Polegate, England, assignor to American Standard Inc., Piscataway, N.J.

Division of Ser. No. 406,821, Mar. 20, 1995, abandoned, which is a continuation of Ser. No. 122,875, Sep. 16, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 473,624  
Claims priority, application United Kingdom, Jun. 25, 1993, 9313140

Int. Cl.<sup>6</sup> A47K 1/04

U.S. Cl. 4—619

12 Claims



1. A sink for use in a kitchen comprising:

- a rear wall;
- a front wall;
- a first side wall opposed to a second side wall, said side walls adjoining said front wall and said rear wall;
- a bottom floor adjoining lower edges of said rear wall, front wall and side walls, said bottom floor being substantially flat, said rear wall, front wall, side walls and bottom floor defining a basin;
- first and second planar ledges extending horizontally outwardly from upper edges of said first and second side walls, respectively;
- a faucet assembly mounted on one of said first and second planar ledges, said faucet assembly including a spout and a control handle mounted on one of said planar ledges, said spout having a discharge opening directed downwardly towards said bottom floor into said basin, said control handle positioned proximate and forward of said spout and adjacent and proximate a front edge of said ledge whereby a user can

easily access said control handle from the front of the sink, said spout adjacent said handle;  
and a drain opening positioned in said bottom floor, said drain opening adjacent a lower edge of said rear wall and a lower edge of one of said side walls.

5,566,405

**METHOD OF MANUFACTURING A HAND COVERING**

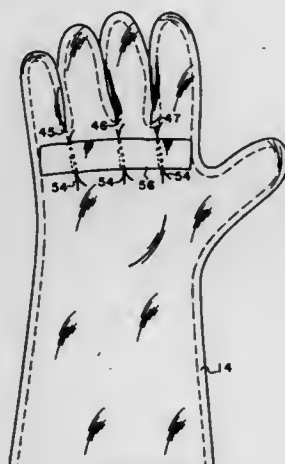
Francis J. Masley, Wilmington, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Mar. 29, 1995, Ser. No. 412,824

Int. Cl.<sup>6</sup> A41D 19/00

U.S. Cl. 2—169

4 Claims



1. A method of producing a hand covering, the hand covering having a plurality of finger stalls, a thumb stall, a thumb crotch, a palm portion, a dorsal portion, and a plurality of finger crotches, the method comprising the following steps:

- providing mating first and second Flat Pattern hand covering portions;
- seaming said first and second hand covering portions to form a complete Flat Pattern hand covering;
- providing an orienting assembly dimensioned to be insertably received within said complete hand covering;
- providing a sufficient orienting force, against the orienting assembly, to form vertical folds in the hand covering;
- providing at least one length of tape;
- permanently bonding the at least one length of tape in a location on the hand covering generally laterally aligned with the thumb crotch; and
- permanently defining the vertical folds in said hand covering with the at least one length of tape such that an original palm circumferential dimension of the hand covering is reduced in an amount from about 10% to about 50%.

5,566,406

**SELF-CONTAINED EMERGENCY EYE WASH STATION**

Rodney L. Demy, Medinah, and Robert B. Hurley, Inverness, both of Ill., assignors to Fendall Company, Arlington Heights, Ill.

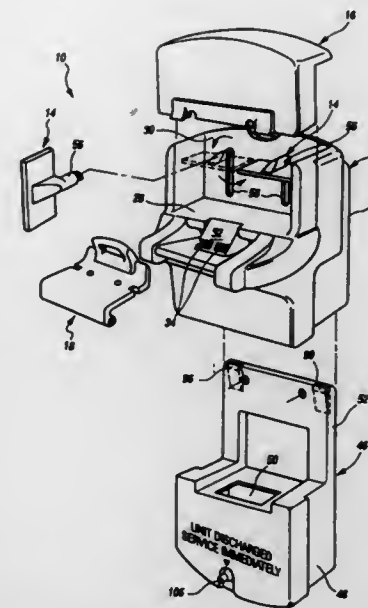
Filed May 26, 1995, Ser. No. 451,191

Int. Cl.<sup>6</sup> A61H 33/00

U.S. Cl. 4—620

15 Claims

- 1. A self-contained emergency eye wash station for dispensing eye wash fluid, comprising:
  - a flexible container containing the eye wash fluid;
  - a nozzle in fluid communication with said flexible container and dispensing the eye wash fluid from said flexible container;
  - a reservoir collecting the eye wash fluid dispensed from said nozzle; and



- b. a lower positioned permeable material of a first, higher permeability extended between the spaced members of the frame and held by them to serve as the infant's supporting permeable material; and
- c. an upper positioned permeable material of a second, lower permeability, removably placed over the lower permeable material and also extended between the spaced members of the frame and held by them to serve as the infant's direct resting surface material, said upper positioned material being soft and gentle to the infant's skin.

5,566,408

**SUSPENDED COIL WAVE REDUCTION SYSTEM FOR A WATER MATTRESS**

Kevin McCarthy, 9212 Adalee Ct., Columbia, Md., and Robert Brooks, 14111 Adkins Rd., Laurel, Md. 20707

Filed Dec. 14, 1995, Ser. No. 572,060

Int. Cl.<sup>6</sup> A47C 27/08

U.S. Cl. 5—682

4 Claims

1. A water mattress having a plurality of corners and a wave reduction system comprising:

- a top sheet;
- a bottom sheet;
- a suspension sheet having a top surface, said top sheet, said bottom sheet and said suspension sheet connected by a welded seam, said suspension sheet positioned between said top sheet and said bottom sheet, dividing the mattress into an upper portion and a lower portion, said suspension sheet having a plurality of holes permitting fluid communication between said upper and lower portions of the mattress, and cut-out portions at said corners, adapted to relieve stress on said welded seam, and a plurality of chambers sealed to said top surface of said suspension sheet, each chamber having a plurality of holes permitting fluid communication between said chambers and the upper and lower portions of the mattress, said chambers comprising buoyant means adapted to maintain said chambers in an expanded state upon the filling of the mattress with water.

5,566,407

**CRIB WITH AIR PERMEABLE SUPPORTING SURFACE**

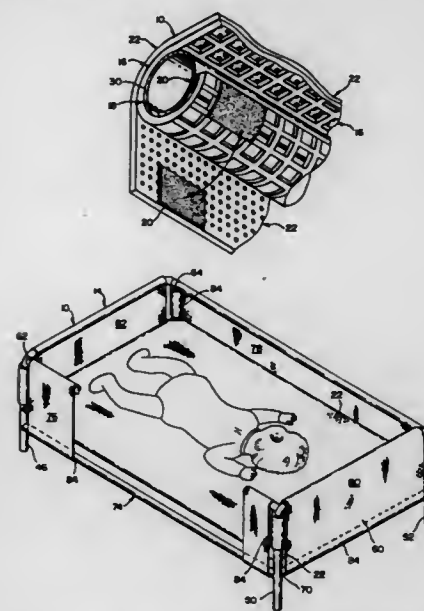
William W. Lien, 18888 N.E. 16th, Redmond, Wash. 98052

Filed Jun. 7, 1995, Ser. No. 482,473

Int. Cl.<sup>6</sup> A47D 7/00; A47C 19/00

U.S. Cl. 5—93.1

16 Claims



1. An infant's crib for newborn infants and infants beyond in age, whereby the infant will always have available breathing air providing the infant with ample oxygen, and preventing the build up of carbon dioxide, which is carried away by air circulating under the infant's crib, comprising:

- a. a frame for placement in part on a supporting surface and having, at a level above the supporting surface, spaced members thereof, arranged in a plane, and adapted to receive and to hold permeable materials extending between these spaced members, upon which an infant may be supported, often being face down;

5,566,409

**MODULAR AIR MATTRESS**

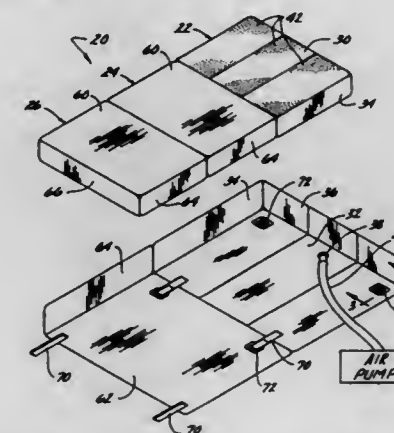
Jeffrey D. Klearman, #2 Frontenac Pl., St. Louis, Mo. 63131

Filed Jul. 1, 1994, Ser. No. 270,168

Int. Cl.<sup>6</sup> A47C 27/10

U.S. Cl. 5—723

15 Claims



15. A modular mattress for supporting a patient comprising a plurality of separate pieces positioned adjacent one another in a longitudinal series, at least one of said pieces being a ventilating air piece and at least one other of said pieces being a non-ventilating piece, and at least one connector for releasably coupling each of said plurality of pieces to said adjacent pieces of said

mattress so that said plurality of pieces may be coupled in said longitudinal series and each of said plurality of pieces may be released from said adjacent pieces to selectively reposition said plurality of pieces in another longitudinal series.

5,566,410

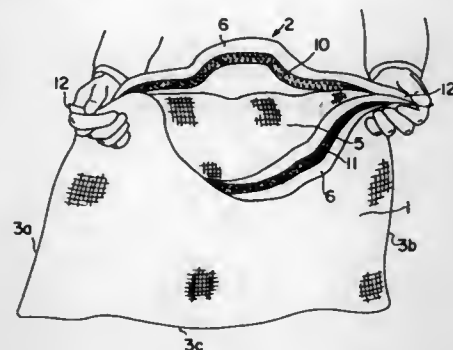
# **QUICK SEAL PILLOW COVER CONFIGURATION AND METHOD**

Alan L. Schaechter, P.O. Box 401, Valley Stream, N.Y. 11582  
Filed Oct. 24, 1994, Ser. No. 328,092

Int. Cl.<sup>6</sup> A47G 9/00

U.S. Cl. 5—490

3 Claims



1. A quick-sealing method of enclosing a pillow in a pillow cover comprising providing a rectangular pillow cover closed on three sides with an opening extending along the length of the fourth side, partially permanently closed along said fourth side at the edges of the opening to form retaining portions each representing about 5% to 20% of the total length of said fourth side of the pillow cover to permit insertion of a pillow through the opening, the open portion of said fourth side having attached thereto a continuous strip of hook and loop closure means centrally located on the inside of the flaps between the retaining portions of the pillow cover, said hook portion of said closure means being on one flap in close proximity to the edge of the cover opening and said loop portion being on the other flap in close proximity to the other edge of the cover opening, thereby allowing the pillow to be easily inserted within the pillow cover, inserting a rectangular pillow through said opening between said retaining portions, said pillow having a length and width slightly smaller than the length and width of the pillow cover, and quickly sealing the pillow within the pillow cover by pulling outwardly in opposite directions on each corner of the retaining portions on the fourth side of the pillow cover.

5,566,411

# **BEDDING ENSEMBLE**

Robyn F. Eiler, 5402 Francisco Dr., Greensboro, N.C. 27410

Filed Jul. 21, 1995, Ser. No. 505,473

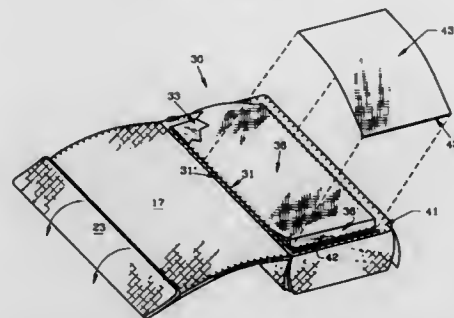
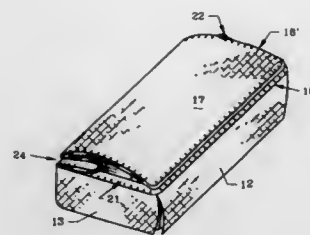
Int. Cl.<sup>6</sup> A47G 9/00; 9/02; 9/04

U.S. Cl. 5—494

7 Claims

1. A bedding ensemble for covering a rectangular mattress, said bedding ensemble comprising:

- (a) a mattress engaging portion, said mattress engaging portion fitted around said mattress, said mattress engaging portion comprising an elastic band, said elastic band positioned beneath said mattress to secure said mattress;
- (b) a top, said top attached to said mattress engaging portion;
- (c) a top cover, said top cover having rectangular shape, said top cover positioned on said top, said top cover comprising means to releasably fasten said top cover to said top along three sides, said top cover permanently affixed to said top along one side, said top cover having width substantially equal to said mattress width, said top cover comprising an extension, said



extension attached to said top cover opposite said foldably affixed side, said top cover and said extension having a combined width greater than said mattress width, said extension for folding beneath said top cover so as to be positioned between said top cover and said top;

- (d) a skirt panel, said skirt panel attached to said top for covering said mattress engaging portion;
- (e) an inner cover, said inner cover removably affixed to said top, said inner cover comprising a top layer, a bottom layer, and a reinforced foot panel;
- (f) a first zipper, said first zipper attached to said top, said first zipper for releasably joining said top cover and said extension to said top when said extension is folded beneath said top cover.

5,566,412

# **INCLINABLE BED FRAME ASSEMBLY**

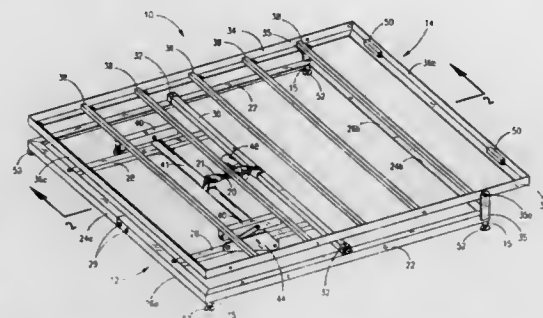
George M. Arnold, 2627 Hwy. 14, Lake Charles, La. 70601

Filed Mar. 16, 1995, Ser. No. 404,928

Int. Cl.<sup>6</sup> A47C 19/04

U.S. Cl. 5—610

10 Claims



1. An inclinable bed frame assembly comprising:

- A) a base frame comprising:
  - a) a plurality of elongated members having approximately equal cross section, interconnected to provide a substantially rectangular shaped main frame with opposed, spatially disposed side head and end rails;
  - b) a detachable actuator cross member having a clevis attachment;
  - c) a pair of truss attached perpendicular to said actuator cross member extending parallel to said side rails and further detachably connected to said head rail;

- d) a post member attached to each side rail adjacent said end rail extending above said base frame side rails;
- e) an adjustable leg extending downward from each corner of said rectangular base frame;
- B) a mattress frame pivotally attached to said post member comprising:
  - a) a plurality of elongated members having approximately equal cross section interconnected to provide a substantially rectangular shaped mattress frame with opposed, spatially disposed side, head and end rails, said frame being longer than said base frame;
  - b) a plurality of slat members perpendicular to said spatially disposed side rails;
  - c) a pair of bridge members being intermediately disposed below and attached to at least two of said slat members; and
- C) a toggle means located intermediate said base frame and said mattress frame for pivotally lifting said mattress frame relative to said base frame comprising:
  - a) a torque bar having a clevis attachment and torque arms fixedly attached at each end, said torque arms being pivotally attached to said truss;
  - b) a toggle link pivotally attached to each said torque arm and to said bridge member, in a manner whereby said torque bar rest on said truss; and
  - c) a positioning means for rotating said torque arms at an incline relative to said base frame, pivotally attached to said actuator cross member and torque bar clevis.

third means for removably affixing said tray member to the isolette.

5,566,414

# **BRIDGE RAISING/SUPPORTING METHOD AND BEARING DEVICE FOR THE METHOD**

Haluo Nonaka, Sakai, Japan, assignor to Matsuo Engineering Co., Ltd., Osaka, Japan

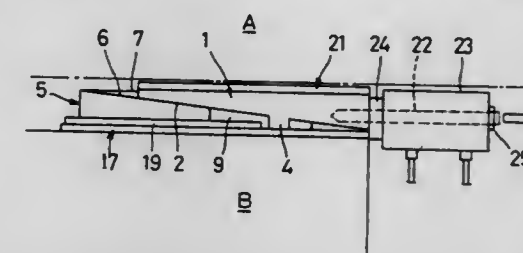
Filed Oct. 19, 1994, Ser. No. 325,872

Claims priority, application Japan, Oct. 20, 1993, 5-262052

Int. Cl.<sup>6</sup> E01D 19/04

U.S. Cl. 14—73.5

11 Claims



1. A method of raising/supporting a bridge on a lower structure, comprising the steps of:

- sliding an upper wedge-shaped pressure receiving member having a slope on its lower face and a wedge-shaped drive member having a slope on its upper face relative to each other on their slopes by drive means for driving said wedge-shaped drive member, to raise an upper face of said upper wedge-shaped pressure receiving member with respect to said lower structure,
- regulating said upper wedge-shaped pressure receiving member and said wedge-shaped drive member,
- restraining relative movements between said wedge-shaped drive member and said upper wedge-shaped pressure receiving member with one or more stopper members after said bridge has been raised, and
- removing said drive means after the regulation of the relative movements of said upper wedge-shaped pressure receiving member and said wedge-shaped drive member.

5,566,415

# **HOSE CLEANING APPARATUS**

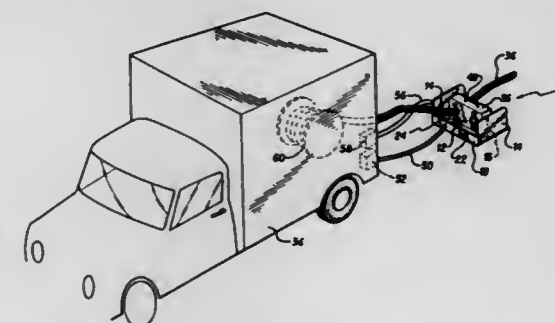
Thomas M. Wallace, 0274 Beard Creek Rd., Edwards, Colo. 81632

Filed Dec. 27, 1995, Ser. No. 579,338

Int. Cl.<sup>6</sup> B08B 9/02

U.S. Cl. 15—88.1

14 Claims



1. A restraining device for restraining an infant in a portable, isolette or the like, the isolette or the like being adapted to be removably secured within a vehicle, the restraining device comprising:

- an elongate tray member;
- a pad member;
- first means for removably securing said pad member in said tray member;
- second means for restraining the infant against said pad member; and,



a front wall and a back wall extending a second predetermined height upwardly from said base, said second predetermined height being one fifth to one half of said first predetermined height;

said base, said two side spray guard walls, said front wall and said back wall forming a fluid-retaining receptacle; for receiving waste fluid during the cleaning of a hose;

a hose container affixed centrally on said base and containing a pressurized fluid, said hose container having a selectively openable lid;

at least one set of apertures oppositely disposed in said hose container, said at least one set of apertures being dimensioned and configured to allow passage of a hose through said hose container;

a brush-supporting cylinder in said hose container, said brush-supporting cylinder being connected between and in communication with said at least one set of apertures;

brushes disposed within said brush-supporting cylinder, whereby a hose passes through said brush-supporting cylinder cylinder frictionally engages said brushes;

a plurality of hollow jets disposed adjacent to said at least one set of apertures, said plurality of hollow jets having spray openings directed toward said at least one set of apertures, said plurality of hollow jets being fluidly connected to said hose container, whereby said pressurized fluid in said hose container is received by said plurality of hollow jets and expelled through said spray openings of said plurality of hollow jets;

a generally tubular supply member connected to and fluidly communicating with said hose container, whereby said pressurized fluid is supplied to said hose container; and

a generally tubular withdrawal member connected to and in fluid communication with said fluid-retaining receptacle, whereby said waste fluid is withdrawn from said fluid retaining receptacle;

whereby, when a hose is forced through said set of apertures, and pressurized fluid is expelled from said plurality of hollow jets, the hose is cleaned by the pressurized fluid and by the brushes.

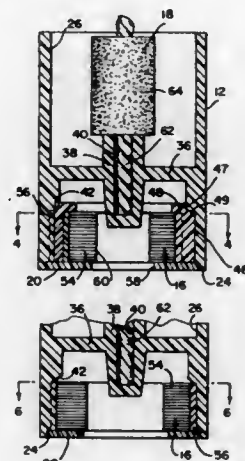
5,566,416

## TWO-IN-ONE BRUSH

Jamie L. Karls, Milwaukee, Wis., assignor to Schaefer Brush Manufacturing Company, Inc., Waukesha, Wis.  
Filed Aug. 30, 1995, Ser. No. 521,209  
Int. Cl.<sup>6</sup> B08B 9/00; A46B 5/02

U.S. Cl. 15—104.04

17 Claims



1. A two-in-one brush for an item to be cleaned comprising:  
a hollow, generally cylindrical, one-piece handle having a length, a constant outer diameter, a longitudinal axis and a pair of open end portions, said handle including a grippable, undulating external surface along the entire length thereof and

including an internal transverse web disposed substantially perpendicular to said longitudinal axis between said open end portions;

an annular female brush member disposed on one side of said transverse web and fixed within one of said open end portions of said handle and in concentric relationship therewith; and

a male brush member secured to and extending outwardly from said transverse web and disposed oppositely along said longitudinal axis from said female brush member in the other of said open end portions of said handle;

said female brush member and said male brush member each having outermost ends terminating within said open end portions and being continuously accessible therefrom wherein said handle substantially permanently shields said female brush member and said male brush member from inadvertent manual contact therewith yet permits contact of said male brush member and said female brush member with the item to be cleaned.

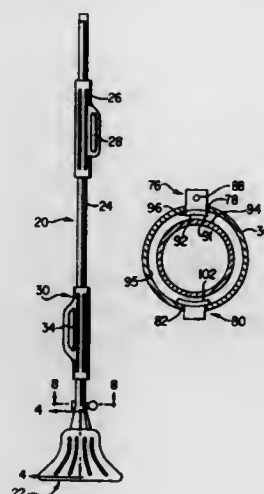
5,566,417

## TWISTABLE WRING MOP WITH DUAL LOCKING MEMBERS

Stephen Hsieh, 3 Winchester, Irvine, Calif. 92720  
Filed Jan. 30, 1995, Ser. No. 380,376  
Int. Cl.<sup>6</sup> A47L 13/142

U.S. Cl. 15—120.2

15 Claims



1. A mop comprising:  
an elongated shaft having an upper portion and a lower portion;  
a handle portion attached to the upper portion of the shaft;  
a base non-rotatably secured to the lower portion of the shaft;  
an outer tube slidably mounted on the shaft;  
a plurality of mop strands having upper ends secured to a first annular tie member and lower ends secured to a second annular tie member, the first annular tie member secured to the outer tube and the second annular tie member secured to the base;

a first locking member movably mounted on the outer tube, the first locking member operably movable between a locked position wherein said first locking member lockingly engages the shaft to fix the tube to the shaft in a desired location along the shaft and an unlocked position wherein said first locking member does not engage the shaft;

a second locking member movably mounted on the outer tube, the second locking member adapted to temporarily engage the outer tube to fix the tube to the shaft in the desired position along the shaft while the first locking member is operated to lockingly engage the shaft to fix the outer tube to the shaft at the desired location along the shaft.

5,566,418

## BACK HAND

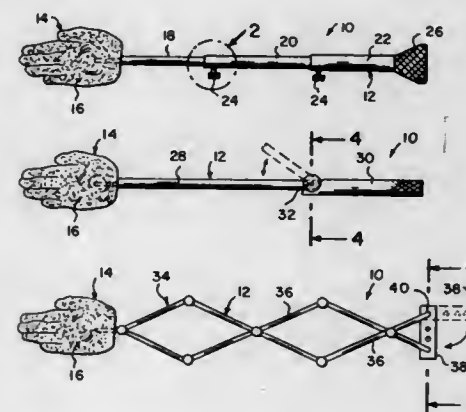
David H. Steffen, 4011 Monroe Rd., Allegan, Mich. 49010, and  
George Spector, 233 Broadway Room 702, New York, N.Y. 10279

Filed Oct. 5, 1995, Ser. No. 539,217

Int. Cl.<sup>6</sup> A47K 7/02

U.S. Cl. 15—244.1

9 Claims



1. A lotion applicator comprising:  
(a) a foam rubber applicator member shaped to resemble a human hand, to apply lotion to the body of the user;  
(b) an extendable arm to which said applicator is affixed, said extendable arm comprising at least one pair of hollow tubular telescopic segments which are adapted to slide relative to each other, each pair of segments further comprising a first segment having a plurality of holes extending through and disposed along a wall thereof, said first segment being slidably received within a second segment having a hole through a wall thereof, the hole in the second segment receives a pull pin, said pull pin comprising an elongated pin having an enlarged head at one end thereof, a spring disposed between the outer peripheral wall of the second segment and the enlarged head of the pull pin, the elongated pin of the pull pin being adapted to engage a selected one of the holes of the first segment so that the segments may be fixed at a plurality of positions, a hand grip positioned on an end of the segment at an extreme proximal end of said extendable arm and said applicator member positioned on the segment at an extreme distal end of said extendable arm; and  
(c) whereby the user can more easily reach the back and hard to reach areas of the body with said applicator member for applying lotion thereto.

drive means for imparting oscillatory movement to said wiper post;

a wiper arm unit mounted to said wiper post for oscillatory movement with said wiper post between a horizontal inwipe position and a vertical outwipe position, said unit having:  
(a) a rigid support having a curved surface, said support fixed to said post, and  
(b) a flexible cantilever arm fixed to said rigid support with a preload induced in said cantilever arm such that a surface of said cantilever arm adjacent said curved surface of said rigid support conforms to said curved surface of said rigid support;

said surface of said cantilever arm movable away from said curved surface of said rigid support in a direction perpendicular to the oscillatory movement of said wiper arm unit upon deflection of said cantilever arm, with the separation between said curved surface of said rigid support and said surface of said cantilever arm increasing as said rigid support and said cantilever arm move from said vertical outwipe position to said horizontal inwipe position and decreasing as said rigid support and said cantilever arm move from said horizontal inwipe position to said vertical outwipe position; and

a wiper blade assembly mounted to said cantilever arm.

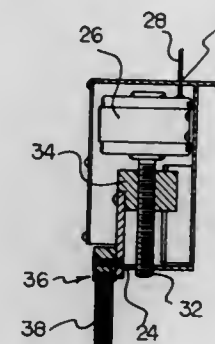
5,566,420

## DEVICE FOR CLEANING THE SURFACE OF A TIRE

Mary Specht, 9 Cedar La., Setanket, N.Y. 11733  
Filed Mar. 19, 1996, Ser. No. 617,544  
Int. Cl.<sup>6</sup> A46B 15/00; 13/02

U.S. Cl. 15—256.5

3 Claims



1. A new and improved device adapted to be coupled to a wheel well of an automobile, the device functioning to clear debris from a tire tread, the device comprising, in combination:  
a housing having an upper portion, a lower portion and an intermediate extent therebetween, the upper portion coupled to the wheel well of an automobile, an aperture formed within the upper portion, and an opening formed through the lower portion, the housing have a hollow interior, the hollow interior having an upper extent and a lower extent;  
a motor mounted within the upper extent of the hollow interior of the housing, an electric cord for delivering power to the motor, the cord coupled to the motor through the aperture of the upper portion;  
a threaded screw having an upper extent, a lower extent and an intermediate extent therebetween, the upper extent of the threaded screw coupled to the motor, the motor serving to selectively rotate the threaded screw in one of two senses;  
a coupling nut threadedly coupled to the threaded screw, the coupling nut having an upper extent and a lower extent with an intermediate extent therebetween; and  
a brush having a lower portion with bristles and an upper portion extending through the opening of the housing and secured to the lower extent of the coupling nut, the motor effecting rotation of the threaded bolt which in turns effects linear movement of the coupling nut to selectively position the brush.

5,566,419

## WINDSHIELD WIPER SYSTEM FOR CURVED WINDSHIELDS

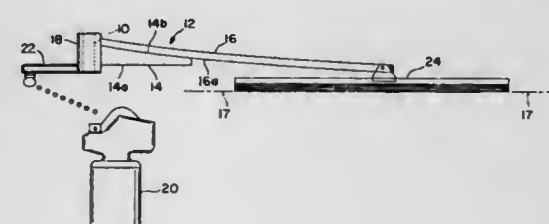
Peter S. Zhou, Dayton, Ohio, assignor to ITT Automotive Electrical Systems, Inc., Auburn Hills, Mich.

Filed Feb. 27, 1995, Ser. No. 395,095

Int. Cl.<sup>6</sup> B60S 1/34; 1/32

U.S. Cl. 15—250.352

8 Claims



1. A windshield wiper system comprising:  
a wiper post;

5,566,421

## VACUUM COMPENSATION VALVE

James Pittman, 269 King Street West, Dundas, Ontario, Canada

PCT No. PCT/CA94/00157, § 371 Date Sep. 26, 1995, § 102(e) Date Sep. 26, 1995, PCT Pub. No. WO94/22355, PCT Pub. Date Oct. 13, 1994

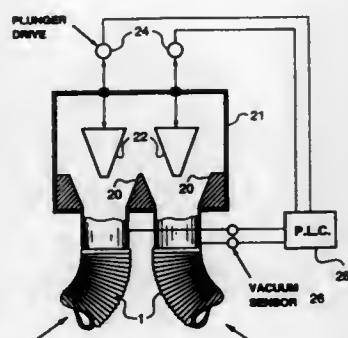
PCT Filed Mar. 25, 1994, Ser. No. 530,101

Claims priority, application United Kingdom, Mar. 26, 1993, 9306331

Int. Cl.<sup>6</sup> A47L 9/00

U.S. Cl. 15—314

3 Claims



1. Apparatus for vacuum collection of material, comprising a vacuum source for creating a vacuum to draw air into a displacement chamber (2), and at least two hoses (1) connected to said displacement chamber for vacuum collection of materials from various locations, characterized by pressure sensors (26) connected to sense the pressure in each said hose, dampers (22) operable in response to the relative pressures between the hoses so as to vary the effective area of the respective connections between the hoses and the displacement chamber in order to equalize and optimize the relative pressures, and automatic control means (28) to so operate said dampers in response to said sensed pressures.

5,566,422

## TANK CONFIGURATION FOR A SMALL FLOOR SCRUBBER

Robert A. Geyer, Champlin, Minn., assignor to Tennant Company, Minneapolis, Minn.

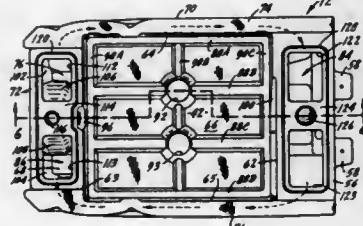
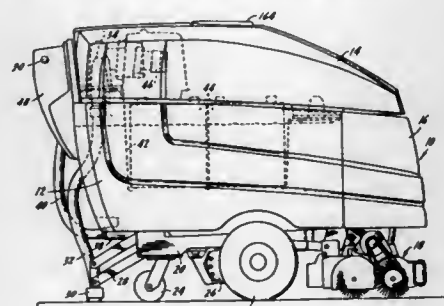
Filed Jan. 13, 1995, Ser. No. 372,506

Int. Cl.<sup>6</sup> A47L 7/00; 11/30

U.S. Cl. 15—320

13 Claims

9. In a walk-behind surface scrubbing machine of the type



having a body including a solution tank for containing scrubbing solution, means on the body for conveying the scrubbing solution from the solution tank to a surface to be scrubbed, means on the body for working the solution on the surface, and a vacuum fan on the body in communication with a vacuum squeegee on the body for recovering soiled solution from the scrubbed surface the improvement comprising a mist and foam controlling solution recovery tank formed in the body, the recovery tank comprising a plurality of chambers including a first expansion chamber at a rear of the body, a second expansion chamber located at a front of the body, and at least one connecting chamber providing fluid communication between the expansion chambers, a lid pivotally attached to the solution recovery tank, the vacuum fan being mounted in the lid and being located so as to circulate fluid from the first expansion chamber through the at least one connecting chamber to the second expansion chamber.

5,566,423

## DELAY MECHANISM FOR RETARDING RELATIVE MOVEMENT BETWEEN TWO MEMBERS

Stephen P. Hassler, Muskego, Wis.; Stephen P. Johnson, Olean, N.Y., and John Lapp, Franklin, Wis., assignors to Cooper Industries, Inc., Houston, Tex.

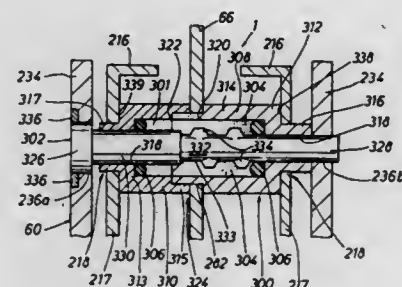
Continuation-in-part of Ser. No. 946,961, Sep. 17, 1992, Pat. No. 5,274,349, Ser. No. 67,512, May 24, 1993, and Ser. No. 65,439, May 24, 1993, Pat. No. 5,355,111. This application

Dec. 27, 1993, Ser. No. 174,940

Int. Cl.<sup>6</sup> E05D 11/10

U.S. Cl. 16—319

10 Claims



1. An apparatus for retarding rotation of a pin member, comprising:

a sleeve having a body and a chamber within said body, said sleeve body comprising first and second coaxial body segments, said first body segment including a reduced-diameter portion and said second body segment including a counter-bore sized to receive said reduced-diameter portion, said reduced diameter portion being axially longer than said counter-bore, such that a circumferential recess is formed when said reduced diameter portion is slidably received in said counter-bore;

a pair of aligned apertures in said body;

a shaft disposed through said apertures and adapted for rotation within said chamber;

viscous material surrounding said shaft and substantially filling the voids in said chamber; and extensions on said shaft for engaging said viscous material and retarding rotation of said shaft in said chamber.

5,566,424

## TILT ADJUSTMENT MECHANISM

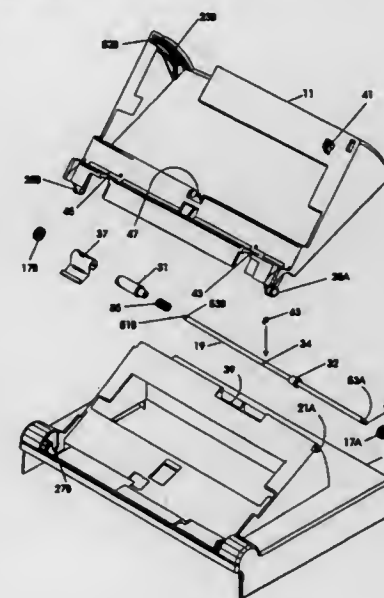
Dennis Crompton, Apex; Richard H. Harris, Raleigh; Herbert G. Leonard, Lousiburg; George Hufford, III, Clayton, and Jeff D. Thomas, Raleigh, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 8, 1995, Ser. No. 436,941

Int. Cl.<sup>6</sup> E05D 7/00; E05C 17/64

U.S. Cl. 16—342

12 Claims



1. A tilt adjustment mechanism comprising:  
a lower housing having support for seating a shaft assembly, said lower housing having a hinge post receptacle;  
said shaft assembly having a shaft, a first gear and a second gear, mounted on said shaft, said shaft having a first resistance when rotated in a rotational direction and a second resistance when rotated an opposite rotational direction,  
an upper housing having hinge posts for hinging said lower housing to said upper housing, said upper housing having a first internal gear for receiving said first gear and a second internal gear for receiving said second gear, said internal gears activating said gears to rotate said shaft in the rotational direction when a downward force is applied to said upper housing with said upper housing rotating with respect to said lower housing about said hinge posts and to rotate said shaft and upper housing in the opposite rotational direction when an upward force is applied to said upper housing wherein said downward force must exceed said first resistance and said upward force must exceed said second resistance in order for the upper housing to move.

5,566,425

## PROCESS AND DEVICE FOR THE DEPOSIT OF A FIBER SLIVER END ON A FLAT CAN

Bernhard Mohr, Titting; Michael Ueding, Ingolstadt; Michael Strobel, Elchstatt, and Albert Krieger, Rottenege, all of Germany, assignors to Rieter Ingolstadt Spinnereimaschinenbau AG, Ingolstadt, Germany

Filed Jul. 15, 1994, Ser. No. 275,768

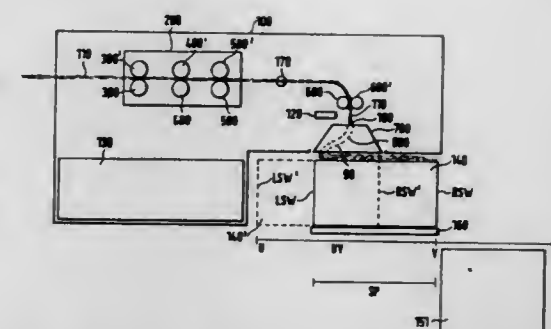
Claims priority, application Germany, Jul. 24, 1993, 43 24 948.5; May 13, 1994, 44 16 911.6

Int. Cl.<sup>6</sup> B30B 13/00

U.S. Cl. 19—159 R

8 Claims

1. An apparatus for precisely depositing a predetermined length of an end of a fiber sliver on a flat can, said apparatus comprising a rotary plate having a sliver guiding channel and an outlet defined therein and a pair of calendar rollers for conveying the fiber sliver through said sliver guiding channel to be deposited from said outlet



in cycloidal loops in a flat can traversing thereunder; said apparatus further comprising a traversing device for moving the flat can between any combination of a stopped position, along a displacement path to a severing position, and to a final transfer position; said apparatus comprising a severing device for severing the fiber sliver at said severing position thereby defining a fiber sliver end having a predetermined desired length; and said apparatus further comprising a control device configured to control and coordinate positions of said rotary plate outlet, said traversing device, and said severing device so that upon braking of said flat can to said stopped position, said rotary plate is slowed accordingly so that said outlet is positioned at a predetermined position with respect to the longitudinal axis of said flat can, said control device further coordinating severing of said fiber sliver at said severing position so that a predetermined length of fiber sliver end is severed and deposited on and end wall of said flat can upon said flat can being conveyed from said stopped position to said final transfer position.

5,566,426

## CAM-ACTION CUFF LINK

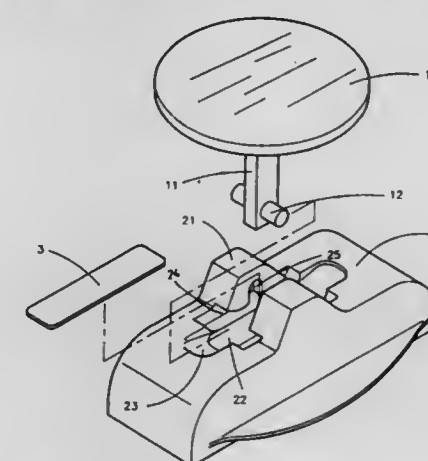
Lu Cheng-Fa, 5F, No. 147, Sec. 2, Chung Hwa Rd., Taipei, Taiwan

Filed May 12, 1995, Ser. No. 439,888

Int. Cl.<sup>6</sup> A44B 1/34

U.S. Cl. 24—102 PL

2 Claims



1. A cuff link comprising:  
a rigid base having a top side, two parallel blocks raised from said top side, and a longitudinal top open chamber defined between said blocks and opening on said top side, said blocks each including a respective pivot hole transversely disposed at an inner side in communication with said top open chamber; said blocks each including a respective side opening communicating with said top open chamber and communicating between the respective pivot hole and said top side of said base;  
a button having a bottom side and a shank perpendicularly extended from the center of said bottom side, said shank having two pivot pins aligned at two opposite sides and



respectively inserted through each side opening on said blocks into said pivot holes for permitting said button to be secured to said base and turned between a fastening position perpendicular to said base and an unfastening position in parallel to said base;

said respective side opening comprising means for inserting a respective one of the two pivot pins into the respective pivot hole from said top side of said base; and

a spring plate inserted into said top open chamber on said top side of said base, said spring plate comprising means for supporting said shank of said button on said base.

5,566,427

## STRAP CLIP AND RETAINER

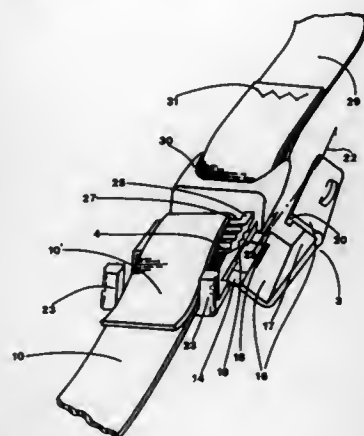
Kim N. Lathrop, 7230 SE. Market, Portland, Oreg. 97215

Filed Apr. 13, 1994, Ser. No. 226,873

Int. Cl.<sup>6</sup> A44B 11/02

U.S. Cl. 24—169

19 Claims



1. A clasp comprising:

a base having a bottom wall, a side wall extending upwardly from the bottom wall, an open top and an open side;

a transverse bight bar above the bottom wall having a fixed end connected to the side wall and a distal end toward the open side of the base;

an operable cover having a top wall and a side wall, the cover having an open position and a closed position; and

the base, the bight bar and the cover in said closed position defining a U-shaped strap receiving channel having a depth selected so that said base, bight bar and cover clampingly engage a strap portion received within the U-shaped strap receiving channel.

5,566,428

MOLDED SYNTHETIC RESIN BELT CONNECTING DEVICE AND METHOD OF PRODUCING THE SAME  
Yoshinobu Takahashi, Toyama-ken, Japan, assignor to YKK Corporation, Tokyo, Japan

Filed Jan. 18, 1995, Ser. No. 374,044

Claims priority, application Japan, Jan. 20, 1994, 6-031765

Int. Cl.<sup>6</sup> A44B 13/00

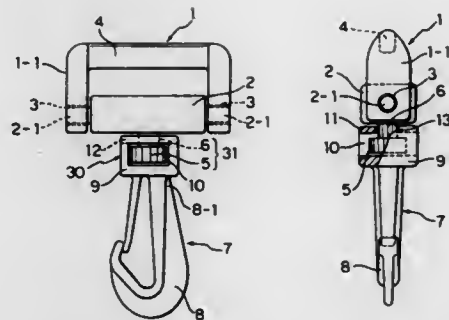
U.S. Cl. 24—265 H

11 Claims

1. A molded synthetic resin belt connecting device comprising:

a belt attachment member; and

a fastening member rotatably connected with said belt attachment member via a swivel joint, said swivel joint including a headed pin formed integrally with one of said belt attachment member and said fastening member, having a neck portion connected to a head portion, said head portion having a flat surface on a side of said head portion toward said neck portion and surrounding said neck portion, and



a socket formed integrally with the other of said belt attachment member and said fastening member and rotatable freely on said headed pin, said socket providing a cavity for containing said head portion beneath a top wall, said top wall defining a slot having a width smaller than a width of said flat surface such that said flat surface confronts a flat face of said top wall to prevent withdrawal of said head portion from said cavity

wherein said belt attachment member and said fastening member are molded of synthetic resin in an assembled condition, with said headed pin freely rotatably received in said socket.

5,566,429

## EXTRUDED ZIPPER WITH ORIENTING MEANS AND METHOD FOR ORIENTING SAME

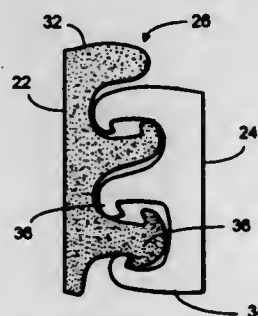
David M. Martinez, Elmont, and Paul A. Tilman, New City, both of N.Y., assignors to Minigrip, Inc., Orangeburg, N.Y.

Filed Oct. 19, 1994, Ser. No. 325,811

Int. Cl.<sup>6</sup> B65D 33/24

U.S. Cl. 24—587

5 Claims



1. In a zipper for use in the manufacture of a reclosable plastic bag, said zipper being of the type having a first profile for attachment adjacent a pull flange area on one side wall of the bag at a top end of the bag and a complementary profile for attachment adjacent a corresponding pull flange area on an opposite side wall of the bag, said first and complementary profiles interlocking with each other in a manner so as to require less of a force to disengage the profiles when said force is applied to said pull flange areas than when said force is applied from within the bag, the improvement comprising, said profiles having edges directed toward and away from said pull flange areas:

indicia on at least a portion of one of the profiles indicative of the orientation of at least one of said edges of said one profile with respect to its associated pull flange area, said indicia not being visible unless viewed under ultraviolet light.

5,566,430

## ENGAGING STRUCTURE OF TWO DECORATIVE ARTICLES

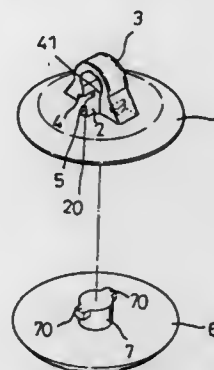
Tung-Tai Cheng, P.O. Box 82-144, Taipei, Taiwan

Filed Jun. 9, 1995, Ser. No. 489,161

Int. Cl.<sup>6</sup> F16B 21/00

U.S. Cl. 24—590

1 Claim



1. An engaging structure of two decorative articles comprising: a male seat formed at one side with a cylindrical pin having at least a pair of opposite protrusions extending radially outwardly from an upper end thereof; and

a female seat formed at a center with a circular opening having at least a pair of opposite grooves for passage of said protrusions of said male seat and provided at one side with an arch-like member located over said circular opening and having two legs, one of said two legs of said arch-like member being formed with a first recess at an inner side thereof for receiving one of said protrusions of said male seat while another one of said two legs of said arch-like member being formed with a second recess at an inner side thereof for receiving another one of said protrusions of said male seat, said first recess being diagonally opposite to said second recess, said female seat being provided thereon with two protrusions one between said opening and each of said two grooves.

a retaining element pivotally connected to said support element and being movable to a first position to retain the lockable element when the locking arrangement is in the locked condition, and being movable to a second position in which the lockable element is not retained when the locking arrangement is in the released condition;

an actuating element pivotally mounted on said support element to be pivotable about a first pivot axis; and

a counter weight associated with the retaining element, the counter weight being pivotally mounted on said support element to be pivotable about a second pivot axis parallel to the first pivot axis, said counter weight being inter-connected with said actuating element so that, when said locking arrangement is in the locked condition, rotation of the actuating element in a first direction causes a rotation of the counter weight in a second direction opposite to the first direction, and rotation of the counter weight in the second direction causes a rotation of the actuating element in the first direction, the actuating element and the counter weight each having centres of gravity arranged relative to a plane defined by the parallel pivot axes so that, when the locking arrangement is in the locked condition, any force on the locking arrangement tending to rotate either one of the counter weight and actuating element in one of the first and second directions will tend to cause the other one of the counter weight and actuating element to rotate in the same direction so that rotational forces acting on the counter weight and actuating element are substantially balanced, the actuating element and counter weight being movable manually between a locked position, corresponding to the locked condition, in which the combination of the actuating element and the counter weight lock the retaining element in the first position, and a release position, corresponding to the released condition, in which the retaining element is free to move to the second position.

5,566,432

## APPARATUS FOR TERMINATING WIRE OR OTHER ELONGATED GENERALLY RIGID ELEMENTS

Randal J. Perisho, Moberly; Tave E. Hass, Columbia; David R. Webb, Excelsior; Steve W. Ancell, Huntsville; Jeff E. Tayon, Moberly, and David L. Crossgrove, Livonia, all of Mo., assignors to Orscheln Company, Moberly, Mo.

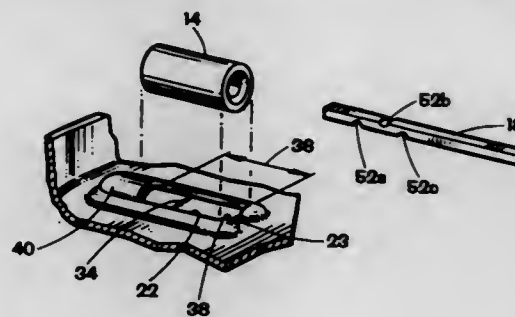
Continuation of Ser. No. 104,185, Aug. 9, 1993, abandoned.

This application Oct. 10, 1995, Ser. No. 541,737

Int. Cl.<sup>6</sup> A44B 21/00

U.S. Cl. 24—703.1

15 Claims



1. A termination assembly for an elongated, generally rigid member, comprising:

a deformable sleeve member having an aperture therethrough, said aperture receiving a portion of said elongated generally rigid member; and

a mounting member, said mounting member including a deformable portion having a pair of generally opposed sidewalls, each of said sidewalls having a generally corrugated shape, defining a channel therebetween, said channel receiving said deformable sleeve and wire assembly, said deformable portion of said mounting member and said deformable sleeve cooperatively deformed relative to one another to form a single

5,566,431  
LOCKING ARRANGEMENT

Lennart Haglund, Vargarda, Sweden, assignor to Autoliv Development AB, Vargarda, Sweden

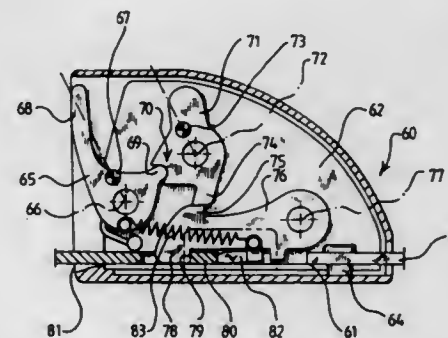
Filed Jan. 31, 1995, Ser. No. 381,435

Claims priority, application United Kingdom, Feb. 11, 1994, 9402695

Int. Cl.<sup>6</sup> A44B 11/25

U.S. Cl. 24—633

10 Claims



1. A locking arrangement having a locked condition in which a lockable element is retained, and a released condition in which the lockable element is released, the locking arrangement comprising: a support element;

assembly securing said elongated generally rigid member to said mounting member.

(c) processing the fabric having the low reference permeability to selectively increase a porosity thereof such that the preselected permeability is achieved.

**5,566,433**  
**METHOD AND APPARATUS FOR TREATMENT OF PILE FABRIC**

Franklin S. Love, III, Columbus, N.C., and Robert S. Brown, Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

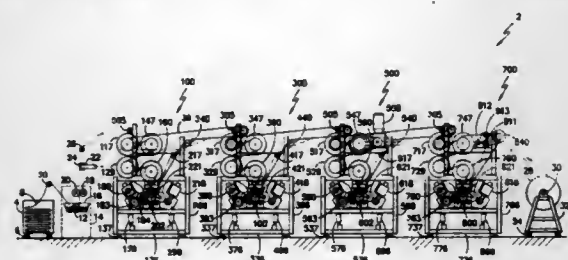
Continuation of Ser. No. 3,200, Jan. 11, 1993, abandoned.

This application May 8, 1995, Ser. No. 436,546

Int. Cl.<sup>6</sup> D06C 7/00; 27/00

U.S. Cl. 26—2 R

18 Claims



3. A process for the continuous treatment of a web of pile fabric having a face with a pile and a back comprising the steps of:

- wetting said pile fabric with water to at least fifty percent saturation; and
- simultaneously heating said pile fabric to a temperature in the range of 225 to 350 degrees Fahrenheit with a plurality of heated rolls and brushing said face of said pile fabric with a plurality of brushes to raise said pile and a plurality of brushes to lower said pile.

**5,566,434**  
**AIR BAG FOR USE IN A MOTOR VEHICLE AND METHOD OF PRODUCING SAME**

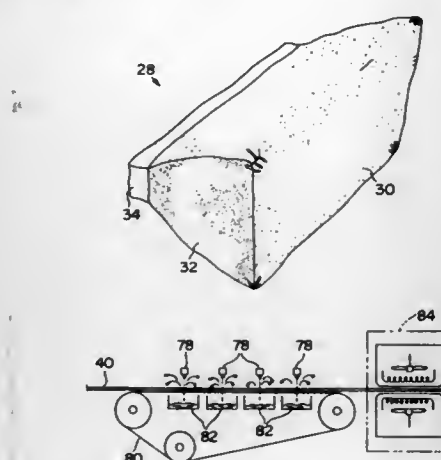
Alonzo W. Beasley, Easley, S.C., assignor to JPS Automotive Products Corporation, Greenville, S.C.

Filed Jun. 15, 1994, Ser. No. 259,869

Int. Cl.<sup>6</sup> D04H 17/00; B60R 21/16

U.S. Cl. 28—112

14 Claims



1. A method of producing a fabric having a preselected permeability for use in a vehicle air bag, said method comprising the steps of:

- providing a fabric constructed substantially entirely of synthetic yarn;
- calendering the fabric at a selected temperature and a selected pressure to achieve a low reference permeability; and

**5,566,435**  
**METHOD OF ATTACHING A TAMPON WITHDRAWAL CORD WITH AN OVERHAND HITCH KNOT**

Robert W. Brown, Jr., Hampden, Mass., assignor to Tambrands Inc., White Plains, N.Y.

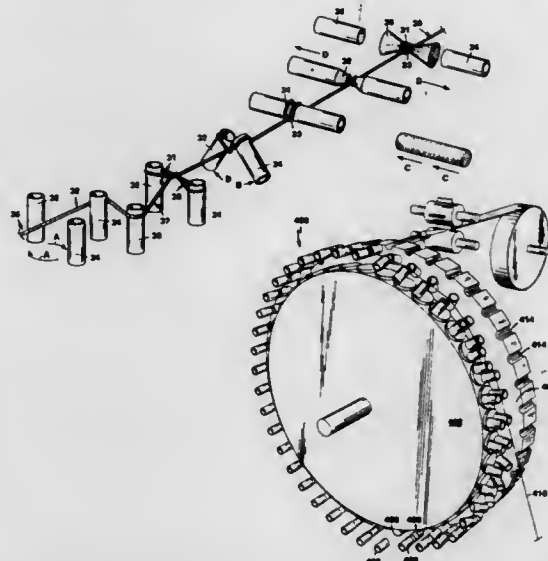
Division of Ser. No. 225,669, Apr. 1, 1994. This application

Sep. 28, 1995, Ser. No. 535,620

Int. Cl.<sup>6</sup> A61F 13/34

U.S. Cl. 28—120

9 Claims



1. A method for forming a tampon, shaped for insertion into a body cavity, comprising the steps of:

- providing a cord;
- forming an S-shaped curve in said cord a portion of said cord extending from each side of the S-shaped curve to define a pair of standing parts;
- crossing the standing parts of the cord over the curve to form two opposed loops;
- folding the loops together around the crossed standing parts;
- inserting a length of absorbent material through the two loops; and
- tightening the loops around the material to form an overhand hitch.

**5,566,436**  
**METHOD OF INSERTING MACHINE PARTS INTO A WORKPIECE**

Yasunari Hirata, Kumamoto, Japan, assignor to Hirata Corporation, Japan

Continuation of Ser. No. 102,317, Aug. 5, 1993, abandoned,

which is a continuation of Ser. No. 925,792, Aug. 4, 1992,

abandoned. This application Aug. 11, 1994, Ser. No. 289,325

Claims priority, application Japan, Apr. 14, 1992, 4-121404

Int. Cl.<sup>6</sup> B23P 21/00

U.S. Cl. 29—33 K

5 Claims

1. A method of robotically inserting an elongated machine part longitudinally into an elongated hole in a workpiece, said method comprising the steps of:

- placing said workpiece on a table which is rotatable around at least two axes, said elongated hole being thereby positioned along a longitudinal axis that is oblique to the vertical direction;
- rotating said table and thereby vertically orienting said hole;

**5,566,438**  
**TOOL FOR RECONNECTING A FUEL HOSE SAFETY BREAK AWAY**

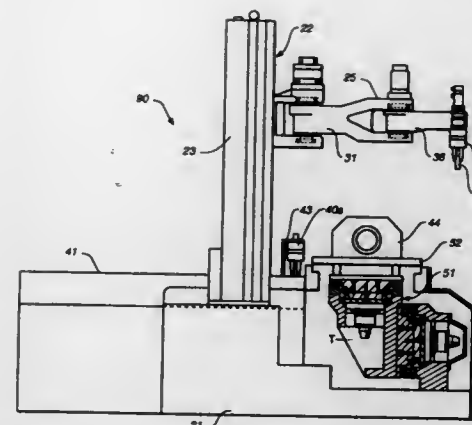
Rothel J. Bullock, 11509 DeHam Dr., Louisville, Ky. 40241

Filed Jan. 17, 1995, Ser. No. 373,104

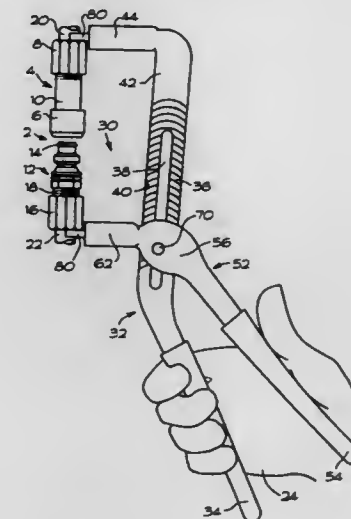
Int. Cl.<sup>6</sup> B23P 19/04

U.S. Cl. 29—237

9 Claims



holding said part vertically by an assembly tool;  
operating a two-dimensionally moving mechanism adapted to move an object only within a horizontal plane and thereby moving said assembly tool horizontally and thereby positioning said part vertically above said hole whereat said part and said hole are vertically aligned on a common axis; and  
moving said two-dimensionally moving mechanism vertically by an elevator means for moving an object only in a vertical direction to thereby move said two-dimensionally moving mechanism vertically and causing said part to be inserted into said hole without causing any torque to be imparted on said part.



1. A tool for reconnecting a hose end and a nozzle end of a fuel hose safety break away so that a fuel may flow therethrough, the hose end being connected to a pump hose having a first geometry and the nozzle end being connected to a nozzle hose having a second geometry, the tool comprising:

- at least a first and a second receivable jaw, said first and said second jaw having a hose engaging portion having a semi-circular shape, said hose engaging portion connected to a shaft, said hose engaging portion of said first jaw having a first shape to receive at least a portion of said pump hose first geometry and to abut said hose end of said safety break away, said hose engaging portion of said second jaw having a second shape to receive at least a portion of said nozzle hose second geometry and to abut said nozzle end of said safety break away;

- a first member having a handle portion at a first end and a jaw receiving portion at a second end, said handle portion having an adjustment portion connected thereto, said adjustment portion having an extended portion thereto, said extended portion being connected to said jaw receiving portion; said adjustment portion having an adjustment slot therein, said adjustment slot having a preselected first length, said adjustment slot having a plurality of channels therealong; said extended portion having a preselected second length; said jaw receiving portion having a first opening thereto; said first receivable jaw shaft being received by said first opening;

- a second member having a handle portion at a first end and a jaw receiving portion at a second end, said handle portion and said jaw receiving portion having an adjustment portion connected therebetween, said adjustment portion having a bore therethrough and a channel engaging portion; said jaw receiving portion having a second opening thereto; said second receivable jaw shaft being received by said second opening; and,

- means for pivotally connecting said first member and said second member, said connecting means received by said bore in said second member adjustment portion and by said adjustment slot in said first member adjustment portion, where said connecting means may be moved in said adjustment slot to a preselected location so that said channel engaging portion of said second member may be engaged with a desired at least one of said plurality of channels of said first member, thereby placing said first jaw and said second jaw in a desired spaced apart relationship.

**5,566,437**  
**INSTALLATION FOR THE REPROFILING OF TRACKS CARRIED OUT ON A RAILWAY LINE**

Jean-Pierre Jaeggli, Geneva, Switzerland, assignor to Speno International SA, Geneva, Switzerland

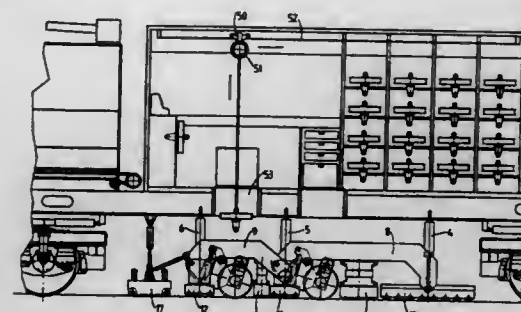
Filed Dec. 7, 1994, Ser. No. 350,545

Claims priority, application Switzerland, Feb. 18, 1994, 498/94

Int. Cl.<sup>6</sup> B23P 6/00; B24B 23/00; B23C 3/00

U.S. Cl. 29—33 R

16 Claims



1. An installation for reprofiling at least one track on a railway line, including a milling device mounted under a railway carriage and movable relatively thereto, through the use of means for lifting and applying against the track, characterized in that it includes at least one unit for heating the track located in front of the milling device, both the heater and the milling device operating during movement of the railway carriage along said at least one track, the heating device operating to heat the outer layers of the head of the track to a temperature below the melting point of the track.



5,566,439

**METHOD FOR FORMING A DECORATIVE COVER**

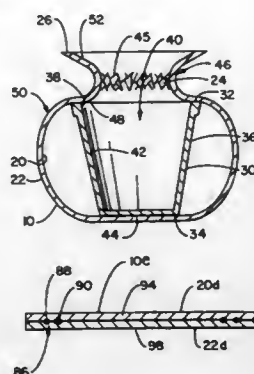
Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc., Oklahoma City, Okla.

Continuation of Ser. No. 926,098, Aug. 5, 1992, which is a continuation-in-part of Ser. No. 803,318, Dec. 4, 1991, Pat. No. 5,344,016, which is a continuation-in-part of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 391,463, Aug. 9, 1989, abandoned, which is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned, and a continuation-in-part of Ser. No. 687,701, Apr. 18, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 467,483

Int. Cl.<sup>6</sup> B21D 35/00

U.S. Cl. 29—469.5

20 Claims



1. A method for forming a decorative cover comprising: providing a sheet of material having an upper surface, a lower surface and an outer peripheral edge and having a plurality of reinforcing elements integrally embedded therein; providing a flower pot having an upper end, a lower end, an outer peripheral surface and an opening extending through the upper end providing access to a retaining space with the flower pot having an inner peripheral surface encompassing a substantial portion of the retaining space and the flower pot having a bottom formed near the lower end of the flower pot; forming the sheet of material about the flower pot to a position wherein the sheet of material extends about substantially the entire outer peripheral surface of the flower pot with a portion of the sheet of material near the outer peripheral edge thereof extending a distance above the upper end of the flower pot; and forming a crimped portion in at least a portion of the sheet of material having the reinforcing elements and with the reinforcing elements in the crimped portion cooperating to hold the sheet of material in the form of the decorative cover extending about the flower pot.

5,566,440

**METHOD FOR THE FABRICATION OF AN OUTFLOW ELEMENT**

Johannes A. H. M. Schoormans, Waalre, and Dirk Van der Net, Eersel, both of Netherlands, assignors to Johannes A. Schoormans, Waalre, Netherlands

Filed May 25, 1995, Ser. No. 446,653

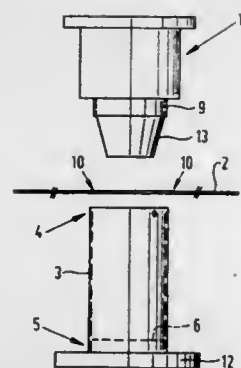
Claims priority, application Netherlands, Oct. 15, 1992, 92 01 790

Int. Cl.<sup>6</sup> B21D 39/00

U.S. Cl. 29—507

2 Claims

1. A method for fabricating an outflow element comprising an outlet pipe having a diameter and two or more inwardly projecting bulges at an end thereof, a plate having a hole with a diameter smaller than the diameter of the outlet pipe, and a clamping tube, all of which are to be permanently fixed together, the method comprising the following steps:



- placing the plate at the end of the outlet pipe; providing a widening tool having a cylindrical central portion and a conical end portion, the cylindrical central portion having a diameter greater than the diameter of the hole in the plate; placing the clamping tube on the cylindrical portion of the widening tool; and pressing the conical portion of the widening tool through the hole in the plate and into the end of the outlet pipe, thereby widening and forming a collar around the hole in the plate and clamping the collar between the clamping tube and the end of the outlet pipe, with the collar pressed and held against the bulges in the outlet pipe.

5,566,441

**ATTACHING AN ELECTRONIC CIRCUIT TO A SUBSTRATE**

Michael J. C. Marsh, Johannesburg; Mark H. Carson, Pretoria; Gideon J. Gouws, Pretoria; Mario A. Marais, Pretoria, and Trevor M. Hodson, Randburg, all of South Africa, assignors to British Technology Group Limited, London, England

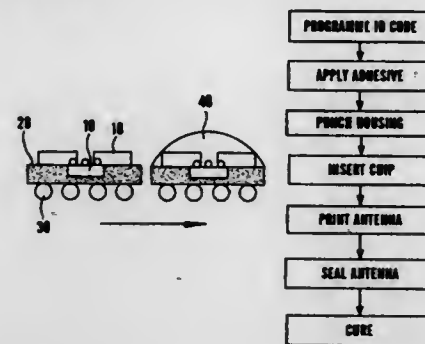
Filed Mar. 11, 1994, Ser. No. 209,046

Claims priority, application South Africa, Mar. 11, 1993, 93/1752

Int. Cl.<sup>6</sup> H01P 11/00

U.S. Cl. 29—600

44 Claims



1. A method of attaching an electronic circuit to a substrate, comprising: providing an electronic circuit having at least two electrical terminals; securing the electronic circuit to the substrate; applying a metallic foil to the substrate and the electronic circuit to define an antenna, so that the metallic foil makes electrical contact with the at least two electrical terminals, wherein: the metallic foil has an adhesive layer thereon for securing the metallic foil to the substrate, and the adhesive layer is removed from the metallic foil in areas corresponding to positions of the electrical terminals of the electronic circuit prior to application of the metallic foil to the electronic circuit or the substrate.

5,566,442

**METHOD OF MAKING A VERTICAL MAGNETIC HEAD WITH AN INTEGRATED COIL**

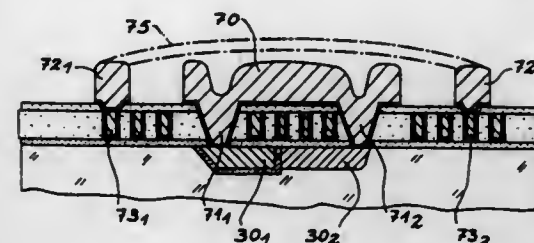
Pierre Gaud, St Egreve, and Henri Sibuet, Le Fontamil, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 13, 1994, Ser. No. 357,299

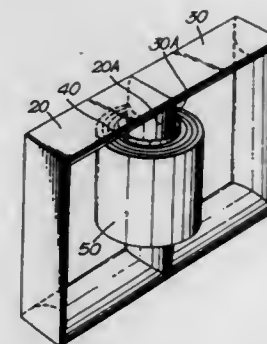
Claims priority, application France, Nov. 16, 1994, 94 13692 Int. Cl.<sup>6</sup> G11B 5/42

U.S. Cl. 29—603.14

5 Claims



1. A process for producing a vertical magnetic head with an integrated coil, comprising the steps of:
  - (a) producing an amagnetic spacer on a substrate; depositing on either side of the spacer a first pole piece and a second pole piece;
  - (b) depositing on the first and second pole pieces an insulating layer;
  - (c) etching a first spiral groove in said insulating layer and above the first pole piece and etching a second spiral groove above the second pole piece;
  - (d) filling said first and second grooves with a conductive material to provide first and second coils;
  - (e) covering an assembly formed by the steps (a)–(d) with a second insulating layer;
  - (f) forming first and second openings in said second insulating layer respectively in the center of the first and second coils wherein said openings extend up to said first and said second pole pieces;
  - (g) opening a third opening in said second insulating layer wherein said third opening is above a first end of said first coil and opening a fourth opening above a first end of said second coil;
  - (h) forming a magnetic material bridge having a first leg using said first opening extending up to and making contact with said pole piece and with a second leg using said second opening and extending up to and contacting said second pole piece; and
  - (i) forming a conductor bridge using said third and said fourth openings above said first and said second ends of said first and second coils wherein said magnetic bridge and said conductor bridge are formed in a single operation from the same material.



- (i) individually pre-forming each of a number of overall rectangular shape said electric coils in the range between two and four coils, each said coil being pre-formed by winding electrical conductors on a respective support which provides a groove having at least in part the shape of a sector of a circle so that said coil has a cross-section of that sector shape at least where it will pass through the core window,
- (ii) assembling the pre-formed coils together so that their circle sector cross-section parts combine to form a circular section solid cylinder where they meet,
- (iii) locating a hollow circular cylindrical mandrel around said circular section solid cylinder, and
- (iv) rotating said mandrel to wind thereon a single roll of continuous non-amorphous steel strip, said strip being made of at least a single thickness of steel and having a single width in the range 250 mm to 1 m, thereby to form an unannealed, uncut said wound magnetic core, having overall circular shape and rectangular cross-section, with said core window substantially filled by said coils.

5,566,444

**TUBE-PLUGGING ASSEMBLY**

Sang-Han Shim, and Young-Do Kang, both of Changwon, Rep. of Korea, assignors to Korea Heavy Industries & Construction Company, Rep. of Korea

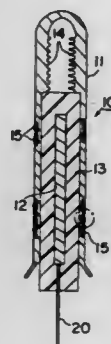
Filed Aug. 4, 1994, Ser. No. 285,000

Claims priority, application Rep. of Korea, Mar. 14, 1994, 5042/1994

Int. Cl.<sup>6</sup> B23P 15/26

U.S. Cl. 29—727

9 Claims



1. The tube-plugging assembly for explosively expanding a plug in a damaged tube, said assembly comprises: a substantially cylindrical plug having a closed first end with a rounded configuration and an open second end; an explosive charge and a buffer subassembly comprising an explosive charge in a rod configuration with a circular cross section, a substantially cylindrical buffer surrounding said explosive charge, said subassembly disposed within said plug in a longitudinal orientation so as to leave an unoccupied space

5,566,443

**METHODS OF MAKING POWER DISTRIBUTION TRANSFORMERS**

Dennis J. Allan, and John V. Grant, both of Stafford, England, assignors to Gec-Alsthom Limited, United Kingdom

Division of Ser. No. 896,198, Jun. 10, 1992, Pat. No. 5,387,894. This application Oct. 12, 1994, Ser. No. 321,729

Claims priority, application United Kingdom, Jun. 10, 1991, 91124354

Int. Cl.<sup>6</sup> H01F 41/06

U.S. Cl. 29—605

30 Claims

1. A method of making an electrical power distribution transformer which includes a core and coil assembly having a wound magnetic core with a central window and electric coils which extend through said core window, wherein the method includes the steps of

between a first end of said subassembly and said closed first end of said plug; and  
a connecting cord for connecting said explosive charge to a remote detonator.

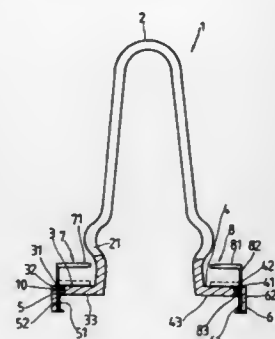
5,566,445

## IC MOUNTING TOOL

Tseng S. Piao, P.O. Box 82-144, Taipei, Taiwan  
Filed Oct. 24, 1994, Ser. No. 330,823  
Int. Cl.<sup>6</sup> H05K 13/04

U.S. Cl. 29—741

3 Claims



1. An IC mounting tool comprising:

a substantially arched spring plate having two opposite ends bilaterally horizontally extended outwards and formed into two opposite horizontal bearing sections and then into two opposite vertical tip sections, said horizontal bearing sections each having a transverse slot and a longitudinal slot perpendicularly extended from said transverse slot in the middle, said vertical tip sections each having a sliding slot and a guide slot;

two movable pawls respectively inserted through the vertical sliding slot of said vertical tip sections, each movable pawl having a horizontal base disposed above one horizontal bearing section and a vertical sliding block extended from said horizontal base at right angles and inserted through the transverse slot on the respective horizontal bearing section into the vertical sliding slot on the respective vertical tip section, the vertical sliding block of each movable pawl having an outward key horizontally disposed at an inner side; and

stop rods respectively disposed in the transverse slots of said horizontal bearing sections to limit upward movement of said movable pawls and to stop them from escaping out of the vertical sliding slots of said vertical tip sections; and

wherein when said movable pawls are moved upwards, the keys of said vertical sliding blocks are respectively received in the longitudinal slots of said horizontal bearing sections, permitting said horizontal bearing sections to be pressed on the IC to be installed and permitting said vertical tip sections to be moved toward each other and clamped on two opposite vertical lateral sides of the IC to be installed; when said movable pawls are moved downwards with the horizontal base of each movable pawl stopped above the respective horizontal bearing section, the key of the sliding block of each movable pawl is extended out of the respective vertical tip section for removing an IC from an IC connector.

5,566,446  
FEED DEVICE FOR FEEDING OF ASSEMBLY PARTS  
Wolfgang Luckhardt, Königstein, and Heinrich Kuckhardt, deceased, late of Frankfurt/Main, both of Germany, assignors to Multifastener Corporation, Detroit, Mich.  
PCT No. PCT/EP93/00835, § 371 Date Mar. 1, 1995, § 102(e)  
Date Mar. 1, 1995, PCT Pub. No. WO93/19889, PCT Pub. Date Oct. 14, 1993

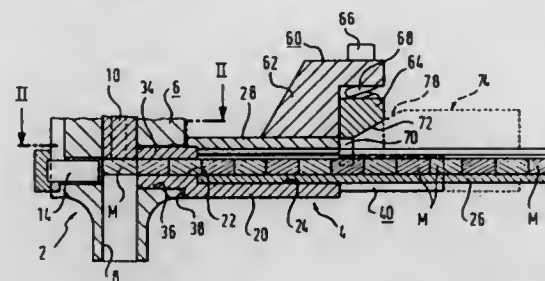
PCT Filed Apr. 2, 1993, Ser. No. 307,850

Claims priority, application Germany, Apr. 3, 1992, 42 11 278.8

Int. Cl.<sup>6</sup> B23P 19/00

U.S. Cl. 29—798

22 Claims



1. A feeding device for feeding fasteners from a supply of fasteners to an installation head, said feeding device comprising:

a nozzle connected to said supply of fasteners, said nozzle having a free end which is adapted to be connected to said installation head, and a continuous channel for the movement of said fasteners from said supply of fasteners to said installation head;

a coupling device for positively coupling said nozzle to said installation head; said coupling device includes at least one lever mounted on opposed sides of said nozzle with each of said at least one lever being mounted to pivot between a connection position and a released position; and

a movable catch mechanism having a first position wherein said catch intersects said channel to block said fasteners from moving through said nozzle, and a second position wherein said catch is removed from said channel permitting passage of said fasteners through said channel;

biasing means for biasing said movable catch to said first position to normally block said fasteners from moving through said mouthpiece, said catch being urged to said second position against said biasing means as said nozzle is connected to said installation head to permit passage of said fasteners through said channel into said installation head;

whereby said supply of fasteners can be interconnected to said installation head by coupling said nozzle to said installation head such that said supply of fasteners is automatically stopped when said nozzle is decoupled from said installation head and is automatically opened when said nozzle is coupled to said installation head.

5,566,447

## PICK-UP POINT CORRECTION DEVICE FOR MOUNTER

Hiroshi Sakurai, Shizuoka-ken, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Dec. 23, 1994, Ser. No. 363,374

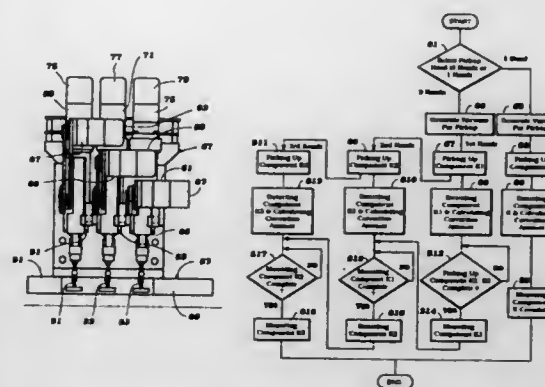
Claims priority, application Japan, Dec. 27, 1993, 5-331222

Int. Cl.<sup>6</sup> H05K 3/30; B23P 19/00

U.S. Cl. 295—832

30 Claims

27. An apparatus for picking up a component at a pick up station and depositing that component in an accurate position at a deposit station, comprising a gripping device adapted to hold and release a component, a support for moving said gripping device for movement between a pick up position and a component mounting position, a detector co-operable with said support and said gripping device for measuring the orientation of a component picked up by



said gripping device for establishing a correction amount to be employed in the positioning of said component in said component mounting position, and a pick up correction device receiving said correction amount from said detector and employing said correction amount in the control of said support for adjusting subsequent movement of said gripping device to a new pick up position for minimizing the amount of subsequent correction amounts.

29. A method of more accurately picking up a component at a pick up station and depositing that component in an accurate position at a deposit station, comprising gripping a component with a gripping device, moving said gripping device between a pick up position and a component mounting position, measuring the orientation of a component picked up by said gripping device, calculating a correction amount to be employed in the positioning of said component in said component mounting position, and adjusting subsequent movement of said gripping device to a new pick up position by employing said correction amount.

5,566,448

## METHOD OF CONSTRUCTION FOR MULTI-TIERED CAVITIES USED IN LAMINATE CARRIERS

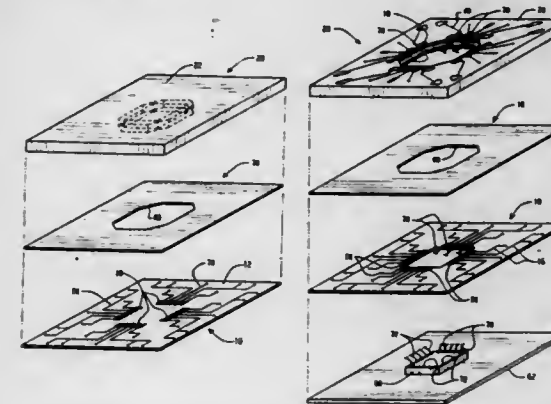
Ashwinkumar C. Bhatt; Thomas P. Duffy, both of Endicott; Jeffrey A. Knight, Endwell, all of N.Y., and James P. Walsh, Vandling, Pa., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 6, 1995, Ser. No. 470,389

Int. Cl.<sup>6</sup> H05K 3/34

U.S. Cl. 29—840

10 Claims



1. A method of forming a laminated structure comprising the steps of:

providing first and second relatively rigid planar elements, each having first and second opposed surfaces, forming a bottomed cavity in said first element, said cavity having a boundary surface extending from the first surface thereof and terminating adjacent to, but spaced from, said second surface of said first element, forming electrical circuitry on said first surface of said second element, said electrical circuitry including bond pads arranged

in a pattern corresponding to the configuration of said boundary surface of said cavity in said first element, joining said first and second elements together with the first surface of each element in opposed juxtaposed relationship to thereby form a structure having a closed internal cavity, with said bond pads being located within said cavity, forming electrical circuitry on said second surface of said first element; forming electrical connection between the electrical circuitry on said first surface of said second element and said electrical circuitry on said second surface of said first element, removing the portion of said first element covering said cavity to thereby provide an opening from said second surface of said first element to said cavity, and providing an integrated circuit chip, and bonding said integrated circuit chip to said bond pads on the second element.

5,566,449

## PROCESS FOR PRODUCING A SHAFT CLAMPING MEMBER

Kenji Okamoto; Hiroyuki Horimura; Masahiko Minemi, all of Saitama; Yoshinobu Takeda, Hyogo; Yoshishige Takano, Hyogo; and Toshihiko Kaji, Hyogo, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of Japan

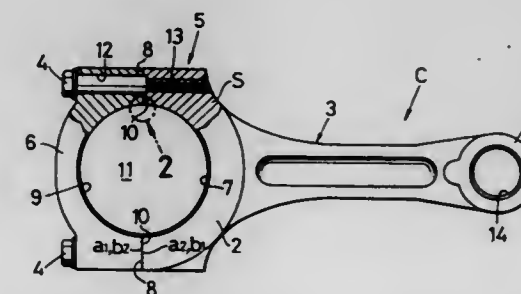
Filed Aug. 18, 1994, Ser. No. 292,691

Claims priority, application Japan, Aug. 19, 1993, 5-205074; Sep. 1, 1993, 5-217512

Int. Cl.<sup>6</sup> B23P 15/10

U.S. Cl. 29—888.092

4 Claims



1. A process for producing a shaft clamping member comprising first and second halves each of which has opposed mating faces at circumferential opposite ends of a semi-circular recess, said first and second halves being fastened to each other by a plurality of threaded members in a state where the opposed mating faces of both the halves are matched to each other to define a shaft-receiving hole by the two semi-circular recesses, said process comprising the steps of:

forming first and second preforms of light alloy material having shapes approximating those of the first and second halves, heating both said preforms to a forging temperature  $T_f$ , placing both said preforms into a cavity in a mold having a shape of said shaft clamping member such that surfaces of said preforms corresponding to said opposed mating faces are adjacently positioned and opposed to each other, subjecting the first and second preforms simultaneously to a forging step to thereby cause said light alloy material to flow and form said first and second halves having an infinite number of recesses and projections in a fitted relation to each other on the opposed mating faces, said recesses and projections being formed due to said light alloy material flowing between the opposed surfaces of said preforms during the forging step, and fitting said recesses and projections on said mating faces to each other when fastening said first and second halves by said threaded members.



5,566,450

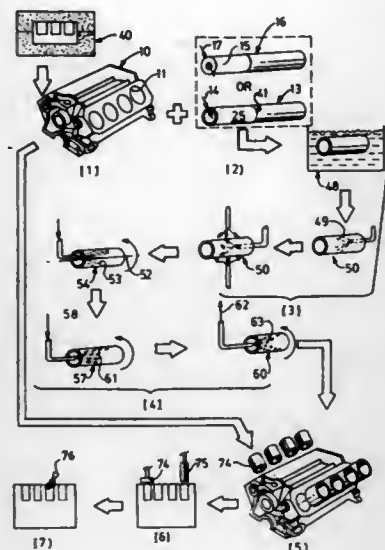
**FLEXIBLY MAKING ENGINE BLOCK ASSEMBLIES**  
V. Durga Nageswar Rao, Bloomfield Township; Robert A. Rose, Grosse Pointe Park; David A. Yeager, Plymouth, and Daniel M. Kabat, Oxford, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 16, 1995, Ser. No. 407,524

Int. Cl.<sup>6</sup> B23P 15/00

U.S. Cl. 29—888.061

10 Claims



1. A method of flexibly making common sized engine blocks with differing volumetric displacements, comprising:
  - (a) making at least first and second engine blocks with commonly sized cylinder bore walls;
  - (b) preparing a set of first liner inserts for the first block from extruded tubing and a set of second liner inserts for the second block from other extruding tubing, each set of liner inserts having a different wall thickness resulting from selecting extruded tubing of a different wall thickness in the range of 1–15 mm;
  - (c) implanting the set of first liner inserts into the first block and the set of second liner inserts into the second block, said implanting being with a fit that promotes thermal conductivity across the face between said inserts and bore wall; and
  - (d) applying an adherent anti-friction wear-resistant coating to at least a zone of the interior of each liner insert, said coating being controlled as to uniform thickness, concentricity, and trueness to the operating axes of said engine blocks, said coating being applied either prior to or subsequent to said implanting.

5,566,451

**METHOD FOR PROVIDING A ROLL MANTLE OF A TUBULAR ROLL FOR A PAPER MACHINE OR EQUIVALENT WITH ROLL BEARINGS**

Juhani Niskanen, Oulunsalo; Pekka Kivioja, Muurame; Juhani Lahtinen; Esa Lensu, both of Jyväskylä, and Esa Salavamäki, Muurame, all of Finland, assignors to Valmet Corporation, Helsinki, Finland.

Division of Ser. No. 236,644, May 2, 1994, Pat. No. 5,509,883.

This application May 9, 1995, Ser. No. 437,503

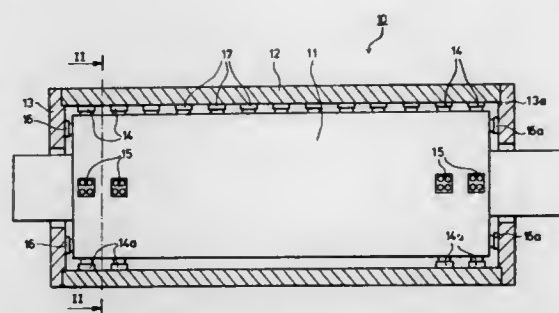
Claims priority, application Finland, Mar. 9, 1994, 941107

Int. Cl.<sup>6</sup> B23P 15/00

U.S. Cl. 29—895.3

20 Claims

1. A method for arranging glide bearing apparatus in a tubular roll mantle of a roll for a paper machine, wherein the roll mantle is supported on a stationary roll axle by glide-bearing members acting upon the roll mantle or upon ends of the roll under hydraulic pressure provided by a pressure medium, comprising the steps of:



- arranging at least a pair of said glide-bearing members to support the roll by acting in opposite radial directions and/or in opposite axial directions, and
- upon a first loading force being applied to a side of the roll which is higher than a second loading force being applied to an opposite side of the roll, adjusting the hydraulic pressure acting on one of said pair of glide-bearing members situated at said side of the roll having said higher loading to a level higher than the hydraulic pressure acting on the other of said pair of glide-bearing members to counteract the forces causing said higher loading.

5,566,452

**DUAL NUTCRACKER**

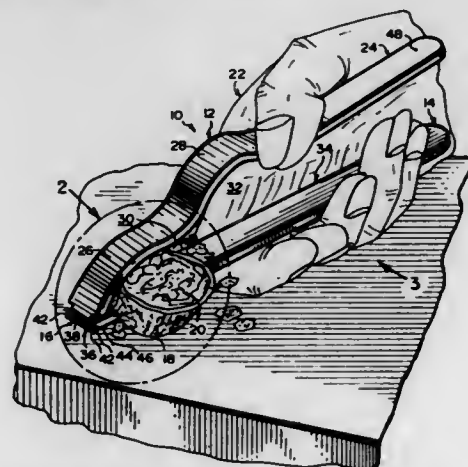
Severn Sample, 1829 Hervey Ave., North Chicago, Ill. 60064

Filed Mar. 1, 1995, Ser. No. 396,764

Int. Cl.<sup>6</sup> B26B 17/00

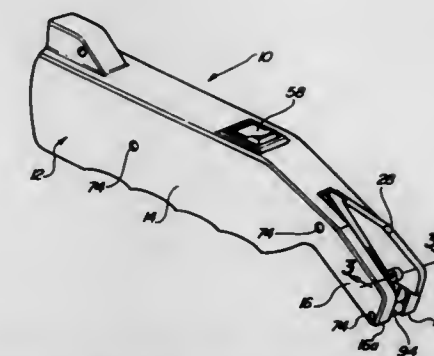
U.S. Cl. 30—120.3

1 Claim



1. A dual nutcracker comprising:
  - a) a first undulating lever;
  - b) a second straight lever comprising a flat bar of solid uniform cross section along the whole length thereof;
  - c) means for pivoting said first undulating lever to said second straight lever, said pivoting means consisting of a hinge located between the forward ends of said first lever and said second lever, said hinge including a central barrel with a longitudinal aperture therethrough formed on the forward end of said first lever, a pair of side knuckles formed on the forward end of said second lever, each said side knuckle having a hole therethrough permitting said central barrel to fit between said side knuckles with said longitudinal aperture in alignment with said holes in said side knuckles, and a pin extending through said holes in said side knuckles and said aperture in said central barrel to allow said first lever to pivot with respect to said second lever; and
  - d) said first undulating lever having means for cracking different sized nuts with a scissor-like action when said first lever and said second lever are gripped by a hand of a person and squeezed together, said cracking means comprising a flat bar

member with a first arched portion adjacent said pivoting means and a second arched portion adjacent said first arched portion, a first cracking area formed between said first arched portion and said second straight lever and a second cracking area formed between said second arched portion and said second straight lever, said first undulating lever being straight except for said first and second arched portions, and said first lever, second lever, and said hinge being all of the same width and fabricated out of sturdy, lightweight aluminum.



5,566,453

**NIPPERS FOR GARDENING**

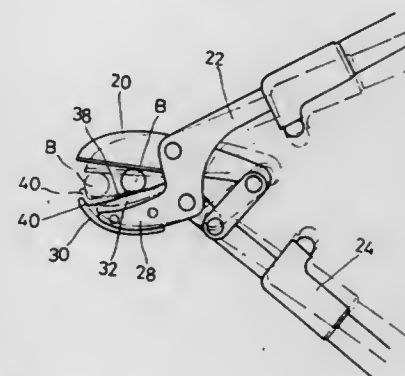
Ching-Shui Lin, 58, MA Yuan West St., Taichung, Taiwan

Filed Sep. 18, 1995, Ser. No. 529,955

Int. Cl.<sup>6</sup> B26B 17/02

U.S. Cl. 30—190

1 Claim



1. A pair of shears comprises a driving blade, a follower blade and a pair of driving and follower grips, wherein the improvement is that:
  - a tang of said follower blade inserted in a front end of said follower grip;
  - a first end of a link connecting a rear end of said driving blade pivotally;
  - a second end of said link connecting a front portion of said driving grip pivotally;
  - a middle portion of said follower blade connecting said driving blade pivotally;
  - a curved fang disposed in a front portion of said follower blade;
  - a clip seat connected to said curved fang;
  - two rows of holding serrations disposed on a surface of a clip side of said clip seat;
  - a clip edge of said clip seat having an inner flange with two notches;
  - an outer flange disposed at an outer edge of said clip seat; an upper recess on an upper surface of said clip seat defined by said outer flange and said inner flange; and
  - said upper recess receiving said curved fang.

5,566,454

**POWER CUTTING SHEARS**

Kenneth D. Eisenbraun, Birmingham, Mich., assignor to United Industrial Trading Corp., Troy, Mich.

Filed Sep. 5, 1995, Ser. No. 523,291

Int. Cl.<sup>6</sup> B26B 15/00

U.S. Cl. 30—228

7 Claims

1. A power cutting shear of the type adapted to cut a narrow, elongated strip from sheet material, comprising:
  - an elongated body having a cutting end comprised of a first side spaced laterally apart from and opposite to a second side;
  - a first pair of flat blades each blade having an elongated cutting edge, one of said first pair of blades being supported on each side of said cutting end with their cutting edges substantially

5,566,455

**ROTARY FILAMENT VEGETATION TRIMMER WITH AIR COOLED FILAMENT**

Leonard Hagstrom, Rte. 4, Box 97, Ashland, Wis. 54806

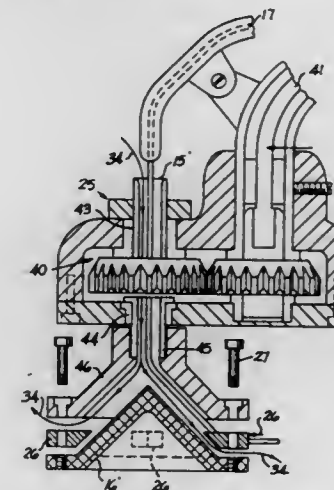
Continuation of Ser. No. 240,148, May 10, 1994, abandoned.

This application Jun. 5, 1995, Ser. No. 460,837

Int. Cl.<sup>6</sup> B26B 27/00

U.S. Cl. 30—276

1 Claim



1. A rotary filament vegetation trimmer cutting head having a plastic filament of predetermined diameter and an accompanying air flow path about the filament extending through the cutting head, said cutting head being constructed with a vertical hollow shaft of a diameter significantly exceeding that of the filament diameter extending partially through the head to form part of the air flow path, and with a generally cylindrical closed bottom lower extremity forming a set of radially exiting cylindrical holes sloping

upwardly from side walls of the generally cylindrical lower extremity and merging in a chamber region communicating with the vertical hollow shaft, and filament cooling means including said chamber region and said boxes which define a greater volume than the hollow shaft for substantially greater air flow volume than the vertical hollow shaft causing air through the air flow path to expand rapidly about the plastic filament entering the chamber region for cooling the filament residing in the chamber region and thereby significantly lengthening the working filament life.

5,566,456

## PRECISION CUT SAW GUIDE BASE PLATE

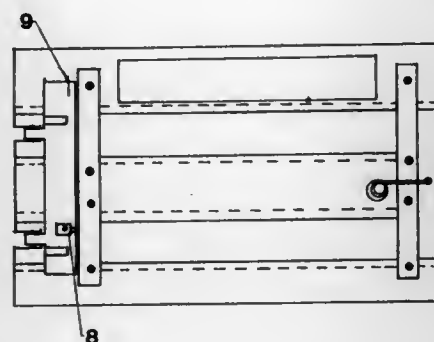
Thomas K. Sawyer, Jr., 308 Oyster La., Virginia Beach, Va. 23456

Filed Mar. 14, 1995, Ser. No. 403,401

Int. Cl.<sup>6</sup> B23D 47/02; B27B 9/04

U.S. Cl. 30—374

6 Claims



1. A precision cut saw guide base plate replacement apparatus to be used on a portable hand held power circular saw for aiding in cross cutting a workpiece comprising:

- an elongated base plate, said base plate having an upper side including an upper surface and an opposite lower side including a lower surface, said base plate including means for attaching said power saw to said upper surface such that said elongated base plate extends in substantially the same direction as a cutting motion of the power saw, said lower surface for engagement with an upper surface of the workpiece,
- a sliding system attached to said base plate for longitudinal sliding movement relative to said base plate between a retracted ready position and an extended position,
- a spring means for biasing said sliding system and said base plate toward said retracted ready position,
- said sliding system including an elongated fence for engaging a side of the workpiece during said cross cutting, said elongated fence extending transversely to said elongated base plate, said fence pivotally attached to said sliding system and pivotably between a non-operative stored position on said upper side of said base plate and an operative position on said lower side of said base plate,
- whereby said base plate replacement apparatus and said power circular saw are used for free sawing when said fence is in said non-operative stored position, and said base plate replacement apparatus and said power circular saw are used for precision cross cutting when said fence is in said operative position.

5,566,457

## JOINT CUTTER

Constantin Batschari, 61118 Bad Vilbel, and Herbert Mitthänder, Affentorplatz 5, 60594 Frankfurt/Main, both of Germany

PCT No. PCT/EP93/00466, § 371 Date Sep. 6, 1994, § 102(e) Date Sep. 6, 1994, PCT Pub. No. WO93/17849, PCT Pub. Date Sep. 16, 1993

PCT Filed Mar. 2, 1993, Ser. No. 295,878

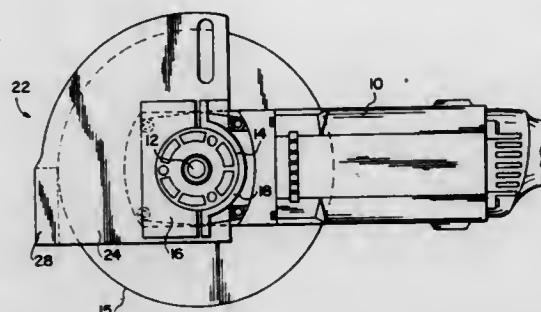
Claims priority, application Germany, Mar. 3, 1992, 9202769

U

Int. Cl.<sup>6</sup> B23D 45/16

U.S. Cl. 30—390

6 Claims



1. A joint cutter comprising a circular tool operable by an electric motor drive (12) covered by a drive housing (10), a mounting device (22) which is detachably fixed with the drive housing and a covering means for partially surrounding the circular tool,

said covering means including a rear section (30) and a front section (58), the rear section incorporating a vacuum connector, the rear section forming a slot (60) through which a first segment of the circular tool can project, said rear section having at least one attachment element within an elongated opening of the mounting device (22) for detachably connecting the rear section to the mounting device and for adjustment of the covering means with respect to said first segment to adjust a desired cutting depth, said front section covering a second segment of the circular tool which is exposed only when the front section is completely removed, whereby the first and second segments which project from the rear section are defined by chords which intersect at right angles.

5,566,458

## CLUTCH MECHANISM FOR RECIPROCATING SAWS

Thomas R. Bednar, Pewaukee, Wis., assignor to Milwaukee Electric Tool Corporation, Brookfield, Wis.

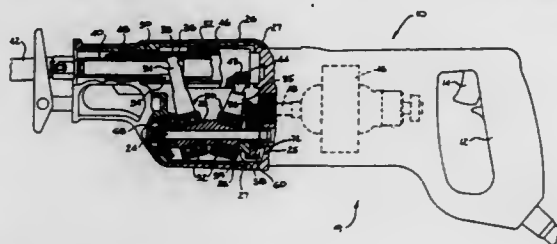
Continuation-in-part of Ser. No. 354,518, Dec. 13, 1994, abandoned, which is a continuation-in-part of Ser. No. 354,560, Dec. 13, 1994, abandoned. This application May 18, 1995,

Ser. No. 444,069

Int. Cl.<sup>6</sup> B23D 49/10; F16D 7/02

U.S. Cl. 30—392

14 Claims



14. A reciprocating saw comprising:  
a housing;  
a spindle reciprocally supported in said housing;

a motor operatively connected to said spindle to reciprocate said spindle, said motor having a stalling torque; and  
a clutch mechanism operatively positioned to provide slippage between said motor and said spindle at a slippage torque that is equal to or greater than said stalling torque of said motor.

5,566,459

## LASER BEAM EMITTING DEVICE TO BE USED AS LEVELS

Charles Breda, 5, rue de la Tour, 31150 Bruguieres, France

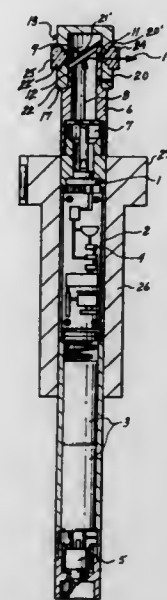
Filed Dec. 2, 1993, Ser. No. 160,250

Claims priority, application France, Dec. 3, 1992, 92 14789

Int. Cl.<sup>6</sup> G01C 5/00

U.S. Cl. 33—290

8 Claims



1. A laser radiation beam emitting device, suitable for use as a level to perform sightings and tracings, the device having a calibrated tube inside of which resides a laser emitting component, for emitting a laser beam wherein an optical emitting axis coincides with the mechanical axis of the tube, means for reflecting the laser beam in a given direction to said axis and, means of rotating the tube on said axis, characterized by having:

said means for reflecting comprising a mirror securely mounted at an end of said tube and set at a 45° angle from the optical emitting axis in order to reflect the beam perpendicular to the axis of the tube,

an end piece mounted to rotate on said end of said tube, coaxially to the latter, said end piece being equipped with a plurality of ports set perpendicular to said tube in order to be brought to and coaxially centered in said reflected beam by simply rotating the end piece,

a plurality of optical systems mounted respectively into said ports.

5,566,460

## TELESCOPIC MEASURING POLE

Steven W. Bates, Bella Vista, Calif., assignor to SECO Manufacturing Co., Inc., Redding, Calif.

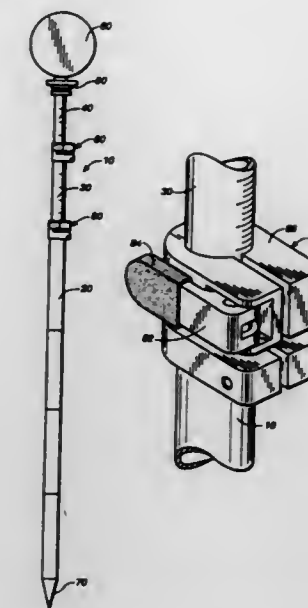
Filed Jul. 28, 1994, Ser. No. 282,056

Int. Cl.<sup>6</sup> G01C 15/06

U.S. Cl. 33—296

2 Claims

1. An improved measuring pole comprising:



a plurality of tubes, each sized to fit movably within another with minimal axial play, the largest of said tubes having a removable pointed end and an open opposite end, the smallest of said tubes having a lower end and an upper end with threaded inside diameter, said tubes having graduated markings, said tubes taken in adjacent pairs constituting an outer tube and an inner tube, said tubes acting together as a telescoping system;

a plurality of lever-operated clamping devices one less in number than said plurality of tubes, said clamping devices capable of fixing said outer tubes in position relative to said inner tubes, said clamping devices operable utilizing only one hand; said lever-operated clamping devices comprising a "U" shaped body having an upper jaw and a lower jaw, said lower jaw fitting snugly around said outer tube, said upper jaw fitting loosely around said inner tube, said jaws having a thread side and a shoulder side, said shoulder sides forming a recessed shoulder, said shoulders having a threaded bore perpendicular to said tubes' longitudinal axes, said lower jaw's thread side forming a threaded bore the same diameter as said lower jaw's shoulder side bore and concentric thereto, said upper jaw thread side forming a housing, said housing having a smooth bore concentric to said upper jaw's shoulder side bore;

a first screw threadably engaged through said lower jaw's shoulder side bore and said thread side bore such that tightening said first screw compresses said lower jaw against said outer tube, a lever having a cam-shaped pivot with open bore and forming a slot perpendicular to said bore, said slot extending partially along said pivot's circumference, said pivot having a coating of a dry film lubricant;

a barrel nut with threaded bore, fitted rotatably inside said open bore, said barrel nut having a coating of said dry film lubricant;

a washer, located between said lever and said housing, said washer having a coating of said dry film lubricant; and

a second screw threadably engaged in said upper jaw's shoulder side extending through said washer and said slot into said barrel nut's threaded bore, such that tightening said second screw adjusts tension applied by closing said lever, rotating said cam-shaped pivot against said washer, thereby drawing said second screw against said upper jaw's shoulder, compressing said upper jaw against said inner tube such that said inner tube and said outer tube become fixed in position relative to each other.





members having an open and a closed position, wherein in said closed position said substrate holding members hold said substrate; and,  
an arm positioning member coupled to each of said arms, said arm positioning member movable to move said first and second arms to position said substrate holding members in said open position and said closed position, said arms having a locked position when said substrate holding members are in said closed position.

5,566,467

## CYCLONE HEAT EXCHANGER

Stefan Hofbauer, Schelklingen, Germany, assignor to Heidelberg Zement Aktiengesellschaft, Heidelberg, Germany  
Filed Feb. 16, 1995, Ser. No. 389,388

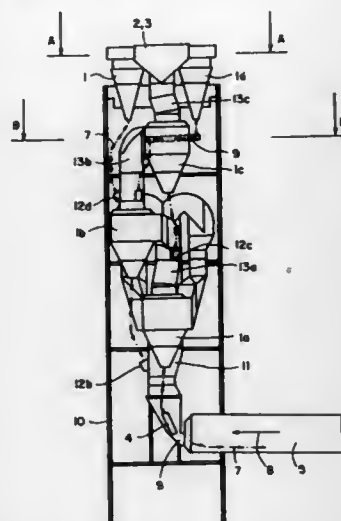
Claims priority, application Germany, Oct. 7, 1994, 44 35 871.7

Int. Cl.<sup>6</sup> F26B 21/06

U.S. Cl. 34—79

5 Claims

1. A cyclone heat exchanger, comprising:



a plurality of arranged one above another cyclone separators defining, respectively, a plurality of heat exchange stages;  
a first inlet for delivering raw meal to said heat exchanger;  
a first outlet for delivering the heated raw meal from said heat exchanger;  
a second inlet for delivering a hot gas to said heat exchanger;  
a second outlet for delivering the cooled gas from the heat exchanger; and  
at least one motor-driven conveyor device arranged between two heat exchange stages, located immediately one above the other and defined by respective cyclone separators, for transporting the raw meal from an upper heat exchange stage to a lower heat exchange stage.

5,566,468

PROCESS AND APPARATUS FOR REGENERATING A MOIST ADSORPTION MEDIUM

Roderich W. Graeff, Darmstadt, Germany, assignor to SOMOS GmbH, Weiterstadt, Germany

Filed May 23, 1994, Ser. No. 247,545

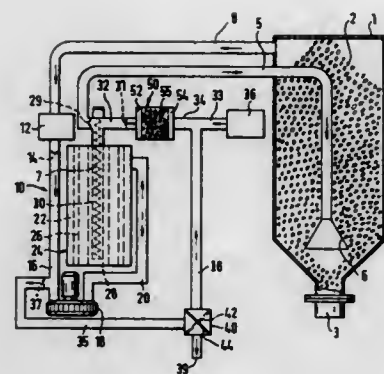
Claims priority, application Germany, May 28, 1993, 43 17 768.9

Int. Cl.<sup>6</sup> F26B 21/06

U.S. Cl. 34—80

27 Claims

1. A process for regenerating an adsorption medium which is freed of an agent adsorbed therein by treatment with a hot gas and thereafter cooled by a stream of cooling gas, wherein a warmed stream of cooling gas emerging from the hot adsorption medium is



conducted through a heat accumulator for taking up heat from the hot adsorption medium and then recirculated through the adsorption medium.

5,566,469

DRYING APPARATUS WITH ROTATABLE HOUSING

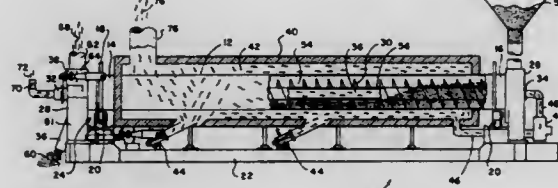
Danny R. Bolton, Brownwood, and David L. Bigham, Novice, both of Tex., assignors to Fen-Tech Environmental, Inc., Brownwood, Tex.

Filed Jul. 18, 1995, Ser. No. 503,475

Int. Cl.<sup>6</sup> F26B 11/04

U.S. Cl. 34—135

10 Claims



1. Thermal vaporization apparatus, comprising:  
a cylindrical tube having two ends;  
a base, with the tube being rotatable with respect to the base;  
first drive means for applying rotating force to the tube;  
an auger having two ends and extending through the tube;  
second drive means for applying rotating force to the auger;  
at least one heating means to heat the exterior of the tube while in rotation;  
feed means for introducing wet material into the interior of the tube and exterior of the auger within the tube; and  
with a stationary wet material input chamber fixed to the base at one end of the tube, and a stationary dried material and product vapor discharge chamber fixed to the base at the other end of the tube, and the ends of the tube extending into their associated chambers.

5,566,470

METERING GRAIN UNLOADER FOR TOWER DRYER

David W. Morrison, Macoupin County, Ill., assignor to Grain Systems, Inc., Assumption, Ill.

Filed Jan. 13, 1995, Ser. No. 372,234

Int. Cl.<sup>6</sup> F26B 17/12

U.S. Cl. 34—167

10 Claims

1. A tower grain dryer including a metering unloader, said tower grain dryer comprising a vertical tower having a plenum therein, said plenum having a plenum wall, said tower having an outer wall surrounding said plenum wall and being spaced outwardly therefrom for forming a cylindric grain drying path between said tower outer wall and said plenum wall, said grain to be dried being conveyed through said cylindric grain drying path generally from top to bottom of said dryer, said outer wall of said tower and said plenum wall being porous to permit air to flow therethrough, said

5,566,472

SEAL FOR USE AT BAND EDGES IN A DRYING SPACE OF A DRYING APPARATUS

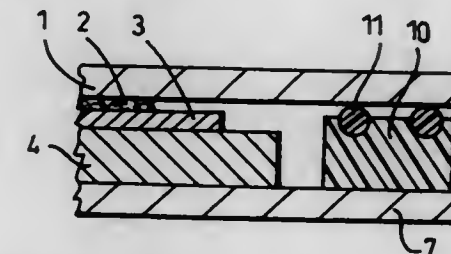
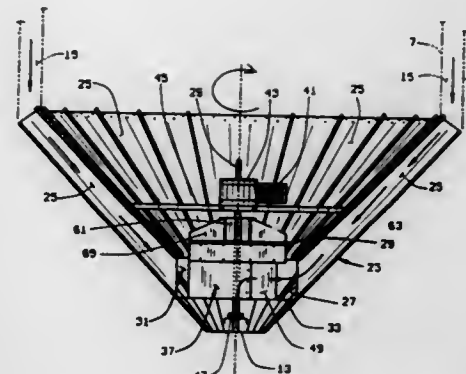
Jukka Lehtinen; Paavo Rautakorpi, both of Tampere, and Seppo Haavisto, Hämeenkyrö, all of Finland, assignors to Valmet-Tampella Oy, Tampere, Finland

Filed May 2, 1994, Ser. No. 236,456

Int. Cl.<sup>6</sup> F26B 25/00

U.S. Cl. 34—242

2 Claims



tower dryer having means for moving air into said plenum, through said plenum wall, through said grain in said grain drying flow path thereby to dry said grain, and through said tower wall to exhaust said air to the atmosphere on the exterior of said outer tower wall, said cylindric grain drying path having a converging hopper section at the bottom of said tower dryer with said grain drying path within said hopper section being divided into a plurality of channels with each of said channels having a grain outlet at the lower end thereof, a floor below said grain outlets, said floor having a grain discharge outlet in a center thereof spaced radially inwardly of said grain outlets, said metering unloader having a generally cylindric unloader body including a cylindric unloader wall, said unloader body being rotatably mounted within a lower portion of said tower above said discharge outlet for rotation about a vertical axis, means for supporting said unloader body and for rotatably driving said unloader body about said vertical axis, said unloader wall extending up from said floor and being spaced relative to said grain outlets of said grain drying path for blocking the gravity flow of grain from said grain outlets toward said discharge opening, said unloader wall having a grain inlet opening therein and a grain unloading path within said unloader body leading from said grain inlet opening in said unloader wall to said grain discharge outlet in said floor, said grain inlet opening receiving grain from each of said grain outlets as said unloader body is rotated about said vertical axis thereby to substantially uniformly remove grain from all of said grain outlets upon each revolution of said metering unloader.

1. In a drying apparatus in which a web to be dried passes in a substantially airless drying space between two bands together with at least a first drying wire, one of the bands being arranged to be heated and the other being arranged to be cooled, the web being positioned against the heated band for evaporating moisture contained in the web, the moisture condensing on the cooled band which is separated from the web by the first drying wire, an improved seal between an edge of the heated band and a corresponding edge of the cooled band to prevent leakages thereat between the drying space and a surrounding space comprising the seal being attached to at least one of the heated band and the cooled band, wherein the seal includes a more rigid main strip attached to at least one of the heated band and the cooled band, and elastomer strips embedded in the main strip.

5,566,473

PROCESSING ROLL APPARATUS AND METHOD FOR WEB DRYING

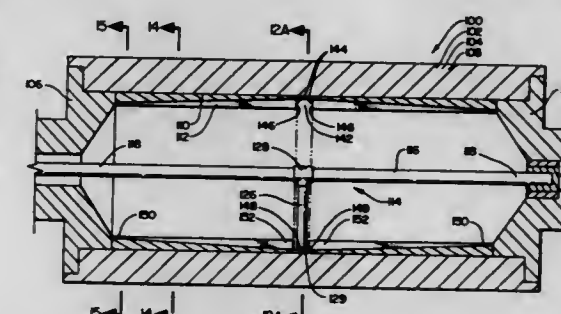
Reijo K. Salminen, 373 Cove Rd., Bellingham, Wash. 98226

Continuation-in-part of Ser. No. 291,115, Aug. 16, 1994. This application Sep. 30, 1994, Ser. No. 315,911

Int. Cl.<sup>6</sup> F26B 3/00

U.S. Cl. 34—454

40 Claims



1. A method of processing material in heat transfer relationship, such as a sheet of paper, said method comprising:  
a. providing a roll structure mounted for rotation and defining an enclosed chamber to contain a condensable heat transfer medium, said roll structure comprising:  
i. a cylindrical side wall having a longitudinal center axis, an outside generally cylindrical contact surface to engage said material in heat transfer relationship and an inside generally cylindrical surface which is exposed to the heat exchange medium in said chamber in heat exchange relationship whereby the medium condenses on the inside surface and heat is conducted through the side wall to the outside surface, said inside generally cylindrical surface having a

5,566,471

ELECTROMOTIVE CURTAIN FOR DRYING CLOTHES

Yoshitaka Hirano, 207 gou, 106 banti, 1 chrome, Hirabari, Tenpaku-ku, Nagoya, Japan

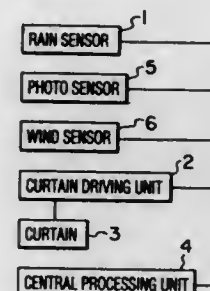
Filed May 9, 1994, Ser. No. 239,891

Claims priority, application Japan, Dec. 24, 1993, 5-077024 U

Int. Cl.<sup>6</sup> F26B 19/00; 25/06; 9/00; E05F 15/20

U.S. Cl. 34—201

3 Claims



1. Electromotive curtain machine for drying clothes comprising a rain sensor for detecting rain, photo sensor for detecting sunshine, curtain driving unit which opens or closes a curtain and central processing unit which gives a signal of opening or closing to said curtain driving unit according to a signal of said rain sensor and a signal of said photo sensor.



- radial depth dimension at a radial surface distance from said longitudinal center axis;
- ii. first and second end walls at first and second ends of said side walls, respectively;
  - b. providing the inside surface of the side wall with a plurality of longitudinally spaced circumferentially extending grooves, each of which as a substantial circumferentially aligned path component and which extends generally circumferentially along the inside surface of the side wall, said circumferentially extending grooves each having a radial circumferential groove distance to a bottom groove portion of each groove greater than said radial surface distance;
  - c. providing the inside surface of the side wall with a plurality of circumferentially spaced, longitudinally aligned collecting grooves, spaced around the circumference of the inside surface of the side wall, each of said longitudinally aligned collecting grooves having a radial longitudinal groove distance to a bottom surface of each of said longitudinally aligned collecting grooves at least as great as said radial circumferential groove distance;
  - d. providing said inside surface of said side wall having a circumferential collecting area having a radial collecting area distance sufficiently great to receive flow from said longitudinally aligned grooves;
  - e. directing a condensable heat exchange medium into said chamber in heat exchange relationship with said inside surface, in a manner that the medium condenses on the inside surface to form condensate, said circumferential grooves, said longitudinal grooves, and said collecting area thus being arranged so that condensate forming on said inside surface is able to follow a flow path into said circumferential grooves, then into adjacent longitudinal collecting grooves and to said collecting area;
  - f. collecting the condensate from the collecting area and directing the condensate from the chamber through a chamber outlet;
  - g. placing said material in contact with the roll and rotating the roll.

5,566,474

## SPORT BOOT HAVING A FIXED-LACE CLOSURE SYSTEM

Patrick Leick, Villaz, and Thierry Donnadieu, Polisy, both of France, assignors to Salomon S.A., Metz-Tessy, France  
 Filed Jun. 14, 1994, Ser. No. 261,046  
 Claims priority, application France, Jun. 21, 1993, 93.07716  
 Int. Cl.<sup>6</sup> A43C 11/00; 1/00; 3/00; A43B 5/04  
 U.S. Cl. 36—50.1 15 Claims



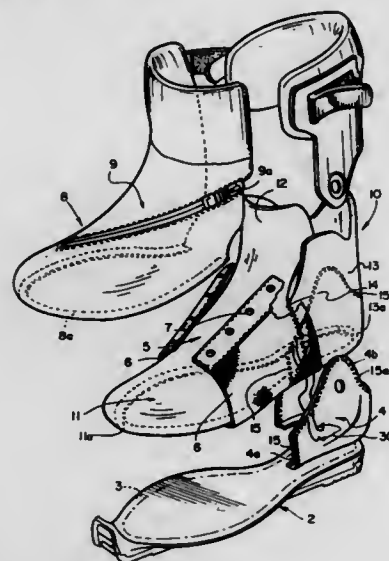
1. A boot comprising:  
 an external sole;  
 an upper affixed onto said external sole and having an opening for facilitating insertion of a foot into the boot, said upper comprising a first portion and a second portion, said opening extending between said first and second portions;

a closure system for connecting said first and second portions of said upper, said closure system comprising  
 a series of return elements, a respective plurality of said return elements being affixed to each of said first portion and said second portion of said upper;  
 a blocking device; and  
 a lace or cable forming two strands, said lace or cable extending in a predetermined path between ones of said return elements and defining a lacing zone, said lacing zone comprising a front lower end and a rear upper end, each of said two strands of said lace or cable having a respective end, each respective end of said two strands being anchored at a respective anchoring location by respective anchoring means at said front lower end of said lacing zone, said two strands extending rearwardly from said lower end of said lacing zone, along said predetermined path between ones of said return elements and, rearward of said ones of said return elements, extending through said blocking device and, beyond said blocking device, said two strands of said lace or cable forming a free loop;  
 said free loop constituting a single means for gripping said lace or cable and for exerting a traction force distributed symmetrically along said two strands from said respective anchoring locations at said front lower end of said lacing zone to bring said first and second portions toward one another for tightening said first and second portions on the foot; and  
 said blocking device comprising a means for blocking said lace or cable upon attaining a predetermined tightening position of said first and second portions during exertion of said traction force.

5,566,475

## SPORTS BOOT HAVING AT LEAST A PARTIALLY ELASTIC LINING

Thierry Donnadieu, Polisy, France, assignor to Salomon S.A., Metz-Tessy, France  
 Filed Nov. 4, 1994, Ser. No. 336,644  
 Claims priority, application France, Nov. 4, 1993, 93.13299  
 Int. Cl.<sup>6</sup> A43B 23/07; 11/00  
 U.S. Cl. 36—55 19 Claims



1. A sports boot comprising:  
 an outer sole having a peripheral zone;  
 a rear stiffener positioned for extending at least rearward of and on opposite sides of a heel of the foot of the wearer of the boot;  
 a vamp extending at least above a forepart of the foot;

an elastic lining extending above the forepart of the foot inside said vamp, said lining having a lower peripheral edge defining an opening;  
 said vamp and said rear stiffener being assembled to said outer sole along said peripheral zone of said outer sole;  
 said lower peripheral edge of said lining being assembled to said peripheral zone of said outer sole; and  
 said lining being fixed to said rear stiffener.

5,566,476

## ATHLETIC FOOT PROTECTOR WITH TOE AND ANKLE IMPACT ABSORBING PROTECTOIN

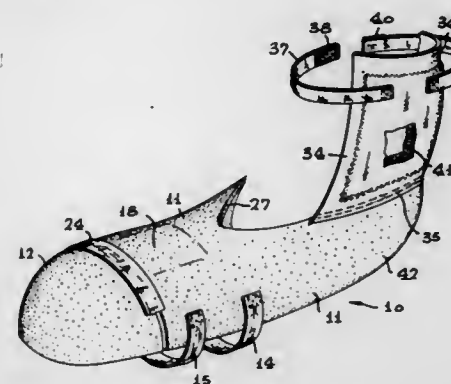
Gregory F. Bertrand, 7401 Whitewood Dr., Fontana, Calif. 92336, and Thomas P. Seyler, 30515 Sand Trap Dr., Agoura Hills, Calif. 91301

Filed Jun. 6, 1995, Ser. No. 467,073

Int. Cl.<sup>6</sup> A43B 13/22; A43C 13/14

U.S. Cl. 36—72 R

6 Claims



1. An athletic foot protector to be worn over the user's shoe comprising:  
 a rigid, reinforced central instep portion having a front end and a rear end adapted to cover the central portion of the user's foot;  
 a rigid, reinforced toe portion separate from said central instep portion;  
 a hinge pivotally connecting said toe portion with said central instep portion at the ball area of the user's foot;  
 securement means releasably attaching said central instep portion to the foot of the user;  
 an expandable and stretchable heel portion of soft, flexible and stretchable material carried on said central instep portion at said rear end and adapted stretch about the heel of the user's foot;  
 a flexible, soft liner carried on said toe portion and said central instep portion adjacent to the foot of the user;  
 said toe portion and said central instep portion are composed of a hard plastic material;  
 said toe portion is of greater thickness than the thickness of said central instep portion;  
 said securement means is at least one strap having opposite ends adapted to encircle the foot and said shoe of the user so that said opposite ends overlap in releasable securement;  
 an elongated extension carried on said central instep portion at said rear end and upwardly projecting to cover the medial ankle of the user; and  
 a releasable strap disposed on said elongated extension for removably securing said elongated extension to the ankle of the user.

5,566,477

## REMOVABLE SHOELACE COVER FOR A SHOE

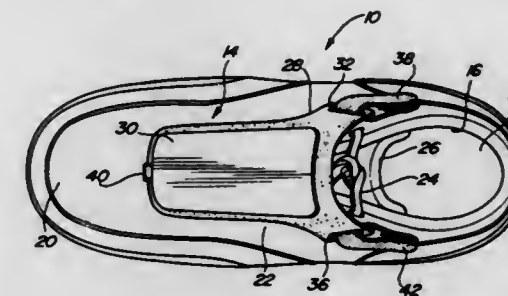
Leroy Mathis, 1817 Olcott, Apt. 1106, Austin, Tex. 78741, and Cheryl McClellan, 19470 Pennington, Detroit, Mich. 48221

Filed Apr. 8, 1994, Ser. No. 225,134

Int. Cl.<sup>6</sup> A43B 3/24; 23/00

U.S. Cl. 36—100

14 Claims

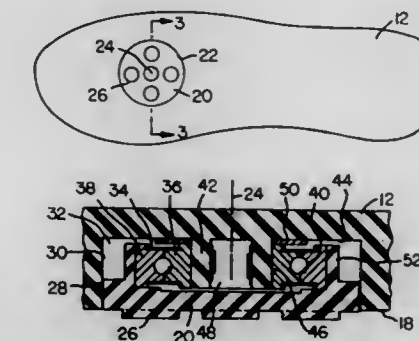


1. A shoelace cover adaptable to be secured to an upper portion of a shoe having a shoelace area, said shoelace cover comprising:  
 a base panel, said base panel including first securing means for pivotably securing the base panel to the upper portion of the shoe independently of a shoelace, wherein the first securing means is a series of three straps engagable with a series of three slots in the base panel, a first strap being rigidly secured to one side area of the shoe and being threadably engaged with a first slot in the base panel, a second strap being rigidly secured to an opposite side area of the shoe and being threadably engaged with a second slot of the base panel, and a third strap being rigidly secured to a top area of the shoe and being threadably engaged with a third slot in a lower region of the base panel;  
 a fashion panel releasably attached to an upper surface of the base panel; and  
 second securing means for securing the fashion panel to the base panel, said second securing means enabling said fashion panel to be readily removable from the base panel such that a shoe wearer can optionally remove and replace the fashion panel with other fashion panels in order to convey differing fashion statements.

5,566,478

## SPORTS SHOE HAVING ROTATABLE TRACTION PAD

Randolph Forrester, R.R. #2, Box 438B, Hollis Center, Me. 04042  
 Filed May 26, 1995, Ser. No. 451,231  
 Int. Cl.<sup>6</sup> A43B 5/00  
 U.S. Cl. 36—134 5 Claims



1. In a shoe that includes a sole having a bottom surface, the improvement comprising:  
 a circular cavity in the shoe sole bottom surface;  
 a circular traction pad located within said cavity; said traction pad having a central axis; and means for rotatably mounting

said traction pad in said cavity, whereby the pad is rotatable around said central axis;

said mounting means comprising a unitary radial anti-friction bearing assembly formed separately from said shoe sole and traction pad; said bearing assembly being centered on said central axis, and comprising an inner race connected to the shoe sole, an outer race connected to said traction pad, and anti-friction bearing elements interposed between said inner and outer races;

said traction pad being formed of a resilient elastomeric material, said elastomeric pad having an integral annular flange extending parallel to said central axis, said flange having a telescopic frictional grip on said outer race, whereby the traction pad is removable from said outer race without disturbing said anti-friction bearing assembly.

5,566,479

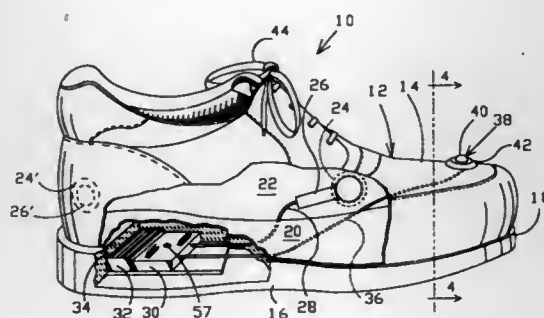
### SHOE CONTRUCTION FOR USE BY DIABETIC PERSONS

Frank B. Gray, 5104 Lyons View Dr., Knoxville, Tenn. 37919;  
John L. Parris, 314 Kennon Rd., Knoxville, Tenn. 37909, and  
Rainer G. Riffert, 3804 Oakhurst Dr., Knoxville, Tenn. 37979  
Filed Mar. 21, 1995, Ser. No. 407,689

Int. Cl.<sup>6</sup> A43B 23/00; A61B 5/00

U.S. Cl. 36—137

17 Claims



1. A shoe for use by a person having a foot malady located in at least one site of the foot of the person where a pressure in excess of a critical threshold pressure has a detrimental effect on the malady, the shoe comprising:

a shoe body to substantially enclose the foot of the person, said shoe body defining an interior surface to contact the foot, said interior surface provided with a relieved region in the at least one site to reduce pressure directed against the foot at said site;

a force sensing resistor unit positioned beneath each said relieved region;

a power source;

a switch circuit connecting said force sensing resistor unit and said power source, said switch circuit detecting current flow through said force sensing resistor unit as a function of the pressure applied to said force sensing resistor unit, and providing an instantaneous output signal when the pressure exceeds the critical threshold; and

an indicator means connected to said switch circuit to receive said instantaneous output signal to provide a signal to the person when the pressure in excess of the critical threshold is applied to said force sensing resistor unit at the location where the pressure is detrimental to the malady.

5,566,480

### CREASE SETTING AND MEASUREMENT

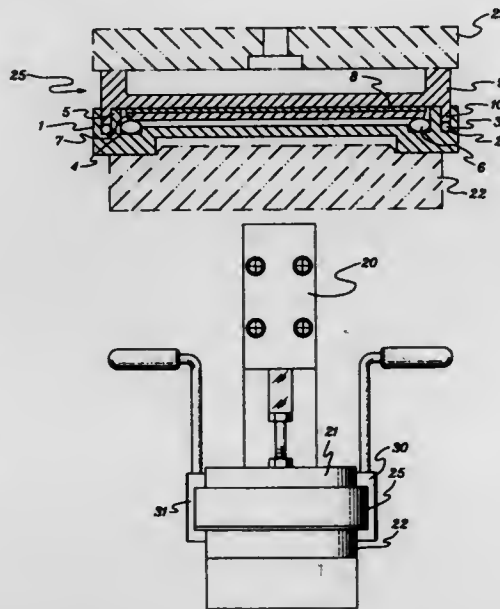
Peter Buckenham, and Nhan G. Ly, both of New South Wales, Australia, assignors to Commonwealth Scientific and Industrial Research Organisation, Campbell, Australia  
PCT No. PCT/AU92/00642, § 371 Date Jul. 5, 1994, § 102(e)  
Date Jul. 5, 1994, PCT Pub. No. WO93/11429, PCT Pub. Date Jun. 10, 1993

PCT Filed Nov. 30, 1992, Ser. No. 244,600

Claims priority, application Australia, Dec. 3, 1991, PK9800  
Int. Cl.<sup>6</sup> D06F 71/36; B65H 45/12

U.S. Cl. 38—17

9 Claims



1. A method of forming a crease in a fabric for measurement of the fabric's crease setting performance comprising:  
conditioning a sample of the fabric to a predetermined water content level;  
bending the sample of fabric upon itself to form a crease therein;  
heating the sample of fabric and maintaining the crease therein for a predetermined period, under conditions which ensure that said predetermined water content of the fabric remains substantially constant; and  
rapidly cooling the sample to set the crease.

5,566,481

### IRONING BOARD COVER WITH SCORCH RESISTANT PANEL

David Lehrman, 207 Barclay Cir., Cheltenham, Pa. 19012

Filed Jan. 6, 1995, Ser. No. 369,236

Int. Cl.<sup>6</sup> D06F 83/00

U.S. Cl. 38—140

22 Claims

1. An ironing board cover assembly for covering an ironing board having a narrow nose portion and a heel portion comprising:

- a) an ironing board cover;
- b) a scorch resistant panel disposed at one end of said ironing board cover, said scorch resistant panel having a perimeter secured to the ironing board cover to form a pocket between said ironing board cover and panel;
- c) a heat resistant panel located in the pocket between the scorch resistant panel and the ironing board cover; and
- d) a bumper having a height of at least 1/3 of an inch (8.46 mm) attached to said ironing board cover around a portion of the perimeter of the scorch resistant panel to partially surround said scorch resistant panel for preventing the iron from sliding off the scorch resistant panel.

5,566,483

### ILLUMINATED SIGN

Andrew R. Ogren, 9752 Wedgewood Alcove, Woodbury, Minn. 55125

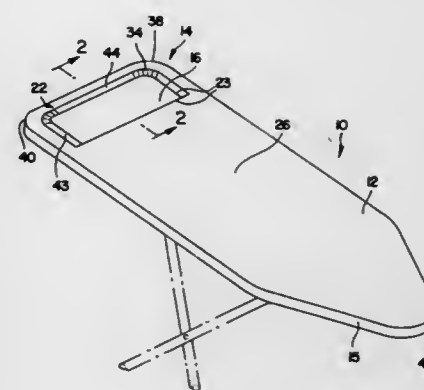
Continuation of Ser. No. 981,194, Nov. 25, 1992, abandoned.

This application Aug. 24, 1994, Ser. No. 295,159

Int. Cl.<sup>6</sup> G09F 13/04

U.S. Cl. 40—564

19 Claims



5,566,482

### CHANGEABLE IMAGE DISPLAY DEVICE

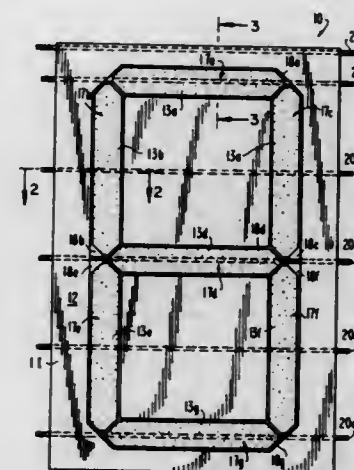
Michael J. Smith, Orangeburg, N.Y., assignor to Arrow Art Finishers, Inc., Bronx, N.Y.

Filed Jan. 30, 1995, Ser. No. 380,597

Int. Cl.<sup>6</sup> G09F 3/04

U.S. Cl. 40—450

15 Claims



1. A device for displaying a changeable image, comprising:

- a) a carrier panel having an exposed major surface and a plurality of panel interstices extending in mutual parallelism along a longitudinal direction, said carrier panel having a plurality of openings corresponding to different segments of the changeable image;

- b) a plurality of image-forming elements having oppositely facing first and second element surfaces visually conforming to and differing from said exposed major surface, respectively, and a plurality of element interstices extending in mutual parallelism along the longitudinal direction; and

- c) means for mounting said elements in said openings for turning movement between active and inactive positions in which said first and said second element surfaces are substantially flush with said exposed major surface, respectively, said element interstices being co-linear with said panel interstices in each said position, said mounting means including a plurality of shafts, one for each element, each shaft passing entirely through one of the element interstices of a respective element and also entirely through said panel interstices which are co-linear with said one of the element interstices.

1. An illuminable decorative sign suited for at least temporary positioning adjacent a surface, said sign comprising:

a backing member of a relatively stiff material;

a display member of a relatively flexible, translucent sheet of material having dimensions in a pair of opposite directions in said sheet, and in a third direction in said sheet, exceeding those of corresponding mounting locations in said backing member in corresponding directions in said backing member, said display member being fastened, at edges thereof crossing each of said pair of opposite directions and said third direction, to said corresponding mounting locations in said backing member such that interior portions of said display member bow out and away from said backing member because of said fastening of said display member to said mounting locations in said backing member to create an illumination space therebetween so that, if lights are mounted on said backing member, they can be enclosed in said illumination space, said display member and said backing member each being rectangular in outline with said translucent sheet of said display member having at least a pair of opposite sides thereof being separated by a greater dimension than corresponding sides of said backing member, said translucent sheet having a cut therein extending into its interior from each of two corners thereof, said display member being substantially linearly scored parallel to, and adjacent to, edges thereof fastened to said backing member, said display member having selected indicia provided thereon; and

a mounting member provided at least in part in said backing member to permit installation of said sign at said surface.

5,566,484

### INTERNALLY ILLUMINATED SIGN

Peter F. Wachter, Northfield, Ill., assignor to Juno Lighting, Inc., Des Plaines, Ill.

Filed Oct. 20, 1995, Ser. No. 546,118

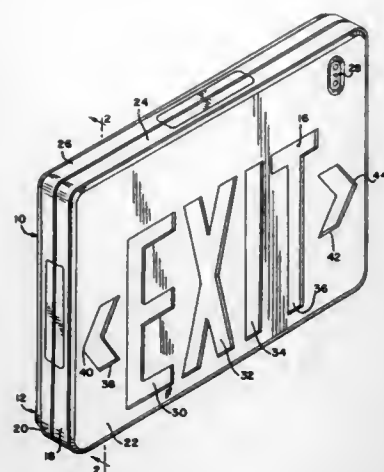
Int. Cl.<sup>6</sup> G09F 13/04

U.S. Cl. 40—570

20 Claims

1. An internally illuminated sign including: a housing, a light source mounted in the housing, said housing having a flat stencil, said stencil having letter openings forming a message, a first directional indicating arrow opening positioned adjacent to one end of the message, said first arrow opening having a directional indicating first point extending away from the message indicating a





direction away from the message, a second directional indicating arrow opening positioned adjacent to a second end of the message opposite to said one end, said second arrow opening having a directional indicating second point extending away from the message in a direction opposite to the directional indicating first point, a first arrow cover removably positioned in the first arrow opening, said first arrow cover having a first arrow body mateably removably positioned in the first arrow opening, said first arrow cover having a first stop on the first arrow body cooperative with the stencil preventing the first arrow cover from passing through the first arrow opening in a direction away from the light source, a second arrow cover removably positioned in the second arrow opening, said second arrow cover having a second arrow body mateably removably positioned in the second arrow opening, said second arrow cover having a second stop on the second arrow body cooperative with the stencil preventing the second arrow cover from passing through the second arrow opening in a direction away from the light source, and a stiff resilient translucent sheet positioned between the stencil and the light source, said translucent sheet holding the first and second arrow covers in the respective arrow openings, said translucent sheet having a first open cut deployed adjacent to a portion of the first arrow opening, said first open cut defining a portion of the sheet being resiliently displaceable to allow the first arrow cover to be removed from the first arrow opening through the first open cut, and said translucent sheet having a second open cut deployed adjacent to a portion of the second arrow opening, said second open cut defining a portion of the sheet being resiliently displaceable to allow the second arrow cover to be removed from the second arrow opening through the second open cut.

5,566,485

## CAR-USED DISTRESS SIGN

Shin-Shui Chang, No.5, Lane 85, Tung-Yang Rd., Feng-Yuan City, Taichung Hsien, Taiwan

Filed Nov. 24, 1995, Ser. No. 562,621

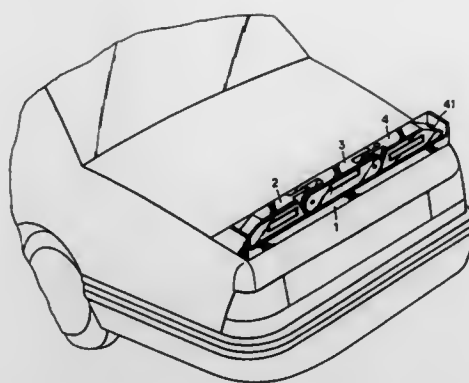
Int. Cl.<sup>6</sup> G09F 21/04

U.S. Cl. 40—591

1 Claim

1. A car-used distress sign comprising a base, a left warning member, a central warning member and a right warning member, said distress sign being characterized in that:

the base is formed with a receptacle and a driving channel is formed on a bottom wall of the receptacle, two pivot seats being disposed on two ends of the driving channel, a latch hook and a first resilient member being pivotally connected with each pivot seat, two electromagnetic pulling members being disposed at a central portion of the driving channel, the latch hooks being connected with the pulling members by driving strings, the left and right warning members being disposed with latch pins, whereby when the pulling members are not activated, the first resilient member is extended to engage the latch hooks with the latch pins and the left and



5,566,486

## FIREARM MONITORING DEVICE

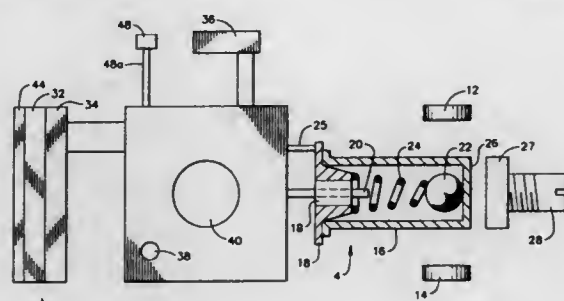
Kenneth L. Brinkley, 3314 Thomas St., Erlanger, Ky. 41018

Filed Jan. 19, 1995, Ser. No. 376,047

Int. Cl.<sup>6</sup> F41A 9/62

U.S. Cl. 42—1.02

21 Claims



1. A firearm monitoring device for attaching to a firearm, said firearm having a firing end and a grip end, and said firearm being susceptible to recoil when discharged, comprising:

a) first means for creating a first signal in response to substantially each recoil of said firearm; and  
b) second means for receiving each said first signal and generating a second signal indicative of the number of said first electrical signals received by said second means;  
wherein said first means comprise an inertia switch comprising a movable mass; and wherein said mass is resiliently biased toward the firing end of the firearm.

5,566,487

## INTEGRAL BUTT PLATE WITH LATCH AND CATCH MECHANISMS FOR PISTOL MAGAZINE

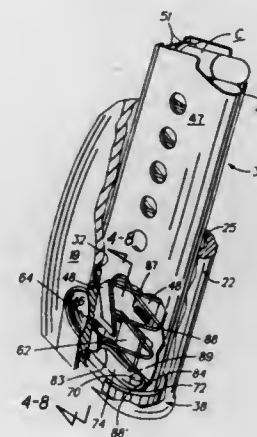
Pardip K. Vaid, Northampton, Mass., and Philip H. Stevens, Skaneateles, N.Y., assignors to Smith & Wesson Corp., Springfield, Mass.

Filed Sep. 12, 1995, Ser. No. 527,530

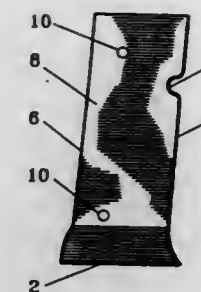
Int. Cl.<sup>6</sup> F41A 9/25; 9/65

U.S. Cl. 42—7

10 Claims



1. In a semi-automatic pistol having a frame with a handgrip defining a backstrap, a front strap and laterally spaced side walls and a downwardly opening chamber within the handgrip adapted to receive a magazine therein, the improvement comprising downwardly open slots provided in spaced opposed relation through both side walls of said frame, each of said slots including side edge portions disposed in generally parallel coplanar relation with the side edge portions in the other of said slots, a first portion of a catch mechanism disposed within said frame, a unitary polymeric magazine butt plate with an integral pair of resiliently flexible arms extending upwardly of the butt plate and in divergent angular relationship, said arms being dimensioned to interfit slidably within said slots to thereby reduce said divergent relationship of said arms while substantially tensioning said arms to resume their divergent condition and a second portion of said catch mechanism disposed on at least one of said arms for interengagement with said first portion in said frame when the magazine is fully inserted into said chamber for releasably retaining the magazine in place in said chamber, said arms including outer surface portions exposed between the edge portions of said slots adapted to be squeezed together to disengage the portions of said catch mechanism to enable withdrawal of the arms from said slots and the magazine from said chamber.



5,566,489

## OVER-BARREL FLASH GUARD FOR USE WITH A MUZZLE-LOADING FIREARM

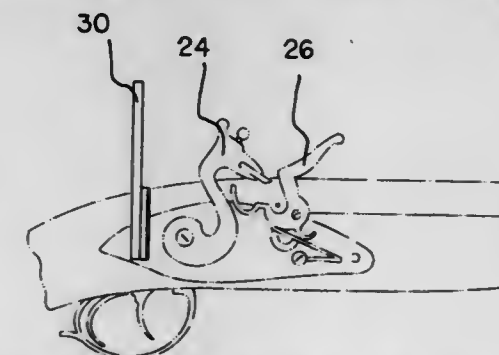
Gary F. Artman, and Ronnie G. Artman, both of RD #1, Box 8, Hartstown, Pa. 16131

Filed May 12, 1995, Ser. No. 440,485

Int. Cl.<sup>6</sup> F41A 35/00; F41H 5/12

U.S. Cl. 42—83

6 Claims



2. An over-barrel flash guard for use with a muzzle-loading firearm comprising:

a) a plate having a front surface, a back surface, and a periphery interconnecting the surfaces formed of an upper edge, a lower edge, a vertical long side edge, and a vertical short side edge and with the side edges interconnected between the upper edge and the lower edge, the plate further having a notch formed on the lower edge and wherein the notch has a narrow upper part and a wide lower part and wherein the lower part of the notch defines a holding space for removably holding a stock of a muzzle-loading firearm at a location near a flintlock thereof and the upper part of the notch defines a sighting window aligned with a sight on the barrel of the muzzle-loading firearm.

5,566,488

## PISTOL GRIP MAGAZINE ADAPTOR

Edwin Y. Yap, 9092 Talbert Ave. #11, Fountain Valley, Calif. 92708

Filed Dec. 9, 1994, Ser. No. 352,366

Int. Cl.<sup>6</sup> F41A 9/71

U.S. Cl. 42—49.02

4 Claims

1. A device for mounting in a hand gun handle magazine comprising:

an insert having a front side, a rear side, a right side and a left side to fit against a magazine wall of the hand gun handle magazine;  
wherein the rear side having a rectangular shaped opening defined therein with the front side having a clip holder slot defined therein;  
the insert having a volume to define a clip space therein into which a clip may be loaded; and  
the insert is retained in the magazine by a means for attachment to the magazine.

5,566,490

## SIGHT COVER

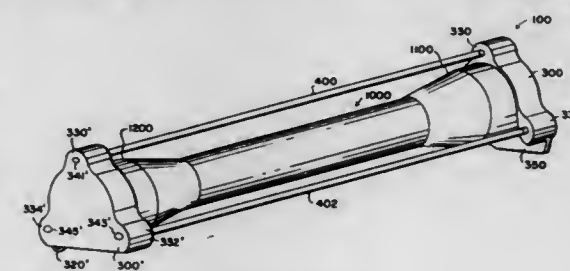
Dave Owen, P.O. Box 520407, Independence, Mo. 64052

Filed Mar. 31, 1995, Ser. No. 414,318

Int. Cl.<sup>6</sup> F41G 1/04; G02B 23/16

U.S. Cl. 42—90

19 Claims



12. A lens cover for a sight comprising:

a first housing presenting a cover adapted for a first end of a sight;  
 a second housing presenting a cover adapted for an opposed second end of the sight;  
 at least one first elastic extending between said first and second housings;  
 a second elastic extending between said first and second housings;  
 a conduit extending through each of said housings for engaging an end of each of said elastics extending between said housings, said at least one first elastic and second elastic being in tension when said housings are positioned at the first and second ends of the sight, said second elastic having a length less than said first elastic and being in greater tension when said housings are positioned at the first and second ends of the sight, said tensioned elastics returning to a normal untensioned position upon movement of a portion of one of said housings away from the adjacent sight end, said elastic movement springily displacing said housings away from the ends of the sight.

5,566,491

# METHOD AND APPARATUS FOR ANIMATING A FLOATING WATERFOWL DECOY

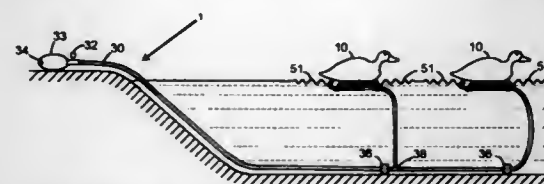
Richard J. Phillips, Rt. 1, Box 366, 9816 NW. 171 Terr., Alachua, Fla. 32615

Filed Oct. 18, 1994, Ser. No. 324,964

Int. Cl.<sup>6</sup> A01M 31/06

U.S. Cl. 43—3

17 Claims



3. An animating apparatus for use with a first waterfowl decoy floating on a water surface above a bottom, which apparatus can be hand-operated by a remotely-located hunter to give the first decoy the appearance of being alive, the apparatus comprising:  
 a tube having a proximal end and a distal end with an opening therein, and a predetermined length;  
 means, attached to the proximal end of said tube for providing an air flow to the proximal end of said tube;  
 a first flexible container;  
 means for attaching the first flexible container to an underside of the first decoy;  
 an anchor weight;  
 means for attaching the anchor weight to the tube to anchor the first decoy in place; and  
 means for attaching the distal end of said tube to the first flexible container to permit air flow into and out of the first flexible container, such that the first flexible container is positioned proximate the first decoy and beneath the water surface such that the air flow provided by the providing means flows from the distal end of said tube and enters the first flexible container causes the first decoy to tilt and generate rings, ripples and waves on the water surface near the first decoy causing the first decoy to appear alive.

5,566,492

# VACUUM DEVICE FOR HARVESTING BRINE SHRIMP EGGS

Michael D. Swenson, Salt Lake City, Utah, assignor to Bruce C. Sanders, Ogden, Utah

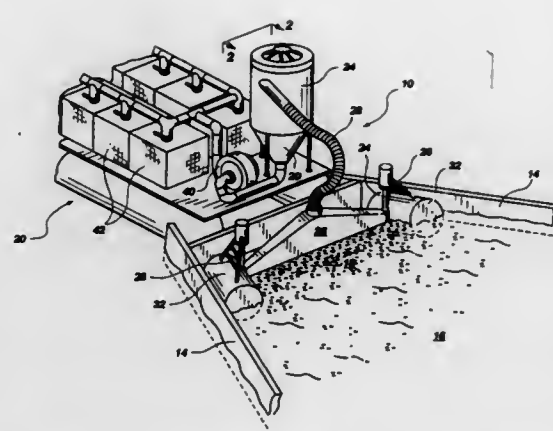
Filed Mar. 16, 1995, Ser. No. 405,346

Int. Cl.<sup>6</sup> A01K 79/00

U.S. Cl. 43—6.5

21 Claims

1. A device for harvesting brine shrimp eggs comprising:



means for concentrating brine shrimp eggs floating at the surface of a body of water;  
 a vacuum system using air flow for removing a surface layer containing a mixture of brine shrimp eggs and water from the body of water and depositing the mixture in a holding tank;  
 a porous storage container; and  
 a pumping system for conveying brine shrimp eggs from the holding tank to the porous storage container.

5,566,493

# LAMP WITH RETRACTABLE UNIVERSAL BULB FOR FISHING RODS

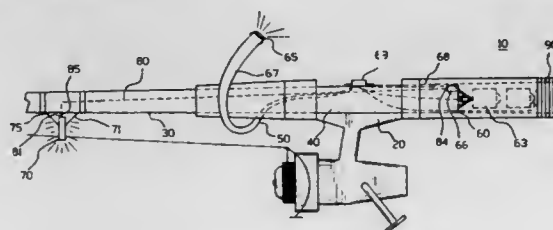
Richard T. Minorics, 2465 N. Delaware Ave., Easton, Pa. 18042

Filed Dec. 20, 1995, Ser. No. 580,075

Int. Cl.<sup>6</sup> A01K 87/00; 87/04

U.S. Cl. 43—17.5

20 Claims



13. A fishing pole comprising:  
 a) a hollow handle portion and a hollow rod portion at an end of said hollow portion;  
 b) said hollow handle portion having an externally exposed segment;  
 c) said self-contained lamp unit having an electrical source, at least one bulb electrically connected to said electrical source via a flexible, elongated means for connecting and a means for switching from a first position which supplies electrical current from said electrical source to said at least one bulb, to a second position which supplies no electrical current;  
 d) said hollow handle portion having a means for placing and retaining said self-contained lamp unit within an interior of said hollow handle portion;  
 e) said means for placing and retaining positioning said flexible, elongated connection means such that it is aligned with said externally exposed segment, wherein said position of said flexible, elongated connection means allows for universal positioning of said at least one bulb in any desired direction;  
 f) a plurality of eyes disposed on an external side of said rod portion, said eyes being constructed of a light conductive material; and  
 g) a plurality of optical fibers having a first end and a second end, said first end abutting said at least one bulb and said second end abutting an end of said eyes closest to said external side of said rod portion, said rod portion having an opening for each of said plurality of eyes to allow one of said

plurality of optical fibers to abut each of said plurality of eyes, wherein said plurality of optical fibers will transmit light to each of said plurality of eyes and effecting illumination of same, when said means for switching is in a first position.

5,566,494

# LUMINESCENT FISHING LURE

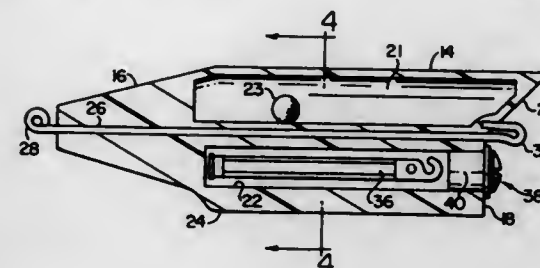
Stephen A. Zimmer, 43 Terrace Garden, Wallingford, Conn. 06492

Filed Jun. 6, 1995, Ser. No. 469,846

Int. Cl.<sup>6</sup> A01K 85/00

U.S. Cl. 43—17.6

16 Claims



1. An illuminated top water lure comprising a translucent axially elongated lure body having a generally cylindrical main part and a generally conical rear part, said main part defining a front wall having a generally radially disposed lower portion and an upper portion forwardly and upwardly inclined from said lower portion, said main part having a generally solid lower portion and a substantially hollow upper portion, said lower portion having a blind bore therein opening through said front wall lower portion, a chemiluminescent light stick freely received within said bore, closure means received within a forward end of said bore and cooperating with said lure body for sealing said bore and releasably retaining said chemiluminescent light stick therein, a barbed hook, hook attaching means for securing said hook to said lure body, and connecting means for attaching a line to said lure.

5,566,495

# FISHING ROD HOLDING AND SUPPORTING DEVICE

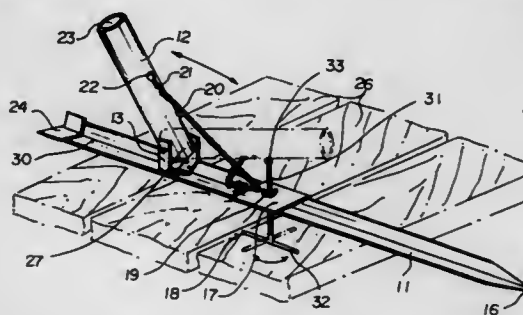
Sun K. Kim, 14208 Wood Whell Ter., Silver Spring, Md. 20906, and Pok K. Kim, 15014 Athey Rd., Burtonsville, Md. 20866

Filed Aug. 16, 1995, Ser. No. 515,944

Int. Cl.<sup>6</sup> A01K 97/10

U.S. Cl. 43—21.2

5 Claims



1. A fishing rod holding and supporting device comprising:  
 a tubular receiver for slidably receiving and supporting a fishing rod, said tubular receiver including:  
 an opening disposed in an upper end thereof for slidably receiving the fishing rod,  
 a pivot pin attached to a bottomward end thereof said pivot pin horizontally disposed in a cross position of the tubular receiver, and  
 a locking aperture disposed on a middle portion thereof,

a V-shaped stand member for supporting the fishing rod on the ground surface and a wood floor deck, said V-shaped stand member including:

a U-shaped hinge disposed on an upper position thereof for pivotally receiving the pivot pin of the tubular receiver so as to pivotally lift the tubular receiver containing the fishing rod when a fish is eating bait on the fishing hook,  
 a V-shaped rubber support adhered to a topward end thereof for comfortably supporting the tubular receiver,  
 a pointed tip disposed at the most bottomward end thereof for inserting the stand member into the ground surface, a center aperture disposed on a center portion and disposed in a valley thereof and slidably receiving a T-shaped anchor so as to tightly attach the V-shaped stand member in a downward position to the wood floor deck.

5,566,496

# UNIVERSAL CRANK BAIT LURE

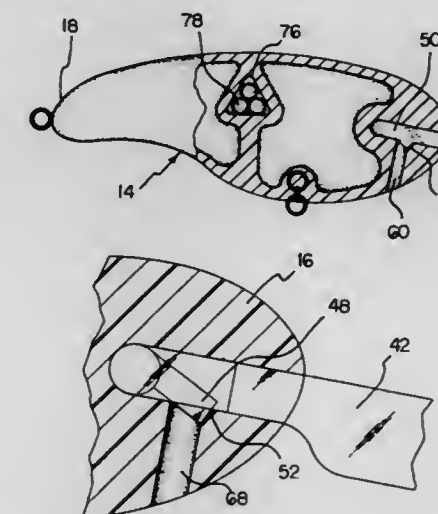
Darin C. Rutherford, 5205 S. Walnut St., and Donald E. Rutherford, II, 4809 West Cr. 500, S., both of Muncie, Ind. 47302

Filed Feb. 5, 1996, Ser. No. 596,584

Int. Cl.<sup>6</sup> A01K 85/00

U.S. Cl. 43—42.09

8 Claims

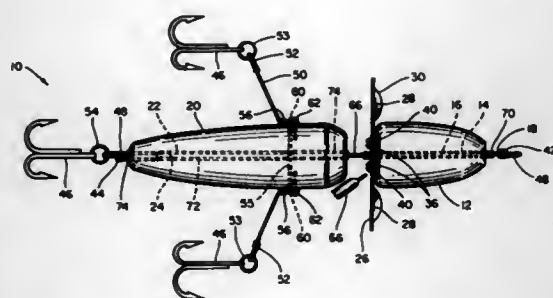


2. A universal crank bait lure comprising:

a rigid body portion having a head end and at least one hook attached thereto;  
 a plurality of interchangeable, rigid bill inserts each having a back end with a locking tab, and positionable within an opening of the head end of the body portion, the locking tab of each bill insert being capable of engaging an interior ledge of the opening with a snap fit;  
 each bill insert having an eye hook attached midway between a front end and the back end, and capable of having fishing line tied thereto; and  
 a passage being accessible from a bottom side of the head end and interconnecting with the opening of the head end of the body portion, the passage being capable of receiving therein an ejector tool having a shaft for positioning within, the shaft being capable of applying a lift force to the locking tab for release of each bill insert from within the head end.



5,566,497  
SOUND PRODUCING FISHING LURE  
Gerald W. Oesterreich, 5071 S. 68th St., Greenfield, Wis. 53220  
Filed Dec. 8, 1994, Ser. No. 351,626  
Int. Cl.<sup>6</sup> A01K 85/01; 85/12  
U.S. Cl. 43—42.16  
20 Claims



15. A variable sound producing and splash generating fishing lure, comprising in combination:

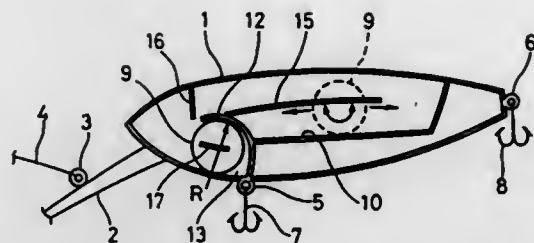
- (a) an elongated head portion having a first axial bore extending axially for rotational securement of the elongated head portion to a front portion of a wire shaft;
- (b) an elongated body portion having a second axial bore extending axially for securement of the elongated body portion to a back portion of the wire shaft;
- (c) a blade having radially extending splash producing curved blade ends, the blade having a wire shaft hole for insertion of the wire shaft therethrough, the wire shaft hole being positioned in an off-centered location of the blade for producing unbalanced rotation of the blade;
- (d) means for loosely securing the blade to a back side of the elongated head portion for movement relative to the elongated head portion while rotating with the elongated head portion to produce a variable amount of clicking sound caused by vibratory action of the blade intermittently striking the means for loosely securing when the fishing lure is drawn through water;
- (e) the wire shaft having a front end and a back end, the front end having means for connection of the shaft to a line, the back end having means for connection of the shaft to a hook; and
- (f) a wire hook hanger connected to the elongated body portion, the wire hook hanger having eyelet ends extended in a spaced apart relationship from the elongated body portion so that hooks operatively connected to the eyelet ends are free from entanglement with one another.

5,566,498  
MECHANISM FOR MOVING AND HOLDING BALANCE-  
WEIGHT IN LURE  
Koichi Itoh, Shizuoka, Japan, assignor to Megabass Co., Ltd.,  
Shizuoka, Japan  
PCT No. PCT/JP94/00432, § 371 Date Nov. 16, 1994, § 102(e)  
Date Nov. 16, 1994, PCT Pub. No. W094/21112, PCT Pub.  
Date Sep. 29, 1994

PCT Filed Mar. 17, 1993, Ser. No. 341,614  
Claims priority, application Japan, Mar. 19, 1993, 5-018625

U.S. Cl. 43—4231 Int. Cl.<sup>6</sup> A01K 85/00 10 Claims

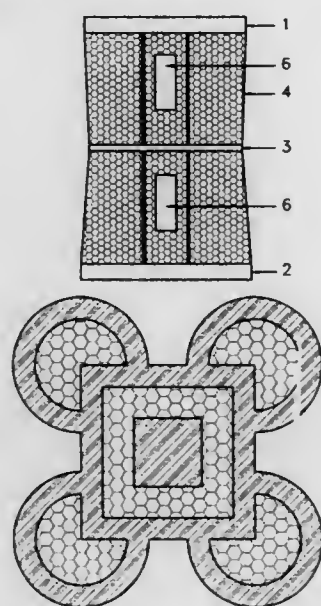
1. A lure having a mechanism for moving and holding a balance-weight, the lure comprising:  
a lure body having exterior walls defining an interior;  
a lip mounted at a front end portion of the lure body;  
an interior wall forming a guide channel in the interior of the lure body between the front end portion and a rear portion of the



the lure body wherein the guide channel is formed by the exterior wall on a top side of the lure body and the interior wall; and

a balance-weight incorporated in said lure body, wherein said balance-weight is adopted to be movable along a longitudinal direction of said lure body by rolling along the guide channel, said guide channel having a pocket provided at the front end portion thereof wherein the pocket is formed by extending the interior wall to the exterior wall at a bottom side of the lure body wherein the bottom side is opposite the top side and further wherein the balance-weight is held within said pocket in a first position and movable in the guide channel to a second position remote from the first position.

5,566,499  
**COLLAPSIBLE BAIT TRAP AND DECOY CAGE TO  
 TANTALIZE AND ATTRACT PREDATOR FISH**  
 John Washecka, 8915 Fairway Hill, Austin, Tex. 78750  
 Filed Mar. 29, 1995, Ser. No. 412,933  
 Int. Cl.<sup>6</sup> A01K 69/06; 71/00; 69/10  
 U.S. Cl. 43—100 2 Claims

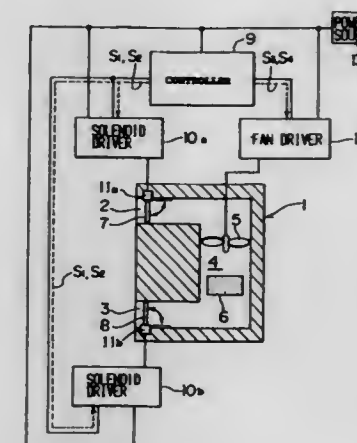


1. An improved collapsible fish trapping and holding system including a substantially multi-cylindrical shaped receptacle having a centrally located feed compartment and two or more semi-cylindrical chambers attached to the centrally located feed compartment which comprises:

- (a) a substantially multi-cylindrical floating top panel;
- (b) a substantially multi-cylindrical bottom panel slightly smaller than the top panel;
- (c) a substantially multi-cylindrical reinforcing or rigidifying ring slightly smaller than the bottom panel;

**5,566,502**  
**ROOM INSECTICIDE DISPENSER**  
Hiromi Shigetoyo, Tokyo, Japan, assignor to Nihon Naishi Inc.,  
Japan  
Filed Jan. 17, 1995, Ser. No. 373,616  
Claims priority, application Japan, Jan. 29, 1994, 6-026352  
Int. Cl.<sup>6</sup> A01M 13/00  
U.S. Cl. 43—125 6 Claims

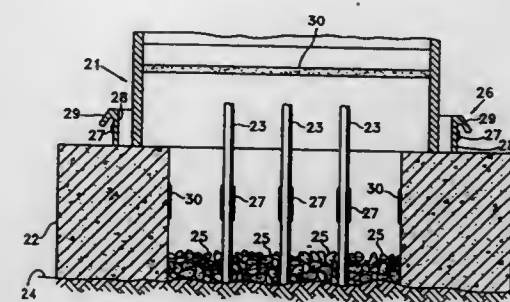
- (d) a collapsible, flexible net vertical side panel connected to the top panel and bottom panel;
- (e) the multi-cylindrical ring would be attached approximately in the middle of the net side panel;
- (f) a funnel which is created when two semi-cylindrical chambers are adjacent to each other they will form a converging conical shaped entrance that serves as a funnel into the trap system;
- (g) a fish trap entrance gate molded on the top panel;
- (h) fish doors are attached to the net vertical side panel at said funnel with a self locking cable tie, the unused portion of the cable tie acts as an obstacle to trapped fish leaving through the fish doors;
- (i) cable ties are fastened from the inside of the trap, the end of the cable ties are not cut and will remain as an obstacle to fish trying to leave the trap by means of the fish doors;
- (j) all parts, with the exception of the net side panel are made of a rigid plastic or fiberglass;
- (k) the net side panel is comprised of a nylon or other man made material that is for use in the salt water.



5,566,500  
SURFACES COATED WITH FLUOROCARBON RESINS  
UPON WHICH INSECTS CANNOT CLIMB OR ALIGHT  
AND METHODS AND MEANS FOR THEIR  
ESTABLISHMENT

**Roger H. Long, Auburn, Pa., assignor to Consep, Inc., Bend, Oreg.**  
**Division of Ser. No. 81,230, June 25, 1993, Pat. No. 5,392,559,**  
**which is a continuation-in-part of Ser. No. 694,689, May 2,**  
**1991, abandoned. This application Nov. 8, 1994, Ser. No.**  
**336,310**

U.S. Cl. 43—121



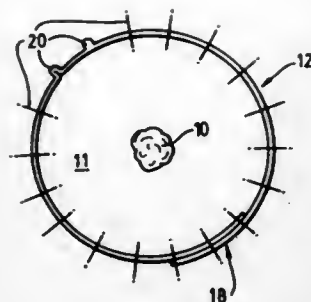
1. A dispersion for coating surfaces to prevent insects from crawling up or alighting upon said surfaces after coating the same with said dispersion when said surfaces are inclined to a horizontal plain, said dispersion consisting essentially of (a) a fluorocarbon resin having a particle size between about 0.05 and 0.5 micron and a viscosity less than about 15 centipoise and (b) a freeze/thaw additive that is a lower alcohol having fewer than five carbon atoms

**5,566,501**  
**Patent Not Issued For This Number**

5,566,503  
PLANT WATERING AID ENCLOSURE  
Jack Nickson, Warren Down, Peasemore Newbury RG16 0JL,  
United Kingdom  
PCT No. PCT/GB92/00775, § 371 Date Sep. 6, 1994, § 102(e)  
Date Sep. 6, 1994, PCT Pub. No. WO92/19096, PCT Pub.  
Date Nov. 12, 1992  
PCT Filed Apr. 27, 1992, Ser. No. 140,202  
Claims priority, application United Kingdom, Apr. 25, 1991,  
9108864

U.S. Cl. 47—33      Int. Cl.<sup>6</sup> A01G 1/00      6 Claims

1. A plant watering aid comprising an elongate wall of flexible water-impervious material having a first end and a second end, said elongate wall being adapted to be formed into a closed continuous wall with said first end overlapping said second end and fixed thereto, said closed continuous wall being inserted in the ground around a plant to be watered, thereby to define a water-retaining enclosure, said elongate wall including a plurality of vertically extending projections distributed at regular intervals along a first side of said elongate wall, a plurality of vertically extending recesses defined at regular intervals along the other or second side



of said elongate wall, each recess of said plurality of recesses selectively resiliently receiving and gripping each of said projections, for sealingly securing said first end and said second end of said elongate wall together to form said closed wall.

5,566,504

## COMBINATION DOOR GASKET AND SAFETY EDGE STRIP

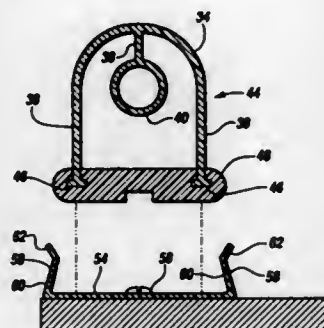
John A. Pitel, 16 Hawthorne Pl., Dumas, Ark. 71639

Filed Apr. 3, 1995, Ser. No. 416,582

Int. Cl.<sup>6</sup> E05F 15/02

U.S. Cl. 49—28

8 Claims



3. An automatic door assembly comprising:
- a closure which has a leading edge, wherein the closure is movable between a position which obstructs a portal and a position which allows access to said portal;
  - means for moving the closure between a position allowing access to the portal and a position obstructing the portal;
  - a flexible gasket which extends along the closure leading edge, wherein the gasket has a wall which protrudes from the leading edge and which defines a gasket interior between the leading edge and the gasket;
  - a rib which is integrally formed with the gasket and which extends toward the closure leading edge;
  - a signal tube which is positioned within the gasket interior and which is integrally formed with the rib and connected along the length of the rib, and thereby spaced from the leading edge in an undeflected condition, wherein deflection of a portion of the gasket causes a deflection of the signal tube;
  - means for retaining the gasket assembly on the leading edge of the closure, wherein the means for retaining the gasket assembly on the leading edge comprises a retainer strip connected to said closure leading edge and having tabs which extend away from the leading edge, and a gasket base engaged with the gasket and engaged with the retainer strip in a snap-fit relation, wherein each tab has a first portion which is inclined inwardly toward the other tab, and a second portion extending from the first portion which is inclined

outwardly away from the other tab, and wherein the base has rounded edges which are engaged between the tab first portions;

- a sensor for detecting air discharged from the signal tube; and
- a controller which is connected to the sensor, wherein the controller reverses the motion of the closure upon detection of air discharged from the signal tube.

5,566,505

## SLIDING DOOR

Masaaki Kamezaki, 1305-2, Nakazato, Iwai-shi, Ibaragi-ken, Japan

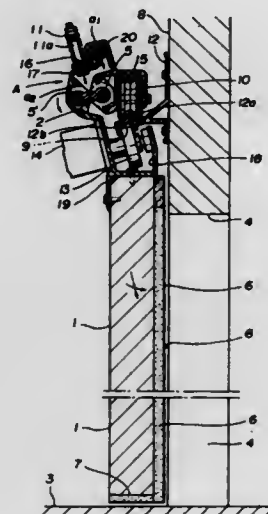
Filed Feb. 14, 1995, Ser. No. 388,404

Claims priority, application Japan, Feb. 15, 1994, 6-040429

Int. Cl.<sup>6</sup> E05D 15/10

U.S. Cl. 49—225

8 Claims



1. A sliding door comprising:
- a door body;
  - a bracket assembly including a first bracket and a second bracket;
  - said first bracket being provided at a lower portion thereof with a first groove which has rolling wheels rotatably supported therein and including a mounting seat section which has elastic suspensions mounted on an upper portion thereof while being slanted at a predetermined inclination angle;
  - said elastic suspensions each including an extensible rod;
  - said second bracket being formed at a lower portion thereof with a second groove which has a driving wheel rotatably supported therein while being slanted at the same inclination angle as that of said elastic suspensions and provided at an upper end thereof with a connection section to which said extensible rod of each of said elastic suspensions is connected at a distal end thereof so as to obliquely upwardly force said second bracket by upward elastic force of said elastic suspensions;
  - said second bracket being provided at a lower end thereof with a door mounting section through which said second bracket is mounted on said door body;
  - two turning pairs including a first turning pair arranged on an outside of said first groove of said first bracket and a second turning pair arranged on an inside of said second bracket opposite to said outside of said first groove;
  - said first and second turning pairs being connected to each other through a link, resulting in providing said bracket assembly;

said door body being mounted at an upper end thereof on said door mounting section of said second bracket, resulting in said bracket assembly being secured to said door body; and a rail including an upper rail surface on which said rolling wheels of said bracket assembly are carried and a lower rail surface slanted at the same inclination angle as that of said driving wheel and pressedly contacted with said driving wheel so as to downwardly force it;

said rail being horizontally rigidly arranged above an entrance of an object to be openably operated by said sliding door;

said door body being kept raised from a floor of said object by upward elastic force of said elastic suspensions while carrying said rolling wheels on said upper rail surface of said rail and said driving wheel being kept pressedly contacted with said lower rail surface of said rail by upward elastic force of said elastic suspensions;

said lower rail surface of said rail being formed on a portion thereof opposite to said driving wheel when said door body is moved to an entrance closed position with a tapered section on which said driving wheel strikes to obliquely move said door body in an inward and downward direction against upward elastic force of said elastic suspension.

5,566,506

## GRAIN BIN LID OPENER

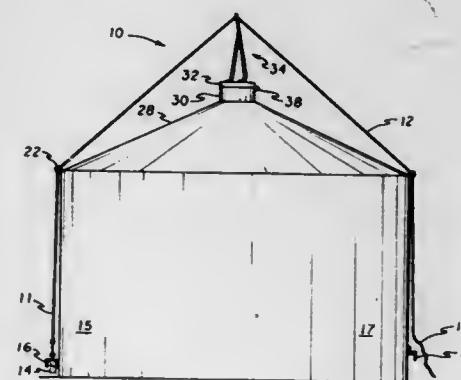
Kenneth D. Phillips, R.R. 1 Box 346, McClure, Ill. 62957

Filed Oct. 23, 1995, Ser. No. 553,785

Int. Cl.<sup>6</sup> E05F 11/00

U.S. Cl. 49—357

6 Claims



1. A ground actuated lid operating system dimensioned and configured to selectively open and close a lid of a storage structure comprising:

- a cable having a first end and a second end;
- said cable originating at said first end from a first side of the storage structure and terminating at said second end at a second side of the storage structure;
- there being a loop formed in said first end of said cable;
- a securing arm pivotally attached to the storage structure and located proximate said first end of said cable;
- a brace located at the top of the storage structure and attached to the lid;
- said cable attached to said brace;
- said loop dimensioned and configured to fit onto said securing arm, wherein when said loop is fitted onto said securing arm said securing arm is capable of securing the lid in a locked position, the lid being actuated by pulling on said second end of said cable, closed by pulling on said first end of said cable, and locked by placing said loop onto said securing arm.

5,566,507

## DOUBLE-HUNG TILTING SASH TYPE WINDOW SYSTEM

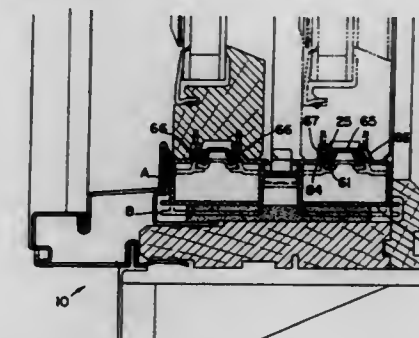
Melvin J. Schmidt, Lakeland, Minn.; Thomas P. Coach, Osceola, Wis.; Glenn C. Hause, Woodbury, Minn.; Dennis A. Galowitz, Stillwater, Minn.; James P. Wyman, White Bear Lake, Minn.; Robert A. Hendricks, New Richmond, Wis.; Lawrence J. Van Steeg, Sioux Falls, S. Dak., and Harold H. Evans, Hudson, Wis., assignors to Andersen Corporation, Bayport, Minn.

Division of Ser. No. 927,204, Aug. 7, 1992, Pat. No. 5,544,450, which is a continuation-in-part of Ser. No. 903,368, Jun. 24, 1992, Pat. No. 5,243,783. This application Jun. 7, 1995, Ser. No. 476,627

Int. Cl.<sup>6</sup> E05D 15/16

U.S. Cl. 49—428

1 Claim



1. A window having an inside and outside, comprising:
- a frame having at least two oppositely disposed side members, a top member and a bottom member;
  - a side jamb liner approximately parallel to and operably connected to each frame side member, the jamb liner having a front face and at least one jamb channel;
  - a sash having two oppositely disposed sides, the sash being slidably mounted in the frame and having a tilted position and an untilted position, the sash in the untilted position having the two sides parallel and proximate opposite frame side members;
  - a locking slide block slidably mounted within the jamb channel for slidably and rotatably mounting the sash to the frame, the locking slide block having a means for retaining the sash, and a locking means adapted for selectively engaging the jamb channel and locking the block in a fixed position when the sash is in the tilted position;
  - a plough extending from the face of each jamb liner in the direction of the opposite frame side member, the plough having an inside facing side and an outside facing side, wherein the outside facing side has a projecting portion extending generally in the direction of the outside of the window;
  - a sash groove in each sash side for slidably mounting the sash in the frame by receiving adjacent ploughs when the sash is in the untilted position, the groove having a generally inside facing side and a generally outside facing side, wherein the inside facing side has a projecting portion projecting generally in the direction of the inside of the window forming an indentation; so that when the sash is in the untilted position the projection portion of the plough engages with the indentation formed by the projecting portion of the groove to resist inward displacement of the sash;
  - means for mounting the jamb liner for lateral displacement from a first position wherein the plough is engaged with the sash groove to a second position wherein the plough is at least partially retracted from the groove;
  - means for laterally displacing the jamb liner from the first position to the second position; and



- (i) a counterbalance operably connected to the frame having a counterbalance tab which includes a means for fastening the tab to the counterbalance, an elongated portion extending from the means for fastening, the elongated portion having a first end proximate the means for fastening and a second end opposite the first end, and a flange proximate the second end.

5,566,508

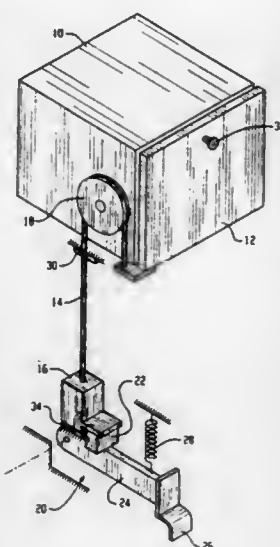
**DRIVE SYSTEM FOR A SLIDING CHAMBER DOOR**  
John C. Houston, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Sep. 19, 1994, Ser. No. 308,661

Int. Cl.<sup>6</sup> E05F 3/00; 11/00

U.S. Cl. 49—445

14 Claims



1. An apparatus for removably enclosing the opening of a chamber, said apparatus comprising:
  - a door, movably mounted to an entry side of said chamber;
  - a counterweight being mechanically connected to the door, the door and counterweight together forming a door/counterweight system wherein the door and the counterweight have different weights so as to create a weight imbalance;
  - a cable and pulley system connecting the door to the counterweight, and thereby suspending the door/counterweight system; and
  - a door actuation assembly substantially in operative mechanical contact with the door/counterweight system for automatically opening the door in response to an actuator, wherein the door actuation assembly comprises a securement, attached to a stationary surface of the apparatus, for releasably engaging the door in a closed position, wherein said securement, when engaged, supplies a securing force sufficient to offset the difference in weights between the door and the counterweight, and wherein, when the actuator disengages the securement, the weight imbalance is sufficient to permit the door to open automatically by gravity acting on the weight imbalance.

5,566,509

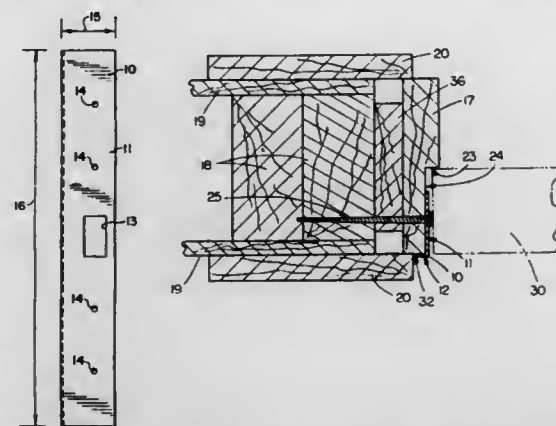
**DOOR JAMB REINFORCEMENT STRIP**

Larry L. Long, 8826 Oak St., Riverview, Fla. 33569  
Continuation-in-part of Ser. No. 139,013, Oct. 21, 1993, abandoned. This application Aug. 14, 1995, Ser. No. 514,682

Int. Cl.<sup>6</sup> E06B 1/04

U.S. Cl. 49—462

8 Claims



1. In combination, a door opening including a wall stud framing said door opening in a wall having at least one wall panel and at least one door casing panel having a forward edge, a vertical door jamb covering said stud and having a face opposite said wall stud and partially defining said door opening and a door jamb edge perpendicular to said door jamb face and underlapping said at least one door casing panel thereby forming an offset distance between said door jamb face and said forward edge of said at least one door casing panel, a reinforced door jamb assembly comprising:
  - an elongated reinforcement strip having an L-shaped transverse cross-section and having a length extending substantially the length of said vertical door jamb, said strip comprised of one short leg and one long leg, said long leg mounted on said door jamb face and said short leg being in flush engagement with said door jamb edge and having a transverse extent such that upon said reinforcement strip being mounted on a door opening, said transverse extent of said short leg of said reinforcement strip is no greater than said offset distance;
  - a plurality of spaced openings formed in said long leg of said reinforcement strip;
  - at least one of said spaced openings being generally rectangular and adapted to receive a tongue of a door latch mechanism in a door and wherein at least one of said plurality of spaced openings is above said rectangular opening and wherein another of said spaced openings is below said rectangular opening; and
  - said elongated reinforcement strip adapted to be mounted on said door opening generally free of modifications to said door casing panel, said door jamb and said door opening.

5,566,510

**MOLDED GLASS RUN CHANNEL CORNER ASSEMBLY**

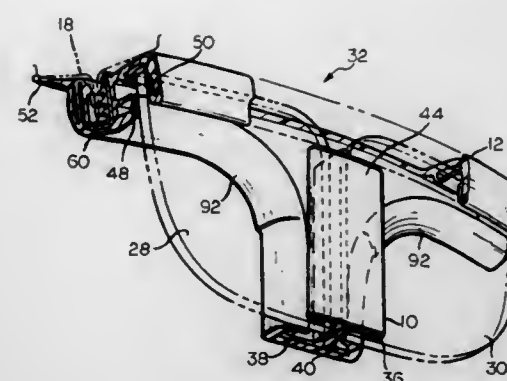
Chris J. Hollingshead, Wabash, and Eric E. Gardner, Hartford City, both of Ind., assignors to GenCorp Inc., Fairlawn, Ohio  
Filed Oct. 26, 1994, Ser. No. 329,605

Int. Cl.<sup>6</sup> E06B 7/16

U.S. Cl. 49—479.1

15 Claims

1. A glass run channel assembly formed by molding, the glass run channel assembly comprising a division post glass run channel and a header glass run channel, the division post glass run channel including an H-shaped cross sectional member having outboard sealing lips including distal finger-like projections and opposing inboard sealing lips including distal finger-like projections, the outboard sealing lips and the inboard sealing lips joined together a selected distance by a cross-piece which functions as a divider to define opposing glass run channels, the outboard sealing lips of the



division post glass run channel having therebetween an outboard presentation surface and the inboard sealing lips of the division post glass run channel having therebetween an inboard presentation surface, the header glass run channel including an inboard sealing lip, outboard sealing lip, inside reveal sealing lip, and a bulb, wherein an inwardly facing edge of the outboard sealing lip, an outwardly facing edge of the inboard sealing lip and the bulb cooperatively form a C-shaped channel and the inside reveal sealing lip and the inboard sealing lip cooperatively form a C-shaped channel to receive a metal flange of an upper door frame, and a corner assembly including:

- a curved inboard sealing lip which bonds with and joins the inboard sealing lip of the header glass run channel and the inboard sealing lips of the division post glass run channel; and
- an inboard presentation surface which bonds with and joins the inboard presentation surface of the division post glass run channel and the inside reveal sealing lip of the header glass run channel, wherein the outboard sealing lips of the division post glass run channel have free edges unconnected to the outboard sealing lip of the header glass run channel.

5,566,511

**BRACE FOR HOLDING A WINDOW SASH IN A WASH POSITION**

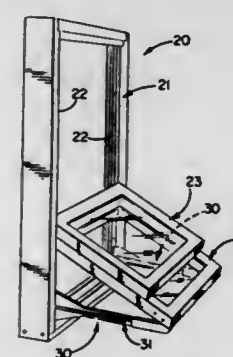
Robert P. Van Drimmelen, R.R. #1, Utica, Ill. 61373

Filed Jan. 9, 1995, Ser. No. 369,894

Int. Cl.<sup>6</sup> E06B 3/00

U.S. Cl. 49—507

14 Claims



1. The combination of:
  - a window comprising (i) a frame having a pair of laterally spaced and vertically extending guide channels, and (ii) a sash slidable upwardly and downwardly in said frame between open and closed positions and swingable downwardly and inwardly from said frame to a wash position; and
  - a brace for holding said sash in said wash position, said brace comprising an elongated arm extending inwardly and generally horizontally from said frame and located beneath said sash, said arm having an inner free end portion engaging one lateral side of said sash near the free end thereof when said sash is in said wash position and preventing said sash from

swinging downwardly from said frame beyond said wash position, and means on the opposite end portion of said arm and releasably received in one of said channels to detachably secure said brace to said frame.

5,566,512

**INFLATABLE STORAGE CHAMBER**

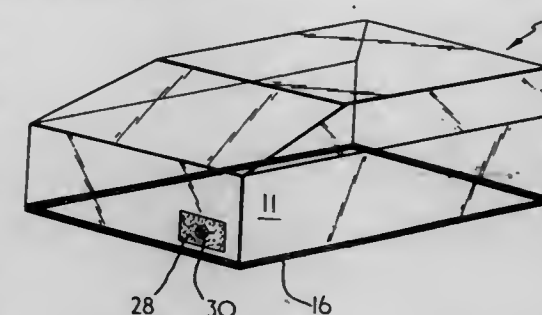
George Page, 123 Jersey Street, Ancoats, Manchester M4 9XX, United Kingdom

Filed May 13, 1994, Ser. No. 242,239

Int. Cl.<sup>6</sup> E04H 15/22; E04G 11/04

U.S. Cl. 52—216

7 Claims



1. An inflatable chamber adapted for the storage of a motor vehicle, which chamber comprises:
  - a plastics material base sheet of generally rectangular shape and of a size not smaller than the vehicle with which the chamber is to be used, the base sheet having four side edges;
  - a flexible plastics material upper sheet preformed to be of such a shape that the upper sheet may enclose a motor vehicle located on the base sheet, the upper sheet defining four lower edges corresponding to the side edges of the base sheet;
  - zipper fastener means extending around all four said side edges of the base sheet and all four said lower edges of the upper sheet whereby operation of the zipper fastener means of the base sheet and the upper sheet joins together the base sheet and the upper sheet to form a substantially sealed chamber;
  - first and second openings formed through the upper sheet at opposed positions therein;
  - electrically driven air fan means mounted on the upper sheet around the first opening and arranged to draw air from the ambient and supply said drawn air through said first opening under pressure to the interior of the chamber thereby to inflate the chamber; and
  - adjustable air vent means mounted on said upper sheet to overlie said second opening whereby the flow of air through the chamber may be controlled by adjustment of said air vent means.

5,566,513

**GUTTER GUARD APPARATUS**

John T. Herren, 1001 River Rd., Farmville, Va. 23901

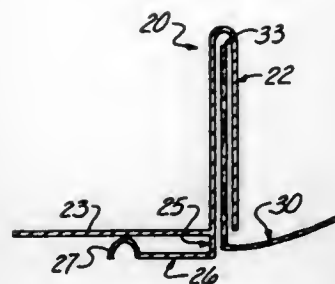
Filed Jun. 6, 1995, Ser. No. 466,177

Int. Cl.<sup>6</sup> E04D 13/064

U.S. Cl. 52—12

9 Claims

1. A gutter guard apparatus for use between the outer lip of a conventional gutter trough and the first and second rows of shingles on a shingled roof, wherein the gutter guard apparatus comprises:
  - a screen member, including a generally flat rectangular sheet of screening material having a first generally flat free end and a second generally vertically disposed captive end, and
  - a guard unit comprising an elongated contoured guard member having first means for captively engaging the vertically disposed captive end of said screening material and a plurality of spaced clip elements for releasably engaging the outer lip of



said conventional gutter trough wherein said first means forms a raised vertical dam to redirect the flow of rain water from said roof into said gutter trough.

#### 5,566,514 SELF-SUPPORTING BUILDING STRUCTURE

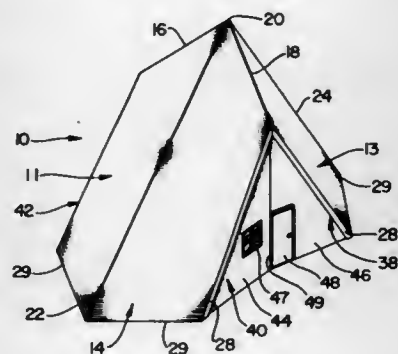
Walter Freller, A-5310 Mondsee, Postfach 2, Innerschwand 226, Australia

Filed Mar. 3, 1995, Ser. No. 397,902

Int. Cl.<sup>6</sup> E04H 1/12

U.S. Cl. 52—79.5

18 Claims



1. A building structure comprising a plurality of sloping sides adjoining one another in the form of a pyramid with adjacent sloping sides joined along a ridge that extends downward from a vertex, said pyramid being truncated along at least one of said ridges below said vertex, thereby forming a first opening which extends through said ridge and two adjacent sloping sides joined at the one ridge, said building structure comprising first, second, third and fourth quadrilateral panels with each one having first, second, third and fourth edges in which the first and third edges oppose each other and the second and fourth edges oppose each other, wherein:

the second edge of the first quadrilateral panel abuts the second edge of the second quadrilateral panel;  
the first edge of the second quadrilateral panel abuts the first edge of the third quadrilateral panel;  
the second edge of the third quadrilateral panel abuts the second edge of the fourth quadrilateral panel; and  
the first edge of the fourth quadrilateral panel abuts the first edge of the first quadrilateral panel.

#### 5,566,515 HIGHLY WIND RESISTANT PRE-ASSEMBLED RELOCATABLE BUILDING STRUCTURE WITH CONTINUOUS SHEET OUTER WALL

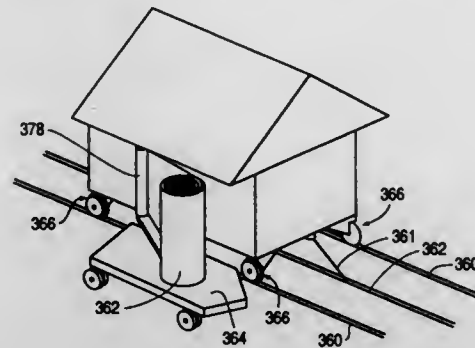
Paul F. Curry, Apartment J-54, 540 Park Blvd., Marion, Va. 24354

Continuation-in-part of Ser. No. 998,673, Dec. 12, 1993. This application Oct. 10, 1995, Ser. No. 540,453

Int. Cl.<sup>6</sup> E04H 9/00

U.S. Cl. 52—79.12

30 Claims



1. A pre-assembled, relocatable building structure which can be transported in completed form and which can be set on foundation members, said building structure having a plurality of sides and a roof, comprising:

- a metallic skeleton including a plurality of pairs of vertically extending column members, longitudinally extending side beam members and laterally extending cross beam members, said side beam and cross beam members being permanently connected to said column members at a level proximate the lower end thereof, said skeleton further including a plurality of angled portions, each of said angled portions being permanently connected to the upper ends of a pair of said column members, said metallic skeleton including at least one cell space defined between adjacent pairs of column members;
- a prefabricated wooden housing unit having a floor, at least one wall and a roof, which is disposed in said cell space, said prefabricated wooden housing unit being effective to fill said cell space and have members located in immediate proximity to each of four column members and which can be fastened to said column members, said wall forming a part of a side of said building structure; and
- a single sheet of material which is wrapped about and fastened to the sides of said building structure, said single sheet covering all sides of said building structure, and having first and second ends which overlap to form a single vertically extending seam.

#### 5,566,516 SPHERICAL GRID

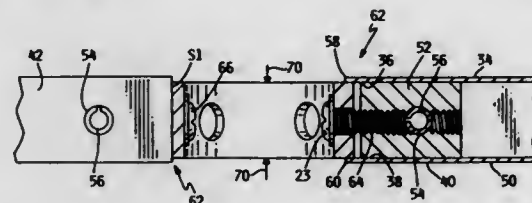
Bryan J. Beaulieu, Burnsville, Minn., assignor to Skyline Displays, Inc., Burnsville, Minn.

Filed May 4, 1994, Ser. No. 237,740

Int. Cl.<sup>6</sup> E04B 1/38

U.S. Cl. 52—81.3

14 Claims



1. A spherical grid of a geodesic configuration, the grid having a spherical center of curvature and comprising:

- a plurality of hubs, each hub having a hub axis, a planar top surface and a planar bottom surface parallel to said top surface, an open interior, an axial thickness separating the top and bottom surfaces, an exterior circumferential surface and a plurality of radial attachment positions, with a radially-extending hole at each attachment position;
- b) a plurality of elongate rigid links, each link having two recessed rectangular ends, each end having an upper lip with an interior upper surface, a lower lip parallel with the upper lip and having an interior lower surface, two parallel vertical edges extending between the upper lip and the lower lip, the separation between the interior upper and lower surfaces sized to the axial thickness of the hub; and an insert member affixed within each end of each elongate link, each insert member having a threaded bore;
- c) a plurality of attachment means for radially attaching each end of the elongate links to one of the attachment positions on one of the hubs whereby the links extend radially from the hubs, whereby the hubs are engaged within the recessed ends, and whereby the parallel vertical edges engage the exterior circumferential surface of the hubs; and wherein each attachment means comprises a threaded screw sized to cooperate with the threaded bore in an insert member, the screw being insertable through the radially-extending hole and being engageable with an insert member; and
- d) a curvature means for aligning each hub axis with the spherical center of curvature.

#### 5,566,517 ARCHITECTURAL PANEL

Mikio Ishii, and Shigeru Mori, both of Miyata-mura, Japan, assignors to Toyoexteria Kabushikikaisha, Tokyo, Japan

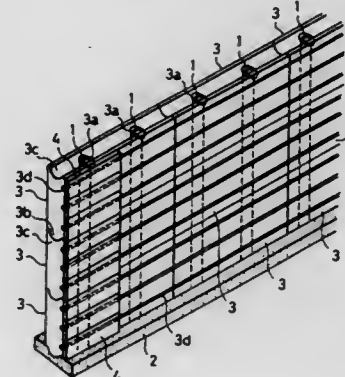
Filed Dec. 27, 1994, Ser. No. 364,475

Claims priority, application Japan, Sep. 10, 1994, 6-242297

Int. Cl.<sup>6</sup> F04B 2/00

U.S. Cl. 52—387

10 Claims



1. An architectural panel comprising:

- a plurality of face members;
- each said face member having a linearly extending projection and a linearly extending groove formed along a back surface thereof, said projection and groove lying parallel to each other entirely across said face member;
- each said groove having substantially the same depth from said back surface as the height of said projection from said back surface and a width wider than a width of said projection;
- a bed having grooves formed along a front surface thereof;
- each face member being fixed to said bed by fitting said projection at said back surface thereof into one of said grooves formed in said front surface of said bed; and
- an adhesive applied to said grooves of said bed and said grooves of said face members such that said bed and said face members are secured to one another with said back surfaces of said face members abutting said front surface of said bed.

#### 5,566,518 CONCRETE FORMING SYSTEM WITH BRACE TIES

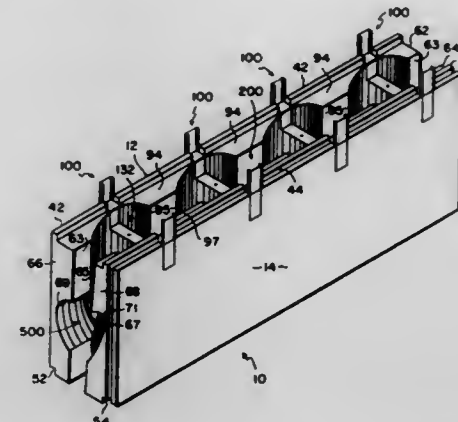
Lynn E. Martin, Paola, Kans.; Jay D. Williamson, Papillion, Nebr.; Kenneth M. Blom, Kansas City, Mo.; Jamieson Vaughan, and Charles S. Smith, both of Omaha, Nebr., assignors to I.S.M., Inc., Paola, Kans.

Filed Nov. 4, 1994, Ser. No. 334,279

Int. Cl.<sup>6</sup> E04B 2/00

U.S. Cl. 52—426

17 Claims



1. In combination with a concrete form, a form tie maintaining a lateral displacement between a pair of sidewalls of the concrete form comprising:

- a support assembly engaging with an exterior surface of each sidewall, each support assembly comprising:
  - at least a lower support plate;
  - means on each support plate engaging the form sidewall adjacent said plate;
- a web connecting said support assemblies, said web comprising:
  - a horizontal strut extending across a top edge of a respective form sidewall, each strut connected to at least said lower support plate of a respective support assembly;
  - a hanger depending from each strut and into a cavity presented between the laterally displaced sidewalls of the form;
  - a bridge spanning said hangers in extension between the sidewalls.

#### 5,566,519 PREFABRICATED PANEL FOR BUILDINGS AND CONSTRUCTIONS AND SYSTEM FOR ITS COUPLING AND ASSEMBLY

Antonio Almaraz-Miera, Escudator Ordóñez 32 - 34 at 1<sup>a</sup>, 08016 Barcelona, Spain

Filed Apr. 5, 1995, Ser. No. 417,214

Claims priority, application Spain, Apr. 7, 1994, 9400787

Int. Cl.<sup>6</sup> E04B 2/08

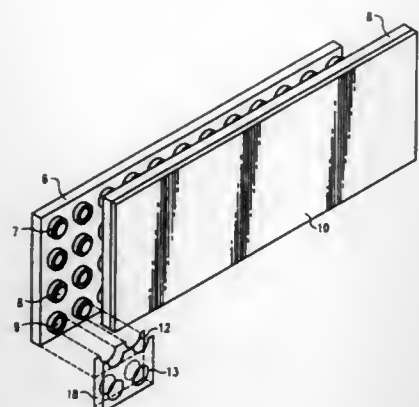
U.S. Cl. 52—592.1

23 Claims

1. A prefabricated panel for buildings and constructions, comprising:

- a plate with faces, said plate having on at least one of said faces projections, said projections having one of a recess and a protuberance alternatively thereon for mortise-and-tenon coupling of said panel with a second panel having mating projections thereon that include the other of a recess and a protuberance, at least one of said protuberances on said panel and mating protuberances on a second panel being comprised of a material more resilient than said projections to provide a removable interference fit between said panel and a second panel for disassembly of said panel and a second panel, said projections on said panel and projections on a second panel defining a hollow space of a predetermined configuration between said panel and a second panel.





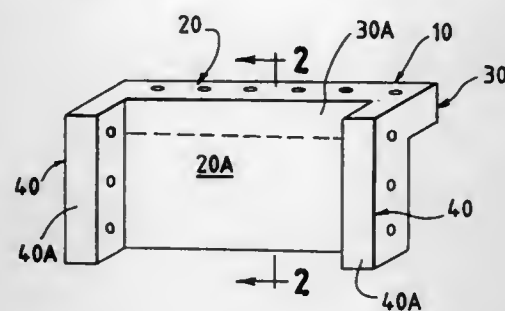
### 5,566,520 INTEGRATED PRECAST CONCRETE FORMING SYSTEM

Abraham Branitzky, 520 Carriage Dr., West Chicago, Ill. 60185

Filed Dec. 9, 1993, Ser. No. 165,018  
Int. Cl.<sup>6</sup> E04C 2/04; E04B 5/04

U.S. Cl. 52—596

14 Claims



1. Integrated precast concrete wall modules designed to be lifted into place and attached to form a structure having an interior adjacent an inner working or living space and an outer exterior, each wall module comprising:

- a web having inner and outer web surfaces defining a web thickness, opposing lateral edges, and opposing top and bottom edges, with the inner web surface being adapted to be located adjacent the interior surface of the structure;
- at least two vertically extending columns associated with the web to enhance the ability of the web to resist bending, each column being positioned adjacent one of the lateral edges of the web, and each column also having inner and outer column surfaces defining a column thickness, with the column thickness being substantially greater than the web thickness, the inner column surface being substantially coplanar with the inner web surface, and the outer column surface projecting in a transverse direction outwardly beyond the outer web surface; and

- a beam being unitary constructed with the web and columns, the beam providing rigidity to the web and strengthening the web against web failure during lifting of the module, the beam being positioned adjacent the top edge of the web and having an inner beam surface located adjacent the interior of the structure and projecting beyond the inner web and inner column surfaces, and an upper surface of the beam being substantially coplanar with an upper surface of the columns and thereby forming a uniform upper surface of the wall module, whereby the resulting wall module can be lifted or tilted into place without structural cracking, and then attached to other wall modules to form the structure.

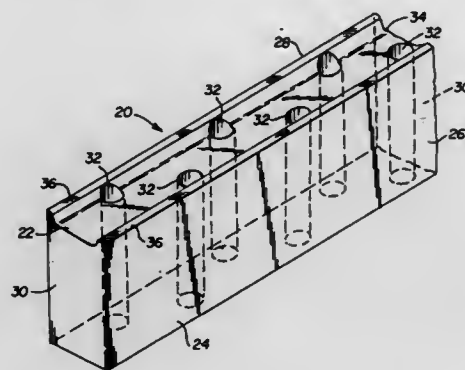
### 5,566,521 BUILDING STRUCTURE AND METHOD

Richard E. Andrews, 13852 W. 78th Pl., Arvada, Colo. 80005, and Mark E. Wilsey, P.O. Box 902, Pagosa Springs, Colo. 81147

Filed Aug. 10, 1994, Ser. No. 288,347  
Int. Cl.<sup>6</sup> E04B 2/20; E04C 2/10

U.S. Cl. 52—606

23 Claims



1. A building structure, comprising:
  - a building block having opposite faces, formed of a synthetic material having a predetermined low density and predetermined high thermal resistance; wherein:
    - said block defines a plurality of approximately vertical core spaces extending between top and bottom surfaces of the block and arranged in at least two core space rows running approximately parallel to a predetermined face of the block;
    - said core space rows are offset from each other such that each core space row is spaced from said predetermined face by a different distance; and
    - the top surface of the block defines a top trough in communication with one end of said core spaces;
  - a cementitious material substantially filling said core spaces and top trough;
  - a plurality of core rods of predetermined high tensile strength similar to concrete reinforcing rod, embedded in said cementitious material in said core spaces, with at least one core rod being located in substantially each core space; and
  - at least one trough rod of predetermined high tensile strength similar to concrete reinforcing rod being located in the top trough.

### 5,566,522 RIBBED PLATE FOR A COMPOSITE SLAB

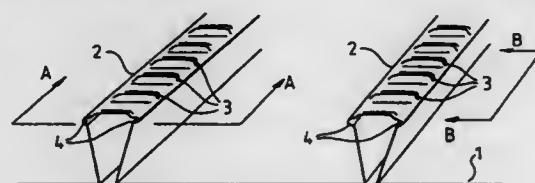
Casper Alander, and Tarmo Mononen, both of Espoo, Finland, assignors to Rannila Steel Oy, Vimpeli, Finland.

PCT No. PCT/FI93/00156, § 371 Date Oct. 20, 1994, § 102(e) Date Oct. 20, 1994, PCT Pub. No. WO93/21405, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 13, 1993, Ser. No. 318,724  
Claims priority, application Finland, Apr. 13, 1992, 921642  
Int. Cl.<sup>6</sup> E04C 2/26; E04B 5/40

U.S. Cl. 52—630

15 Claims



1. A ribbed plate for a composite slab, comprising:
  - an essentially planar plate;
  - protruding ribs formed in the essentially planar plate;

- said protruding ribs including spaced apart side walls connected to each other by an upper flange;
- said upper flange being surface profiled in order to achieve better adhesion between the ribbed plate and concrete of the composite slab;
- the surface profiling of the upper flange of each rib including spaced apart transverse corrugations extending across the upper flange;
- a junction of respective said side walls and the upper flange including a longitudinal protrusion with an essentially U-shaped cross-section; and
- the transverse corrugations being supported on the longitudinal protrusions and extending over them.

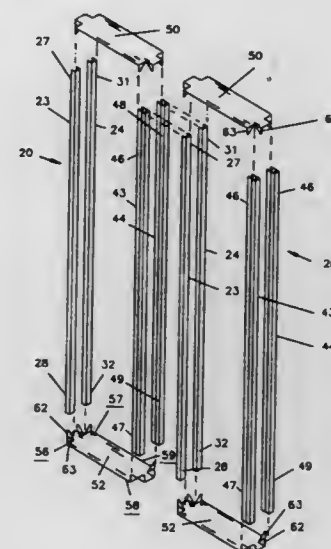
### 5,566,523 WALL PANEL CONSTRUCTION

Leroy Ozanne, 15800 S. Woodland, Shaker Heights, Ohio 44120

Filed Jun. 20, 1995, Ser. No. 493,224  
Int. Cl.<sup>6</sup> E04H 1/00

U.S. Cl. 52—655.1

24 Claims



1. A generally box shaped wall panel construction including in combination a first pair of spaced and generally parallel side frame members each having first and second end portions, each of said side frame members of said first pair having a generally channel shaped cross section, said frame members having three sides and one open end, said open end of each channel shape facing in a first direction,

- a second pair of spaced and generally parallel side frame members each having first and second end portions, each of said side frame members of said second pair having a generally box-shaped cross section with a portion of the box-shape facing in a second direction opposite said first direction, first and second plates respectively connecting said first and second end portions of said first and second pair of said side frame members in a fixed position with respect to each other, each said plate having four corners, of each corner being formed into first and second tabs extending generally normal to the plate and generally at a right angle to each other, an end portion of each side frame member residing adjacent said first and second tabs of a corner of a plate, and an affixing means connecting said tab to said end portion of said side frame member to fixedly secure the same together.

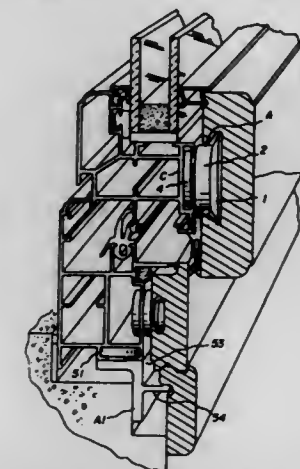
### 5,566,524 COUPLING FOR COMPOUND PROFILE MEMBERS FOR DOORS OR WINDOWS

Giancarlo Bettin, Gonars, Italy, assignor to Archimede Progetti SRL, Gonars, Italy  
PCT No. PCT/IT92/00048, § 371 Date Feb. 18, 1994, § 102(e) Date Feb. 18, 1994, PCT Pub. No. WO93/04256, PCT Pub. Date Mar. 4, 1993

PCT Filed Apr. 29, 1992, Ser. No. 196,099  
Claims priority, application Italy, Aug. 23, 1991, UD91A0133  
Int. Cl.<sup>6</sup> E04C 2/38

U.S. Cl. 52—717.01

5 Claims



1. Coupling system for profiles of doors and window frames comprising a plurality of profile connection keys (A) spaced along a first profile (C), a second profile B, each of said profiles having longitudinal grooves facing each other, the profile connection keys (A) each having first and second sides and opposite flanges on said sides, said flanges being connected to the profiles by rotation after their insertion in the respective profile grooves, one of said flanges comprising a substantially rectangular key hooking head having a central longitudinal axis on one side (1) and a disc-shaped flange having a periphery on the other side (4) connected by a neck (3) with an intermediate key shaped spacer (2), said disc-shaped flange (4) has a modified disc-shaped form with resilient interference protrusions (41) extending outwardly of the periphery of the disc-shaped flange on two orthogonal crossing axes (X/Y) respectively crossing at a point coinciding with the central longitudinal axis of said key hooking head (1).

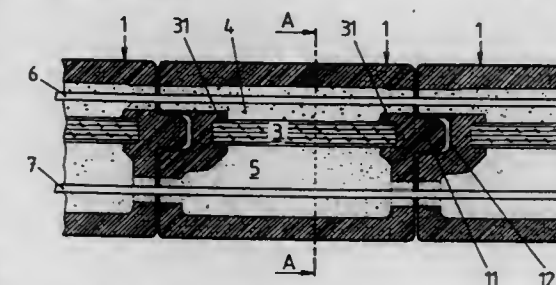
### 5,566,525 METHOD OF ERECTING WALLS, AND FORM ELEMENTS THEREFOR

Alois Schwarz, Kirchdorf, Austria, assignor to C. M. E. Schwarz Holding-Gesellschaft m.b.H., Kirchdorf in Tirol, Austria

Filed Nov. 23, 1994, Ser. No. 344,480  
Claims priority, application Austria, Nov. 23, 1993, 2371/93  
Int. Cl.<sup>6</sup> F04C 1/00

U.S. Cl. 52—745.09

8 Claims



1. A method for erecting walls of a building, which comprises:

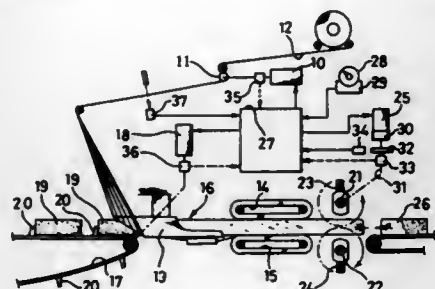
joining form elements together and forming a row of a plurality of mutually adjacent form elements, inserting an insulating layer of a heat-insulating material into the form elements, the heat-insulating material dividing the form elements in a longitudinal direction of a wall into an outer region towards an exterior surface of the wall and an inner region towards an interior surface of the wall; subsequently inserting a heat-conducting layer of readily heat-conducting material in the outer region defined in each form element of the row of form elements; inserting a heat-retaining layer of heat-retaining material in the inner region defined in each form element of the row of form elements; inserting a pipe into the heat-retaining layer for conducting a carrier medium for heating and cooling the wall; and repeating the foregoing steps by placing further rows on the row of form elements and erecting the walls of the building.

**5,566,526**  
**DEVICE MOTOR CONTROLLING APPARATUS FOR USE IN PACKAGING MACHINE**

Yasutaka Suga, Ibaraki, Japan, assignor to Ibaraki Seiki Machinery Company, Ltd., Osaka-fu, Japan  
Filed Aug. 25, 1995, Ser. No. 519,572  
Int. Cl.<sup>6</sup> B65B 9/06; 51/26; 51/30

U.S. Cl. 53—75

5 Claims



1. An apparatus for use in a packaging machine for controlling a rotational speed of a film transportation motor for transporting an elongated film web through a tube forming means to form the film web into a continuous tube, a rotational speed of an article transportation motor for feeding a succession of equidistantly spaced articles to be packaged into the film tube from an entrance side of the tube forming means, and a rotational speed of a sealer driving motor for driving rotary sealers for cross-sealing the film tube between adjacent articles to be packaged on an exit side of the tube forming means, thereby running the respective motors at speeds interrelated with each other, said apparatus comprising:

- a timing means for outputting a signal for every pivoting of shafts of the rotary sealers;
- a rotational angle division detecting means for outputting a multiplicity of pulse signals by subdividing an rotational angle of the shafts of the rotary sealers;
- a reference pulse generator for generating a micropulse as a reference pulse;
- a cycle determining means for determining drive cycles of the respective motors based on the micropulse generated by the reference pulse generator;
- a rotational speed determining means for determining rotational speeds of shafts of the respective motors in a cycle determined by the cycle determining means;
- a cyclic variable speed determining means for determining a cyclic variable speed of the sealer driving motor based on numerical data indicative of a size of the articles input from an input device and by comparing the pulse output from the rotational angle division detecting means with the reference pulse generated by the reference pulse generator; and
- a cycle offset correcting means for correcting cycle offsets of the film transportation motor and the article transportation motor by comparing pulses output from encoders respectively pro-

vided to the film transportation motor and the article transportation motor with the signal output from the timing means.

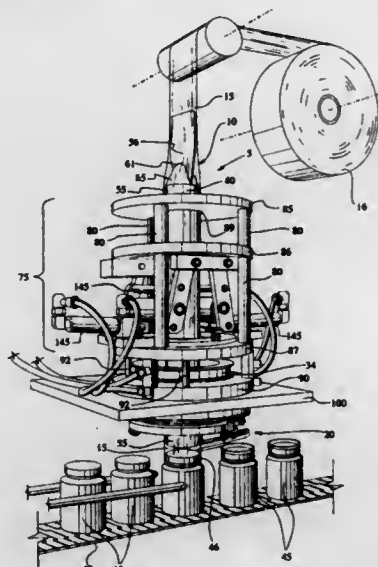
**5,566,527**  
**APPARATUS FOR APPLYING A HEAT-SHRINKABLE BAND TO THE NECK OF A CONTAINER**  
Hugues Drewitz, St. Eustache, Canada, assignor to H.G. Kalish, Inc., Quebec, Canada

Filed May 23, 1995, Ser. No. 447,352

Int. Cl.<sup>6</sup> B65B 7/28

U.S. Cl. 53—295

11 Claims



1. An apparatus for applying a sleeve to a container, the apparatus comprising:

- a) means for advancing the sleeve along a predetermined feed path for causing the sleeve to slip at least partially over the container;
- b) a sleeve cutting assembly, including:
  - a blade carrier rotatable about said feed path;
  - a cutting blade mounted to said blade carrier, said cutting blade being selectively moveable between a cutting position and a non-cutting position, in said cutting position said blade penetrating the sleeve, whereby rotation of said blade carrier causes said blade to slit the sleeve, in said non-cutting position said blade being in a spaced apart relationship with the sleeve thereby allowing the sleeve to advance along said feed path without interfering with said cutting blade.

**5,566,528**  
**FACSIMILE PACKAGING DEVICE AND METHOD**  
Peter H. Y. Lee, 1447 Second St., Manhattan Beach, Calif. 90266

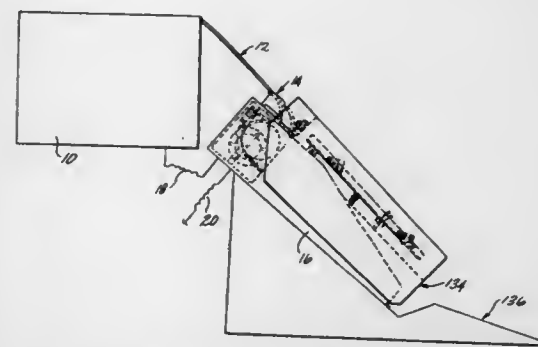
Filed Nov. 16, 1994, Ser. No. 340,581

Int. Cl.<sup>6</sup> B65B 9/02; 11/50; 61/26

U.S. Cl. 53—411

20 Claims

1. A method for packaging a transmission of printed material comprising the steps of: delivering a first sheet of packaging material to a receiving tray, the delivering the first sheet including introducing a recess in a first edge of the first sheet to a stop member in the tray so that the stop member impedes movement of the first sheet; delivering a first page of printed material to the receiving tray so that a lower surface of the first page contacts an upper surface of the first sheet of packaging material, the delivering the first page including placing a first edge of the first page into

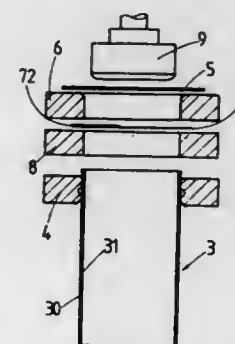


contact with the stop member so that the first edge of the first sheet extends beyond the first edge of the first page; delivering a second sheet of packaging material to the receiving tray; and affixing the second sheet to the first sheet so as to form a package containing the first page.

**5,566,529**  
**PROCESS FOR MANUFACTURING A TUBULAR PACKAGE, AND PACKAGE OBTAINED BY THE IMPLEMENTATION OF THE PROCESS**  
Georges Sireix, 9 bis rue St Marc-68400, Riedisheim, France  
Filed Feb. 21, 1995, Ser. No. 391,540  
Claims priority, application France, Feb. 22, 1994, 94 02003  
Int. Cl.<sup>6</sup> B65B 61/18

U.S. Cl. 53—412

9 Claims



1. A process for manufacturing a tubular package having a tubular body made of a rigid material, a bottom and a lid joined to said body in an impermeable manner, a diaphragm attached between said body and lid, said bottom, lid and diaphragm made of the same or similar rigid material as said body, the process comprising the steps of:

- (1) forming said body;
- (2) forming a first lid cup from a piece cut from a reel of rigid material by drawing said material using a male forming tool and a first external die;
- (3) forming a second lid cup from a piece cut from a reel of a second material by drawing said second material using said drawing tool for forming said first lid cup and a second external die located on a path of said drawing tool between said first external die and said tubular body, said forming step for forming said second lid cup includes the step of forming said second cup to contact a lower face of the first cup at least over part of the height of the lateral surface thereof;
- (4) inserting simultaneously the combination of first and second lid cups in a first end of said body using said male tool via one of the ends of said tubular body held from the outside, near said end by jaws;
- (5) joining at least the upper third of said walls of the first and second cups in an impermeable manner to the inner side wall of the body,

- (6) prescoring the lateral surface of the tubular body along a peripheral line located between a first joint area for joining said first cup to the inner wall of the tubular body and a joint area for joining said second cup, the one forming said diaphragm, to the inner wall of the tubular body;
- (7) providing for opening of the lid without tearing said diaphragm, said step of prescoring being selectively produced either along part of the peripheral line if it is a package with a hinged lid, or right along it, if it is a package with a detachable lid;
- (8) folding over said first end of the tubular body by means of a folding over plug thereby completing the manufacture of the lid;
- (9) turning the body over and filling it with product to be packaged, and
- (10) closing the second end of the tubular body.

**5,566,530**  
**PACKAGING SYSTEM**  
Peter Johnstone; Gary Emmerton, both of C/o. 34-36 Lakeside Avenue., Reservoir Victoria 3073, Australia; Paul J. Fitzpatrick, 18 Enderley venue, Hamilton, New Zealand; Perehama Hanara, 19 St. Winifreds Avenue, Hamilton, New Zealand, and Lindsay G. Wyborn, 73 Nevada Road, Hamilton, New Zealand

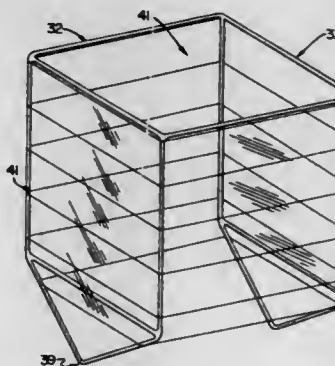
Continuation of Ser. No. 983,560, Mar. 15, 1993, abandoned.

This application Aug. 10, 1994, Ser. No. 288,962  
Claims priority, application Australia, Aug. 9, 1990, PK1658; Jul. 11, 1991, PK7175

Int. Cl.<sup>6</sup> B65B 43/08; 53/00

U.S. Cl. 53—441

11 Claims



1. A method of forming a wrapped, unitized container for liquid, powder, granular or solid material comprising the steps of: forming an open frame, locating a base member in said frame, said open frame defining an open space having a volume approximating the volume of said unitized container; applying stretch plastic wrapping film in stretched condition around said open frame and said base member to form said container open at one end with said open frame in place; filling said container through said open end at least partially with said material onto said base member; removing said open frame from said container open at one end after at least said partial filling; and then closing said open end of said container to form a totally closed container in which said plastic wrapping film and said base member alone form said container.



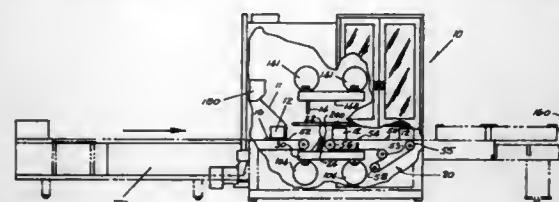
5,566,531

**NAPKIN WRAPPING MACHINE AND METHOD FOR WRAPPING NAPKINS**

John E. Nordstrom, Manitowoc, and Christopher J. Rusch, Two Rivers, both of Wis., assignors to John E. Nordstrom, and Barbara A. Nordstrom, both of Two Rivers, Wis.  
Continuation-in-part of Ser. No. 914,679, Jul. 15, 1992, abandoned. This application May 4, 1994, Ser. No. 237,795  
Int. Cl.<sup>6</sup> B65B 7/00; 11/00; 51/00

U.S. Cl. 53—466

15 Claims



9. A method of wrapping workpieces using a wrapping machine, the work pieces having a front, back, top, bottom, and sides, the wrapping machine including a wrapping material wrapping means for partially wrapping a predetermined portion of the wrapping material around the bottom, front, and top of the workpieces; the predetermined portion of wrapping material having a first tail and a second tail, the first and second tails extending out past the back of the work-pieces; an infeed means, for infeeding a supply of work-pieces into the wrapping material wrapping means; a sealing station, adjacent to the material wrapping means, including a movable first tail folder means for folding the first tail of the wrapping material against the back of the workpieces, a movable second tail folder means for folding the second tail over the first tail to form a tube, having open ends and a rear seam around the work pieces, a movable rear seam sealing mechanism, a separable conveyor assembly having first belt assembly and a second movable belt assembly adjacent thereto, a timed moving means for moving the second movable belt assembly away from the first belt assembly to present a gap between the first belt assembly and the second movable belt assembly for a predetermined period of time, support means for supporting the second tail folder means and the rear seam sealing mechanism, a first control means for controlling the movement of the first tail folder means, a second control means for controlling the movement of the second tail folder means and the rear seam sealing mechanism through the gap with respect to the support means, and timed actuating means for actuating the rear seam sealing mechanism to seal the rear seam; the first tail folder means being connected to the first control means; the second tail folder means and the rear seam sealer mechanism both being connected to the support means and the second control means; the timed actuating means being connected to the support means and the rear seam sealing means; a tucker means adjacent to the sealing station, for tucking in the open ends of the tube of the wrapping material around the sides of the workpieces after the rear seam has been sealed; a sealing means, adjacent to the tucker means, for sealing the ends of the wrapping material against the sides of the workpieces; the conveyor assembly extending from the wrapping means through the sealing station and the tucker means to the sealing means, whereby the work pieces may be conveyed from the infeed means through the napkin wrapping machine to the sealing means, the method comprising the steps of:

feeding the workpieces into the wrapping means and placing a predetermined portion of wrapping material around the work-pieces;

the wrapping material having a first tail and a second tail; continuously moving the workpieces contained in the wrapping material on the conveyor assembly to the sealing station and folding the first tail over the back of the workpieces as the workpieces move from the first belt assembly to the second belt assembly;

separating the second belt assembly from the first belt assembly to form a gap between the first and second belt assemblies; bringing the second tail folder means and the rear seam sealing means through the gap and folding the second tail over the

first tail against the back of the workpieces to form a rear seam and sealing the rear seam; tucking the open ends of the tube of wrapping material against the sides of the workpieces and then sealing the tucked ends in place.

5,566,532

**BAGGER FOR ORGANIC MATERIAL**

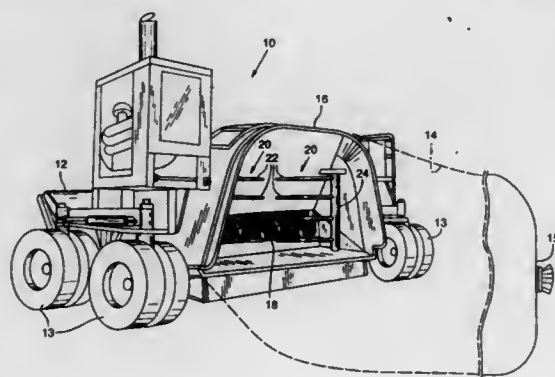
Larry Inman, and Mike Koskela, both of Astoria, Oreg., assignors to Ag-Bag International Limited, Warrenton, Oreg.

Filed Jan. 11, 1996, Ser. No. 584,569

Int. Cl.<sup>6</sup> B65B 1/24; 25/02

U.S. Cl. 53—529

4 Claims



1. A bagging machine including a compaction assist mechanism comprising:

a tunnel including a front inlet and a rear outlet, a rotor positioned in the front inlet for force feeding an organic crop material into the tunnel, and a bag surrounding the rear outlet and defining thereby a bag opening for receiving the organic material from the tunnel;

a gate mechanism positioned in the tunnel between the inlet and outlet, said gate mechanism having a closed position providing a barrier to movement of the organic material through the tunnel and a graduated opened position, and pressure means urging the gate to the closed position and responding to an opposing pressure applied by the force feeding of the material against the gate for graduated opening of the gate following compaction of the organic material against the gate.

5,566,533

**STABILIZER SADDLE GIRTH**

Linda G. Larisch, Lowell, Mich., assignor to Kimberlite Acres, Inc., Lowell, Mich.

Filed Jan. 27, 1995, Ser. No. 379,729

Int. Cl.<sup>6</sup> B68C 1/14

U.S. Cl. 54—23

23 Claims



1. A saddle girth comprising:

an elongated, flexible girth band;

a pair of elongated girth straps extending the length of said girth band and having portions extending beyond said girth band for attachment to saddle billets on opposite sides of a horse; said pair of elongated girth straps crossing each other at the centers thereof such that each strap is positioned forwardly of the other strap at one end and rearwardly of the other strap at the opposite end;

said girth straps being longitudinally movable relative to each other and relative to said girth band; and keepers cooperative with said girth band and said girth straps located to keep said girth straps so positioned.

5,566,534

**FLOATATION CUTTING APPARATUS WITH CENTRIFUGE CHAMBER**

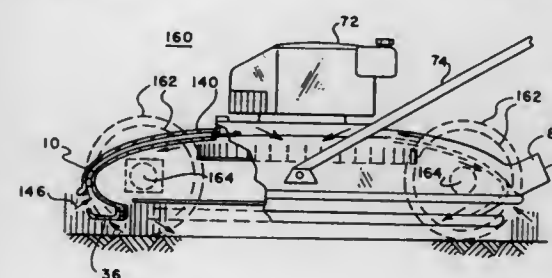
Arthur L. Fassauer, P.O. Box 124, Canyon, Tex. 79015

Filed May 17, 1994, Ser. No. 245,021

Int. Cl.<sup>6</sup> A01D 34/72

U.S. Cl. 56—12.8

6 Claims



1. An air-floated apparatus, comprising:

a substantially endless housing having an open bottom and an air intake opening, said housing being adapted to cooperate with a support surface beneath said housing to define a substantially enclosed chamber;

air moving means located in said chamber for pressurizing air within said chamber sufficient to float said housing above the support surface, said air moving means being adapted to provide a downward flow of air in said chamber;

centrifuge means located in said chamber and defining a centrifuge raceway for centrifuging material in said chamber, said chamber being configured to accommodate centrifuging of material in the presence of air pressure sufficient to float said housing above the support surface; and

a resilient member extending into the chamber to form a shelf for centrifuging the material.

5,566,535

**REMOTE HEADER ANGLE ADJUSTMENT MECHANISM FOR SWING-TONGUE HARVESTERS**

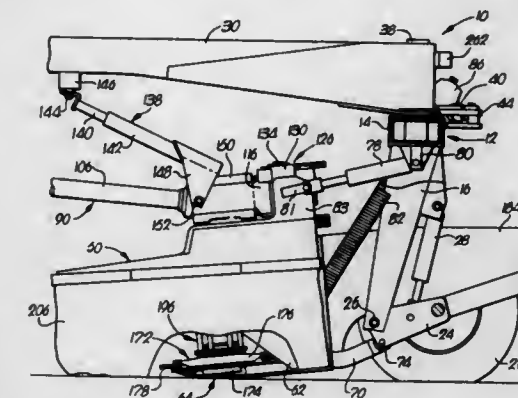
Martin E. Pruitt, Hesston, Kans., assignor to Hay & Forage Industries, Hesston, Kans.

Filed May 9, 1995, Ser. No. 438,245

Int. Cl.<sup>6</sup> A01D 47/00

U.S. Cl. 56—15.1

41 Claims



1. In a pull-type crop harvesting machine, the improvement comprising:

a mobile frame; a harvesting header attached to the frame in a manner permitting the header to be adjustably tilted between a number of harvesting tilt positions relative to the frame; a hydraulic operating circuit for use in controlling a certain function of the machine; a hydraulic tilt circuit for controlling tilt of the header; a control valve assembly connected to said circuits and shiftable between an operating circuit position in which the operating circuit communicates with a source of hydraulic pressure and an alternative tilt circuit position in which the tilt circuit communicates with said source of hydraulic pressure; and actuating mechanism operably coupled with said valve assembly for selectively and remotely controlling the shifting of the valve assembly between its alternative positions.

5,566,536

**MOWER-CONDITIONER PLATFORM SUSPENSION INCLUDING SINGLE UPPER ARM AND HYDRAULIC CYLINDER FOR PLATFORM LIFT**

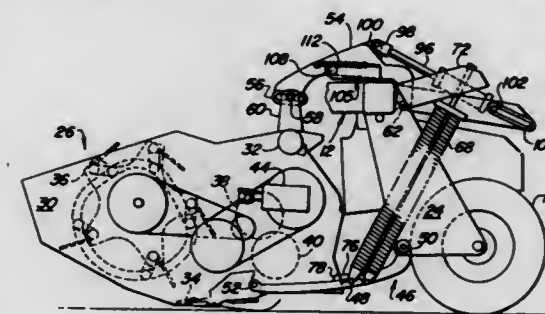
Jerry L. Krafka, Roger D. Stephenson, and Michael J. Verhulst, all of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Apr. 17, 1995, Ser. No. 422,965

Int. Cl.<sup>6</sup> A01D 34/03

U.S. Cl. 56—15.2

14 Claims



1. In a mower-conditioner of the type including a wheel-supported mobile main frame, an elongate platform having a support frame disposed ahead of and extending transversely to a path of travel of the main frame, said platform further including a crop severing device extending between side frame members of said support frame and being fixed to said support frame, a suspension connecting said platform support frame to said main frame and including a pair of transversely spaced lower links having respective rear ends pivotally mounted to lower locations of said main frame and having respective front ends pivotally mounted to lower locations of said platform support frame, an upper lift arm located transversely from and between said lower links and having a rear end pivotally connected to an upper location of said main frame by a first coupling including a first pivot pin inserted in a first set of transversely aligned openings in said main frame and upper lift arm and having a front end pivotally connected to an upper location of said platform support frame by a second coupling including a second pivot pin inserted in a second set of transversely aligned openings in said platform support frame and upper lift arm, and a hydraulic lift cylinder having opposite ends respectively pivotally connected to said main frame and said upper lift arm for serving as the sole means for moving said platform between a lowered cutting position resting on the ground and an elevated transport position, the improvement comprising: said first set of aligned openings including a lateral float slot located in said main frame and having a major axis located approximately on a line of centers determined by said first and second pivot pins when the platform is in its lowered cutting position so as to permit the upper lift arm to swing through a desired range of side-to-side movement, and being oriented at an angle of at least 40° to said determined line of centers when the platform is raised to its transport position to thereby restrict side-

to-side movement of said lift arm to an amount considerably less than said desired range, whereby the need for upstops for effecting level transport is eliminated.

5,566,537

## MOWER WITH A SAFETY DEVICE

Fernand Kieffer, Saverne; Rene Walter, Goetzenbruck, and Horst Neuerburg, Saverne, all of France, assignors to Kuhn S.A., Saverne Cedex, France

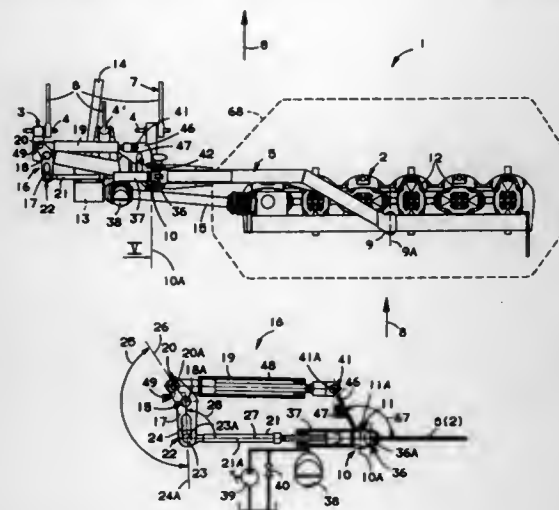
Filed May 1, 1995, Ser. No. 432,066

Claims priority, application France, Apr. 29, 1994, 94 05429

Int. Cl.<sup>6</sup> A01D 34/66; 34/82

U.S. Cl. 56—15.2

48 Claims



## 1. A mower comprising:

- a cutting mechanism extending during operation transversely to a direction of operation of the mower;
- an attachment structure which is adapted to be connected to a motor vehicle;
- a carrying beam connected on one hand to the cutting mechanism by means of a first articulation having an axis directed forward, and on the other hand to the attachment structure by means of a second articulation having an axis directed forward and by means of a third articulation having an axis directed upward, which permits pivoting of the second articulation with respect to the attachment structure; and
- a safety device which maintains the cutting mechanism in a normal operating position, but allows the cutting mechanism to pivot rearwardly about the axis of the third articulation in case an obstacle is encountered, the safety device including an energy accumulator;

wherein:

the safety device further comprises a pivoting member connected to the attachment structure by means of a fourth articulation, and a connecting rod connected on one hand indirectly to the carrying beam with a first lever arm with respect to the axis of the third articulation, and on the other hand to the pivoting member by means of a fifth articulation, the energy accumulator being connected to the pivoting member by means of a connection so as to act on said pivoting member with a second lever arm, said connection being capable, from a certain pivoting angle of the cutting mechanism toward the rear, of decreasing said second lever arm with which the energy accumulator acts on the pivoting member.

# 5,566,538

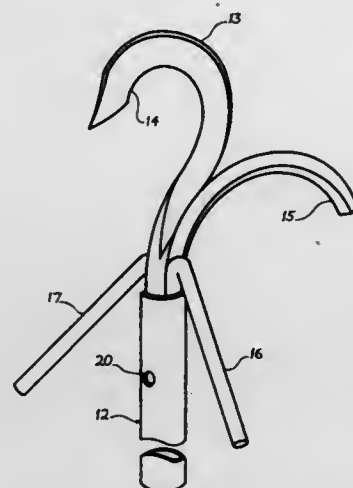
## APPARATUS AND METHOD FOR REMOVING PLASTIC BAGS AND OTHER DEBRIS FROM TREES

Ian A. Frazier, 240 Woodworth Ave., Missoula, Mont. 59801, and Thomas W. McClelland, 29 Rowe Rd., Alford, Mass. 01230

Filed Dec. 6, 1994, Ser. No. 350,259  
Int. Cl.<sup>6</sup> A01D 1/00

U.S. Cl. 56—239

6 Claims



1. A method of removing plastic bags and other debris from trees, comprising:
  - providing an elongated pole with an end, said end having fixed thereto a hook-like cutting member with a sharpened inside edge and a plurality of unsharpened hook members, said cutting member and said hook members being stationary with respect to each other;
  - extending said end to the vicinity of a plastic bag entangled in a tree;
  - utilizing the cutting member to cut the entanglement of the plastic bag; and
  - utilizing at least one of said hook members to hook and remove the plastic bag from the tree.

5,566,539

# METHOD AND APPARATUS FOR REPAIRING A YARN BREAKAGE IN A PAIR OF SPINNING UNITS

Rolf Binder, Schauenbergstrasse 3, CH-8353 Raterschen, Switzerland, and Martin Witschl, Bachtelstrasse 24, CH-8200 Schaffhausen, Switzerland

Continuation-in-part of Ser. No. 728,555, Jul. 11, 1991, Pat. No. 5,313,773, Ser. No. 878,496, May 5, 1992, Pat. No. 5,237,810, Ser. No. 919,876, Jul. 27, 1992, abandoned, and Ser. No. 986,595, Dec. 7, 1992, Pat. No. 5,339,614. This application Jul. 21, 1993, Ser. No. 95,654

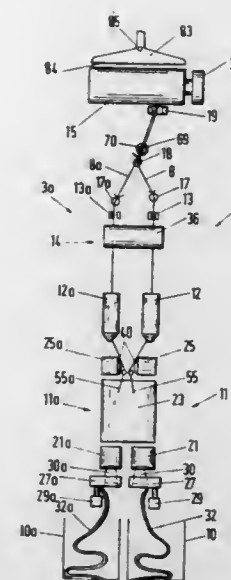
Claims priority, application Switzerland, Jul. 23, 1992, 02323/92

Int. Cl.<sup>6</sup> D01H 11/00; 13/04

U.S. Cl. 57—261

13 Claims

1. In a yarn spinning machine having a pair of spinning mechanisms simultaneously spinning first and second yarns from first and second supplies of slivers wherein the first and second spun yarns are wound up jointly on a single bobbin, a method for restarting spinning operations in the pair of spinning mechanisms upon a breakage or discontinuance in one of the yarns being spun, the method comprising:
  - stopping the supplies of slivers after an occurrence of a breakage or discontinuance in one of the two yarns being spun;
  - retrieving an end of each of the firsthand second spun yarns and reversely routing the retrieved first and second yarn ends through the first and second spinning mechanisms;



- capturing the first and second yarns after the reverse routing at an inlet to the first and second spinning mechanisms;
- establishing one yarn length between an end of the first yarn and the inlet to the first spinning mechanism and establishing another different yarn length between an end of the second yarn and the inlet to the second spinning mechanism;
- simultaneously withdrawing the first and second yarns forwardly through the first and second spinning mechanisms at the same rate of withdrawal; and,
- joining the ends of the first and second yarns with a restarted end of each of the first and second silver supplies as the yarns are being withdrawn and before the ends of the yarns are withdrawn through the spinning mechanisms;
- the joined ends of the reversely routed yarns being withdrawn forwardly into the first and second spinning mechanisms at different times during withdrawal.

# 5,566,540

## TRANSPORT ASSEMBLY IN A RING SPINNING MACHINE WITH DRIVEN CONVEYOR BELTS FOR DELIVERING EMPTY TUBES AND FOR REMOVING COPS DISPOSED ALONG SPINDLE ROWS AT THE MACHINE

Josef Bertrams, Wegberg, and Moritz O. Weich, Dresden, both of Germany, assignors to W. Schlafhorst AG & Co., Mönchengladbach, Germany

Filed Jun. 9, 1994, Ser. No. 257,360

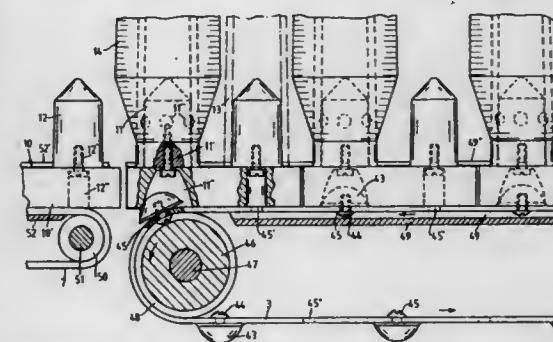
Claims priority, application Germany, Jun. 9, 1993, 43 19 173.8

U.S. Cl. 57—281

Int. Cl.<sup>6</sup> D01H 9/10; 9/14

9 Claims

1. In a ring-spinning machine having rows of spindles disposed



on both sides thereof at a given spindle spacing, an assembly for transporting empty tubes and cops, which comprises:

- two separate, driven conveyor belts disposed alongside the rows of spindles of the ring-spinning machine, said conveyor belts being independently drivable for delivering empty tubes towards and moving cops away from the spindles, said conveyor belts having openings formed therein at a mutual spacing approximately corresponding to half the given spindle spacing;
- a plurality of caddies each carrying an arbor for receiving an empty tube and an arbor for receiving a cop; each of said caddies having a length being less than the given spindle spacing; and each of said caddies having an indentation formed in a bottom surface thereof;
- guide tracks extending along said conveyor belts for guiding said caddies on said conveyor belts;
- driver members secured in at least every other one of said openings of said conveyor belts, said driver members engaging in said indentations formed in the bottom surface of each of said caddies for transporting said caddies in a form-locking manner.

5,566,541

# OPENING ROLLER FOR AN OPEN-END SPINNING DEVICE

Fritz Stahlecker, Bad Ueberkingen, and Karl-Josef Brockmanns, Willich, both of Germany, assignors to Fritz Stahlecker, Bad Ueberkingen, Germany

Filed May 13, 1994, Ser. No. 242,672

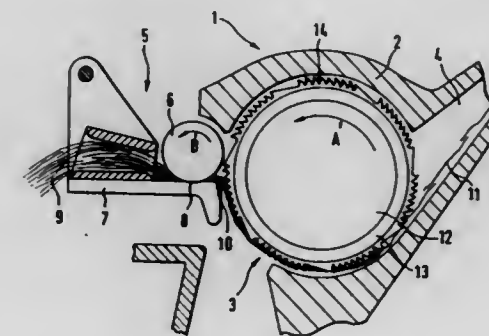
Claims priority, application Germany, Jul. 13, 1993, 43 23 364.3

Int. Cl.<sup>6</sup> D01H 4/32

U.S. Cl. 57—408

26 Claims

1. An opening roller for an open-end spinning device compris-



ing:

- a rotatable roller body having a roller body rotational axis, and
- combing teeth arranged in a predetermined pattern over a circumferential area of said roller body and serving to comb out fibers from a supplied sliver when said roller body is rotatably driven, said predetermined pattern including a plurality of axially spaced apart circumferentially extending rows of radially extending combing teeth,
- wherein each of said rows includes a plurality of full combing effect teeth and a plurality of reduced combing effect teeth, said reduced combing effect teeth including radially extending combing surfaces which are different than corresponding radially extending combing surfaces of said full combing effect teeth to thereby form zones of reduced combing effect as compared to zones formed by said full combing effect teeth, said zones of reduced combing effect serving to minimize damage to fibers combed from the sliver by the opening roller, wherein the maximum radial extent of said reduced combing effect teeth is less than the maximum radial extent of said full combing effect teeth,
- wherein said zones of reduced combing effect are uniformly distributed over the circumferential area of said roller body so that fibers are evenly combed out of said sliver by said combing teeth, and



wherein the zones with reduced combing effect include a zone which comprises at least one modified tooth, said modified tooth having a predetermined contour projecting radially from the opening roller and extending in the circumferential direction.

5,566,542

# METHOD FOR REGULATING AND AUGMENTING THE POWER OUTPUT OF A GAS TURBINE

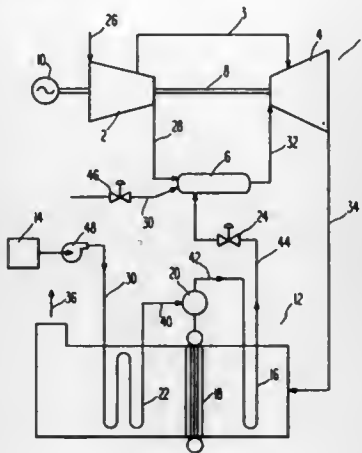
Allen G. Chen, Orlando, and Leslie R. Southall, Longwood, both of Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 24, 1994, Ser. No. 295,114

Int. Cl.<sup>6</sup> F02C 3/30

U.S. Cl. 60—39.05

10 Claims



1. A method of regulating the operation of a gas turbine power plant so as to achieve a desired shaft power, comprising the steps of:

- compressing air;
- heating said compressed air, thereby producing a hot gas;
- directing a variable flow rate of steam into said hot gas, thereby producing a mixture of hot gas and steam;
- expanding said mixture of hot gas and steam in a turbine, thereby producing an expanded gas/steam mixture, said turbine having a rotating shaft disposed therein, whereby said expansion of said mixture of hot gas and steam imparts power to said shaft, said power being a function of the flow rate of said hot gas/steam mixture; and
- adjusting said flow rate of said gas/steam mixture by adjusting said flow rate of said steam, so as to maintain said desired shaft power from said turbine shaft while maintaining approximately constant the temperature of said gas/steam mixture that is expanded in said turbine.

5,566,543

# PVC-BASED GAS GENERANT FOR HYBRID GAS GENERATORS

Robert D. Taylor, Hyrum, and Brett Hussey, Bountiful, both of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Nov. 17, 1993, Ser. No. 153,686

Int. Cl.<sup>6</sup> C06D 5/06

U.S. Cl. 60—219

5 Claims

1. A method for improving the filterability of combustion products of a gas generating composition for an inflatable device, said composition containing a vinyl chloride polymer and an alkali metal salt oxidizing agent, said method comprising adding from about 0.1 to about 4 per cent of a nucleating agent for vaporious halides of alkali metals, said agent being selected from the group consisting of silica, alumina, aluminum silicates, graphite, alumi-

num, silicon, an alkaline earth metal salt, and mixtures thereof to the gas-generating composition; and causing said composition to burn in communication with a filter associated with said device.

5,566,544

# ROCKET PREBURNER INJECTOR WITH TAILORED GAS TEMPERATURE PROFILE

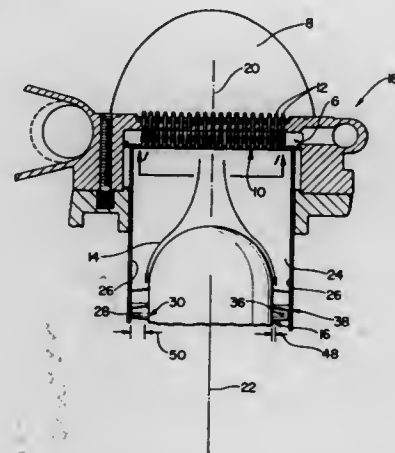
Donald E. Paulus, Jupiter, and George B. Cox, Jr., Tequesta, both, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 998,981, Dec. 31, 1992, abandoned. This application May 27, 1994, Ser. No. 250,243

Int. Cl.<sup>6</sup> F02K 9/00

U.S. Cl. 60—258

1 Claim



1. In a rocket engine having a preburner injector with a faceplate which includes a plurality of injector elements located therein that produce combustion gases used to drive a turbine of a turbopump, the faceplate is symmetric about a first axis extending therethrough that is perpendicular to the faceplate, and the turbine is rotatable about an axis of rotation and located within a passage in which the faceplate is located, the improvement comprising

providing first injector elements located in a first annular section of the faceplate, and providing second injector elements located in a second annular section of the faceplate, the second section is radially outward from the first section relative to the first axis, each of the injector elements in the first section has a first fuel orifice for admitting fuel into the first injector and a first oxidizer orifice for admitting oxidizer into the first injector, each of said first fuel orifices has a first minimum fuel flow area and each of said first oxidizer orifices has a first oxidizer flow area, and each of the injector elements in the second section has a second fuel orifice for admitting fuel into the second injector and a second oxidizer orifice for admitting oxidizer into the second injector, each of said second fuel orifices has a second minimum fuel flow area and each of said second oxidizer orifices having a second minimum oxidizer flow area, and the ratio of the second oxidizer flow area to the second fuel flow area of each injector in the second section is greater than the ratio of the first oxidizer flow area to the first fuel flow area of each injector in the first section.

5,566,545

# PROCESS AND AN APPARATUS FOR TREATING AN EXHAUST GAS, AND A HONEYCOMB STRUCTURAL EXHAUST GAS FILTER

Toshihiko Hijikata, Nagoya; Tetsuya Hiraoka, Handa, and Kazuhiko Umehara, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan

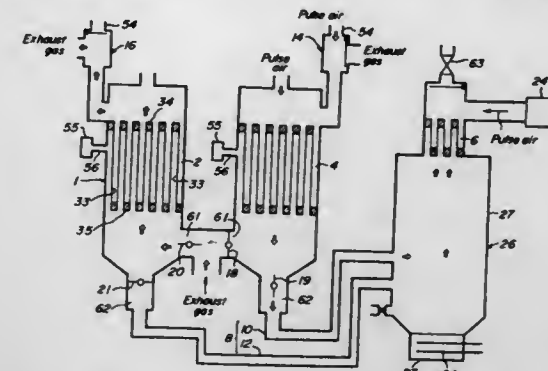
Filed Aug. 10, 1994, Ser. No. 288,033

Claims priority, application Japan, Aug. 10, 1993, 5-198409; Aug. 10, 1993, 5-198410

Int. Cl.<sup>6</sup> F01N 3/02

U.S. Cl. 60—274

25 Claims



1. An exhaust gas honeycomb filter comprising a honeycomb structural body having an outer peripheral wall and inner walls forming a number of gas flow holes through which an exhaust gas passes along a flow direction; first sealed portions sealing exhaust gas-downstream ends of the gas flow holes that are located in given first rows; second sealed portions sealing exhaust gas-upstream ends of the remaining gas flow holes that are located in remaining second rows; and gas stream-introducing channels each provided near and upstream of said first sealed portions, wherein said gas stream-introducing channels penetrate the outer peripheral wall of the honeycomb structural body and extend through inner walls along the first rows.

5,566,546

# METHOD OF INFERRING SOAK TIMES FOR AN ELECTRONIC ENGINE CONTROL SYSTEM

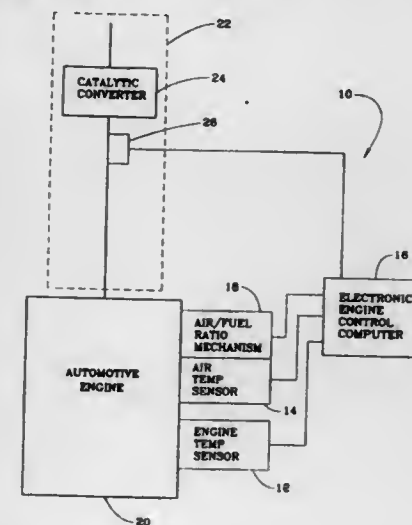
Todd A. Rumpsa, Royal Oak, and Michael J. Cullen, Northville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1994, Ser. No. 364,380

Int. Cl.<sup>6</sup> F01N 3/20

U.S. Cl. 60—274

20 Claims



1. An electronic engine control system for controlling at least one feature of an internal combustion engine supplied with an engine coolant and a mixture of charging air and fuel, said control system comprising:

- an engine sensor for measuring the temperature of the engine;
- an air sensor for measuring the temperature of the charging air supplied to the engine; and
- at least one computer with software for storing the temperature measured by said engine sensor and air sensor at the time the engine is turned off, software for providing an inferred soak time based on the temperature of the engine and the charging air stored at the time the engine is turned off and respectively measured by said engine sensor and air sensor at the time the engine is restarted, and a software control strategy for controlling at least one feature of the engine based on said inferred soak time.

5,566,547

# CONTROLLING APPARATUS FOR INTRODUCING AIR INTO AN EXHAUST PIPE OF AN INTERNAL COMBUSTION ENGINE

Yasuhiko Hosoya, Toshiaki Kuroda, and Hideaki Katashiba, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

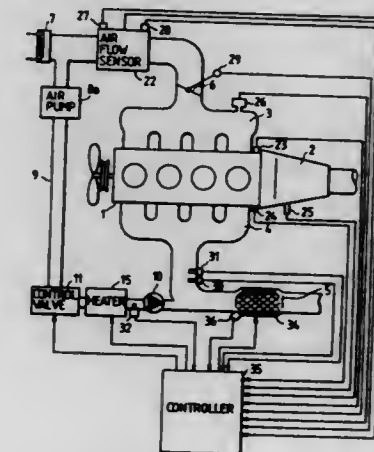
Division of Ser. No. 78,465, Jun. 18, 1993. This application Jun. 6, 1995, Ser. No. 463,634

Claims priority, application Japan, Jun. 23, 1992, 4-164811

Int. Cl.<sup>6</sup> F01N 3/30

U.S. Cl. 60—284

3 Claims



1. An apparatus for controlling the introduction of air into an exhaust pipe of an internal combustion engine, comprising: means for introducing air into said exhaust pipe of said internal combustion engine upstream of a catalyst via an air introducing pipe; air heating means for heating the air introduced into said air introducing pipe; catalyst heating means for heating the catalyst; and controlling means for varying an amount of air introduced into said exhaust pipe at a predetermined time interval.

5,566,548

# EXHAUST MANIFOLD JOINT

Greesh Khurana, Lafayette, Ind.; assignor to Caterpillar Inc., Peoria, Ill.

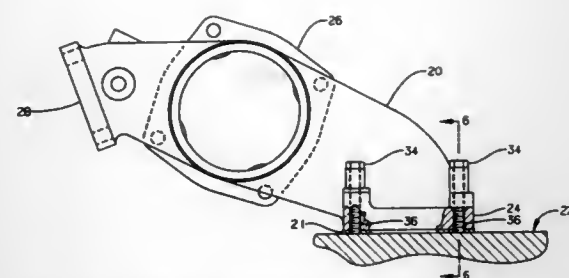
Filed Nov. 9, 1994, Ser. No. 336,436

Int. Cl.<sup>6</sup> F01N 7/10

U.S. Cl. 60—322

15 Claims

1. A manifold assembly for use with an internal combustion engine, comprising:



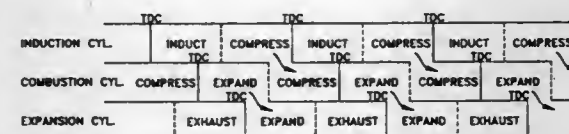
a head of an internal combustion engine;  
a first exhaust manifold having a first flange adapted for mounting to said head;  
a second exhaust manifold having a second flange adapted for mounting to said head;  
said first exhaust manifold and said second exhaust manifold being slidably connected relative one another to communicate exhaust gasses therebetween;  
said first flange and said second flange each including a mounting surface and a bolt hole extending from said mounting surface, said bolt hole including a first cylindrical portion opposite said mounting surface and a second larger diameter cylindrical portion adjacent to said mounting surface; and  
a fastener received through said bolt hole and threadably engaged with said head;  
wherein said second cylindrical portion defines a predetermined diametral clearance with said fastener adjacent to said head when said first cylindrical portion contacts said fastener during lateral movement of said first flange and said second flange relative to said head.

**5,566,549**  
**IN-LINE ENGINES HAVING RESIDUAL CYCLES AND METHOD OF OPERATION**  
John M. Clarke, Chillicothe, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Jun. 5, 1995, Ser. No. 464,184  
Int. Cl.<sup>6</sup> F02G 3/02

U.S. Cl. 60—620

8 Claims



4. An engine having a plurality of combustion, induction-compression and exhaust-expansion cylinders and a plurality of combustion cylinder pistons each connected to a respective crank throw of the engine crank shaft, comprising:

- a plurality of induction crank throws each connected to the engine crank shaft;
- a plurality of expansion crank throws each connected to the engine crank shaft, said combustion, induction and expansion crank throws each being circumferentially positioned in the range of between 90 and 120 degrees from adjacent associated crank throws;
- a plurality of induction-compression cylinder pistons each connected to a respective induction crank throw;
- a plurality of exhaust-expansion cylinder pistons each connected to a respective expansion crank throw;
- an induction valve associated with each induction-compression cylinder and being controllably moveable between a first position at which the induction-compression cylinder is open to the atmosphere and a second position at which the induction-compression cylinder is closed to the atmosphere;
- an expansion valve associated with each exhaust-expansion cylinder and being controllably moveable between a first position

at which the exhaust-expansion cylinder is open and a second position at which the expansion cylinder is closed;  
a first fluid pathway connecting the induction-compression cylinder and the combustion cylinder in fluid communication;  
a second fluid pathway connecting the combustion cylinder and the exhaust-expansion cylinder in fluid communication;  
a first valve positioned in the first fluid pathway and being adapted to initiate and terminate fluid communication from the induction-compression cylinder into the combustion cylinder;  
a second valve positioned in the second fluid pathway and being adapted to initiate and terminate fluid communication from the combustion cylinder into the exhaust-expansion cylinder;  
a first control means for opening the first valve and initiating communication at about 60 degrees before TDC of the induction-compression cylinder piston and about at BDC of the combustion cylinder piston and for terminating communication at about TDC of the induction-compression cylinder piston and about 60 degrees after BDC of the combustion cylinder piston; and  
a second control means for opening the second valve and initiating communication at about 60 degrees before BDC of the combustion cylinder piston and at about TDC of the exhaust-expansion cylinder piston and for terminating communication at about BDC of the combustion cylinder piston and about 60 degrees after TDC of the exhaust-expansion cylinder piston.

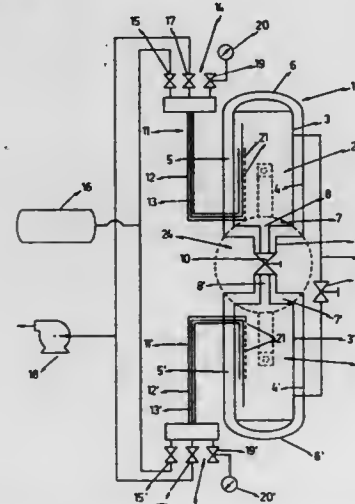
**5,566,550**  
**APPARATUS FOR CRYOGENICALLY SEPARATING ELASTOMERIC MATERIALS FROM METALLIC AND TEXTILE MATERIALS FORMING COMPOSITES THEREWITH**

Gerardo Pagaza-Melero, Cuajimalpa; Raymundo Fernandez-Y-Sosa, Naucalpan de Juárez; Santiago Bastida-Sanchez; Agustín Bastida-Sanchez, both of Almoloya de Juárez; Víctor Pagaza-Melero, San Juan de Aragón, and Jesús F. Pagaza-Melero, Col. Seminario, all of Mexico, assignors to Gerardo Pagaza-Melero, Lomas de Vista Hermosa Cuajimalpa, Mexico

Filed Aug. 26, 1994, Ser. No. 296,646  
Int. Cl.<sup>6</sup> F17C 7/02

U.S. Cl. 62—50.1

13 Claims



1. An apparatus for cryogenically separating plastics materials and/or synthetic or natural vulcanized or non vulcanized rubbers from metallic and textile materials forming composites therewith, which comprises:

- at least two treatment chambers for receiving said composite materials, each of said treatment chambers having a port for permitting the loading of said composite materials and the unloading of cryogenically crystallized treated materials,

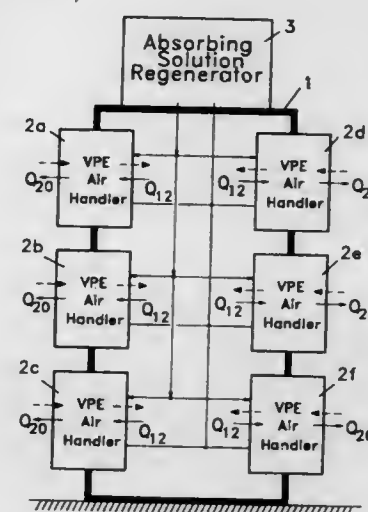
means for selectively applying cryogenic fluid to each of said chambers to contact and treat the composite material therein, and  
first duct means for interconnecting said treatment chambers to transfer cryogenic fluid from one chamber to the other.

**5,566,551**  
**VAPOR PRESSURE ENHANCEMENT (VPE) AIR COOLING-HEATING PROCESS AND APPARATUS FOR USE THEREIN**

Chen-Yen Cheng, c/o Dr. Wu-Cheng Cheng, 10308 Paddington Ct., Ellicott City, Md. 21042  
Continuation-in-part of Ser. No. 295,771, Aug. 29, 1994, Pat. No. 5,526,653. This application Sep. 22, 1995, Ser. No. 533,499  
Int. Cl.<sup>6</sup> B01D 9/04

U.S. Cl. 62—532

20 Claims



1. A process of transforming a stream of internal air into a product stream of cooled air or a product stream of heated air that comprises

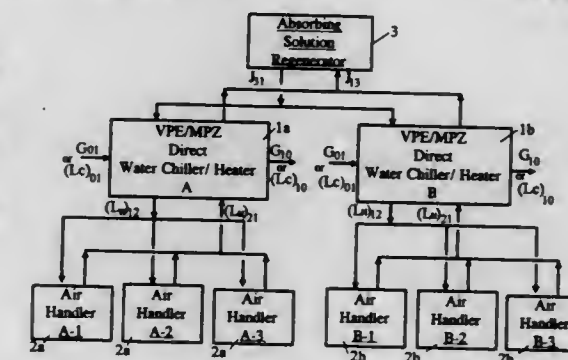
1. A first step of subjecting the internal air stream to a heat interaction
  - (a) with a system water that is under a low pressure to thereby generate a first low pressure vapor, referred to as an inner water vapor and produce the cooled air, or
  - (b) with a system water vapor, referred to as an inner water vapor, to thereby condense the water vapor and produce the heated air;
2. A second step of entering a heat interaction with the environment to
  - (a) condense a water vapor, referred to as an outer water vapor by rejecting heat of condensation to the environment, or
  - (b) vaporize water: to generate a water vapor, referred to as an outer water vapor by receiving heat from the environment,
3. A third step of subjecting the inner water vapor and the outer water vapor to an absorption vapor pressure enhancement operation of
  - (a) absorbing the inner water vapor into an absorbing solution and transfer the heat of absorption through a heat conductive wall to vaporize water and thereby generate the inner water vapor, the pressure of the outer water vapor being substantially higher than the pressure of the inner water vapor, or
  - (b) absorbing the outer water vapor into an absorbing solution and transfer the heat of absorption through a heat conductive wall to vaporize water and generate the inner water vapor, the pressure of the inner water vapor being substantially higher than the pressure of the outer water vapor.

**5,566,552**  
**VAPOR PRESSURE ENHANCEMENT (VPE) DIRECT WATER CHILLING-HEATING PROCESS AND APPARATUS FOR USE THEREIN**

Chen-Yen Cheng, 10308 Paddington Ct., Ellicott City, Md. 21042  
Continuation-in-part of Ser. No. 295,771, Aug. 29, 1994, Pat. No. 5,526,653. This application Jul. 17, 1995, Ser. No. 503,874  
Int. Cl.<sup>6</sup> B01D 9/04

U.S. Cl. 62—534

20 Claims



1. A process of transforming a stream of system water into a product stream of chilled water or a product stream of heated water that comprises

1. A first step of subjecting the water stream to an adiabatic liquid-vapor interaction of
  - (a) flash vaporizing the water under a low pressure to thereby generate a first low pressure vapor, referred to as an inner water vapor and produce the chill water, or
  - (b) bringing the system water in contact with a water vapor, referred to as an inner water vapor, to thereby condense the water vapor and produce the heated water;
2. A second step of entering a heat interaction with the environment to
  - (a) condense a water vapor, referred to as an outer water vapor by rejecting heat of condensation to the environment, or
  - (b) vaporize water: to generate a water vapor, referred to as an outer water vapor by receiving heat from the environment,
3. A third step of subjecting the inner water vapor and the outer water vapor to an absorption vapor pressure enhancement operation of
  - (a) absorbing the inner water vapor into an absorbing solution and transfer the heat of absorption through a heat conductive wall to vaporize water and thereby generate the outer water vapor, the pressure of the outer water vapor being substantially higher than the pressure of the inner water vapor, or
  - (b) absorbing the outer water vapor into an absorbing solution and transfer the heat of absorption through a heat conductive wall to vaporize water and generate the inner water vapor, the pressure of the inner water vapor being substantially higher than the pressure of the outer water vapor.

**5,566,553**  
**PROCESS FOR THE PRESERVATION OF PRODUCTS AT LOW TEMPERATURE IN AN INSULATED CHAMBER, INSTALLATION FOR PRACTICING THE PROCESS, INSULATED CHAMBER AND CONTAINER FOR SUCH A CHAMBER**

Claude Gibot, Clichy Sous Bois, and Philippe Bouguet, Fosses, both of France, assignors to Carboxyque Francaise, Puteaux, France

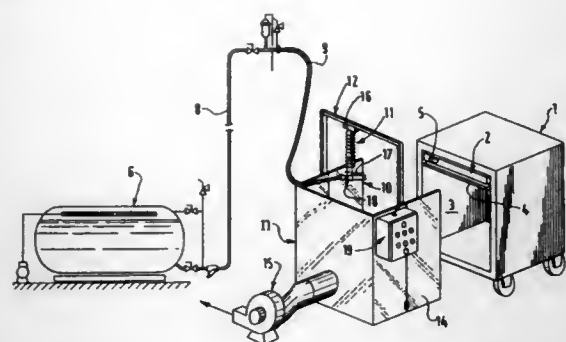
Division of Ser. No. 285,718, Aug. 4, 1994, Pat. No. 5,511,379.  
This application Feb. 1, 1996, Ser. No. 595,260  
Int. Cl.<sup>6</sup> F25J 5/00

U.S. Cl. 62—603

8 Claims

1. An apparatus for generating dry ice in a dry ice holder of a transportable container having an injection side, comprising a source of liquid CO<sub>2</sub> under pressure, a line extending from the





source for supplying liquid CO<sub>2</sub>, terminating by a distributor means for mating engagement with the injection side of the holder and including a distribution valve means, and a control unit for controlling the distribution valve means, the control unit including calculating means programmable to control selective opening of the distribution valve means in dependence of at least one climatic parameter.

5,566,554

## HYDROCARBON GAS SEPARATION PROCESS

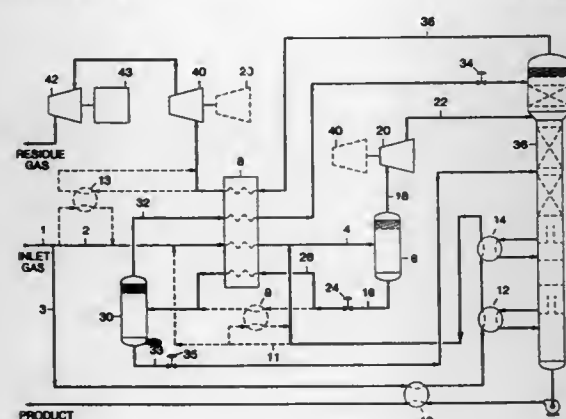
Bharat Vijayaraghavan, Houston, and Ricardo J. Ostaszewski, Sugarland, both of Tex., assignors to KTI Fish, Inc., Houston, Tex.

Filed Jun. 7, 1995, Ser. No. 476,835

Int. Cl.<sup>6</sup> F25J 3/00

U.S. Cl. 62—621

16 Claims



1. A process for separating components of a feed gas containing methane and heavier hydrocarbons, comprising the steps of: condensing said feed gas to provide a first vapor component comprising vapor and a first liquid component comprising condensed liquid; directing said first vapor component to a demethanizer; and partially vaporizing at least a portion of said first liquid component to form a second vapor component and a second liquid component, said second vapor and liquid components being directed to different feed points on the demethanizer.

5,566,555

## VAPOR RECOVERY SYSTEM WITH REFRIGERATION AND REGENERATION CYCLES

J. Paul Hewitt, P.O. Box 1091, Angleton, Tex. 77515

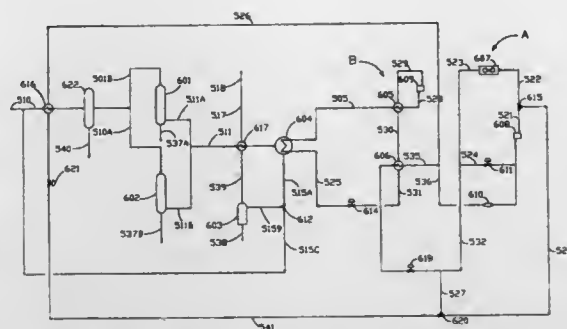
Filed Mar. 27, 1995, Ser. No. 411,271

Int. Cl.<sup>6</sup> F25J 3/00

U.S. Cl. 62—623

14 Claims

1. A system for removing substantially all of the chemical vapors from an air-chemical vapor mixture, comprising:



- a vapor chiller having an inlet and an outlet to condense substantially all of said hydrocarbons or chemicals in said mixture by indirect heat exchange with a refrigerant gas at a cryogenic temperature;
- a drain to remove substantially all of said condensed hydrocarbons or chemicals from said vapor chiller;
- a vent to remove said air less substantially all of said hydrocarbons from said vapor chiller;
- a compressor having an inlet and an outlet to compress said refrigerant gas;
- a condenser in fluid connection with the outlet of said compressor to condense substantially all of said refrigerant liquid;
- an expansion means in fluid connection with said condenser to reduce the pressure of and expand said refrigerant liquid back to a refrigerant gas thereby reducing the temperature of said refrigerant gas to a cryogenic temperature;
- a first fluid connection between said expansion means outlet and said vapor chiller inlet wherein said refrigerant gas is heated by indirect heat exchange with said mixture thereby cooling said mixture;
- a second fluid connection between said compressor outlet and said vapor chiller inlet whereby compressed refrigerant gas from said compressor is passed alternative to and exclusive of said first fluid connection directly to said vapor chiller to heat said vapor mixture; and
- a third fluid connection between said vent and said vapor chiller whereby the vapors may be recycled.

5,566,556

## PROCESS AND UNIT FOR SUPPLYING A GAS UNDER PRESSURE TO AN INSTALLATION THAT CONSUMES A CONSTITUENT OF AIR

Robert Ekins, and Alain Guillard, both of Paris, France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procédés Georges Claude, Paris Cedex, France

Division of Ser. No. 242,452, May 13, 1994. This application Jul. 20, 1995, Ser. No. 504,656

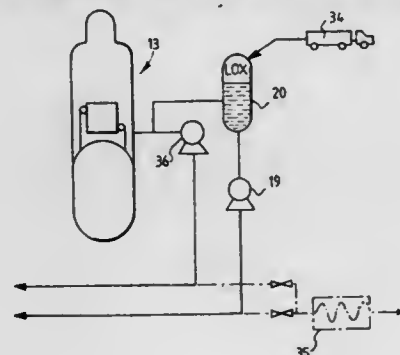
Claims priority, application France, Jun. 7, 1993, 93 06789

Int. Cl.<sup>6</sup> F25J 3/00

U.S. Cl. 62—654

7 Claims

1. Cryogenic distillation separation unit for producing at least



one gaseous product comprising at least one distillation column, a vessel for storing a cryogenic liquid, pressurizing means for pressurizing said liquid, a main heat exchanger permitting heat exchange between a feed gas of the distillation column and said pressurized liquid, an auxiliary heat exchanger permitting vaporization of said pressurized liquid, and means for selectively sending said pressurized liquid to one of said main and auxiliary heat exchangers.

5,566,557

## FINGER RING COMPRISED OF SEVERAL ANNULI

Ornella Pasquetti, Milan, Italy, assignor to Piaget International S.A., Geneva, Switzerland

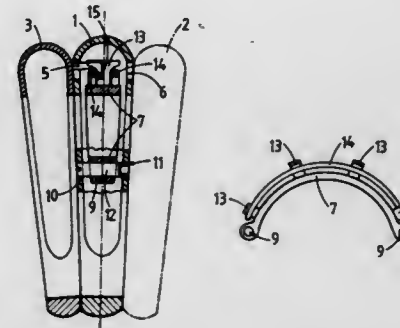
Filed May 24, 1995, Ser. No. 449,708

Claims priority, application Switzerland, May 25, 1994, 1616/94

Int. Cl.<sup>6</sup> A44C 9/00

U.S. Cl. 63—15.2

4 Claims



1. A finger ring comprised of at least two annuli fastened together removably by means of a coupling device including a male coupling member in the form of a hook extending from a lateral face of at least one first annulus and designed for entering a second annulus via a bore provided on at least one of its lateral faces, the coupling device further including an insert fastened inside the second annulus, said insert comprising at least one wire spring adapted releasably to retain in the coupling position of the annuli a nose of the hook of the first annulus.

5,566,558

## FABRIC SLITTING AND TAKE-UP MECHANISM FOR A CIRCULAR KNITTING MACHINE

Koji Tsuchiya, Hyogo, Japan, assignor to Precision Fukuhara Works, Ltd., Japan

Filed Aug. 7, 1995, Ser. No. 511,933

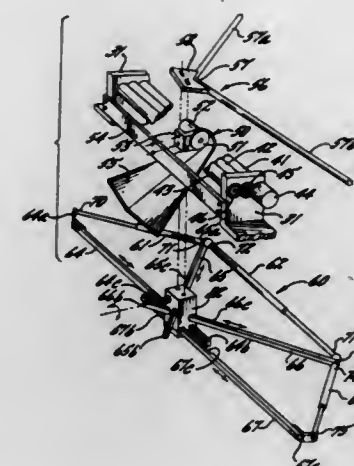
Claims priority, application Japan, Aug. 8, 1994, 6-208146

Int. Cl.<sup>6</sup> D04B 35/34

U.S. Cl. 66—151

17 Claims

1. A circular knitting machine and take-up mechanism for producing a single layer web of knit fabric comprising knitting means for forming a tubular knit fabric, first let-off rolls means for receiving the tubular fabric from said knitting unit, flattening the fabric into a double-layer web and for delivering the fabric from the circular knitting machine under controlled tension, slitting means beneath and adjacent to said first let-off roll means for slitting the fabric longitudinally along a predetermined line, spreading means adjacent said slitting means for spreading the slit fabric into a single layer web said spreading means being adjustable, second let-off roll means beneath and adjacent to said spreading means for receiving the single layer web and for drawing the web across said spreading means, and



web take-up means for taking-up the web for storage and subsequent use.

5,566,559

## DYEING MACHINE WITHOUT ROLLERS

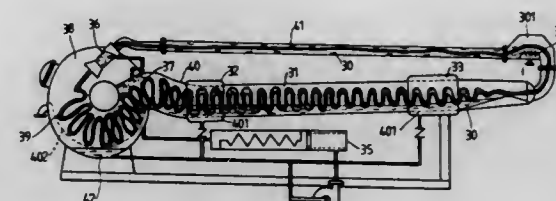
Fang-Ping Chen, P.O. Box 82-144, Taipei, Taiwan

Filed Sep. 5, 1995, Ser. No. 523,641

Int. Cl.<sup>6</sup> D06B 3/28

U.S. Cl. 68—177

1 Claim



1. A dyeing machine without rollers comprising: a circular trough having a neck portion at an upper portion thereof; a tail portion having an upper inlet extending upwardly and said tail portion then extending vertically downwardly to form a lower outlet; a large tubular passage located under the neck portion of said circular trough and connected between the neck portion of said circular trough and the lower outlet of said tail portion; a small tubular passage connected between said circular trough and said upper inlet of said tail portion; a first chamber mounted on said large tubular passage and provided at a bottom thereof with a first filtering net; a second chamber mounted on said large tubular passage and provided at a bottom with a second filtering net; a branch pipe connecting said first and second chambers with said circular trough; and a pump connected with said first and second chambers through said branch pipe for forcing excessive dyeing liquid collected by said chambers to flow to said circular trough.

5,566,560

## AIR BAG ANTI-THEFT DEVICE

Anthony LiCausi, DOXON Inc., 58-30 64th St., Maspeth, N.Y. 11378, assignor to Anthony LiCausi, Middle Village, N.Y.

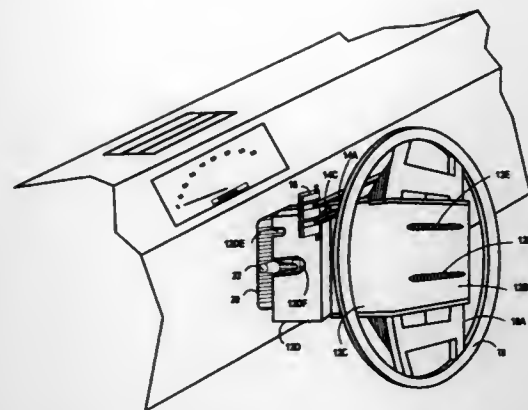
Filed May 8, 1995, Ser. No. 436,743

Int. Cl.<sup>6</sup> E05B 73/00

U.S. Cl. 70—18

5 Claims

1. An anti-theft device comprising:



- a) an air bag cover (12) adapted to engage a middle portion of a steering wheel (18) containing an air bag device, the air bag cover (12) comprises a front portion (12B) with a first side edge and a second side edge, a first side portion (12C) comprises a top edge wherein a first side flange (12G) extends outward from a top edge of the first side portion (12C) and a second side portion (12A) having a top edge and a second side flange (12G) extending outwardly from the top edge of the second side portion (12A), the second side portion (12A) enclosing an ignition switch located on the steering column (20) when the air bag cover (12) engages the middle portion of the steering wheel (18), the first side portion (12C) and the second side portion (12A) both extending backwardly from the front portion (12B) wherein the first side portion (12C) extends backwardly from the first side edge of the front portion (12B) and the second side portion (12A) extends backwardly from the second side edge of the front portion (12B) and the first side portion (12C) and second side portion (12B) are parallel;
- b) a stabilizing member (12D) is attached to the first side portion (12C) of the air bag cover, the stabilizing member (12D) engages the steering column (20) and the stabilizing member (12D) is attached to a rear edge of the first side portion (12C), the stabilizing member (12D) comprises a front flange (12DA) extending outwardly from the rear edge of the first side portion (12C), a side flange (12DB) that extends backwardly from the front flange (12DA), a top flange (12DC) is attached to a top edge of both the front flange (12DA) and the side flange (12DB), a bottom flange (12DD) attached to a bottom edge of both the front flange (12DA) and the side flange (12DB); and
- c) a bracket member (14) attached to the air bag cover (12) for securing the air bag cover (12) to the steering wheel (18).

5,566,561

## AUTOMOBILE ANTI-THEFT DEVICE

Richard Hucknall, 3 Fairview Ave., Great Neck, N.Y. 11023

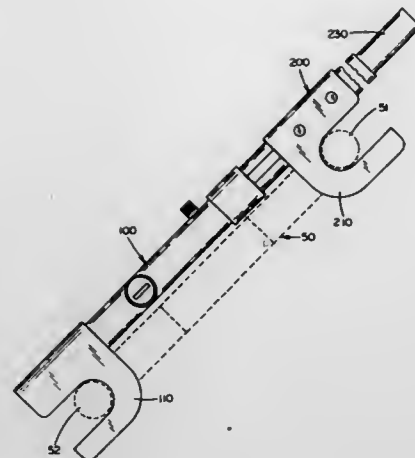
Filed Jun. 22, 1994, Ser. No. 263,727

Int. Cl.<sup>6</sup> B60R 25/02

U.S. Cl. 70—209

20 Claims

1. An anti-theft device for attachment to the steering wheel of an automobile, comprising in combination first and second members only, each having wheel gripping means forming a part thereof, the wheel gripping means on one of said members being mounted for limited translation along said one member, means for assembling said first and second members in coaxial alignment, core means adapted for translation within and between said members when coaxially assembled, and means responsive to said translation to increase the separation between said wheel gripping means and said means responsive to said translation adapted for telescopic translational movement to increase the length of the aligned assembly to more than the combined length of said first and second members.



5,566,562

## LOCKING SYSTEM FOR VEHICLE DOORS

Hiroshi Fujii, Heelands, United Kingdom, assignor to Nissan

Motor Co., Ltd., Yokohama, Japan

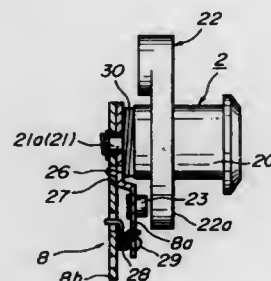
Filed Jul. 13, 1994, Ser. No. 274,261

Claims priority, application Japan, Jul. 14, 1993, 5-173486

Int. Cl.<sup>6</sup> E05B 47/00

U.S. Cl. 70—277

9 Claims



1. A locking system for a door, comprising:
- a locking mechanism capable of being locked and unlocked for locking and unlocking the door, respectively;
  - a lock cylinder connected via a first rod to said locking mechanism and operated from the outside of the door, said lock cylinder having a lock cylinder main body rotatable between a locking position and an unlocking position for causing said locking mechanism to be locked and unlocked, respectively;
  - a locking button connected via a second rod to said locking mechanism and operated from the inside of the door, said locking button being movable between a locking position and an unlocking position for causing said locking mechanism to be locked and unlocked, respectively;
  - a security mechanism operable for at least one of electric or electromagnetic actuation to lock said locking button in said locking position thereof and to unlock said locking button;
  - control circuit means for controlling said at least one of electric or electromagnetic actuation of said security mechanism;
  - locking switch means for supplying, when closed in response to rotation of said lock cylinder main body into said locking position thereof, to said control circuit means a signal for causing said security mechanism to lock said locking button in said locking position thereof;
  - unlocking switch means for supplying, when closed in response to rotation of said lock cylinder main body into said security mechanism unlocking position, to said control circuit means a signal for causing said security mechanism to unlock said locking button; and
  - a lever unit installed on an end portion of said lock cylinder main body for transmitting an operation force applied to said

lock cylinder to said first rod whilst converting rotary motion of said lock cylinder main body to reciprocating motion of said first rod;

said lock cylinder main body being further rotatable into a security mechanism unlocking position located between said locking position and said unlocking position;

said lever unit having a switch lever installed on said end portion of said lock cylinder main body for rotation therewith for causing said locking switch means to be closed when said lock cylinder main body is rotated into said locking position thereof and for causing said unlocking switch means to be closed when said lock cylinder main body is rotated into said security mechanism unlocking position, an operating force transmitting lever rotatably installed on said end portion of said lock cylinder main body and connected to said first rod, spring means interposed between said switch lever and said operating force transmitting lever for urging said operating force transmitting lever toward said unlocking position thereof, and engagement means having an arcuate slit and a guide projection movable in said arcuate slit for engaging said switch lever and said operating force transmitting lever in such a manner as to allow, when said lock cylinder main body is rotated from said locking position to said security mechanism unlocking position, said switch lever to rotate relative to said operating force transmitting lever.

5,566,563

Patent Not Issued For This Number

5,566,564

## ROLLING BLOCK FOR ROLLING METALLIC BARS OR WIRES

Hans Brauer, Leichlingen, Germany, assignor to Kocks Technik GmbH &amp; Co., Hilden, Germany

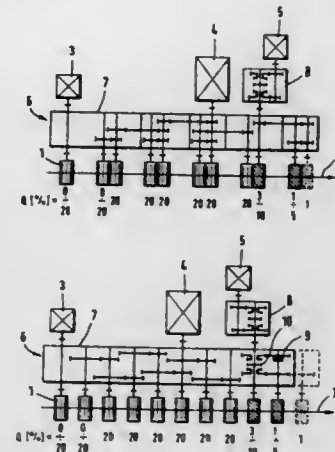
Filed Mar. 17, 1994, Ser. No. 214,832

Claims priority, application Germany, Mar. 17, 1993, 43 08 449.4

Int. Cl.<sup>6</sup> B21B 13/10; 39/00; 31/00

U.S. Cl. 72—226

22 Claims



1. A rolling block for rolling metallic bars or wires, comprising a plurality of successive frame spots; a plurality of rolling frames arranged on said frame spots and each having three rollers arranged in a star-like manner and radially adjustable with respect to a longitudinal axis of a rolling product; driving means for driving said rollers and including separately regulatable motors with a front motor, at least one central motor, and at least one rear motor, said rolling frames including less rolling frames than said frame spots, said rolling frames including rolling frames provided with finishing passes and all located always at an outlet side and

driven by said at least one rear motor, a first one of said rolling frames provided with drawing passes being always located at a first frame spot provided at an inlet side and also driven by said front motor, and all remaining rolling frames provided with drawing passes being located at frame spots which immediately follow said first frame spot and at frame spots immediately preceding said rolling frames with finishing passes and driven by said at least one central motor.

5,566,565

## PIPE BENDING DEVICE

Shigeru Saegusa, Sunto-gun, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Japan

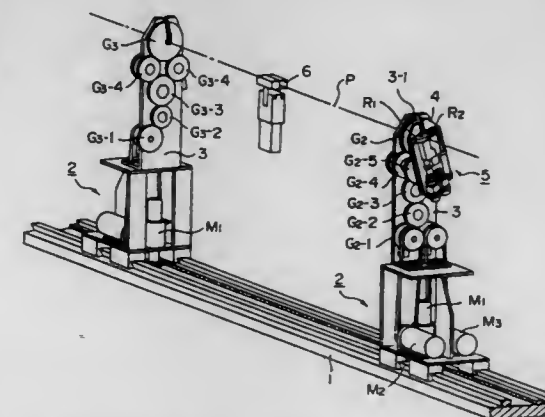
Filed Feb. 24, 1995, Ser. No. 394,283

Claims priority, application Japan, Feb. 25, 1994, 6-053223

Int. Cl.<sup>6</sup> B21D 7/024

U.S. Cl. 72—306

5 Claims



1. A pipe bending device for bending a pipe having a longitudinal axis, said device comprising: an elongate bed; a movable unit mounted on said bed in a manner to move longitudinally of the same, a support plate on said movable unit and projecting away from said bed; a twisting plate rotatably mounted on said support plate for holding and rotating said pipe by a predetermined angle on the axis of the pipe for setting a selected bend direction for the pipe; a bending roller unit mounted on said twisting plate for bending the pipe, which is held by said twisting plate, by a predetermined bending angle in a plane normal to said twisting plate; a first rotation transmitting train on said support plate for transmitting rotation to said twisting plate for setting the selected bend direction; a second rotation transmitting train on said support plate for transmitting rotation to said bending roller unit for bending said pipe by said predetermined bending angle; a twisting motor on said movable unit for operating said first rotation transmitting train to rotate said twisting plate for setting said selected bend direction for said pipe; and a bending/twisting motor for operating said second rotation transmitting train to rotate said bending roller unit for bending said pipe by said predetermined angle.

5,566,566

## METHOD OF MAKING A PAPER CLIP

Matthew C. Harper, Thousand Oaks, Calif., assignor to Scott L. Brotzman, Alta Loma, Calif.

Continuation-in-part of Ser. No. 186,997, Jan. 27, 1994, abandoned. This application Jun. 2, 1995, Ser. No. 458,810

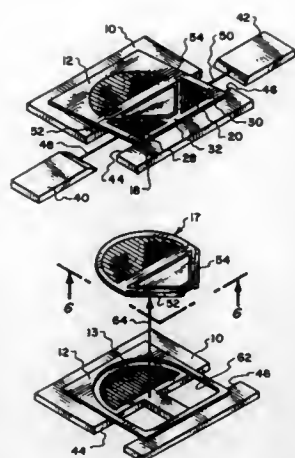
Int. Cl.<sup>6</sup> B21D 28/10; 53/36

U.S. Cl. 72—336

12 Claims

1. The method of making a paper clip comprising sequentially the steps of:
- placing the overall configuration of a paper clip onto an outer planar surface of a thin sheet of rigid yet bendable material





where the configuration includes the body of the paper clip and an adjacent pair of spaced-apart wings with there being an exterior edge formed between the overall configuration of the paper clip which includes the wings of the paper clip and the thin sheet of rigid yet bendable material; then severing only the exterior edge at said wings from the sheet of rigid yet bendable material leaving the remaining portion of the exterior edge unsevered; then partially deflecting the wings to a canted position relative to the sheet of rigid yet bendable material creating a bend line between each wing and the body of the paper clip; then severing the remaining exterior edge of the paper clip; and then removing the paper clip from the remaining exterior edge and the sheet of bendable material.

5,566,567

## ROTARY CUP INFEED

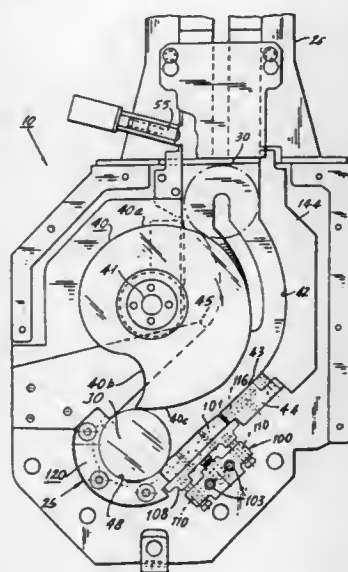
Ralph Main, San Pedro, Calif., assignor to Sequa Corporation, Hackensack, N.J.

Filed Apr. 25, 1995, Ser. No. 428,880

Int. Cl.<sup>6</sup> B21D 22/00; 43/16; B21J 13/10

U.S. Cl. 72—361

8 Claims



1. Apparatus for processing cup-like circular-sided parts including:  
a supply station constructed to hold cup-like circular-sided parts disposed side-by-side in a moving stack;  
a tool including a movable section mounted to move along a path that extends through a receiving station;

an indexing information for locating a circular-sided part at said receiving station for engagement by said movable section of said tool;  
a rotatably mounted feed member for separating the most downstream cup-like part in the stack from the remaining cup-like parts in the stack and transferring circular-sided parts one at a time from said supply station to said receiving station;  
said movable section being movable along said path between a forward position in front of said receiving station and a return position behind said receiving station, with said movable section when moving forward in a working stroke engaging a circular-sided part taken from said stack and disposed at said receiving station;  
said feed member having a pocket to receive circular-sided parts from said supply station;  
said feed member being rotated continuously about a fixed axis in coordination with movement of said movable section whereby a circular-sided part is disposed at said receiving station for each working stroke of said movable section;  
said supply station including an exit through which cup-like parts leave one at a time;  
a guideway through which circular-sided parts move while travelling from said exit to said indexing formation;  
said feed member including an arcuate lead-in formation extending from said pocket in the rotational direction for said member;  
said lead-in formation receding gradually from said exit toward said axis as said lead-in formation moves past said exit to support and control movement of a circular-sided part as it moves through said exit into said pocket;  
said guideway being defined by a stationary inner guide extending upstream from a first end of said indexing formation, a stationary outer guide spaced from said inner guide, and a tiltable tensioner extending upstream from a second end of said indexing formation and being interposed between said outer guide and said indexing formation;  
said tensioner including a shoe having a forward facing surface that is biased forward to engage sidewalls of circular-sided parts as they move toward said indexing formation; and  
while moving through said guideway toward said indexing formation, said circular sided parts passing said forward facing surface and in so doing contacting said forward facing surface to force said shoe rearward against action of a biasing force which urges said forward facing surface forward toward said inner guide.

5,566,568

MANUFACTURING PROCESS FOR CANS FOR  
FOODSTUFF PACKING, EQUIPPING THEM WITH  
VACUUM CLOSING DEVICES BY EASILY REMOVABLE  
UNCLINCHED METAL COVERS

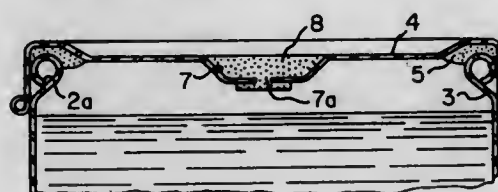
Arnaldo Rojek, São Paulo, Brazil, assignor to Metalgrafica Rojek Ltda., Brazil

Filed Mar. 29, 1994, Ser. No. 219,653

Int. Cl.<sup>6</sup> B21D 11/10

U.S. Cl. 72—379.4

10 Claims



1. Manufacturing process of a can for foodstuff packing, comprising the steps of:  
forming a cylindrical body from a tin sheet having a lower part and an upper part;  
forming an outwardly wound cord on top of said upper part, said cord having an external border disposed outside of said cylindrical body when formed;

retracting said upper part below said cord causing a marked reduction in a diameter of said upper part, wherein said upper part is now defined from a remaining section of said cylindrical body as an inclination inward and wherein said external border of said cord is in vertical alignment with said remaining section of said cylindrical body;  
clenching a bottom wall to said lower part; and  
closing said upper part of said cylindrical body with an easily removable metal cover that includes a relief hole with a detachable sealing obturator.

5,566,569

DETECTION OF UNPRESSURIZED MOVING  
CONTAINERS

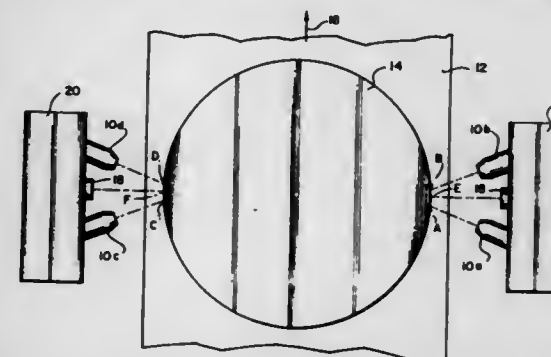
Eugene K. Achter, Lexington; Glenn Gray, Woburn; Helmut W. Klotzsch, Groton, and David Lieb, Lexington, all of Mass., assignors to Thermedics Detection Inc., Chelmsford, Mass.

Filed Aug. 29, 1994, Ser. No. 297,640

Int. Cl.<sup>6</sup> G01M 3/36; 3/02; 3/38

U.S. Cl. 73—37

37 Claims



1. A method of detecting an unpressurized moving container, comprising:  
directing a fluid against the moving container,  
detecting a level of deflection of the moving container resulting from the directed fluid, and  
indicating that the container is unpressurized when the detected level of deflection exceeds a threshold level.

5,566,570

METHOD AND APPARATUS FOR EVALUATING FOLD  
ENDURANCE AND SURFACE ADHESION OF SHEET  
MATERIALS

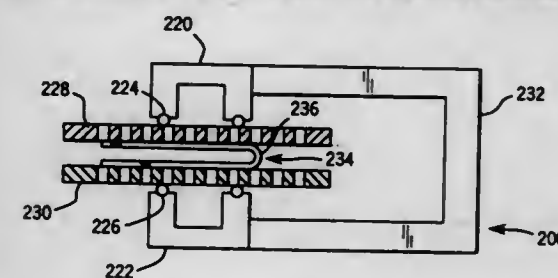
Steven G. Hankel, Blue Mounds; Dennis E. Gunderson, Madison; C. Timothy Scott, Mt. Horeb, and Roland L. Gleisner, Jr., Jefferson, all of Wis., assignors to Director, Bureau of Engraving and Printing, Department of the Treasury

Filed Jul. 21, 1994, Ser. No. 278,586

Int. Cl.<sup>6</sup> B21D 7/04

U.S. Cl. 73—159

12. A method capable of testing the endurance of a sheet and the



endurance and adhesion of surface treatments on the sheet, said method comprising:

- applying a pressure differential to a preselected section of a first slidable directionally porous surface;
- applying a pressure differential to a preselected section of a second slidable directionally porous surface;
- maintaining a preselected spacing between said surfaces;
- securing a portion of a sheet to said first surface;
- securing a different portion of said sheet to said second surface, thereby creating a fold at a preselected position on said sheet, the radius of said fold being determined by the spacing between said first and second surfaces; and
- selectively sliding said first surface relative to said second surface, thus permitting said fold to move over a preselected area of said sheet.

5,566,571

DIFFERENTIAL PRESSURE DETECTING EQUIPMENT  
CAPABLE OF PREVENTING ACCUMULATION OF NON-  
CONDENSIBLE GASES

Eljoe Kasai, and Tomohiko Masuda, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

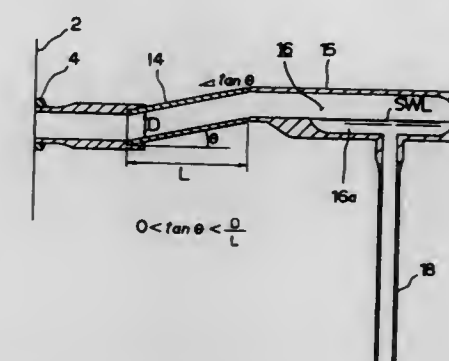
Filed Mar. 28, 1995, Ser. No. 411,993

Claims priority, application Japan, Mar. 29, 1994, 6-059306

Int. Cl.<sup>6</sup> G01F 23/00; G21C 17/00

U.S. Cl. 73—299

16 Claims



1. A water level measuring apparatus for measuring a water level in response to a pressure difference between a steam phase side and a liquid phase side, comprising:  
a steam phase side pressure detector for detecting a steam phase side pressure;  
a condenser having a steam flow-in port and an inner condenser chamber;  
a connection pipe connecting the steam phase side pressure detector and the steam flow-in port of the condenser;  
a liquid phase side pressure detector for detecting a liquid phase side pressure;  
a differential pressure detector connected to the condenser through a reference water column side pipe connected to a bottom portion of the condenser and connected to the liquid phase side pressure detector through a variable water column side pipe, respectively, to detect a pressure difference between a reference water head pressure of the reference water column side pipe and a variable water head pressure of the variable water column side pipe,  
wherein said connection pipe has an upward inclination  $\theta$  from the steam phase side pressure detector to the condenser so as to satisfy an equation of  $0 < \tan \theta < D/L$ , in which D is an inner diameter of the connection pipe and L is an axial length of the connection pipe.

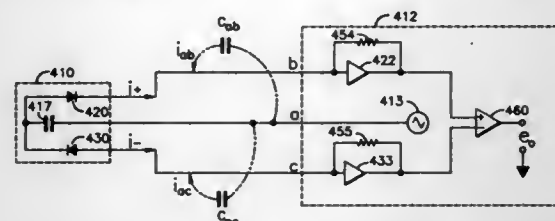
**5,566,572**  
**CIRCUITRY TO MINIMIZE STRAY CAPACITANCE**  
**EFFECTS IN A CAPACITIVE LIQUID LEVEL**  
**MEASUREMENT DEVICE**

Richard J. Pankow, Easton, and J. David Epler, Bethany, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 11, 1994, Ser. No. 241,265  
 Int. Cl.<sup>6</sup> G01F 23/26; G01R 27/26

U.S. Cl. 73—304 C

18 Claims



1. Circuitry for minimizing the effects of stray capacitance on the output of a capacitive liquid level measurement system, comprising:

- a capacitive sensor for mounting in a liquid storage container, the sensor having a capacitance the magnitude of which varies according to the liquid level in said storage container;
- voltage supply means for providing a time varying voltage to one side of said capacitive sensor;
- a pair of diodes connected to the other side of said capacitive sensor, said pair of diodes being oppositely directed from one another to thereby provide two signal paths from said other side of said capacitive sensor, each signal path differing from the other according to the polarity of signals conducted thereon;
- each of said signal paths conducting a current signal having a monopolar component corresponding to current flowing through said capacitive sensor and a bipolar component corresponding to current flowing through stray capacitance;
- said circuitry being characterized by:
- conversion means connected to each of said signal paths for providing a voltage signal the magnitude of which is related to the magnitude of said current signal being conducted by said signal path; and
- difference means connected to said conversion means for providing a difference signal indicative of the difference between said voltage signals, the magnitude of said difference signal being indicative of said liquid level.

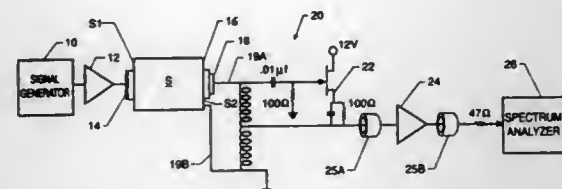
**5,566,573**  
**CAPACITIVE ACOUSTIC WAVE DETECTOR AND**  
**METHOD OF USING SAME**

William T. Yost, Newport News, Va., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 27, 1994, Ser. No. 317,491  
 Int. Cl.<sup>6</sup> G01N 29/12

U.S. Cl. 73—643

16 Claims



1. A capacitive detector for detecting acoustic waves propagated through a non-gaseous material, comprising:

- a dielectric having first and second substantially parallel faces, the first face being acoustically isolated from a surface of the material; and
- an electrode electrically coupled to the second face of said dielectric;
- said electrode and material surface being adapted to connect to an inductance capacitance circuit for measuring an oscillating capacitance between said electrode and the material surface as the material surface is oscillated by each acoustic wave propagated through the material, the changing capacitance being indicative of acoustic waves propagated through the material.

**5,566,574**  
**METHOD AND DEVICE FOR MONITORING AND**  
**MAINTAINING CORRECT REGULATION OF THE**  
**TENSION OF A YARN FED TO A TEXTILE MACHINE**

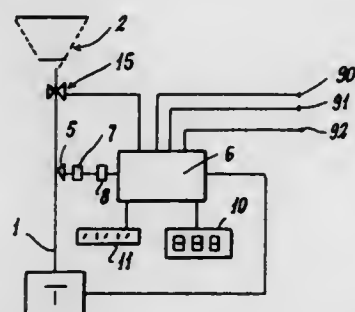
Barea Tiziano, Busto Arsizio, Italy, assignor to International Trading S.r.L., Busto Arsizio, Italy

Filed Mar. 24, 1994, Ser. No. 217,507

Claims priority, application Italy, Apr. 5, 1993, M193A0671  
 Int. Cl.<sup>6</sup> G01L 5/00

U.S. Cl. 73—862.473

21 Claims



- 1. A method for monitoring tension of a yarn unwound from a support bobbin and fed to a textile machine and for maintaining the tension of the yarn substantially constant and equal to a predetermined tension value, comprising the steps of:
- determining whether the yarn is moving between the bobbin and the textile machine at a position between the bobbin and the textile machine,
- directing the yarn in a path from the bobbin to the textile machine over a tension sensor such that the yarn is in continuous engagement with the tension sensor,
- continuously measuring the tension of the yarn by maintaining the yarn in engagement with the tension sensor, the tension sensor generating a continuous electrical signal proportional to the tension of the yarn, said tension sensor selected from the group consisting of a piezoresistor and a foil strain gage,
- comparing the measured tension of the yarn to the predetermined tension value to detect whether there is a difference between the measured tension and a predetermined tension value, and
- adjusting the tension of the yarn at a position between the bobbin and the position in which the tension is measured if the measured tension is different than the predetermined tension value to cause the tension of the yarn to substantially equal the predetermined tension value.

**5,566,575**  
**ROCKER PIN LOAD CELL WITH A ROTATION**  
**LIMITER**

Ronald Will, Alsbach; Markus Franz, Rosdorf; Ralf Waegner, Trebur; Hans-J. Gerlach, Hoechst, and Werner Schlachter, Darmstadt, all of Germany, assignors to Hottinger Baldwin Messtechnik GmbH, Darmstadt, Germany

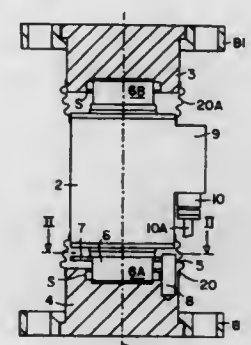
Filed Jun. 6, 1995, Ser. No. 465,732

Claims priority, application Germany, Dec. 13, 1994, 9419696 U

Int. Cl.<sup>6</sup> G01L 1/04

U.S. Cl. 73—862.629

8 Claims



- 1. A rocker pin load cell having a longitudinal pin axis, comprising a rocker pin (2) having two rocker pin ends, at least one support socket (3 or 4) for supporting at least one rocker pin end of said rocker pin, a rocker pin rotation limiting collar (7) rigidly connected to said one end of said rocker pin (2) received in said at least one socket (3 or 4), said limiting collar having an opening (10, 10') forming two stop surfaces (11, 12) spaced from each other and facing each other, a rocker pin rotation limiting stop stud (8) rigidly mounted to said one socket (3 or 4) for cooperation with said stop surfaces (11, 12) of said limiting collar (7), said stop stud (8) having a longitudinal axis extending in parallel to said longitudinal pin axis, said rocker pin load cell further comprising at least one elastic jacket (20) enclosing said limiting collar (7) and said stop stud (8).

**5,566,576**  
**UNIVERSAL SAMPLING DEVICE FOR HIGH AND LOW**  
**VISCOSITY SUBSTANCES**

Samuel E. Sher, Rockaway; Stephen A. Borgianini, Mount Holly; Robert E. Carpenter, Nutley; Scott Santora, Hammon, and William S. Scavuzzo, Clark, all of N.J., assignors to Norton Company, Worcester, Mass.

Division of Ser. No. 939,341, Sep. 2, 1992, Pat. No. 5,349,875.  
 This application Jun. 1, 1994, Ser. No. 252,516

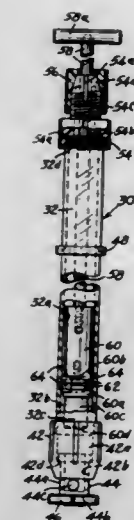
Int. Cl.<sup>6</sup> G01N 1/00

U.S. Cl. 73—864.65

1 Claim

- 1. A device for retrieving samples of substances at various depths from source contained by bottom and side containing walls without complete submergence of the device in the substance comprising:

- an elongated tube having an outer wall surrounding an internal chamber and extending between opposite inlet and outlet ends of the tube;
- inlet valve means including an inlet valve body with an inlet valve bore therein connected to an inlet end portion of the tube and adapted for manual insertion into the substance and allowing the passage of a sample thereof into the internal chamber of the tube;
- a piston slidably mounted in the internal chamber and sealingly engaging the internal surface of the outer wall of the tube;
- a piston rod attached to and extending upwardly from the piston and slidable through the outlet end of the tube having an internal bore and surface extending around the piston rod and a vent passage for allowing passage of air into and out of the internal chamber above the piston;



adjustable collet means connected to the outlet end portion of the outlet vent valve means for frictionally engaging and securing the piston rod and attached piston; and means attached to the piston rod for actuating the piston and sucking a sample of the substance through the inlet valve means and into the internal chamber.

**5,566,577**  
**DRIVING MECHANISM OF A WINDSCREEN WIPER**  
**FOR AN AUTOMOTIVE VEHICLE**

Josef Klar, Löchgau, Germany, assignor to ITT Automotive Europe GmbH, Germany

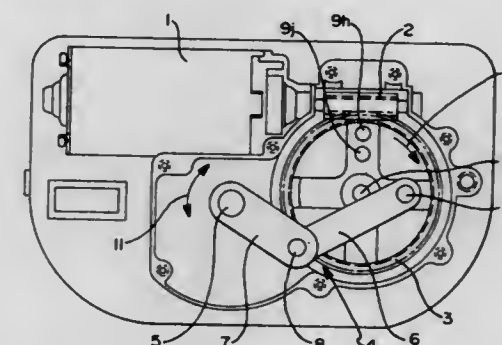
PCT No. PCT/EP93/01423, § 371 Date Mar. 23, 1995, § 102(e) Date Mar. 23, 1995, PCT Pub. No. WO93/25415, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 4, 1993, Ser. No. 351,455

Claims priority, application Germany, Jun. 13, 1992, 42 19 480.6

Int. Cl.<sup>6</sup> B60S 1/24; F16H 21/52  
 U.S. Cl. 74—42

7 Claims



- 1. A driving mechanism for use in vehicle windshield wiper system having a windshield wiper arm coupled to a wiper shaft, the driving mechanism comprising:
- a motor having a gear and operably rotating said gear;
- a first wheel part supported by a bearing shaft for concentric rotation about an axis of said bearing shaft and having gear teeth on an outer perimeter of said first wheel part engaged by said gear and having a locating line extending radially from said axis;
- a second wheel part having an adjustment feature facilitating the second wheel part being fixed to said first wheel part at a selected orientation and together with the first wheel part cooperatively defining at least two selectively used hinge points with said hinge points being unequally radially spaced from said axis of said bearing shaft; and



a crank drive member having a first end hinged to a selected one of said hinge points, a second end of said crank drive member being coupled to the wiper shaft such that rotation of said first wheel part cause movement of the wiper shaft to perform a windshield wiping operation, wherein said selected one of said hinge points is fixed in a predetermined angular position with respect to said locating line of said first wheel to assure that the wiper arm is in a park position when the windshield wiping operation terminates.

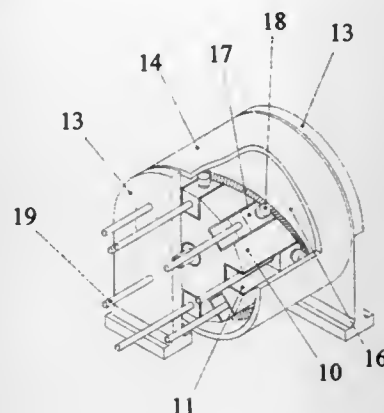
**5,566,578**  
**POWER RECEIVING TORQUE TRANSLATING OUTPUT DEVICE**

Arthur S. Rose, Seattle, Wash., assignor to Robert Sternoff, Kirkland, Wash.

Filed May 19, 1995, Ser. No. 444,764  
Int. Cl.<sup>6</sup> F02B 75/26; F16H 25/12

U.S. Cl. 74—57

7 Claims



1. A power receiving, torque translating, output device comprising:

- a block of octagonal shape and cast construction having a round hole cast into the centerline of said block parallel to the eight equal sides of said block, at least eight rectangular grooves cast axially into said block parallel to said centerline having their open sides facing outwardly from said centerline, fastener receiving threads;
- a stationary shaft of round section having attachment threads on each end, fitted through said round hole protruding at each end of said block;
- at least one mounting plate having an attachment seat for said shaft and fastening means to secure said block and apertures for connecting rods;
- a rotor having a hub portion having friction reducing beating means rotatably mounted to said stationary shaft, a drum shaped outer portion adapted to overlap the full length of said block, the drum having an outer surface adapted to mate with power output belts, and an inner surface adapted to mount a cam in close proximity for rotation about said block;
- a cam affixed inside said rotor having two tubular portions whose adjacent edges form a two cycle sinusoidal groove of substantially rectangular cross section;
- at least eight actuators of rectangular shape adapted to reciprocate in said rectangular grooves;
- at least eight cam follower bearings attached by threaded fastener means perpendicular to said actuators adapted to intersect and cooperate with said cam; and
- at least eight connecting rods having attachment threads on each end adapted to connect said actuators to external devices capable of producing reciprocating power.

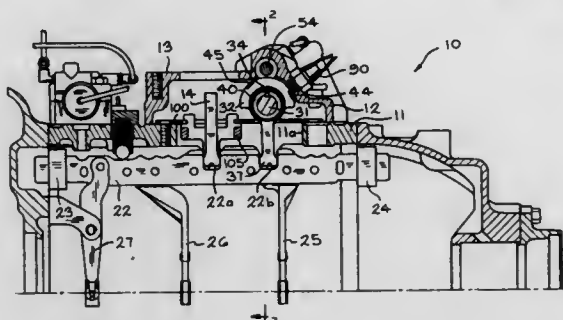
**5,566,579**  
**VEHICLE TRANSMISSION HAVING MANUALLY SHIFTED LOWER GEARS AND AUTOMATICALLY SHIFTED HIGHER GEARS**

George A. Willford, Waterville; Kurt R. Baer; John M. Loeffler, both of Toledo, all of Ohio, and Dennis D. Schwaiger, Whitmore Lake, Mich., assignors to Dana Corporation, Toledo, Ohio

Division of Ser. No. 147,283, Nov. 3, 1993. This application Jun. 5, 1995, Ser. No. 461,190  
Int. Cl.<sup>6</sup> F16H 61/00

U.S. Cl. 74—335

20 Claims



1. A transmission comprising:

- an input shaft;
- an output shaft;
- a gear engaging mechanism selectively operable in a first condition, wherein said input shaft is not connected to said output shaft, and a second condition, wherein said input shaft is connected through said gear engaging mechanism to said output shaft;
- a shift rail movable between a first shift rail position, wherein said gear engaging mechanism is operated in said first condition, and a second shift rail position, wherein said gear engaging mechanism is operated in said second condition;
- a shift shaft having a shift member mounted thereon for rotation with said shift shaft and for axial movement relative thereto between a first shift member position, wherein said shift member is engaged with said shift rail, and a second shift member position, wherein said shift member is disengaged from said shift rail;
- means for selectively rotating said shift shaft when said shift shaft is located in said first shift member position so as to cause movement of said shift rail between said first and second shift rail positions; and
- means responsive to rotation of said shift member for generating a signal which is representative of the relative position of said shift rail.

**5,566,580**  
**MOTION TRANSMITTING ROD WITH SECURITY DEVICE**

André Girard, La Chapelle Du Noyer, and Giovanni Piu, Bourges, both of France, assignors to Hutchinson, Paris, France

PCT No. PCT/FR94/00585, § 371 Date Mar. 3, 1995, § 102(e) Date Mar. 3, 1995, PCT Pub. No. WO94/27068, PCT Pub. Date Nov. 24, 1994

PCT Filed May 17, 1994, Ser. No. 374,510

Claims priority, application France, May 18, 1993, 93 05991; Jul. 20, 1993, 93 08887

Int. Cl.<sup>6</sup> G05G 25/00; B60K 20/00; F16H 59/02

U.S. Cl. 74—473 R

14 Claims

1. A motion transmission rod comprising:
- two rod parts having adjacent tubular extremities; and
  - an elastic filtering sleeve including
- a rigid core,
  - an elastic coating on said rigid core, and



two opposite sleeve extremities of said coated rigid core which are engaged in said tubular extremities whereby said filtering sleeve connects said rod parts to each other.

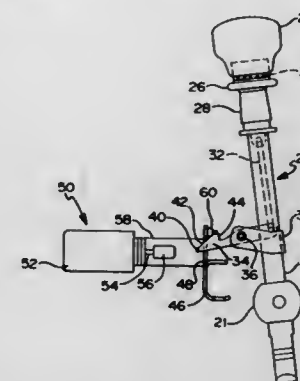
**5,566,581**  
**MANUAL TRANSMISSION AND IGNITION INTERLOCK**  
Randall D. Smale, Farmington Hills, and Gary A. Novotny, Flushing, both of Mich., assignors to Dura Automotive Systems, Inc., Troy, Mich.

Filed Oct. 11, 1994, Ser. No. 328,678

Int. Cl.<sup>6</sup> B60K 20/04

U.S. Cl. 74—475

15 Claims



1. A shift lever lock for a vehicle having a manual transmission controlled by a shift lever movable between a plurality of operating positions including REVERSE, comprising a latch bar movably mounted on the shift lever for movement between latched and unlatched positions, means biasing the latch bar to latched position, a latch receiver mounted on the vehicle for receiving the latch bar upon shift lever movement to REVERSE to latch the shift lever, an operator on the shift lever for moving the latch bar from latched to unlatched positions, and a lock device operable to lock the latch bar in latched position to prevent movement of the shift lever out of REVERSE.

**5,566,582**  
**SELECTOR MECHANISM FOR A VEHICLE TRANSMISSION**

David E. Beadle, Southam; Mahesh Chauhan, Coventry; John S. Ebre, Redditch; Iorwerth D. Lewis, Grovesend; Robin C. Powell, Harpole; Robert J. Railton, Birmingham; Michael Robinson, Loughor, and Alan F. Sheppard, Hunt End, all of United Kingdom, assignors to Rover Group Limited, Birmingham, England

Filed Nov. 4, 1994, Ser. No. 334,878

Claims priority, application United Kingdom, Nov. 5, 1993, 9322836

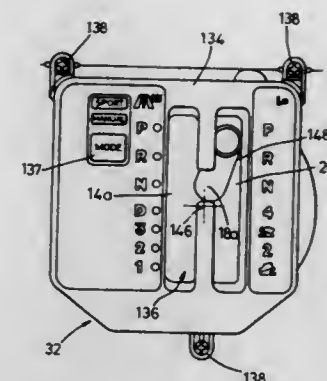
Int. Cl.<sup>6</sup> B60K 20/06

U.S. Cl. 74—475

18 Claims

1. A selector mechanism for a vehicle transmission which comprises an automatic transmission drivingly coupled to a range-change transmission having first and second selectable ranges, the selector mechanism comprising:

- a support;
- a driver operable selector lever constrained by the support for movement along a first path for shift selection in the automatic transmission with the first range of the range-change



transmission selected, along a second path substantially parallel to the first path for shift selection in the automatic transmission with the second range of the range-change transmission selected and along a third path transverse to the first and second paths whereby movement of the selector lever along the transverse path effects a change from one range to the other in the range-change transmission;

- a detent mechanism for locating the selector lever at positions in the support corresponding to selected shift positions;
- selector release means on the selector lever and movable to disengage the detent mechanism;
- a detent spring which cooperates with the selector release means such that the selector release means requires movement against the bias of the detent spring when disengaging the detent mechanism; and
- a blocking spring which cooperates with the selector release means such that the selector release means requires further movement against the bias of the blocking spring after overcoming the bias of the detent spring to enable the selector lever to be moved along the transverse path to effect a range-change.

**5,566,583**  
**SHIFTING APPARATUS OF AUTOMATIC TRANSMISSION**

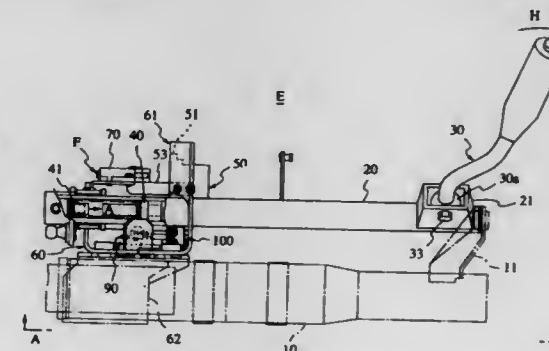
Yasuhito Suzuki, Shizuoka-ken, Japan, assignor to Fujikiko Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 28, 1994, Ser. No. 345,113

Claims priority, application Japan, Nov. 30, 1993, 5-300003  
Int. Cl.<sup>6</sup> F16H 59/00

U.S. Cl. 74—477

4 Claims

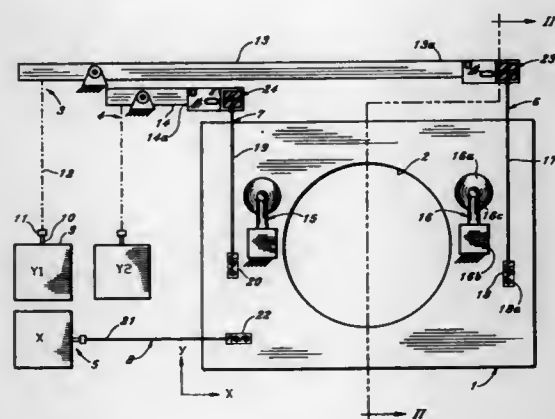


1. A shifting apparatus for an automatic transmission mounted on a steering column (10), comprising:
- a shift lever (30) shiftable between a park position and drive positions formed in a shift plate (61);
  - a selector member (50) having an arm (53), said arm being formed with a detent portion (51) selectively engaged with one of a plurality of shift positions of said shift plate when said shift lever (30) is shifted;
  - a shift lever lock mechanism having:

a shift lock member (90) for locking said selector member (50);  
 a switch (70) turned on by said arm (53) of said selector member (50) when said shift lever is set to the park position;  
 an actuator (80) energized when said switch (70) is turned on to move said shift lock member (90) to a shift lock position; and  
 an actuation member (100) associated with said selector member (50) and said shift lock member (90) between the shift lock position and a shift unlock position; and  
 a key lock mechanism (200) for locking and unlocking said actuation member (100) via a key lock cable (105).

**5,566,584**  
**FLEXURE SUPPORT FOR A FIXTURE POSITIONING DEVICE**  
 Joseph Briganti, Monroe, Conn., assignor to Beta Squared, Inc., Brookfield, Conn.

Filed Aug. 31, 1995, Ser. No. 522,014  
 Int. Cl.<sup>6</sup> B23Q 1/25; G03B 27/53  
 U.S. Cl. 74—490.07



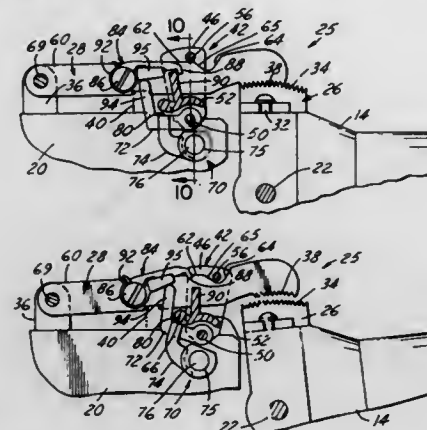
1. An improved flexure support for a fixture positioning device having a fixture adapted to be selectively positioned along a first axis with respect to a reference member, said flexure support being connected to said fixture, coarse positioning means connected to the flexure support and adapted to move the flexure support and fixture along the first axis, and fine positioning means adapted to selectively engage the fixture and move it along the first axis, wherein said flexure support comprises:

a longitudinal slender flexure member extending between the coarse positioning means and the fixture along the first axis so as to constrain the fixture to move along the first axis while permitting substantial freedom of movement of the fixture in a direction perpendicular to the flexure member by flexing thereof, and  
 a yieldable coupling connected to said flexure member along the first axis between the fixture and the coarse positioning means, said yieldable coupling being constructed to permit limited movement of the fixture along the first axis while it is being restrained against such movement by the coarse positioning means.

**5,566,585**  
**TILT STEERING COLUMN LOCKING MECHANISM**  
 William M. Snell, Grand Blanc; Rodney L. Eaton, Clarkston; David A. White, Goodrich, and Thomas S. Kaliszewski, Troy, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Continuation-in-part of Ser. No. 205,221, Mar. 3, 1994, Pat. No. 5,452,624. This application May 15, 1995, Ser. No. 442,233

Int. Cl.<sup>6</sup> B62D 1/18  
 U.S. Cl. 74—493 12 Claims



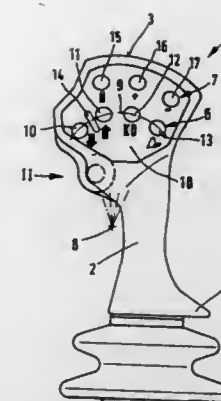
1. Apparatus for releasably locking the tilt steering column of an automotive vehicle in adjusted position, comprising support structure adapted to be affixed to the vehicle frame, a steering column assembly, means pivotally mounting said steering column assembly on said support structure for vertical pivotal movement, a rack carried by said steering column assembly and having rack teeth, a pawl having first and second ends, pawl teeth at said first end of said pawl, means pivoting said second end of said pawl to said support structure for pivotal movement of said pawl to positions engaging and disengaging said rack and pawl teeth, a bracket, means pivoting said bracket to said support structure for movement between first and second positions, said pawl having a cam surface provided with locking and release surface portions, said bracket having a lock pin slidable over said cam surface and engageable with said locking surface portion thereof in its first position and with said release surface portion thereof in its second position, said pawl, when said bracket is in its first position, being moved by said lock pin to its position engaging said rack and pawl teeth to lock said steering column assembly in adjusted position and when said bracket is in its second position, being released by said lock pin for movement to its position disengaging said rack and pawl teeth and releasing said steering column assembly, means operative when said bracket is moved to its second position for moving said pawl to its position disengaging said rack and pawl teeth, latching means for latching said bracket in said first position thereof, and operating means for releasing said latching means and thereafter in sequence for moving said bracket from the said first to the said second position thereof.

**5,566,586**  
**STEERING STICK FOR SWITCHING OR ACTUATING COMPONENTS OF A UTILITY VEHICLE**

Armin Lauer, Immenstaad; Walter Frei, and Alfred Schobinger, both of Friedrichshafen, all of Germany, assignors to ZF Friedrichshafen AG, Friedrichshafen, Germany  
 PCT No. PCT/EP93/00320, § 371 Date Jul. 18, 1994, § 102(e) Date Jul. 18, 1994, PCT Pub. No. WO93/15927, PCT Pub. Date Aug. 19, 1993

PCT Filed Feb. 10, 1993, Ser. No. 256,599  
 Claims priority, application Germany, Feb. 13, 1992, 42 04 223.2

Int. Cl.<sup>6</sup> G05G 1/04  
 U.S. Cl. 74—523 11 Claims  
 1. A steering stick (1) for switching and actuating components of a utility vehicle comprising:

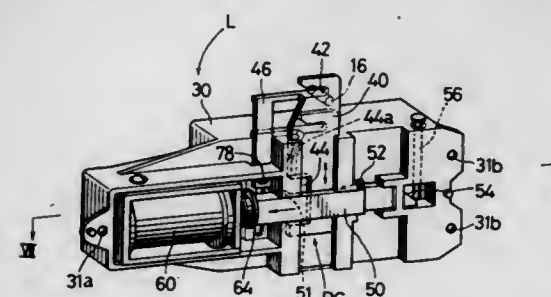


a handle (2) ergonomically adapted to a hand and having a head (3) with switching elements (6, 7) arranged so as to be within reach of a thumb of a hand gripping said handle  
 wherein a first row of first switching elements (6) is spatially positioned with respect to said handle (2) such that the first switching elements (6) lie substantially in a first arc (9) having a radius substantially corresponding to the radius of a thumb of a hand gripping said handle (2);  
 a second row of additional switching elements (7) is arranged in a second arc spatially positioned with respect to said handle (2) adjacent the first row of said first switching elements (6), relative to a thumb of a hand gripping said handle (2);  
 said first switching elements (6) consist of a plurality of keys (10, 11, 12, 13) for: traveling forward, traveling in reverse, stepping down by one gear and moving a working implement to a predetermined position, respectively, and said additional switching elements (7) consist of a plurality of keys (15) for: switching to a neutral position of a transmission, stepping the transmission up and stepping the transmission down, respectively; and  
 signaling elements are placed on said head (3) of said steering stick (1) for visual indication of actuation of said switching elements.

**5,566,587**  
**SHIFT LOCK DEVICE FOR AUTOMATIC TRANSMISSION**

Yoshitaka Sogo; Hideki Kanematsu, and Kazuo Takahashi, all of c/o Tsuda Kogyo Kabushiki Kaisha 1-1, Saiwai-cho 1-chome, Kariya-shi, Aichi-ken, all of Japan  
 Continuation of Ser. No. 63,288, May 18, 1993, Pat. No. 5,456,133. This application Jun. 7, 1995, Ser. No. 472,276  
 Claims priority, application Japan, Dec. 17, 1992, 4-355862  
 Int. Cl.<sup>6</sup> G05G 1/04; 1/06

U.S. Cl. 74—526 7 Claims

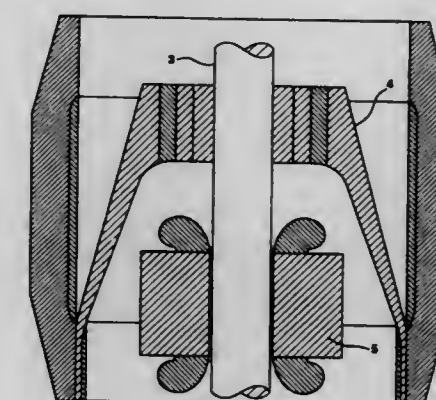


1. A shift lock device for precluding the operability of a shift lever which operates an automatic transmission of an automobile, by preventing an engagement pin to move when the shift lever is positioned in a parking position, wherein the engagement pin is enabled to move by operating a push button provided on the shift

lever so as to permit operation of the shift lever to a desired drive position, said shift lock device comprising:  
 a housing having flanged portions with holes for mounting on a support plate, said housing including a first chamber and a second chamber;  
 a locking mechanism for preventing operation of the engagement pin under a desired condition and  
 an actuator connected to said locking mechanism and actuated for releasing a locking condition of the locking mechanism under a specific condition enclosed in said second chamber;  
 a control switch coupled with said locking mechanism, said control switch being operative to detect whether the shift lever is positioned in the parking position or not and generate a corresponding signal and  
 a controller responsive to the signal from said control switch generating a corresponding signal for controlling said actuator enclosed in said first chamber of the housing.

**5,566,588**  
**FLYWHEEL ROTOR WITH CONICAL HUB AND METHODS OF MANUFACTURE THEREFOR**  
 Daniel Bakholdin, 14929 Sylvan St., Van Nuys, Calif. 91411; Robert W. Bosley, 18104 Hoffman Ave., Cerritos, Calif. 90701, and Harold A. Rosen, 14629 Hilltree Rd., Santa Monica, Calif. 90402

Filed Jan. 14, 1994, Ser. No. 181,038  
 Int. Cl.<sup>6</sup> H05K 5/04; 7/02  
 U.S. Cl. 74—572 17 Claims



14. A flywheel rotor for a flywheel energy storage system, comprising:

an outer, primarily cylindrical portion including first fibers having a predetermined first tensile strength for storing a relatively large amount of total system energy; and  
 a hub portion fixedly coupled to said outer cylindrical portion including:  
 a single conical member formed from second fibers of a second predetermined second tensile strength; and  
 an inner cylindrical member operatively connected to a rotatable shaft,  
 wherein said conical member directly connects a first end of said outer cylindrical portion with said inner cylindrical member, wherein a second end of said outer cylindrical portion is disposed proximate to said inner cylindrical member whereby the separation between said second end of said outer cylindrical portion and said inner cylindrical member is substantially less than the separation between said first end of said outer cylindrical portion and said inner cylindrical member, and wherein said first tensile strength is substantially greater than said second tensile strength.



5,566,589

**BICYCLE CRANK ARM EXTENDER**

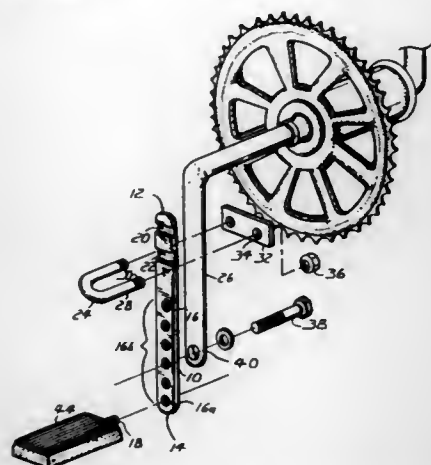
Vernon E. Buck, 12381 E. Potter Rd., Davison, Mich. 48423

Filed Aug. 28, 1995, Ser. No. 520,084

Int. Cl.<sup>6</sup> B62M 3/02

U.S. Cl. 74—594.1

8 Claims



1. An extender for a bicycle crank arm including a pedal, said extender comprising:
  - a unitary elongated member having an inner end, an opposing outer end, and a plurality of transverse, threaded through-bores, one of said plurality of transverse, threaded through-bores being proximate to said opposing outer end for receiving the pedal;
  - a cylindrical rod member for connecting the crank arm to said elongated member at a second one of said plurality of transverse, threaded through-bores; and
  - attaching means for attaching said inner end of said elongated member to the crank arm.

5,566,590

**CRANK DEVICE**

Joo S. Wan, 1001-32, Sadang 1 Dong, Dongjakgu, Seoul, Rep. of Korea

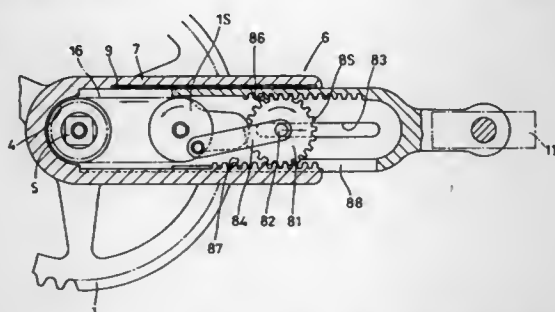
Filed Jul. 14, 1994, Ser. No. 273,127

Claims priority, application Japan, Jul. 14, 1993, 5-174349

Int. Cl.<sup>6</sup> G05G 1/14

U.S. Cl. 74—594.3

19 Claims



1. A crank mechanism comprising: a rotary shaft rotatable about the longitudinal axis thereof; a crank arm fixed to said rotary shaft so as to rotate therewith, said crank arm comprising a first arm portion having one end fixed to said rotary shaft, and a second arm portion mounted to said first arm portion so as to be slidable relative to said first arm portion; a rotary member rotatably mounted to said crank arm so as to be rotatable relative to said crank arm; transmission means for rotating said rotary member relative to said crank arm as said crank arm is turned about the longitudinal axis of said rotary shaft; and motion converting means integrated with said rotary member for moving said second arm

portion toward said first arm portion while said rotary member is rotating a first half of one full rotation in one direction and for moving said second arm portion away from said second arm portion while said rotary member is rotating the second half of said one full rotation in said one direction, said motion converting means comprising a first motion transmitting component coupled to said rotary member, and a second motion transmitting component engaging said first motion transmitting component during the entire time said rotary member is making said one full rotation.

5,566,591

**ENGINE/TRANSMISSION ADAPTER KIT**

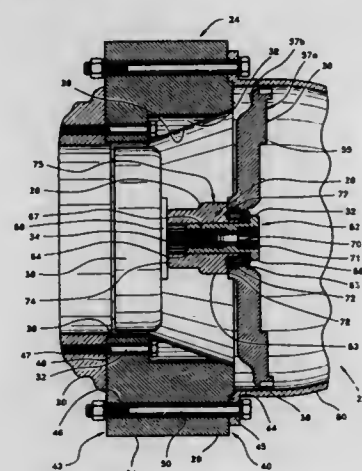
James D. Burkett, 3069 Carnelian St., Las Vegas, Nev. 89121

Filed May 3, 1994, Ser. No. 237,284

Int. Cl.<sup>6</sup> F16H 57/02

U.S. Cl. 74—606 R

8 Claims



1. A kit for use in connecting an engine to a transmission, said engine having a housing with an output end with an output shaft extending therefrom and having splines thereon over a first section and being threaded on an exterior or a second section and said transmission having a transmission housing, comprising:
  - a connector housing having a first end, a second end, and a central aperture therethrough, said first end of said connector housing adapted for connection to the housing of said engine at said output end, said second end of said connector housing adapted for connection to the transmission housing whereby said connector housing spaces said output end of said engine apart from said transmission housing;
  - a flywheel adapter comprising a substantially tubular member having a first end with neck extending therefrom, and a second end having a number of engaging splines located therein for engagement with said splines on said engine output shaft;
  - a flywheel for mounting to said flywheel adapter, said flywheel having a central flange with a bore therethrough and including a number of engaging teeth on an outer periphery thereof; and
  - a gland nut, said gland nut comprising a hollow cylindrical member having a head at one end and including threaded on an interior surface thereof for engagement with said threads on said engine output shaft, said gland nut sized for insertion into said flywheel adapter.

5,566,592

**ADJUSTING DRIVE, IN PARTICULAR A WINDOW-LIFT DRIVE FOR A MOTOR VEHICLE**

Peter Adam, Hoechberg, and Rudolf Fiedler, Bad Mergentheim, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

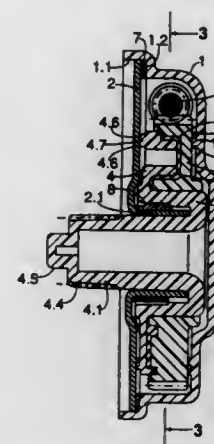
Filed Jan. 19, 1995, Ser. No. 375,450

Claims priority, application European Pat. Off., Jan. 21, 1994, 94100857

Int. Cl.<sup>6</sup> F16H 57/02; 1/16

U.S. Cl. 74—606 R

30 Claims



1. An adjusting drive comprising:
  - a) a gear housing;
  - b) a gear-housing lid, the gear housing lid,
    - i) sealing off the gear housing, and
    - ii) including an axial bearing neck, the axial bearing neck, projecting axially into the gear housing, and being attached to the gear-housing lid;
  - c) a drive plate, the drive plate
    - i) having a radially inner axial bearing projection, the radially inner axial bearing projection rotatably supporting the drive plate on the axial bearing neck of the gear-housing lid, and
    - ii) having a radially outer axial bearing projection, the radially outer axial bearing projection attached radially on the outside to the drive plate, concentrically to the bearing neck; and
  - d) a drive-side gear wheel, the gear wheel being supported, in a tangentially displaceable manner, on the radially outer axial bearing projection of the drive plate, wherein the axial bearing neck provides a rotatable, concentric bearing arrangement for the drive-side gear wheel and for the drive plate.

5,566,593

**DRIVE DEVICE FOR A VEHICLE PART THAT IS DISPLACEABLE BETWEEN END POSITIONS**

Claus Vordermaier, München, Germany, assignor to Webasto Karosseriesysteme GmbH, Germany

Filed Jan. 11, 1995, Ser. No. 371,435

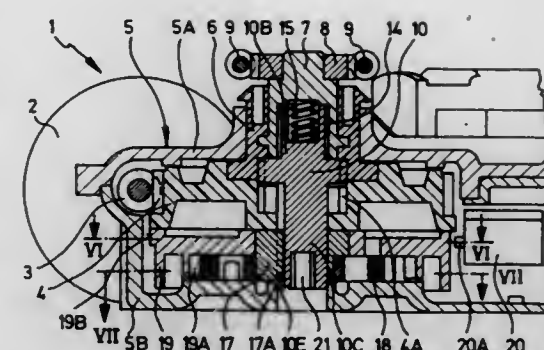
Claims priority, application Germany, Feb. 5, 1994, 44 03 574.8

Int. Cl.<sup>6</sup> B60J 7/057; F16H 1/16

U.S. Cl. 74—625

8 Claims

1. Drive device for a vehicle part that is displaceable between end positions, comprising an electric motor that is connected by a reduction gear to a pinion gear on an output shaft via an input shaft, the pinion gear being in driving connection with the displaceable vehicle part by power transmission means, at least one switch for stopping operation of the electric motor in at least one predetermined position of the displaceable vehicle part, and an indexing gear and eccentric gear in driving connection with the reduction gear for actuation of the switch; wherein the output shaft, a driving part of the eccentric gear and a worm wheel of the



reduction gear are drivingly coupled to the input shaft in a normal working position of the drive device and have gear means enabling axial shifting of the input shaft into an emergency actuation position in which the worm wheel is uncoupled from the input shaft, and the eccentric gear and the output shaft remain coupled with the input shaft.

5,566,594

**LONG LIFE RE-RULABLE STEEL RULE DIE SYSTEM**

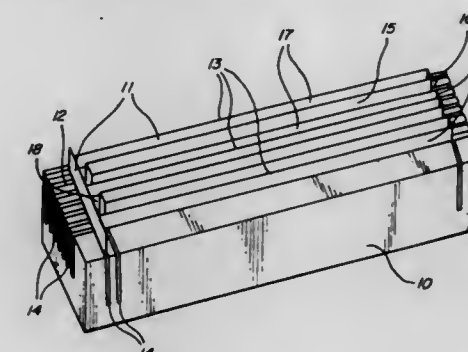
Steven B. Michlin, 5310 Bentley Suite 105, West Bloomfield, Mich. 48322

Filed Nov. 5, 1993, Ser. No. 147,493

Int. Cl.<sup>6</sup> B21K 5/20

U.S. Cl. 76—107.8

5 Claims



1. A method for making a re-rulable steel rule die, said method comprising using a computer-directed laser beam to cut precise slots through multiple metal frame layers, joining said multiple metal frame layers together such that said slots align, inserting blades into said slots to cut work material adjacent a first surface of said joined frame layers, and attaching a plate on a second surface of said joined frame layers opposite said first surface to prevent said blades from protruding from said second surface.

5,566,595

**SOCKET MOUNTING ARRANGEMENT**

Thomas R. Goff, Campbellville, Ky., assignor to Socket Retainer Systems, Inc., Campbellville, Ky.

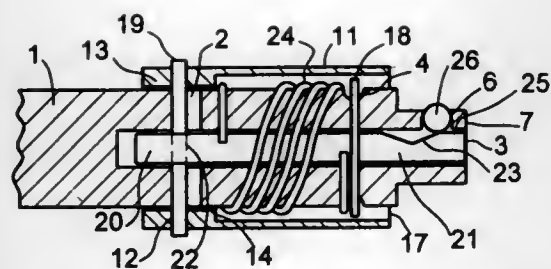
Continuation-in-part of Ser. No. 110,984, Aug. 24, 1993, abandoned. This application Dec. 6, 1994, Ser. No. 350,332

Int. Cl.<sup>6</sup> B25B 23/16

U.S. Cl. 81—177.85

28 Claims

1. A socket wrench extension mounting arrangement, comprising:
  - an elongated extension shaft having a wrench drive section at one end and a socket drive stud at an opposite socket drive male end;
  - said socket drive stud having a plurality of side walls for cooperatively engaging a cavity of a tool socket;



- a latch ball projecting a selected distance from an opening formed in one of said plurality of said side walls having a top portion of lesser diameter than said opening adapted for retaining said ball and engaging a retaining means in the cavity of said tool socket;
- said shaft having an axially extending central shaft bore extending inwardly a selected distance from said socket drive male end, and a shaft hole extending through said shaft and said central shaft bore;
- said shaft including a groove extending circumferentially therearound at least a portion thereof for retaining a ring retaining means;
- a slide having a selected cross-sectional width adapted to be received in said central shaft bore for longitudinal movement therein, said slide having an inner main body portion having a slide hole extending therethrough and a distal end forming a slide head, said slide including a tapered notch between said main body portion and said slide head;
- a sleeve to be received coaxially around said shaft near said male end, said sleeve having a first portion of a selected internal diameter and a second portion of a selected reduced interval diameter forming a lip therebetween, said sleeve including a sleeve hole through said second portion;
- a pin extending through said sleeve hole, said shaft hole, and said slide hole; and
- a spring extending coaxially around said shaft being compressed between said sleeve lip and said ring retaining means; wherein forward motion of said sleeve toward said socket driven end releases said socket.

5,566,596

## HAND TOOL ASSEMBLY

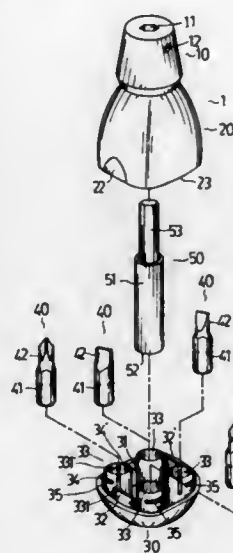
Ching-Chou Lin, No. 150, Sec. 3, Chung Shan Rd., Wu Jih Hsiang, Taichung Hsien, Taiwan

Filed Sep. 26, 1995, Ser. No. 533,786

Int. Cl. B25G 1/08

U.S. Cl. 81—490

5 Claims



## 1. A hand tool assembly comprising:

- a casing, said casing comprising a coupling portion at one end, a receptacle portion at an opposite end, said coupling portion comprising a polygonal center through hole longitudinally disposed at the center, said receptacle portion comprising a receiving space in communication with the polygonal center through hole of said coupling portion, and an orifice at one end of said receiving space remote from said coupling portion;
- a shank having one end terminating in a polygonal coupling rod for fitting into the polygonal center through hole of the coupling portion of said casing, and an opposite end terminating in a polygonal socket for holding a polygonal tool bit for turning screws; and
- a cover detachably covered on the orifice of the receptacle portion of said casing, said cover comprising a recessed portion on the inside, two upright plug boards raised from said recessed portion at two opposite sides and respectively inserted into the orifice of said receptacle portion and stopped against the periphery wall of said receiving space to hold said cover in place, and a plurality of tubular upright bit holders disposed inside said recessed portion for holding a respective tool bit, said tubular upright bit holders defining a space within said recessed portion for holding the polygonal socket of said shank for permitting said shank to be received inside said casing, each tubular upright bit holder comprised of two symmetrical halves spaced by longitudinal splits for holding one tool bit, one half of each tubular upright bit having a tooth on the outside for engagement with an inside wall of the receptacle portion of said casing.

5,566,597

## METHOD OF PRODUCING A TORUS SURFACE ON A LATHE WORK

Harald Fazis, Weil am Rhein, Germany, assignor to Ludwig Boschert Maschinen-und Apparatebau GmbH & Co.KG, Lorrach, Germany

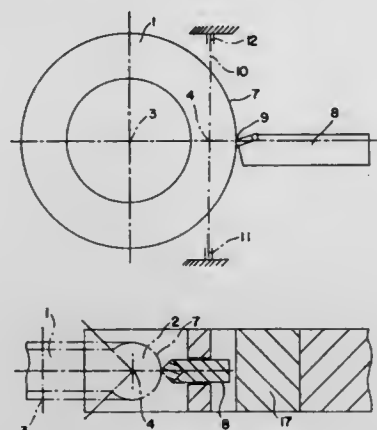
Filed Apr. 20, 1994, Ser. No. 230,103

Claims priority, application Germany, May 4, 1993, 43 14 723.2

Int. Cl. B23B 1/00

U.S. Cl. 82—1.11

9 Claims



1. A method of machining an essentially toroidal surface on a work piece where the toroidal surface is formed by rotation of a circular surface around a first axis along a radius of rotation, the circular surface having a circumference of about 270 degrees and a center where the radius of rotation is defined by (1) the center and (2) the first axis of rotation which is spaced from the center of the circular surface, the work piece arranged for rotation around the first axis while being in contact with a cutting tool at a circumferentially extending surface thereof, the method comprising the steps of:

- (a) rotating the circular surface around the first axis along the radius of rotation to obtain a torus of which the toroidal surface forms a portion; and
- (b) rotating the cutting tool without interruption through an angle of about 270 degrees around a second axis of rotation to form the essentially toroidal surface where the second axis of rotation extends at a right angle to the first axis and passes through the center of the circular surface.

5,566,598

## METHOD FOR SURFACE PROCESSING OF A PHOTORECEPTOR BASE FOR ELECTROPHOTOGRAPHY

Sunao Kawada; Masataka Inagi; Masao Itoh; Toyotsugu Itoh; Takayoshi Hashimoto, and Akira Ohira, all of Hachioji, Japan, assignors to Konica Corporation, Japan

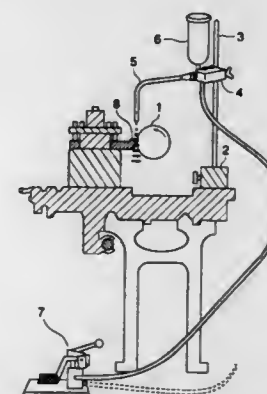
Filed Jul. 1, 1994, Ser. No. 270,173

Claims priority, application Japan, Jul. 16, 1993, 5-177000

Int. Cl. B23B 1/00; B23Q 11/12

U.S. Cl. 82—1.11

14 Claims



1. A method for cutting a surface of a base of a photoreceptor for electrophotography, the method comprising steps of:

- (a) supplying an aqueous cutting fluid to the surface of the photoreceptor base in mist form;
- (b) cutting the surface of the photoreceptor base by a cutting tool comprising a monocrystal diamond, wherein an amount of said aqueous cutting fluid being supplied is not less than  $5 \times 10^{-6}$  ml/mm<sup>2</sup>.

5,566,599

## CUTTER APPARATUS

Katsuji Ebihara, Tokyo, Japan, assignor to Ebihara & Company, Tokyo, Japan

Filed Jun. 2, 1994, Ser. No. 253,031

Claims priority, application Japan, Jun. 2, 1993, 5-132108; Jun. 3, 1993, 5-133330

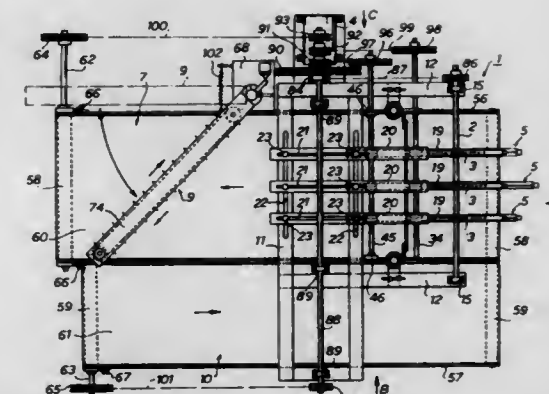
Int. Cl. B26D 7/28

U.S. Cl. 83—76.1

7 Claims

1. A cutter apparatus for cutting cloth, comprising:

- (a) a plurality of disk-shaped cutters locked on a common horizontal shaft at selected intervals;
- (b) a drive motor to turn the cutters;
- (c) means to feed a length of cloth to the cutters by holding and advancing the cloth to cut the same into cloth pieces;
- (d) means to separate the cut cloth pieces;
- (e) first transport means to transport the separated cloth pieces and to discharge them from the cutter apparatus;
- (f) means to measure a length of the cloth being supplied to the cutters, the measured length being in the direction in which the cloth is cut into cloth pieces;
- (g) means to sort out those cloth pieces which have measured lengths greater than a predetermined length;



- (h) second transport means to transport the sorted out cut pieces back to a feed side of the cutter apparatus; and
- (i) control means to supply a drive signal to the sorting means when a measured length of cloth is greater than said predetermined length to thereby cause the sorting means to sort out cut pieces of such cloth and also to supply a stop signal to the sorting means when a predetermined time has lapsed from a start of sorting to thereby cause the sorting means to stop sorting.

5,566,600

## CONVEYOR/CLASSIFIER SYSTEM FOR VERSATILE HI-SPEED FOOD LOAF SLICING MACHINE

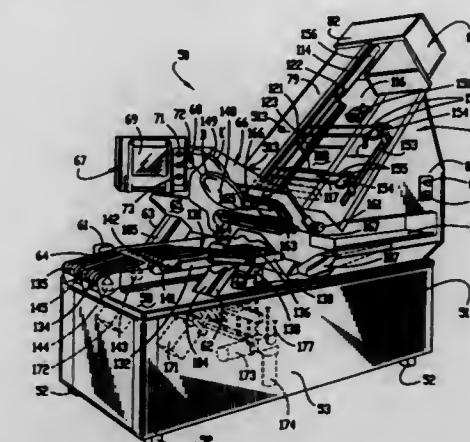
Arthur A. Johnson, Mokena; Scott A. Lindee, New Lenox, and Glenn A. Sandberg, Lockport, all of Ill., assignors to Formax, Inc., Mokena, Ill.

Filed Oct. 11, 1994, Ser. No. 320,749

Int. Cl. B26D 7/30

U.S. Cl. 83—77

9 Claims



8. An improved high speed food loaf slicing machine comprising:
- a slicing station including a knife blade and a knife blade drive cyclically driving the knife blade along a predetermined cutting path;
- loaf support means supporting a first food loaf and a second food loaf for movement along first and second loaf paths, respectively, into the slicing station for repetitive slicing of both loaves by the knife blade;
- a receiver, including a receiver conveyor having a plurality of spaced receiver conveyor belts, located below the slicing station to receive food loaf slices cut from the first and second food loaves, respectively, to form a first food loaf slice group and a second food loaf slice group, the food loaf slices cut by the knife blade being collected on the belts of the receiver conveyor;



a receiver lift mechanism, connected to the receiver conveyor, for moving the receiver conveyor vertically toward and away from the slicing station;

a receiver conveyor drive for driving the receiver conveyor horizontally at a predetermined discharge speed to discharge food loaf slice groups from the receiver;

a deceleration conveyor for receiving food loaf slice groups from the receiver; and

a deceleration conveyor drive for driving the deceleration conveyor at predetermined speed lower than the discharge speed.

5,566,601

# APPARATUS FOR CUTTING CONTAINERS, AWAY FROM A FOIL WEB

Peter Mueller, Mutlangen, and Martin Beck, Urbach, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

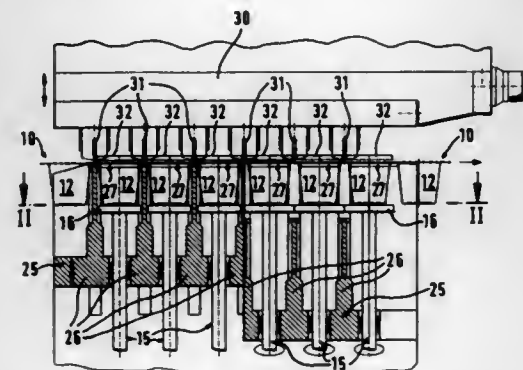
Filed Sep. 30, 1994, Ser. No. 317,657

Claims priority, application Germany, Oct. 1, 1993, 43 33 528.4

Int. Cl. B26D 1/06; 7/06

U.S. Cl. 83—123

15 Claims



1. An apparatus for cutting containers (12) away from a foil web (10), comprising a cutting knife (30) that determines an outer contour of a certain number of containers (12) arranged in rows; a die (25) that is movable counter to the cutting knife (30) and has receptacles (24) for the containers (12) that are to be cut away; and support platforms (15), disposed in the receptacles (24) of the die (25), the die (25) being lowerable beneath a plurality of support faces (16) of the support platforms so as to deliver and remove the containers (12), the support platforms (15) are disposed rotatably between two angular positions about aligned axes disposed in a direction of motion of the die (25), and crosswise to their axes of rotation have two different extensions (17, 18), offset by an angle, so that in one angular position they are received with play in the receptacles (24), and in another angular position, with the die (25) lowered, aligned with one another by a longer length (18), they form a virtually gapless conveyor path for the containers (12).

5,566,602

# FOOD PRODUCT SLICER

Clarence Dennis, 2332 Field Stone Dr., Mendota Heights, Minn. 55120

Division of Ser. No. 102,545, Aug. 5, 1993, Pat. No. 5,383,384. This application Jan. 24, 1995, Ser. No. 377,169

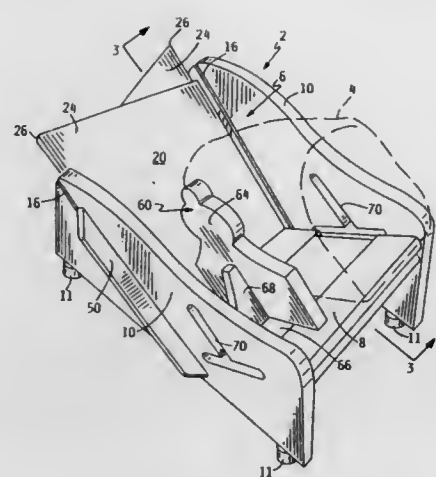
Int. Cl. B26D 1/10

U.S. Cl. 83—168

7 Claims

1. A food product slicer for use with a hand-held knife for cutting slices of food product from a loaf of food product, which comprises:

(a) a substantially planar bottom wall on which a loaf of food product may be laid for cutting a slice of food product off one end of the loaf;



- (b) two transversely spaced apart, substantially planar side walls which are fixedly secured to the bottom wall along the sides thereof and with the bottom wall received between the side walls to define a generally U-shaped channel in which the loaf is received during a slicing operation, the side walls extending over substantially the entire length of the bottom wall with each side of the bottom wall being fixedly attached to one of the side walls, and wherein the side walls have undersides that are shaped for supporting the U-shaped channel formed between the side walls and the bottom wall on a substantially horizontal surface;
- (c) an upright, substantially planar end wall fixedly secured to the bottom wall and the side walls and extending perpendicularly upwardly from the bottom wall with the end wall also being received between the side walls, wherein the end wall includes a front face against which the one end of the food product loaf may be abutted when cutting a slice off the one end of the loaf;
- (d) means fixed relative to the end wall for guiding an elongated knife blade of a hand-held knife in a direction parallel to the end wall for cutting a food product slice having a first predetermined thickness equal to the distance between the front face of the end wall and the knife guiding means;
- (e) wherein the bottom wall is inclined relative to the horizontal to have an upper and a lower end, wherein the end wall is secured to the bottom wall proximate to the lower end thereof to allow the loaf to self feed down into engagement with the end wall with the loaf sliding downwardly in the U-shaped channel formed between the side walls and the bottom wall until it engages against the end wall; and
- (f) selectively usable means located between the end wall and the knife guiding means during use for selectively adjusting the thickness of the food product slices by spacing them one end of the food product loaf away from the end wall by at least a first predetermined distance, wherein the thickness adjusting means comprises at least one sliding plate that is configured to slide in and out of the U-shaped channel.

5,566,603

# DOUBLE-SIDED MITER BOX FOR MACHINE TOOLS IN PARTICULAR PANEL SAWS

Reiner Moeres, Sietstr. 17, D-32549 Bad Oeynhausen, Germany

PCT No. PCT/EP94/01336, § 371 Date Jan. 4, 1995, § 102(e) Date Jan. 4, 1995, PCT Pub. No. WO94/25230, PCT Pub. Date Nov. 10, 1994

PCT Filed Apr. 28, 1994, Ser. No. 362,485

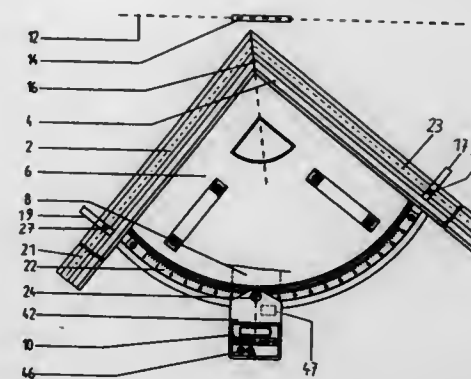
Claims priority, application Germany, May 4, 1993, 9306681

Int. Cl. B26D 7/01

U.S. Cl. 83—468.3

14 Claims

1. A double-sided miter box for machine tool panel saws having a driven tool, comprising:



two contact rails (2, 4), which can be moved relative to the driven tool (14) and which are connected to one another so as to enclose a right angle between them and which are jointly mounted pivotably about a rotation axis (16) disposed on an angle bisector near the driven tool (14);

an electrical measurement transducer for measuring; and

a display (10) for indicating a pivoting angle of the contact rails (2, 4) relative to a tool plane (12), characterized in that the electric measurement transducer comprises a magnetically coded measuring tape (18), which is disposed about the rotation axis (16) along a graduated partial circle and

a sensor (20) which senses the measuring tape (18) without contact therewith, a value measured by the sensor being indicated on the display (10) as an angular measurement of the pivoting angle.

5,566,604

# APPARATUS FOR EXTRACTING A FLEXIBLE PRODUCT FROM A MACHINE FOR FABRICATING SAME

Werner Sperling, Dellingsen, and Jürgen Lührig, Alfeld, both of Germany, assignors to Spirka Maschinenbau GmbH & Co. KG, Alfeld (Leine), Germany

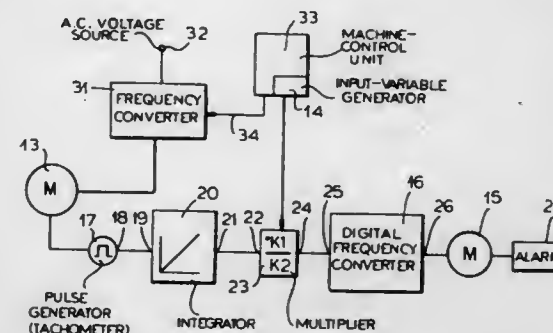
Filed Nov. 30, 1994, Ser. No. 347,655

Claims priority, application Germany, Dec. 13, 1993, 93 19 096.4 U

Int. Cl. D04C 3/38

U.S. Cl. 87—31

7 Claims



1. An apparatus for withdrawing a flexible product from a machine for fabricating said product, said apparatus comprising:

a machine drive;

means connected with said machine drive for deriving a control frequency representing a speed of said machine drive;

a product-withdrawal mechanism on said machine for withdrawing said product at a speed determined to maintain a quality of said product;

a synchronous motor operatively connected with said mechanism for driving same at said speed determined to maintain said quality of said product; and

a digital frequency converter responsive to said control frequency and connected to said synchronous motor for controlling said synchronous motor to operate said synchronous motor at a speed proportional to said speed of said machine drive, said means connected with said machine drive for deriving a control frequency representing a speed of said machine drive being an incrementally effective pulse generator connected to said machine drive, and a digital integrator having an input connected to an output of said pulse generator for generating a digital value representing angular displacement of said machine drive, said integrator having an output operatively connected with said digital frequency converter.

5,566,605

# CENTRIFUGAL TYPE EXTRACTION CELL HAVING A DEFORMABLE SEALING JOINT FOR A HOT BEVERAGE PREPARATION MACHINE

Erik Lebrun, Ibos, Jean-Paul Astegno, Espoey, Alain Macera, Lanne, Alexandre Rouches, Tarbes, and Jean-Michel Dulout, Sazos, all of France, assignors to SEB S.A., Ecully, France

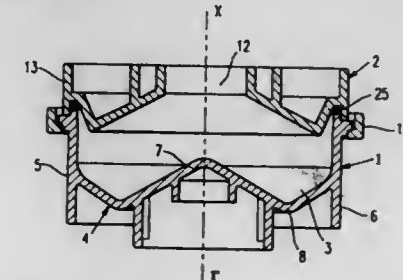
Continuation-in-part of Ser. No. 338,105, Nov. 9, 1994, abandoned. This application Jul. 14, 1995, Ser. No. 503,065

Claims priority, application France, Nov. 9, 1993, 93 13606

Int. Cl. A47J 31/22

U.S. Cl. 99—302 C

18 Claims



1. An extraction cell of the centrifugal type for a hot beverage preparation machine, comprising: a drum (1) for retaining a mass of a finely divided product from which the beverage is to be prepared; a cover (2) provided with a liquid delivery orifice (12) for forming a mixture of liquid and the finely divided product, said cover being mounted on said drum; sealing means interposed between said drum and said cover; and filtration means for separating, from the finely divided product, liquid which has formed the mixture with the finely divided product, wherein both said filtration means and said sealing means are constituted by at least one deformable seal (25) having deformation properties, and being mounted, to insure that below a pre-established operating pressure existing in said cell, fluid tightness of said cell is maintained, and beyond the preestablished operating pressure, filtration of the finely divided product-liquid mixture occurs by deformation of said seal.

5,566,606

# BARBECUE GRILL

Robert L. Johnston, 4448 Sims St., Columbus, Ga. 31907

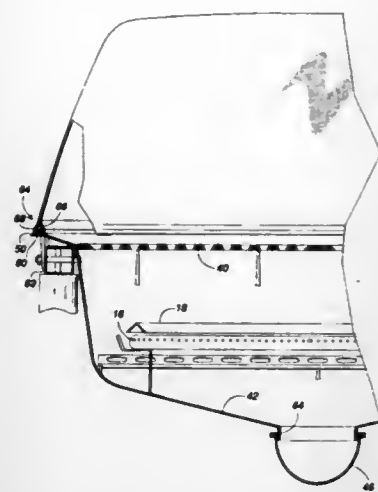
Filed Aug. 12, 1994, Ser. No. 289,890

Int. Cl. A47J 37/00; 37/07

U.S. Cl. 99—446

9 Claims

1. A barbecue grill assembly comprising a fire box with a burner element disposed therein, a cooking grate for receiving food items to be cooked thereon disposed in said fire box above said burner element, said fire box including a substantially planar flange portion extending upwardly and outwardly from said cooking grate at an angle between approximately thirty to forty-five degrees, and a hood member hingedly connected to said fire box for selectively covering the fire box.



5,566,607

## GRILL WITH GREASE DEFLECTOR ASSEMBLY

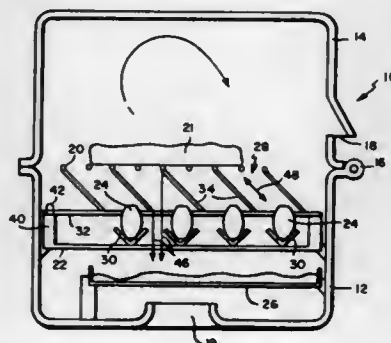
Norman Schleimer, P.O. Box 75, Pound Ridge, N.Y. 10576

Filed May 11, 1995, Ser. No. 439,230

Int. Cl.<sup>6</sup> A47J 37/07

U.S. Cl. 99—446

7 Claims



## 1. A grill for cooking food comprising:

- an element for supporting the food to be cooked;
- a plurality of rows of heating elements, each of said rows being mounted below said element and being spaced from adjacent rows; and
- a grease deflector assembly positioned between the element and the rows of heating elements, said assembly including an elongated slat of a non-combustible material for each row of heating elements, the length of each slat being at least equal to that of the corresponding row of heating element, and; each slat extending downward at an angle from substantially the underside of the element to a position adjacent to and spaced from at least the corresponding row of heating elements, the slat overlying the corresponding row of heating elements to prevent drippings from the food from touching the row of heating elements while permitting drippings off the end of a slat to pass between adjacent rows of heating elements and providing an unobstructed path between adjacent slats for radiant energy from its heating elements to the food.

5,566,608

## VERTICAL FLOW RIPENING ROOM

Mehrdad Vajdani, Prembroke Pines, and Zbigniew Kilarski, Miami, both of Fla., assignors to Cool Care Consulting, Inc., Deerfield Beach, Fla.

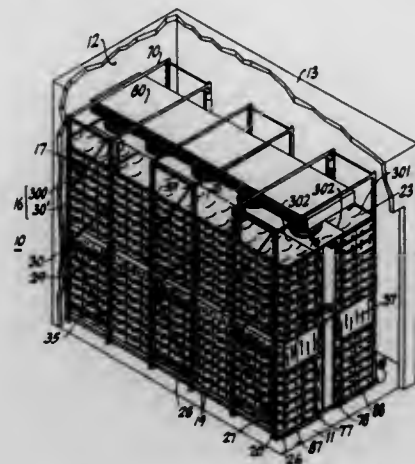
Continuation of Ser. No. 326,900, Oct. 21, 1994, abandoned.

This application Apr. 24, 1995, Ser. No. 427,310

Int. Cl.<sup>6</sup> A23B 7/00; 7/144; A23L 1/00; 3/00

U.S. Cl. 99—475

20 Claims



## 1. An apparatus for controlled, pressurized ripening of fresh produce, comprising:

- a. a chamber having a ceiling and front, rear and side walls;
- b. a frame structure arranged within said chamber to position and support at least two rows of palletized produce, each of said two rows including at least two vertically spaced tiers of palletized produce, said at least two rows being spaced apart by said frame structure to define an interstitial space therebetween, and said at least two rows being further spaced by said frame structure from the walls and ceiling of said chamber to define a fluid circulation space around said palletized produce;
- c. sealing means to seal said interstitial volume from said fluid circulation space;
- d. said frame structure including sealing members to seal said vertical space between said at least two-tier from fluid circulation therethrough; and
- e. fluid control means located above said interstitial space to intake fluid from said interstitial space and to exhaust fluid into said fluid circulation space;
- f. whereby to create a pressure differential between said interstitial space and said fluid circulation space such that said fluid is forced to flow uniformly through said palletized produce.

5,566,609

## SHOPPING CART CLIPBOARD AND COUPON HOLDER

Suzanne Kirschner, 1120 Ashbridge Rd., Bryn Mawr, Pa. 19010

Filed Nov. 24, 1995, Ser. No. 562,402

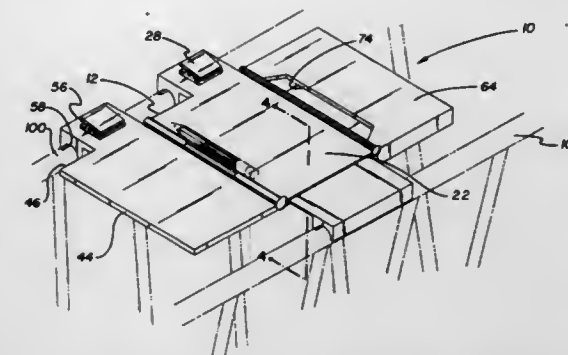
Int. Cl.<sup>6</sup> A47B 23/00

U.S. Cl. 108—42

3 Claims

## 1. A shopping cart clipboard and coupon holder for temporarily mounting to a shopping cart for holding shopping lists and coupons comprising, in combination:

- a center portion having an upper edge, a lower edge, a right edge, and a left edge, the center portion including a planar surface, the upper edge having an upper cart securement portion extending outwardly therefrom, the upper cart securement portion including a recessed lower surface adapted for coupling with a shopping cart bar, an upper surface of the upper cart securement portion having a spring biased clip secured thereto, the planar surface having an implement securement clip secured thereto, the lower edge having a recess formed therein, the recess having a plurality of rounded



- recesses formed in an upper surface thereof, the recess slidably receiving a lower cart securement portion therein, the lower cart securement portion including a recessed lower surface adapted for coupling with a shopping cart bar, the lower cart securement portion having a rounded protrusion on an upper end thereof adapted for selective coupling with one of the plurality of rounded recesses to prevent sliding of the lower cart securement portion out of the center portion;
- a left portion having an upper edge, a lower edge, a right edge, a left edge, and a planar surface, the right edge being hingedly coupled with the left edge of the center portion, the upper edge having a cart securement portion extending outwardly therefrom, the cart securement portion including a recessed lower surface adapted for coupling with a shopping cart bar, an upper surface of the cart securement portion having a spring biased clip secured thereto;
- a coupon receiving portion having an upper edge, a lower edge, a right edge, and a left edge, the left edge being hingedly coupled with the right edge of the center portion, the right edge having a coupon receiving recess formed therein.

5,566,611

## APPARATUS FOR SEPARATING LIQUID FROM FIBROUS SUSPENSIONS

Peter Scheucher, Kumberg; Gerhard Heindler; Walter Schininger, both of Graz; Gerhard Paier, Krottendorf-Galsfeld, and Peter Mraz, Klosterneuburg, all of Austria, assignors to Andritz-Patentverwaltungs-Gesellschaft m.b.H., Graz, Austria

PCT No. PCT/AT93/00083, § 371 Date Mar. 20, 1995, § 102(e) Date Mar. 20, 1995, PCT Pub. No. WO93/23239, PCT Pub. Date Nov. 25, 1993

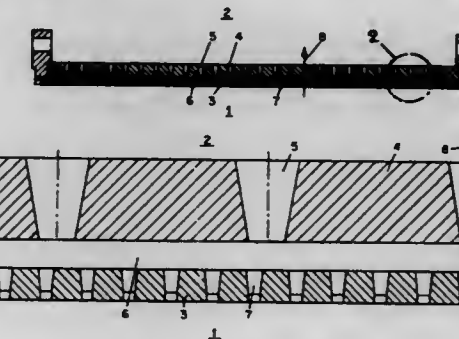
PCT Filed May 14, 1993, Ser. No. 335,859

Claims priority, application Austria, May 15, 1992, A996/92

Int. Cl.<sup>6</sup> B30B 9/14; 9/26

U.S. Cl. 100—127

44 Claims

5,566,610  
APPARATUS FOR BALING LOOSE MATERIALS

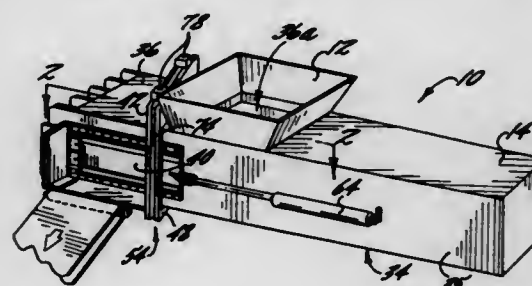
Lonnie R. Robinson, and Robert L. Taylor, II, both of Mecklenburg County, N.C., assignors to Lindemann Recycling Equipment, Inc., Charlotte, N.C.

Filed Apr. 5, 1995, Ser. No. 416,959

Int. Cl.<sup>6</sup> B30B 9/30

U.S. Cl. 100—98 R

22 Claims



## 1. An apparatus for baling loose materials, the apparatus comprising:

- a housing defining a charging passage and a compaction chamber in communication with the charging passage, wherein said housing comprises a floor panel and first and second opposed side panels, and wherein said housing further comprises an upper panel defining an opening therein which is in communication with the charging passage and which is adapted to receive the loose materials for collection within the charging passage;
- a compacting ram assembly disposed at least partially within the charging passage and adapted for movement therein such that the loose materials which are collected within the charging

## 1. In an apparatus for separating liquid from fibrous pulp suspensions comprising a solids retention means of multiple-layered construction having liquid passages, wherein the layers are composed of a screen (3) and a supporting body (4) for the screen, the improvement wherein

- one layer, which faces the fibrous suspension, takes the form of the screen (3) with passages (7) which increase in cross-section in the drainage direction of the liquid,
- another layer, which faces away from the fibrous suspension, takes the form of the supporting body (4) having slot-shaped passages (5), and
- at least one free space for liquid distribution is provided between the screen (3) and the supporting body (4).

5,566,612

## MIMEOGRAPHIC PRINTING MACHINE

Yuji Satoh, Tokyo, Japan, assignor to Riso Kagaku Corporation, Tokyo, Japan

Filed Jul. 27, 1995, Ser. No. 507,842

Claims priority, application Japan, Aug. 8, 1994, 6-185791

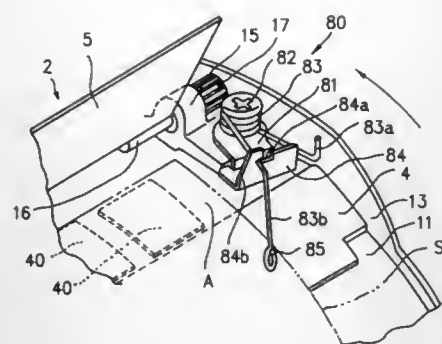
Int. Cl.<sup>6</sup> B41L 13/14

U.S. Cl. 101—119

7 Claims

## 1. A mimeographic printing machine, comprising:





a cylindrical printing drum which has inner and outer peripheral surfaces and an ink-pervious area for passing ink from the inner peripheral surface to the outer peripheral surface, and is driven to rotate on a center axis of itself with a stencil paper wrapped around said outer peripheral surface;  
ink supply means provided within said printing drum, for supplying the ink to said inner peripheral surface;  
clamping means provided on said outer peripheral surface of said printing drum, for clamping on said printing drum a leading edge of said stencil paper wrapped around said outer peripheral surface; and  
stencil paper holding means movably mounted on said outer peripheral surface of said printing drum, for holding said stencil paper on said printing drum in the vicinity of the leading edge of said stencil paper when said clamping means has released said stencil paper.

5,566,613

# METHOD AND APPARATUS FOR REGULATING INK DISTRIBUTION IN AN UNDERSHOT INKING UNIT OF A PRINTING MACHINE

Achim Stoffler, Offenbach; Valentin Gensheimer, Muhlheim; Edgar Werber, Offenbach; Marc Hinz, Rodenbach; Peter Hummel, Offenbach; Jurgen Wenzel, Hainburg Hess; Albrecht Volz, Rodermark; Joachim Blum, Hainburg Hess; Hubert Zschetzsch, and Manfred Straub, both of Offenbach, all of Germany, assignors to MAN Roland Druckmaschinen, Germany

Continuation of Ser. No. 237,076, May 3, 1994, Pat. No. 5,493,970. This application Sep. 26, 1995, Ser. No. 533,678  
Claims priority, application Germany, May 3, 1993, 43 14 426.9; Mar. 30, 1994, 44 11 109.6

Int. Cl.<sup>6</sup> B41F 31/06; 31/14

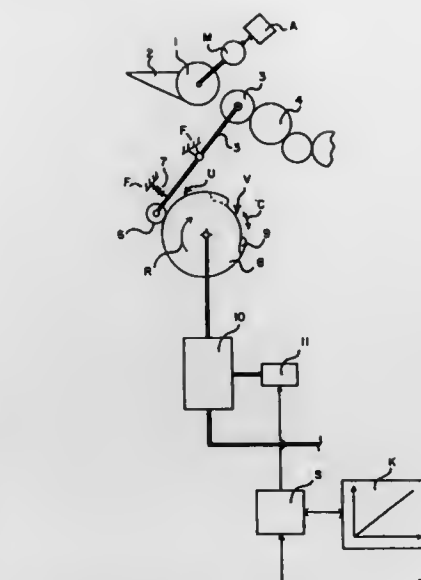
U.S. Cl. 101—350

10 Claims

1. A method for regulating the distribution of ink in an undershot inking unit for a printing machine, said undershot inking unit comprising an ink fountain; an ink fountain roller cooperating with said ink fountain, whereby an ink film is generated on the surface of said ink fountain roller; an inking roller; an intermittent ductor roller for transferring said ink film to said inking roller as a result of oscillating movement between and periodic contact of said ductor roller with said ink fountain roller and said inking roller; drive means for oscillating said ductor roller including a cam follower roller engageable with rotatable cam means having variable predominant and subordinate circumferential contours and means for adjusting the effective circumferential lengths of said predominant and subordinate contours; said method comprising:

rotating said cam means for oscillating said ductor roller between said ink fountain roller and said inking roller in direct proportion to the printing speed of said printing machine;

controlling the rotational speed of the ink fountain roller independently of the printing speed of said printing machine; and  
adjusting the effective circumferential lengths of said predominant and subordinate contours of said rotatable cam means for varying the rotational contact angle defined as the relative angular proportion of each oscillation that the intermittent



ductor roller is in contact with the ink fountain roller in direct proportion to changes in the printing speed of said printing machine while maintaining constant, in each oscillation of said ductor roller, the period of contact of said ductor roller with said ink fountain roller.

5,566,614

# ADJUSTING DEVICE FOR A GRIPPER OPENING CAM IN A CHAIN DELIVERY OF A SHEET-FED PRINTING PRESS

Udo Ganter, Friedberg, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

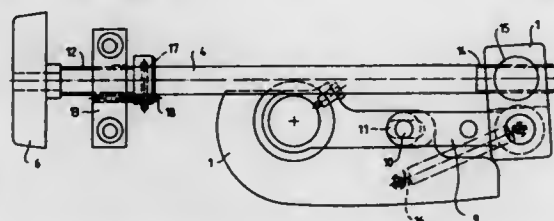
Filed Oct. 17, 1994, Ser. No. 324,417

Claims priority, application Germany, Oct. 15, 1993, 43 35 230.8

Int. Cl.<sup>6</sup> B41F 1/30

U.S. Cl. 101—408

6 Claims



1. In combination with a chain delivery for delivering sheets in a sheet-fed printing press, wherein the printing press has a press frame, and wherein the delivery includes grippers disposed on gripper carriages of endlessly revolving chains and the grippers have cam rollers, an adjusting device for a gripper opening cam onto which the cam rollers of the grippers run for opening the grippers, the adjusting device comprising an adjusting shaft journaled in the press frame and having an axis, a lever arm swivelable about a swivel axis transverse to the axis of the adjusting shaft and articulately connected to the gripper opening cam, and linkage means for converting rotation of the adjusting shaft into swivelling of said lever arm, said adjusting shaft being formed at opposite ends thereof with respective spindle threads of mutually opposite pitch, a spindle nut fixedly disposed on said press frame and being formed with a thread of a given pitch and a spindle nut connected to the lever arm and being formed with a thread of a pitch opposite the given pitch, said adjusting shaft being screwable by the respective spindle threads thereof into the corresponding spindle nuts, and said nuts and said shaft defining a combination of a left-hand and a right-hand thread.

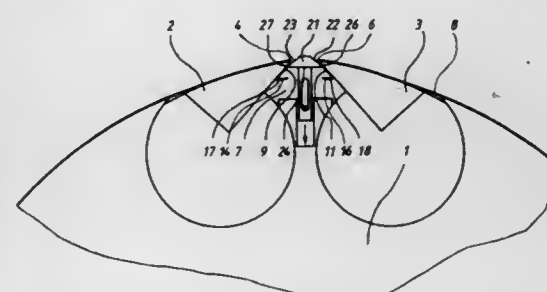
5,566,615

# PRINTING PLATE END CLAMPING APPARATUS

Claus D. Barrois, Erlenbach, Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany  
Filed Jun. 9, 1995, Ser. No. 489,543  
Claims priority, application Germany, Jun. 10, 1994, 44 20 314.4

Int. Cl.<sup>6</sup> B41F 27/06  
U.S. Cl. 101—415.1

4 Claims

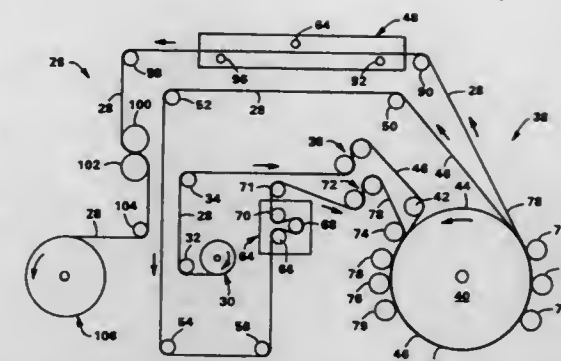


1. A printing plate end clamping apparatus usable for attaching and clamping gravure printing plates with first and second generally Z-shaped beveled edges to a gravure printing cylinder comprising:

first and second pivotable printing plate end securing devices having printing plate first and second end securing flanges, said flanges being shaped to engage said first and second Z-shaped beveled edges of said printing plate, each of said printing plate end securing flanges having an outer face having a curvature which continues a curvature of said printing cylinder;

a cylinder trough in said printing cylinder and defined by said first and second end securing flanges of said printing plate end securing devices, said cylinder trough having a bottom surface; and

a plate end clamping bar disposed for radial movement in said cylinder trough, said plate end clamping bar being biased radially outwardly in said cylinder trough, said clamping bar being generally trapezoidal in cross-sectional shape and having first and second lateral faces and a base, with corner ridges being formed at intersections of said first and second lateral faces and said base, said first and second lateral faces of said clamping bar and said first and second printing plate end securing flanges cooperating to sandwich said first and second beveled edges of said printing plate as said first and second securing flanges are pivotably moved radially inwardly on said plate cylinder to a closed position, said radially movable plate end clamping bar being forced radially inwardly against said bias by said radially inward movement of said first and second plate end securing flanges and forcing said beveled edges of said printing plate against said first and second plate end securing flanges.



the continuously moving substrate that is single-passing through the printing station, and  
printing ink on the portion of the continuously moving substrate that is repeat-passing through the printing stage.

5,566,617

# METHOD FOR CLEANING A ROTATING CYLINDER IN A PRINTING MACHINE

Klaus Durrnagel, Bad Schwalbach, Germany, assignor to MAN Roland Druckmaschinen AG, Germany

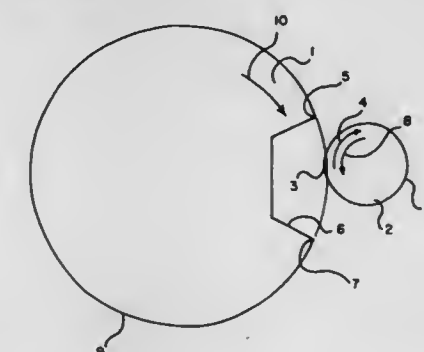
Filed Oct. 19, 1995, Ser. No. 545,251

Claims priority, application Germany, Oct. 27, 1994, 44 38 347.9

Int. Cl.<sup>6</sup> B41F 35/00

U.S. Cl. 101—483

6 Claims



1. A method for cleaning a rotating cylinder in a printing machine, the method comprising the steps of: providing a printing machine including a rotatable washing roller fluidically communicating with a source of washing fluid, whereby the surface of said washing roller is wetted to thereby provide a washing surface for said washing roller, said printing machine including means for moving said washing roller between a cleaning position in which said surface of said washing roller engages said rotating cylinder and an idle position in which said surface of said washing roller does not engage said rotating cylinder,

moving said washing roller to said washing position;

rotating said washing roller in a first direction opposite to the direction of rotation of said rotating cylinder to thereby clean at least a first portion of said rotating cylinder; and  
rotating said washing roller in a second direction the same as the direction of rotation of said rotating cylinder to thereby clean at least a second portion of said rotating cylinder.

5,566,616

# SUBSTRATE PRINTED BY A SINGLE SUBSTRATE, REPEAT-PASS PRINTING PROCESS

Robert J. Schlein, Appleton, Wis.; Daniel J. Conrad, Murfreesboro, Tenn., and Joseph S. Kucherosky, Philadelphia, Pa., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 347,981, Dec. 2, 1994. This application May 26, 1995, Ser. No. 451,280

Int. Cl.<sup>6</sup> B41F 13/54

U.S. Cl. 101—483

6 Claims

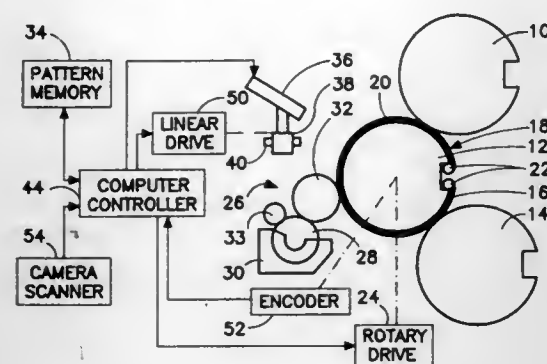
1. A printed substrate made by the process comprising: providing a continuously moving substrate, single-passing a portion of the continuously moving substrate through a printing station without directly printing thereon, repeat-passing the portion of the continuously moving substrate back through the printing station and over another portion of

**5,566,618**  
**METHOD AND APPARATUS FOR USE IN OFFSET PRINTING**

Joseph Frazzitta, 279 Cherry Pl., East Meadow, N.Y. 11554  
 Filed Aug. 3, 1995, Ser. No. 510,761  
 Int. Cl.<sup>6</sup> B41L 15/10

U.S. Cl. 101—492

21 Claims



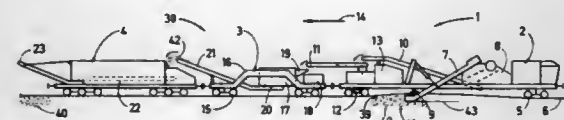
1. A method used in offset printing, comprising:  
 providing, in an electronic memory, an electrically encoded image to be transferred to a printing substrate during a coating application in an offset printing process;  
 attaching an offset printing blanket under tension to a blanket cylinder of an offset printing machine;  
 after attachment of said blanket to said cylinder, automatically cutting said blanket in accordance with said electrically encoded image; and  
 removing sections of said blanket along cut lines made in said blanket during the cutting thereof.

**5,566,619**  
**METHOD AND APPARATUS FOR REHABILITATING THE SUBGRADE SUPPORTING A BALLAST BED**  
 Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft M.B.H., Vienna, Austria

Filed Oct. 31, 1995, Ser. No. 551,183  
 Claims priority, application Austria, Nov. 15, 1994, 2109/94  
 Int. Cl.<sup>6</sup> E01B 27/00

U.S. Cl. 104—2

6 Claims



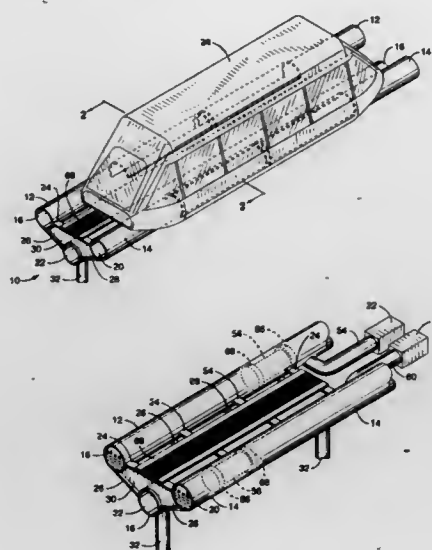
1. A method for rehabilitating the subgrade supporting a ballast bed for a track, which comprises the steps of  
 (a) lifting the track off the ballast bed, removing an upper portion of the ballast from the ballast bed, comminuting the removed ballast to obtain gravel, storing the gravel, and laying the track on a remaining portion of the ballast bed, in a first stage,  
 (b) lifting the track off the remaining ballast bed portion, removing the ballast of the remaining ballast bed portion until the subgrade is exposed, and laying the track on the exposed subgrade, in a second stage, and  
 (c) lifting the track off the subgrade, discharging the stored gravel on the subgrade, planing and compacting the gravel on the subgrade until a protective layer for the subgrade is obtained, and laying the track on the protective subgrade layer, in a third stage.

**5,566,620**  
**LEVITATED RAIL SYSTEM**  
 Bradley D. Siewert, 1401 Stonebridge Way, Roseville, Calif. 95661

Filed Nov. 16, 1995, Ser. No. 559,335  
 Int. Cl.<sup>6</sup> E01B 25/00

U.S. Cl. 104—124

15 Claims



12. A levitated rail system, comprising:  
 (a) a first hollow rail for levitating at least a part of a vehicle on the exterior of the rail, said first rail having a cylindrical cross section;  
 (b) a second hollow rail, said second rail having a cylindrical cross section, said second rail parallel to said first rail, said second rail coupled to said first rail;  
 (c) a third hollow rail, said third rail having a cylindrical cross section, said third rail parallel to said first rail and said second rail, said third rail positioned between said first rail and said second rail, said third rail positioned below said first rail and said second rail, said third rail coupled to said first rail, said third rail coupled to said second rail;  
 (d) a plurality of base members, said base members coupled to said third rail, said base members positioned to support said third rail from the ground;  
 (e) at least one freight capsule, said freight capsule associated with the hollow interior of at least one of said rails; and  
 (f) pressurized fluid means for driving said freight capsule within the rail with which said freight capsule is associated.

**5,566,621**  
**CONVEYOR ARRANGEMENT FOR ROLLING TRANSPORT DEVICES**  
 Jarle Wanvik, Skule Bardsons qt. 5, N-7016 Trondheim, Norway

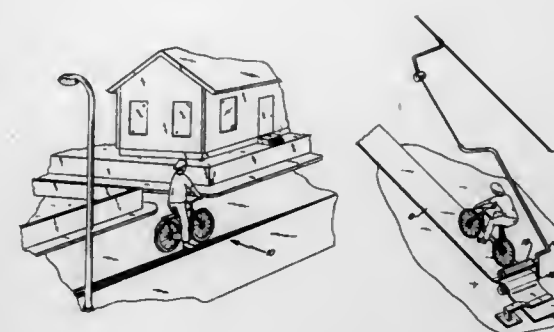
PCT No. PCT/N093/00112, § 371 Date Jan. 6, 1995, § 102(e) Date Jan. 6, 1995, PCT Pub. No. WO94/01313, PCT Pub. Date Jan. 20, 1994

PCT Filed Jul. 9, 1993, Ser. No. 362,585  
 Claims priority, application Norway, Jul. 10, 1992, 921781  
 Int. Cl.<sup>6</sup> B61B 11/00

U.S. Cl. 104—173.1

8 Claims

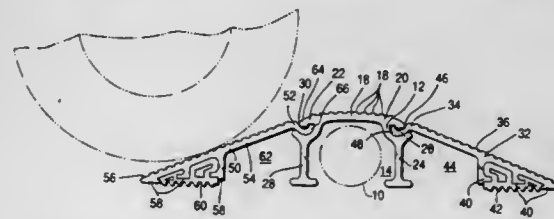
1. An engine-driven device for the transportation of a person on a cycle or wheeled transport tool, including an endless wire, or belt in a loop between two end points, having a level difference, and equipped with at least one foot carrier placed in contact with a forced guidance for the carrier, wherein the forced guidance is placed in contact with the ground, and the carrier is in guided encroachment with the forced guidance.



**5,566,622**  
**A COLLAPSIBLE HOSE BRIDGING APPARATUS**  
 Theodore Ziaylek, Jr., 140 Riverview Dr., and Michael P. Ziaylek, 15 Cold Spring Ave., both of Yardley, Pa. 19067  
 Filed Jun. 2, 1995, Ser. No. 459,397  
 Int. Cl.<sup>6</sup> B61K 13/00

U.S. Cl. 104—275

18 Claims



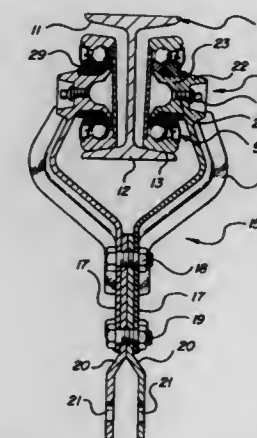
1. A collapsible hose bridging apparatus comprising:  
 A. a central support member defining a hose retaining passage extending longitudinally therethrough, said central support member including:  
 (1) a main support plate extending above and across said hose retaining passage for supporting a load thereabove, said main support plate defining a first main end and a second main end thereof spatially disposed from one another;  
 (2) a first inner leg member attached to said main support plate adjacent said first main end and extending downwardly therefrom along one side of said hose retaining passage to facilitate supporting said main support plate above said hose retaining passage, said first inner leg member and said first main end of said main support plate defining a first lateral arcuate slot means extending therebetween;  
 (3) a second inner leg member attached to said main support plate adjacent said second main end and extending downwardly therefrom to facilitate supporting said main support plate above said hose retaining passage, said second inner leg member being positioned in spaced relation to said first inner leg member to define said hose retaining passage therebetween;  
 B. a first ramp means including:  
 (1) a first upper end;  
 (2) a first inclined plate attachable with respect to said main support plate along said first upper end thereof and extending outwardly and downwardly therefrom to support a load thereupon;  
 (3) a first lower end oppositely positioned from said first upper end on said first plate;  
 C. a first detachable engagement means positioned between said first upper end of said first ramp means and said first main end of said main support plate for detachable attachment therebetween;  
 D. a second ramp means including:  
 (1) a second upper end;  
 (2) a second inclined plate attachable with respect to said main support plate along said second upper end thereof and extending outwardly and downwardly therefrom to support a load thereupon;

- (3) a second lower end oppositely positioned from said second upper end on said second plate; and  
 E. a second detachable engagement means positioned between said second upper end of said second ramp means and said second main end of said main support plate for detachable securement therebetween.

**5,566,623**  
**WHEEL AND BEARING SYSTEM FOR A LOAD TRANSPORTING OVERHEAD TROLLEY ASSEMBLY**  
 Robert C. Wareham, Midland, Mich., assignor to Saginaw Products, Inc., Saginaw, Mich.  
 Filed Sep. 5, 1995, Ser. No. 523,539  
 Int. Cl.<sup>6</sup> B61B 3/00; F16C 33/60

U.S. Cl. 105—155

14 Claims



1. An improved wheel and bearing system in combination with a load support bracket having a laterally angularly outwardly projecting system-mounting stem supporting said system for rolling travel along an overhead track having a wheel support surface, comprising  
 a. wheel-incorporated, radially inner and outer race members with anti-friction load bearing balls between them, said radially inner and outer race members having laterally aligned, annular, curvilinear grooves compositely forming a raceway for receiving said balls and retaining them between said race members;  
 b. said radially inner race member being split and formed of mating laterally outer and laterally inner abutting members, both of which have bores receiving said bracket stem; and  
 c. laterally mating, non-compressible radial slide surfaces on said laterally inner and outer members with radially aligned generally annular grooves formed in said respective slide surfaces and a circumferentially compressible, separable, retention ring spring carried in one of said annular grooves and projecting radially into the other groove sufficiently to provide a snap fit relationship when the said laterally inner and outer radially inner race members are moved relatively laterally with said respective slide surfaces in sliding relationship, into mating assembly.

**5,566,624**  
**TWIN-SHEET THERMOFORMED PALLET WITH HIGH STIFFNESS DECK**  
 Henry F. Brown, Portage, and Dennis A. Giannini, Poynette, both of Wis., assignors to TriEnda Corporation, Portage, Wis.

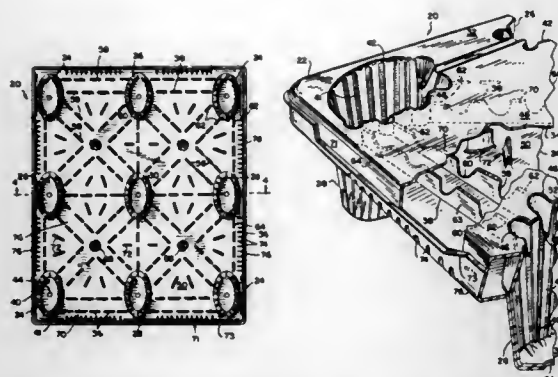
Filed Aug. 15, 1995, Ser. No. 515,288  
 Int. Cl.<sup>6</sup> B65D 19/00

U.S. Cl. 108—51.1

11 Claims

1. A twin-sheet thermoformed thermoplastic pallet comprising:  
 a) a deck having an upper skin and a lower skin;





- b) a plurality of feet connected to the deck, wherein each foot has an upwardly opening cavity;
- c) a plurality of downwardly opening pockets formed in the pallet lower skin, wherein each pocket is longer than it is wide, and wherein at least a first pocket and a second pocket are formed in closely spaced relation to one another such that a web of fused plastic material is defined between the first pocket and the second pocket, and wherein said at least first pocket and second pocket define reinforcing deck rib; and
- d) a downwardly extending shell formed in the deck adjacent a foot cavity, and fused to the deck lower skin, wherein portions of said first pocket are fused to said shell, the foot being thereby joined to the rib.

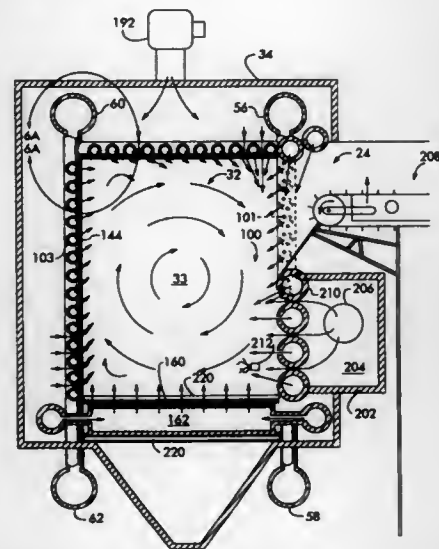
5,566,625

# COMBUSTION APPARATUS INCLUDING PNEUMATICALLY SUSPENDED COMBUSTION ZONE FOR WASTE MATERIAL INCINERATION AND ENERGY PRODUCTION

Bob W. Young, 102 Windham La., Easley, S.C. 29642  
Continuation of Ser. No. 103,457, Aug. 6, 1993, Pat. No. 5,408,942. This application Apr. 19, 1995, Ser. No. 424,889  
Int. Cl.<sup>6</sup> F23G 5/00

U.S. Cl. 110—243

14 Claims



1. Combustion apparatus comprising:  
walls defining a combustion chamber having a pneumatically suspended combustion zone;  
at least a portion of each of said walls comprising a plurality of adjacent tubes having tube interiors and tube walls;  
said tube walls having openings oriented generally towards the combustion zone; and  
at least one tube supply blower connected to said tubes for pressurizing said tube interiors with combustion-supporting

gas such that combustion-supporting gas streams are directed out of said openings to at least partially define the combustion zone and to force the heat of combustion away from said walls.

5,566,626

# INCINERATION KILN DEVICES AND METHODS OF PROTECTING THE SAME

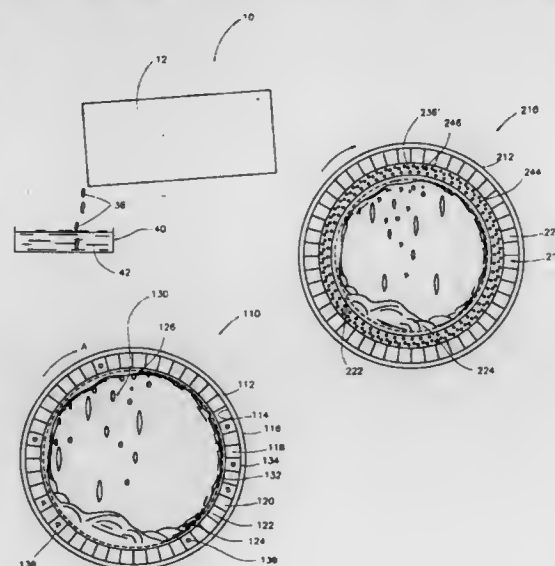
Walter R. Schaefer, Cherry Hill, N.J.; Eustathios Vassiliou, Newark, Del.; Bruno R. Kuhn, Nassau Bay, Tex., and Joseph F. Guinto, Pitman, N.J., assignors to Rollins Environmental Services, Inc., Wilmington, Del.

Filed Dec. 12, 1994, Ser. No. 353,670

Int. Cl.<sup>6</sup> A47J 36/00

U.S. Cl. 110—246

19 Claims



1. An incineration kiln device of the slagging type comprising:  
an outer metal shell having an inside surface and an outside surface;  
a protective layer comprising a first sub-layer adjacent to the inside surface of the outer metal shell, a second sub-layer on top of the first sub-layer, the second sub-layer comprising a substantially continuous phase, a third sub-layer comprising solidified slag, suitable to accept a fourth sub-layer of molten slag on top of it;  
a quantum failure identifier at least partially encased within the substantially continuous phase, discrete pieces of the quantum failure identifier being lighter in color than the slag; and  
means for monitoring the quantum failure identifiers in slag exiting the kiln, in case at least part of said identifiers are transferred from the second sub-layer to the molten slag of the fourth layer during the operation of the kiln.
10. A method of protecting the integrity of an incineration kiln of the slagging type, the kiln comprising  
an outer metal shell having an inside surface and an outside surface, and  
a protective layer comprising a first sub-layer adjacent to the inside surface of the outer metal shell, and a second sub-layer on top of the first sub-layer, the second sub-layer comprising a substantially continuous phase;  
the method comprising the steps of  
encasing a quantum failure identifier at least partially within the second sub-layer in the form of discrete pieces dispersed in said substantially continuous phase, the discrete pieces of the quantum failure identifier being lighter in color than slag exiting the kiln.  
slagging the kiln,

monitoring the quantum failure identifier in the exiting slag to determine whether there is presence of said quantum failure identifier indicating at least partial failure of the protective layer, and  
taking corrective action to restore the protective layer.

5,566,627

# METHOD AND APPARATUS FOR OZONE TREATMENT OF SOIL TO KILL LIVING ORGANISMS

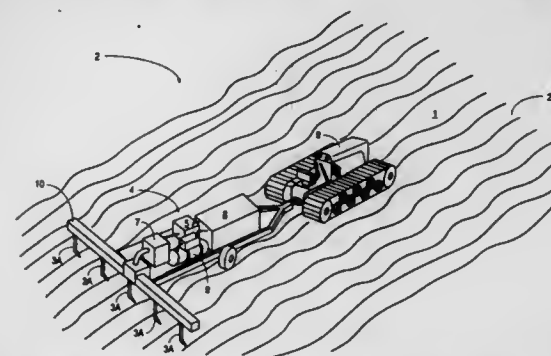
Alan E. Pryor, 655 S. Fair Oaks Ave., Apt. 1-304, Sunnyvale, Calif. 94086

Continuation-in-part of Ser. No. 184,333, Jan. 18, 1994. This application Oct. 31, 1994, Ser. No. 332,628

Int. Cl.<sup>6</sup> A01C 23/00

U.S. Cl. 111—118

14 Claims



1. A process for killing living organisms in top soil in a field, said process comprising:  
generating a gas, said gas comprising unacidified ozone and a carrier gas;  
injecting said gas into said top soil, from a naturally occurring surface of said field, said soil being suitable for plant growth purposes prior to said injecting, said soil comprising a plurality of living organisms, said injecting oxidizing at least a majority of said living organisms to weaken said living organisms such that said living organisms eventually die before their natural death.

5,566,629

# TUFTING MACHINE PATTERNING APPARATUS

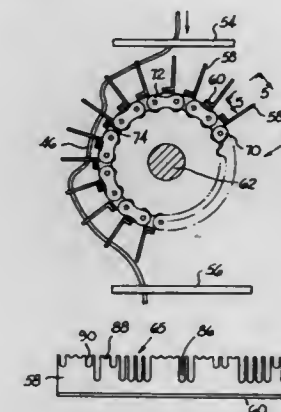
William H. Satterfield, Dalton, Ga., assignor to Spencer Wright Industries, Inc., Dalton, Ga.

Filed Apr. 11, 1995, Ser. No. 420,127

Int. Cl.<sup>6</sup> D05C 15/16

U.S. Cl. 112—80.01

6 Claims



1. In a tufting machine, means for feeding a base material in one direction, a yarn carrying needle disposed on one side of said base material, means for reciprocating said needle for penetrating said base material and forming loops therein, a looper disposed on the other side of said base material from said needle and having a free end pointing in the direction of feed of said base material for seizing and shedding the loops in succession, yarn feed means for feeding yarn to said needle at a constant rate in an amount sufficient to accommodate the yarn requirements of said needle to form a loop at a disposition for seizing by said looper, a pattern attachment separate from said feed means disposed intermediate said feed means and said needle for selectively pulling yarn from said needle so that the amount of yarn fed to said needle is inadequate to accommodate said yarn requirements, said pattern attachment comprising a plurality of slats mounted for movement about an axis, means for moving said slats about said axis in timed relationship to the reciprocation of said needle, each of said slats having a groove formed on a distal end, the grooves in certain of said slats being deeper than the grooves in other of said slats, and yarn guide means comprising a first yarn guide adjacent said attachment for directing yarn from said feed means into the groove of a first of said moving slats, and a second yarn guide adjacent said attachment for receiving yarn from the groove of a second of said moving slats remote from said first slat and directing said yarn to said needle, said yarn being disposed within a groove of each slat in a sector of slats between said first and second slat.

# GROUND CLOSER KIT FOR ATTACHMENT TO A SEEDING/FERTILIZING APPARATUS AND A SEEDING/FERTILIZING APPARATUS HAVING A GROUND CLOSER PLATE

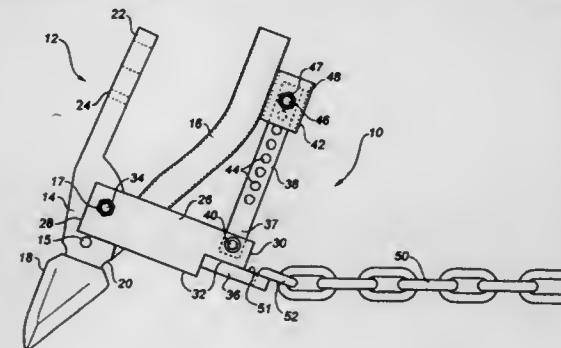
Walter Schoenhofer, R.R. #5, Wetaskiwin, Alberta, Canada

Filed Aug. 9, 1995, Ser. No. 513,129

Int. Cl.<sup>6</sup> A01C 5/00

U.S. Cl. 111—198

5 Claims



1. A ground closer kit for attachment to a ground opening apparatus having a delivery tube, comprising:

5,566,630

**IN-LINE NEEDLE BAR ARRANGEMENT FOR TUFTING MACHINES**

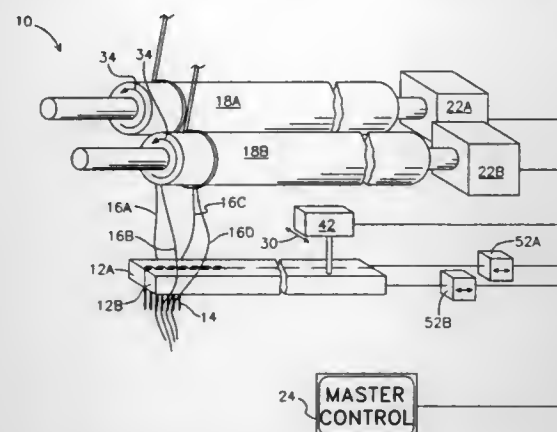
Clyde Burgess, Dalton; Gerald Morrison, Ringgold, both of Ga., and M. Steven Berger, Chattanooga, Tenn., assignors to Durkan Patterned Carpets, Inc., Dalton, Ga.

Filed Mar. 14, 1994, Ser. No. 213,178

Int. Cl.<sup>6</sup> D05C 15/30

U.S. Cl. 112—80.41

15 Claims



1. An in-line needle bar for tufting a selected fabric, said in-line needle bar comprising:

a first needle bar for carrying a first plurality of needles, said first needle bar defining a plurality of protrusions integrally formed with said first needle bar on a first side thereof, said plurality of protrusions being vertically disposed and linearly spaced apart, said plurality of protrusions defining a space between each successive pair thereof, said space defining a width substantially equal to a width defined by each said plurality of protrusions, each of said plurality of protrusions defining a through opening oriented vertically in a central portion thereof for receiving one of said first plurality of needles, each of said plurality of protrusions further defining first and second side walls, said first and second side walls each having a planar configuration and being disposed parallel one to the other;

a second needle bar for carrying a second plurality of needles, said second needle bar defining a plurality of protrusions integrally formed with said second needle bar on a first side thereof, said plurality of protrusions being vertically disposed and linearly spaced apart, said plurality of protrusions defining a space between each successive pair thereof, said space defining a width substantially equal to a width defined by each said plurality of protrusions, each of said plurality of protrusions defining a through opening oriented vertically in a central portion thereof for receiving one of said second plurality of needles, each of said plurality of protrusions further defining first and second side walls, said first and second side walls each having a planar configuration and being disposed parallel one to the other, said first face of said second needle bar being oriented to engage said first face of said first needle bar such that said plurality of protrusions defined by said first needle bar are closely received by said spaces defined between said plurality of protrusions defined by said second needle bar, said first plurality of needles and said second plurality of needles defining a single row of needles when said first needle bar and said second needle bar are so engaged; and

a needle bar spacing device for moving said second needle bar into and out of engagement with said first needle bar.

5,566,631

**SHIELD FOR ATTACHMENT TO A PRESSER FOOT**

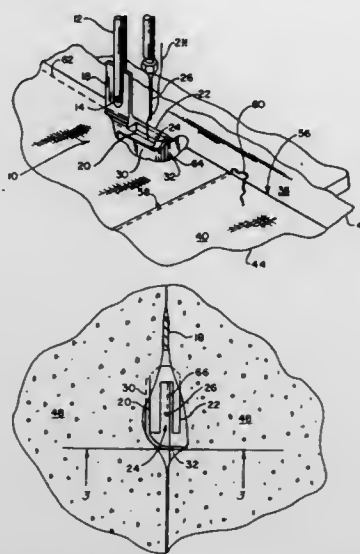
Terry L. Reinhart, Findlay, and Vaughn J. Piper, Elida, both of Ohio, assignors to Findlay Industries, Inc., Findlay, Ohio

Filed May 8, 1995, Ser. No. 399,226

Int. Cl.<sup>6</sup> D05B 29/06

U.S. Cl. 112—235

4 Claims



1. A presser foot and shield combination for attachment to a presser foot lifter shaft on a sewing machine, comprising, a pair of sole plates extending generally perpendicular to a bar, said bar being configured for connection to a lifter shaft, said sole plates being connected to said bar and spaced apart to form a gap to allow the passage of a needle and thread therebetween, said sole plates extending away from said bar and being parallel with each other, said sole plates having lower surfaces lying in the same plane to engage the upper surface of a sewable material, said sole plates terminating in upwardly sloping end remote from said bar, a shield rigidly secured to said presser foot, said shield being of a curved L-shape configuration with one leg of said L-shape extending transversely across said space between said sole plates and at a level below said sloping ends, said transversely extending leg being located remote from said bar and spaced beyond said upward slope of said sole plates, and shield having a lower surface which is not below the elevation of said sole plate lower surfaces, said shield lower surface allows sewable material to pass beneath said shield during sewing operations but is low enough to deflect material above said sewable material away from said space between said sole plates.

5,566,632

**CONTROL METHOD FOR AUTOMATIC SEWING MACHINE AND APPARATUS THEREOF**

Yoshifumi Nishizawa, Nagoya; Tomonori Abe, Nagoya; Iwao Yamane, and Satoru Yamada, both of Nagoya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1993, Ser. No. 43,819

Claims priority, application Japan, Apr. 7, 1992, 4-085579

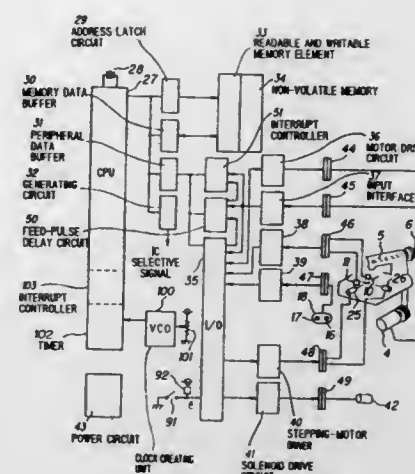
Int. Cl.<sup>6</sup> D05B 21/00

U.S. Cl. 112—470.03

19 Claims

16. A control apparatus for an automatic sewing machine having a spiggle, comprising:

a motor for driving said spiggle of said sewing machine; a cloth retaining means for clamping an article to be sewed;



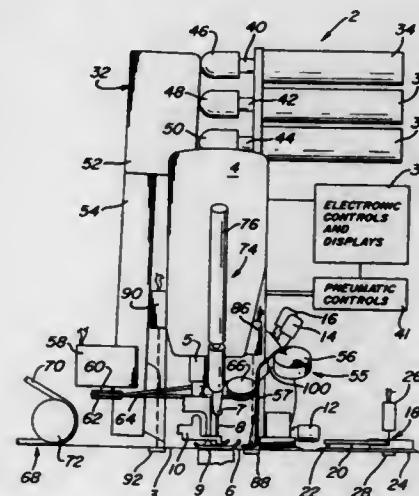
**SEWING MACHINE WITH TAPE FEED AND PNEUMATIC DEVICES FOR CLAMPING WORKPIECES**  
Martin K. Westrom, Wilkes-Barre, Pa., assignor to G&G Sewing Machine Company, Inc., Dunmore, Pa.

Filed Dec. 28, 1993, Ser. No. 174,551

Int. Cl.<sup>6</sup> D05B 19/16; 35/06; 35/10; 37/04

U.S. Cl. 112—470.03

51 Claims



1. A sewing machine comprising a needle, a foot, means for feeding material past said needle, and means for holding said material in place as said material is being sewn, said means for holding said material in place comprising means for impinging a stream of compressed air onto said material and wherein said means for holding said material in place comprises a source of compressed air and a pneumatic cylinder having a piston and a piston head and wherein said compressed gas is compressed air

and said means for holding said material in place further comprises a first air line connecting said source of compressed gas to said pneumatic cylinder, and a second air line connecting said source of compressed gas to said piston head, and wherein said piston head has an opening therein through which said compressed air flows to impinge on said material.

5,566,634

**SHIP'S STEM DUCT WITH AIRFOIL SECTION**

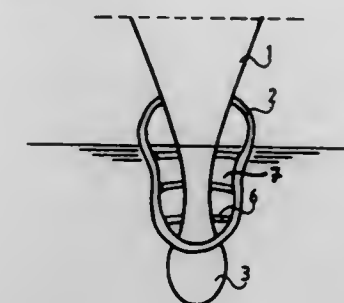
Emanuel E. Petromanolakis, 12 Pantokratoros Street, Peristeri, Athens, Greece

Filed Mar. 20, 1995, Ser. No. 406,420

Int. Cl.<sup>6</sup> B63B 1/32

U.S. Cl. 114—56

19 Claims



1. A stem duct for use on a ship having a bow including opposed bow sides and a bow frontal surface, said stem duct comprising, wall portions adapted to be mounted to the bow of the ship and to extend forwardly of the bow frontal surface and upwardly on the opposed bow sides from below to above the ship's waterline when the ship is in motion, said stem duct being shaped to substantially follow the shape of the opposed bow sides and having a closed bottom end and defining a water flow passage between an interior surface of said stem duct and the bow, said wall portions each including an airfoil portion extending generally in a longitudinal direction of the ship, said airfoil portions having on the opposed bow sides of the ship a leading edge defining at least one inlet opening of said water flow passage and a trailing edge defining at least one outlet opening of said water flow passage, the airfoil portions having convex interior surfaces and said flow passages converge and then diverge in a rearward direction of the ship, said convex interior surfaces increase the speed of water passing through said flow passages relative to the speed of water flowing around the outer surface of said stem duct, to create a reduced pressure interior to said stem duct and a flow depression downstream from said stem duct.

5,566,635

**TAILPIECE FOR THE FORKED BOOM OF A RIG FOR SURFBOARDS**

Marc Namur, Weiterstadt, Germany, assignor to Fanatic Sports GmbH, Ransbach-Baumbach, Germany

Filed Aug. 25, 1995, Ser. No. 519,333

Claims priority, application Germany, Aug. 25, 1994, 9413579 U

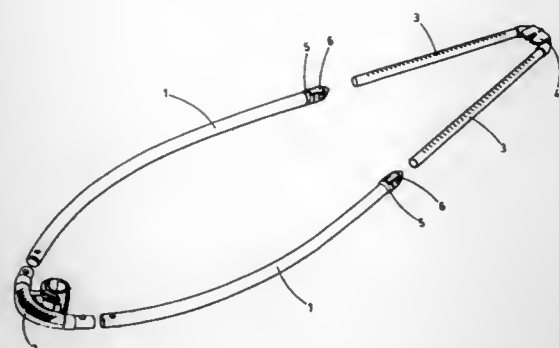
Int. Cl.<sup>6</sup> B63B 15/00

U.S. Cl. 114—97

8 Claims

1. Tailpiece for a forked boom of a rig for surfboards, comprising a tube bend segment (9), carried by a tube bend (10) to which is fastened bars (3) of the forked boom, wherein on the upper side of the tube bend segment (9) there is a plate (12) with a wide straight-through slit (13) for receiving a fastening ring (14) of the clew (8) of the sail (7) the bend segment (9) having a rear opening (15), a spring-loaded latch (16) exposed through said opening (15), and a hook (17) on said latch (16) for swivelling in and out of the fastening ring (14) of the sail (7).





5,566,636

## OFF SHORE MOORING SYSTEM

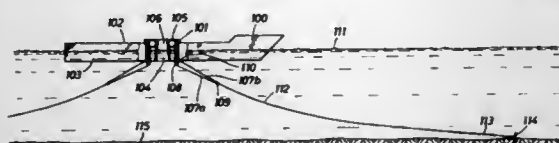
Christian V. Wolf, Houston, and Thomas S. Burns, Sugarland, both of Tex., assignors to Reading & Bates Development Co., Houston, Tex.

Continuation-in-part of Ser. No. 62,945, May 17, 1993, Pat. No. 5,390,618. This application Feb. 21, 1995, Ser. No. 391,442

Int. Cl.<sup>6</sup> B63B 21/50

U.S. Cl. 114—230

4 Claims



1. In a mooring system for mooring a vessel, having a hull with a waterline and a turret extending through the hull, in a body of water, having a water surface and a bottom at a depth beneath the water surface, in a mooring area subject to waves which generate a wave action which extends below the water surface, said mooring system comprising: a vessel mooring line having a free end; pulling equipment located within the turret and attached to the vessel mooring line, for extending, retracting and tensioning the vessel mooring line; mooring tackle having a first end and a second end; and anchor means for anchoring the vessel to the bottom connected to the second end of the mooring tackle, the improvement which comprises:

- a first fairlead attached to the turret below the vessel hull for receiving the vessel mooring line first end from the pulling equipment and freely passing the vessel mooring line outward from the vessel;
- a block, located a distance away from the vessel hull, and comprising block fairlead means for receiving and freely passing the vessel mooring line extended from the pulling equipment, and further comprising block connecting means for connecting the block to the first end of the mooring tackle; and
- a second fairlead attached to the turret below the vessel hull at a position laterally spaced from the first fairlead, for receiving and freely passing the vessel mooring line from the block fairlead for attachment to the vessel.

5,566,637

## BOAT CABIN TOP DECK MOLD ASSEMBLY WITH BUILT-IN ICE CHEST

Kenneth C. Benza, 4000 Iva Ln., Fairfax, Va. 22032

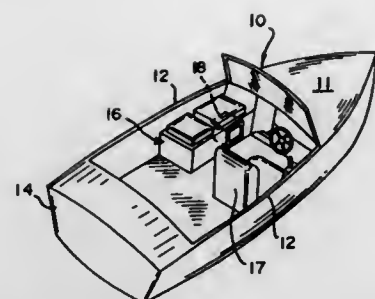
Filed Nov. 17, 1995, Ser. No. 559,995

Int. Cl.<sup>6</sup> B63B 17/00

U.S. Cl. 114—343

4 Claims

1. A combination of a boat hull, the boat hull including side boards, a transom and a top deck assembly with a hull drain hole



provided in one of said side boards and transom, and an ice chest slidably mounted in a recess in the top deck assembly, said ice chest comprising:

- a drawer having a longitudinal dimension extending along a longitudinal axis and a drawer drain hole for draining water from said drawer by gravity;
- mounting means for sliding said drawer, relative to the top deck assembly, along said longitudinal axis;
- a stationary tray, mounted in the bottom of the recess and extending over at least substantially said longitudinal dimension, for receiving water drained from said drawer in all positions of the drawer allowed by said sliding, said tray having a tray drain hole and an upper surface sloped toward said tray drain hole; and
- a conduit for discharging water from said tray drain hole out of the boat hull through said hull drain hole.

5,566,638

## COLLAPSIBLE MARKER CONE

Gary Rokosny, Piscataway, N.J., assignor to Regent Sports Corporation, Hanppauge, N.Y.

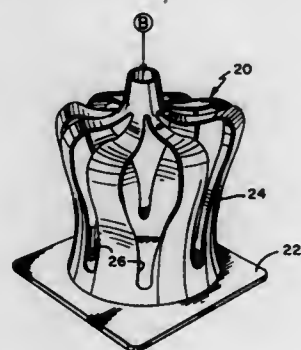
Continuation of Ser. No. 191,330, Feb. 3, 1994, abandoned.

This application Oct. 13, 1995, Ser. No. 542,427

Int. Cl.<sup>6</sup> E01F 9/00

U.S. Cl. 116—63 C

12 Claims



1. A marker cone comprising:

- a unitary conical portion including a tip end spaced from a base end and including selectively weakened regions, said weakened regions allowing said conical portion to collapse along a vertical axis of said conical portion in response to a predetermined force being applied to said conical portion along said vertical axis, said weakened regions including slots extending substantially from said base end to said tip end, said slots including adjacent slots wherein a distance of said conical portion between said adjacent slots is smaller proximate to said tip end than a distance of said conical portion between said adjacent slots proximate to said base end.

5,566,639

## ANIMAL WATERER WITH QUICK DISCONNECT AND VALVE ALIGNMENT FEATURES

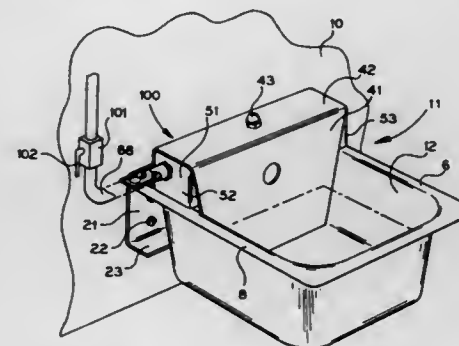
James E. McKinstry, and Billy L. Denny, both of Cedar Rapids, Iowa, assignors to Nelson Manufacturing Company, Cedar Rapids, Iowa

Filed Jun. 5, 1995, Ser. No. 464,096

Int. Cl.<sup>6</sup> A01K 7/04

U.S. Cl. 119—78

5 Claims



1. An animal waterer comprising:
  - a watering bowl,
  - a pair of spaced upwardly extending pins attached to an upper edge of said watering bowl and each of said pins formed with an enlarged head,
  - a valve assembly,
  - a locking means movably mounted on said valve assembly and formed with two generally key-shaped openings with larger portions through which the heads of said pins of said watering bowl can be inserted when the locking means is in a first position, and wherein said locking means can be moved to a second position to lock said watering bowl to said valve assembly.

5,566,640

## ENCLOSED LITTER BOX DEVICE

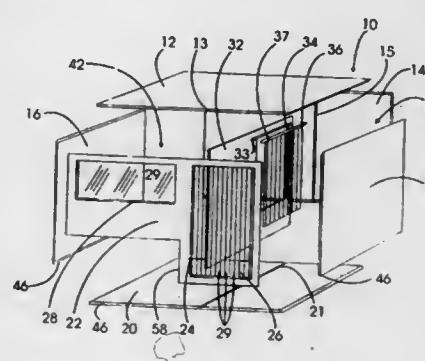
James W. Krumrei, 5711 Windsong Ln., Milford, Ohio 45150

Filed Nov. 14, 1994, Ser. No. 339,470

Int. Cl.<sup>6</sup> A01K 29/00

U.S. Cl. 119—165

25 Claims



1. A litter device comprising:
  - an enclosed housing defined by a plurality of outside panels, wherein one of said panels comprises a first opening sized to permit the passage of an animal therethrough;
  - first and second chambers within said housing separated by a partition panel, said first opening providing access to said first chamber, and said partition panel provided with a second opening sized to permit the passage of an animal therethrough to said second chamber; and
  - flexible closure means located adjacent each of said first and second openings for allowing selective passage of an animal

through each of said openings, said closure means normally closing said respective opening to provide an effectively isolated air space between said openings and preventing air flow between said openings.

5,566,641

## NO MESS LITTER BOX

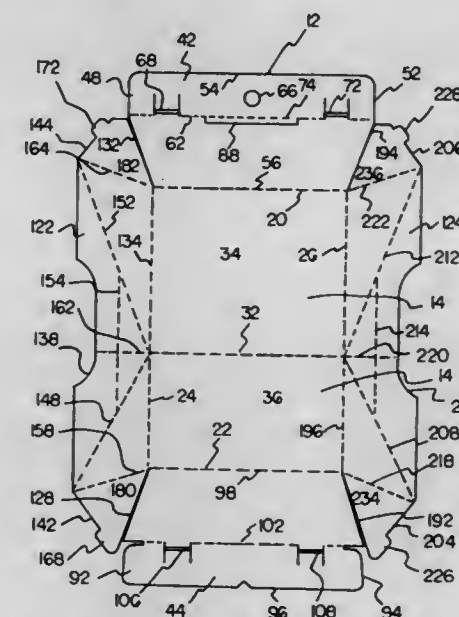
Bruce A. Radli, and Lorraine A. Radli, both of 64 Sunset Dr., Howell, N.J. 07731

Filed May 15, 1995, Ser. No. 446,947

Int. Cl.<sup>6</sup> A01R 29/00

U.S. Cl. 119—168

19 Claims

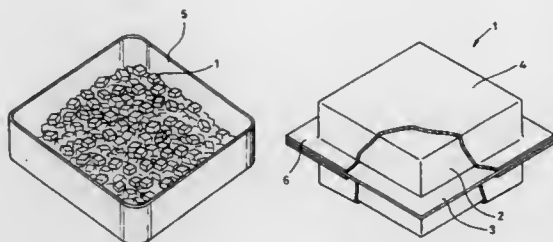


1. A new and improved no mess litter box for a pet that is disposable comprising, in combination:

- a flexible sheet of rigid material having a base with a rectangular configuration with a border extended peripherally upward therefrom forming an upper end border, a lower end border, and a left side border and a right side border therebetween, the sheet having a non-symmetrical vertical fold line positioned on the base perpendicular to each side border, the non-symmetrical vertical fold line capable of dividing the base into an upper section and a lower section with the upper section having a length greater than a length of the lower section;
- a pair of spaced opposed rigid end panels having a trapezoidal configuration forming a top end panel and bottom end panel, the top end panel having a left side, a right side, a top end edge, a bottom end edge being in communication with the upper border of the base and a top vertical fold line perpendicular to the sides therebetween, the top end panel including an opening positioned above the top vertical fold line and adjacent the top end edge, the top vertical fold line having a first horizontal slit, a second horizontal slit and a central horizontal slit therebetween, the first slit being adjacent the left side with the second slit adjacent the right side, the top fold line of the top end panel when folded positions the top end panel in a plane horizontal to the base along the upper border forming a top end wall having a height about between 4 to 5 1/2 inches plus or minus ten percent and the top end edge being positioned in a plane parallel the base forming a top vertical shelf, the top vertical shelf having a front end edge and a back end edge with a locking tab formed thereon from the central horizontal slit of the top panel, the bottom end panel having a left side, a right side, a top end edge, a bottom end edge being in communication with the lower border of the base and a bottom vertical fold line perpendicular to the sides there between, the bottom vertical fold line having a first

horizontal slit being adjacent the left side of the bottom end panel and a second horizontal slit being adjacent the right side of the bottom end panel, the bottom fold line of the bottom panel when folded positions the bottom end panel in a plane horizontal to the base along the lower border forming a bottom end wall having a height about between 4 to 5½ inches plus or minus ten percent and the top end edge of the bottom panel being positioned in plane parallel the base forming a bottom vertical shelf, the bottom vertical shelf having a front end edge and a back end edge, each vertical shelf pointing in a direction away from the base; and

- a pair of space opposed rigid side panels having a rectangular configuration forming a left side panel and a right side panel, the left side panel having a left end side, a right end side, a bottom end edge being in communication with the left side border of the base, a top end edge concave along the center having a pair of opposed sections sloping horizontally in a downward direction toward the sides, a pair of diagonal creases, a vertical crease and a plurality of horizontal fold lines, the top end edge further including a fastener tab atop each section, the horizontal fold lines of the left panel adjacent the right end side being folded in an outwardly direction forming a pair of triangular flaps with the fastener tab of the section of the top end edge being positioned thereon, the flaps when moved forward in the direction of the top end wall and the bottom end wall positioning the left panel in a plane horizontal to the base forming a left side wall, the left side wall having a height about between 4 to 5½ inches plus or minus ten percent, the left side wall maintaining a horizontal position by passing the fastener tabs through the respective horizontal slits of the top and bottom end walls and securing the fastener tabs within the horizontal slits, the right side panel having a left end side, a right end side, a bottom end edge being in communication with the right side border of the base, a top end edge concave along the center having a pair of opposed sections sloping horizontally in a downward direction toward the side, a pair of diagonal creases, a vertical crease and a plurality of horizontal fold lines, the top end edge further including a fastener tab atop each section, the horizontal fold lines of the right panel adjacent the end sides being folded in an outwardly direction form a pair of triangular flaps with the fastener tab of the section of the top end edge being positioned thereon, the flaps when moved forward in the direction of the top end wall and the bottom end wall positioning the right panel in a plane horizontal to the base forming a right side wall, the right side wall having a height about between 4 to 5½ inches plus or minus ten percent, the right side wall maintaining a horizontal position by passing the fastener tabs through the respective horizontal slits of the top and bottom end walls and securing the fastener tabs within the horizontal slits, each side wall being coupled to the top and bottom end wall forming an open box configuration with the base being capable of receiving a supply of litter.



5,566,643

## CONTROL OF SHARKS

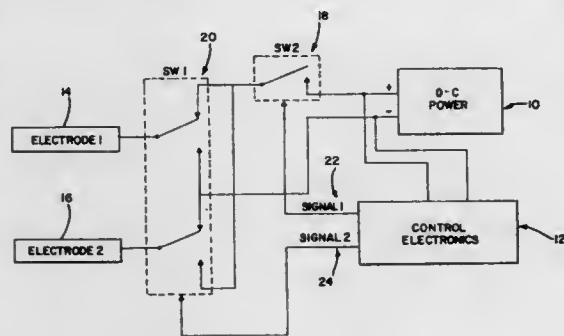
Graeme E. Charter, Durban; Sherman H. Ripley, Westville, and Norman G. Starkey, Durban, all of South Africa, assignors to Natal Sharks Board, Natal, South Africa  
Filed Jun. 23, 1994, Ser. No. 264,813

Claims priority, application South Africa, Jun. 24, 1993, 93/4532

Int. Cl. A01K 61/00

U.S. Cl. 119—220

24 Claims



10. Apparatus for controlling aquatic animals in a body of water, said apparatus comprising:  
a power supply;  
a first electrode and a second electrode for immersion in a body of water;  
first controllable switch means for connecting the first and second electrodes selectively to an output of the power supply in response to control signals; and  
control means arranged to provide the control signals to the first controllable switch means for the first controllable switch means to apply electrical pulses to the first and second electrodes, the pulses having a duration of between 0.1 and 200 ms, a repetition rate of between 1 and 60 Hz and a field strength in the body of water, at a distance of 1 m of 1 to 10 Vm<sup>-1</sup>, thereby to repel aquatic animals from the vicinity of the first and second electrodes.

5,566,644

GRANULAR ABSORBENT MATERIAL FOR PET ANIMAL  
Kengo Ochi, Kawano, Japan, assignor to Uni-Charm Corporation, Ehime-ken, Japan

Filed Aug. 17, 1995, Ser. No. 516,033

Claims priority, application Japan, Aug. 23, 1994, 6-198628  
Int. Cl. A01K 1/015

U.S. Cl. 119—171

4 Claims

1. Granular absorbent material for pet animal comprising:  
a plurality of grains;  
said grains each having a core formed from absorbent material;  
a liquid-impermeable partition sheet or a liquid permeation retardant sheet parting said core into upper and lower halves; and  
a liquid-permeable sheet covering said core.

5,566,644

## BALL SCREW POWER DRIVE FOR VENTILATION CURTAINS

Neil D. Beery, Harrisonburg, Va., assignor to AGRI Ventilation Systems, Inc., Dayton, Va.

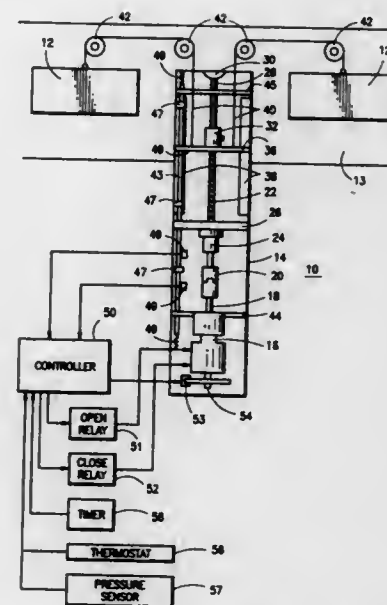
Continuation-in-part of Ser. No. 180,374, Jan. 12, 1994, abandoned. This application Jul. 13, 1994, Ser. No. 274,403

Int. Cl. A01K 1/00

U.S. Cl. 119—448

21 Claims

1. A power drive comprising:  
a motor having an output shaft;  
brake means connected to said motor for stopping said output shaft and holding it in a fixed position;  
screw drive means attached to said output shaft, said screw drive means including a linearly moveable element moveable between first and second positions;



means for connecting said moveable element to an air flow control device to be opened and closed; and  
controller means for actuating said motor and said brake means to selectively move said linearly moveable element.

5,566,645

## ANIMAL TRAINING METHOD AND APPARATUS

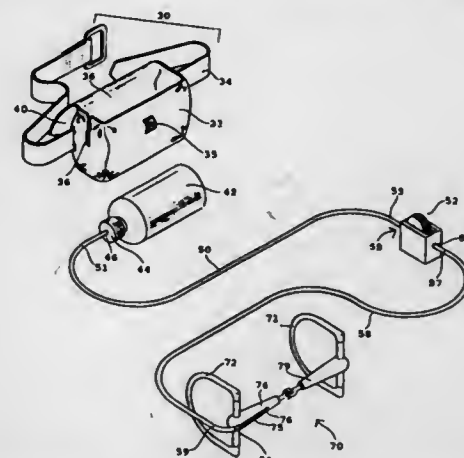
Toni H. Cole, 2280 Cemetery Rd., Sunnyside, Wash. 98944

Filed Aug. 1, 1994, Ser. No. 284,075

Int. Cl. B68B 1/00; A01K 15/00

U.S. Cl. 119—712

17 Claims



1. A primary reinforcement training apparatus to reinforce desired animal behavior during training by providing a reward to an animal simultaneously with, or immediately following, performance of a desired behavior, comprising:  
a. reservoir containing a reward substance selected from the group consisting of liquids, solids, and mixtures of liquids and solids;  
b. a flow control means for starting and stopping of a flow of the reward substance from the reservoir, said flow control means being operable simultaneously with, or immediately following, an exhibition of the desired behavior by the animal being trained;  
c. a supply tube connecting said reservoir to the flow control means;  
d. a delivery tube removably affixed to the substantially vertical side member of a hackamore or bitless bridle, and then bent or

curved at an angle so that the terminal end of the delivery tube is placed inside the animal's mouth, said delivery tube connecting the flow control means to the mouth of the animal; and  
e. a means of securing one end of the delivery tube in the mouth of the animal.

5,566,646

Patent Not Issued For This Number

5,566,647

## STEAM GENERATOR EQUIPPED WITH A DEVICE FOR TRAPPING MIGRATING BODIES

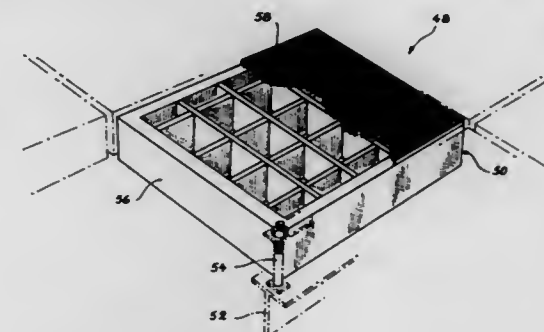
Yves Pascal, Nantene, France, assignor to Framatome, Paris, France

Filed May 18, 1994, Ser. No. 245,669

Claims priority, application France, May 27, 1993, 93 06372  
Int. Cl. F22B 1/02

U.S. Cl. 122—34

6 Claims



1. A steam generator comprising:  
(a) a vertically axed outer envelope;  
(b) a horizontal tube sheet tightly fixed within the outer envelope;  
(c) a bundle of inverted U-tubes, each having two ends fixed to the tube sheet and respectively issuing below the tube sheet into an admission collector and a discharge collector for the primary fluid;  
(d) means for supplying secondary water issuing into the outer envelope above the tube sheet;  
(e) an inner envelope covering the bundle of tubes;  
(f) substantially vertical discharge pipes extending upwards from an upper part of the inner envelope;  
(g) drying means placed in the outer envelope at a distance above upper ends of the discharge pipes; and  
(h) secondary steam extraction means located at a top of the outer envelope; and  
(i) migrating body trapping means located in the outer envelope, at an intermediate level between upper ends of the discharge pipes and the drying means, said trapping means being located at least above each discharge pipe and defining passages having a maximum dimension smaller than a minimum distance separating the tubes of the bundle.



5,566,648

## HEAT EXCHANGER

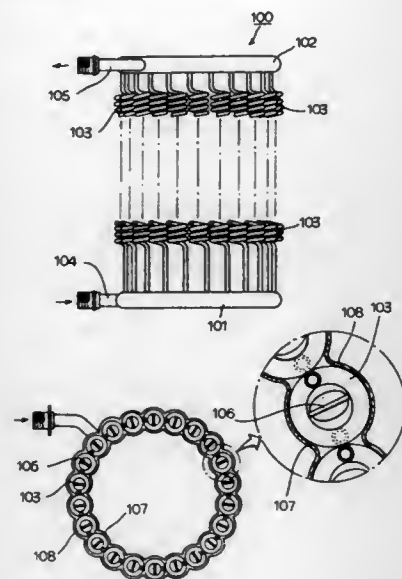
Gordon W. Fenn, Brevard, N.C., and Young M. Ryoo, Ansan, Rep. of Korea, assignors to Frontier, Inc., Ann Arbor, Mich.  
Filed Jun. 7, 1995, Ser. No. 482,831

Claims priority, application Rep. of Korea, Jan. 23, 1995, 95-914

Int. Cl.<sup>6</sup> F22B 23/06

U.S. Cl. 122—367.3

2 Claims



1. A heat exchanger having an imaginary longitudinal axis and comprising:

- an annular lower manifold which is disposed about such axis and to which a cold-water intake through which cold water comes is connected;
  - an annular upper manifold which is disposed about such axis and to which a hot-water exit through which hot water is discharged is connected;
  - a plurality of axially extending, coil-shaped heat exchange tubes connected between said lower and upper manifolds, said plurality of coil-shaped heat exchange tubes presenting radially inwardly facing surface portions toward such axis and radially outwardly facing surface portions away from such axis;
  - an inner liner for embracing said radially inwardly facing surface portions of said plurality of coil-shaped heat exchange tubes; and
  - an outer liner for embracing said radially outwardly facing surface portions of said plurality of coil-shaped heat exchange tubes,
- said inner and outer liners forming a path for burned gas.

5,566,649

## METHOD AND APPARATUS FOR THE CLEANING OF FIRE TUBES IN A FIRE TUBE BOILER

Orlin Norris, P.O. Box 674, Chatham, N.J. 07928

Filed Aug. 4, 1995, Ser. No. 511,369

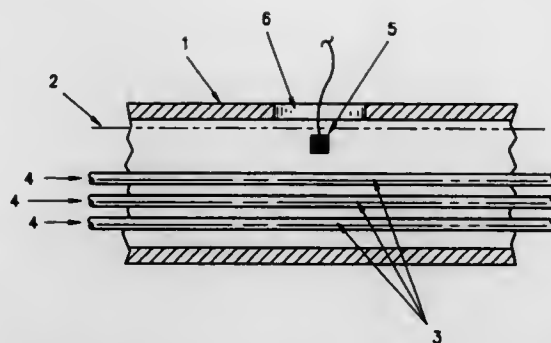
Int. Cl.<sup>6</sup> F22B 37/18

U.S. Cl. 122—379

9 Claims

1. A method for cleaning fire tube boilers, where the boiler includes an outer shell having interior surfaces, a plurality of fire tubes and water at a predetermined level, comprising:

- a plurality of ultrasonic transducers placed inside said boiler and below said water level, said plurality of ultrasonic transducers being inserted in a folded state and deployed in an expanded state inside said boiler, and
- simultaneously activating said plurality of ultrasonic transducers to a frequency so that ultrasonic energy is transmitted through



said water to said fire tubes and said interior surfaces so that debris, deposits and sludge is removed.

5,566,650

## INTERNAL COMBUSTION ENGINE WITH LIMITED TEMPERATURE CYCLE

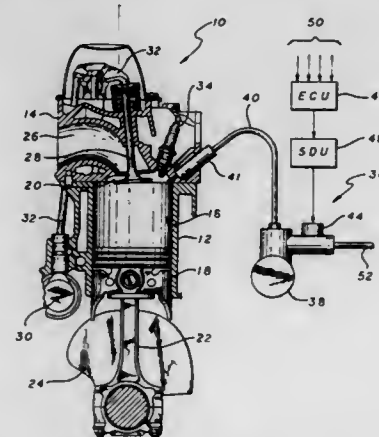
Douglas C. Kruse, 9440 Irondale Ave., Chatsworth, Calif. 91311

Continuation of Ser. No. 146,832, Oct. 29, 1993, Pat. No. 5,460,128, which is a continuation of Ser. No. 919,916, Jul. 27, 1992, Pat. No. 5,265,562. This application Jun. 6, 1995, Ser. No. 466,817

Int. Cl.<sup>6</sup> F02B 1/14; 41/00; F02D 41/26

U.S. Cl. 123—27 R

8 Claims



1. A method of operating an internal combustion expanding chamber piston engine for providing limited temperature combustion, said engine having (1) at least one cylinder and an associated piston for forming a combustion chamber, said piston having a top dead center position, (2) an operating cycle including an intake stroke, a compression stroke and an expansion stroke, and (3) a fuel introduction system, said method comprising the steps of:

- forming a predetermined fuel/air mixture by introducing a predetermined fraction of the total fuel required for complete combustion of the process air in the combustion chamber;
  - igniting said fuel/air mixture when the piston is substantially at top dead center; and
  - introducing substantially at the beginning of the expansion stroke, a second fraction of the total fuel required for complete combustion;
- wherein the combustion of the fuel/air mixture resulting from the fuel first introduced is a substantially constant volume process;
- wherein the combustion as a result of the introduction of the second fraction is a substantially isothermal process; and
- wherein said forming, igniting and introducing include providing a stratified charge.

5,566,651

## DEVICE FOR CONTINUOUS ANGULAR ADJUSTMENT BETWEEN TWO SHAFTS IN DRIVING RELATIONSHIP

Andreas Strauss, Herzogenaurach, and Eduard Golovatai-Schmidt, Nuremberg, both of Germany, assignors to Ina Walzager Schaeffler KG, Germany

PCT No. PCT/EP93/01091, § 371 Date Oct. 18, 1994, § 102(e) Date Oct. 18, 1994, PCT Pub. No. WO93/24736, PCT Pub. Date Dec. 9, 1993

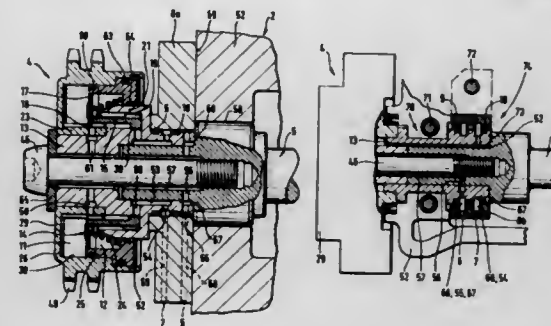
PCT Filed May 5, 1993, Ser. No. 325,245

Claims priority, application Germany, Jun. 1, 1992, 42 18 082.1

Int. Cl.<sup>6</sup> F01L 1/344

U.S. Cl. 123—90.17

12 Claims



1. A device for continuous angular adjustment between at least a crankshaft and a camshaft of an internal combustion engine in driving relationship comprising an adjusting element (4) which is connected to a shaft to be adjusted while being arranged in an axial direction thereto and comprising a hydraulically actuatable piston (14) which is connected to a pressure medium circuit, characterized in that a separate connecting plate (8a, 8b) fixed on a cylinder head (2) is associated with the adjusting element (4), and said connecting plate radially surrounds the camshaft which is to be adjusted, the connecting plate (8a, 8b) comprising pressure medium ducts (6, 7) for pressure medium supply to the adjusting element (4).

5,566,652

## LIGHT WEIGHT CAM FOLLOWER

David W. Deppe, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

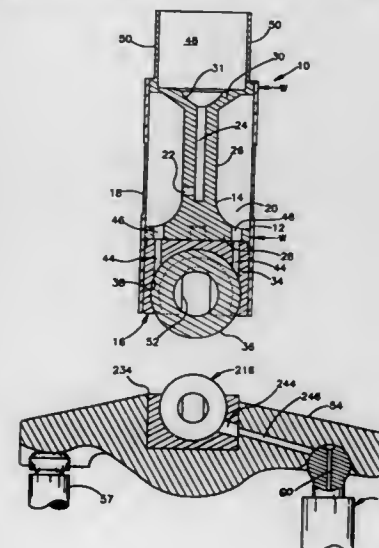
Filed Oct. 6, 1995, Ser. No. 540,606

Int. Cl.<sup>6</sup> F01L 1/16; 1/18; F01M 9/10

U.S. Cl. 123—90.35

7 Claims

1. A cam follower for an internal combustion engine comprising



a body; a cam follower element received within said body; and a force transmitting surface on said body, said force transmitting surface being effective to transmit a valve opening force applied to said cam follower element to a poppet valve of said engine; said cam follower element comprising a plastic insert member received in said body and having a generally semi-cylindrical cavity formed therein, and an axleless roller received within said cavity, said insert member being conformable under load to the surface of said roller; and means formed within said insert member for conducting pressurized engine oil from a source external to said cam follower to said cavity.

5,566,653

## METHOD AND APPARATUS FOR CLEAN COLD STARTING OF INTERNAL COMBUSTION ENGINES

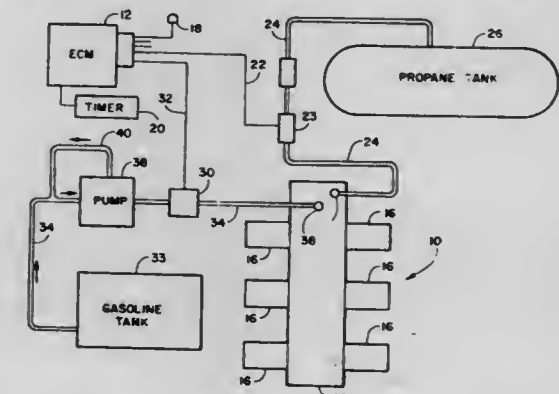
James J. Feuling, 2521 Palma, Ventura, Calif. 93003

Continuation-in-part of Ser. No. 274,342, Jul. 13, 1994. This application May 11, 1995, Ser. No. 439,549

Int. Cl.<sup>6</sup> F02B 1/00

U.S. Cl. 123—179.8

28 Claims



1. An improved starting system for internal combustion engines which comprises:

- starting means for starting said internal combustion engine including means for igniting fuel in combustion chambers;
- fuel injection means for introducing a gaseous fuel into said combustion chambers when the engine is started;
- means for interrupting the flow of said gaseous fuel to said combustion chambers upon expiration of a predetermined time period from about 10 to 70 seconds; and
- fuel injection means for introducing liquid fuel into the combustion chambers and ending introduction of gaseous fuel after expiration of said predetermined time period.

5,566,654

## PRECOMBUSTION CHAMBER FOR DIESEL ENGINE

Tatsuyuki Masuda, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Twata, Japan

Filed Mar. 3, 1994, Ser. No. 205,940

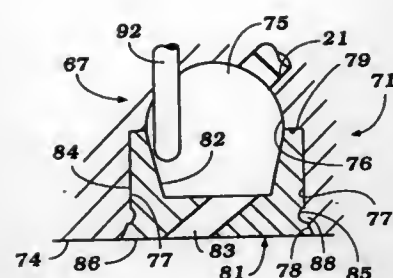
Claims priority, application Japan, Mar. 4, 1993, 5-044057

Int. Cl.<sup>6</sup> F02B 19/16

U.S. Cl. 123—271

6 Claims

1. A cylinder head arrangement for an internal combustion engine comprised of a cylinder head member having a first surface adapted for sealing relation around a cylinder bore of an associated cylinder block, said first surface surrounding a second surface forming in part a main combustion chamber, said cylinder head member defining a cavity in said second surface forming at least in part a precombustion chamber, an insert piece extending at least in part into said cavity for enclosing said cavity and forming in further part said precombustion chamber, an opening in said insert piece communicating said precombustion chamber with said combustion chamber, and interlocking means carried by said insert



piece and said cylinder head member for affixing said insert piece to said cylinder head member comprising a chamfer formed in said cylinder head at the lower termination of said cavity, a groove formed in said insert piece, and a tapered surface formed on a lower portion of said insert piece adjacent said groove and engaging said chamfer and deflecting cylinder head material into said groove in interlocking relationship therewith.

#### 5,566,655 METHOD FOR CONTROLLING THE FLOW OF FLUID THROUGH AN INTAKE PIPE OF AN INTERNAL COMBUSTION ENGINE

Werner Rumez, Mühlacker, and Siegfried Sumser, Stuttgart, both of Germany, assignors to Daimler-Benz AG, Stuttgart, Germany

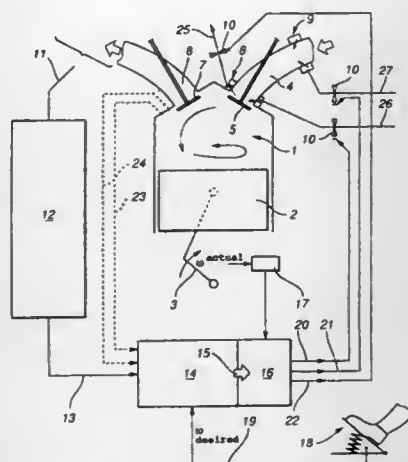
Filed Oct. 20, 1995, Ser. No. 546,200

Claims priority, application Germany, Oct. 24, 1994, 44 37 947.1

Int. Cl.<sup>6</sup> F02B 17/00; F02M 25/00

U.S. Cl. 123—306

6 Claims



1. A method of controlling the flow of fluid through an engine intake duct and past an engine intake valve into an internal combustion engine, from which exhaust gases are discharged into an exhaust pipe of an exhaust system of said engine, said method comprising the steps of: measuring at least one exhaust gas parameter in said exhaust pipe, comparing said measured exhaust gas parameter with at least one parameter of a characteristic diagram developed with a view to achieving minimum fuel consumption and minimum emission of harmful substances of the internal combustion engine, supplying a first additional fluid stream to said intake duct at a location adjacent said intake valve, supplying a second additional fluid stream to said intake duct at a distance upstream of said intake valve, removing fluid from said intake duct at a location adjacent said intake valve, and varying the mass flows and flow profiles of said additional fluid streams in dependence on regulating variables selected by way of said characteristic diagram so as to obtain minimum fuel consumption and minimum emission of harmful substances as measured in said exhaust pipe.

#### 5,566,656 CONTROL SYSTEM FOR A BUTTERFLY VALVE

Josef Buchl, Lenting, Germany, assignor to Audi AG, Ingolstadt, Germany

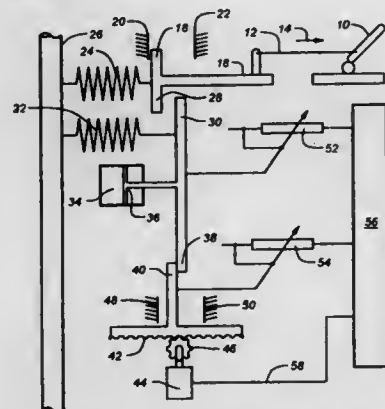
Filed Mar. 29, 1995, Ser. No. 413,123

Claims priority, application Germany, Apr. 2, 1994, 44 11 630.6

Int. Cl.<sup>6</sup> F02D 7/00

U.S. Cl. 123—399

14 Claims



1. A control system for a butterfly valve in the intake tract of an internal combustion engine fitted with (a) a gas pedal connected to an adjustment element, (b) an activation element capable of being moved in an opening direction by a cam on the adjustment element, the adjustment element connected to the butterfly valve and controlling the degree of opening of the butterfly valve, (c) an electro-mechanical adjustment system capable of being activated by drive and fitted with a cam capable of moving the activation element in the opening direction of the butterfly valve, (d) an impact device pulling the activation element in the closing direction of the butterfly valve, causing the activation element to rest against the cam of either the adjustment element or the electro-mechanical adjustment system, (e) a minimum idle stop limiting movement of the electro-mechanical adjustment system in the closing direction of the butterfly valve, (f) a full load stop limiting movement of the activation element in the opening direction of the butterfly valve, (g) a first actual value sensor monitoring movement of the activation element, and (h) evaluation electronics receiving signals from the first actual value sensor, said first actual value sensor having a first characteristic curve and a second different characteristic curve across the total range of movement of the butterfly valve.

#### 5,566,657 ACCELERATION RESPONSIVE CONTROL SYSTEM AND METHOD FOR INTERNAL COMBUSTION ENGINE

Katsuharu Hosoe, Okazaki, Japan, assignor to Nippondenso Co., Ltd., Kariya-city, Japan

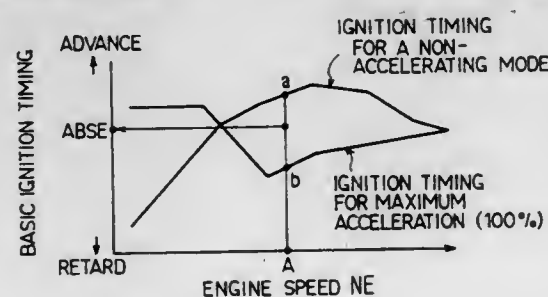
Filed Dec. 8, 1995, Ser. No. 569,607

Claims priority, application Japan, Dec. 12, 1994, 6-307496; Sep. 11, 1995, 7-232229

Int. Cl.<sup>6</sup> F02P 5/15

U.S. Cl. 123—418

18 Claims



1. A control system for controlling output of an internal combustion engine, said system comprising: rotation detecting means for detecting rotational movements that occur in the internal combustion engine; relative acceleration rate computing means for calculating a relative acceleration rate based on a signal from the rotation detecting means, the relative acceleration rate indicating the proportion of current acceleration with respect to maximum acceleration achievable by the internal combustion engine; control value computing means for computing a control value in accordance with the relative acceleration rate calculated by the relative acceleration rate computing means; and control means for controlling the internal combustion engine in accordance with the control value calculated by the control value computing means.

#### 5,566,658 CLAMPING LOAD DISTRIBUTOR AND TOP STOP FOR A FUEL INJECTOR

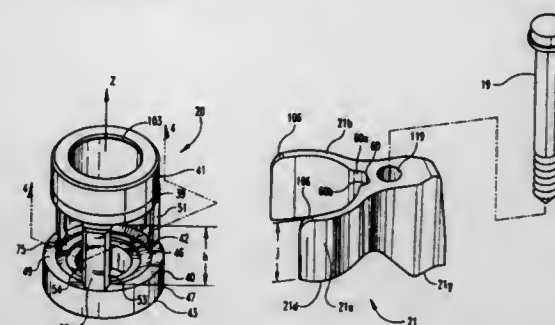
Steven D. Edwards, Columbus; Daniel K. Hickey, Greenwood; Dave A. Olson, Columbus; George L. Muntean, Columbus; Chandresh Shah, Columbus, and David L. Eastman, Columbus, all of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Apr. 21, 1995, Ser. No. 427,114

Int. Cl.<sup>6</sup> F02M 55/02

U.S. Cl. 123—470

17 Claims



1. An apparatus for receiving a clamping load to secure a fuel injector unit to a cylinder head, comprising: a body for receiving a portion of the fuel injector unit therein, said body having a first end and an opposite second end; a stop connected to said first end of said body, said stop for restricting the axial movement of said portion of the fuel injector unit receivable in said body; a clamp receiving portion for receiving the clamping load, said clamp receiving portion positioned within said body; and a contact portion contactable with the fuel injector unit and being connected to said second end of said body for transmitting the clamping load to the fuel injector unit, said contact portion being positioned radially inward from said clamp receiving portion.

#### 5,566,659 METHOD AND DEVICE FOR CONTROLLING AN ELECTROMAGNETIC LOAD

Klaus Franzke, Leonberg, and Stefan Keller, Eberdingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Apr. 19, 1995, Ser. No. 424,943

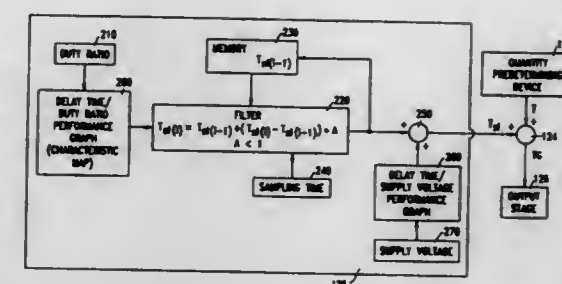
Claims priority, application Germany, May 2, 1994, 44 15 361.9

Int. Cl.<sup>6</sup> F02M 51/00

U.S. Cl. 123—490

11 Claims

1. A method of driving an electromagnetic load, comprising the steps of:



predetermining a basic time duration during which the load is to be driven;  
determining a correction delay time as a function of a power supplied to the load;  
generating a corrected time duration by correcting the basic time duration of driving the load as a function of the correction delay time; and  
driving the load for the corrected time duration.

#### 5,566,660 FUEL INJECTION RATE SHAPING APPARATUS FOR A UNIT FUEL INJECTOR

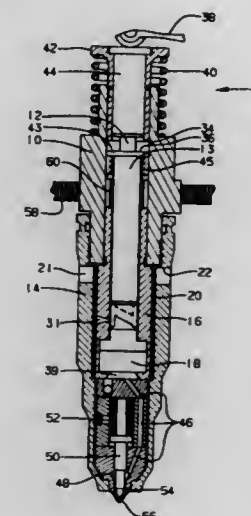
Fred A. Camplin, Peoria; Michael A. Flinn, East Peoria; Jeffrey D. Graves, Pontiac, and Lianghe Zuo, Normal, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Apr. 13, 1995, Ser. No. 420,930

Int. Cl.<sup>6</sup> F02M 37/04; 47/02; F02B 3/00

U.S. Cl. 123—496

13 Claims



1. A fluid unit injector rate shaping apparatus, comprising: a housing having a longitudinal bore;  
a plunger sleeve having a longitudinal extending bore and being movable within and relative to said housing bore, said housing bore and said plunger sleeve defining a fluid pump chamber, said plunger sleeve being movable a preselected distance into the pump chamber;  
a plunger slidably positioned in said plunger sleeve bore and being movable a preselected distance into the pump chamber; first means of moving said plunger in a direction toward the fluid pump chamber;  
second means of moving said plunger sleeve in a direction toward the fluid pump chamber during movement of said plunger.



5,566,661

**FUEL ECONOMIZERS, APPLICABLE TO GAS-OIL AND GASOLINE ENGINES AND BURNERS**

D. onzalo G. Zorita, Ronda de Santa María, n° 2, -28880 Meco (Madrid), Spain

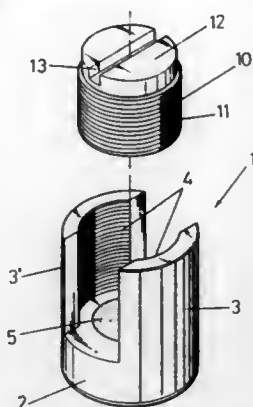
Filed Jun. 8, 1995, Ser. No. 480,603

Claims priority, application Spain, Jan. 10, 1995, 9500053

Int. Cl. F02M 33/00

U.S. Cl. 123—538

3 Claims



1. A magnetic housing for producing magnetic fields on a fuel conduction pipe having fuel flowing therethrough for reducing the fuel consumption rate of a combustion engine, said housing comprising:

a main body comprising a bottom portion having a cylindrical shape with a cylindrical recess for supporting an exposed cylindrical magnetic receiver, and a top portion having a pair of winged vertical projections, curved at the same degree as the cylindrical bottom portion, each of said projections having an inner helicoidal threading and each positioned apart from one another to allow said pipe to rest on the exposed magnet therethrough; and

a complementary body having a cylindrical shape with a cylindrical recess at the bottom thereof for supporting an exposed cylindrical magnetic transmitter, said complementary body further having an outer helicoidal threading acceptable into said inner helicoidal threading of said projections upon rotating said complementary body to secure said pipe between the exposed magnets of the main and complementary bodies.

5,566,662

**ENGINE AIR/FUEL CONTROL SYSTEM WITH AN ADAPTIVELY LEARNED RANGE OF AUTHORITY**

Isis A. Messih, Troy, Mich., assignor to Ford Motor Company, Dearborn, Mich.

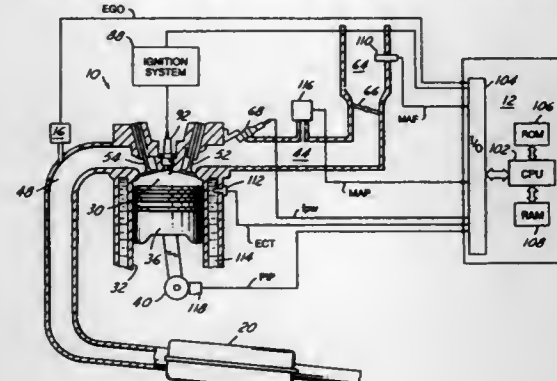
Filed Oct. 2, 1995, Ser. No. 538,086

Int. Cl. F02D 41/14

U.S. Cl. 123—674

8 Claims

1. An air/fuel control method for an internal combustion engine,



comprising the steps of:

providing an adjustment for fuel flow delivered to the engine in response to a first and a second feedback variable to maintain a desired air/fuel ratio;  
generating said first feedback variable by integrating an output of an exhaust gas oxygen sensor positioned in the engine exhaust;  
generating said second feedback variable from said first feedback variable to force said first feedback variable towards a desired feedback value; and  
limiting said first feedback variable by a limit value related to said second feedback variable.

5,566,663

**AIR/FUEL CONTROL SYSTEM WITH IMPROVED TRANSIENT RESPONSE**

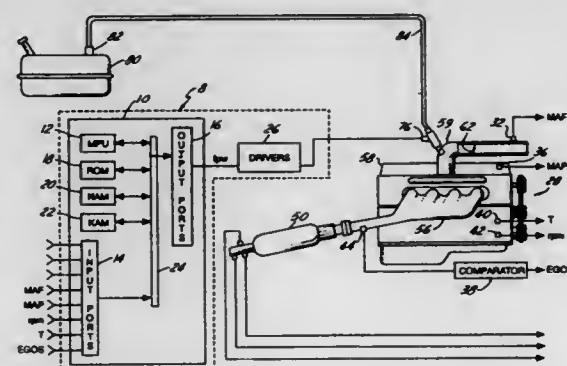
Douglas R. Hamburg, Bloomfield Hills, and Nicholas G. Zorka, Clarkston, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 17, 1994, Ser. No. 297,085

Int. Cl. F02D 41/00

U.S. Cl. 123—679

15 Claims



1. A method for controlling engine air/fuel ratio, comprising the steps of:

delivering fuel to the engine in response to a fuel command signal from a controller having a microprocessor;  
generating said fuel command signal by said controller in response to an output signal from an exhaust gas oxygen sensor;  
modulating said fuel command signal by said controller with a modulation signal;  
generating a detected air/fuel transient period by said controller in response to said output signal; and  
altering said modulation signal by said controller during said detected air/fuel transient period.

5,566,664

**BOW STRING RELEASE WITH ROLLER STRING RETENTION MEMBERS**

Gary J. Todd, 33551 Giftos, Clinton Township, Mich. 48035

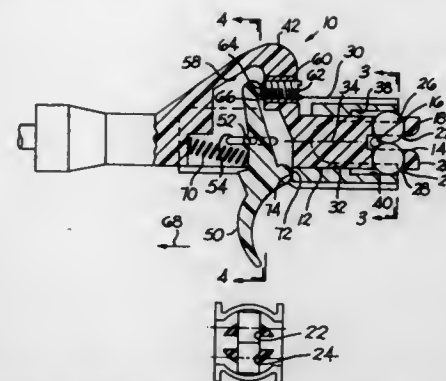
Filed May 4, 1995, Ser. No. 433,983

Int. Cl. F41B 5/18

U.S. Cl. 124—35.2

3 Claims

1. A bow string release mechanism comprising:  
a string-engaging body (12) having a string-reception slot (14) therein, forming two spaced arms (18 and 20), said slot being disposed in a plane that defines the movement plane of the bowstring;  
a roller guide channel (22 or 24) extending through each arm in a direction transverse to the slot plane, each guide channel having an axis, said channels being axially aligned;  
a cylindrical axle-less roller floatably mounted in each guide channel for translational movement along the channel axis;



each roller having a central axis, a cylindrical side surface centered on said central axis, and two end surfaces;  
said rollers being arranged in their respective channels so that the roller axes are parallel to each other and to the engaged section of the bowstring, whereby the bowstring exerts an expanding force on opposed cylindrical side surfaces of the rollers; and

a roller-retainer sleeve (30) slidably encircling said string-engaging body for movement between a first position forcing the two rollers into surface engagement with each other, and a second position displaced from the channel axes, whereby said rollers are separated to release the bowstring.

5,566,665

**METHOD AND APPARATUS FOR MOUNTING ARCHERY QUIVERS AND THE LIKE ON ARCHERY BOWS**

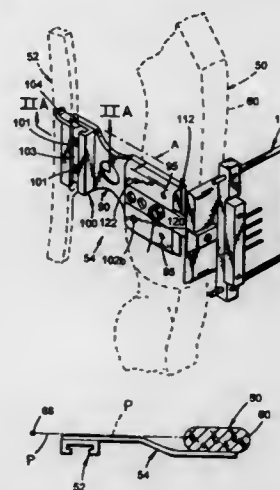
Robert E. Stinson, 7292 Peaceful Valley Rd., Acme, Mich. 49610

Filed Oct. 20, 1994, Ser. No. 326,760

Int. Cl. F41B 5/06

U.S. Cl. 124—86

16 Claims



1. A mounting apparatus for attaching a quiver to a bow, the bow including a handle and a bowstring operably connected to the bow to define a central thrust plane when shooting an arrow, said mount comprising:

an extension member including a first end configured for attachment to the bow handle, and further including a second end spaced from said first end, a quiver-attachment mount at said second end, said extension member being configured such that said second end is located closer to said central plane of said bow than said first end, whereby a quiver mounted on said attachment mount is disposed in a position of enhanced dynamic balance relative to said thrust plane to minimize torsional kick produced by off-plane masses.

8. An archery apparatus comprising:

an archery bow including a handle, resilient limbs extending from said handle and a bowstring operably mounted on said limbs, said bowstring and bow defining a force plane for shooting an arrow;

a quiver and a quiver-mounting structure; and

an extension attached to said handle at a point of mutual contact, said extension including a portion to secure said quiver-mounting structure on said extension at a location spaced from said handle, said extension having a configuration to position said portion to secure said quiver-mounting structure at a location generally behind said bow handle and more closely proximate to said force plane than said point of mutual contact between said extension and said handle.

13. A method of dynamically balancing an archery bow and a quiver carried by said bow, comprising:

using an extension attachable to said bow to support and locate said quiver, said extension having a first portion configured for attachment to the bow and a second portion for supporting said quiver; and

configuring said extension to locate said second portion in a position more closely adjacent the plane of bowstring motion than said first portion, whereby the off-plane loading effects of said quiver are minimized and vibration and torque correspondingly reduced when an arrow is shot from the bow.

5,566,666

**ROTATING TOOL**

Sven-Eric Sjödin, Dalkärrsleden 37, S-162 24, Vällingby, Sweden

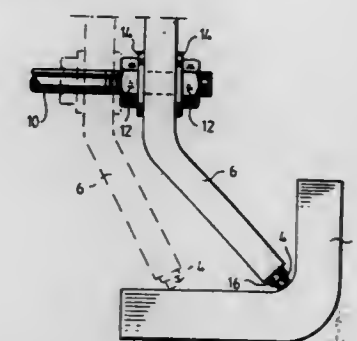
Filed Jan. 30, 1995, Ser. No. 256,940

Claims priority, application Sweden, Jan. 29, 1992, 9200240

Int. Cl. B28D 1/00

U.S. Cl. 125—15

19 Claims



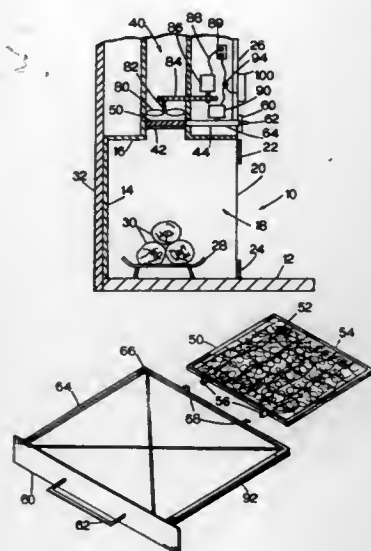
1. A rotating tool, comprising:

a hub having a central section for attaching said hub to a rotatable shaft and a disc-shaped hub section surrounding said central section, said central section and said hub section being comprised of an elastomeric material and formed as a unitary body;

a plurality of sleeves embedded in said hub section, each sleeve having an end terminating in said hub section and an opposing end protruding from said hub section, the protruding ends being spaced around a circumference of said hub section; and working tips fastened in the protruding end of each sleeve, each working tip having a base disposed in the protruding end of the sleeve and a tip protruding from said end of the sleeve.

**5,566,667**  
**SMOKE FILTER WITH AUTOMATED CLOGGING PREVENTION FOR OPEN-HEARTH FIREPLACES**  
 Jennifer Cox, 7 Dromara La., Ladue, Mo. 63124  
 Filed Jul. 24, 1995, Ser. No. 505,972  
 Int. Cl.<sup>6</sup> F24B 1/191  
 U.S. Cl. 126—507

10 Claims



10. A device for conveniently opening and closing a fireplace damper, comprising:

- a damper support bracket positioned in the flue channel;
- a damper plate which is properly sized to fit into the damper support bracket;
- an access channel that is accessible through an opening in the fireplace front, which allows the damper plate to be inserted into the damper support bracket, and subsequently removed from the damper support bracket, without requiring insertion of an operator's hand into the fireplace in a manner that might get the operator's hand sooty or dirty.

**5,566,668**  
**LIFE-SAVING HELMET**  
 Mongkol Jesadanont, Faculty of Pharmaceutical Sciences, Chulalongkorn U. Bkk 10330 THX  
 Filed May 19, 1995, Ser. No. 445,031  
 Int. Cl.<sup>6</sup> A62B 7/02  
 U.S. Cl. 128—201.26

4 Claims

1. A life-saving helmet set for fire-escaping purpose, comprising:
  - a transparent hard plastic bowl, made of transparent hard plastic, large enough to cover the whole head of a wearer having a cover sheath at its lower end with an elastic band attached at its lower rim to fit around the neck of said wearer with or without a waterproof adhesive tape applied around between said elastic band and said wearer's neck to prevent leakage of fluid into said helmet;
  - a mouth-piece tubing, positioned relatively at the level of said wearer's mouth having one end inside said helmet such that said wearer can keep this inner end in his mouth for blowing out the exhaled air during the use of said helmet, and another end outside said helmet with a check valve at the outermost end to allow the flowing of the exhaled air only in one direction, from inside to outside of said helmet;
  - a pressure-regulating tubing, positioned relatively at the level slight above said wearer's nose having one end inside and another end outside said helmet with an automatic check valve at the outermost end to allow the flowing of the air only in one direction, from inside to outside of said helmet only when the pressure within said helmet is greater than one atmospheric pressure;

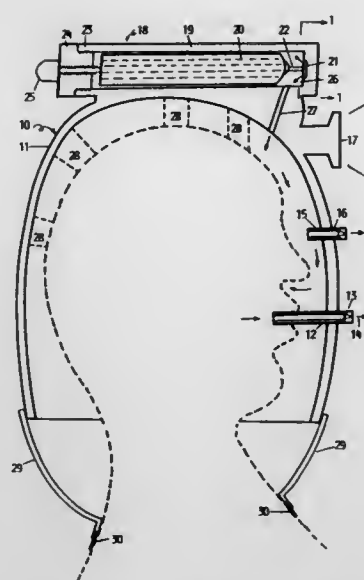
**5,566,669**  
**AUTOCLAVABLE CARBON DIOXIDE ABSORBER/VALVE FOR USE IN ANESTHESIA AND RESUSCITATION APPARATUS**  
 David Komesaroff, Melbourne, Australia, assignor to Techbase Pty Ltd., Melbourne, Australia  
 Filed Jun. 15, 1995, Ser. No. 490,779  
 Claims priority, application Australia, Jun. 20, 1994, PM6344

Int. Cl.<sup>6</sup> A61M 16/20; 16/22

U.S. Cl. 128—205.12

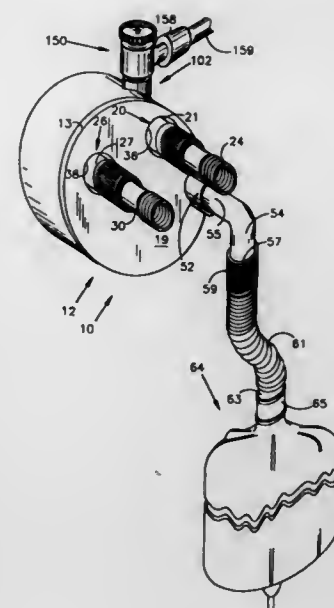
22 Claims

1. A canister for use with an anesthesia and resuscitation machine, the canister including a canister body defining an interior for holding a carbon dioxide absorbent material, a unidirectional expiratory valve integrally mounted to the canister body through which a patient gas can pass into the canister body interior, a unidirectional inspiratory valve integrally mounted to the canister body through which the patient gas can pass out of the canister body interior, an overflow orifice extending through the canister body, through which the patient gas can pass, and a unidirectional overflow valve means coupled to the overflow orifice for permitting a controlled flow of patient gas therethrough to maintain a desired gas pressure within the interior of the canister body, the valve means being biased by gravity into a valve engaged position to normally prevent the flow of patient gas therethrough and being movable, against the influence of gravity, if an over-pressure situation occurs with the interior of the canister body.



**5,566,672**  
**BIOMEDICAL ELECTRODE**  
 Adrian L. Faasse, Jr., Caledonia, Mich., assignor to Labeltape Meditec, Inc.  
 Continuation-in-part of Ser. No. 176,777, Jan. 3, 1994, abandoned. This application May 12, 1994, Ser. No. 241,665  
 Int. Cl.<sup>6</sup> A61B 5/0408; A61N 1/04  
 U.S. Cl. 128—640

37 Claims

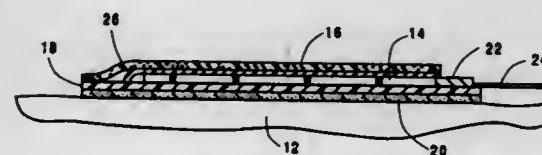


5,566,670

Patent Not Issued For This Number

**5,566,671**  
**MEDICAL ACOUSTIC SENSOR RECEPTACLE**  
 Chad Lyons, 51 Montoya Dr., Branford, Conn. 06405  
 Filed May 23, 1994, Ser. No. 247,322  
 Int. Cl.<sup>6</sup> A61B 5/04  
 U.S. Cl. 128—639

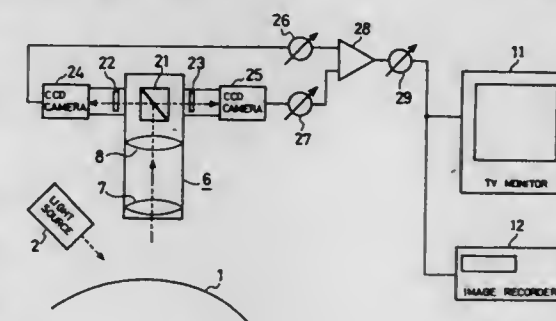
15 Claims



1. A medical acoustic sensor receptacle comprising: an outside layer and a skin side layer attached together to form a pocket, the pocket having an opening allowing a medical acoustic sensor to be inserted into and removed from the pocket, the medical acoustic sensor being responsive to acoustic signals transmitted through the body of a patient; the skin side layer being constructed of a sound transmitting sheet material having sufficient flexibility to permit the skin side layer to deform into close acoustic contact with the skin of the patient at each desired acoustic sensing location on the patient; and the outside layer being constructed of a stretchable elastic material that stretches to receive the medical acoustic sensor when the medical acoustic sensor is inserted into the pocket, the elastic properties of the stretchable material providing an elastic holding force to hold the medical acoustic sensor into close acoustic contact with the skin side layer when the medical acoustic sensor is inserted into the pocket.

**5,566,673**  
**APPARATUS FOR MEASURING BRAIN ACTIVITY**  
 Satoru Shiono, Hyogo, and Manabu Tanifuji, Fukui, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
 Filed Jun. 1, 1995, Ser. No. 457,373  
 Claims priority, application Japan, Aug. 3, 1994, 6-182334  
 Int. Cl.<sup>6</sup> A61B 5/00  
 U.S. Cl. 128—653.1

33 Claims



1. A brain activity measuring apparatus comprising: light projection means for projecting a ray of light on to a surface of a brain;



light reception means for receiving a reflected light, which is derived from the projected light, from the brain surface;  
light path dividing means for splitting and directing a light beam provided by said light reception means to a plurality of light paths;  
light transmission means disposed on said light paths and adapted to transmit light beams having light components of different wavelengths;  
image signal producing means for producing image signals from the light beams transmitted by said light transmission means; and  
differential amplifier means for producing a differential signal based on a difference of the image signals produced by said image signal producing means.

5,566,674

# METHOD AND APPARATUS FOR REDUCING ULTRASOUND IMAGE SHADOWING AND SPECKLE

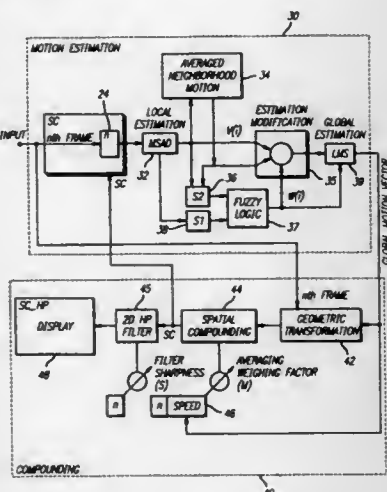
Lee Weng, Issaquah, Wash., assignor to Siemens Medical Systems, Inc., Iselin, N.J.

Filed Jun. 30, 1995, Ser. No. 496,991

Int. Cl.<sup>6</sup> A61B 8/00

U.S. Cl. 128—660.07

20 Claims



1. A method for providing a spatially compounded image from a plurality of individual image frames, comprising the steps of:  
dividing a current image frame into a plurality of sub-image regions;  
estimating local motion vectors of the respective sub-image regions between the current image frame and a previously compounded image frame;  
estimating global image motion vectors based on the estimated local motion vectors;  
transforming the current image frame geometrically to coincide with the previously compounded image frame using the estimated global image motion vectors;  
compounding the current image frame with the previously compounded image frame to provide a new compounded image; and  
displaying the new compounded image.

## 5,566,675 BEAMFORMER FOR PHASE ABERRATION CORRECTION

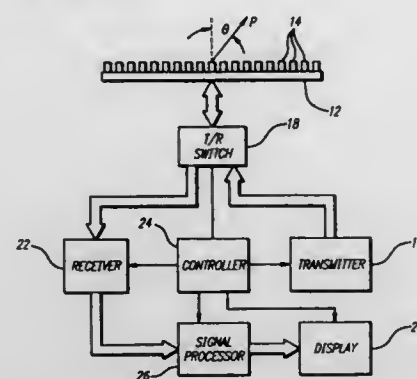
Ming Li, Seattle, and Levin Nock, Issaquah, both of Wash., assignors to Siemens Medical Systems, Inc., Iselin, N.J.

Filed Jun. 30, 1995, Ser. No. 497,176

Int. Cl.<sup>6</sup> A61B 8/00

U.S. Cl. 128—661.01

22 Claims



1. A method of correcting for aberrations in transmission media within an ultrasonic imaging system utilizing an ultrasonic transducer array having a plurality of transducer elements, comprising the steps of:  
receiving a set of input signals comprising phased array echo signals corresponding to a region of interest within said transmission media from the ultrasonic transducer array wherein each one of said set of phased array echo signals corresponds to one of said plurality of transducer elements;  
dividing the set of input signals into a plurality of distinct processing groups within a parallel processing stage;  
estimating difference in phase between adjacent ones of the input signals within each respective one of the processing groups;  
matching the input signals based on the estimated difference in phase between the adjacent ones of the input signals;  
summing the associated matched input signals to form a corrected beam signal from each respective one of the processing groups; and  
repeating sequentially said dividing, estimating, matching, and summing steps utilizing the corrected beam signals as the input signals in at least one subsequent parallel processing stage until a single corrected beam signal remains.

5,566,676

# PRESSURE DATA ACQUISITION DEVICE FOR A PATIENT MONITORING SYSTEM

Bernd Rosenfeldt, Hamilton; Kenneth Fuchs, Wayland, and Robert R. Addiss, Bedford, all of Mass., assignors to Siemens Medical Systems, Inc., Iselin, N.J.

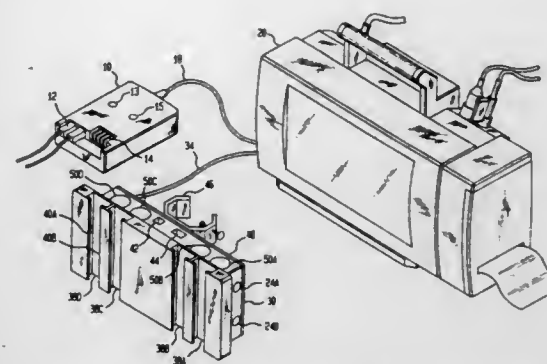
Filed Dec. 11, 1992, Ser. No. 989,416

Int. Cl.<sup>6</sup> A61B 5/02

U.S. Cl. 128—672

18 Claims

1. A data acquisition device located in a first housing for use in a patient monitoring area having a patient monitoring system located therein for monitoring a patient, which patient monitoring system includes a signal processing and display device located in a second housing which is remote and independently positionable from said first housing, but still located in said patient monitoring area, and a plurality of pressure transducers adapted to be coupled to a patient, said transducers producing a plurality of patient blood pressure signals, the data acquisition device comprising:  
receiving means in said first housing for receiving signals representing blood pressure from said plurality of pressure transducers;  
conditioning means, coupled to said receiving means, located in said first housing, and responsive to control signals from said



signal processing and display device for controllably conditioning the signals representing blood pressure for transmission to the signal processing and display device, the pressure transducers and the conditioning means being collocated, and the conditioning means, due to being located in said first housing, being positionable independent of the signal processing and display device located in said second housing;  
means for electrically coupling the pressure transducers with the conditioning means; and  
bi-directional communication means for selectively coupling the conditioning means with the signal processing and display device, to provide for the transmission of said control signals from said signal processing and display device located in said second housing to said data acquisition device located in said first housing for controlling said conditioning means, and to provide for the transmission of the conditioned blood pressure signals from said first housing to the signal processing and display device in said second housing.

5,566,677

# CALIBRATION OF SEGMENTAL BLOOD CHANGES IN ARTERIES AND VEINS DURING DETECTION OF ATHEROSCLEROSIS

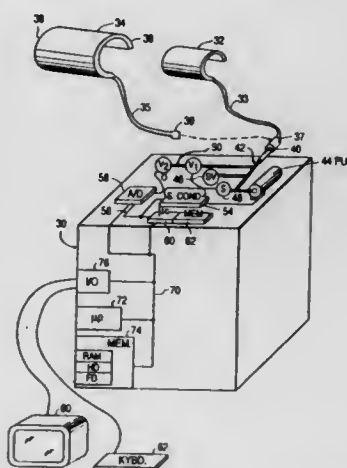
Jeffrey K. Raines, 770 Cloughton Island Dr. No. 402, Miami, Fla. 33131; Leon T. Snyder, 1461 SW. 16th St., Boca Raton, Fla. 33486, and John Hoffman, 5646 Old Fort Jupiter Rd., Jupiter, Fla. 33458

Filed Aug. 4, 1994, Ser. No. 285,904

Int. Cl.<sup>6</sup> A61B 5/02

U.S. Cl. 128—694

8 Claims



1. In combination with a volume plethysmograph which detects the degree of atherosclerosis by analysis of blood volume change at discrete levels of cuff pressure, an improved calibrated system for measuring blood volume changes through an artery of a patient with a pressure cuff bound about a limb containing said artery comprising:

5,566,678

# DIGITAL EEG NOISE SYNTHESIZER

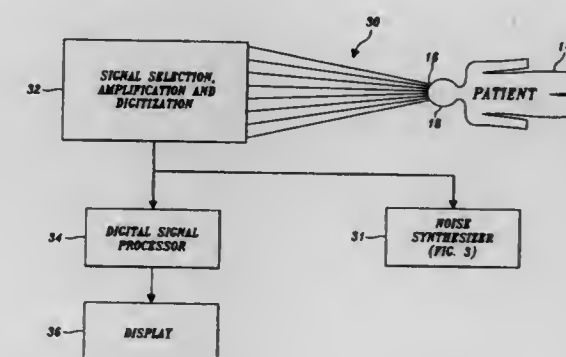
John A. Cadwell, Richland, Wash., assignor to Cadwell Industries, Inc., Kennewick, Wash.

Continuation of Ser. No. 119,955, Sep. 10, 1993. This application Jan. 5, 1995, Ser. No. 369,270

Int. Cl.<sup>6</sup> A61B 5/04

U.S. Cl. 128—731

11 Claims



1. In a digital EEG system wherein EEG signals are displayed on a nonaudible display, the improvement comprising an electronic noise synthesizer generating audible sounds, concurrent with display of the EEG signals on the nonaudible display, that correspond to the sounds that would have been produced by a pen-on-paper EEG recorder if the EEG signal had been applied to a pen-on-paper EEG recorder.

**5,566,679**  
**METHODS FOR MANAGING THE REPRODUCTIVE STATUS OF AN ANIMAL USING COLOR HEAT MOUNT DETECTORS**

Kevin S. Herriott, Meridian, Id., assignor to Omniglow Corporation, Novato, Calif.

Filed Aug. 31, 1994, Ser. No. 297,972  
 Int. Cl.<sup>6</sup> A61B 10/00

U.S. Cl. 128—738

12 Claims



1. A method for managing the reproductive status of cows comprising:

selecting a pressure responsive estrus detection patch from a plurality of color patches wherein each color of patch indicates a particular breeding management status for the cow from a group consisting of:

- a) a first color of patch identifying a cow's status as being in the interval between
  - 1) parturition and
  - 2) first post-partum estrous cycle;
- b) a second color of patch identifying a cow's status as being artificially inseminated and in the interval between
  - 1) first post partum estrous cycle and
  - 2) next estrous cycle;
- c) a third color of patch identifying a cow's status as being in the interval between
  - 1) having been artificially inseminated in the first post partum estrous cycle and showing a next estrous cycle after the insemination and having received selective management, wherein the selective management choice is from the group consisting of re-insemination and therapeutic treatment; and
  - 2) the next estrous cycle after treatment or re-insemination;
- d) a fourth color of patch identifying a cow's status as being in the interval between
  - 1) the first post partum estrous cycle, having received treatment without insemination and
  - 2) the next estrous cycle;
- e) a fifth color of patch identifying a cow's status as being in the interval between
  - 1) an estrous cycle other than first post partum and having been artificially inseminated during a plurality of estrous cycles and
  - 2) the next estrous cycle since last breeding;
- f) a sixth color of patch identifying a cow's status as being in the interval between
  - 1) an estrous cycle without artificial insemination and
  - 2) being maintained with a bull for natural mating;

attaching the selected color of patch to the cow near the dorsal midline between the pelvis and tailhead of the animal; and observing and monitoring the cows for release of the indicator substance contained in the patch in response to pressure from mounting.

**5,566,680**  
**TRANSDUCER-TIPPED INTRAUTERINE PRESSURE CATHETER SYSTEM**

Kenard E. Urion, Woodbury, N.J.; George R. Allen, Grand Island, N.Y., and Brian T. O'Mara, Mercerville, N.J., assignors to Graphic Controls Corporation, Buffalo, N.Y.

Filed Sep. 22, 1995, Ser. No. 532,438

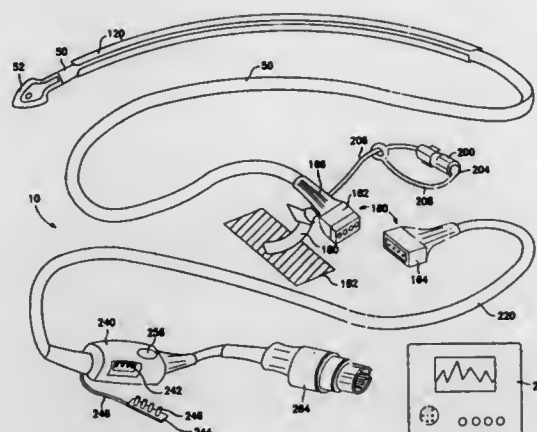
Int. Cl.<sup>6</sup> A61B 5/03

U.S. Cl. 128—778

44 Claims

1. An intrauterine pressure catheter system for measuring the pressure in the uterus of a woman in labor and delivering a signal representative of intrauterine pressure to an external monitor, said system comprising:

- a disposable, firm, flexible catheter having:
- (a) a first end,



- (b) a second end,
  - (c) a cable lumen longitudinally traversing the inside of said catheter from said first end to said second end with a vent hole emanating from said cable lumen proximate said second end of said catheter, and
  - (d) an amnio lumen longitudinally traversing the inside of said catheter from said first end to said second end with at least one amnio port emanating from said amnio lumen proximate said first end of said catheter;
- a disposable, asymmetric tip affixed to said first end of said catheter with an undercut resisting slippage of said catheter following insertion into the uterus, said tip having a width greater than its height and tapering to an apex opposite said first end of said catheter;
- a disposable pressure sensor fixed and rigidly mounted in said tip affixed to said catheter, said pressure sensor measuring intrauterine pressure;
- a disposable first connector affixed to said second end of said catheter;
- a disposable leadwire cable carried in said cable lumen of said catheter and electrically connecting said pressure sensor to said first connector; and
- a reusable monitor cable having a first end, a second end, a second connector on said first end of said monitor cable adapted to engage said first connector, and a monitor connector on said second end of said monitor cable adapted to engage the monitor, said monitor cable transmitting electrical signals from said first connector to the monitor.

**5,566,681**  
**APPARATUS AND METHOD FOR STABILIZING A BODY PART**

Kim H. Manwaring, 3440 E. Tonto Dr., Ahwatukee, Ariz. 85044, and Mark L. Manwaring, SW. 1430 Wadleigh Dr., Pullman, Wash. 99163

Filed May 2, 1995, Ser. No. 433,238

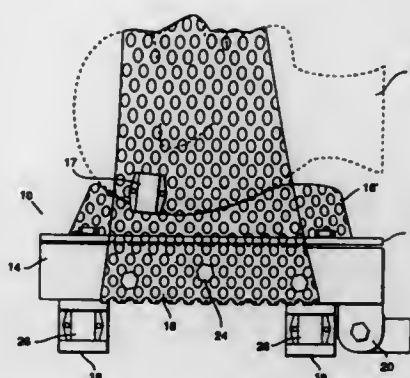
Int. Cl.<sup>6</sup> A61G 15/00

U.S. Cl. 128—845

10 Claims

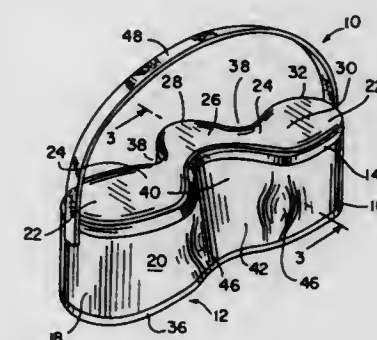
1. An apparatus for locating a body part of a subject, said apparatus comprising:

- a support frame;
- a rigid template mounted to said support frame, said rigid template being contoured to accommodate said body part; and means for interchangeably holding a plurality of radiographic imaging fiducial markers and a corresponding plurality of stereotaxy fiducial markers at substantially common reference points relative to said body part when said body part is positioned with said rigid template.



**5,566,682**  
**THERAPEUTIC SUPPORT DEVICE**  
 Edward Q. Yavitz, 3828 Spring Creek Rd., Rockford, Ill. 61114  
 Filed Aug. 11, 1995, Ser. No. 514,429  
 Int. Cl.<sup>6</sup> A47G 9/00; A61B 19/00  
 U.S. Cl. 128—845

19 Claims



1. A device for supporting at least a portion of a torso of a person and for reducing pressure against the breasts of the person, comprising:

- a pillow having a top and a bottom, the top being defined at least in part by an upper perimeter having a complex curvilinear shape, the bottom being defined at least in part by a lower perimeter having a complex curvilinear shape, the top and the bottom being connected along the upper and lower perimeter at an edge, the upper perimeter and top cooperating to provide:
- a pair of shoulder support regions;
- a pair of scapula support regions, each scapula support region being connected to an adjacent shoulder support region; and
- a sternum support region connecting the scapula support regions and having a protruding portion wherein the pair of shoulder support regions, pair of scapula support regions and sternum support regions cooperate to eliminate potentially harmful pressure against the breasts of the person.

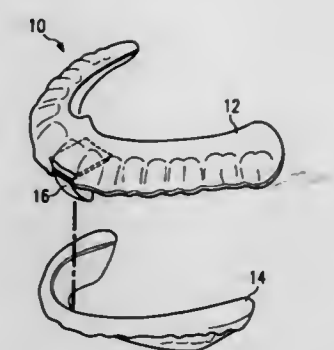
**5,566,683**  
**APPARATUS FOR PREVENTION OF SNORING AND IMPROVED BREATHING DURING SLEEP**  
 W. Keith Thornton, 5524 Edlen, Dallas, Tex. 75220  
 Continuation-in-part of Ser. No. 129,598, Sep. 29, 1993, Pat. No. 5,427,117. This application Mar. 24, 1995, Ser. No. 410,325  
 Int. Cl.<sup>6</sup> A61C 5/00

U.S. Cl. 128—848

22 Claims

1. A dental device, comprising:

an upper arch fitting at least some of a user's upper teeth, said upper arch including a slot; and



a post extending downward from said upper arch, said post including:

a base adapted to fit in said slot, said base including a plurality of receiving grooves; and

a ramp adapted to fit in at least one of said receiving grooves, said ramp causing said user's lower jaw to extend forward with respect to said user.

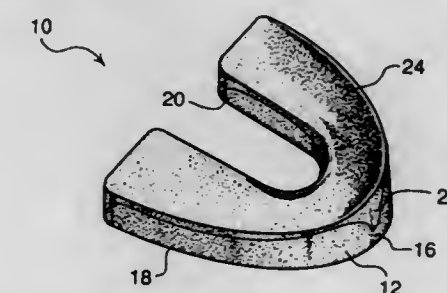
**5,566,684**  
**CUSTOM FIT MOUTHGUARD**  
 Eugene C. Wagner, Pacific Palisades, Calif., assignor to Dental Concepts Inc., Elmsford, N.Y.

Filed Nov. 21, 1995, Ser. No. 560,278

Int. Cl.<sup>6</sup> A61C 5/14

U.S. Cl. 128—861

10 Claims



1. A mouthguard suitable for custom fitting in a user's mouth and for conforming to the contours thereof, the mouthguard comprising a generally U-shaped thermoplastic trough, the trough being channel shaped in transversed cross section, the trough including a bottom wall, a labial front wall, a pallet front wall, the pallet front wall having a height less than the labial front wall, a pair of buccal side walls and a pair of lingual side walls, the mouthguard further including a thermoplastic fill, the fill being carried in the trough and extending above the elevation of the labial front wall, the pallet front wall and at least a front and a rear portion of the lingual side walls, the thermoplastic fill being formed of a composition having a glass transition temperature as low as 140° F., the trough being formed of a thermoplastic composition having a higher glass transition temperature.



**5,566,685**  
**PROTECTION OF LIVING SYSTEMS FROM ADVERSE EFFECTS OF ELECTRIC, MAGNETIC AND ELECTROMAGNETIC FIELDS**

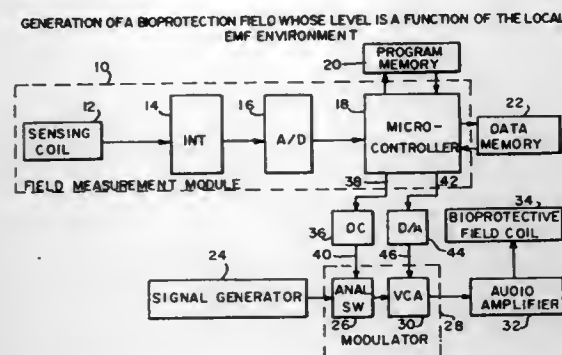
Theodore A. Litovitz, Annapolis, and Luis M. Penafiel, Rockville, both of Md., assignors to The Catholic University of America, Washington, D.C.

Continuation-in-part of Ser. No. 642,417, Jan. 17, 1991, and a continuation-in-part of Ser. No. 88,034, Jul. 6, 1993, Pat. No. 5,450,859, and a continuation-in-part of Ser. No. 107,623, Aug. 18, 1993. This application Jun. 24, 1994, Ser. No. 265,718

Int. Cl.<sup>6</sup> A61B 19/00

U.S. Cl. 128—898

2 Claims



1. A method of inhibiting the adverse effects of an electromagnetic field on living systems, which method includes the step of measuring the strength of the electromagnetic field to which the living system would be exposed, the step of generating a bioprotection field to which the living system is to be exposed, and the step of controlling the strength of the bioprotection field as a function of the measured strength of the electromagnetic field.

**5,566,686**  
**METHOD AND DEVICE FOR DETERMINING THE DENSITY OF A STREAM OF FIBROUS MATERIAL ON A CIGARETTE MANUFACTURING MACHINE**

Rudolf Grossbach, Mainz; Peter Huber, Frankfurt A.M.; Ernst-Guenter Lierke, Schwalbach/Ts; Michael Fiedler, Hofheim; Rainer Weiss, Hattersheim, all of Germany; Armando Neri, Bologna, Italy; Giancarlo Santin, San Lazzaro Di Savena, Italy, and Giovanni Squarzone, Argelato, Italy, assignors to G.D. Societa' Per Azioni, Bologna, Italy.

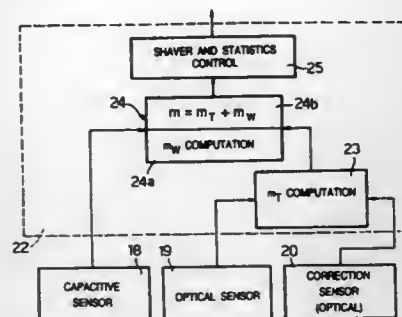
Filed Dec. 2, 1994, Ser. No. 349,070

Claims priority, application Italy, Dec. 3, 1993, B093A0486

Int. Cl.<sup>6</sup> A24C 5/14

U.S. Cl. 131—84.4

19 Claims



1. A method of determining the density of a stream of fibrous material (17) on a cigarette manufacturing machine (1), said stream of fibrous material (17) comprising a dry component and a liquid in varying unknown proportions; said method comprising the steps of:

effecting a first capacitive measurement for obtaining a first signal indicating a quantity which may be expressed as a function of the density of the dry component and of the density of the liquid in said stream of fibrous material; effecting a second optical measurement for obtaining a second signal correlated to the density of the dry component in said stream of fibrous material; and generating, on the basis of said first and second signals, a third signal indicating the density of said stream of fibrous material.

**5,566,687**  
**HAIRDRESSER'S COMB**

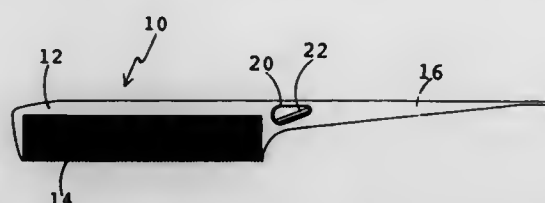
Tomislav Trapanovski, 22 Canterbury Trail, Fairport, N.Y. 14450

Filed Sep. 18, 1995, Ser. No. 529,682

Int. Cl.<sup>6</sup> A45D 24/00

U.S. Cl. 132—148

2 Claims



1. A hairdresser's comb including a comb section and a handle: said handle including an elongated aperture with sidewalls converging from a wide end to a narrow end of said aperture; a blade disposed within said aperture; along one of said sidewalls; said wide end of said aperture adapted to receive a bottle closure tip: whereby, rotation of said closure tip within said aperture is effective to roll said tip against said blade to sever said closure tip.

**5,566,688**  
**HAIR IRON FOR STRAIGHT-PERMING**

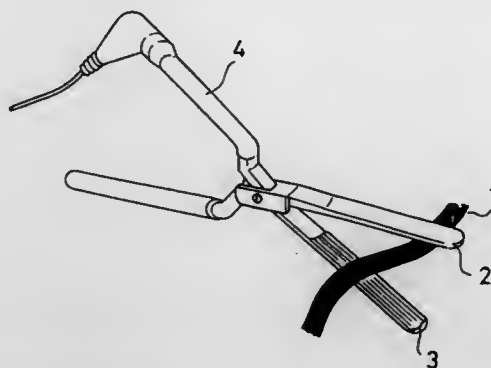
Tetugi Nakamura, 3400-1 Tabeta Kawanabe Cho, Kawanabe-gun, Kagoshima-ken, Japan

Division of Ser. No. 997,788, Dec. 29, 1992, Pat. No. 5,357,988. This application Jun. 15, 1994, Ser. No. 260,074

Int. Cl.<sup>6</sup> A45D 7/02

U.S. Cl. 132—21.1

2 Claims



1. A hair iron for straight-perming hair with heat and perming solution of a type having a grip part and pressing members, at least one of said pressing members being designed to be heated up for pressing hair, said pressing members, between which hair is clamped and pressed, comprising uneven opposing faces matching each other provided on the relative opposing faces of the pressing

members, a section thereof being a waveform wherein a width of one wave of the waveform is one-fifth to one-thirtieth of a length of one wave.

**5,566,689**  
**HAIR-CONTAINING DEVICE**

Joan E. Yeater, 28-1/2 Fleet St., Marina Del Ray, Calif. 90292

Filed Nov. 2, 1994, Ser. No. 333,230

Int. Cl.<sup>6</sup> A45D 7/02

U.S. Cl. 132—212

8 Claims



1. A hair-containing device for managing the wet hair of a user, the hair-containing device comprising:

a shaped fabric bag having a closed end and an open end and a front and a back, the bag being worn with the front of the open end in contact with the user's forehead and the back of the open end in contact with the nape of the user's neck, a slit in the front of the bag extending from the open end to a point intermediate between the open end and the closed end, the bag having a shape which results in the bag draping from the top of the head to the neck and along the spine of the user when the bag is containing the user's hair and the open end encircles the user's head at the hair line;

a means for holding the open end of the shaped fabric bag in intimate contact with the user's head comprising an enclosed fabric passageway around the perimeter of the open end from one side of the slit to the other side and a drawstring threaded through the passageway and having end portions that extend outside the passageway, the size of the open end being fixed by tying the end portions of the drawstring together, the size of the one end being controlled by the lengths of the end portions extending outside the passageway.

a clip body made of flexible material having oppositely disposed arcuate first and second side members joined at each to form a passageway for inserting hair therebetween, said joined ends forming a first end portion and a second end portion; said first side member having a planar surface, said second side member having a planar surface; said planar surfaces of said first and second side members having a plurality of teeth extending therefrom for holding the hair as the hair is rolled over said clip; an outer periphery surface on said first and second side members having a plurality of corrugated portions for positioning of the hair evenly along the outer surface; first and second hooks integrally connected at the first and second end portions, respectively, of the hair clip body to hold said clip body in a folded position in the hair after the clip is rolled to the desired hairdo.

**5,566,691**  
**FLOSSING APPARATUS**  
 John W. Dolan, Boothwyn, Pa.; John W. Spencer, Jr., Rising Sun; Richard Wilson, North East, both of Md., and James Walter, Flagstaff, Ariz., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Jun. 7, 1995, Ser. No. 481,742

Int. Cl.<sup>6</sup> A61C 15/00

U.S. Cl. 132—321

15 Claims



1. An article for facilitating oral prophylaxis comprising: an elongated fiber of polytetrafluoroethylene having a predetermined length, said fiber length defining at least one section of porous polytetrafluoroethylene and at least one section of substantially non-porous polytetrafluoroethylene which is substantially more rigid than said porous polytetrafluoroethylene length section, wherein the at least one section of substantially non-porous polytetrafluoroethylene has a density of at least 1.95 g/cc.

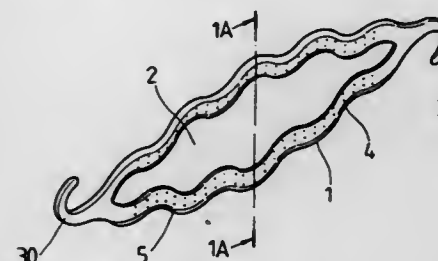
**5,566,690**  
**HAIR CLIP**  
 Hsu Shih-Ming, P.O. Box 82-144, Taipei, Taiwan

Filed Oct. 25, 1994, Ser. No. 328,511

Int. Cl.<sup>6</sup> A45D 8/00

U.S. Cl. 132—276

1 Claim



1. A hair clip for holding hair into an arranged hairdo, said hair clip comprising:

**5,566,692**  
**DENTAL FLOSS PACKAGE**  
 Thomas E. Thornton, 43 Contentment Island Rd., Darien, Conn. 06820

Filed Apr. 29, 1994, Ser. No. 235,703

Int. Cl.<sup>6</sup> A61L 15/00

U.S. Cl. 132—324

2 Claims

1. A dispensing dental floss package comprising in combination: a control card having an apex along a fold line, said control card having a face portion on one side of said apex and a rear portion on the opposite side of said apex, said control card defining an interior space between said face portion, rear portion and below said apex, dental floss placed on said control card, said dental floss having a floss section, brush section and threader section, said floss section placed in a



zigzag folded position in the interior of said control card, said brush section placed on the face portion of said control card with the threader section extending over said apex to hold said brush section on the face portion of said control card and, a package enclosing said control card, said package having an opening to permit the pulling of said brush section of the dental floss from the control card by a user for flossing.

5,566,693

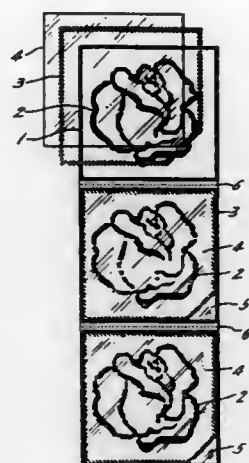
## FRAGRANCE SAMPLER

Anthony J. Gunderman, Phoenix; David Molr, Annapolis, both of Md., and Robert M. O'Connell, deceased, late of Belle Mead, N.J., assignors to Color Prelude, Inc., Baltimore, Md. Continuation-in-part of Ser. No. 857,993, Mar. 26, 1992, which is a continuation-in-part of Ser. No. 306,394, Feb. 6, 1989, Pat. No. 5,192,386, which is a division of Ser. No. 199,175, May 26, 1988, Pat. No. 4,848,378, which is a division of Ser. No. 875,172, Jun. 17, 1986, Pat. No. 4,751,934. This application Dec. 13, 1993, Ser. No. 165,482

Int. Cl.<sup>6</sup> A45D 34/00

U.S. Cl. 132—333

27 Claims



1. A fragrance sampler comprising a unit dose handout, said handout comprising:  
a single flat disposable sheet comprising a base;  
a unit dose of a body fragrance screen printed in a pattern onto said single flat disposable sheet, said unit dose of body fragrance being removable from the base for application to the skin of a user; and  
a protective thin film overlay laminated to said base to seal said body fragrance and prevent release of said fragrance prior to use.

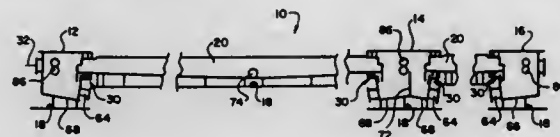
5,566,694  
CONTINUOUS PICKLING TANK WITH EXPANDABLE SEALS

William H. Pugh, Pittsburgh, Pa., and Dieter Kottzieper, Mansfield, Ohio, assignors to Allegheny Plastics, Inc., Leetsdale, Pa., and Ecopic Corporation, Mansfield, Ohio  
Filed Jun. 7, 1995, Ser. No. 478,876

Int. Cl.<sup>6</sup> B08B 3/08

U.S. Cl. 134—64 R

19 Claims



1. A shallow bath pickling tank comprising:  
first and second end stands spaced from each other and secured to a foundation;  
a trough extending between said end stands adapted to receive a pickling acid therein; and  
an expandable seal coupling each said end stand with said trough, each said seal allowing for thermal expansion of said trough relative to said stand.

5,566,695

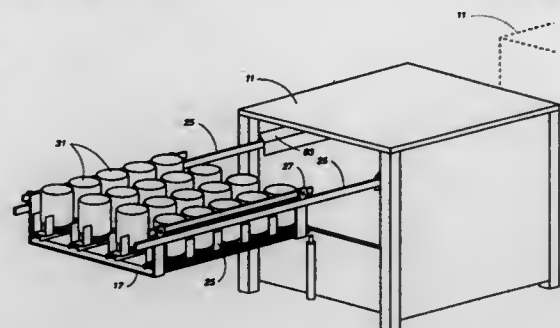
## MODULAR APPARATUS AND METHOD FOR CLEANING CONTAINERS

William D. Levey, Oakland, and William J. Sell, Petaluma, both of Calif., assignors to Environmental Sampling Supply, Inc., Oakland, Calif.  
Continuation of Ser. No. 27,115, Mar. 4, 1993, Pat. No. 5,409,545. This application Feb. 14, 1995, Ser. No. 388,376

Int. Cl.<sup>6</sup> B08B 3/02; 9/08

U.S. Cl. 134—83

4 Claims



1. A modular apparatus for cleaning containers having an open mouth end comprising  
at least two modular cleaning bays, said modular cleaning bays being interchangeably cascaded together and including a first bay and end bay,  
transporting means for transporting a set of inverted containers along a defined container support plain and in a predetermined spaced relationship successively into each modular cleaning bay from said first bay to said end bay, said transport means including a container support tray for holding a set of containers in an inverted position and in a predetermined spaced relationship, continuous guide rails longitudinally extending through each of said modular cleaning bays for movably supporting said container support tray as said support tray advances from cleaning bay to cleaning bay and for holding said container support tray in position within each of said cleaning bays, and support tray drive means associated with each cleaning bay for picking up said container support tray, for positionably moving said container support tray on said guide rails within said cleaning bay, and for exiting the support tray from said cleaning bay.

5,566,697

## OSCILLATOR SCREEN CLEANING APPARATUS

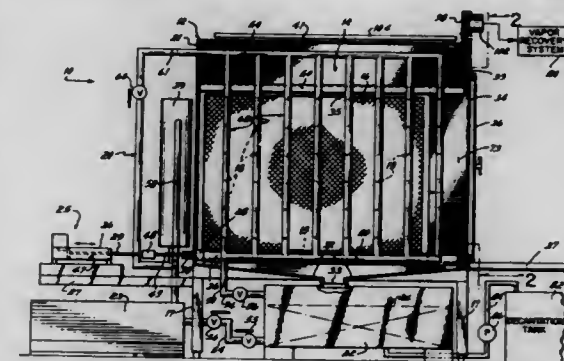
Albert B. Cord; Cameron W. Cord, both of Cincinnati, Ohio; David N. Gehrich, St. Paul, Ind.; Gregory N. Jensen, Westchester, and Ted K. Parr, Cincinnati, both of Ohio, assignors to Intercontinental Chemical Corporation, Cincinnati, Ohio

Filed Feb. 7, 1995, Ser. No. 384,737

Int. Cl.<sup>6</sup> B08B 3/02

U.S. Cl. 134—109

17 Claims



fluid stream supply means for supplying a selected cleaning fluid to each one of said cleaning bays, said fluid stream supply means having at least one nozzle bank disposed within each of said modular cleaning bays below said container support plain, each of said nozzle banks having a set of elongated nozzle elements arranged in correspondence with the spaced relationship of the set of inverted containers transported into said bays,  
means in each modular cleaning bay for registering the nozzle elements of said nozzle bank for said bay with a set of containers transported into said bay,  
means in each modular cleaning bay operative over a defined nozzle bank process cycle for cycling the nozzle bank in said bay in a forward and return movement that causes said set of nozzle elements to traverse through the mouth ends of a set of containers registered therewith, and  
fluid control means for each modular cleaning bay for activating the bay's fluid stream supply means such that a fluid stream is emitted from said set of nozzle elements when said nozzle elements traverse through a set of containers registered therewith,  
the support tray drive means for each of said cleaning bays including position feedback means for precisely positioning said container support tray within its associated cleaning bay during at least one nozzle bank process cycle,  
each of said cascaded cleaning bays being fluidly isolated from its adjacent cleaning bays to prevent cross-contamination of fluids.

1. An apparatus for cleaning a screen with a sprayed cleaning liquid comprising:  
a housing forming a cleaning chamber for receiving a screen;  
a plurality of spray nozzles positioned inside the cleaning chamber to spray, with cleaning liquid, the screen within the chamber;  
a supply reservoir coupled to the plurality of spray nozzles for supplying cleaning liquid to the spray nozzles;  
an oscillating mechanism operable for moving said screen in a repeated, continuous oscillating motion within said cleaning chamber to thus move the screen repeatedly back and forth in front of the spray nozzles to clean the screen;  
whereby the oscillating movement and plurality of spray nozzles yields repeated and increased screen coverage by the sprayed cleaning liquid for improved cleaning and removal of undesired contaminants from the screen.

5,566,696

## DISHWASHER WITH BALANCING VANES ON PUMP IMPELLER

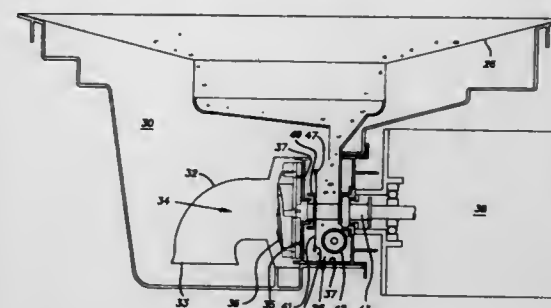
John E. Dries, and James M. Edwards, both of Kinston, N.C., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed May 26, 1995, Ser. No. 450,918

Int. Cl.<sup>6</sup> B08B 3/02

U.S. Cl. 134—104.1

17 Claims



1. A washer comprising:  
a wash chamber in which objects are treated with a liquid;  
first and second sump chambers in communication with the wash chamber;  
a filter disposed between the first sump chamber and the second sump chamber;  
a shaft extending through the first chamber;  
a wall disposed between the first sump chamber and the second sump chamber, the shaft extending through the wall;  
a motor connected to drive the shaft;  
a pump having an inlet in communication with the second chamber; and  
an impeller of the pump disposed in the second sump chamber and connected to the shaft, said impeller comprising first vanes on a first face of the impeller adapted for moving liquid from the second sump chamber to the wash chamber, and second vanes on an opposite face of the impeller adapted to resist flow from the first sump chamber into the second sump chamber.

5,566,698

## SAFE ACTUATING MECHANISM FOR AN AUTOMATIC UMBRELLA

Shu C. Yu, 425, Chung Hsing Road, Pin Chang City, Taoyuan, Taiwan

Filed Nov. 14, 1995, Ser. No. 557,560

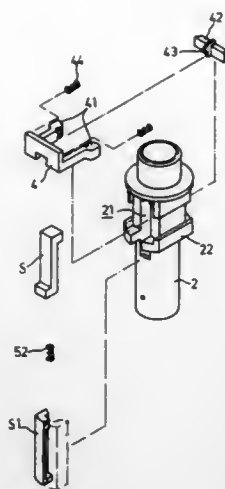
Int. Cl.<sup>6</sup> A45B 25/14

U.S. Cl. 135—24

1 Claim

1. A safe actuating mechanism for an automatic umbrella comprising:  
a security body arranged inside an umbrella handle, the body having a groove and being provided with a coupling seat for receiving a coupling piece which has a hooked portion each at both ends to grasp a bar so that said coupling piece cling to said security body, said bar further having a hooked projection in its middle portion and springs being arranged between said coupling piece and said security body to constantly bias the hooked projection of said bar towards the groove of said security body in a way that said hooked projection is kept in a ready position to lock an outer tube;  
a Z-shaped push lever of which one end extends into a guide block attached to one side of said security body, with a spring disposed beneath the bottom thereof to keep the push lever moving upwards and enable it to be moved inwards, and the other end reaches near said groove;  
a connecting rod of which them lower end is a spherical end with a reduced neck portion near the end and the lower end extends into a central hole of said security body, and a tubular column disposed inside said security body;





said tubular columns further having a spring and a plunger provided therein, and said plunger having a slant surface on its top which faces toward a hollow of the tubular column so that when the neck portion, which is made of an elastically flexible material, touches the slant surface the lower end of said connecting rod will bend to engage with said tubular column and said inner tube.

5,566,699

## SAFETY RUNNER FOR USE IN UMBRELLAS

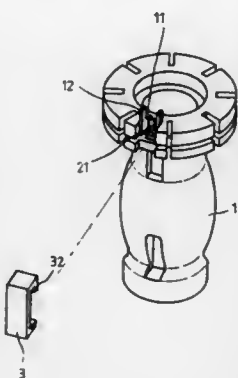
Chin S. Kou, No. 27-1, Lane 188, Chin Mar Road, Sec. 3, Chang Hua City, Taiwan

Filed Feb. 5, 1996, Ser. No. 596,609

Int. Cl.<sup>6</sup> A45B 25/06

U.S. Cl. 135—28

1 Claim



1. A safety runner for use in an umbrella, comprising: an attachment means formed on one side of said runner; said attachment means having a recessed portion within said runner accommodating twisted ends of said umbrella finishing wires, and two raised engaging portions; a cap, wherein said cap has an U-shaped body including an inner flange formed on an inside top surface and a raised dot formed on an inside bottom surface; said flange and raised dot allow said cap to be affixed to said attachment means to form a closed space for housing the twisted ends of said umbrella finishing wires.

5,566,700

## WALKING STICK

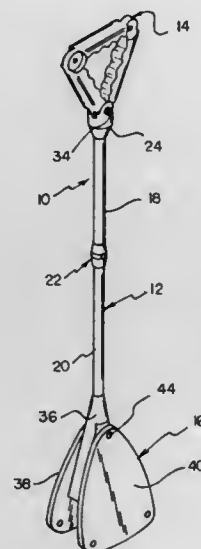
Roger C. Brown, 13 Townholm Crescent, Hanwell, London, England

Filed Dec. 4, 1995, Ser. No. 567,114

Int. Cl.<sup>6</sup> A61H 3/02

U.S. Cl. 135—72

8 Claims



1. A walking stick comprising: a stanchion assembly comprising an upper tube and a lower tube telescopically and slidably interrelated; a coupler interposed between said tubes to adjustably secure the tubes together at a desired longitudinal length; a handgrip assembly secured to an upper end of the stanchion assembly; said handgrip assembly comprising: a mounting neck secured to the upper end of said stanchion assembly, a plurality of disparate handgrips including a first handgrip, a second handgrip and a third handgrip; wherein said second handgrip coupled at a first end thereof to a first end of said first handgrip, said third handgrip coupled at a first end to a second end of said second handgrip, and said first handgrip being coupled at a second end to a second end of the third handgrip; said handgrips are cooperatively shaped to define mounting recesses at connecting ends thereof, with one of said mounting recesses being received and secured within said mounting neck.

5,566,701

## COLLAPSIBLE DISPLAY FRAMEWORK

Stephen Grey, Unit 1/54 2019 Chegwyn St., Botany, Australia

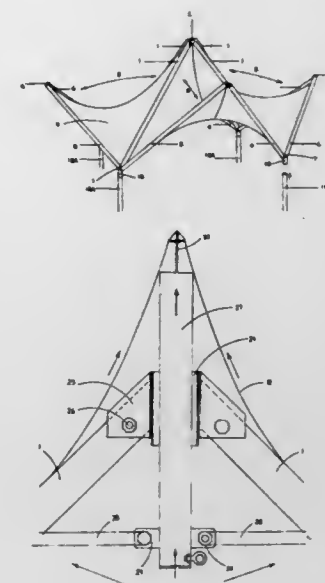
Filed Jun. 5, 1995, Ser. No. 461,531

Int. Cl.<sup>6</sup> E04B 1/00

U.S. Cl. 135—98

9 Claims

1. A collapsible support structure for a cover means, said structure comprising at least three apex poles with first ends pivotally connected together so that in use said poles are movable between a raised configuration in which the second opposite ends extend outwardly in different directions to create a pyramid shaped frame and a collapsed configuration, and pairs of perimeter poles with each pair forming an inverted V between said opposite ends of adjacent apex poles when in said raised configuration and bracket means comprising struts which extend between and are pivotally attached to respective apex poles intermediate their ends and a central flange means whereby the first connected ends of said apex poles and said central flange means may be pushed toward each other to obtain said raised configuration or pushed apart to obtain said collapsed configuration and said apex poles and perimeter



poles being pivotally connected so as to fold together into close substantially parallel positions when in said collapsed configuration.

5,566,702

## ADAPTIVE FAUCET CONTROLLER MEASURING PROXIMITY AND MOTION

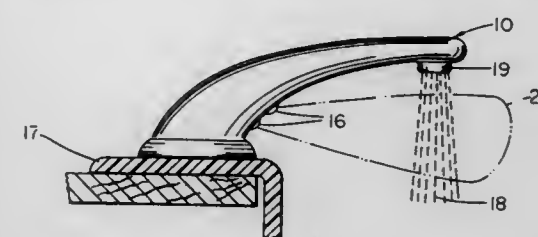
Harald Philipp, 651 Holiday Dr., Bldg. 5, Suite 300, Pittsburgh, Pa. 15220

Filed Dec. 30, 1994, Ser. No. 366,814

Int. Cl.<sup>6</sup> E03C 1/05

U.S. Cl. 137—1

29 Claims



12. A method of operating a faucet controller comprising an emitter of optical radiation, a detector of optical radiation having as an output an electrical signal corresponding to the intensity of said radiation received, a computer having computer memory associated therewith, and an electrically actuated valve controlled by said computer, said method comprising the steps of

- storing, in a first location in said computer memory, a water-offset value equal to said signal corresponding to radiation reflected only from a stream of water from said faucet,
- storing, in a second location in said computer memory, a threshold value,
- forming a first algebraic difference by subtracting said threshold value from said signal output at a first time and opening said valve if said first difference is greater than zero,
- forming a second algebraic difference by subtracting the sum of said threshold value and said water-offset value from said signal at a second time subsequent to said first time, and
- closing said valve if said second difference is less than zero.

5,566,703

## FLUID CONTROL VALVE

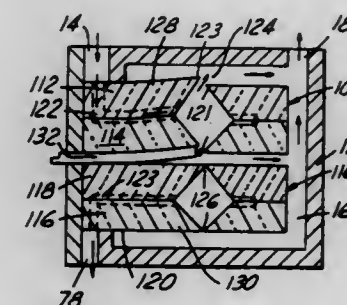
Shunso F. Watanabe, Livonia; Steven J. Eckert, Royal Oak, and Gerald H. Engelman, Dearborn, all of Mich., assignors to Ford Motor Company, Dearborn, Mich., and Raytheon Company, Lexington, Mass.

Division of Ser. No. 163,212, Dec. 6, 1993, Pat. No. 5,445,185, which is a continuation-in-part of Ser. No. 43,127, Apr. 5, 1993, Pat. No. 5,267,589. This application Mar. 10, 1995, Ser. No. 401,531

Int. Cl.<sup>6</sup> F15B 13/044

U.S. Cl. 137—1

9 Claims



7. A method for controlling fluid delivered to a device driven thereby, the method comprising:

- delivering the fluid into a supply port disposed in a valve body, the valve body including an outlet port capable of delivering the fluid to the device, and a relief port for returning the fluid to a source thereof;
- positioning an actuator sandwiched between an upper and a lower metering element, the actuator and the metering elements being supported by a wall of the valve body, one of the metering elements being provided with an inlet channel, and the other metering element being provided with an outlet channel;
- providing a pair of opposing metering orifices within each metering element; and
- disposing a cantilevered spring valve within each pair of metering orifices, each cantilevered spring valve being continuously displaceable between an opened position and a normally closed position, each cantilevered spring valve having a pair of metering edges that cooperate with the associated metering element so that the edges block fluid when the associated cantilevered spring valve is closed.

5,566,704

## BACKFLOW PREVENTER AND TEST COCK ASSEMBLY

Rand H. Ackroyd, Methuen, and Steven P. Hofmann, Bradford, both of Mass., assignors to Watts Investment Company, Wilmington, Del.

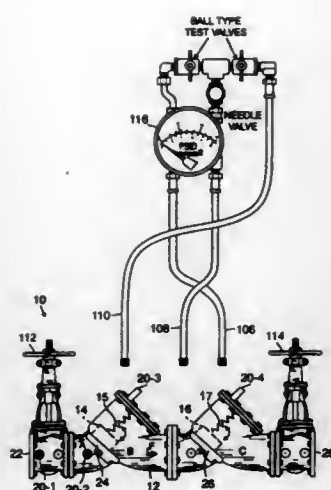
Filed Jan. 6, 1995, Ser. No. 369,412

Int. Cl.<sup>6</sup> E03C 1/10; F16K 37/00

U.S. Cl. 137—14

7 Claims

1. A backflow prevention test assembly for use with a backflow preventer comprising a body defining a conduit for flow of fluid between an inlet and an outlet, a first valve and a second valve disposed in sequence in the conduit, the first valve having a first position permitting flow in a first direction and a second position opposing flow in a second direction opposite the first direction, with first means for biasing the first valve toward the second position, and the second valve having a first position permitting flow in the first direction and a second position for opposing flow in the second direction, with second means for biasing the second valve toward the second position, said backflow prevention test assembly comprising: at least one test valve in fluid communication with the conduit through an aperture defined by the backflow preventer body, said test valve comprising



a test valve body defining an axial bore, said test valve body having a male end and an outer surface having a male thread,  
a piston defining a test conduit and disposed within said axial bore for movement between a first position permitting test flow through said test conduit and a second position resisting test flow through said test conduit, and  
means for biasing said piston toward said second position, and  
a test kit assembly comprising a test apparatus, and a fitting sized for threaded attachment upon said male end of said test valve body in sealing engagement,  
said fitting comprising a fitting seal positioned for sealing engagement with said test valve, and said fitting defining a displacement surface disposed for engagement, after sealing engagement of said fitting seal with said test valve, with an opposed surface of said piston in a manner to urge said piston toward said first position, thereby to establish fluid communication between said test apparatus and a region of the conduit within the backflow preventer body.

5,566,705

## SNAP-CLOSURE FLOAT VALVE ASSEMBLY

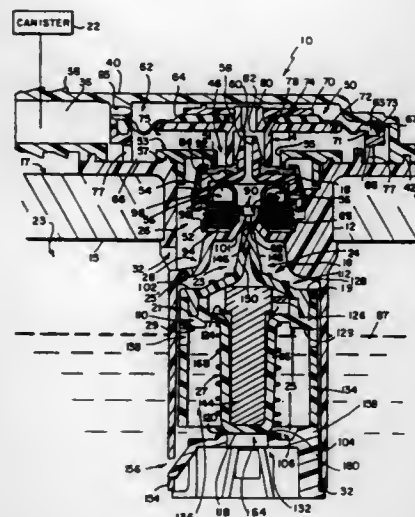
Robert S. Harris, Connersville, Ind., assignor to Stant Manufacturing Inc., Connersville, Ind.

Filed Jun. 30, 1995, Ser. No. 497,217

Int. Cl.<sup>6</sup> F16K 31/34

U.S. Cl. 137—43

44 Claims



1. An apparatus for controlling venting of fuel vapor through a vent aperture in a fuel tank, the apparatus comprising a float valve

having a vertical axis extending therethrough and including a base having an upper end and a lower end, an upwardly-extending closure member appended to the upper end of the base and formed to include a vent aperture closure cap, and a downwardly-extending, elongated, weighted unit depending from the lower end of the base, the lower end of the base having a first downwardly-presented surface of a predetermined cross-sectional area positioned on the float valve to lie at a position coinciding with the fluid level in the fuel tank when the vent aperture closure cap moves to a position closing the vent aperture in the fuel tank, the weighted unit having a second downwardly-presented surface positioned to lie in axially spaced-apart relation to the first downwardly-presented surface, the second downwardly presented surface having a cross-sectional area that is less than the predetermined cross-sectional area of the first downwardly-presented surface.

5,566,706

## SIPHONING DEVICE TO ATTAIN DESIRED WATER LEVEL IN POOLS AND THE LIKE

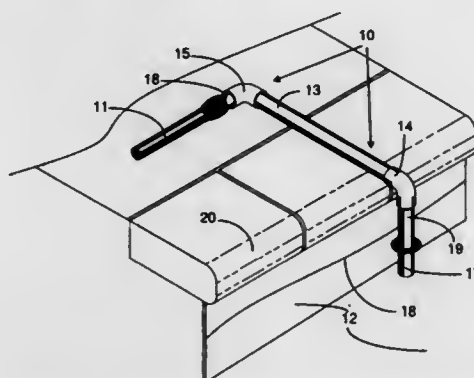
Richard J. Harpenau, 17368 SE. Conch Bar Ave., Tequesta, Fla. 33469

Filed Oct. 20, 1995, Ser. No. 546,273

Int. Cl.<sup>6</sup> F04F 10/02

U.S. Cl. 137—152

1 Claim



5,566,707

## PUTTY PLATE

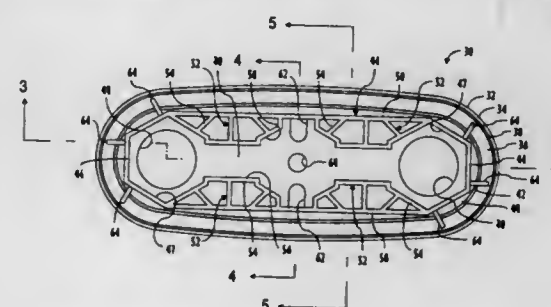
Fred Y. F. Ching, Canyon County; Darren M. Mark, Castaic; Donald J. Segien, Jr., Chatsworth, and Curtis S. Woolley, Granada Hills, all of Calif., assignors to Emhart Inc., Newark, Del.

Filed Sep. 28, 1995, Ser. No. 534,911

Int. Cl.<sup>6</sup> F16L 5/00

U.S. Cl. 137—359

27 Claims



1. A putty plate, which comprises:  
a base wall of a prescribed thickness with a first surface on one side of the wall and a second surface on the other side of the wall;  
a first plurality of integrally-joined ribs integrally formed with and extending outward from the first surface in a first prescribed pattern;  
a second plurality of integrally-joined ribs integrally formed with and extending outward from the second surface in a second prescribed pattern;  
a continuous groove formed in the base wall in a continuous pattern which defines a perimeter of the first and second surfaces;  
at least one hole formed through the base wall; and  
a rib surrounding at least a portion of the at least one hole.

a tubular adapter partially insertable into the valve port, the adapter having a first end section with an outside diameter slightly less than the inside diameter of the valve port, an external annular flange having a first annular surface limiting insertion of the first end section into the valve port and a second annular surface facing away from the first annular surface, a sealing member providing sealing engagement between the first end section and the valve port, and a second end section;

an elongated lock nut comprising an axial bore having an inside diameter large enough to receive the second end section of the adapter therethrough, internal threads engageable with the externally threaded valve port to hold the sealing member of the tubular adapter in sealing engagement with the valve port, and an internal annular flange abutting against the second annular surface of the external annular flange of the adapter when the internal threads of the lock nut are sufficiently engaged with the external threads of the valve port to bring the sealing member of the adapter into sealing engagement with the valve port; and

a tubular polymeric coupling having a first open end adapted to receive the second end section of the adapter in sliding engagement therewith, a second open end adapted to receive the free end of the polymeric pipe segment in sliding engagement therewith, and means for permanently attaching the coupling to the second end section of the adapter and to the free end of the pipe segment to provide a fluid-tight connection therebetween.

5,566,709

FLUID PLANT AND ITS OPERATING METHOD  
Tadashi Fujii, Hitachi; Yoshiyuki Kataoka, Ibaraki-ken, and Shōchiro Kinoshita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

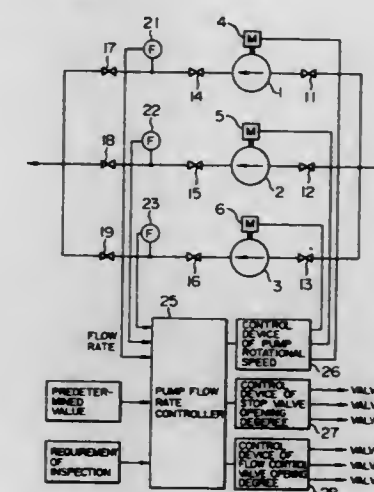
Filed Jun. 16, 1993, Ser. No. 77,063

Claims priority, application Japan, Sep. 18, 1992, 4-249482

Int. Cl.<sup>6</sup> F04B 41/06

U.S. Cl. 137—487.5

6 Claims

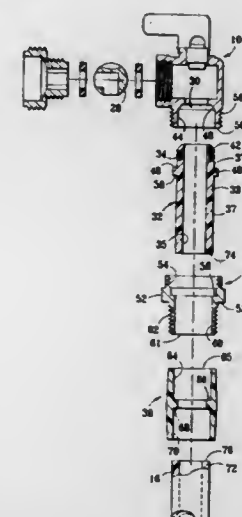
VALVE CONNECTOR SYSTEM FOR PLASTIC PIPE  
Billy J. Hobbs, Jr., Gardnerville, Nev., assignor to LSP Products Group, Inc., Carson City, Nev.

Filed Nov. 14, 1995, Ser. No. 557,602

Int. Cl.<sup>6</sup> F16L 5/00; 17/00

U.S. Cl. 137—360

44 Claims



1. A fluid plant comprising a plurality of systems which are operated at capacities less than a rated capacity during normal operation, switching means for changing desired systems of said plurality of systems to be operated at the rated capacity, isolating means for isolating said desired systems of the plurality of systems from systems to be inspected, judgement means which information based on signals indicating requirement of inspection of apparatus is inputted to judge whether a command of inspection has been issued or not in each system, and a flow rate controller which transmits control signal, on the basis of information from said judgement means, to control devices for controlling operations of apparatus in each system, said control signals serving to operate said isolating means, such that a system to be inspected is isolated,

1. A connector system for attaching a valve to a free end of a segment of pipe made of a polymeric material, the system comprising:  
an externally threaded valve port having an inside diameter;



and such that capacities of the desired systems, which have been operated at less than the rated capacity, are increased so that the desired systems operate at the rated capacity.

5,566,710

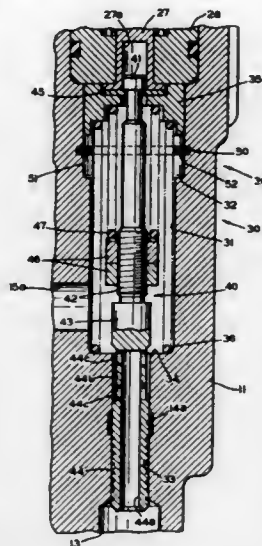
# PRE-DETENT TACTILE FEEDBACK ASSEMBLY FOR A FLUID CONTROL VALVE

Derek A. Dahlgren, St. Paul, and Jeffrey B. Wasson, Circle Pines, both of Minn., assignors to Dana Corporation, Toledo, Ohio

Filed Sep. 29, 1994, Ser. No. 314,861  
Int. Cl.<sup>6</sup> F16K 37/00

U.S. Cl. 137—556

15 Claims



1. A control valve comprising:

- a case including a first port, a second port, and a bore which is capable of providing communication between said first and second ports;
- a plunger having at least a portion thereof disposed within said bore for movement between first and second plunger positions;
- a valve disposed within said bore and operably connected to said plunger for movement between a closed position when said plunger is located in said first plunger position, wherein fluid communication is prevented between said first and second ports, and an opened position when said plunger is located in said second plunger position wherein fluid communication is permitted between said first and second ports; and
- an elastic member mounted within said bore and positioned to engage a portion of said plunger during movement from said first plunger position to said second plunger position so as to provide a tactile indication of said movement.

5,566,711

# COMBINED CONTROL AND REGULATING VALVE FOR LIQUIDS OR GASES

Leif Glansk, Fristad, and Leif Marstorp, Ljung, both of Sweden, assignors to Tour & Andersson AB, Johanneshov, Sweden

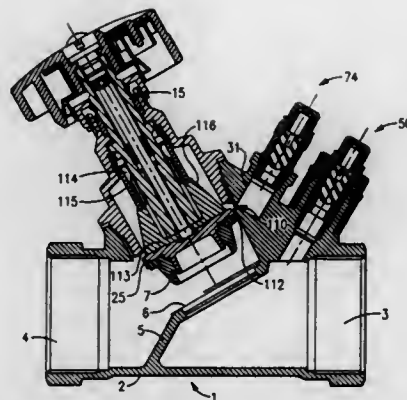
Division of Ser. No. 294,608, Aug. 23, 1994, abandoned, which is a continuation of Ser. No. 984,428, Jul. 10, 1991, abandoned. This application Aug. 8, 1995, Ser. No. 512,677  
Claims priority, application Sweden, Aug. 28, 1990, 9002744; Mar. 12, 1991, 9100735

Int. Cl.<sup>6</sup> F16K 51/00

U.S. Cl. 137—557

11 Claims

1. A valve for measuring and controlling at least one of temperature and pressure in a fluid medium channel comprising:



- a valve housing (2) defining said fluid medium channel therein and having a partition wall (5) dividing said fluid medium channel into an inlet (3) and an outlet (4);
  - a valve bore (118) in said housing having a valve spindle (8, 15) extending therethrough in sealed engagement therewith, a valve body (7, 25) attached to an inner end of said spindle (8, 15), an outer diameter of said valve body (7, 25) being slightly smaller than an inner diameter of said valve bore (118), thereby defining an annular narrow gap (112) between an inner peripheral surface of said valve bore and an outer peripheral surface of said valve body;
  - a valve opening passing through said partition wall (5) connecting said inlet to said outlet and having an edge located in said partition wall (5) defining a valve seat (6) for cooperation with said valve body (7, 25);
  - a first passage (31) extending into said housing and having a first passage extension (30) extending said first passage (31) into communication with said outlet (4) on a side of said valve body (7, 25) remote from said valve seat (6); and
  - a first measuring nipple (74) sealingly received in said first passage (31), for insertion of a measuring probe, through said first measuring nipple and into said first passage for measuring at least one of temperature and pressure at a location in said first passage (31), said first passage (31) being in communication with said outlet (4) via said first passage extension (30) and said narrow gap (112);
- wherein said valve body (7, 25) and said valve bore (118) are sized to provide said narrow gap (112) with a gap width sufficient to permit equalization of pressure of the fluid medium on both sides of said gap, yet narrow enough to prevent turbulence created in the region of said valve seat (6) from passing through said narrow gap into said first passage (31), to ensure accurate measuring results.

5,566,712

# FUELING SYSTEMS

George W. White, 701 Piney Point Rd., Houston, Tex. 77024; Edwin R. Daniel, 8310 S. Briarhollow La., Houston, Tex. 77027; James E. Kirkland, 704 F Bering Dr., Houston, Tex. 77057; and James S. Shively, 5261 Memorial Dr., Houston, Tex. 77007

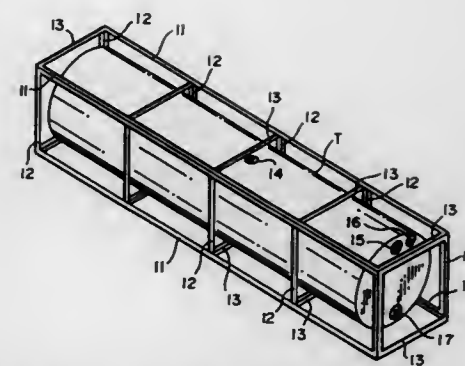
Continuation-in-part of Ser. No. 158,023, Nov. 26, 1993, Pat. No. 5,441,234. This application May 30, 1995, Ser. No. 453,154

Int. Cl.<sup>6</sup> F16K 24/00; F17C 13/08

U.S. Cl. 137—587

6 Claims

1. A supported cryogenic tank for storing liquid fuel, the tank comprising
- a hollow tank vessel having an interior and suitable for receiving and storing a cryogenic liquid fuel,
  - a support frame encompassing the tank vessel, the frame comprising
  - longitudinal beams extending along a length of the tank vessel and welded thereto,



- vertical beams interconnected between the longitudinal beams and welded thereto and to the tank vessel,
- horizontal beams interconnected between the longitudinal beams and welded thereto and to the tank vessel,
- the beams spaced apart to permit access to the tank vessel and to apparatuses thereon, and
- a relief valve mounted on the tank for relieving pressure in the tank when it reaches a certain pre-set level, the relief valve accessible from an exterior of the tank, the liquid fuel flowable from the interior of the hollow tank vessel, through the relief valve, and to outside the tank.

5,566,713

# GAS DISPENSING CONTROL ASSEMBLY AND GAS BOTTLE EQUIPPED WITH SUCH AN ASSEMBLY

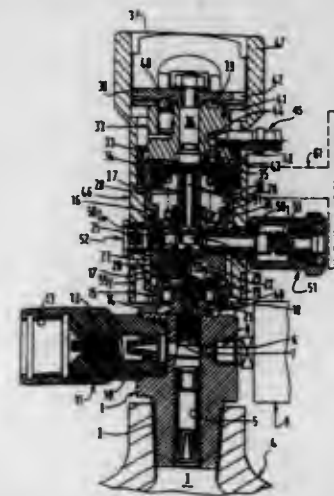
Gerard Lhomer, Le Mesnil Saint Denis, and Gilbert Theurant, Vitry sur Seine, both of France, assignors to TAEMA, Antony, France

Filed Jun. 2, 1994, Ser. No. 253,096

Claims priority, application France, Jun. 3, 1993, 93.06646  
Int. Cl.<sup>6</sup> F16K 31/44; 51/00

U.S. Cl. 137—613

18 Claims



13. Gas control dispensing assembly for connection to a tank containing gas under high pressure, comprising a first gas outlet, a shutoff valve connected in series between the tank and the first gas outlet and being exposed to said high pressure, pressure reducer means couplable to said shut-off valve, a flow regulator, said flow regulator and said pressure reducer means being assembled in a first mobile subassembly arranged in a control and actuation structure solidly attached to a second subassembly which incorporates said shut-off valve, and wherein said pressure reducer means is arranged in a first block slidably interacting with a first end of said second subassembly and comprising a hollow rod portion selectively interacting with said shut-off valve.

14. Assembly according to claim 13, wherein said pressure reducer means comprises a valve, piston means supporting said

valve and slidable in said first block and interacting with a valve seat formed in said first block.

5,566,714

# HYDRAULIC COUPLER

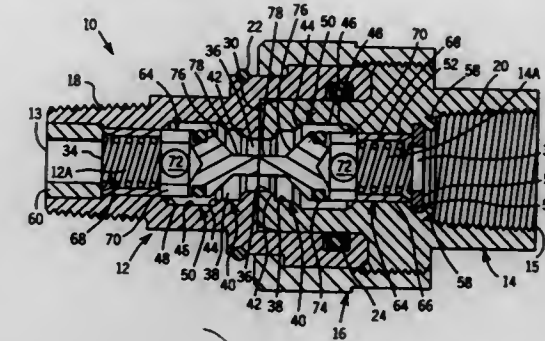
Douglas P. Miller, New Berlin, Wis., assignor to Applied Power Inc., Butler, Wis.

Filed May 24, 1995, Ser. No. 453,129

Int. Cl.<sup>6</sup> F16L 37/28

U.S. Cl. 137—614.04

8 Claims



1. In a hydraulic coupler of the type having two halves releasably secured together with a poppet in each half slidable axially in a bore of said half in which when said halves are secured together said poppets abut one another to open a flow path which extends through said halves from one end of said coupler to the other and when said halves are released from each other each said poppet is biased to a closed position so as to close said flow path in each half, each said poppet having a hollow tubular barrel section at an outward end for axial flow through said poppet, a stem at an inward end of a smaller outside diameter than said barrel section and a transition section joining said barrel section and said stem, said stem extending beyond its corresponding half in said closed position to abut the stem of the other poppet when said halves are secured together, and crossbores through said poppet for communicating flow into or out of said barrel section, the improvement wherein each said bore has an inward section adjacent to said stem of said poppet, an outward section for slidably receiving said barrel section of said poppet, a seating section for seating against said poppet and a flow section adjacent to said crossbores in said poppet, said seating and flow sections being between said inward and outward sections and said flow section being between said seating and outward sections and of a diameter greater than the diameter of said outward section, said crossbores opening into said flow section and said seating section having a cylindrical portion with a diameter which is equal to the diameter of said outward section.

5,566,715

# FLOOD PREVENTION VALVE

Harry G. Griffin, 2005 Mumfry Rd., Chalmette, La. 70043

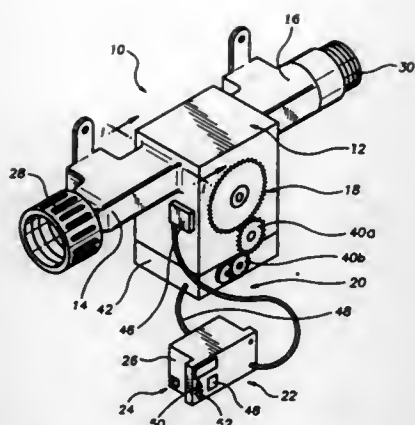
Filed Oct. 5, 1995, Ser. No. 539,594

Int. Cl.<sup>6</sup> F17D 3/00; F16K 31/12

U.S. Cl. 137—624.11

16 Claims

1. A flood prevention valve comprising:
- a rotary valve assembly having an input line, an output line, a rotating valve vane including an internal magnetic coupling ring affixed to said rotating valve vane, an external magnetic coupling ring having a coupling gear secured concentrically thereto, and a gearing linkage having at least one linking gear enmeshed with said coupling gear;
  - a gear stop mechanism including a solenoid having a stop member positionable by said solenoid in a manner such that said stop member engages and prevents said linking gear from rotating in response to a first electrical signal to said solenoid



and disengages and allows said linking gear to rotate in response to a second electrical signal to said solenoid; a timer circuit having a magnetic sensor capable of detecting rotation of said internal magnetic coupling ring; and an output circuit in electrical connection with said solenoid that puts out a first predetermined signal to said solenoid when a predetermined rotation interval has been exceeded.

5,566,716

## HYDRAULIC CONTROL VALVE

Yoshio Togashi; Kenji Nakamura, both of Kobe; Hiroshi Iwata, Kakogawa; Michisada Sakamoto, Akashi, and Yutaka Yasuhara, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

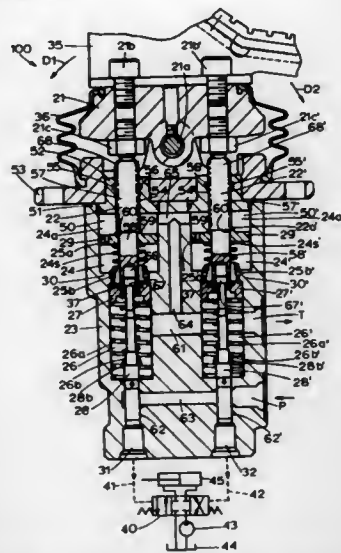
Filed Jun. 1, 1995, Ser. No. 456,964

Claims priority, application Japan, Nov. 10, 1994, 6-276720

Int. Cl.<sup>6</sup> F15B 13/02; F16K 31/62

U.S. Cl. 137—636.1

3 Claims



1. A hydraulically operated control valve, wherein one of a pair of spool valves with associated respective output ports is displaced selectively by pivoting an operating member so that a pump port and an output port corresponding to said one of the spool valves communicate with each other via the spool valve, and the other output port and a tank port communicate with each other via the other spool valve, thereby to generate secondary pressure which is proportional to the amount of pivoting motion of the operating member, in either one of the output ports corresponding to the pivoting operation, comprising:

a cam member pivotable toward one or the other side of a neutral position, in response to the amount and direction of operating the operating member;

a pair of push rods each interposed between the cam member and one of the pair of spool valves;

a pair of pistons each respectively mounted to one of the push rods respectively in liquid tight condition;

a housing having the cam member mounted in the upper portion thereof, said housing including,

a pair of piston chambers containing a respective piston and each piston chamber having an oil chamber being defined on one side of the piston and a damper chamber being defined on the opposite side of the piston;

a pair of throttles, each respective throttle enabling fluid communication between the oil chamber and the damper chamber;

a pair of spring chambers in said housing each spring chamber adapted to movably mount a respective spool valve;

a pair of partition members each respectively separating the piston chambers and the spring chambers, and adapted to movably mount the push rods;

a pair of damping springs each respectively mounted in a respective damping chamber to spring bias the respective piston in the direction to depart from the partition members; and

a pair of check valves, each respective check valve selectively enabling fluid communication movement from the spring chamber to the damper chamber and preventing fluid communication movement from the damper chamber to the spring chamber.

5,566,717

## ASSEMBLY FOR CONTROLLING FLUID PASSING THROUGH A MANIFOLD

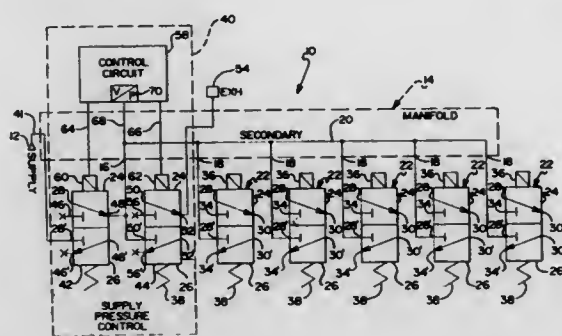
Michael E. Robert, Farmington Hills, Mich., assignor to Mac Valves, Wixom, Mich.

Filed Apr. 6, 1995, Ser. No. 417,746

Int. Cl.<sup>6</sup> F16K 11/00

U.S. Cl. 137—883

4 Claims



1. A fluid flow assembly comprising:

a manifold defining an input port and a plurality of output ports, said manifold further including a communication line extending from said input port to each of said plurality of output ports for providing fluid communication therebetween; and

a valve assembly in fluid communication with said input port for receiving fluid from a fluid supply, said valve assembly including an electronic control electrically connected to said valve assembly for controlling said valve assembly such that said valve assembly opens and closes to provide a predetermined pressure of the fluid to said communication line, said valve assembly further including a fill valve and an exhaust valve, said fill and exhaust valves being two position two way valves having inlet, exhaust and cylinder ports.

5,566,718

## FLUID PRESSURE DEVICE

Shigekazu Nagai; Hiroshi Matsushima; Yoshiharu Ito, and Akio Saitoh, all of Ibaraki-ken, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 193,060, Mar. 8, 1994, abandoned.

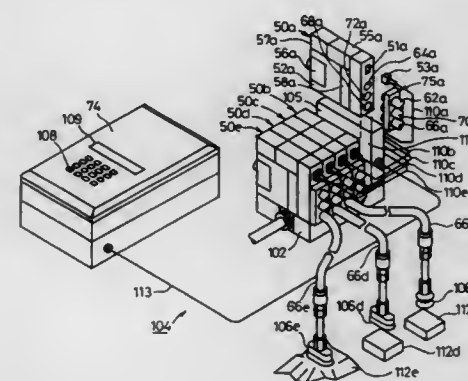
This application May 30, 1995, Ser. No. 453,826

Claims priority, application Japan, Sep. 10, 1991, 3-258388; Sep. 10, 1991, 3-258389

Int. Cl.<sup>6</sup> F16K 11/00

U.S. Cl. 137—884

15 Claims U.S. Cl. 138—98



7. A fluid pressure device comprising:

(a) a first fluid unit comprising a plurality of interconnected block components, wherein each of said plurality of block components of said first fluid unit performs a different function, said first fluid unit further comprising:

(i) a first wall surface;

(ii) a first electrical terminal disposed at a location on said first wall surface;

(iii) a first plurality of fluid ports disposed on said first wall surface and spaced from said location on said first wall surface;

(b) a first electrical connector mating with said first electrical terminal;

(c) a first fluid connecting block having a plurality of fluid connectors mating with said first plurality of fluid ports;

(d) a second fluid unit comprising a plurality of interconnected block components, wherein each of said plurality of block components of said second fluid unit performs a different function, said second fluid unit further comprising:

(i) a second wall surface;

(ii) a second electrical terminal disposed at a location on said second wall surface;

(iii) a second plurality of fluid ports disposed on said second wall surface and spaced from said location on said second wall surface;

(e) a second electrical connector mating with said second electrical terminal;

(f) a second fluid connecting block having a plurality of fluid connectors mating with said second plurality of fluid ports; and

(g) a manifold; wherein:

(h) said first and second fluid units are mounted on said manifold and said first and second fluid units are disposed adjacent to each other, and further wherein said first fluid connecting block can be disconnected from said first plurality of fluid ports while allowing said second fluid connecting block to remain connected to said second plurality of fluid ports.

5,566,719

## METHOD FOR LINING A BRANCH PIPE OF AN UNDERGROUND PIPE

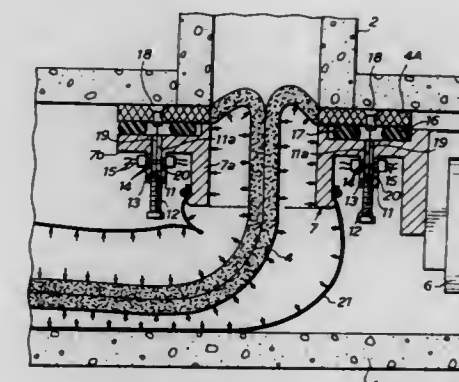
Takao Kamiyama, Hiratsuka, and Yasuhiro Yokoshima, Ibaraki-ken, both of Japan, assignors to Shonan Gosei-Jushi Seisakusho K.K., Kanagawa-ken, and Yokoshima & Company, Ibaraki-ken, both of Japan

Filed Mar. 3, 1995, Ser. No. 398,241

Claims priority, application Japan, Jul. 5, 1994, 6-153383

Int. Cl.<sup>6</sup> F16L 55/16

4 Claims



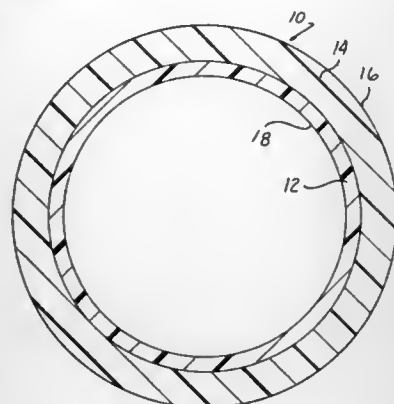
1. A method for lining a branch pipe of an underground main pipe comprising the steps of: (a) preparing a tubular liner bag made of a nonwoven fabric soaked with a hardenable liquid resin, one end of said tubular liner bag being closed; (b) turning outwardly the open end of said tubular liner bag to form a collar which is so curled as to have a curvature equal to that of the inner wall of the main pipe; (c) curing the liquid resin in said collar to thereby harden the collar; (d) embedding stopper tacks in said collar at appropriate locations, each of said stopper tacks having its bottom end exposed from the back face of said collar and connected with a string; (e) facing the back face of the collar of the branch pipe liner bag with the upper face of a flange of a fluid pressure sealing nozzle, which comprises a hollow cylindrical part, through which the liner bag is passed, the flange extending perpendicularly from the side of said cylindrical part, at least one endless sealant laid on the upper face of said flange, and a string pull means provided in said flange; (f) engaging said strings with said string pull means of the flange; (g) causing said string pull means to pull said strings so that the collar and the flange are moved toward each other until sufficient sealing effect is obtained at the juncture between the collar and the flange by means of the endless sealant; (h) packing that portion of said liner bag which is tailing out from the fluid pressure sealing nozzle in an everter, which is a tubular body with one end closed; (i) connecting the open end of said everter with the bottom end of the cylinder part of the fluid pressure sealing nozzle in a manner such a closed space is defined by the inner wall of the everter, the inner wall of said cylindrical part and the outer surface of the unevverted part of the liner bag; (j) positioning said fluid pressure sealing nozzle together with the everter at the opening of the branch pipe in the main pipe such that the collar is fitted on the inner wall of the main pipe around the opening of the branch pipe; (k) everting said branch pipe liner bag into the branch pipe from the fluid pressure sealing nozzle toward the surface of the ground by supplying pressurized fluid into said closed space from the closed end of the everter; (l) hardening said hardenable liquid resin impregnated in the branch pipe liner bag while keeping the liner bag inflated by means of the fluid pressure; (m) severing said strings and detaching the fluid pressure sealing nozzle from the collar of the branch pipe liner bag; and (n) cutting off that portion of said liner bag which protrudes outside the branch pipe.



**5,566,720**  
**ELONGATED FUEL AND VAPOR TUBE HAVING MULTIPLE LAYERS AND METHOD OF MAKING THE SAME**  
 Craig Cheney, Lapeer, and Frank L. Mitchell, Rochester, both of Mich., assignors to ITT Corporation, New York, N.Y.  
 Filed Jan. 10, 1995, Ser. No. 370,603  
 Int. Cl.<sup>6</sup> F16L 11/04

U.S. Cl. 138—137

29 Claims



1. An elongated fuel and vapor tube used in conjunction with an internal combustion engine in a motor vehicle system to handle fluids containing hydrocarbons comprising:

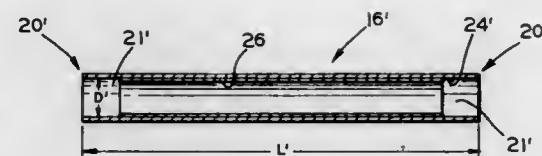
- a first layer disposed radially innermost and having an inner surface capable of prolonged exposure to a fluid containing hydrocarbon and an outer surface spaced a first predetermined radial thickness from the inner surface, the first layer composed of an extrudable, melt processible terpolymer consisting essentially of:
  - a fluorinated alkylene having between 2 and 4 carbon atoms and between 2 and 4 fluorine atoms;
  - an  $\alpha$ -fluoro olefin having between 2 and 6 carbon atoms and between 2 and 6 fluorine atoms; and
  - a fluorinated vinyl compound selected from the group consisting of vinylidene fluoride, vinyl fluoride and mixtures thereof;
- a second layer bonded to the first layer, the second layer having a second predetermined thickness greater than the thickness of the first layer, the second layer uniformly connected to the first layer and consisting essentially of a melt processible thermoplastic capable of sufficiently permanent laminar adhesion to the first layer to prevent delamination during desired lifetime of the tube wherein the melt-processible thermoplastic resin is selected from the group consisting of, bromoisobutene-isoprene resins, polybutadiene, chlorinated butylrubber, chlorinated polyethylene, polychloromethoxy-irane, chloroprene, chlorosulfonopolyethylene, ethyleneoxide, terpolymers of ethylenepropylenediene, copolymers of ethylenepropylene, isobutene-isoprene, nitril butadiene, styrenebutadiene, polysulfide, polyphenolsulfide and polysulfones.

**5,566,721**  
**DRIVESHAFT TUBE HAVING SOUND DEADENING COATING**  
 Douglas E. Brees, Northwood, Ohio, assignor to Dana Corporation, Toledo, Ohio  
 Filed Jul. 20, 1995, Ser. No. 504,323  
 Int. Cl.<sup>6</sup> F16L 9/14

U.S. Cl. 138—145

12 Claims

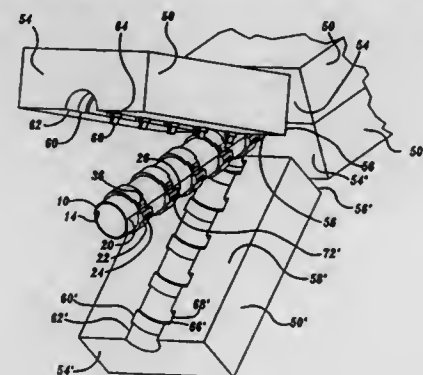
- 1. A driveshaft tube for a vehicle drive train comprising:
  - a single hollow cylindrical tube including a pair of ends, said tube defining an inner cylindrical surface;
  - an end fitting secured to each end of said tube and adapted to provide a rotational driving connection between a source of rotational power and a load; and



a coating of a sound deadening material adhered to said inner cylindrical surface of said tube for absorbing acoustical noise within said tube to reduce the magnitude of such acoustical noise transmitted through said tube.

**5,566,722**  
**SELF LOCKING SLITTED CORRUGATED TUBING**  
 Donald D. Bartholomew, Mt. Clemens, Mich., assignor to Proprietary Technology, Inc., Bloomfield Hills, Mich.  
 PCT No. PCT/US92/09994, § 371 Date May 16, 1995, § 102(e) Date May 16, 1995, PCT Pub. No. WO94/11663, PCT Pub. Date May 26, 1994  
 PCT Filed Nov. 17, 1992, Ser. No. 436,357  
 Int. Cl.<sup>6</sup> F16L 9/00; B29B 15/00; B29C 49/00  
 U.S. Cl. 138—166

30 Claims



1. A corrugated sleeve for retaining conducting equipment such as cables, wiring, tubing and the like, comprising:

- a sleeve formed of a single piece of plastic of generally tubular shape having a longitudinal portion which includes an inner surface, an outer surface, successive alternating enlarged and reduced diameter sections and means for joining a plurality of corresponding male and female locking members which are formed by slitting the sleeve;
  - said male locking members extending from said slit sleeve along a first longitudinal edge at said enlarged diameter sections, wherein a plurality of said male locking members are provided with an outwardly projecting tab including a locking top edge;
  - said female locking members extending along the enlarged diameter sections from the second longitudinal edge and having a shape to receive said male locking members, said female locking members having means to lock said male locking members including a blocking wall for precluding the undesired removal of the male locking members;
  - whereby said male locking members are adjoined to said corresponding female locking members by inserting said male locking members into said female locking members such that the locking top edge of the tabs snap under the blocking walls of the female member.
7. A method of making a corrugated sleeve useful for enclosing lengths of conducting equipment such as cables, wiring and tubing, comprising the steps of:
- (a) providing a plurality of mating first and second mold plates which are joinable along mating surfaces having a cavity defined by successive enlarged and reduced diameter sections, said first and second mold plates including alternating lugs and lug receiving and locking areas wherein the first mold

- plate includes a ledge located below the mating surface along which said lug and lug receiving and locking areas are disposed;
- (b) removing said corrugated sleeve from said mold plates and slitting said corrugated sleeve to form first and second longitudinal edges;
- (c) providing a plurality of said diameter sections with an outwardly projecting male tab members; and
- (d) providing a corresponding number of outwardly projecting female locking members with means for retaining said male tab members.

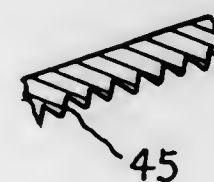
11. A mold plate assembly for the production of a corrugated sleeve, comprising:

- a plurality of first and second mold plates arranged along a linear path, each of which includes a body having a longitudinal cavity with successive sections of enlarged and reduced diameter and a surface for mating said first and second mold plates;
  - said first mold plates including a ledge located below the level of said mating surface and a plurality of lugs and recesses extending between said ledge and said mating surface; and
  - said second mold plates including a projection which extends radially from said body which contains a plurality of lugs and recesses;
- whereby upon aligning said mating surfaces, the lugs of the first and second mold plates become aligned with the corresponding recesses of the first and second mold plates such that male and female locking members can be formed along the sleeve.

**5,566,723**  
**APPARATUS AND METHOD FOR GUIDING A TEXTILE WEB OVER A CONVEX GUIDING SURFACE**  
 William J. Alexander, III, Mauldin, S.C., assignor to Alexander Machinery, Inc., Simpsonville, S.C.  
 Continuation of Ser. No. 222,233, Apr. 4, 1994, Pat. No. 5,431,192. This application Jun. 7, 1995, Ser. No. 481,050  
 Int. Cl.<sup>6</sup> D03D 49/20

U.S. Cl. 139—1 B

5 Claims

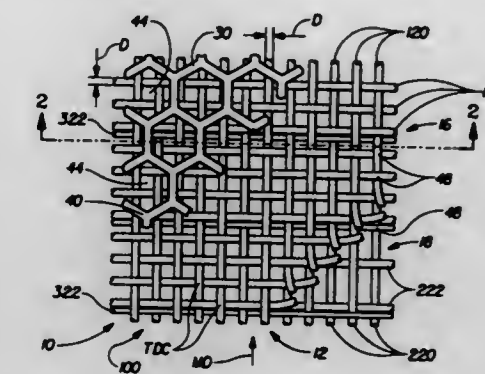


- 1. Apparatus for guiding a textile web received from a source of web material in open width for winding upon a take-up roll comprising:
  - means directing a textile web at a first angle in open width toward a textile web guiding surface for changing the direction of the web;
  - a stationary outwardly curved extruded aluminum section over which said textile web is carried in a predetermined wrap;
  - a fixed support at each end of said section for mounting said section in stationary relation thereto between said source and said take-up roll;
  - a curved outer convex textile web guiding surface on said section consisting of said aluminum with a hardened, brittle, wear resistant surface engaging said textile web received thereover; and
  - means directing said textile web at a second angle away from said wear resistant surface;
- whereby said extruded aluminum section serves as a guide for changing the direction of the textile web while minimizing wear.

**5,566,724**  
**MULTIPLE LAYER, MULTIPLE OPACITY BACKSIDE TEXTURED BELT**  
 Paul D. Trokhan, Hamilton, and Glenn D. Boutlier, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio  
 Continuation of Ser. No. 252,703, Jun. 2, 1994, Pat. No. 5,500,277. This application Dec. 20, 1995, Ser. No. 575,425  
 Int. Cl.<sup>6</sup> D03D 13/00

U.S. Cl. 139—383 A

25 Claims



1. A cellulosic fibrous structure through-air-drying belt comprising:

- a web facing layer of interwoven machine direction yarns and cross-machine direction yarns, said machine direction and cross-machine direction yarns of said first layer having a first opacity substantially transparent to actinic radiation and being interwoven in a weave;
- a machine facing second layer of interwoven machine direction yarns and cross-machine direction yarns, a plurality of said machine direction or said cross-machine direction yarns of said machine facing second layer having a second opacity greater than said first opacity and being substantially opaque to actinic radiation, said machine direction yarns and said cross-machine direction yarns of said second layer being interwoven in a weave, and
- said first layer and second layer being tied together by a plurality of tie yarns, said tie yarns having an opacity less than said second opacity and being substantially transparent to actinic radiation.

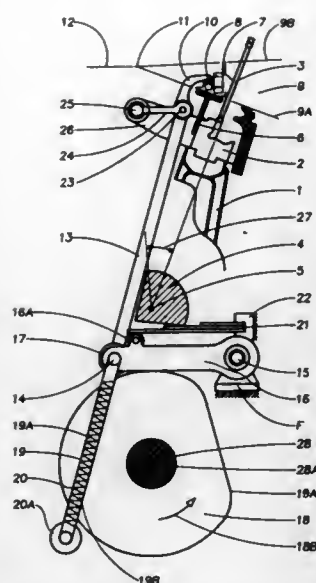
**5,566,725**  
**WEFT CLAMP CONTROLLER FOR A WEFT GRIPPER IN A SHUTTLELESS LOOM**  
 Siegfried Jaeger, Lindau, Germany, assignor to Lindauer Dornier Gesellschaft mbH, Lindau, Germany  
 Filed Apr. 26, 1995, Ser. No. 429,537  
 Claims priority, application Germany, May 5, 1994, 44 15 862.9

U.S. Cl. 139—446

Int. Cl.<sup>6</sup> D03D 47/12

12 Claims

- 1. A weft clamp controller for a weft gripper in a shuttleless loom with a sley (1) carrying a reed (3) and a sley shaft (4) connected to said sley for performing a beat-up motion, said weft clamp controller comprising a weft clamp operating finger (10), a drive cam (18; 30, 31) for operating said finger (10), a coupling link (13) having a first end connected to said finger (10), said coupling link having a second end cooperating with said drive cam (18; 30, 31), a rocking guide arm (24) for said coupling link (13), a first pivot (23) connecting said guide arm (24) to said coupling link (13) below said finger (10), a second pivot (25) connecting said guide arm (24) to said sley (1) for movement with said sley (1), at least one cam follower roller (17), a first journal (14) rotatably securing said cam follower roller (17) to said second end of said coupling link (13) for a direct engagement of said cam follower roller (17) at said second end of said coupling link (13)



means for carrying a load related to tensioning of the band, said means for carrying located more adjacent to said proximal end than said distal end of said housing assembly.

5,566,727

# PROCESS AND FILLING ADAPTER FOR THE IN-DRUM DRYING OF LIQUID RADIOACTIVE WASTE

Dietmar Erbse, Rodenbach; Reinhard Thiele, Frankfurt, and Helmut Walter, Offenbach, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Division of Ser. No. 7,055, Jan. 21, 1993, Pat. No. 5,378,410.

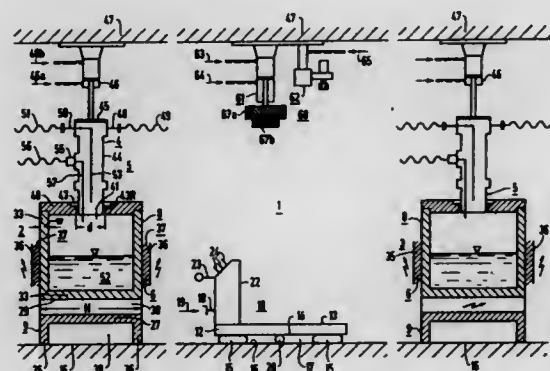
This application Sep. 19, 1994, Ser. No. 308,130

Claims priority, application Germany, Jul. 20, 1990, 40 23 162.3

Int. Cl.<sup>6</sup> B65B 31/00; B67C 3/00

U.S. Cl. 141—7

8 Claims



1. A filling assembly for in-drum drying of liquid radioactive waste, comprising:

- a lid for sealing a shielded container, said lid having a central opening formed therein;
- a plug to be placed in and removed from said opening;
- a filling adapter having an outside diameter fitting said opening for inserting said filling adapter into said opening with said plug removed and for pouring liquid radioactive waste into the sealed container and venting vapors from the container, said filling adapter having a rectilinear steel casing with end regions, an outer periphery, a flange protruding past said outer periphery at one of said end regions, at least two connection points at another of said end regions, and a filling line extending from one of said connection points through said steel casing; and
- a heater for heating the liquid radioactive waste in the container.

5,566,728

# METHOD AND APPARATUS FOR USE WITH INFLATABLE STOWAGE PADS FOR TRANSPORT PURPOSES

Guenter Lange, Gangelt, Germany, assignor to Spanset Inter AG, Oetwil am See, Switzerland

Filed Aug. 29, 1994, Ser. No. 296,165

Claims priority, application Germany, Oct. 22, 1993, 9316201.4 U; May 9, 1994, 44 16 312.6

Int. Cl.<sup>6</sup> B65B 1/04; 3/04

U.S. Cl. 141—10

10 Claims

5. A combination comprising an inflatable stowage pad for transport purposes and a compressed air-operated apparatus for inflating the stowage pad using compressed air, said compressed air-operated apparatus including means for generating a suction flow using the compressed air for evacuating the stowage pad.

with said drive cam (18; 30, 31), an urging mechanism (16, 20 or 16B, 29) connected to said first journal for constantly urging said cam follower roller (17) into engagement with said drive cam (18; 30, 31), and a drive shaft (28) for driving said drive cam (18; 30, 31) in synchronism with said sleigh shaft (4).

5,566,726

# ADAPTABLE BANDING TOOL

Miklos Marelin, Aurora, Colo., assignor to Band-It-Idex, Inc., Denver, Colo.

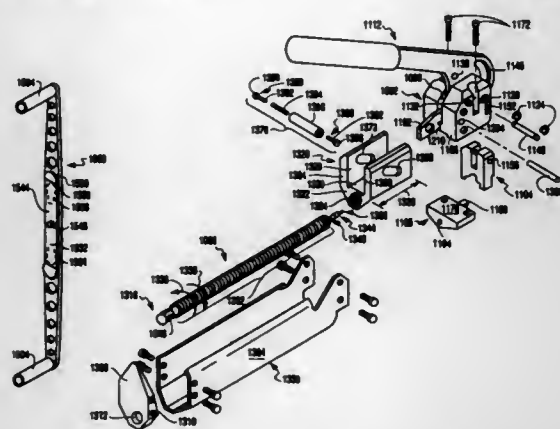
Continuation-in-part of Ser. No. 594,377, Oct. 5, 1990, Pat. No. 5,127,446, Ser. No. 908,983, Jul. 6, 1992, Pat. No. 5,322,091, and Ser. No. 163,815, Dec. 6, 1993. This application

Jun. 2, 1994, Ser. No. 253,121

Int. Cl.<sup>6</sup> B21F 9/00

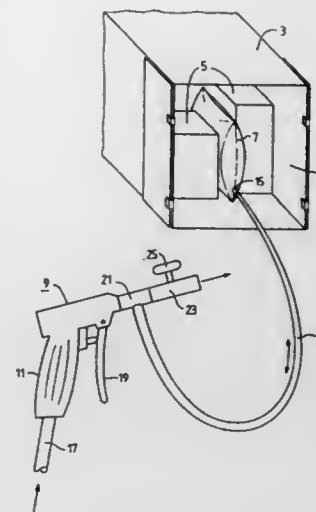
U.S. Cl. 140—123.6

18 Claims



13. A banding tool for tensioning a band with a buckle, comprising:

- a housing assembly having a length and a proximal end adjacent to which a band is first received and a distal end located at an end opposite from said proximal end;
- a first lock forming assembly for forming a first lock on the band after the band has been tensioned, said first lock forming assembly being removably attached to said housing assembly wherein at least a second lock forming assembly, different from said first lock forming assembly, is substitutable for said first lock forming assembly so that said tool is able to form different band locks; and
- a tensioning assembly for receiving a free end of the band and for tensioning the band, said tensioning assembly including



5,566,729

# DRUG RECONSTITUTION AND ADMINISTRATION SYSTEM

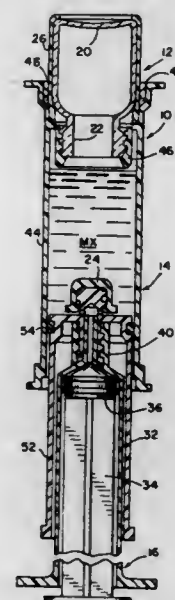
Richard W. Grabenkort, Barrington; John C. Tanner, II, Lake Bluff, and Sheldon M. Wecker, Libertyville, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Apr. 6, 1995, Ser. No. 417,575

Int. Cl.<sup>6</sup> B65B 1/04; 3/04; 31/00

U.S. Cl. 141—25

13 Claims



1. A drug reconstitution and administration system comprising:
  - a container, having a mouth, for containing a medicament;
  - a syringe assembly including a barrel having an open end and a generally closed end defining a flow passage, and a plunger slidably positioned in said barrel and extending from said open end, said plunger defining with said barrel an internal chamber in fluid communication with said flow passage; and
  - a mixing adapter assembly for mixing a liquid in said syringe assembly with the medicament in said container, said adapter assembly including an outer sleeve for sealingly receiving the mouth of said container at one end thereof, and an inner sleeve slidably positioned within said outer sleeve and having a generally closed end defining a flow port and an open end, said inner sleeve being slidably movable relative to said outer sleeve to define therewith an expandable mixing chamber within said outer sleeve.

said inner sleeve and said barrel of said syringe assembly respectively comprising connector means for detachably connecting said flow passage of said barrel with the flow port of said inner sleeve in fluid communication, so that said syringe assembly is positionable generally within the open end of said inner sleeve, and the liquid in said internal chamber of said syringe assembly can be caused to flow from said internal chamber, through said flow passage and said flow port, and into said mixing chamber as said inner sleeve slides outwardly of said outer sleeve so that the liquid can be mixed with medicament from said container to form a mixture, said mixture thereafter being caused to flow from said mixing chamber into said internal chamber of said syringe assembly by movement of said inner sleeve inwardly of said outer sleeve and movement of said plunger outwardly of said barrel for subsequent administration of said mixture from said syringe assembly after detachment of said barrel from said inner sleeve.

5,566,730

# GAS ACTUATOR ASSEMBLY

George W. Liebmann, Jr., 75 Bank St. #4E, New York, N.Y. 10014

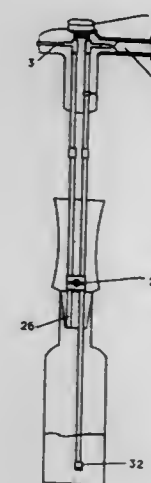
Division of Ser. No. 326,040, Oct. 19, 1994, Pat. No. 5,458,165.

This application Jun. 26, 1995, Ser. No. 494,341

Int. Cl.<sup>6</sup> B65B 31/00

U.S. Cl. 141—64

14 Claims



1. A food storage container comprising:

- a) a storage compartment;
- b) a lid releasably sealed in an air-tight manner to the storage compartment; and
- c) a gas actuator assembly for supplying a gas to the storage compartment comprising:
  - i) a housing,
  - ii) a pressurized gas source contained entirely within the housing,
  - iii) first connector means for fluidically connecting the gas source to a compressed gas supply tube adapted to supply compressed gas to the interior of the storage compartment,
  - iv) an evacuation tube adapted to evacuate air from the interior of the storage compartment,
  - v) second connecting means for fluidically connecting the evacuation tube to an outlet formed in the housing for evacuating air contained within the storage compartment, and
  - vi) actuation means fluidically connected to the first and second connector means for selectively enabling gas to travel from the gas source through the compressed gas supply tube into the storage compartment while substantially simultaneously enabling air to be evacuated from the storage compartment through the evacuation tube.

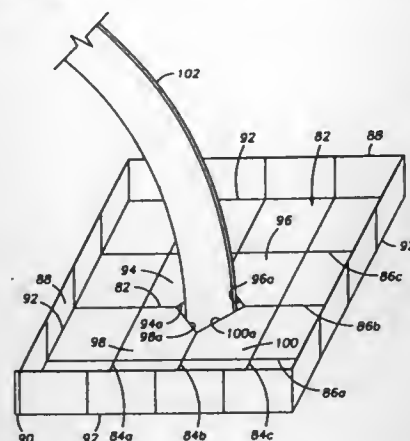


5,566,731

**MARINE VESSEL FUEL SPILL PREVENTION DEVICE**  
Herbert W. Holland, 2314 Chimney Rock, Houston, Tex. 7056  
Division of Ser. No. 265,418, Jun. 24, 1994, Pat. No.  
5,518,797. This application Apr. 20, 1995, Ser. No. 424,173  
Int. Cl.<sup>6</sup> B65B 1/04;3/04

U.S. Cl. 141—86

3 Claims



1. A method of containing, collecting and removing hydrocarbon backflow and overflow at the fuel intake port of the fuel tank of a vessel being fueled before the hydrocarbons spill onto the surface of the water proximate a marine fueling facility dock area, comprising the steps of:

providing a spill containment device formed as a pillow having an outer envelope layer of textile material, a plurality of chambers formed in stratification therein by internal layers of textile material with a polymer material disposed with the chambers of the device having a property of acting to absorb and solidify liquid hydrocarbon substances coming into contact with the device and migrating to its interior, a plurality of quilting seams formed in the device to define hydrocarbon absorption consolidation points within the device and establish the chambers as distinct hydrocarbon absorption units within the device, and a plurality of folding wicking segments at the center of the device;

placing the spill containment device on the hull or deck of the vessel with the wicking segments at the center of the device centered over the opened fuel intake port; and inserting a fuel filling nozzle through the wicking segments at the center of the device, folding the wicking segments into the fuel intake port with the fuel filling nozzle to allow fuel forced out of the fuel intake port to come in contact with the containment device.

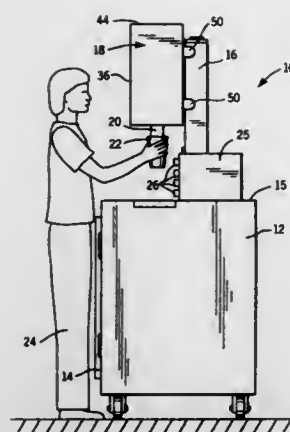
5,566,732

**BEVERAGE DISPENSER WITH A READER FOR SIZE INDICA ON A SERVING CONTAINER**  
Patrick L. Nelson, Sun Prairie, Wis., assignor to Exel Nelson Engineering LLC, Madison, Wis.  
Filed Jun. 20, 1995, Ser. No. 492,881  
Int. Cl.<sup>6</sup> B65B 1/04;3/00

U.S. Cl. 141—94

13 Claims

1. An apparatus for dispensing a beverage into containers, said apparatus comprising:  
a nozzle having an outlet through which the beverage is dispensed;  
a valve coupled to said nozzle for controlling the flow of the beverage through said nozzle;  
a mechanism for reading an indicia printed on a given container placed under said nozzle, wherein the indicia identifies a volume for the given container, said mechanism producing a signal which indicates the volume for the given container; and a controller which responds to the signal from said mechanism by operating said valve to dispense beverage from said



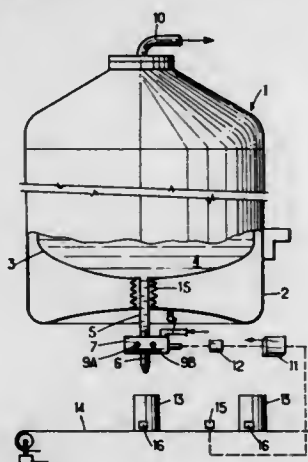
nozzle, wherein a quantity of beverage that is dispensed is determined from the signal.

5,566,733

**APPARATUS FOR DELIVERING, AT HIGH FREQUENCY, MEASURED QUANTITIES OF LIQUID**  
Jean-Pierre Germain, Montigny le Bretonneux, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédés George Claude, Paris Cedex, France  
Filed Nov. 16, 1994, Ser. No. 341,140  
Claims priority, application France, Dec. 1, 1993, 93 14341  
Int. Cl.<sup>6</sup> B65B 1/30;3/28

U.S. Cl. 141—192

3 Claims



1. In an apparatus to deliver, at high frequency, measured quantities of liquid, comprising electrovalve means (7A, 7B) having an inlet and an outlet, and provided with an adjustment means (9A, 9B) permitting adjusting with precision the flow passing through the electrovalve means when the electrovalve means is open, a supply conduit (5) connecting the inlet of the electrovalve to a source of liquid, a distribution conduit (6) connected to the outlet of the electrovalve means and opening where the liquid is to be delivered, and control means (11) controlling the opening and the closing of the electrovalve means; the improvement wherein the electrovalve means comprises first and second electrovalves (7A, 7B) mounted in parallel between the supply conduit (5) and the distribution conduit (6), switching means (12) interposed between the control means and the first and second electrovalves to actuate selectively one of said first and second electrovalves, and a third electrovalve (7C), disposed between a gas supply conduit (8) connected to a source of gas under pressure and the distribution conduit (6), said third electrovalve being controlled by the control means (11) to control the opening and closing of said third electrovalve according to a program such that said gas under pressure

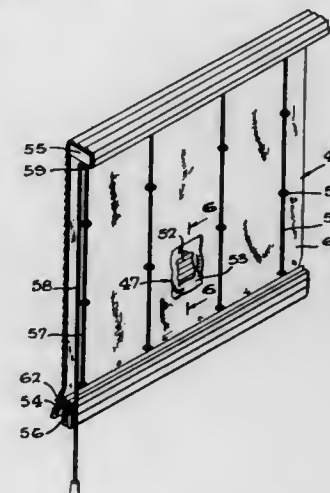
is delivered into the distribution conduit (6) after the closing of the first or the second electrovalve, so as to expel drops of liquid remaining within the distribution conduit.

5,566,734

**PLEATED WINDOW SHADE**  
Arnold Levy, and Frank L. Meyer, both of 7327 Lankershim Blvd., Unit 6, North Hollywood, Calif. 91605  
Filed Feb. 23, 1995, Ser. No. 393,368  
Int. Cl.<sup>6</sup> E06B 9/06

U.S. Cl. 160—84.04

9 Claims



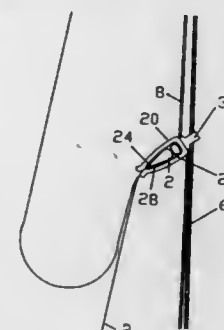
1. A window shade comprising:  
a pliable backing layer selectively sized and configured to conform to a window;  
a facing layer of closely, horizontally pleated, pliable fabric tightly bonded to said backing layer so as to retain the pleats permanently, and with said backing layer defining a unitary, pliable window covering conforming to the window; and apparatus attached to the window covering for mounting the window covering to a window, said apparatus including adjusting means for raising and lowering the window covering with respect to such window.

5,566,735

**ROMAN-TYPE SHADE**  
Ralph Jelic, Valencia, Pa., assignor to Verosol USA Inc., Pittsburgh, Pa.  
Filed Mar. 28, 1995, Ser. No. 411,937  
Int. Cl.<sup>6</sup> E06B 9/06

U.S. Cl. 160—84.04

20 Claims



1. An improved Roman shade of the type consisting of a sheet of fabric connected between a bottom rail and a headrail and gathered at selected intervals to provide a series of cascading transverse

pleats and lift cords for raising and lowering the shade wherein the improvement comprises:

- a plurality of spacer cords attached between the headrail and the bottom rail;
- a set of generally U-shaped ribs each rib comprised of a pair of legs connected together at a proximate end to form a top of the rib and abutting one another at their distal end to define a fabric receiving cavity therebetween; and
- at least one cord carrier attached to each rib and connected to one of the spacer cords, each cord carrier having a hole through which one of the lift cords passes, wherein the generally U-shaped ribs grip the fabric at selected intervals to form the series of cascading transverse pleats in the fabric when the shade is in an open position and in a fully closed position.

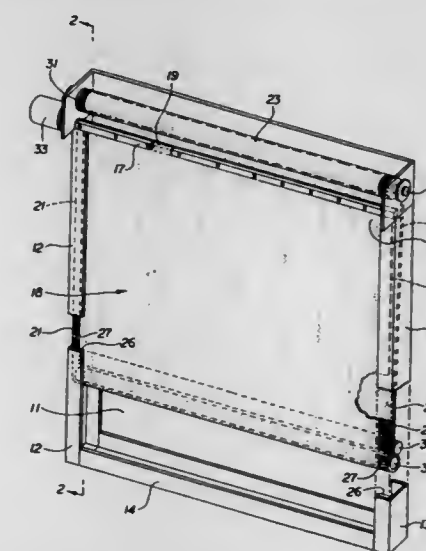
5,566,736

**SEALABLE CURTAIN**

Grant W. Crider, Rte. 1 Box 17, Bremen, Ala. 35033, and Charles H. Harbison, 3217 Georgetown Pl., Birmingham, Ala.  
Filed Nov. 13, 1995, Ser. No. 556,484  
Int. Cl.<sup>6</sup> E06B 9/08

U.S. Cl. 160—121.1

11 Claims



1. Apparatus for opening and closing a portal in a structure comprising, in combination:

- a pair of spaced apart opposing channel members defining the lateral margins of said portal;
- a flexible curtain, having a length greater than the length of said lateral margins of said portal, elongated side portions, a first end and a second end each having a dimension commensurate with the separation of the channel members, with said first end being fixedly attached across said portal at an upper end thereof, said second end folded back on itself to define an upwardly opening pocket;
- an elongated roller captured within said pocket, and having opposing ends captured within said opposing channel members;
- a weighting roller supported on and separated from said elongated roller by said upturned end, and having opposing ends captured within said opposing channel members superjacent said elongated roller; and
- means for urging said upturned end along a vertical path such that said pocket is positioned at different heights.

5,566,737

## LOUVERABLE ROLLER BLIND

Gunther Erber, Ebental, Austria, assignor to Andreas Erber, Ebental, Austria

PCT No. PCT/AT93/00066, § 371 Date Aug. 3, 1994, § 102(e) Date Aug. 3, 1994, PCT Pub. No. WO93/21417, PCT Pub. Date Oct. 28, 1993

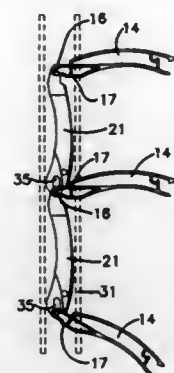
PCT Filed Apr. 20, 1993, Ser. No. 284,425

Claims priority, application Austria, Apr. 21, 1992, 812/92

Int. Cl.<sup>6</sup> E06B 9/08

U.S. Cl. 160—133

12 Claims



1. A louverable roller blind comprising: stationary guide profiles (31); pull chain elements (21, 40) connected with one another in a hinged manner via first hinge pins (16); adjusting chain elements (23, 41) connected with one another in a hinged manner via second hinge pins (30), lying in a plane; lamellar blind slats (14) guided laterally in the stationary guide profiles, and connected in a hinged manner in their upper areas with the pull chain elements (21, 40) via said first hinge pins and in their lower areas with the adjusting chain elements (23, 41); pin means (32) for connecting the adjusting chain elements (23, 41) with the lamellar blind slats (14) at the distance from said plane; and whereby the first hinge pins (16) and the second hinge pins (30) are aligned with one another in a non-louvered state of the roller blind.

5,566,738

## LOUVERED MOVABLE WINDOW SHUTTER

Hagay Yaddya, 21 Klausner Street, Kiryat-Ata, Israel

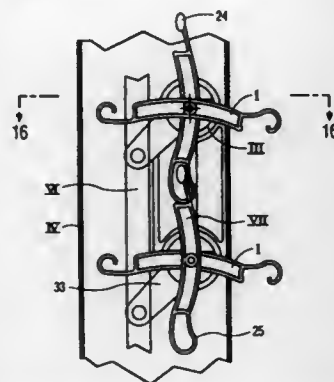
Filed May 4, 1995, Ser. No. 434,790

Claims priority, application Israel, May 15, 1994, 109652

Int. Cl.<sup>6</sup> E06B 9/08; E05D 15/06

U.S. Cl. 160—133

19 Claims



1. A roller shutter designed for louvering purposes, in combination with guide rails adapted to be mounted on sides of an opening

and a rotatable shaft adapted to be mounted on top of said opening, said shutter further comprising:

a plurality of solid slats having parallel horizontal axes, said slats being movable in an upward and a downward direction in the guide rails by being wound up or down on the rotatable shaft, each slat having an upper edge with a hook-shaped connector and a lower edge with a hook-shaped connector, the upper and the lower hook-shaped connectors having openings facing in opposite directions to effect engagement of the connectors on the upper edge of each slat with the connectors on the lower edge of the slat positioned thereabove when said slats are in position to be raised, thereby holding all slats in a solid connection while the axes of the slats are at a maximum distance from each other, and permitting disengagement of said upper and lower connectors by turning of said slats about the axes thereof, upon complete lowering of said shutter onto a lower abutment surface of the opening, while the axes of the slats are at a minimum distance from each other, and whereof each slat is provided with a flat lug at each of two ends thereof,

a plurality of rotatable rotors rotatably mountable in at least one of said guide rails at said minimum distance one above the other, each said rotor having a slot of a size permitting one said lug to slide into said slot, said rotors being aligned with said slots in a straight line, permitting said lugs to pass through all the slots during lowering or raising of said shutter, and

means for simultaneous turning of all the rotors in one direction while said shutter is in the completely lowered position, effecting said connectors to disengage and all said slats to simultaneously turn about the same angle of inclination.

5,566,739

## SEPARATION RESISTANT SLAT CONNECTIONS FOR FOLDING SHUTTERS

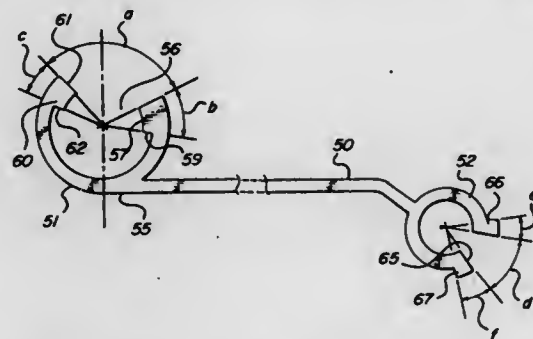
Robert E. Hoffman, 5618 Riviera Dr., Coral Gables, Fla. 33146

Filed Jul. 20, 1995, Ser. No. 504,467

Int. Cl.<sup>6</sup> E05D 15/26

U.S. Cl. 160—183

2 Claims



1. A separation resistant slat connection for accordion-type folding shutters having a number of vertically elongated, narrow, generally flat slats that are pivotally connected together along their adjacent vertical edges for extending the shutter across a building opening or folding the shutter for clearing the opening, comprising: each slat having integral, tube-like, connector formations provided upon its opposite, elongated vertical edges for pivotally interconnecting with corresponding connector formations on the next adjacent slat; one of said connector formations being an outer connector member and the other of such connector formations forming an inner connector member of a size to fit, generally co-axially, within the outer member of the next slat; each connector member having an elongated slot, extending along its entire length, with the slot in the outer member forming an opening, in cross-section, that is substantially 1/4rd of the circumference of the tube-like shaped outer member and the slot in the inner member forming an opening, in the

cross-sectional direction, that is substantially 1/4th of the circumference of the inner-tube member;

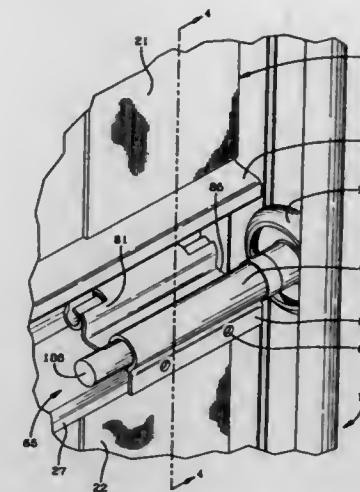
the opposite longitudinal edges which define the slot in the outer member each having an integral, radially, inwardly extending bead formed thereon each of said one edge beads formed on each outer member is narrower in the circumferential direction than the second edge bead that is formed on its respective outer member;

the opposite edges defining the slot in the inner member each having an integral, radially, outwardly extending bead; with the slat edge portion upon which the inner member is provided being formed in the shape of an integral, narrow, elongated strip, extending the full length of the slat, and extending at an obtuse angle relative to the remainder of the slat and being integrally joined with its inner member along a plane which approximately bisects the inner member and its slot;

the opposite edge portion of each slat being joined integrally to the outer member along a plane that is tangent to the outer member along a line which is slightly angularly offset from a diametrical plane which bisects the outer member and its slot; the integral narrow strip extends through the slot of its respective outer member and is pivotally moveable between the opposite edges defining the slot in its respective outer member;

the adjacent slats may be pivoted about their respective interfitted outer and inner members for extending the shutter into its covering position, at which time the adjacent slats may be arranged at approximately a 90 degree angle relative to each other with one edge bead of the outer connector member engaging said strip and with the second edge bead of the same outer member being arranged closely adjacent to one edge bead of its respective inner member to form therewith a double thickness bead reinforcement extending along the adjacent vertical edges of their slats, and with the second edge bead of the inner member being arranged within and closely adjacent to the interior surface formed within the respective outer formation near a diametrical plane which approximately bisects the roughly 90 degree angle formed by the two adjacent connected slats;

whereby the interfitted inner and outer connector members and their adjacent beads provide a structure which resists penetration of the shutter and resists separation of adjacent slats by forces resulting from a forceful impact against the shutter, and whereby the shutter is foldable to arrange the slats in close face-to-face relationship.



5,566,741

## ROLL SCREEN APPARATUS

Takeshi Ogawara; Yukinori Chisaka, and Masato Fujihara, all of Tokyo, Japan, assignors to Kabushiki Kaisha Nichibei, Tokyo, Japan

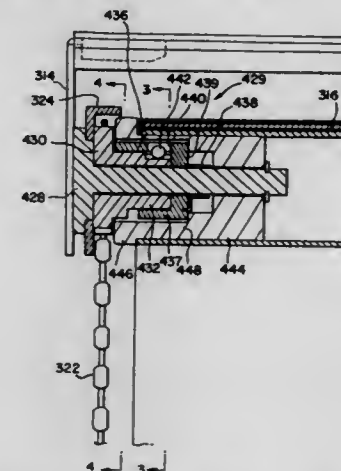
Filed May 26, 1994, Ser. No. 250,119

Claims priority, application Japan, Jun. 2, 1993, 5-156260; Jun. 16, 1993, 5-169656; Jul. 8, 1993, 5-193052; Feb. 24, 1994, 6-053079

Int. Cl.<sup>6</sup> E06B 9/56

U.S. Cl. 160—297

1 Claim



5,566,740  
SECTIONAL OVERHEAD DOOR  
Willis J. Mullet, Pensacola Beach, and Albert W. Mitchell, Pace, both of Fla., assignors to Wayne-Dalton Corp., Mt. Hope, Ohio

Division of Ser. No. 260,108, Jun. 15, 1994, Pat. No. 5,522,446. This application Apr. 18, 1995, Ser. No. 423,894

Int. Cl.<sup>6</sup> E05D 15/10

U.S. Cl. 160—229.1

10 Claims

1. A pivotal connector in combination with a sectional door comprising, at least two adjacent panels, a first hinge element having a first leaf overlying a portion of one of said adjacent panels, spaced apertures in said first leaf for receiving fasteners to attach said first leaf to said one of said adjacent panels, a generally cylindrical first knuckle at one edge of said first leaf, a through slot in said first leaf proximate to said first knuckle, a second hinge element having a second leaf overlying the other of said adjacent panels, spaced bores in said second leaf for receiving fasteners to attach said second hinge element to said other of said adjacent panels, and a generally cylindrical second knuckle at one edge of said second hinge element extending into said through slot and rotatable about said first knuckle for controlled relative pivotal motion between said first hinge element and said second hinge element, said first knuckle having raised circumferential strips for engaging said second knuckle as bearing surfaces.

1. A roll screen apparatus including a screen-winding pipe rotatably supported at both ends by opposite side plates of a frame, with an upper side of a screen being connected to the pipe for winding and unwinding, a winding spring for applying a force to the screen-winding pipe to rotate it in a direction in which the screen is wound up thereon, and a clutch device arranged to permit transmission of the rotating force of an associated pulley through an operation cord and transmit the resilient force of the winding spring, characterized in that the clutch device comprises:

- a stationary axle unrotatably mounted to the side plates;
- a plug rotatably supported relative to the stationary axle, and connected to the screen-winding pipe so as to rotate together with the pipe, wherein said pulley is rotatably fitted relative to the stationary axle;
- a rotational cylinder connectable to the pulley so as to rotate together with the pulley, but rotatable a predetermined counterwise angle;
- an engagement member for one of connecting and disconnecting between the rotational cylinder and the plug depending on the direction of rotation of the pulley relative to the rotational cylinder; and



an unidirectional clutch spring to one of engage and disengage the rotational cylinder to the stationary axle depending on the direction of rotation of the rotational cylinder.

5,566,742

# CASTING METHOD USING CORE MADE OF SYNTHETIC RESIN, CORE MADE OF SYNTHETIC RESIN, AND CAST PRODUCT

Masaru Nemoto, 1867-1, Showa-cho, Isesaki-Shi, Gunma-Ken, Japan

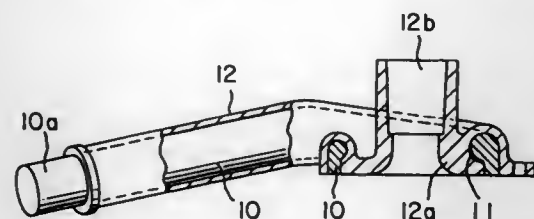
Filed Mar. 15, 1995, Ser. No. 404,431

Claims priority, application Japan, Apr. 13, 1994, 6-074995; May 12, 1994, 6-098556; Jun. 9, 1994, 6-127669; Jul. 22, 1994, 6-171181; Dec. 5, 1994, 6-300951; Dec. 5, 1994, 6-301126

Int. Cl.<sup>6</sup> B22C 9/10

U.S. Cl. 164—132

8 Claims



1. A casting method using a synthetic resin core, comprising: a step of placing the synthetic resin core in dies; a step of filling the dies in which the synthetic resin core is placed, with a molten metal; a step of cooling the molten metal in the dies to form a cast product with a projecting portion projecting from the dies, then; a step of taking the cast product and the synthetic resin core out of the dies, then; a step of heating the cast product and the synthetic resin core so that said synthetic resin core achieves a softened state; and a step of holding and pulling out the projecting portion using a clamp device so that the synthetic resin core in the softened state is drawn out of the cast product, thereby forming an inner space in the cast product.

5,566,743

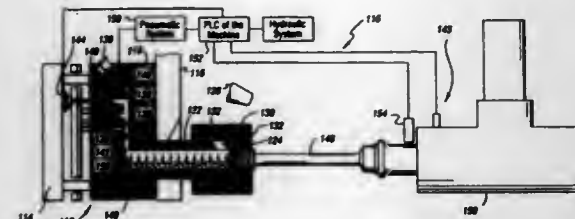
# METHOD OF INJECTING MOLTEN METAL INTO A MOLD CAVITY

Milko G. Guergov, 615 Washington #5, Monroe, Mich. 48161  
Continuation-in-part of Ser. No. 236,471, May 2, 1994, Pat. No. 5,441,680. This application Jan. 10, 1995, Ser. No. 370,602

Int. Cl.<sup>6</sup> B22D 17/32

U.S. Cl. 164—457

5 Claims



1. A method of injecting molten metal from a melt holder into a mold cavity defined within a mold in a metal casting apparatus, comprising: supplying pressurized gas to the mold cavity and melt holder to pressurize gas in the cavity and molten metal in the melt holder prior to injection;

generating a melt pressure in the molten metal sufficient to inject the molten metal into the cavity after the gas in the cavity is pressurized; monitoring the melt pressure and the pressure of gas in the cavity as the melt moves from the melt holder into the mold cavity; and providing a closed loop controller to maintain a predetermined controllable pressure difference between the melt pressure and the pressure of gas in the cavity throughout a substantial portion of a period of time during which molten metal is being injected into the cavity to fill the cavity.

5,566,744

# APPARATUS AND METHOD TO ENSURE HEAT TRANSFER TO AND FROM AN ENTIRE SUBSTRATE DURING SEMICONDUCTOR PROCESSING

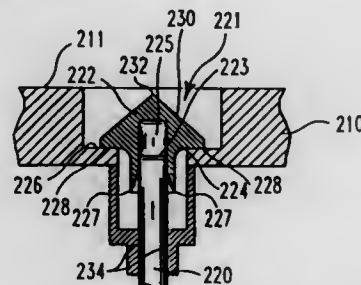
Avi Tepman, Cupertino, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 300,274, Sep. 2, 1994, abandoned, which is a continuation of Ser. No. 58,855, May 5, 1993, Pat. No. 5,366,002. This application Dec. 12, 1995, Ser. No. 570,803

Int. Cl.<sup>6</sup> H01L 21/00

U.S. Cl. 165—80.1

14 Claims



5. A lift finger useful in combination with a substrate support platform used in the processing of semiconductor substrates, comprising:
  - a) a lift finger pin member having a smooth outer surface; and
  - b) a lift finger sealing cover which is slidably disposed upon said lift finger pin member, wherein an upper surface of said lift finger sealing cover is capable of contacting a substrate to be processed, and a lower surface of said lift finger sealing cover is capable of making contact with a surface on an underlying support platform during semiconductor processing, and wherein said lift finger sealing cover functions in combination with said lift finger pin member in a manner which is self-adjusting, whereby a continuous contact with said underlying support platform is ensured.
12. A method useful in obtaining even and repeatable heat transfer over essentially an entire substrate used in a semiconductor process, said method comprising the steps of:
  - a) providing a support platform upon which a substrate to be processed is positioned;
  - b) attaching said substrate to said support platform;
  - c) causing a build up of heat transfer fluid between said substrate and said support platform;
  - d) controlling the leakage of heat transfer fluid from between said substrate and said support platform using a continuous, platform fluid flow barrier, wherein said platform fluid flow barrier is in continuous contact with both said support platform and said substrate to be processed; and
  - e) providing a means for preventing fluid flow through at least one opening on the surface in said support platform through which at least one lift finger is operated, wherein said means for preventing flow of said heat transfer fluid through said lift finger opening comprises a lift finger sealing cover which contacts a surface upon said support platform in a manner which creates a barrier to the flow of fluid through said at least one lift finger opening.

5,566,745

# SHUTTERED RADIATOR SYSTEM WITH CONTROL

James A. Hill, Pittsfield; Gregory A. Marsh, Erie, and Myron L. Smith, Fairview, all of Pa., assignors to General Electric Company, Erie, Pa.

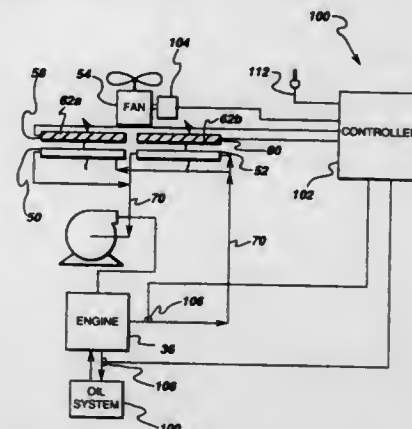
Continuation of Ser. No. 60,108, May 10, 1993, abandoned.

This application Jan. 23, 1995, Ser. No. 376,633

Int. Cl.<sup>6</sup> F01P 7/02; 7/10

U.S. Cl. 165—299

9 Claims



1. A radiator assembly for an engine having a cooling water system for circulating cooling water through the engine to operatively control the temperature of the engine, the assembly including:
  - a radiator in fluid communication with the cooling system;
  - a fan means, including a motor for driving said fan means, for selectively drawing air through the radiator and into the inlet of the fan means;
  - a shutter means for selectively controlling the drawn air flow through the radiator;
  - a motor shield for shielding the motor from relatively hot air exiting from the shutter means;
  - air ducts situated about the motor for supplying relatively cool air to cool the motor; and
  - control means comprising an engine control computer responsive to a water temperature sensor, an ambient air temperature sensor and an oil temperature sensor, the control means being operatively attached to the shutter means for actuating the shutter means to control the drawn air flow in dependence on a determined control temperature, the control means including means operatively attached to the fan means for selecting and setting the speed of the fan means in dependence on the determined control temperature.

5,566,746

# OIL COOLING APPARATUS

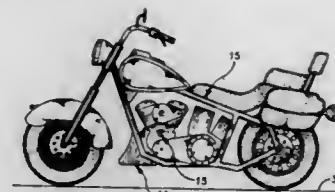
Anthony E. Reise, 17 Thurston Ave., Portsmouth, R.I. 02871  
Filed Nov. 7, 1994, Ser. No. 335,094

Int. Cl.<sup>6</sup> F01P 11/08

U.S. Cl. 165—41

18 Claims

1. An oil cooling apparatus for cooling oil contained in a motorcycle engine of a motorcycle, said apparatus comprising:
  - a housing having an interior defined by a front wall, a bottom wall extending rearwardly from the front wall, and a pair of spaced apart side walls which attach respective sides of the front and bottom walls, said housing further having an opening for accessing the interior of the housing, a plurality of inlet louvers formed in the front wall and a plurality of outlet louvers formed in the bottom wall, wherein air enters the interior of the housing via the inlet louvers and exits the interior of the housing via the outlet louvers;
  - means for mounting said housing on an engine of a motorcycle in a position such that the opening of the housing generally faces the engine; and



means for cooling oil contained within the engine of the motorcycle comprising tubing in fluid communication with the engine whereby oil flows therethrough, and radiator means, disposed within said housing, for removing heat from the tubing, said tubing being disposed within said radiator means, wherein air, due to the flow of air into the housing via the inlet louvers and out of the housing via the outlet louvers, circulates within the interior of the housing around said radiator means for removing heat from said radiator means thereby cooling the oil flowing through the tubing.

5,566,747

# METHOD OF COOLING A COIL

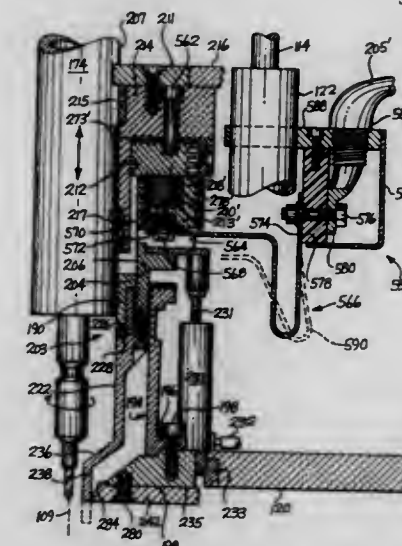
Gregory C. Givier, and Gregory L. Clark, both of Issaquah, Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 812,514, Mar. 27, 1992, Pat. No. 5,203,855, which is a division of Ser. No. 632,445, Dec. 21, 1990, abandoned. This application Dec. 23, 1992, Ser. No. 996,809

Int. Cl.<sup>6</sup> H01F 5/00; 7/08; 7/20; 7/16

U.S. Cl. 165—47

4 Claims



1. A method for cooling a coil of an electromagnetic riveting machine, having a thick copper transducer positioned adjacent to said coil for induction of eddy currents and a repelling magnetic force, comprising:

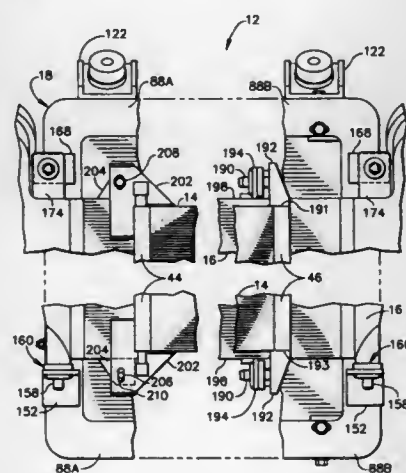
allowing said transducer to separate from said coil during energization thereof;  
 maintaining contact between said transducer and said coil for sufficient time to cause substantial heat transfer from said coil to said transducer; and  
 directing a flow of cooling fluid around said transducer to transfer heat from said transducer to said fluid and hence out of said machine.

**5,566,748**  
**CHARGE AIR COOLER/CONDENSER SUB-ASSEMBLY FOR USE IN A MOTOR VEHICLE**  
 Steven S. Christensen, Fremont, Calif., assignor to AlliedSignal Inc., Morris Township, N.J.

Filed Nov. 13, 1995, Ser. No. 554,959  
 Int. Cl.<sup>6</sup> F28F 9/00

U.S. Cl. 165—67

7 Claims

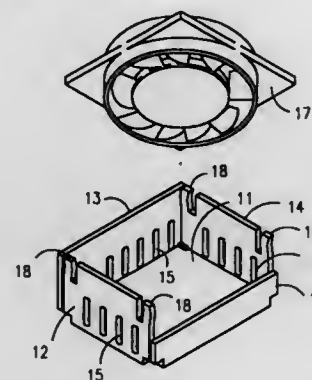


1. A cooling system sub-assembly for use in a motor vehicle, comprising:
  - a charge air cooler mountable to a support structure attached to a chassis of the motor vehicle;
  - a condenser mounted to said charge air cooler so as to accommodate at least differential thermal growth between said condenser and said charge air cooler and so as to dispose said condenser in series flow relationship with said charge air cooler, wherein said condenser includes a core and first and second lateral end portions attached to opposite lateral ends of said core;
  - a pair of vertically spaced generally horizontally extending pins extending substantially in the direction of said differential thermal growth connected to said first lateral end portion of said condenser;
  - a pair of vertically spaced pin-receiving mount means attached to said charge air cooler, wherein each of said mount means includes a hole formed therein which is aligned with one of said pins;
  - a pair of compressible grommet assemblies, wherein one of said compressible grommet assemblies is disposed within said hole formed in one of said mount means;
  - wherein each of said pins is inserted through one of said grommet assemblies.

**5,566,749**  
**STAMPED AND FORMED HEAT SINK**  
 William D. Jordan, Dallas, and Matthew C. Smithers, Lewisville, both of Tex., assignors to Thermalloy, Inc., Dallas, Tex.  
 Continuation of Ser. No. 226,632, Apr. 12, 1994, abandoned.  
 This application Oct. 10, 1995, Ser. No. 544,060  
 Int. Cl.<sup>6</sup> F28F 7/00; 13/12

U.S. Cl. 165—80.3

10 Claims

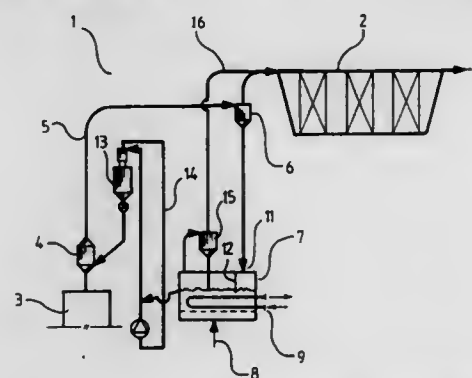


1. A heat sink for use with a fan to cool an electronic device comprising:
  - a thermally conductive sheet body forming a base having a face for attachment to said electronic device;
  - heat dissipation elements bent from said sheet body and extending from opposed edges of said base perpendicular to said base;
  - openings stamped in said heat dissipation elements for the flow of air into said body;
  - said heat dissipating elements being spaced for an interference fit with said fan, said fan being snapped into said heat dissipating elements; and
  - detents formed by slots in said heat dissipating elements, said detents snapping over said fan when said fan is inserted into said heat sink apparatus.

**5,566,750**  
**METHOD AND APPARATUS FOR COOLING HOT GASES**  
 Olli E. Arpalahti, Varkaus; Ossi Ikonen, Pieksämäki, and Arto Jäntti, Joroinen, all of Finland, assignors to Foster Wheeler Energia Oy, Helsinki, Finland  
 Filed Jun. 20, 1995, Ser. No. 436,207  
 Claims priority, application Finland, Nov. 16, 1992, 925185  
 Int. Cl.<sup>6</sup> F28D 13/00

U.S. Cl. 165—104.16

20 Claims



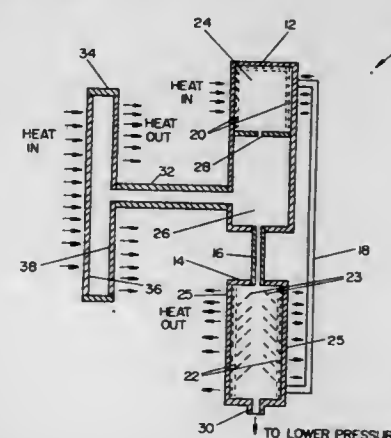
12. Apparatus for cooling exhaust gases from a vertical shaft, of a molten phase furnace, comprising:
  - a mixing chamber connected to the vertical shaft, above the furnace;
  - means for introducing cooled particles into said mixing chamber to be mixed with exhaust gases therein;

a non-liquid-cooled conduit extending upwardly from said mixing chamber;  
 a fluidized bed of particles with heat recovery means for recovering heat from particles in said fluidized bed while simultaneously cooling the particles;  
 said fluidized bed connected to said means for introducing cooled particles into said mixing chamber;  
 a separator connected to said non-cooled conduit for separating particles from gases introduced into said separator from said mixing chamber, and passing the particles in a first path to said fluidized bed, while passing gases in a second path; and  
 a second stage heat recovery boiler connected to said second path.

**5,566,751**  
**VENTED VAPOR SOURCE**  
 William G. Anderson; Kevin H. Richardson, both of Lancaster, and Scott D. Garner, Lititz, all of Pa., assignors to Thermalcore, Inc., Lancaster, Pa.  
 Filed May 22, 1995, Ser. No. 446,502  
 Int. Cl.<sup>6</sup> F28D 15/00

U.S. Cl. 165—104.27

6 Claims

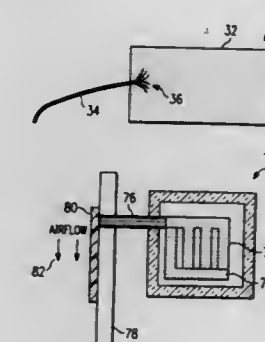


1. A vapor source which generates vapor and removes non-condensable gases from the vapor, comprising:
  - an evaporator chamber;
  - an evaporating wick structure located within the evaporator chamber and subjected to heat;
  - a venting chamber;
  - a condensing wick located within the venting chamber so that the condensing wick transfers heat to a cooled portion of the venting chamber;
  - vapor flow means interconnecting the evaporator chamber and the venting chamber so that vapor generated at the evaporating wick moves to the condensing wick;
  - capillary means interconnecting the condensing wick and the evaporator wick so that liquid condensed at the condensing wick is transported to the evaporating wick;
  - liquid located within the evaporator chamber so that the liquid is vaporized by the heat to which the evaporator wick is subjected and condensed at the condensing wick; and
  - open vent means interconnecting the venting chamber to a region of lower pressure than the pressure which exists within the venting chamber, so that non-condensable gases within the venting chamber are removed from the venting chamber.

**5,566,752**  
**HIGH HEAT DENSITY TRANSFER DEVICE**  
 Judson V. Arnold, Bedford; James R. Peoples, Burleson, and Elbert L. McKague, Fort Worth, all of Tex., assignors to Lockheed Fort Worth Company, Fort Worth, Tex.  
 Filed Oct. 20, 1994, Ser. No. 326,650  
 Int. Cl.<sup>6</sup> F28F 7/00; F28D 15/02

U.S. Cl. 165—185

13 Claims

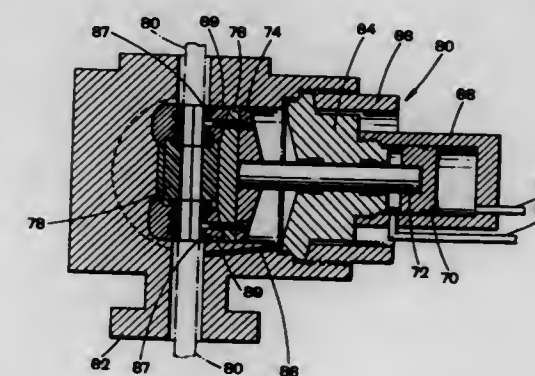


1. A heat transfer device for dissipating and removing heat energy from a heat source and delivering the heat energy to a heat sink, comprising:
  - a diamond substrate for receiving the heat energy from the heat source;
  - an interconnect point for connecting to said diamond substrate for receiving the heat energy from said diamond substrate; and
  - a fiber fused to said diamond substrate at said interconnect point for receiving the heat energy from said diamond substrate and conducting the heat energy to the heat sink.

**5,566,753**  
**STRIPPER/PACKER**  
 D. W. Van Winkle, Houston, and Bobby G. Hurst, Beaumont, both of Tex., assignors to Drexel Oil Field Services, Inc., Conroe, Tex.  
 Filed Jun. 7, 1995, Ser. No. 474,393  
 Int. Cl.<sup>6</sup> E21B 33/02; 33/08

U.S. Cl. 166—84.1

8 Claims

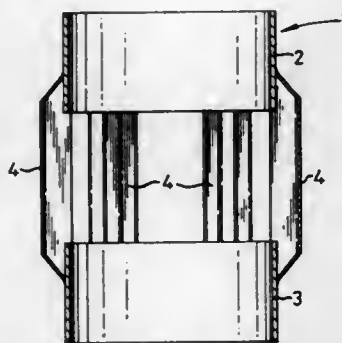


1. A stripper/packer comprising:
  - a. a housing with a bore extending through the housing;
  - b. a chamber extending laterally of the bore in the housing and communicating with the bore;
  - c. a packer element within the chamber; and
  - d. a horizontally oriented actuator in contact with the packer element to compress the packer element, the actuator comprising:
    - i. a horizontally oriented rod;
    - ii. a prime mover coupled to a first end of the rod; and



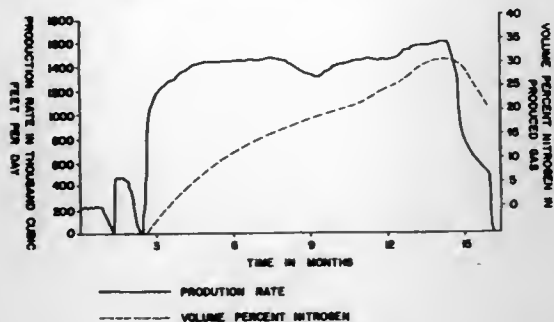
- iii. a pressure transmitter on a second end of the rod, the pressure transmitter in abutting contact with the packer element, the pressure transmitter comprising:  
a pusher plate coupled to the second end of the rod; and  
a polymeric energizer between the pusher plate and the packer element.

**5,566,754**  
**CENTRALISERS**  
Arnold Stokka, Sandnes, Norway, assignor to Weatherford/Lamb, Inc., Houston, Tex.  
Filed Feb. 14, 1995, Ser. No. 388,603  
Claims priority, application United Kingdom, Sep. 24, 1994, 9419313  
Int. Cl.<sup>6</sup> E21B 17/10  
U.S. Cl. 166—241.6  
12 Claims



1. A centraliser which comprises a first member which can be mounted around a length of casing, a second member which can be mounted around said casing, and at least one rigid member which extends between said first member and said second member, said rigid member being substantially irreversibly collapsible against said casing when subjected to a lateral load of from 5 to 30 tonnes.

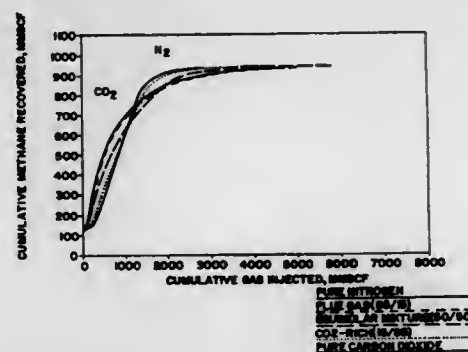
**5,566,755**  
**METHOD FOR RECOVERING METHANE FROM A SOLID CARBONACEOUS SUBTERRANEAN FORMATION**  
John P. Seidle; Dan Yee, both of Tulsa, Okla., and Rajen Puri, Aurora, Colo., assignors to Amoco Corporation, Chicago, Ill.  
Continuation-in-part of Ser. No. 147,111, Nov. 3, 1993, Pat. No. 5,388,642, and Ser. No. 147,125, Nov. 3, 1993, Pat. No. 5,388,643, and Ser. No. 147,122, Nov. 3, 1993, Pat. No. 5,388,641, and Ser. No. 147,121, Nov. 3, 1993, Pat. No. 5,388,640, and Ser. No. 146,920, Nov. 3, 1993, Pat. No. 5,388,645. This application Feb. 13, 1995, Ser. No. 387,258  
Int. Cl.<sup>6</sup> E21B 43/18  
U.S. Cl. 166—263  
11 Claims



1. A method for recovering methane from a solid carbonaceous subterranean formation having a production well in fluid communication with the formation and an injection well in fluid communication with the formation, the method comprising the steps of:

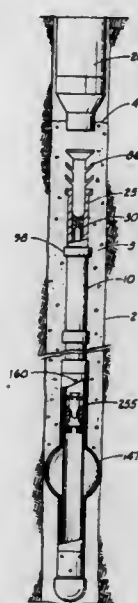
- a) processing a gaseous fluid containing at least 60 volume percent nitrogen and at least 15 volume percent oxygen through a cryogenic separator to produce an oxygen-depleted effluent;  
b) injecting the oxygen-depleted effluent into the formation through the injection well at a rate of from about 300,000 standard cubic feet per day to about 1,500,000 standard cubic feet per day, the injection well having a well spacing of from about 1,000 feet to about 5,000 feet from the production well;  
c) thereafter suspending injection of the oxygen-depleted effluent into the formation;  
d) recovering a first methane-containing gaseous mixture from the formation through the production well during at least a portion of injection step b), the first methane-containing gaseous mixture having a first methane-desorbing gas volume percent; and  
e) recovering a second methane-containing gaseous mixture from the formation through the production well after performing suspending step c), the second methane-containing gaseous mixture having a second methane-desorbing gas volume percent less than the first methane-desorbing gas volume percent.

**5,566,756**  
**METHOD FOR RECOVERING METHANE FROM A SOLID CARBONACEOUS SUBTERRANEAN FORMATION**  
Joseph J. Chaback; Dan Yee, both of Tulsa, Okla.; Richard F. Volz, Jr., Littleton, Colo.; John P. Seidle, Tulsa, Okla., and Rajen Puri, Aurora, Colo., assignors to Amoco Corporation, Chicago, Ill.  
Continuation of Ser. No. 222,743, Apr. 1, 1994, Pat. No. 5,439,054. This application Aug. 7, 1995, Ser. No. 511,963  
Int. Cl.<sup>6</sup> E21B 43/16  
U.S. Cl. 166—263  
20 Claims



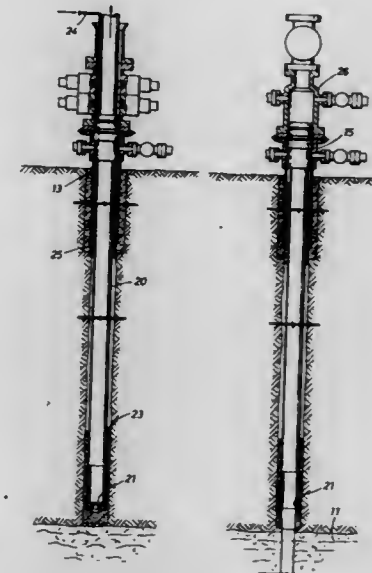
1. A method for recovering methane from a solid carbonaceous subterranean formation penetrated by an injection well and a production well, the method comprising the steps of:  
a) injecting a desorbing gaseous fluid comprising a weaker adsorbing fluid component and a stronger adsorbing fluid component into the formation through the injection well;  
b) recovering an effluent comprising methane through the production well; and  
c) subsequent to step a), injecting a liquid into the formation through the injection well.

**5,566,757**  
**METHOD AND APPARATUS FOR SETTING SIDETRACK PLUGS IN OPEN OR CASED WELL BORES**  
Robert B. Carpenter, Allen, Tex.; Anthony M. Badalamenti, Lafayette, La.; Jerry L. Logan, Katy, Tex., and David F. Laurel, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.  
Filed Mar. 23, 1995, Ser. No. 409,379  
Int. Cl.<sup>6</sup> E21B 33/134  
U.S. Cl. 166—285  
37 Claims



1. An apparatus for setting sidetrack plugs in a well bore comprising:  
a tail pipe releasably attached to a tubing string;  
an inflation packer assembly attached to said tail pipe, said inflation packer comprising:  
a substantially cylindrical packer mandrel having a central flow passage defined therethrough;  
a substantially cylindrical packer body disposed about said packer mandrel, said packer body comprising an inflatable packer bladder;  
inflation passage means for communicating inflation fluid to said packer bladder, said inflation passage means comprising:  
a passageway defined between said packer body and said packer mandrel; and  
an inflation port disposed through said packer mandrel, so that said central flow passage is communicated with said passageway; and  
circulation means for communicating said central flow passage with said well bore operably associated with said packer bladder, so that a cementitious fluid pumped through said central flow passage is communicated with said well bore above said packer bladder after said packer bladder reaches a maximum inflation pressure, thereby forming said sidetrack plug; and  
an inflation port opening sleeve disposed in said packer mandrel and releasably attached thereto, said opening sleeve being operably associated with said inflation port so that said open sleeve initially prevents flow through said inflation port, said sleeve being adapted to release from said mandrel after a predetermined pressure is placed on said sleeve, thereby opening said inflation port and communicating said port with said passageway.

**5,566,758**  
**METHOD AND APPARATUS FOR DRILLING WELLS IN TO GEOTHERMAL FORMATIONS**  
Buford G. Forester, 8619 Pine Pl., Humble, Tex. 77364  
Filed Jun. 7, 1995, Ser. No. 483,714  
Int. Cl.<sup>6</sup> E21B 33/14  
U.S. Cl. 166—285  
14 Claims



1. A method of drilling a well into a geothermal zone wherein the method comprises the steps of:  
(a) drilling a well borehole toward a desired geothermal zone wherein the drilling stops short of the geothermal zone;  
(b) positioning a casing string in the drilled well extending from the top of the well substantially to the bottom of the well;  
(c) cementing a bottom portion of the casing string in the well borehole;  
(d) applying tension to the casing string above the bottom-cemented portion; and  
(e) anchoring the top end of the casing string at or near the surface.

**5,566,759**  
**METHOD OF DEGRADING CELLULOSE-CONTAINING FLUIDS DURING COMPLETIONS, WORKOVER AND FRACTURING OPERATIONS OF OIL AND GAS WELLS**  
Robert M. Tjon-Joe-Pin, and Brian B. Beall, both of Houston, Tex., assignors to BJ Services Co., Houston, Tex.  
Filed Jan. 9, 1995, Ser. No. 370,075  
Int. Cl.<sup>6</sup> E21B 43/25; 43/26  
U.S. Cl. 166—300  
22 Claims

1. A method of reducing the viscosity of a cellulose-containing fluid used during workover, fracturing or completion operations and found within a subterranean formation which surrounds a completed wellbore comprising the steps of:  
formulating the cellulose-containing fluid by blending together an aqueous fluid, a cellulose-containing hydratable polymer, and an enzyme system;  
pumping the cellulose-containing fluid to a desired location within the wellbore;  
allowing the enzyme treatment to degrade the polymer, whereby the fluid can be removed from the subterranean formation to the well surface; and  
wherein the enzyme treatment has activity in the pH range of about 9 to about 11 and effectively attacks  $\beta$ -D-glucosidic linkages in the hydratable polymer.

5,566,760

# METHOD OF USING A FOAMED FRACTURING FLUID

Phillip C. Harris, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 2, 1994, Ser. No. 300,604

Int. Cl.<sup>6</sup> E21B 43/26

U.S. Cl. 166—308

9 Claims

1. A method for fracturing subterranean formations penetrated by a wellbore comprising the step of:

pumping a foamed fracture fluid down the wellbore at a pressure and rate of flow sufficient to fracture the subterranean formation wherein the foamed fracture fluid comprises an aqueous phase, a gaseous phase and a proppant, wherein the aqueous phase comprises:

- (a) an associated polymer selected from the group consisting of hydrophobically modified guar and hydrophobically modified hydroxymethylcellulose; and
- (b) a surfactant.

5,566,761

# INTERNAL DRILLING RISER TIEBACK

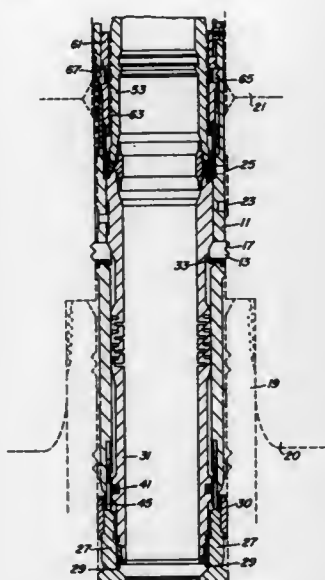
Joseph W. Pallini, Jr., Tomball, and Rockford D. Lyle, Pinehurst, both of Tex., assignors to ABB Vetco Gray, Inc., Houston, Tex.

Filed Jun. 30, 1995, Ser. No. 497,306

Int. Cl.<sup>6</sup> E21B 33/038

U.S. Cl. 166—345

21 Claims



1. A tieback apparatus for connecting to a subsea wellhead assembly a tieback string of casing lowered from a platform at the surface, the subsea wellhead assembly having an internal locking profile and a casing hanger therein having an internal sealing surface, the tieback apparatus comprising in combination:

- a housing;
- a sub carried within the housing and having a lower end containing a seal for sealingly engaging the internal sealing surface of the casing hanger when in a landed position, the sub having an upper end for connecting to the tieback string;
- a housing locking element carried by, the housing for locking the housing to the internal locking profile of the subsea wellhead assembly, the housing locking element being movable relative to the housing between a retracted position and an engaged position;
- retaining means for carrying the sub in an upper position relative to the housing while the tieback apparatus is being lowered into the subsea wellhead assembly;
- release means for releasing the retaining means in response to the housing landing in the subsea wellhead assembly, allow-

ing the sub to move downward to the landed position in sealing engagement with the internal seal surface; and a cam surface on the sub which moves the housing locking element to the engaged position in engagement with the internal locking profile as the sub moves downward to the landed position.

19. A method of connecting to a subsea wellhead assembly a tieback string of casing lowered from a platform at the surface, the subsea wellhead assembly having an internal locking profile and a casing hanger therein having an internal sealing surface, the method comprising:

- mounting a housing locking element to a housing;
- mounting a lower sub portion within the housing which has a lower end containing a seal and a cam;
- rotatably mounting an upper sub portion to the lower sub portion, the upper sub portion having a set of external threads which engage internal threads located in the housing;
- connecting the upper sub portion to the tieback string;
- lowering the housing and upper and lower sub portions into the well while retaining the lower sub portion in an upper position relative to the housing;
- when the housing lands in the subsea wellhead assembly, releasing the lower sub portion to move downward to a landed position with the seal in sealing engagement with the internal seal surface;
- the downward movement of the lower sub portion causing the cam to move the housing locking element to an engaged position in engagement with the internal locking profile; then rotating the upper sub portion relative to the lower sub portion, the rotation of the threads relative to each other forcing the upper sub portion and lower sub downward relative to the locking element to a preload position in which the locking element exerts an upward preload force on the profile in the housing.

5,566,762

# THRU TUBING TOOL AND METHOD

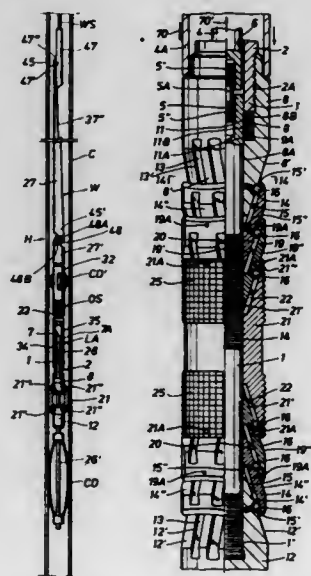
Britt O. Braddick, and Allen K. Rives, both of Houston, Tex., assignors to TIW Corporation, Houston, Tex.

Filed Apr. 6, 1994, Ser. No. 223,704

Int. Cl.<sup>6</sup> E21B 23/00; 7/08

U.S. Cl. 166—382

95 Claims



1. Apparatus for connecting with a setting tool to move through smaller diameter tubing for securing in a larger diameter tubular member in which the tubing extends, the assembly comprising: an expandable anchor for moving through the smaller diameter tubing to a position in the larger diameter tubular member, the expandable anchor including a mandrel having an upper end

and a lower end, a bottom expander secured with said mandrel, and a top expander releasably secured with said mandrel; said top expander and said bottom expander each having a plurality of inclined external uniform curved peripheral surfaces which slope outwardly that have a continuous curvature throughout each of said plurality of inclined external peripheral surfaces;

each of said external uniform curved peripheral surfaces of said top expander having an inner upper expander connected therewith by an upper limit pin which enables limited relative movement between said inner upper expander and said external uniform curved peripheral surface with which it is connected;

each of said external uniform curved peripheral surfaces of said bottom expander having an inner lower expander connected therewith by a lower limit pin which enables limited relative movement between said inner lower expander and said external uniform curved peripheral surface with which it is connected;

said inner upper expander and said inner lower expander each having an inclined internal uniform curved surface which conforms with the contiguous external curved surface on said top expander and said bottom expander, respectively, with which said inner upper expander and said inner lower expander is connected, respectively;

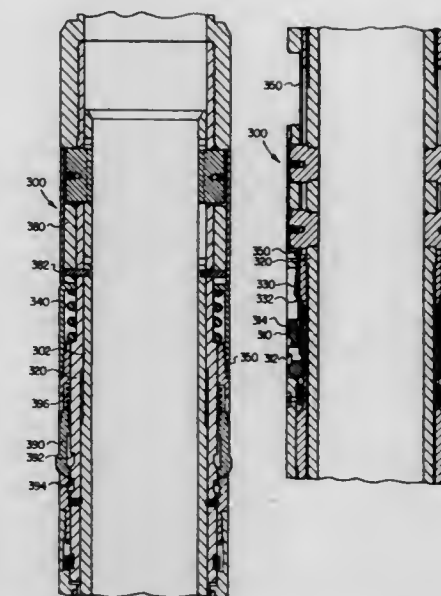
said inner upper expander and said inner lower expander each having an inclined external uniform curved surface;

an outer upper expander and an outer lower expander each positioned in an outwardly inclined and overlapped contiguous relationship with said inner upper expander and inner lower expander, respectively, on said top expander and said bottom expander, respectively;

said outer upper expander and said outer lower expander each having an inclined internal uniform curved surface which conforms with said external curved surface of said inner upper expander and said inner lower expander with which said outer upper expander and said outer lower expander engages, respectively;

said outer upper expander and said outer lower expander each having an outwardly inclined external uniform curved surface; and

a plurality of upper slips and a plurality of lower slips releasably secured with and extending between said outer upper expander and said outer lower expander, respectively.



main well flow conductor, said bushing window protecting a periphery of said main well flow conductor window from contact with said tool; and an anchoring structure coupled to said tubular member for fixing said tubular member at a predetermined location and orientation within said main well flow conductor.

5,566,764

# IMPROVED COIL TUBING INJECTOR UNIT

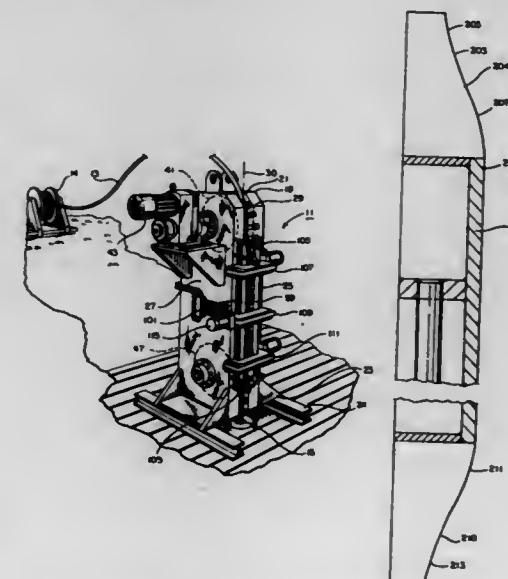
Tom Elliston, 1401 Westover La., Fort Worth, Tex. 76107

Filed Jun. 16, 1995, Ser. No. 458,228

Int. Cl.<sup>6</sup> E21B 19/22

U.S. Cl. 166—385

11 Claims



1. A coil tubing injector unit for injecting tubing into a well bore having a vertical well axis, the coil tubing injector unit comprising: a main injector frame positionable adjacent the well bore, the main injector frame having a top, a bottom and opposing vertical sides, a selected one of the opposing vertical sides having a longitudinal opening formed therein which defines a vertical run for the injector unit, the vertical run defining a central vertical axis for the injector unit which is alignable with the well bore vertical axis;

5,566,763

# DECENTRALIZING, CENTRALIZING, LOCATING AND ORIENTING SUBSYSTEMS AND METHODS FOR SUBTERRANEAN MULTILATERAL WELL DRILLING AND COMPLETION

Jimmie R. Williamson; John C. Gano, both of Carrollton, and David L. Reising, Irving, all of Tex., assignors to Halliburton Company, Dallas, Tex.

Division of Ser. No. 380,768, Jan. 30, 1995, which is a continuation-in-part of Ser. No. 296,941, Aug. 26, 1994. This application Jun. 8, 1995, Ser. No. 488,586

Int. Cl.<sup>6</sup> E21B 33/10

U.S. Cl. 166—382

41 Claims

1. A guide bushing for use proximate a junction between a main well flow conductor and a lateral wellbore, said guide bushing comprising:

- a tubular member having a predetermined inner diameter less than that of said main well flow conductor and an outer diameter sufficient substantially to centralize said guide bushing within said main well flow conductor, said tubular member having a bushing window defined in a sidewall thereof, said bushing window having a defined height thereof coaxial with and along a length of said tubular member, said guide bushing locatable proximate said junction, said bushing window registerable with a main well flow conductor window, said guide bushing centralizing a tool having a diameter less than said predetermined inner diameter with respect to said



a plurality of gripper block assemblies carried on the main injector frame, each of the gripper block assemblies including a pair of plier-like halves which are pivotable between an open position and a closed, gripping position as the assemblies enter the vertical run, whereby the plier halves grip a selected length of tubing fed into the main injector frame along the central vertical axis of the injector unit in order to inject the tubing into the well bore;

drive means located on the main injector frame for driving the gripper block assemblies within the main injector frame; and wherein the vertical run is defined by opposing vertical rails which are spaced apart a selected distance for frictionally engaging the gripper block assemblies as the assemblies enter the vertical run, each opposing vertical rail having an upper tapered surface which is shaped as a linear accelerator ramp in order to minimize loading on the gripper block assemblies as they enter the vertical run and reduce noise during operation of the injector unit, the upper tapered surface which is shaped as a linear accelerator ramp being defined by an outermost extent which is concave in profile, the outermost extent of each tapered surface joining an innermost extent which assumes a convex profile, the innermost extent joining a vertical planar surface which extends downwardly in the direction of the well bore vertical axis.

5,566,765

## HORSESHOE

Eugene D. Ovnick, Columbia Falls, Mont., assignor to World Wide Horseshoes, Inc., Whitefish, Mont.

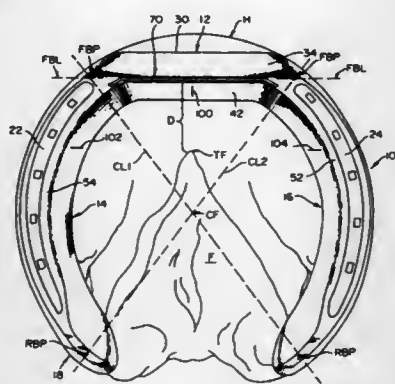
PCT No. PCT/US93/02573, § 371 Date May 31, 1995, § 102(e) Date May 31, 1995, PCT Pub. No. WO94/21113, PCT Pub. Date Sep. 29, 1994

PCT Filed Mar. 22, 1993, Ser. No. 193,013

Int. Cl.<sup>6</sup> A01L 1/04

U.S. Cl. 168—4

11 Claims



1. Horseshoe device for attachment to a horse's hoof, comprising:

(a) a generally U-shaped body made of substantially solid material and having a toe portion and a pair of arcuate branch portions with heel areas at the ends thereof, said toe portion transitioning into branch portions at the forward end of said body, said body having a top, substantially planar side for contacting a horse's hoof and including fullering grooves within said branch portions and nail holes therein for attaching said body to said hoof;

(b) said toe portion being extended between said branch portions to provide a front edge sloped rearwardly and downwardly that extends across said toe portion and transitions into outer side edge surfaces of said branch portions and further having an inside edge sloped forwardly and downwardly that extends across said toe portion and transitions into inner side edge surfaces of said branch portions, the toe portion front and inside edges defining a lower bottom edge between them that extends across said toe portion, said lower bottom edge of said toe portion having a relatively narrow width extended

across said toe portion and having enlarged front bearing areas at the ends thereof in the regions where said toe portion transitions into said branch portions, said enlarged front bearing areas of said lower bottom edge of said toe portion having the lowest elevation of said toe portion and including front bearing points for the body whereby said front bearing points define a front bearing line for said body extending across said toe portion with said fullering grooves located rearwardly of said front bearing points.

5,566,766

## METHOD FOR EXTINGUISHING TANK FIRES

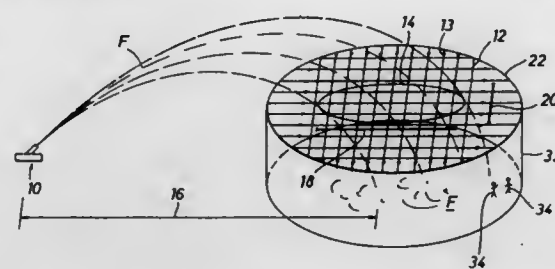
Dwight Williams, Vidor, Tex., assignor to Williams Fire And Hazard Control, Inc., Mauriceville, Tex.

Filed Apr. 24, 1995, Ser. No. 427,360

Int. Cl.<sup>6</sup> A62C 3/06

U.S. Cl. 169—43

3 Claims



1. A method for assisting in extinguishing flammable and combustible liquid tank fire using foam, comprising: empirically determining a footprint for a plurality of nozzles; and configuring one or more nozzles with respect to a tank such that predicted nozzle footprint and predicted foam run would cover a tank surface with foam.

5,566,767

## FLEXIBLE TOOTH WITH INTERCHANGEABLE ELEMENTS FOR A PLOUGHING APPARATUS

Jean Dubreuil, Ambert; Gerard Dubreuil, Saint-Etienne, and Joseph Masson, Saint Chamond, all of France, assignors to Manufacture De Ressorts De Terrenoire, Saint Etienne, France

PCT No. PCT/FR94/00272, § 371 Date Jul. 17, 1995, § 102(e) Date Jul. 17, 1995, PCT Pub. No. WO94/21105, PCT Pub. Date Sep. 29, 1994

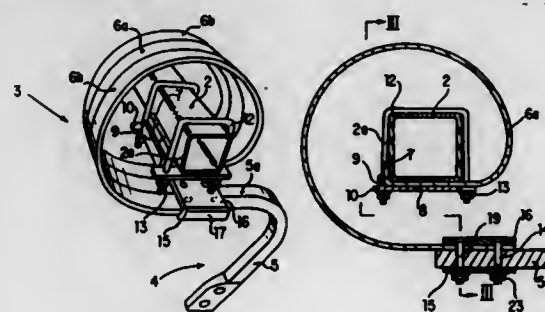
PCT Filed Mar. 14, 1994, Ser. No. 397,110

Claims priority, application France, Mar. 15, 1993, 93 03232

Int. Cl.<sup>6</sup> A01B 35/24

U.S. Cl. 172—708

19 Claims



1. A flexible tooth for a tilling implement, comprising: a plurality of flexible "c" shaped blades, the plurality of blades being mounted side by side so that longitudinal sides of the

blades are adjacent one another, the plurality of blades having first ends that are attachable to a cross member of a tilling implement;

a curved arm having a first end that is attachable to second ends of the plurality of blades and a second end that is attachable to a replaceable tool;

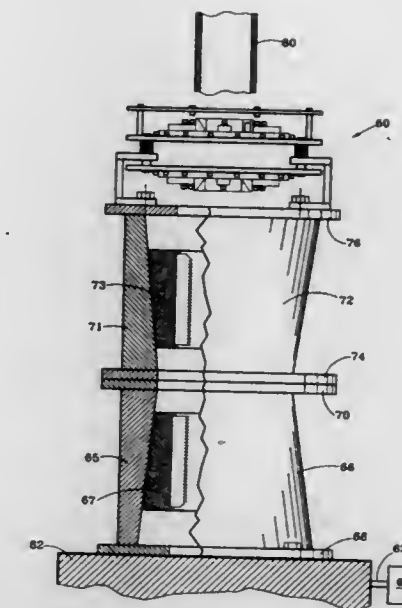
a first connecting device for connecting the first ends of the plurality of blades to the cross member of the tilling implement; and

a second connecting device for connecting the second ends of the plurality of blades to the first end of the curved arm, the second connecting device comprising:

a U-shaped body having a channel for receiving the first end of the curved arm and having legs for receiving and surrounding the second ends of the plurality of blades,

a tightening plate that is insertable between the legs of the U-shaped body so that the second ends of the plurality of blades are interposed between the tightening plate and the U-shaped body, and

at least one bolt that is passable through the tightening plate, at least one of the plurality of blades, the first end of the curved arm, and the U-shaped body to attach the second ends of the plurality of blades to the first end of the curved arm.



5,566,768

## DRILL ATTACHMENT

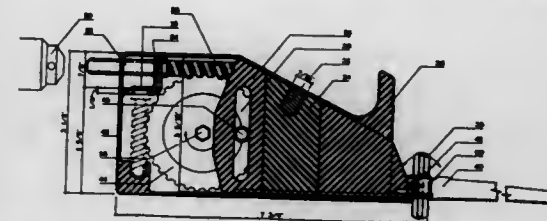
George C. Bourke, 8176 Spanker Ridge Dr., Bentonville, Ark. 72712

Filed Mar. 31, 1995, Ser. No. 414,029

Int. Cl.<sup>6</sup> B23D 51/10

U.S. Cl. 173—29

2 Claims



1. A power tool attachment for converting rotary motion from a power tool into reciprocating motion of a saw comprising: a housing, a helical gear mounted in said housing and having a peg mounted eccentrically thereon, a blade connected to a blade drive arm, said blade drive arm reciprocable in said housing and having a slot therein, said peg received in said slot, a pair of worm gears mounted in said housing orthogonally with respect to each other and each being engaged with said helical gear, said worm gears each having an end with a recess therein, said helical gear having a recess in a center portion thereof, and a drive pin receivable in any one of said recesses and a rotatable power tool chuck at opposite ends thereof, whereby rotation of said power tool chuck enables the reciprocation of said blade along an axis parallel to a rotation axis of said power tool chuck or along any axis orthogonal to said axis of said power tool chuck depending upon which recess the drive pin is received.

5,566,770  
GEARLESS ANGLED SPINDLE  
Gregory A. Bowser, Boynton Beach, Fla., assignor to Air Turbine Technology, Inc., Boca Raton, Fla.  
Continuation of Ser. No. 112,390, Aug. 27, 1993, abandoned.  
This application Oct. 11, 1994, Ser. No. 320,980  
Int. Cl.<sup>6</sup> F03B 13/00

U.S. Cl. 173—218

10 Claims

1. A spindle apparatus comprising:  
a handle portion having a longitudinal axis, said handle portion including means for receiving air and for directing the flow of said air therethrough;  
a head portion having a reaction turbine-type motor coupled to an outlet of the directing means for receiving said air therefrom and a rotatable shaft coupled to said reaction turbine-type motor, said rotatable shaft having an axis of rotation, said head portion being coupled to said handle portion such that said axis of rotation forms a predetermined angle with respect to said longitudinal axis; and  
means for attaching a desired tool to said rotatable shaft;

5,566,769

## TUBULAR ROTATION TOOL FOR SNUBBING OPERATIONS

Randolph L. Stuart, Odessa, Tex., assignor to Eckel Manufacturing Company, Inc., Odessa, Tex.

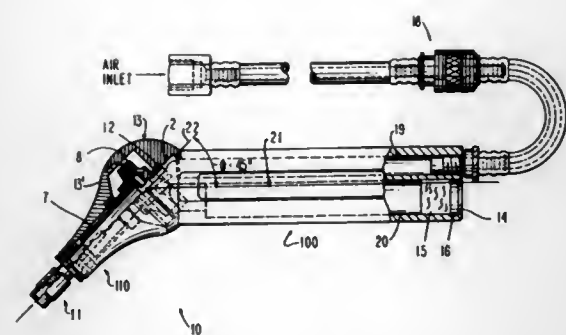
Filed Oct. 31, 1994, Ser. No. 332,117

Int. Cl.<sup>6</sup> E21B 19/16; 3/00

U.S. Cl. 173—149

19 Claims

1. A tool for rotating a tubular member passing through a slip assembly of a drilling rig, the slip assembly including an outer



said reaction turbine-type motor causing said shaft and said tool to rotate upon receiving said air from said outlet of said directing means.

5,566,771

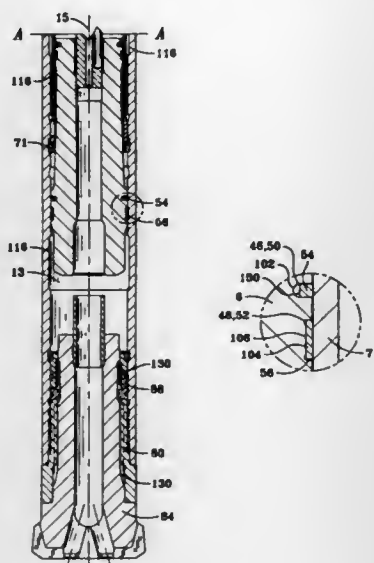
# REVERSIBLE CASING FOR A SELF-LUBRICATING, FLUID-ACTUATED, PERCUSSIVE DOWN-THE-HOLE DRILL

Dale R. Wolfer, Salem, and Leland H. Lyon, Roanoke, both of Va., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Aug. 30, 1995, Ser. No. 520,799  
Int. Cl.<sup>6</sup> E21B 4/14

U.S. Cl. 175—296

7 Claims



1. A casing for a self-lubricating, fluid-actuated, percussive down-the-hole drill comprising:

- (a) an elongated, hollow tubular body having a first casing end and a second casing end, said body having a longitudinal axis extending therethrough;
- (b) an internal surface on said body forming a bore therein, said bore being substantially circular in cross section, as viewed perpendicular to said longitudinal axis;
- (c) said casing having a centerline axis perpendicular to said longitudinal axis, said centerline axis being spaced substantially equally from said first and second casing ends;
- (d) said internal surface forming a profile comprising:
  - (i) first undercut and land means between said centerline axis and said first casing end, for supporting operative elements of a drill backhead assembly in said bore and for defining, with said operative elements, passageways for flow of percussive fluid therein;
  - (ii) second undercut and land means between said centerline axis and said second casing end, for supporting operative

elements of a drill fronthead assembly in said bore and for defining, with said operative elements, passageways for flow of percussive fluid therein;

- (e) said first undercut and land means including an annular scalloped portion of said casing comprising a plurality of longitudinally extending grooves in said inner surface, said grooves being spaced parallel to each other, and each pair of grooves alternating with a longitudinally extending land surface therebetween, formed by said inner surface; and
- (f) whereby, when a piston is slidingly positioned adjacent to said inner surface, a self-lubricating seal member and a self-lubricating bearing member positioned on said piston can slide over said scalloped portion, to maintain contact with said inner surface, while alternately opening and closing said grooves during a cycle of drill operation.

5,566,772

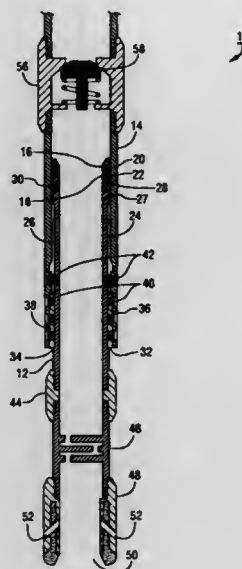
# TELESCOPING CASING JOINT FOR LANDING A CASTING STRING IN A WELL BORE

Malcolm Coone, Katy, and Thomas L. Kelley, Houston, both of Tex., assignors to Davis-Lynch, Inc., Houston, Tex.

Filed Mar. 24, 1995, Ser. No. 410,111  
Int. Cl.<sup>6</sup> E21B 17/08

U.S. Cl. 175—321

26 Claims



1. A casing joint for use in landing a casing string in a well bore of an oil or gas well, comprising:

- an outer tubular member connectable at one end to a first section of the casing string;
- an inner tubular member partially disposed within the outer tubular member, said inner tubular member adapted to be axially movable relative to the outer tubular member and connectable at an outer end to a second section of the casing string;
- a fluid being supplied to the outer tubular member at a first pressure and being discharged from the inner tubular member at a second pressure; and
- means for causing the inner tubular member to move axially relative to the outer tubular member in response to the difference between said first pressure and said second pressure.

5,566,773

# TRACKED UNDERCARRIAGE FOR HARVESTERS

Manfred Gersmann, Sassenberg, Germany, assignor to Claas oHG Beschränkt haftende offene Handelsgesellschaft, Harzewinkel, Germany

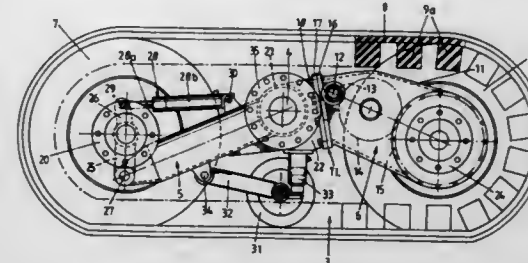
Filed May 2, 1995, Ser. No. 433,917

Claims priority, application Germany, May 4, 1994, 44 15 689.8

Int. Cl.<sup>6</sup> B62D 55/104

U.S. Cl. 180—9.5

19 Claims



1. A tracked undercarriage for harvesters with a wheel-track drive unit disposed on both sides of the machine, which has two rockers including a first removable rocker (6) and a second rocker, the rockers being height-adjustably seated on a common, horizontal axle (4) extending transversely in respect to a direction of travel, two dual wheels, rotatably seated on free ends of the two rockers, an endlessly revolving track guided around both dual wheels, one tensioning element for the track acting on at least one dual wheel bearing, and a drive for at least one dual wheel, wherein a separating line (TL) is drawn outside of the axle (4) in the removable rocker (6), a releasable connection (16, 17, 18) with the second rocker (5) extended past the axle (4) is located in this separation line (TL).

5,566,774

# OPERATING METHOD FOR A HYBRID VEHICLE

Masato Yoshida, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

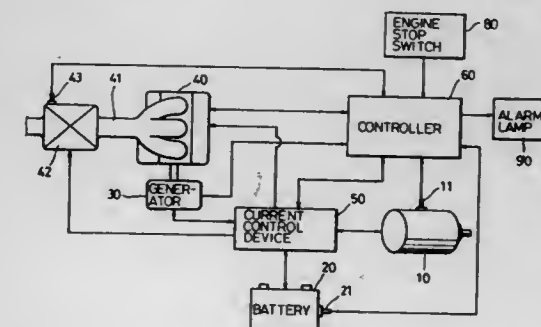
Division of Ser. No. 60,991, May 14, 1993, Pat. No. 5,492,190.  
This application Jun. 7, 1995, Ser. No. 476,331

Claims priority, application Japan, May 15, 1992, 4-123814; May 15, 1992, 4-123815; May 15, 1992, 4-123819

Int. Cl.<sup>6</sup> B60K 13/04

U.S. Cl. 180—65.4

4 Claims



1. A method of operating a hybrid vehicle having an internal combustion engine, an electric motor for driving said vehicle, a battery for supplying electric power to said electric motor, a generator driven by said internal combustion engine for charging said battery, a starter for starting said internal combustion engine, and an exhaust gas purifying catalyst, comprising:
  - (a) determining whether an operation of said internal combustion engine is requested;
  - (b) detecting a temperature of said exhaust gas purifying catalyst;

- (c) determining whether said temperature detected in said step (b) is lower than a first predetermined value;
- (d) stopping said internal combustion engine when it is determined in said step (a) that said operation of said internal combustion engine is requested and determined in said step (c) that said temperature is lower than said first predetermined value;
- (e) supplying electric power to said exhaust gas purifying catalyst when it is determined in said step (a) that said operation of said internal combustion engine is requested and determined in said step (c) that said temperature is lower than said first predetermined value;
- (f) starting said internal combustion engine by said starter when it is determined that said temperature is higher than said first predetermined value;
- (g) detecting a storage amount of said battery;
- (h) detecting whether an operation of said vehicle has been terminated; and
- (i) continuing charging of said battery by said generator if said storage amount of said battery at an instant at which said operation of said vehicle is terminated is smaller than a second predetermined value.

5,566,775

# SKIRTED SURFACE EFFECT VEHICLE

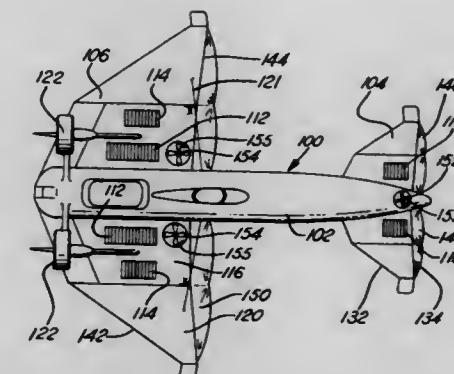
Harry Schoell, 2968 SW. 23rd Ave., Fort Lauderdale, Fla. 33312

Continuation-in-part of Ser. No. 926,312, Aug. 10, 1992, Pat. No. 5,314,035. This application May 24, 1994, Ser. No. 248,804

Int. Cl.<sup>6</sup> B60V 1/08; 1/11

U.S. Cl. 180—120

17 Claims



1. A surface effect vehicle for traversing a water or ground surface, the surface effect vehicle comprising:
  - an elongate body having a forward end and a rear end;
  - forward and rear scoops mounted adjacent the respective forward and rear ends of the body, each scoop having an angle of attack sufficiently large to cause a stall effect on the scoop during normal operation transversing the surface and having an arched leading edge defining, in conjunction with the surface, a forwardly facing opening and each scoop having a fan opening therein;
  - forward and rear skirts movably mounted relative to the forward and rear scoops between first extended positions covering the forwardly facing openings wherein the scoops and skirts generally seal with the surface to be traversed and second retracted positions wherein the skirts do not cover the forwardly facing openings;
  - pressurizing apparatus in communication with the respective fan openings in the forward and rear scoops for blowing air beneath the forward and rear scoops;
  - propulsion means for moving the surface effect vehicle across the surface;
  - wherein when the forward and rear skirts are placed in their extended positions covering the forwardly facing openings



and the pressurizing apparatus is activated, the surface effect vehicle may be lifted from the surface to be traversed; and wherein when the forward and rear skirts are placed in their retracted positions and the propulsion means moves the surface effect vehicle across the surface, air is forced through the uncovered forwardly facing openings and beneath the scoops to lift the surface effect vehicle from the surface being traversed while the stall effect on the scoops limits lift and enhances stability.

# 5,566,776 DIFFERENTIAL LIMIT TORQUE CONTROL APPARATUS

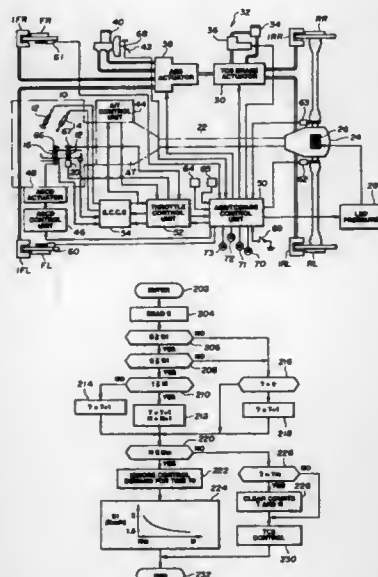
Toru Iwata, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 10, 1995, Ser. No. 402,220

Claims priority, application Japan, Mar. 16, 1994, 6-045952  
Int. Cl.<sup>6</sup> B60K 28/16

U.S. Cl. 180—197

7 Claims

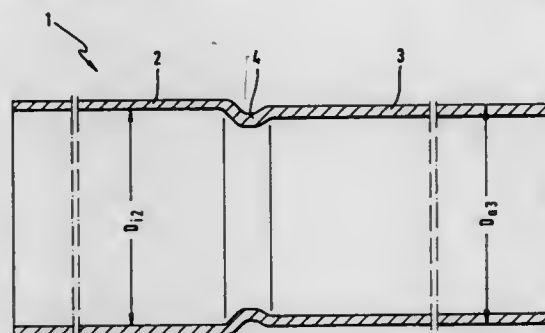


1. A traction control apparatus for use with an automotive vehicle having an internal combustion engine through which an output drive is transmitted to drive road wheels, comprising:  
means for detecting a slippage produced on the drive road wheels during acceleration;  
means for producing first traction control demands repetitively at time intervals when the detected slippage exceeds a predetermined value, the first traction control demands including normal and exceptional demands;  
means for setting a limit time;  
first traction control means responsive to the normal demand for performing at least one of fuelcut control and ignition control to reduce the engine output drive for a time shorter than the limit time and responsive to the exceptional demand for performing at least one of fuelcut control and ignition control to reduce the engine output drive for a time longer than the limit time;  
means for counting the number of times the exceptional demand has been provided to the first traction control means;  
means for setting a limit value; and  
means for inhibiting the response of the first traction control means to first traction control demand for a predetermined period of time when the counted number reaches the limit value.

5,566,777  
UPSET TUBE  
Jörg Trommer, Neunkirchen-Seelscheid, and Markus Eschbach, Overath, both of Germany, assignors to GKN Automotive AG, Lohmar, and Löhrr & Bromkamp GmbH, Offenbach am Main, both of Germany  
Filed Nov. 29, 1993, Ser. No. 159,433  
Claims priority, application Germany, Nov. 30, 1992, 42 40 237.9

Int. Cl.<sup>6</sup> B60K 17/22; B60R 19/34  
U.S. Cl. 180—232

8 Claims



1. A metallic upset tube having an axial length for accommodating impact energy of a motor vehicle comprising:  
a radially inwardly directed bead within the axial length of the metallic upset tube, said bead comprising two inwardly directed flanks along a longitudinal direction immediately adjacent to and separating a first cylindrical tube part from a second cylindrical tube part wherein one of said cylindrical tube parts defines a maximum diameter and said flanks being angled on both axial ends such that a first angle ( $\alpha$ ) of one of the flanks of the bead is greater than a second angle ( $\beta$ ) of another of the flanks of the bead.

# 5,566,778 CONTROL ASSEMBLY FOR OPERATING AN AGRICULTURAL TRACTOR

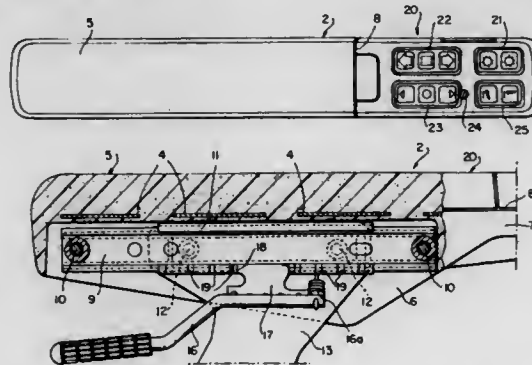
Carlo Valier, and Tiziano Salvini, both of Milan, Italy, assignors to SAME S.p.A., Treviso, Italy

Filed Apr. 28, 1995, Ser. No. 430,370

Claims priority, application Italy, Aug. 3, 1994, TO940172 U  
Int. Cl.<sup>6</sup> B60K 26/00; 23/00

U.S. Cl. 180—334

8 Claims



1. A control assembly for operating an agricultural tractor having a driver's seat arm rest including an arm rest body, an electronically controlled power-shift transmission with a reversing gear and associated first control members for the gear ratio shifting and second control members for selecting forward speed and reverse speed, and an electronic control device of the engine rotation speed with associated third control members, wherein said control assembly is an electrical control unit arranged on said armrest and fitted within a front depression of the arm rest body, substantially flush

with said body, and wherein said first, second and third control members are constituted by respective keys grouped on said control unit, wherein said arm rest body is further provided with a manually operable consent push button for inhibiting or enabling activation of said control unit, and

wherein said arm rest further comprises a substantially vertical support to be secured to a tractor driver's seat, wherein said arm rest body is swingably connected to said support around a substantially horizontal axis oriented transversely of said body, and wherein first adjustment means are provided for adjusting the inclination of said body relative to said support.

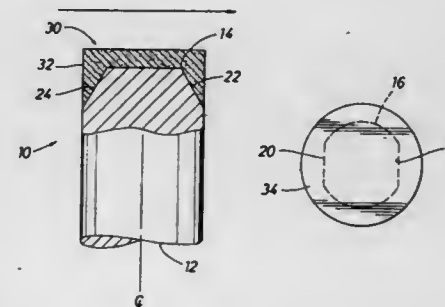
5,566,779  
INSERT FOR A DRILL BIT INCORPORATING A PDC LAYER HAVING EXTENDED SIDE PORTIONS  
Thomas M. Dennis, Houston, Tex., assignor to Dennis Tool Company, Houston, Tex.

Filed Jul. 3, 1995, Ser. No. 497,527

Int. Cl.<sup>6</sup> E21B 10/46

U.S. Cl. 175—426

12 Claims



10. An abrasion resistant insert for a cone or bit body used in earth drilling comprising a drill bit insert having an angled face located on the side of the insert facing in the direction of movement of the insert wherein the angled face is covered by a PDC layer placed thereon and joined to the insert with respect to the working face of the borehole during drilling, and a second angled face located on the side of the insert opposite the direction of movement of the insert.

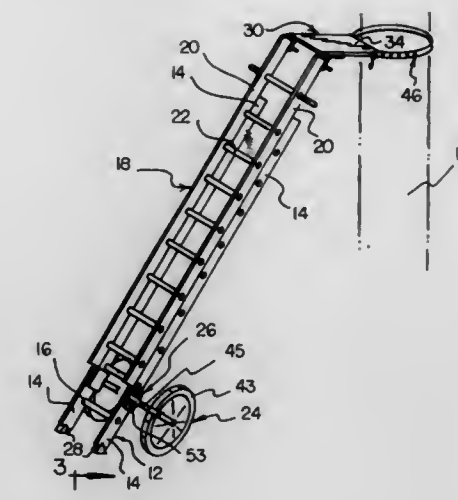
5,566,780  
LADDER-BASED CART APPARATUS  
Harry M. Bambrugh, 925 Hillcrest La., Oregon, Wis. 53575  
Filed May 18, 1995, Ser. No. 443,731

Int. Cl.<sup>6</sup> A01M 31/02

U.S. Cl. 182—116

8 Claims

1. A ladder-based cart apparatus, comprising:  
a first ladder assembly which includes a pair of first lateral support members and a plurality of first rungs connected between said first lateral support members,  
a second ladder assembly which includes a pair of second lateral support members and a plurality of second rungs connected between said second lateral support members,  
a pair of wheel assemblies supported by said first lateral support members at preselected positions along said first lateral support members, and  
connection assembly means for connecting said wheel assemblies to said preselected positions along said first lateral support members, such that said wheel assemblies are located below both said first ladder assembly and said second ladder assembly,  
wherein said connection assembly means has a height which is less than respective widths of said first lateral support members so that translation of said second lateral support members with respect to said first lateral support members is not interfered with by said connection assembly means.



5,566,781  
APPARATUS AND METHODS FOR FLUSHING AND CLEANING OIL STRAINER, CRANKCASE AND OTHER COMPONENTS OF AN INTERNAL COMBUSTION ENGINE

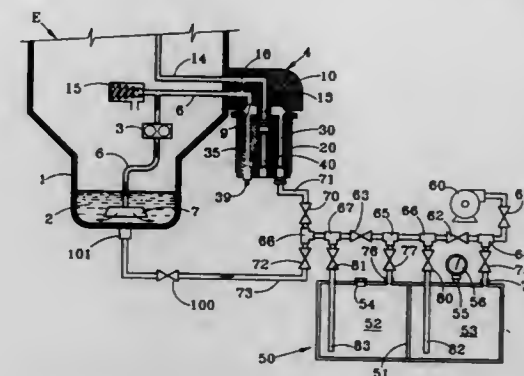
Jimmie H. Robert, 15938 Singapore, Houston, Tex. 77040, and Eddie L. Robert, 13926 Cedar Point, Houston, Tex. 77070

Filed Apr. 25, 1995, Ser. No. 428,373

Int. Cl.<sup>6</sup> F16N 33/00

U.S. Cl. 184—1.5

17 Claims



1. An apparatus for flushing and cleaning an internal combustion engine of the type having a crankcase, an oil pump, an oil strainer and an oil distribution system for moving parts of said engine and a removable full-flow oil filter, inflow areas of which are connected through an inflow port to a discharge of said oil pump, a suction side of said oil pump being connected, through said oil strainer, to said crankcase, outflow areas of said oil filter being in fluid communication, through an outflow port, with said oil distribution system for said moving parts of said engine, said apparatus comprising a reverse flush cartridge for temporary replacement of said filter, said cartridge having first and second passages therethrough, said first passage having an outlet, which communicates with said inflow port but does not communicate with said outflow port, and an inlet connectable to a source of pressurized fluid whereby said pressurized fluid may be forced through said first passage, said inflow port, said oil pump and said oil strainer, in a direction opposite of normal flow through said strainer, to flush and clean said oil strainer and crankcase, said second passage having an outlet, which communicates with said outflow port but does not communicate with said inflow port, and an inlet connectable to a source of pressurized fluid whereby said pressurized fluid may be forced through said second passage and said outflow port to said oil distribution system.

15. A method of flushing and cleaning a crankcase, an oil strainer and components of an internal combustion engine of the

type having a removable oil filter, inflow areas of which are connected through an inflow port to a discharge of an oil pump and a suction side of which is connected, through said oil strainer, to said crankcase, outflow areas of said oil filter being in fluid communication, through an outflow port, with an oil distribution system of moving parts of said engine, said method comprising the steps of:

- 1) removing an oil filler plug of said engine;
- 2) draining used oil from said crankcase;
- 3) removing said oil filter;
- 4) replacing said oil filter with a reverse flush cartridge having first and second passages therethrough, said first passage having an inlet and an outlet which communicate with said inflow port but do not communicate with said outflow port, said second passage having an inlet and outlet which communicate with said outflow port but do not communicate with said inlet port;
- 5) connecting a source of pressurized cleaning fluid to said first cartridge passage inlet forcing said cleaning fluid, in a direction opposite of normal flow, through said first passage, said inflow port, said oil pump and said oil strainer to flush and clean said oil strainer and said crankcase;
- 6) draining said cleaning fluid and contaminants cleaned thereby from said crankcase;
- 7) disconnecting said source of cleaning fluid from said first passage inlet;
- 8) connecting a source of pressurized oil to said second passage inlet forcing said pressurized oil through said outflow port and the oil distribution system of said engine to flush said oil therefrom;
- 9) removing said cartridge;
- 10) installing a new oil filter; and
- 11) adding clean oil to said engine.

5,566,782

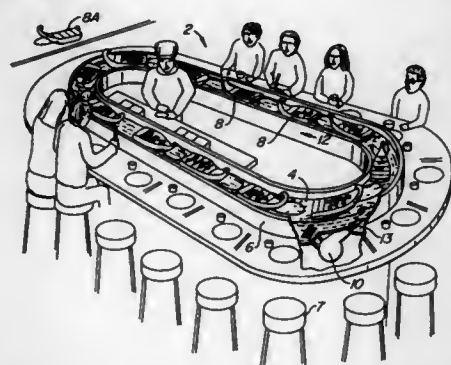
## HYDRAULIC SYSTEM FOR SERVING FOOD

Yukio Iwamoto, and Masako Iwamoto, both of 1 James Ave., Atherton, Calif. 94027

Continuation of Ser. No. 149,687, Nov. 9, 1993, Pat. No. 5,474,153. This application Jun. 6, 1995, Ser. No. 466,666 Int. Cl.<sup>6</sup> B65G 53/02

U.S. Cl. 186-49

1 Claim



1. An apparatus for serving and displaying food comprising: a continuous watercourse having a watercourse width and an outer periphery, the continuous watercourse containing water having a free surface; means for inducing a current in the continuous watercourse; a plurality of food carriers floating in the continuous watercourse under the influence said current, said food carriers being structurally independent from one another so that each food carrier is independently removable from said watercourse, said food carriers each having a length of the water line when floating in the watercourse; and a plurality of bumpers positioned between said food carriers and sized to maintain a predetermined spacing between said food carriers in said watercourse, the bumpers having a length in the direction of current equal to at least one-quarter the length

of the waterline, each bumper comprising a T-bar extending from one of the food carriers.

5,566,783

## VEHICLE PARKING SYSTEM

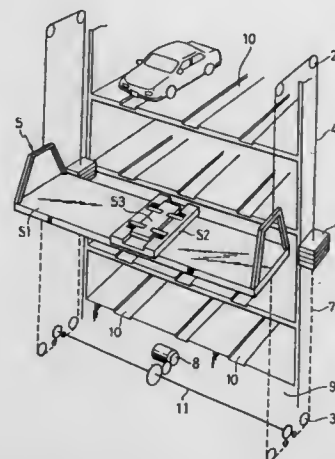
Kyoichi Yamashita, Yokohama, Japan, assignor to Koyo Jidoki Co., Ltd., Kanagawa-ken, Japan

Filed Jan. 9, 1995, Ser. No. 370,250

Claims priority, application Japan, Feb. 25, 1994, 6-053201 Int. Cl.<sup>6</sup> B66F 7/02

U.S. Cl. 187-210

1 Claim



1. An elevator system in an elevator shaft facing at least one parking space in a parking tower comprising a carriage movable vertically in the shaft, a counterweight suspended in the shaft on an opposite side from said carriage, upper wheels rotatably mounted at an upper end of the shaft at both sides thereof, a pair of suspended cables using wire ropes strung over the upper wheels located on both sides of the elevator shaft and having opposite ends, said carriage and said counterweight being connected at side ends thereof to the opposite ends of each of said suspended cables, lower wheels located at a bottom end of the elevator shaft at both sides thereof, a pair of lower haulage cables using chains strung around said lower wheels and having opposite ends respectively joined to said side ends of said carriage and said counterweight, and a driving unit and driving shafts connected to said driving unit transmitting torque to rotatably drive both lower haulage cables in synchronization and apply lifting force to said carriage via said lower haulage cables, said driving unit and driving shafts being located at the bottom end of said elevator shaft.

5,566,784

## SELF-PROPELLED ELEVATOR SYSTEM

Jean-Marie Rennetaud, Farmington, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Jul. 8, 1994, Ser. No. 272,166

Int. Cl.<sup>6</sup> B66B 9/00

U.S. Cl. 187-249

3 Claims

1. An elevator system having a car for guided travel within a hoistway, the hoistway including a rail extending longitudinally through the hoistway and engaged with the car to guide the travel of the car, the elevator system including: a pair of opposing, independent drive means disposed on the car, each drive means including a rotatable output shaft; a pair of traction rollers, each traction roller disposed on one of the pair of output shafts, the traction rollers engaged with opposite sides of the rail and biased towards the rail to provide sufficient traction between the rail and rollers to propel the car along the rail.

5,566,786

## CABLE AS SUSPENSION MEANS FOR LIFTS

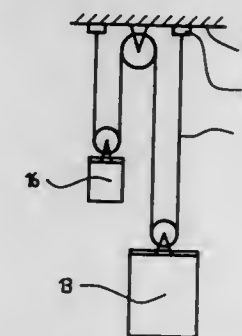
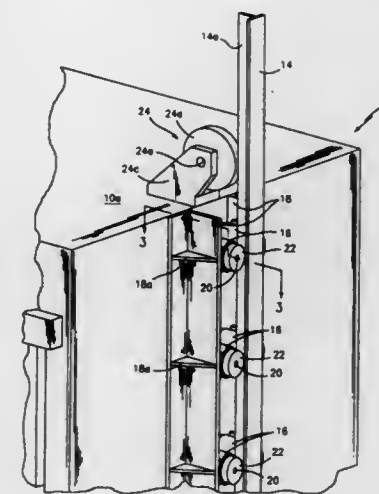
Claudio De Angelis, Root, and Ernst Ach, Ebikon, both of Switzerland, assignors to Inventio AG, Hergiswil NW, Switzerland

Filed Feb. 23, 1995, Ser. No. 393,073

Claims priority, application WIPO, Mar. 2, 1994, PCT/CH94/00044; Switzerland, Aug. 23, 1994, 02578/94 Int. Cl.<sup>6</sup> B66B 11/08

U.S. Cl. 187-266

24 Claims



1. A cable serving as suspension means for elevators, with the cable connected with one of an elevator car and a load receiving means and driven via one of a drive pulley and a winch, wherein carrying strands of the cable are comprised of synthetic fibers, with the synthetic fibers being surrounded by a closed annular sheathing of synthetic material which fills an intermediate space between the carrying strands.

5,566,785

## ELEVATOR DRIVE MACHINE PLACED IN THE COUNTERWEIGHT

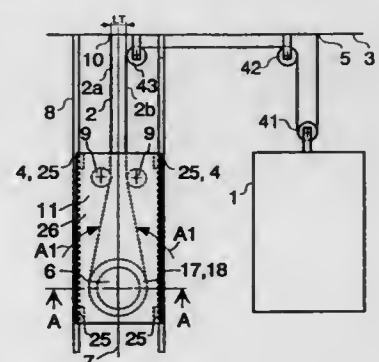
Harri Hakala, Hyvinkää, Finland, assignor to Kone Oy, Helsinki, Finland

Filed Jun. 28, 1994, Ser. No. 266,697

Claims priority, application Finland, Jun. 28, 1993, 932972 Int. Cl.<sup>6</sup> B66B 9/02

U.S. Cl. 187-250

20 Claims



1. Counterweight of a rope-suspended elevator movable along guide rails and an elevator motor placed in the counterweight, a guide rail plane passes through centers of at least two of the guide rails and said motor comprising:

a traction sheave, a bearing, a shaft, an element supporting the bearing, a stator provided with a plurality of windings and at least one rotating disc-shaped rotor, air gaps being provided in the motor between the at least one rotor and the stator windings, planes formed by the air gaps being substantially perpendicular to the shaft of the motor, the traction sheave being directly attached to the at least one rotor and intersecting the guide rail plane.

5,566,787

## METHOD AND APPARATUS FOR CONTROLLING AN ELEVATOR SYSTEM

Jong-tae An, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

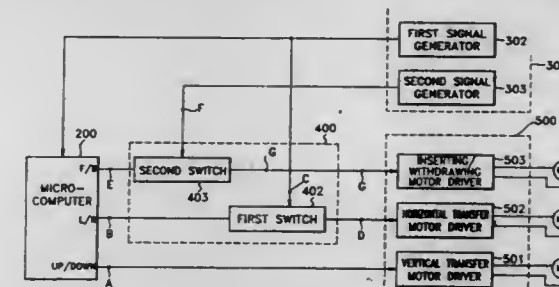
Filed May 26, 1995, Ser. No. 452,011

Claims priority, application Rep. of Korea, Aug. 13, 1994, 94-19990

Int. Cl.<sup>6</sup> B66B 1/00

U.S. Cl. 187-276

8 Claims



1. A method for controlling an elevator system which includes a vertical transfer motor for driving a vertical transfer device, a horizontal transfer motor for driving a horizontal transfer device and an inserting/withdrawing motor for driving a device for inserting or withdrawing a predetermined object into or from a desired destination, so as to insert or withdraw the predetermined object into or from the desired destination, said method comprising the steps of:

- (a) vertically transferring said vertical transfer device to the position of the predetermined object according to a first control signal when the first control signal for controlling said vertical transfer motor is output from a microcomputer;
- (b) starting to horizontally transfer said horizontal transfer device to the position of said predetermined object according to a second control signal when the second control signal is



output from said microcomputer together with said first control signal, and completing the operation of said horizontal transfer device according to a first external control signal; and (c) starting to insert or withdraw said predetermined object into or from said destination according to a third control signal when the third control signal for controlling said inserting/withdrawing motor is output from said microcomputer after said steps (a) and (b) are completed, and completing the operation for inserting or withdrawing said predetermined object into or from the destination according to a second external control signal.

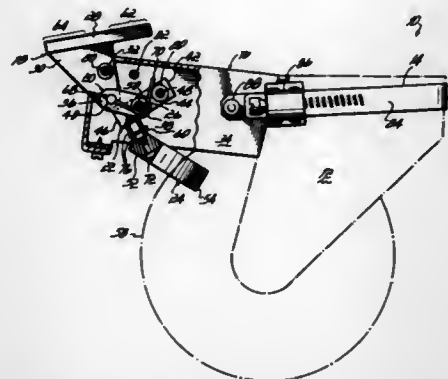
5,566,788

## SHOPPING CART BRAKE ASSEMBLY

Leonard Smith, and Ralph L. Powers, both of Cincinnati, Ohio, assignors to EPHEC, Inc., Cincinnati, Ohio  
Filed Feb. 24, 1995, Ser. No. 394,692  
Int. Cl.<sup>6</sup> B60B 33/00

U.S. Cl. 188—1.12

14 Claims



1. A caster wheel foot brake assembly, comprising:
    - a foot pedal having a foot pad and a lever protruding from the undersurface of said foot pad, said lever being pivotably mounted to a brake housing which is adapted to be attached to a caster;
    - a connector arm having a first end and a second end wherein said first end is pivotably connected to said lever;
    - a brake arm having a first end, a middle region and a second end, said first end being pivotably mounted to said brake housing, said middle region being pivotably attached to said second end of said connector arm;
    - a braking foot having a plurality of braking extensions adapted to frictionally engage a caster wheel, said braking foot being connected to said second end of said brake arm; and
    - a hinge spring for exerting an angular force between said connector arm and said brake arm;
- said foot pedal, connector arm, brake arm, braking foot and hinge spring forming an overcenter locking mechanism such that when said brake housing is attached to said caster, said locking mechanism being adapted to move said braking foot overcenter in toggle fashion into a releasably locked braking position frictionally engaging said caster wheel upon application of a first force to said foot pedal, and said locking mechanism being further adapted to move said braking foot back overcenter into a disengaged nonbraking position upon application of a second force exerted on said foot pedal and upon application of a rearward movement of said caster wheel.

5,566,789

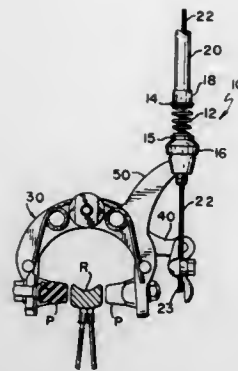
## BICYCLE ANTI-LOCKING BRAKE

William B. Allen, 10412 SW. 145th Ct., Miami, Fla. 33186  
Filed Jul. 6, 1995, Ser. No. 498,937  
Int. Cl.<sup>6</sup> B62L 5/20

U.S. Cl. 188—24.15

4 Claims

1. In a bicycle having at least one wheel that includes a rim and at least one pivotally mounted brake caliper member that is actu-



ated through a Bowden cable mechanism that includes a sheathing member that coaxially houses a cable member that passes through an adjusting nut that is mounted to said brake caliper member, the improvement comprising spring means coaxially disposed around said cable member between said sheathing member and said adjusting nut so that said spring means opposes the force applied by a user actuating said cable member, thereby permitting a user to readily adjust the tension of said spring means.

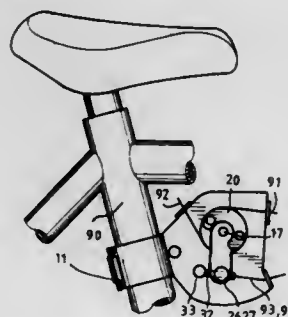
5,566,790

## BICYCLE BRAKE ASSEMBLY

Tsung-I Chen, 58 Ma Yuan West St., Taichung, Taiwan  
Filed Nov. 13, 1995, Ser. No. 554,964  
Int. Cl.<sup>6</sup> B62L 1/06

U.S. Cl. 188—24.16

1 Claim



1. A bicycle brake assembly comprising:
  - a main frame;
  - a retaining ring disposed at a rear portion of said main frame;
  - a hollow shaft extending from the right surface of said main frame;
  - a first, second and third lugs disposed at the right surface of said main frame;
  - each of said lugs having a hole thereon;
  - a front brake line passing through said first lug;
  - a rear brake line passing through said second lug;
  - a first and second brake control lines passing through said third lug;
  - said hollow shaft inserted in a center hole of a hollow rotor;
  - a first recess formed on said rotor to receive a front head of said front brake line;
  - a second recess formed on said rotor to receive a rear head of said rear brake line;
  - said rotor having two opposite chambers defined by corresponding flanges at the opposite sides of the rotor, respectively;
  - a first and second pintles disposed on said corresponding chambers, respectively;
  - each said pindle having a slot and a bottom circular hole at each end of said pindle, respectively;
  - each said bottom circular hole receiving a hollow cylinder post;
  - a hollow screw which has a through hole passing through said bottom slot and said hollow cylinder post;
  - said first and second brake control lines passing through said corresponding through holes, respectively;

one end of each of said brake control lines positioned by a positioning hole of a screw bolt; said screw bolt passing through a washer, a nut, and said through hole; two coiled springs disposed between said corresponding pintles and said rotor, respectively; a positioning plate which has a hole connected to said rotor with a bolt; and a spring which is disposed between said rotor and said positioning plate passed through by said bolt.

a carbon-fiber reinforced carbon composite materials, characterized in that:

the average coefficient of dynamic friction  $\mu_{avg}$  is 0.30 or more; the maximum instantaneous coefficient of friction  $\mu_{max}$  in a period from the starting of braking to the time at which the braking pressure reaches a predetermined value  $P$  ( $P=2-50$  kg/cm<sup>2</sup>) is 0.60 or more, and wear rates of the disk and the pads are  $7.0 \times 10^{-3}$  mm/(stop-surface) or less.

5,566,791

## RAILWAY BRAKE SHOE

Joseph C. Kahr, Southern Pines, S.C., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.  
Filed Feb. 1, 1993, Ser. No. 11,557  
Int. Cl.<sup>6</sup> F16D 69/00

U.S. Cl. 188—250 G

7 Claims



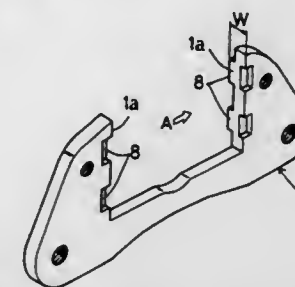
5,566,791

## DISC BRAKE

Hidehori Ohishi, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan  
Filed Oct. 30, 1995, Ser. No. 550,111  
Claims priority, application Japan, Oct. 31, 1994, 6-266847  
Int. Cl.<sup>6</sup> F16D 65/095

U.S. Cl. 188—73.39

4 Claims



1. A disc brake, comprising:
  - a disc having an axis of rotation and an axial direction;
  - a brake piston;
  - an inner pad and an outer pad disposed opposite to each other on both sides of said disc, said inner and outer pads being adapted to be brought into frictional contact with said disc; and
  - a fixed torque-carrying plate having a torque-carrying surface that has a longitudinal centerline, has a zigzag shape that comprises a plurality of protrusions extending in the axial direction of said disc, and is symmetrical with respect to the longitudinal centerline of said torque-carrying surface, said inner pad abutting said torque-carrying surface at least when said brake piston acts upon said inner pad such that said torque-carrying plate carries brake torque applied to said inner pad.

1. For frictionally braking a railway car wheel having a tread, a brake shoe member comprising:

- a backing plate to which a brake force is applied;
- a brake shoe block comprising first and second separate brake shoe segments each having first and second sidewalls and opposing end walls delineating a braking face therebetween adapted to engage said wheel tread to provide said frictional braking of said railway car wheel;
- said first sidewall of each of said first and second brake shoe segments having a longitudinal taper extending in opposite directions with corresponding angles of taper; and
- said opposing end walls of each of said first and second brake shoe segments including an inner end wall at one terminus of said first sidewall adjacent a longitudinal midpoint of said brake shoe member and an outer end wall at the other terminus of said first sidewall, the lateral dimension of said braking face decreasing in a direction from said inner end wall to said outer end wall of respective ones of said first and second brake shoe segments, such lateral dimension being greatest at said inner end wall thereof.

5,566,792

## SLIDING UNIT FOR A BRAKE AND METHOD OF PRODUCING THE SAME

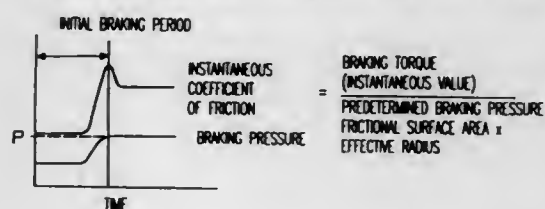
Iwao Yamamoto; Kazuo Niwa; Hitoshi Seki; Toshiro Kusahara, and Yoshiaki Inoue, all of Kagawa, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan  
Filed Oct. 23, 1995, Ser. No. 547,114

Claims priority, application Japan, Oct. 25, 1994, 6-260536; Oct. 26, 1994, 6-262846; Nov. 2, 1994, 6-269779  
Int. Cl.<sup>6</sup> F16D 49/00

U.S. Cl. 188—218 XL

8 Claims

3. A sliding unit for a brake comprising a disk and pads made of



5,566,794

## SHOCK ABSORBER HAVING NONADJUSTABLE METERING

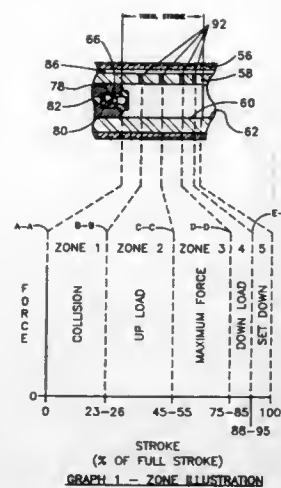
Harold D. Wiard, Livonia, Mich., assignor to Ace Controls, Inc., Farmington, Mich.

Filed Sep. 2, 1994, Ser. No. 300,705  
Int. Cl.<sup>6</sup> F16F 9/48

U.S. Cl. 188—287

5 Claims

1. A nonadjustable shock absorber for soft contact deceleration of a shock load including, a low pressure zone (44), a hydraulic cylinder having a high pressure zone chamber (12,60), a piston (20,66) in said cylinder for movement under a shock load through a predetermined total stroke length from an initial position to a final position therein, and fluid pathway metering control means for controlling high pressure fluid escaping from the high pressure zone chamber (12,60) into the low pressure zone (44), ahead of the piston (20,66) as the piston moves from the initial position in response to a shock load, said fluid pathway metering control



means serving to control the high pressure fluid escape rate as a function of piston displacement from the initial position, wherein the improvement comprises:

- said fluid pathway metering control means comprises four fluid metering pathways, of which the first three fluid metering pathways are approximately linear spaced apart, each having a predetermined area, which operate to successively restrict the amount of high pressure fluid escaping from the high pressure zone chamber, and the area of each of the four spaced apart fluid metering pathways being closed off at a first, a second, a third and a fourth transition point as the piston moves from the initial position through its predetermined total stroke to its final position to create a number one, two, three, four and five control zones and to provide a triangular shaped force profile during the compression of the shock absorber;
- said number one control zone, extending from the initial position of said piston to said first transition point, and having a length of from 23 percent to 26 percent of the total length of the piston stroke;
- said number two control zone, extending from the first transition point to the second transition point, and having a length of from 23 to 26 percent of the total length of the piston stroke;
- said number three control zone, extending from the second transition point to the third transition point, and having a length of from 24 to 28 percent of the total length of the piston stroke;
- said number four control zone, extending from the third transition point to the fourth transition point, and having a length of from 13 to 18 percent of the total length of the piston stroke; and,
- said number five control zone, extending from the fourth transition point to the total stroke position of the piston, and having a length of from 2 to 10 percent of the total length of the piston stroke.

5,566,795

## BRAKING SYSTEM FOR A RAIL CAR

Richard Barefoot, 116 Gap Creek Rd., Marietta, S.C. 29661  
Filed Aug. 24, 1994, Ser. No. 294,976

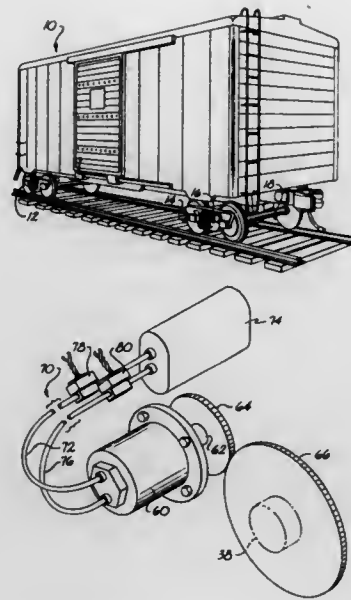
Int. Cl.<sup>6</sup> F16D 57/02

U.S. Cl. 188—294

22 Claims

1. A braking system for a rail car, said braking system comprising:

- a hydraulic pump in operative association with an axle of a rail car such that said hydraulic pump is driven by said axle when the axle is rotating either clockwise or counterclockwise;
- a hydraulic fluid circulation loop in communication with said hydraulic pump for supplying, receiving and circulating a hydraulic fluid to and from said pump, said hydraulic fluid circulation loop comprising a hydraulic fluid reservoir, a first conduit connecting said reservoir to said hydraulic pump and



a second conduit also connecting said reservoir to said hydraulic pump for completing said loop; and  
a first fluid restrictive device positioned along said first conduit and a second fluid restrictive device positioned along said second conduit, said first and second restrictive devices for regulating the flow of hydraulic fluid to and from said hydraulic pump, wherein by restricting the flow of fluid from said pump when said axle of said rail car is rotating, said pump exerts a braking force on said axle.

5,566,796

## ONE-PIPE SHOCK ABSORBER

Cornelis De Kock, Oud-Beijerland, Netherlands, assignor to Koni B.V., Oud-Beijerland, Netherlands  
PCT No. PCT/NL94/00039, § 371 Date Aug. 17, 1995, § 102(e)  
Date Aug. 17, 1995, PCT Pub. No. WO94/19619, PCT Pub. Date Sep. 1, 1994

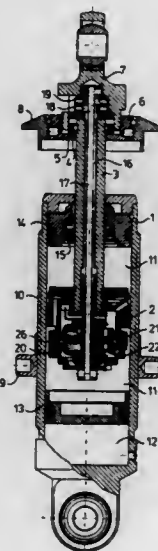
PCT Filed Feb. 17, 1994, Ser. No. 505,335

Claims priority, application Netherlands, Feb. 19, 1993, 9300316

Int. Cl.<sup>6</sup> F16F 9/32; 9/46

U.S. Cl. 188—299

5 Claims



1. One-pipe shock absorber comprising a cylinder (1), a piston (2) movable in said cylinder, fluid passages (22) hollowed out in the piston, damper valves (36, 37) which close the passages until a certain fluid pressure is reached and means to enable the damping to be adjusted both for the outward stroke and for the inward stroke, characterized in that said passages (22) are made both in a first damping disc (21) for damping the outwards piston movement and in a second damping disc (20) for damping the inwards piston movement, which damping discs (21, 20) are movably fitted in the piston with a fixed axial spacing relative to one another, in that a seating ring (26) extends between the two damping discs (21, 20) and said spacing between the damping discs is greater than the height of the seating ring (26), so that when one of said damping discs engages on the seating ring the other of said damping disc is clear of the seating ring, and in that the adjusting means for damping comprise a slide (23a, 23b) which is affixed to each damping disc and can be operated remotely, which slides are able, respectively, to close a larger or smaller number of passages (22) in the damping discs (20, 21).

the plurality of edges of the panel at a position to overlap clothes extending along the panel when packed in the garment bag configuration;

a second broad flexible laminar support piece fixedly connected to the interior of the panel adjacent to and along the edge of the panel opposite the attachment of the first flexible support piece, at a position to overlap clothes extending along the panel;

the first laminar support piece substantially corresponding to the panel in size and having a width sufficient to overlap the second support piece, thus holding the clothes against the panel and generally in the garment bag configuration peripherally around the interior of the case when in the closed position; and

a packing pouch having an interior into which to pack articles, the packing pouch having an edge connected to and along the edge of the support structure opposite the exterior panel, the connection forming a living hinge, allowing the packing pouch to extend from the interior of the case oppositely of the panel when the case is in the open position, the packing pouch folding into the interior of the case to be substantially surrounded by the clothes when the case is in the closed position.

5,566,797

## INTEGRATED FLIGHT BAG AND GARMENT BAG LAGGAGE CASE

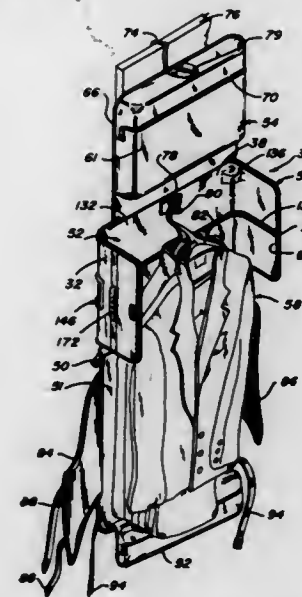
Clemens Van Himbeek, Maarkedal, Belgium, assignor to Samsonite Corporation, Denver, Colo.

Filed Mar. 14, 1994, Ser. No. 213,333

Int. Cl.<sup>6</sup> A45C 5/12; 5/14; 7/00; 13/26

U.S. Cl. 190—18 A

30 Claims



1. A luggage case having a generally rectangular prismatic configuration of a size and shape similar to a flight bag when in a closed position and presenting a garment bag configuration for packing clothes when the case is in an open position, comprising:

- a rigid support structure for the case, said support structure having a U-shape and defining a plurality of edges, said edges forming a perimeter;
- a flexible exterior panel connected to one of said plurality of edges of the support structure and extendable laterally from the support structure to expose an interior of the panel and the case, the panel forming an exterior wall of the garment bag configuration, the extended panel having a plurality of edges forming a perimeter;
- a selective attachment device connecting the perimeter of the panel to the perimeter of the support structure to complete the prismatic configuration when the case is in the closed position and to generally enclose the interior of the case;
- a first broad flexible laminar support piece fixedly connected to an end of the interior of the panel adjacent to and along one of

5,566,798

## TRUNK WITH A CONCEALABLE RETRACTABLE HANDLE

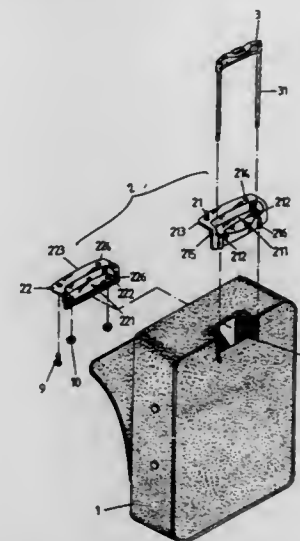
Cheng-Hsien Tsai, No. 103, Da-Ming 1st Rd., Tien-Tzu Hsiang, Taichung Hsien, Taiwan

Filed Jul. 10, 1995, Ser. No. 499,923

Int. Cl.<sup>6</sup> A45C 13/04; 13/26

U.S. Cl. 190—115

6 Claims



1. A trunk comprising: a trunk body reinforced by a lining and a supporting frame on the inside and defining a storage chamber, said trunk body including a top notch, a front cover covering said storage chamber at one side, a metal frame fastened around the periphery of said storage chamber at an opposite side relative to said front cover, a back cover fixedly fastened to said metal frame and covering said storage chamber on a side opposite to said front cover, said metal frame having a top recessed portion defining, with said top notch, a handle mounting space;

a handle mounting frame assembly mounted in said handle mounting space, said handle mounting frame including an upper handle holder and a bottom handle holder, said bottom handle holder having a recessed portion, said upper handle holder having a recessed portion fitted into the recessed portion on said bottom handle holder; and  
handle means mounted to said handle mounting frame assembly for movement between an extended position and a retracted



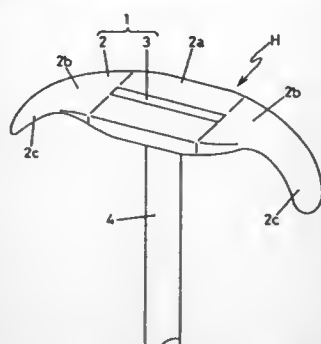
position wherein a handle of said handle means is located within the recessed portion of said upper handle holder.

**5,566,799**  
**LOW AERODYNAMIC NOISE TYPE CURRENT**  
**COLLECTION EQUIPMENT**

**Hidetoshi Hidaka, Okayama; Kengo Iwamoto, Osaka; Yasuhiro Noguchi; Motohiro Miyamura, both of Hyogo; Seichi Yazima, Osaka, and Inao Sakai, Hyogo, all of Japan, assignors to West Japan Railway Company, Osaka, Japan**  
Filed Jan. 20, 1995, Ser. No. 375,830  
Int. Cl.<sup>6</sup> B60L 5/08; 5/20

U.S. Cl. 191--55

## 20 Claims



1. A low aerodynamic noise type current collector, comprising:  
a contact strip for contacting a wire;  
a collector head having a lateral dimension in a lateral direction that is longer than a longitudinal dimension in a longitudinal direction, said collector head comprising lateral ends, a central region having a bottom surface, side regions at said lateral ends and a top surface, said contact strip being mounted on said collector head at said top surface so as to extend in the lateral direction; and  
an elongate support portion supporting said collector head at said bottom surface;  
wherein said central region of said collector head has a vertical cross-sectional shape in the longitudinal direction that is rectangular and said side regions of said collector head each have a vertical cross-sectional shape in the longitudinal direction that includes portions that are convex in front and rear orientations of the longitudinal direction.

5,566,800  
HIGH SPEED LOW NOISE CURRENT COLLECTING  
EQUIPMENT AND METHOD ON COLLECTING  
CURRENT

**Toshiaki Makino; Katsuyuki Terada; Michio Sebata; Morishige Hattori, all of Kudamatsu; Hideo Takai, Hikari; Toshi Yasui, Kndamatsu; Masabumi Oshima, Hitachi; Akiyoshi Iida, Mitsuoka; Yasushi Takano, Niihari-gun; Chisachi Katoo, Inashiki-gun, and Kenji Kobayashi, Niihari-gun, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**  
**Division of Ser. No. 174,280, Dec. 28, 1993. This application**  
**Apr. 20, 1995, Ser. No. 425,612**

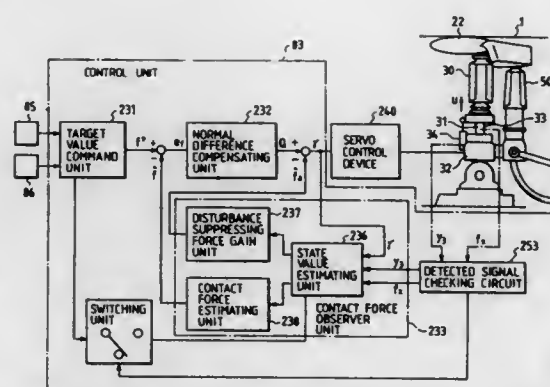
Claims priority, application Japan, Dec. 28, 1992, 3-347955;  
Feb. 16, 1993, 5-26500; Apr. 26, 1993, 5-99822

Int. Cl.<sup>6</sup> B60L 5/16

U.S. CL. 191-67

## 2 Claims

1. A current collector for a railway trolley vehicle, said current collector comprising:
- a current collecting member including a contact strip;
  - a driving system for moving said current collecting member into and out of contact with a trolley wire;
  - a conductive element for conducting electric power collected by said current collecting member from the trolley wire to a load;



- a load cell for detecting a force acting between said current collecting member and said driving system, said load cell being installed between said current collecting member and said driving system;
- a displacement meter for detecting displacement of said driving system;
- first estimating means for providing an estimated contact force value by estimating values of first parameters of said contact strip, said current collecting member, and the trolley wire, based on outputs of said load cell and said displacement meter, and summing products of each of the values of the first parameters and a corresponding value of a first set of weighting factors;
- second estimating means for providing an estimated disturbance suppressing force value by estimating values of second parameters of said contact strip, said current collecting member, and the trolley wire, based on outputs of said load cell and said displacement meter, and summing products of each of the values of the second parameters and a corresponding value of a second set of weighting factors; and
- control means for calculating a difference force value by subtracting the estimated disturbance suppressing force value and the estimated contact force value from a contact force target value, and for adjusting a pushing-up force of said driving system on the basis of the calculated force difference force value.

5,566,801  
TORQUE CONVERTER HAVING A RETARDER  
MECHANISM THEREIN

**Takao Fukunaga, Yawata, and Shigeru Takeshita, Neyagawa,**  
both of Japan, assignors to **Kabushiki Kaisha Daikin Sel-**  
**sakusho, Osaka, Japan**

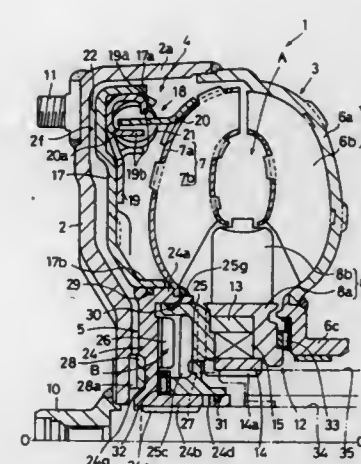
**Filed Mar. 7, 1995, Ser. No. 400,222**

Claims priority, application Japan, Mar. 10, 1994, 6-039614  
Int. Cl.<sup>6</sup> F16H 45/02; 45/00

U.S. Cl. 192-3.23

## 5 Claims

1. A torque converter comprising:
  - a front cover attached to a torque converter main body housing,
  - said housing and said front cover defining an annular chamber;
  - an impeller formed on an inner surface of said housing;
  - a turbine disposed in said annular chamber concentric with and opposed to said impeller;
  - a hydraulically actuated retarder disposed in said annular chamber radially inward from and concentric with said impeller and said turbine, said retarder including a rotary impeller connected to said turbine for rotation therewith, said retarder also including a fixed impeller opposed to said rotary impeller, said rotary impeller and said fixed impeller defining a retarder subchamber;
  - a one way clutch mechanism disposed radially inward from said turbine and said impeller, adjacent to said retarder, said one way clutch mechanism having an inner race and an outer race, said fixed impeller engaged with and connected to said inner race; and



- a stator impeller mounted to said outer race such that said stator impeller is limited to rotation in one direction only by said one way clutch mechanism about said inner race.

**5,566,802**  
**CONTINUOUS SLIP HYDROKINETIC TORQUE  
CONVERTER CLUTCH INTERFACE WITH  
CURCUITOUS GROOVE FOR COOLING AND WETTING  
CLUTCH INTERFACE ZONE**

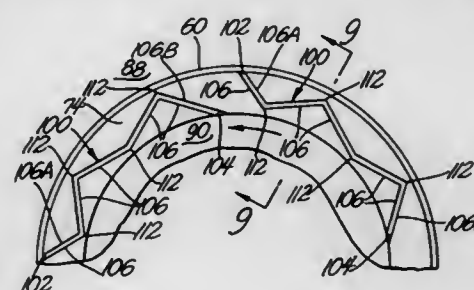
**Malcolm E. Kirkwood, Livonia, Mich., assignor to Borg-Warner Automotive, Inc., Sterling Heights, Mich.**

Filed Jul. 17, 1995, Ser. No. 503,126

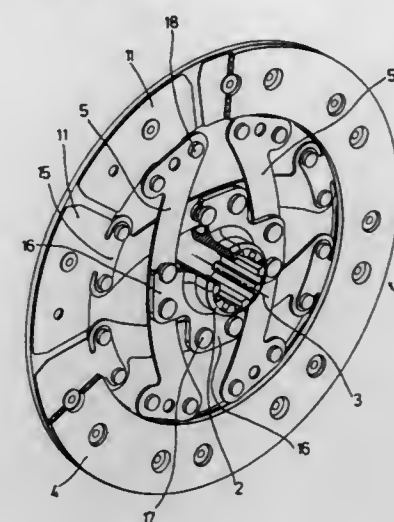
Int. Cl.<sup>6</sup> F16H 45/02; F16D 69/00:13/72

U.S. CL. 192-3.29

## 19 Claims



10. An annular friction clutch facing for a hydrokinetic torque converter continuous slip bypass clutch, said facing having a prescribed width and at least one circuitous groove extending a substantial annular distance about said facing adapted to direct hydraulic fluid in a hydrokinetic torque converter from a high pressure cavity at an outer edge of said facing and across the width of said facing in a circuitous path in at least three traversing passes to a low pressure cavity at an inner edge of said facing, each of said passes extending substantially the entire width of said facing, said groove having an inlet section that defines one of said passes and has an inlet that is adapted to open said groove at said outer edge of said facing to said high pressure cavity, and said groove having an outlet section that defines another of said passes and has an outlet that is adapted to open said groove at said inner edge of said facing to said low pressure cavity at an angular location remote from said inlet.



1. A clutch assembly for a motor vehicle, said clutch assembly comprising:
- a flywheel defining an axis of rotation and an axial direction parallel to the axis of rotation;
  - a clutch disc;
  - a pressure plate for applying an axially directed force to said clutch disc, with respect to the axis of rotation of said flywheel, to engage said clutch disc with said flywheel;
  - said clutch disc being disposed between said flywheel and said pressure plate;
  - said clutch disc comprising an outer periphery;
  - said clutch disc comprising friction lining means;
  - said friction lining means being disposed at said outer periphery of said clutch disc;
  - said friction lining means for contacting said pressure plate and said flywheel during engagement of said clutch disc with said flywheel;
  - said friction lining means comprising a radially inner edge disposed towards said axis of rotation of said flywheel;
  - said radially inner edge of said friction lining means comprising an inner circumference;
  - means for actuating said clutch disc to engage said friction lining means between said pressure plate and said flywheel;
  - said clutch disc further comprising:
    - a hub;
    - means for connecting said friction lining means to said hub;
    - said means for connecting comprising a plurality of connecting members;
    - each said connecting member having a first end and a second end;
    - said first end of each said connecting member being disposed at its corresponding first point of said inner circumference of said friction lining means;
    - said second end of each said connecting member being disposed at its corresponding second point of said inner circumference of said friction lining means;
    - each of said points of said inner circumference of said friction lining means being spaced a substantial angular distance from one another;
    - said first end and said second end of each said connecting member extending between their corresponding said first

point and second point on said inner circumference of said friction lining means;  
 said first end and said second end of each said connecting member being disposed a substantial angular distance from one another;  
 each said connecting member comprising a central portion disposed between said first end and said second end of each said connecting member;  
 said first end of each said connecting member being disposed a substantial distance from said hub;  
 said central portion of each said connecting member being disposed closer to said hub than said first end;  
 said second end of each said connecting member being disposed a substantial distance from said hub; and  
 said central portion of each said connecting member being disposed closer to said hub than said second end.

5,566,804

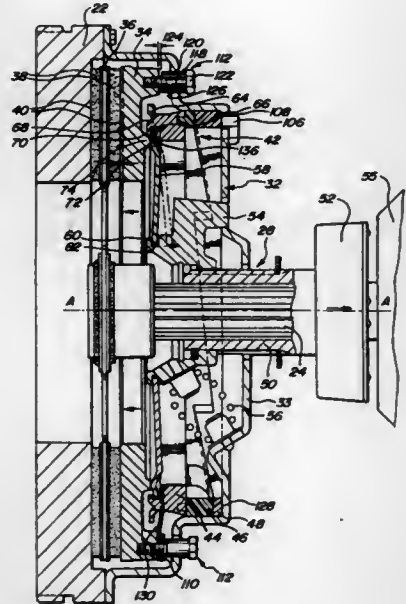
# AUTOMATICALLY ADJUSTING FRICTION TORQUE DEVICE

Daniel V. Gochenour, Auburn; Barry T. Adams, St. Joe; Martin E. Kummer, Auburn; Christopher M. Davis, Albion; Steven D. Lepard, Angola; Michael L. Bassett, and Kevin F. Schlosser, both of Auburn, all of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Jun. 21, 1994, Ser. No. 263,315  
 Int. Cl.<sup>6</sup> F16D 13/75

U.S. Cl. 192—70.25

3 Claims



1. A friction torque device comprising:
  - a driving member having an axis of rotation;
  - a cover coupled to said driving member for rotation with said driving member;
  - a pressure plate coupled to said cover for rotation with said cover;
  - an axially extending driven shaft;
  - a driven member coupled to said driven shaft for rotation with said driven shaft, said driven member interposed between said driving member and said pressure plate;
  - a friction surface associated with said driven member, said friction surface engaging said driving member for transmitting torque from said driving member to said driven member;
  - a release assembly extending about said driven shaft;
  - an annular first member of an adjustment mechanism extending about said axis at a radially outer position with respect to said release assembly, said annular first member being coupled to said cover for rotation with said cover;

an annular second member of the adjustment mechanism adjacent to and contacting said first member, said second member having a cam surface in contact with said first member, wherein when said second member rotates with respect to said first member, said second member cams against said first member to move an axial end of one of said first member and said second member from a first axial position to a second axial position relative to said cover;  
 an elongated biasing member received radially inwardly of said second member, said biasing member having a first end and a second end, said first end of said biasing member being received in said second member and said second end of said biasing member being received in a bracket attached to said cover, said bracket including an outwardly extending arm, said bracket and said arm maintaining said biasing member in a curved orientation wherein said second member is biased to rotate with respect to said first member by said elongated biasing member; and  
 a radially extending lever member interposed between said release assembly and said adjustment mechanism, said lever member being coupled to an axial end of said adjustment mechanism, said lever member cooperating with said axial end of said adjustment mechanism and said release assembly to move said pressure plate to engage and disengage said driven member and said driving member, said axial end of said adjustment mechanism being at a first position relative to said cover prior to wear on said friction surface, said lever member further cooperating with said adjustment mechanism to move said axial end of said adjustment mechanism to a second position relative to said cover after wear has occurred on said friction surface, said second position being axially spaced from said first position.

5,566,805

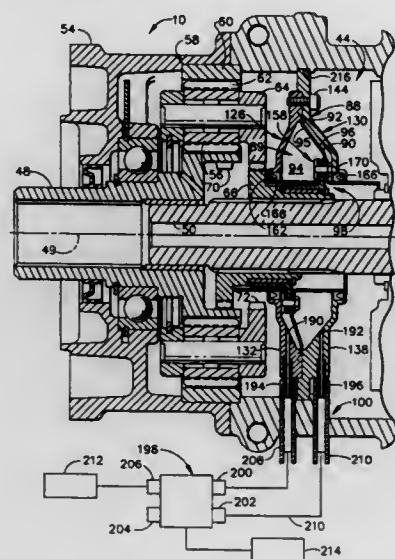
# VACUUM OPERATED SPEED RANGE SHIFTING MECHANISM

Randy L. Sommer, Monroeville, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 21, 1994, Ser. No. 360,970  
 Int. Cl.<sup>6</sup> F16D 25/10; 25/04

U.S. Cl. 192—87.16

19 Claims



16. An actuator shift mechanism comprising:
  - an annular shift sleeve, said shift sleeve being axially moveable between a first axial position and a second axial position;
  - a non-rotatable annular housing disposed coaxially about said shift sleeve, wherein said housing defines an interior chamber;
  - a flexible annular diaphragm having an outer portion attached to said housing, said diaphragm disposed within said housing so

as to divide said interior chamber into first and second annular cavities, wherein said first and second cavities are substantially sealed;  
 an annular, non-rotatable shift collar assembly attached to said diaphragm and disposed in surrounding relationship with said shift sleeve and movably engaged therewith; and  
 a pressurizing mechanism creating a pressure differential in one of said first and second cavities so as to exert a generally axial force on said diaphragm within said interior chamber causing movement of said diaphragm and corresponding axial movement of said shift collar assembly thereby moving said shift sleeve to one of the first and second axial positions.

5,566,806

# VENDING MACHINE FOR TENNIS BALL CONTAINERS

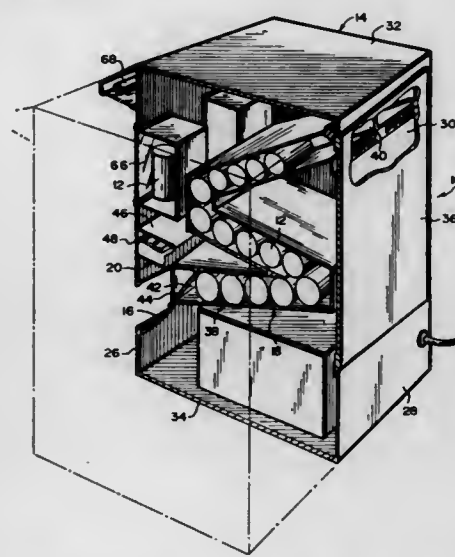
David L. Reale, 15 January Walk, Long Beach, N.Y. 11561

Filed Oct. 4, 1994, Ser. No. 317,713

Int. Cl.<sup>6</sup> G07F 11/34

U.S. Cl. 194—215

1 Claim



1. A vending machine for tennis ball containers comprising:
  - a) a box-shaped cabinet having a front wall with a delivery station built therein, a pair of side walls, a top wall, a rear wall, and a removable access panel in said rear wall;
  - b) a plurality of storage chutes within said cabinet, each said chute holding a series of one particular brand of tennis ball containers, and wherein each said storage chute is a serpentine channel track having an upper inlet port and a lower outlet port in which the upper inlet port, located behind said access panel in said rear wall of said cabinet, will receive the particular brand of tennis ball containers, while the lower outlet port will be in communication with the delivery station in said front wall of said cabinet, and a hinged door located at the lower outlet port of each said serpentine channel track;
  - c) means in said cabinet for accepting currency to cover the cost of one of the particular brand of tennis ball containers, said currency accepting means including a bill receptacle having a slot, said bill receptacle located in said front wall of said cabinet so that the slot can receive bills deposited therein, bill return means coupled to said bill receptacle in said front wall of said cabinet to eject bills deposited into the slot in said bill receptacle, coin receptacle means having a slot located in said front wall of said cabinet to receive coins deposited therein and coin return means coupled to said coin receptacle means to eject coins;
  - d) means in said cabinet for selecting one of the particular brand of tennis ball containers, said selecting means including

switch means for selecting the tennis ball brand, bill and comparator means aligned between said bill receptacle means and said coin receptacle means to determine if a proper amount of money has been deposited, a plurality of price displays electrically connected to said comparator means to determine the amount of money needed to purchase the particular brand of tennis ball container selected, and input delineator and logic control means;

- e) means for dispensing one at a time, one of the particular brand of tennis ball containers selected, into the delivery station of said cabinet, said dispensing means including a plurality of tennis ball venter escapement mechanisms, each escapement mechanism mechanically connected to one said hinged door;
- f) a plurality of display windows in said front wall of said cabinet above said brand selection switch means wherein each display window maintains one particular brand of tennis ball container to be dispensed therefrom when one said brand selection switch is manually depressed; and
- g) lamp assembly means mounted on an upper edge of said front wall of said cabinet to illuminate said front wall of said cabinet at night.

5,566,807

# COIN ACCEPTANCE METHOD AND APPARATUS

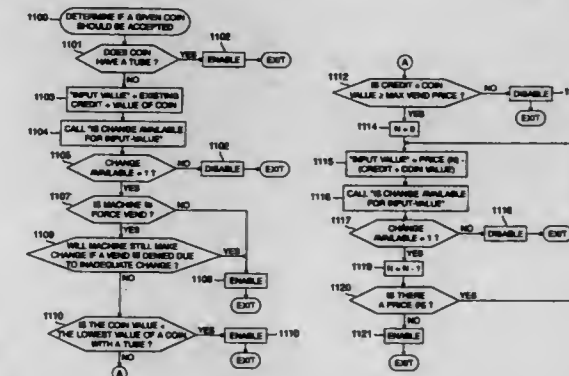
Mark J. Morun, West Chester, Pa., assignor to Mars Incorporated, McLean, Va.

Filed Mar. 3, 1995, Ser. No. 397,917

Int. Cl.<sup>6</sup> G07D 1/02

U.S. Cl. 194—217

10 Claims



5. A method for accepting genuine non-tubed coins in a vending machine, wherein the vending machine contains at least one coin tube for making change, comprising:
  - setting an overpay amount;
  - calculating a change value equal to the sum of a combination of coins available in the coin tubes that is closest to the value of an inserted non-tubed coin, without exceeding the value of the non-tubed coin; and
  - accepting the non-tubed coin if the difference between the change value and the value of the non-tubed coin is less than or equal to the overpay amount.

5,566,808

# LOW PROFILE COIN ANALYZER APPARATUS

Donald O. Parker, and Keith W. Parker, both of Grand Rapids, Mich., assignors to Parker Engineering & Manufacturing Co., Grand Rapids, Mich.

Filed Sep. 9, 1994, Ser. No. 303,770

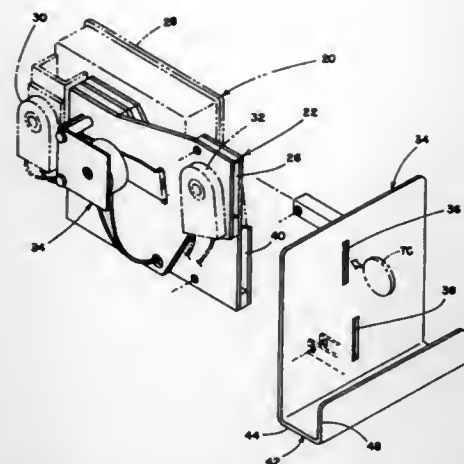
Int. Cl.<sup>6</sup> G07D 5/08

U.S. Cl. 194—317

19 Claims

5. A low profile coin analyzer apparatus comprising:





- a faceplate including slots defining coin receiving and coin rejecting slots in said faceplate;
- a test coin path aligned with said coin-receiving slot and defined by a coin support surface and a pair of parallel spaced apart guide walls on opposite sides of said support surface;
- a rejected coin path laterally offset from said test coin path aligned with said coin rejecting slot and an opening defined in said one of said guide walls between said test coin path and said rejected coin path, said opening is at least as large as an acceptable coin or token, wherein a coin may be laterally deflected from said coin support surface to said rejected coin path through said opening, wherein said opening defines an edge between said test coin path and said rejected coin path in the direction of movement of a coin in said coin receiving path, wherein said edge is beveled;
- a coin deflecting surface selectively positioned in said test coin path at said opening and an electromagnetic actuator for selectively positioning said coin deflecting surface in said test coin path for laterally deflecting coins off said support surface toward said rejected coin path;
- an electronic assembly having a test coin sensor and a circuit which causes said actuator to withdraw said coin deflecting surface from said test coin path in response to said control identifying an acceptable coin or token; and
- said test coin path terminating in an accepted coin path laterally collinear with said test coin path, wherein coins not deflected off said support surface by said coin deflecting surface will roll freely along said coin support surface past said opening as a result of rolling inertia in a same general direction to said accepted coin path.

5,566,809

## VENDING MACHINE PROTECTIVE DEVICE

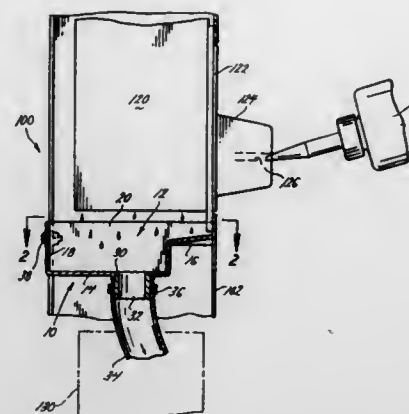
Carl L. Vogt, St. Louis, and Ronald E. Lovall, Manchester, both of Mo., assignors to Coin Acceptors, Inc., St. Louis, Mo. Continuation of Ser. No. 184,778, Jan. 21, 1994, abandoned, which is a continuation of Ser. No. 893,202, Jun. 2, 1992, abandoned. This application Dec. 11, 1995, Ser. No. 570,381 Int. Cl.<sup>6</sup> G07F 9/00

U.S. Cl. 194—348

13 Claims

1. In a vending machine of the type dispensing merchandise for sale and including a bill validator, and a means for protecting the machine from damage resulting from liquid introduced into the bill validator:

- (a) a bill validator having a bottom from which liquid issues, and
- (b) a mechanical, non-electronic catch pan, disposed below the bill validator and having a bottom portion and wall portions defining an open top substantially as large as said bill validator bottom to catch liquid introduced into and exiting from the



bill validator said catch pan temporarily containing said liquid, and drainage means for directing liquid away from the catch pan, the catchment area and depth of the catch pan and the drainage means being sufficient to prevent substantial overflow during drainage of said liquid.

5,566,810

## REDUCTION OF HANDRAIL VIBRATION IN PASSENGER CONVEYORS

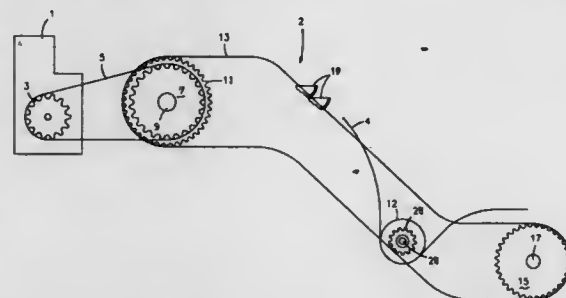
Helmut Meyer, Bueckeburg; Alfons von Herz, Stadthagen, and Dirk Winkelhake, Buchholz, all of Germany, assignors to Otis Elevator Company, Farmington, Conn.

Filed Jul. 12, 1995, Ser. No. 501,346

Int. Cl.<sup>6</sup> B66B 23/06

U.S. Cl. 198—331

3 Claims



1. A handrail drive assembly in a passenger conveyor, which conveyor includes: a moving handrail; a drive motor; a drive motor chain; a plurality of passenger treads; tread chains attached to each of the passenger treads; and a plurality of drive sprockets and tread sprockets over which said drive motor chain and said tread drive chains, respectively, pass, said handrail drive assembly comprising:

- a) rotatable handrail drive means engaging said handrail;
- b) idler sprocket means engaging at least one of said tread chains whereby movement of said tread chains causes rotation of said idler sprocket means; and
- c) means for delivering power to the handrail drive means, said means for delivering power consisting essentially of an elastomeric coupling which engages both of said handrail drive means and said idler sprocket means, said elastomeric coupling being operable to damp motion jerks originating in said drive motor and/or tread drive chains so as to provide smoothed movement of said handrail.

5,566,811

## METHOD AND MACHINE FOR PRODUCING FILTER-TIPPED CIGARETTES

Florenzo Draghetti, Medicina, and Salvatore Rizzoli, Bologna, both of Italy, assignors to G.D. Società Per Azioni, Bologna, Italy

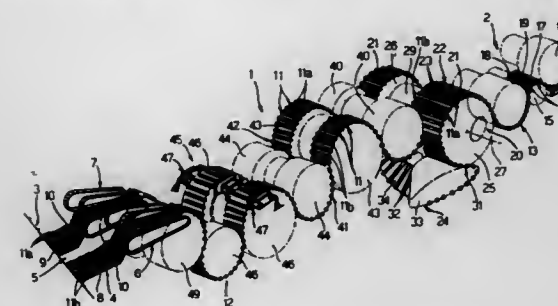
Filed May 25, 1994, Ser. No. 248,619

Claims priority, application Italy, May 31, 1993, BO93A0244; Apr. 7, 1994, BO94A0147

Int. Cl.<sup>6</sup> B65G 47/24

U.S. Cl. 198—399

13 Claims



1. A method of producing filter-tipped cigarettes (11), the method comprising stages consisting in feeding two side by side successions (21, 22) of oppositely-oriented filter-tipped cigarettes (11a, 11b); and in a turnover stage turning over the cigarettes (11a; 11b) in a first (21; 22) of the two successions (21, 22) so that they are oriented the same way as the cigarettes (11b; 11a) in a second (22; 21) of the two successions (21, 22); characterized in that said turnover stage provides for transferring each cigarette (11a; 11b) in a transfer stage in the first succession (21; 22) from a first position in relation to the cigarettes (11b; 11a) in the second succession (22; 21), to a second position on the opposite side of the cigarettes (11b; 11a) in the second succession (22; 21); said transfer stage involving turning each cigarette (11a; 11b) in the first succession (21; 22) over by 180°, to form two successions (21, 22) of equioriented, transversely-spaced cigarettes (11).

5,566,812

## ALIGNING DEVICE USED IN MANUFACTURING FILTER PLUGS FOR CIGARETTES

Takayuki Irikura, Tokyo, Japan, assignor to Japan Tobacco Inc., Tokyo, Japan

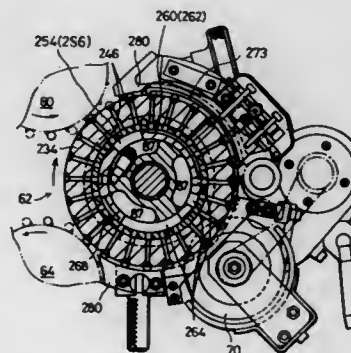
Filed Mar. 30, 1995, Ser. No. 413,380

Claims priority, application Japan, Mar. 31, 1994, 6-063712

Int. Cl.<sup>6</sup> B65G 17/46

U.S. Cl. 198—471.1

8 Claims



1. An aligning device used in manufacturing filter plugs for cigarettes comprising: receiving means for receiving articles, which are filter plugs or elements thereof, said receiving means including a rotatable drum and a plurality of feeding grooves disposed on an outer

peripheral surface of said drum at equal intervals in the circumferential direction thereof and receiving at least one article;

moving means for moving the article received in the feeding groove, said moving means including a pair of leads formed on both sides of each of the feeding groove and extending along the feeding groove, covering means having a seal member covering part of the outer peripheral surface of said drum, the covering means forming the feeding groove into a tunnel-shaped passage when the feeding groove passes through the seal member as said drum rotates, and suction means for sucking air in the tunnel-shaped passage to generate a suction force for sucking the article therein and air currents in the leads thereof, the generated suction force and air currents moving the article in the tunnel-shaped passage in one direction in cooperation with each other; and

stopper means for stopping the movement of the article in the tunnel-shaped passage to position the article at a predetermined location in the feeding groove, said stopper means including a stopper fixed to said drum and positioned in each of the feeding groove.

5,566,813

## AUTOMATED MAIL PROCESSING CLEANING SYSTEM

Donald Thomas, 2150 Stockbridge Ave., Woodside, Calif. 94062; Steve Ellis, Sacramento, Calif.; Paul Kriz, South San Francisco, Calif., and Gordon Scott, Los Altos, Calif., assignors to Donald Thomas, Woodside, Calif.

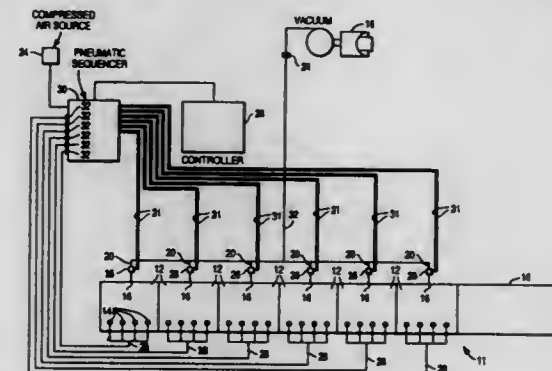
Continuation of Ser. No. 227,930, Jul. 20, 1994, Pat. No.

5,465,828. This application Aug. 23, 1995, Ser. No. 518,438

Int. Cl.<sup>6</sup> B65G 45/22

U.S. Cl. 198—495

12 Claims



1. A cleaning system for mail processing equipment having a conveyor for transporting mail, the system comprising: air supply means for directing a supply of air near the conveyor; vacuum means spaced apart from the air supply means for creating a vacuum near the air supply means, wherein said vacuum means comprises a vacuum plenum having a plurality of spaced apart vacuum ports near the conveyor; and a controller for actuating the vacuum means during operation of the air supply means.

5,566,814

## PRESS, MULTISTATION PRESS OR SIMILAR FORMING MACHINE

Hans Hofele, Goeppingen, Germany, assignor to L. Schuler GmbH, Germany

Filed Oct. 4, 1994, Ser. No. 317,540

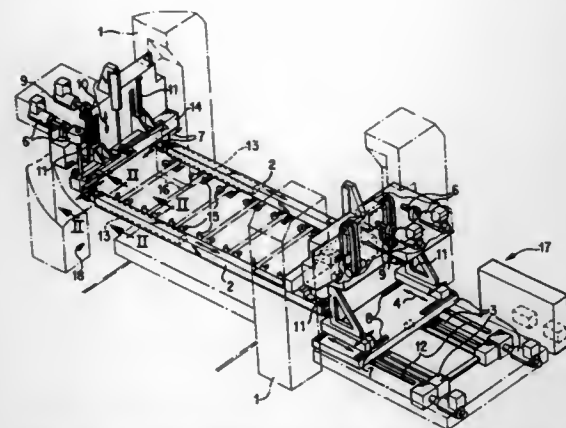
Claims priority, application Germany, Oct. 4, 1993, 931 15 971.9

Int. Cl.<sup>6</sup> B65G 25/00

U.S. Cl. 198—621.1

6 Claims

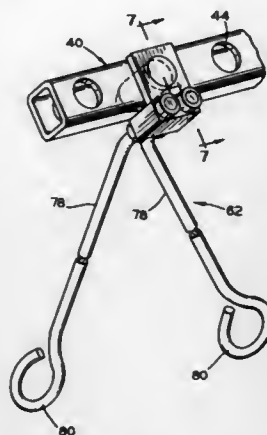
1. A press having a plurality of machining stations, comprising:



transport rails and holding devices on the transport rails, said transport rails providing a transfer movement of workpieces in the machining stations, the transport rails having guiding devices;

first driving devices coupled to the transport rails for applying the transfer movement in a first end area of the transport rails; second driving devices coupled to the transport rails for applying a lifting/lowering movement to the transport rails; third driving devices coupled to the transport rails for applying an opening/closing movement to the transport rails at the first end area and at a second end area of the transport rails; guides at the second end area of the transport rails on which the guiding devices of the transport rails run in a transfer movement direction, wherein the guides have a length that is a function of the length of the transfer movement of the transport rails and of the length of the guiding devices, wherein each of the guides is disposed on one of the guides so as to be displaceable in the transfer movement direction, wherein each of the guides is movably disposed for the lifting/lowering movement and the opening/closing movement and is provided with running rails extending in the transfer movement direction, the running rails having lengths that are larger than the length of the transfer movement of the transport rails, the second end areas of the transfer rails being moved into a linking area of the guides when the transfer movement is carried out.

**5,566,815**  
**CONVEYOR SYSTEM WITH LOAD BARS**  
Richard A. Dooley, 400 S. Westwood Ave., Toledo, Ohio 43609  
Filed Sep. 15, 1994, Ser. No. 306,480  
Int. Cl.<sup>6</sup> B65G 17/32  
U.S. Cl. 198—687.1



1. A conveyor comprising overhead conveyor rail means having a generally horizontal portion and an angled portion, a load bar,

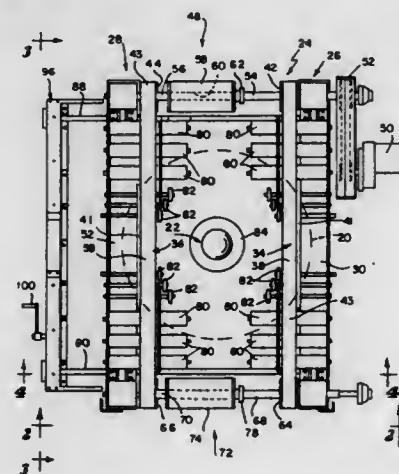
means supporting said load bar below said conveyor rail means, said load bar having a predetermined length and a plurality of openings uniformly spaced therealong, said openings having axes forming pivot angles, and a hanger having an upper angled end inserted in one of said openings and being substantially coaxial therewith, said hanger having a block extending along a lower side of said load bar, said hanger having two upper, angled end portions pivotally received in said block, said hanger also having two lower portions extending outwardly from one another and having means for supporting a panel or the like to be carried along the conveyor.

**5,566,816**  
**CONVEYING AND CENTERING APPARATUS**  
Peter L. Gross, Indianapolis, and Norman G. Poole, Plainfield, both of Ind., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Oct. 11, 1994, Ser. No. 320,905  
Int. Cl.<sup>6</sup> B65G 15/10

U.S. Cl. 198—817

6 Claims



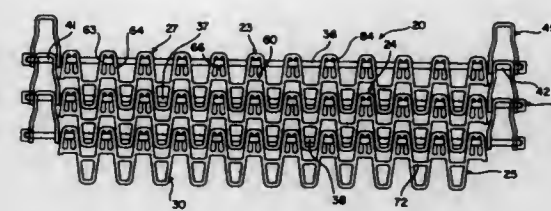
1. A conveyor comprising two conveyor sections, each conveyor section comprising a frame extending generally longitudinally of the conveyor, a first splined shaft rotatable in an end of the frame, a second shaft rotatable in the other end of the frame, a first wheel on the first shaft, means for rotating the first wheel on one of the conveyor sections, a second wheel on the second shaft, a belt trained about the first and second wheels, the belt having a first side for engaging the first and second wheels and a second side for engaging an article conveyed along the conveyor, and means providing a relatively low friction surface between the first and second wheels, the first side of the belt lying adjacent the relatively low friction surface to be supported thereby when an article is conveyed along the conveyor, and means for coupling the two conveyor sections, the coupling means comprising first and second bearing rollers, the first roller having a splined center opening for engaging the splines on the first shaft for receiving the ends of the first shaft to synchronize the movements of the belts on the two conveyor sections, and means for adjusting the spacing between the conveyor sections.

**5,566,817**  
**CONVEYOR BELT**  
William A. Meeker, 362 Wren La., Strasburg, Va. 22657  
Filed May 31, 1995, Ser. No. 454,725  
Int. Cl.<sup>6</sup> B65G 15/54

U.S. Cl. 198—848

20 Claims

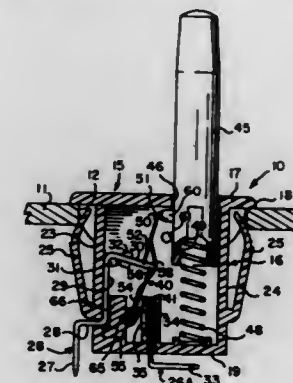
1. A conveyor belt comprising:  
a plurality of laterally extending and longitudinally spaced rods, each of said rods having first and second laterally spaced end portions;



**5,566,819**  
**PUSH BUTTON SWITCH WITH OVER CENTER BRIDGE**  
James R. Lustgarten, Chesterton; John A. Stuhlmacher, Crown Point; Jon Kretzmann, and Elmer Martin, both of Valparaiso, all of Ind., assignors to McGill Manufacturing Company, Inc., Valparaiso, Ind.  
Continuation of Ser. No. 149,282, Nov. 9, 1993, abandoned.  
This application Apr. 28, 1995, Ser. No. 430,301  
Int. Cl.<sup>6</sup> H01H 5/18

U.S. Cl. 200—407

8 Claims



a plurality of interfitted, open conveyor modules, each of said modules including a plurality of integrally formed forwardly and rearwardly extending link ends that alternate laterally across said module, each of said forwardly and rearwardly extending link ends being provided with through holes located between upper and lower surfaces thereof, each of said plurality of rods extending through the through holes provided in forwardly extending link ends of a respective one of said modules and the through holes provided in the rearwardly extending link ends of an adjacent one of said modules that is interfitted with said one of said modules; and

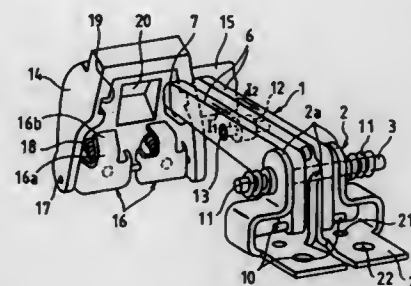
standoff means for maintaining a gap between a lateral surface portion of a corresponding front wall of each of the forwardly extending link ends and a respective one of said plurality of rods.

**5,566,818**  
**MOVABLE CONTACTOR DEVICE IN CIRCUIT BREAKER**  
Katsunori Kuboyama, and Naoshi Uchida, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan  
Filed Feb. 15, 1994, Ser. No. 196,473  
Claims priority, application Japan, Feb. 16, 1993, 5-050003; Mar. 9, 1993, 5-075362

Int. Cl.<sup>6</sup> H01H 1/00

U.S. Cl. 200—271

16 Claims



1. A movable contactor device in a circuit breaker, comprising: two contactor elements made up of plate-like conductors, arranged in such a manner that said contactor elements are in parallel with each other and are movable independent of each other, for forming a movable contactor;

a movable contact made up of two separate parts which are respectively formed on first ends of said two contactor elements;

a current passing pin for rotatably coupling second ends of said two contactor elements to a connecting conductor, wherein said second ends are located opposite from said first ends; and a pair of contact springs mounted on both end portions of said current passing pin, for pushing said contactor elements and said connecting conductor against one another while permitting a slidable rotation therebetween.

**5,566,820**  
**DUST MOP PACKAGE**  
Timothy E. Deaton, Brookville, Ohio, assignor to Vining Industries, Inc., Springfield, Ohio  
Filed May 15, 1995, Ser. No. 441,017  
Int. Cl.<sup>6</sup> B65D 65/12

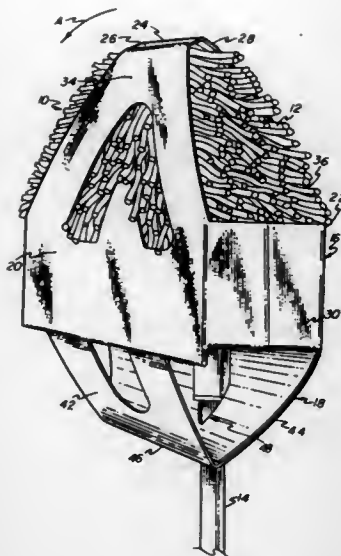
U.S. Cl. 206—15.3

16 Claims

1. A mop package for use with a mop including a mop head and a handle pivotally connected to the mop head, said package comprising:

a body portion for receiving a mop head, said body portion including a front wall and a rear wall;





a biasing portion connected to said body portion, said biasing portion including a front panel and a rear panel, said front and rear panels each extending from a respective junction with one of said front and rear walls wherein said rear panel is formed contiguously with said rear wall; means defining an aperture in said rear panel of said biasing portion for receiving a handle therethrough; and a base portion extending between said front wall and said rear wall at said junctions, said base portion including an aperture for receiving a handle therethrough; and wherein said front and rear panels angle toward each other in a direction extending away from said base portion and away from said front and rear walls.

12. A blank for a mop package comprising:

a front wall;  
a rear wall;  
a top connector portion connected to said front and rear walls at respective first and second fold lines;  
a front flap connected to said front wall at a third fold line;  
a rear flap connected to said rear wall at a fourth fold line;  
a front panel and a rear panel defined by said rear flap wherein said front panel is connected to said rear panel by a fifth fold line and said rear panel includes an aperture formed therein;  
a first base member defined by said front flap, said first base member including an aperture formed therein; and wherein said first, second, third, fourth, and fifth fold lines are parallel to each other.

5,566,821

#### SUTURE RETAINER

David L. Brown, Wallingford, Conn.; Andrew P. Stellan, Riverlax, N.J., and Edward A. Gemma, Jr., Milford, Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Jan. 10, 1995, Ser. No. 370,956

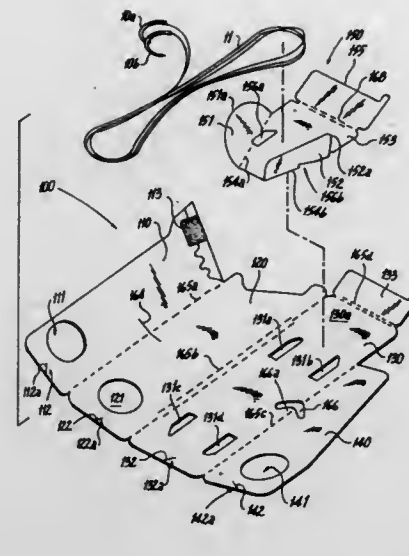
Int. Cl.<sup>6</sup> A61B 17/04

U.S. Cl. 206—63.3

31 Claims

1. A surgical suture retainer comprising retention means for retaining a suture loop in a generally epitrochoidal shape, said retention means having at least two spaced apart suture abutment surfaces generally facing each other in non-parallel relationship for contacting the outside of the suture loop.

31. In combination, a suture retainer and a coiled suture, the suture retainer comprising retention means abutting the outer edge of the coiled suture at two spaced apart positions for holding the coiled suture in a generally epitrochoidal shape, said retention means including two spaced apart non-parallel surfaces in generally facing relationship.



5,566,822

#### SUTURE RETAINER

Christopher Scanlon, Milford, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

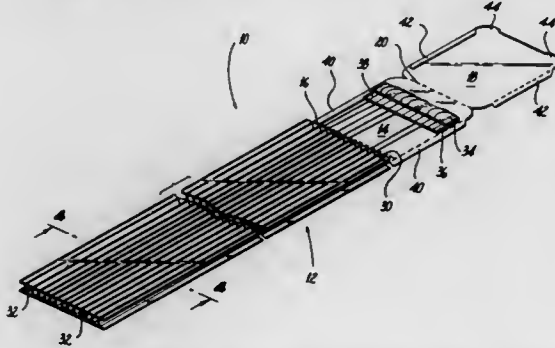
Continuation of Ser. No. 164,522, Dec. 9, 1993, abandoned.

This application May 8, 1995, Ser. No. 437,246

Int. Cl.<sup>6</sup> A61B 17/06

U.S. Cl. 206—63.3

18 Claims



1. A suture package comprising on elongated based member including first and second panel members aligned in general parallel relation and interconnected by a plurality of transverse portions, said transverse portions defining therebetween adjacent elongated suture compartments open at a first end thereof to facilitate insertion and removal of a suture portion, a retaining panel member connected to a transverse edge of said base member, a cover panel member foldably connected along a transverse edge to said retaining panel member and adapted to fold onto said retaining panel member, and a pair of opposed flaps disposed along longitudinal sides of said cover panel member.

5,566,823

#### TOOTHBRUSH HOLDER

Shirley F. Summers, R.R. 3, Box 527, Marion, Ill. 62959

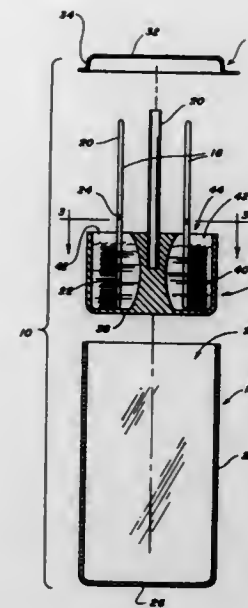
Filed Jan. 22, 1995, Ser. No. 376,798

Int. Cl.<sup>6</sup> B65D 83/10

U.S. Cl. 206—209.1

8 Claims

1. A toothbrush holder comprising an unpartitioned container with a closed bottom, a sidewall and an open top, said open top and said bottom being spaced apart a distance greater than the length of a toothbrush having a handle and a bristle portion;  
a removable cap for closing the open top of the container;



a tray with a bottom and a sidewall, said tray divided into a plurality of separate receptacles for holding a liquid antiseptic, each receptacle consisting of an open top and a closed bottom and a sidewall with a depth adapted to receive the bristle portion of the toothbrush such that substantially only the bristles are immersed in the liquid antiseptic;  
said tray further having a handle attached to the tray, said handle extending upwardly above the open receptacles, said tray being slidable through the open top and between the sidewall of the container by said handle, said handle being adapted to be grasped by a user at the open end of the container and said tray being stopped when the bottom of the tray reaches the bottom of the container.

5,566,824

#### PACKAGING ASSEMBLY WITH IMPROVED STACKABILITY

Joris Gustaaf Jozef Tack, and Christian Daniel Verhelle, both of Bever, Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US94/00745, § 371 Date Jul. 18, 1995, § 102(e) Date Jul. 18, 1995, PCT Pub. No. WO94/16955, PCT Pub. Date Aug. 4, 1994

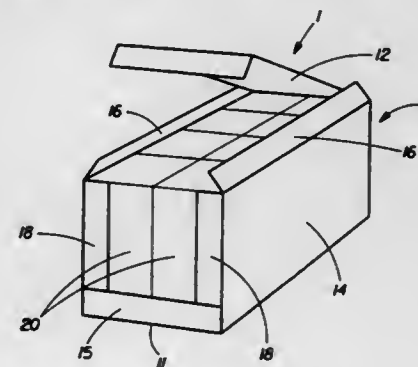
PCT Filed Jan. 19, 1994, Ser. No. 491,967

Claims priority, application European Pat. Off., Jan. 20, 1993, 93870007

Int. Cl.<sup>6</sup> B65D 81/18; 21/00

U.S. Cl. 206—213.1

3 Claims



1. A packaging assembly of multiple identical flexible inner containers for fluids combined in a tight fitting outer case of

rectangular shape suitable for vertical stacking of said packaging assembly, said flexible inner containers comprising a gaseous head space above said liquid, said packaging assembly being characterized in that said flexible inner containers have an inside pressure above the relevant ambient pressure at 20° C. and said gaseous head space is from 5% to 25% of the volume of said liquid in said inner containers.

2. A packaging assembly of multiple identical flexible inner containers for fluids combined in a tight fitting outer case of rectangular shape suitable for vertical stacking of said packaging assembly, said flexible inner containers comprising a gaseous head space above said liquid, said packaging assembly being characterized in that said flexible inner containers have an inside pressure above the relevant ambient pressure at 20° C. and said gaseous head space is filled with a gas which is inert relative to said fluid in said inner containers.

3. A packaging assembly multiple identical flexible inner containers for fluids combined in a tight fitting outer case of rectangular shape suitable for vertical stacking of said packaging assembly, said flexible inner containers comprising a gaseous head space above said liquid, said packaging assembly being characterized in that said flexible inner containers have an inside pressure above the relevant ambient pressure at 20° C., said inner containers are rectangular and have essentially flat foldable gable tops, and said inner containers have an essentially flat foldable gable top and said inside pressure is less than 100 Pa above the relevant ambient pressure at 20° C. when said flat foldable gable top is in an upright gable top position.

5,566,825

#### GOLF BAG WITH A POCKET HAVING MULTIPLE OPENINGS

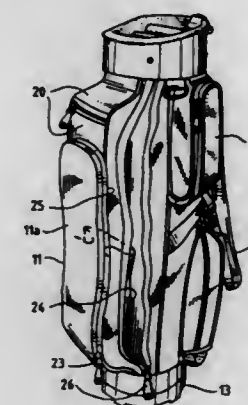
David Price, Hendersonville, Tenn., assignor to Wilson Sporting Goods Co., Chicago, Ill.

Filed Jan. 26, 1995, Ser. No. 378,406

Int. Cl.<sup>6</sup> A63B 55/00

U.S. Cl. 206—315.5

6 Claims

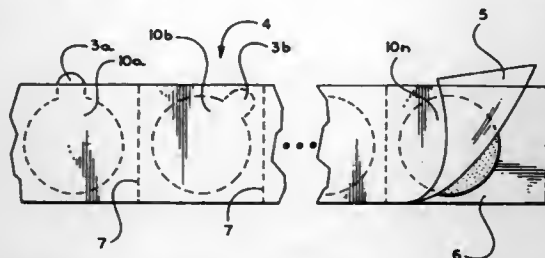


1. A golf bag comprising: a generally tubular bag portion having an elongate, generally tubular body with a bottom and an open top, said bag portion defining a pocket with a cavity, a first elongate access opening disposed at one side of the golf bag generally longitudinally of the tubular body and a second elongate access opening disposed at a second side of the golf bag generally longitudinally of the tubular body, each access opening communicating with the inside of the pocket; first closure means for closing and opening the first access opening; and second closure means for closing and opening the second access opening; the first and second sides lying generally perpendicularly to each other; the first and second elongate openings extending across a substantial portion of the length of the tubular body.

**5,566,826**  
**DISPOSABLE ADHESIVE NECKTIE FASTENER**  
 Robert L. Evans, 161 Lakeview Dr., Cordele, Ga. 31015  
 Filed Feb. 21, 1995, Ser. No. 391,659  
 Int. Cl.<sup>6</sup> B65D 85/02

U.S. Cl. 206—338

2 Claims

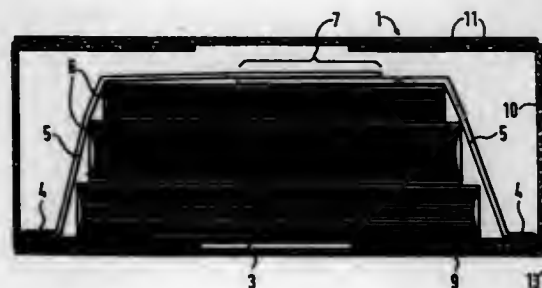


1. An article of manufacture, comprising:  
 a plurality of necktie fasteners, each necktie fastener for removably attaching a display end of a necktie to a tail end of said necktie, each necktie fastener comprising a flat substantially circular wafer having a first side and a second side bearing adhesive on said first and second sides, said adhesive having a greater affinity for said wafer than for said necktie such that said adhesive will remain substantially affixed to said wafer when attached to and subsequently removed from said necktie;  
 said necktie fasteners removably attached to at least one perforated ribbon having an edge, said adhesive having a greater affinity for said wafer than for said ribbon such that said adhesive will remain substantially affixed to said wafer when attached to and subsequently removed from said ribbon;  
 each necktie fastener having an integral handle portion extending from the periphery of said wafer;  
 each necktie fastener positioned on said ribbon so that said handle portion extends laterally beyond the edge of said ribbon.

**5,566,827**  
**BOOK PACKAGING CONTAINER**  
 Tarmo Janhonen, Vantaa, Finland, assignor to Pussikeskusoy, Helsinki, Finland  
 Filed Oct. 12, 1994, Ser. No. 321,988  
 Claims priority, application Finland, Oct. 12, 1993, 934496  
 Int. Cl.<sup>6</sup> B65D 25/10

U.S. Cl. 206—424

20 Claims



1. A book packaging container, comprising four walls (10), a floor (9) and cover flap (11) which can be folded into a container closing cover after wrapping the books, said walls, floor and cover defining a space having a certain size and shape, a separate base sheet (3) laid upon said floor of said container having cardboard flaps (5) including bases located adjacent to an edge (13) between opposite ones of said walls (10) and said floor (9) of said container, said flaps also each having an end and a length which is more than the sum of the half-height and the half-length of said container but less than the length of said container, whereby said ends of said flaps (5) are adapted to be fastened in an overlapping (7) fashion against each other on top of a bundle of books (6), and wherein

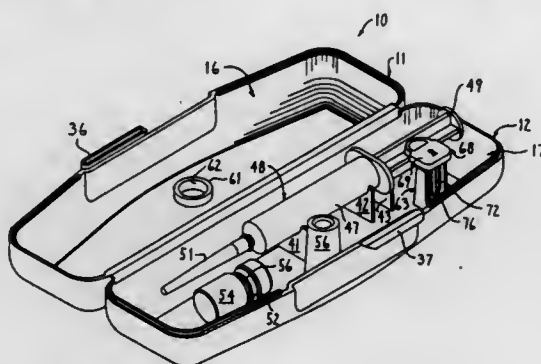
said separate base sheet (3) is made of cardboard and has a size that matches the floor of said container (1), such that said base sheet (3) abuts with its edges against said walls (10) surrounding said floor of said container, and that said bases of said flaps (5) join said base sheet (3) at a small distance from the ends of said base sheet (3).

18. A book packaging container comprising four walls, a floor, and at least one cover flap for folding into a container closing cover, said container including book securing flaps extending upwardly within said container from positions spaced inwardly from opposed ones of said walls over a base sheet fitted on said container floor, said book securing flaps including bases located adjacent to an edge between opposite ones of said walls and said floor, said book securing flaps each having an end and a length sufficient to extend upwardly and over at least one book when placed within said container between said book securing flaps such that said book securing flap ends will overlap and can be fastened to secure the book within said container, said base sheet having edges which abut said walls surrounding said floor of said container, and said bases of said book securing flaps join said base sheet at a small distance from the ends of said base sheet.

**5,566,828**  
**LOCKING PACKAGE FOR A SYRINGE**  
 Paul Claes, Beveren; Leo De Bondt, Breendonk, and Walter Van Giel, Aartselaar, all of Belgium, assignors to The Upjohn Company, Kalamazoo, Mich.  
 Filed Feb. 21, 1995, Ser. No. 390,964  
 Int. Cl.<sup>6</sup> B65D 85/20; 55/00

U.S. Cl. 206—570

8 Claims



1. A locking container for a syringe, comprising:  
 means defining a syringe receiving cavity including a pair of cover members each having an outer surface extremity, at least part of one of said pair of cover members being movable relative to the other cover member between an opened and a closed condition by means of an integral hinged assembly to permit access to said syringe receiving cavity located therebetween;  
 syringe holding means on one of said pair of cover members and oriented in said syringe receiving cavity;  
 locking key holding means on one of said pair of cover members and oriented in said syringe receiving cavity;  
 an elongated locking key removably stored on said locking key holding means and having thereon a catch at one end and an enlarged head at the other end;  
 means defining a pair of axially aligned holes when said cover members are in said closed position, one of said holes being provided through one of said pair of cover members and the other of said holes being provided through the other of said pair of cover members;  
 latch means fixedly oriented in one of said aligned two holes for operative engagement with said catch when said enlarged head contacts said outer surface extremity of the other of said pair of cover members in a region adjacent the other of said pair of holes to effect a locking of said cover members together in said closed position;

whereby a movement of said cover members to said opened position will provide access to the syringe and said locking key oriented in said syringe receiving cavity and facilitating a removal of the syringe and said locking key from said syringe receiving cavity, a movement of said cover members to said closed position causing the syringe, if soiled and placed back into said syringe receiving cavity, to become housed in said syringe receiving cavity, said pair of holes relatively movably receiving therein said end of said locking key having said catch until said catch operatively engages said latch means and said enlarged head contacts said outer surface extremity, at which time said locking key is rendered nonmovable in said holes and said cover members are hence forth locked together in said closed position.

8. A locking container for a syringe, comprising:  
 means defining a syringe receiving cavity including a pair of cover members each having an outer surface extremity, at least part of one of said pair of cover members being movable relative to the other cover member between an opened and a closed condition by means of an integral hinged assembly to permit access to said syringe receiving cavity located therebetween;

syringe holding means on one of said pair of cover members and oriented in said syringe receiving cavity;

an elongated locking key having thereon a catch at one end and an enlarged head at the other end;

means defining a pair of axially aligned holes when said cover members are in said closed position, one of said holes being provided through one of said pair of cover members and the other of said holes being provided through the other of said pair of cover members; and

latch means fixedly oriented in one of said aligned two holes for operative engagement with said catch when said enlarged head contacts said outer surface extremity of the other of said pair of cover members in a region adjacent said the other of said pair of holes to effect a locking of said cover members together in said closed position;

whereby a movement of said cover members to said opened position will provide access to the syringe oriented in said syringe receiving cavity and facilitating a removal of the syringe from said syringe receiving cavity, a movement of said cover members to said closed position causing the syringe, if soiled and placed back into said syringe receiving cavity, to become housed in said syringe receiving cavity, said pair of holes relatively movably receiving therein said end of said locking key having said catch until said catch operatively engages said latch means and said enlarged head contacts said outer surface extremity, at which time said locking key is rendered nonmovable in said holes and said cover members are hence forth locked together in said closed position.

**5,566,829**  
**COSMETIC TESTER MODULE**  
 Joseph Cotilletta, 130 Broadway, Cresskill, N.J. 07624  
 Filed Jun. 9, 1995, Ser. No. 488,904  
 Int. Cl.<sup>6</sup> B65D 83/06

U.S. Cl. 206—581

11 Claims

1. A tester module for testing cosmetic samples located at predetermined intervals on a tape comprising:

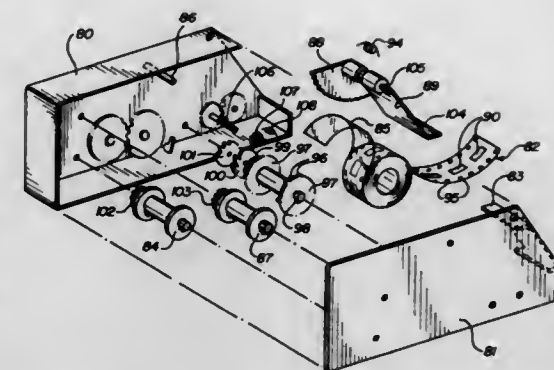
a housing having a base, outwardly extending side walls, one of the said walls having an aperture and a removable cover mounted over the walls to close the housing;

a tape take up reel and a tape supply reel mounted to the housing, said tape extending from the supply reel to the take up reel; and,

means for driving the reels to expose a cosmetic sample adjacent the window.

6. A tester module for testing cosmetic samples located at predetermined intervals on a tape comprising:

a housing having a tape supply reel and a tape take up reel mounted therein and a gear system to actuate the reels driving the tape from the supply reel to the take up reel;



the housing includes a base, side walls extending outwardly therefrom and a cover mounted over the walls, one of said walls including an aperture; and  
 a pivotable window mounted over the aperture and including to a gear segment, said segment engaging the gear system to drive said tape when the window is closed presenting a sample adjacent the aperture.

11. A tester module for testing cosmetic samples comprising:  
 a housing having a removable cover and testing aperture;  
 a pivotable door covering the aperture and having a driving gear segment coupled thereto;  
 a gearing arrangement connected to the gear segment to be actuated thereby including a drive sprocket coupled thereto;  
 a supply reel having a strip including a plurality of samples mounted thereon, perforations along both edges thereof, and a liner covering said samples; and,  
 a take up reel for the liner and a take up reel for the strip wherein opening the door drives the gear segment to actuate the sprocket wheel and drive the strip with a sample adjacent the aperture and the liner and strip onto the respective take up reels.

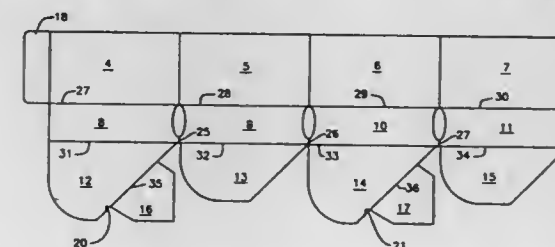
**5,566,830**  
**SAMPLE DISPLAY AND DISTRIBUTION DEVICE**  
 Herbert E. Margolin, 11 Beacon La., East Northport, N.Y. 11731

Filed Oct. 25, 1994, Ser. No. 328,203

Int. Cl.<sup>6</sup> B65D 5/52

U.S. Cl. 206—730

13 Claims



1. A merchandise display and distribution apparatus comprising:  
 a) a first wall panel, a second wall panel, a third wall panel, and a fourth wall panel;  
 b) a first central panel, a second central panel, a third central panel, and a fourth central panel;  
 c) a first support panel, a second support panel, a third support panel, and a fourth support panel, said first support panel provided with a first interlock notch and a first securing tab, said first securing tab sized and disposed to engage said second support panel when said blank is formed into a merchandise display and distribution apparatus, said third support panel provided with a second interlock notch and a second securing tab, said second securing tab sized and disposed to engage said fourth support panel when said blank is formed into a merchandise display and distribution apparatus;



- d) a first fold line disposed between and connecting said first wall panel and said second wall panel, a second fold line disposed between and connecting said second wall panel and said third wall panel, a third fold line disposed between and connecting said third wall panel and said fourth wall panel, a fourth fold line disposed between and connecting said first wall panel and said first central panel, a fifth fold line disposed between and connecting said second wall panel and said second central panel, a sixth fold line disposed between and connecting said third wall panel and said third central panel, a seventh fold line disposed between and connecting said fourth wall panel and said fourth central panel, an eighth fold line disposed between and connecting said first central panel and said second central panel, a ninth fold line disposed between and connecting said second central panel and said third central panel, a tenth fold line disposed between and connecting said third central panel and said fourth central panel, an eleventh fold line disposed between and connecting said first support panel and said second support panel, a twelfth fold line disposed between and connecting said second support panel and said third support panel, a thirteenth fold line disposed between and connecting said third support panel and said fourth support panel, a fourteenth fold line disposed between and connecting said first support panel and said first securing tab, a sixteenth fold line disposed between and connecting said third support panel and said second securing tab; and
- e) a flap attached to said first wall panel said flap disposed substantially opposite said second wall panel.

5,566,831

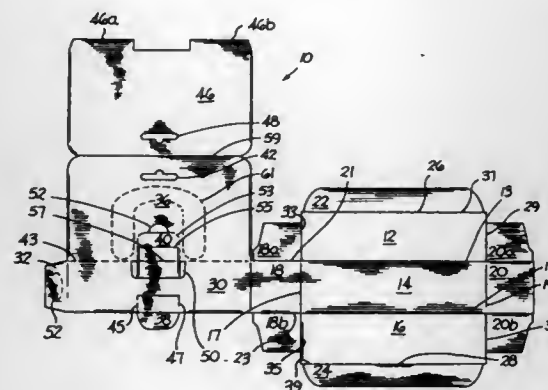
# UNITARY BLANK FOR FORMING A MERCHANDISING DISPLAY CONTAINER CONVERTIBLE INTO A MAILABLE CONTAINER

Robert E. Swenson, Jeffersonville, Ind., assignor to Colorama Creations, a division of Life Lines, Inc., Jeffersonville, Ind.  
Filed Nov. 16, 1995, Ser. No. 559,361

Int. Cl.<sup>6</sup> B65D 5/54

U.S. Cl. 206—767

11 Claims



1. A unitary blank having a multiplicity of fold, cut, and score lines permitting the blank to be folded along said fold and cut lines to form a container attached along a first score line to a display panel adapted to be hung from a merchandising display unit, said blank defining at least one locking slot and further having a first tab connected along a first folding line to a first panel and connected to said display panel along a second score line, said first tab being insertable in said slot when said display panel is separated from said container thereby causing said first panel to enclose said container and locking said container in mailable form.

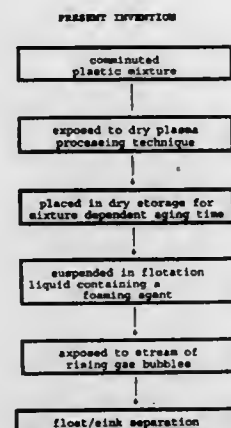
## METHOD FOR SORTING PLASTICS FROM A PARTICLE MIXTURE COMPOSED OF DIFFERENT PLASTICS

Björn Stückrad, and Karsten Löhr, both of Ulm, Germany, assignors to Daimler-Benz AG, Stuttgart, Germany  
Filed Aug. 7, 1995, Ser. No. 512,525  
Claims priority, application Germany, Aug. 5, 1994, 44 27 718.0; May 31, 1995, 195 19 865.4

Int. Cl.<sup>6</sup> B03B 1/00

U.S. Cl. 209—9

25 Claims



1. Method for separating plastic particles by types from a particle mixture of different types of plastics comprising the sequential steps of:
- surface treating the plastic particles in a physically dry manner by plasma processing of the particle mixture to change the wettability of the plastic particles;
  - placing the plasma processed particle mixture in dry storage for a predetermined time period to further change the wettability of at least one type of plastic particle; and
  - placing the stored processed particle mixture in a flotation device for separation according to wettability.

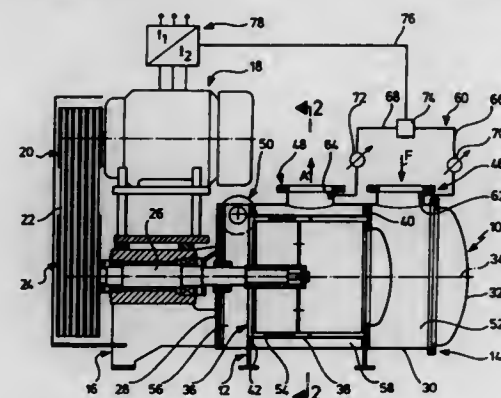
5,566,833

# PRESSURE SORTER FOR FIBER SUSPENSIONS AS WELL AS A PROCESS FOR THE PREPARATION OF FIBER SUSPENSIONS

Jochen G. Pfeffer, Enningen, and Erich Czerwoniak, Pfullingen, both of Germany, assignors to Hermann Finckh Maschinenfabrik GmbH & Co., Pfullingen, Germany  
Continuation of Ser. No. 377,373, Jan. 25, 1995. This application Jan. 26, 1995, Ser. No. 381,270  
Int. Cl.<sup>6</sup> B07B 1/04; B07D 21/02

U.S. Cl. 209—273

20 Claims

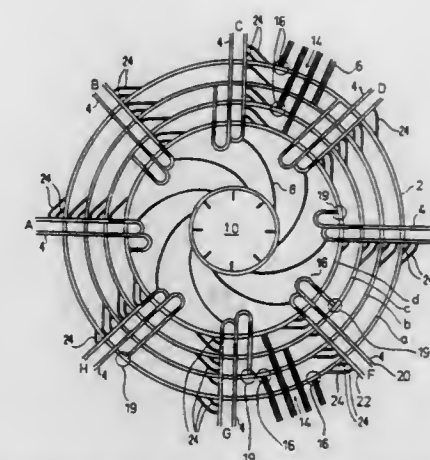


1. A pressure sorter for fiber suspensions, comprising a housing, a screen mounted in a stationary position within said housing and being of a configuration which is rotationally symmetrical to a

screen axis, said screen having a wall thickness of approximately 6 mm to approximately 9 mm, said screen separating a supply chamber encircled by the screen from an accepts chamber located outside the screen, wherein an inflow side of the screen faces the supply chamber and the supply chamber and the accepts chamber communicate with one another via through channels located in the screen wall, wherein the through channels, when viewed radially from the supply chamber, are slots approximately parallel to the screen axis, said slots having the same length as well as each having a clear slot width measured in the circumferential direction of the screen of approximately 0.1 mm to approximately 0.25 mm and forming in the screen wall a plurality of rows of slots with each row extending in the circumferential direction of the screen and the rows being arranged in spaced relation to one another in the direction of the screen axis, and wherein the inflow side of the screen includes contours generating turbulences in the fiber suspension to be treated, a rotor within said supply chamber and rotatable about the screen axis, an inlet for the fiber suspension to be treated communicating with a first axial end of the supply chamber, an accepts outlet communicating with the accepts chamber and a rejects outlet communicating with a second axial end of the supply chamber, wherein for generating positive and negative pressure pulses in the fiber suspension to be treated the rotor has a plurality of profiled elements arranged in the supply chamber and following one another in the circumferential direction of the rotor, said profiled elements each having a first flank lying in front in the rotational direction as well as approximately parallel to the screen axis for driving the fiber suspension to be treated in the rotational direction of the rotor as well as a second flank lying behind the first flank in a direction opposite to the rotational direction for drawing liquid back from the accepts chamber through the screen and into the supply chamber, wherein said rotor has such a number of profiled elements that the accepts volume  $V_{Gmax}$  (in liters) drawn off per minute at the accepts outlet of the pressure sorter during its operation does not exceed approximately

$$V_{Gmax} = 32 \times F_f \times D / 8$$

where D means the screen wall thickness (in mm) and  $F_f$  the sum of the surface area (in  $cm^2$ ), measured perpendicular to the circumferential direction of the rotor, of those sections of the first flanks of all the profiled elements located opposite the rows of slots in a radial direction in relation to the screen axis.



transporting goods and luggage from an associated outer arrival area to said rotating sorter conveyor, said inbound string including means for selectively transferring goods and luggage, being transported from the outer arrival areas, to selected ones of said rotating conveyor loops.

5,566,835

# CLEANER WITH INVERTED HYDROCYCLONE

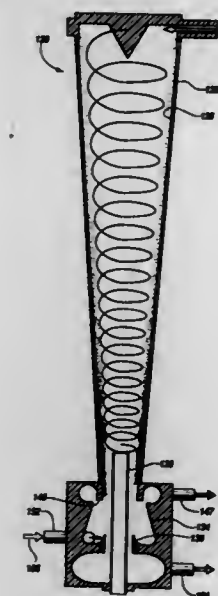
David B. Grimes, Greenfield, Mass., assignor to Beloit Technologies, Inc., Wilmington, Del.

Filed Oct. 5, 1995, Ser. No. 539,445

Int. Cl.<sup>6</sup> B03B 5/34

U.S. Cl. 209—725

21 Claims



1. A cleaner for separating heavyweight reject particles and light reject particles from acceptable particles in an input fluid flow, the cleaner comprising:

a body having a fluid inlet through which the input fluid flow is injected into the cleaner;

portions of the body defining a first chamber having outer inverted conical walls, wherein the input fluid is injected tangentially into the chamber, and wherein the input fluid is caused to be distributed within the inverted conical chamber such that the heavyweight reject particles are positioned in closer proximity to the walls, the lightweight reject particles are positioned centrally along the axis of the chamber and the acceptable particles are positioned primarily between the heavyweight reject particles and the lightweight reject particles;

## METHOD AND SYSTEM FOR TRANSPORT OF GOOD AND LUGGAGE IN AN AIRPORT OR SIMILAR FACILITY

Ole Prydtz, Hjortshøj, and Ralph Kofoed, Horsbøl, both, Denmark, assignors to Kosan Crisplant A/S, Aarhus, Denmark

Continuation of Ser. No. 743,418, Aug. 26, 1991, abandoned.

This application Jun. 6, 1995, Ser. No. 471,691

Claims priority, application Denmark, Feb. 24, 1989, 0861/89

Int. Cl.<sup>6</sup> B07C 5/00; B65G 47/10

U.S. Cl. 209—559

8 Claims

1. A system for transporting goods and luggage within an airport-type facility, the facility including a central departure area, a plurality of outer departure areas, a plurality of outer arrival areas, and a central delivery area, said system comprising:

a rotating sorter conveyor system including a plurality of rotating conveyor loops;

a feeding conveyor, for transporting goods and luggage from the central departure area to said rotating sorter conveyor and selectively transferring the goods and luggage to selected ones of said plurality of rotating conveyor loops; and

a plurality of endless loop string conveyors radiating outwardly from said rotating sorter conveyor to the plurality of outer departure areas and the plurality of outer arrival areas, each string conveyor including an outbound string for transporting goods and luggage from said rotating sorter conveyor to an associated outer departure area and an inbound string for

a tube which extends axially within the body to receive a portion of the flow containing lightweight reject particles;  
 portions of the body defining a second chamber having generally frustoconical walls, the diameter of the second chamber narrowing as it extends upwardly, wherein the second chamber is positioned beneath the first chamber;  
 portions of the body defining a heavyweight reject outlet which extends outwardly from the walls of the second chamber;  
 portions of the body defining an acceptable particle flow outlet positioned below the second chamber and in communication therewith; and  
 a first splitter fixed to the body to extend into the second chamber above the acceptable particle flow outlet, wherein the splitter has a lip which extends into the flow from the first chamber, said lip serving to split a portion of said flow containing heavyweight reject particles into the second chamber, while allowing the remainder of the flow containing acceptable particles to flow to the acceptable particle flow outlet, and wherein a recirculating flow is established within the second chamber of a portion of the flow containing heavyweight reject particles, said recirculating flow extending adjacent the flow downward from the first chamber with low turbulence.

5,566,836

## TELECOMMUNICATION RELAY RACK

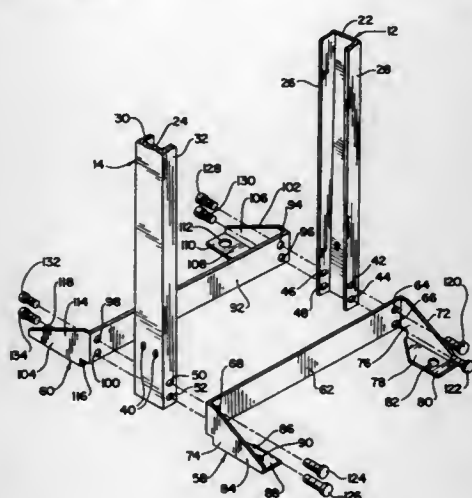
Zev Z. Lerman, Chicago, Ill., assignor to Homaco, Inc., Chicago, Ill.

Filed Jun. 1, 1995, Ser. No. 456,681

Int. Cl.<sup>6</sup> A47F 7/00

U.S. Cl. 211—26

20 Claims



16. A telecommunication relay rack installation including; a relay rack having a pair of substantially parallel uprights held in a substantially vertical attitude, each of said uprights having a top at its upper end and a bottom at its lower end, a horizontal member secured to each of the uprights adjacent to the top of the respective upright, and a base secured to the uprights adjacent to the bottom of each of the uprights holding the uprights in a substantially vertical attitude, said base including a pair of identical base halves secured to opposite sides of the uprights, each of said base halves including a horizontal squaring plate, each of said uprights having a pair of vertically spaced aligning apertures adjacent to the bottom on opposite sides of the respective upright, each of said squaring plates having a pair of vertically spaced base apertures adjacent to each of a pair of horizontally spaced opposed ends of the respective squaring plate, said base apertures on an opposed end of each of said squaring plates being registerable with respective aligning apertures on a respective side of a respective upright, a base fastener positioned in each base aperture and respective aligning aperture securing the respective base half to a respective side of a respective upright, said base fasteners with the squaring plates and

uprights cooperating with the horizontal member to hold the uprights in a substantially vertical attitude and parallel to each other, each base half having a foot fixed to the respective squaring plate, each foot extending away from the respective uprights, each foot including a toe pad extending below the bottom of the respective upright, and a substantially horizontal bearing surface connected to the toe pads supporting the relay rack.

5,566,837

## BALL CAP STORAGE AND DISPLAY RACK

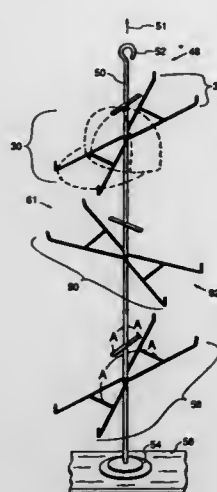
Greg Lema, 4022 Glendale Ct., Merced, Calif. 95348

Filed Mar. 16, 1994, Ser. No. 213,559

Int. Cl.<sup>6</sup> A47F 7/06

U.S. Cl. 211—33

18 Claims



1. A rack for storing baseball caps having a visor extending forwardly from a head cover, comprising:  
 a vertically oriented support member of elongated shape having a length, and first and second ends;  
 attachment means for attaching said support member to a surface;  
 a plurality of rack section means attached to said support member at periodic intervals along said length, each rack section means including  
 cap body support means attached to said support member for supporting the head cover of one of the baseball caps when the rear portion of the head cover is folded inwardly toward the visor;  
 cap visor supporting platform means attached to said support member beneath said cap body support means and in spaced apart relationship to said cap body support means for receiving and supporting the cap visor, said platform means including  
 a generally horizontally extending structure defining a support plane intersecting said vertically oriented support member, said structure having a generally triangular or trapezoidal configuration with a base-like extremity and an apex-like opposite extremity, said opposite extremity being rigidly affixed to said support member, and  
 captivation means extending upwardly from said base-like extremity and away from said support plane for captivating the visor of the cap placed on said structure with the head cover thereof folded and supported by said cap body support.

5,566,838

## SHOE-RACK ASSEMBLY WITH A HEATING DEVICE

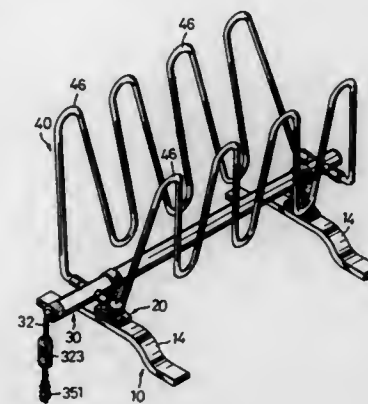
Lung-Hai Tseng, No. 40-30, Kuang-Hsing Rd., Tai-Ping Hsiang, Taichung Hsien, Taiwan

Filed Feb. 1, 1995, Ser. No. 381,764

Int. Cl.<sup>6</sup> A47F 7/08

U.S. Cl. 211—37

4 Claims



1. A shoe-rack assembly comprising:  
 a supporting device wherein said supporting device includes two inverted U-shaped brackets, each of said brackets having a flat top portion with a central hole and two threaded holes each disposed on an opposite side of said central hole;  
 a pipe with two ends disposed on said supporting device, one of said ends of said pipe having an electrical connector connected thereto, said electrical connector having two terminals mounted therein;  
 means for fastening said pipe to said supporting device wherein said fastening means includes two pairs of clamping units releasably connected adjacent to said two ends of said pipe, each pair of said clamping units having a positioning seat and a retaining hook which is connected releasably to said positioning seat, said positioning seat being inverted, T-shaped, and having a crossbar and a vertical hollow bar connected to said crossbar, said vertical hollow bar having a transverse partition formed at an intermediate section thereof, said transverse partition having an aperture which is aligned with said central hole of one of said brackets, said crossbar having two through holes which are aligned respectively with said two threaded holes of one of said brackets, said retaining hook of each pair of said clamping units being inverted, U-shaped, and having two leg portions extending into an upper end of said vertical hollow bar of one of said clamping units, said two leg portions having a connecting plate connected perpendicularly therebetween, said connecting plate having a threaded hole formed therein, each of said pairs of said clamping units having a threaded bolt passing upwardly through said central hole of one of said brackets, passing upwardly through said aperture of said partition of said vertical hollow bar of one of said pairs of said clamping unit, and engaging said threaded hole of said connecting plate of said retaining hook of one of said pairs of said clamping units, each of said ends of said pipes passing between said two leg portions of said retaining hook of one of said pairs of clamping units and being clamped between said upper end of said vertical hollow bar and an upper portion of said retaining hook of one of said pairs of clamping units, each of said clamping units having two screws extending downwardly through said two through holes of said crossbar thereof, and being threaded into said two threaded holes of said brackets; at least one thermally conductive hollow tube member having two ends connected to said pipe, said tube member having a

wavy configuration with a plurality of peaks which are adapted to insert into and support shoes; and  
 at least one resistance heating wire extending through said tube member and having two ends connected respectively to said two terminals of said electrical connector.

5,566,839

## STAND FOR HOLDING OBJECTS OF THE SAME SHAPE

Hans-Peter Müller, Eggweg 2, CH - 6315 Oberägeri, Switzerland

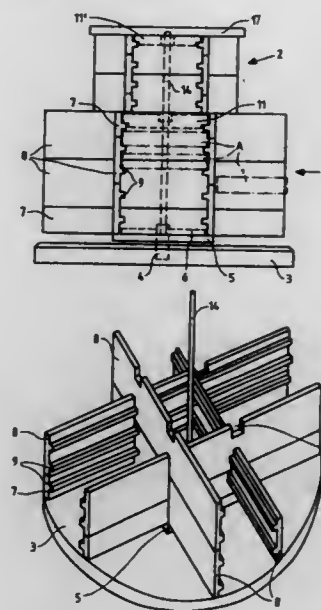
Filed Nov. 7, 1994, Ser. No. 336,676

Claims priority, application Switzerland, Mar. 10, 1993, 717/93

Int. Cl.<sup>6</sup> A47G 29/00

U.S. Cl. 211—40

7 Claims



1. A stand for holding objects all having a same form and being in sets, the objects of each set having a common size, a common length, and a common height; the stand comprising:  
 at least one holding part (1, 2) for objects of one of the sets; the one holding part further comprising  
 a plurality of pairs of bar-shaped structural elements (7, 8), the structural elements being of a first type and being disposed around a vertical center axis,  
 the structural elements of each of the pairs being identical in shape, deployed horizontally, and mutually parallel, each of the pairs comprising one level of the one holding part; adjacent levels including respective pairs in perpendicular arrangement and interlocking with one another;  
 each of the structural elements including  
 two identical longitudinal ribs (9) on an inner side thereof and two pairs of identical transverse grooves (10) on upper and lower edges thereof;  
 a groove-to-end length, from a structural element end to a transverse structural element, adopted to be generally equal to the common length of the objects;  
 a distance between the ribs adopted to be generally equal to the common height of the objects;  
 the structural elements resting in the transverse grooves of adjacent structural elements of a different level; and  
 the ribs of the structural elements of each pair facing each other to form parallel supports for holding the objects.



5,566,840

# DEVICE FOR ALIGNING PRINTED CIRCUIT BOARDS AND PATTERN CARRIERS

Paul R. Waldner, Bad Homburg, and Bernd Gennat, Kelkheim,  
both of Germany, assignors to Multiline International  
Europa L.P., Germany

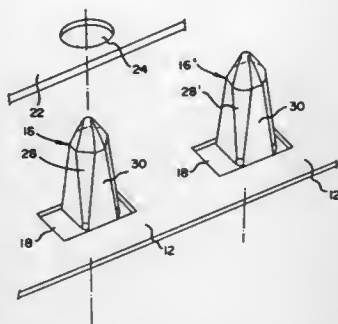
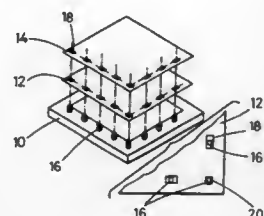
Filed Nov. 10, 1994, Ser. No. 337,118

Claims priority, application Germany, Nov. 12, 1993, 43 38  
656.3

Int. Cl.<sup>6</sup> A47G 19/08

U.S. Cl. 211—41

8 Claims



1. A device for mutually aligning perforated printed circuit boards and pattern carriers, said device comprising:  
a support having guides therein; and  
pins disposed in said guides, each of said pins having parallel lateral surfaces along a length thereof and corners having a shape selected from chamfered and rounded corners, thereby forming a substantially polygonal-shaped cross-section, a distance between said parallel lateral surfaces matching a width of said guides such that said pins are axially movable within said guides and laterally immovable in said guides, said corners of said pins tapering from the support toward free ends thereof.

5,566,841

# BAR CLAMP HOLDER

Norris M. Evans, 4925 Chicago Ave., Fair Oaks, Calif. 95628,  
and Michael E. Evans, 9465 Lake Natomas Dr., Orangevale,  
Calif. 95662

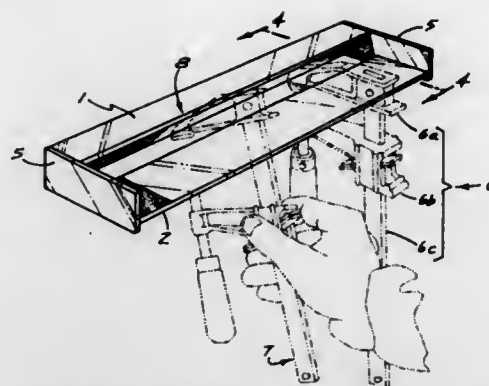
Filed Apr. 28, 1995, Ser. No. 431,128

Int. Cl.<sup>6</sup> A47F 7/00

U.S. Cl. 211—70.6

3 Claims

1. A bar clamp holder of finite length having an open mouth in the form of a U-shaped member, said U-shaped member comprising, a generally horizontal upper surface being of sufficient outward dimension so as to provide a means to overlay or capture the nose portion of the fixed jaw of a commonly proportioned bar clamp, a generally vertical support surface and being adapted to accept a fixing means, a generally horizontal lower surface extending or placed outward from said generally vertical support surface for a substantial portion of the width of the bar clamp holder so as to allow a means for the fixed and movable jaws of a commonly proportioned bar clamp to be closed around said lower surface, a generally vertical surface extending downward from said generally horizontal upper surface, a pair of end plates placed separately and located at each end of the upper and lower surfaces of the bar



clamp holder and in the generally vertical plane that passes through the collective end surfaces of the upper surface and the lower surface.

5,566,842

# HOLDER FOR STORING A TOOTHPASTE DISPENSER AND TOOTHBRUSHES

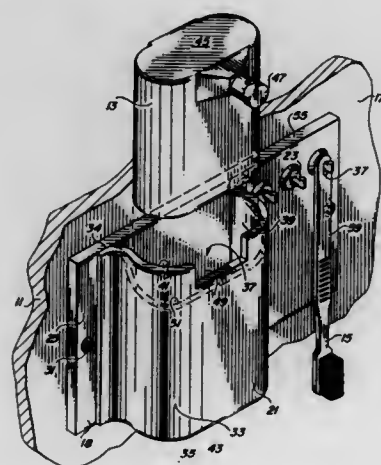
Breeze R. H. Dennis, 3412 Griffin, #1605, Fort Worth, Tex. 76133

Filed Sep. 13, 1994, Ser. No. 305,045

Int. Cl.<sup>6</sup> A47F 7/00

U.S. Cl. 211—87

5 Claims



1. A tooth care equipment retaining apparatus for mounting on a wall, comprising:  
a base mounted on the wall;  
a cup coupled to said base, said cup and said base defining a cavity therebetween;  
a toothpaste pump dispenser removably located in said cavity, a depressible top section and a dispenser nozzle provided on said toothpaste pump dispenser, wherein said nozzle dispenses toothpaste from said toothpaste pump dispenser responsive to operation of said depressible top section; and  
at least one toothbrush mounting member coupled to said base.

5,566,843

# RETRACTABLE FOLDING HANGER DEVICE

Phillip C. Kruska, 3031 W. Charter Oak, Phoenix, Ariz. 85029

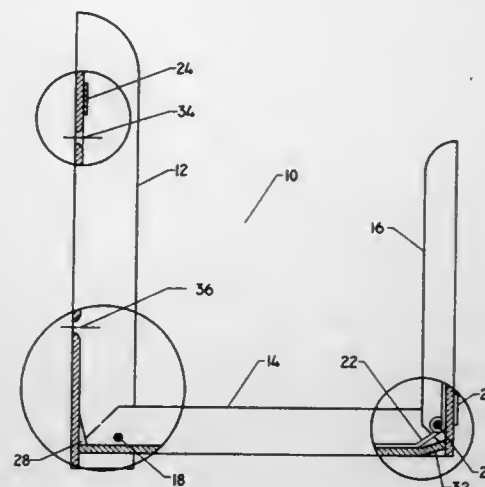
Filed Mar. 1, 1994, Ser. No. 204,586

Int. Cl.<sup>6</sup> A47H 1/00

U.S. Cl. 211—104

12 Claims

1. A retractable folding hanger device comprising:  
base means for attaching said device to a flat surface;  
extension means for hanging objects therefrom;



retention means for retaining objects hung on said extension means;  
first connection means for pivotally connecting said extension means to said base means; second connection means for pivotally connecting said retention means to said extension means;  
holding means for unobstructedly holding said device in an open position whereupon said extension means extends substantially orthogonally from said base means and said retention means extends substantially orthogonally from said extension means;  
said base means, said extension means and said retention means each defining a U-shaped channel, each said channel having a transverse dimension to enable said retention means to nest within said extension means, and said extension means to nest within said base means so that when said device is in its retracted position, said retention means and said extension means fold into a nested relationship within said base means.

5,566,844

# DISPLAY UNIT BACK WALL AND DISPLAY UNIT INCORPORATING SAME

Didier Bernardin, 60 Rue de Varenne, 75007 Paris, France

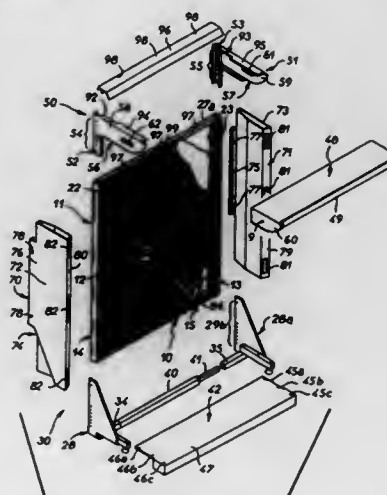
Filed Aug. 15, 1994, Ser. No. 290,496

Claims priority, application France, Aug. 16, 1993, 93 10007

Int. Cl.<sup>6</sup> A47B 43/00; 47/00; 57/00

U.S. Cl. 211—189

9 Claims



1. A display unit comprising:  
a display unit back wall having a U-shape unitary construction frame including two parallel uprights along a first and second

side thereof, said uprights forming at least part of a slideway for a plurality of stacked slats, and a crossmember fixed to a bottom end of each of the two uprights along a third side of said frame, a plurality of stiffener bars fastened to the uprights and to the crossmember, said stiffener bars being all situated within a peripheral edge of the frame perpendicular to a general plane thereof, two feet extending transversely towards said back wall of said display unit, a plurality of holes in a median part of a transverse cross-section of each of said uprights, and said feet including a plurality of holes cooperating with the holes of said uprights and adapted to be assembled to said uprights by removable fixing means using said holes, each of said feet including at least one polygon-shaped cross-section tube section extending along the third side of said unitary contraction U-shaped frame towards the other foot and a linking bar having ends with a cross-section complementary to an inside cross-section of each of the tube sections of the respective feet being received by the tube sections.

5,566,845

# CONTAINER HAVING A SEAL PUNCTURING DEVICE

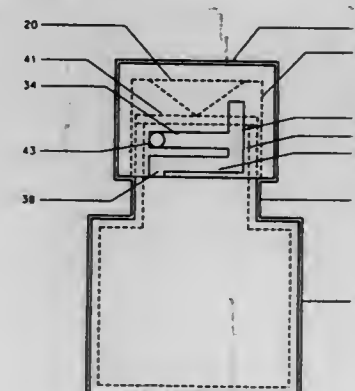
Steven J. Frank, Havertown, Pa., assignor to IDEA Laboratories, Inc., Wynnewood, Pa.

Filed Feb. 1, 1995, Ser. No. 382,451

Int. Cl.<sup>6</sup> B65D 50/02

U.S. Cl. 215—208

8 Claims



1. A closure for a container member having an opening for receiving flowable material therein, said closure comprising:  
a hollow body member having means for engaging and closing a container member over an opening in said container member for receiving flowable material into said container, said body member having an upper surface and a lower edge, said body member having a slot arrangement for engaging a post member on said container member to releasably attach the body member to the container member, said slot arrangement comprising a plurality of vertical slots and a plurality of horizontal slots intersecting said vertical slots, said plurality of vertical slots including first and second parallel vertical slots, said plurality of horizontal slots including first and second parallel horizontal slots, said first vertical slot intersecting said edge of said body member and said first horizontal slot, said first horizontal slot intersecting said first and second vertical slots, said second horizontal slot intersecting said second vertical slot, said second vertical slot extending above said second horizontal slot, said second horizontal slot having a closed end portion to retain said body member in a predetermined vertical position relative to said container member.

5,566,846

**BUTTON ENHANCEMENT COATING SYSTEM**

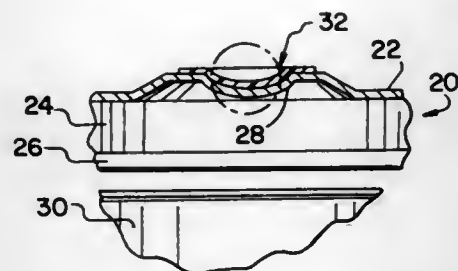
Albert J. James, Chicago, Ill., assignor to Continental White Cap, Inc., Northbrook, Ill.

Continuation of Ser. No. 61,272, May 13, 1993, abandoned, which is a continuation of Ser. No. 884,866, May 13, 1992, abandoned, which is a continuation of Ser. No. 585,179, Sep. 20, 1990, abandoned. This application Feb. 8, 1994, Ser. No. 193,808

Int. Cl.<sup>6</sup> B65D 39/00

U.S. Cl. 215—230

20 Claims



1. A closure having an end panel including a package condition indicating deflectable button, and tamper indicating means carried by said button to permanently indicate that said closure has been applied to a container and removed, said tamper indicating means comprising a first colored coating layer bonded to an exterior of said button, and a second colored coating layer releasably bonded to an exterior surface of said first colored coating layer, said colors of said layers combining to display one color when said colored coating layers are bonded together and to display only the color of said second colored coating layer when said colored coating layers become separated.

5,566,847

**ELECTRONIC PLUG BOX**

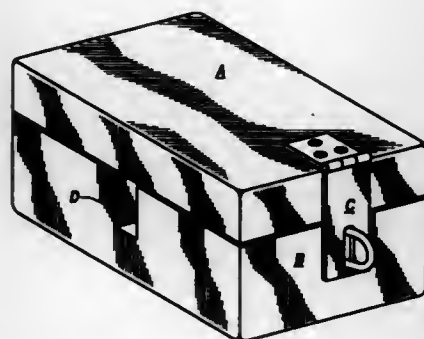
Debra R. Ali, P.O. Box 5605, Savannah, Ga. 31414, and John B. Collier, Jr., 521 E. 40 St., Savannah, Ga. 31401

Filed Feb. 11, 1993, Ser. No. 16,280

Int. Cl.<sup>6</sup> B65D 43/00

U.S. Cl. 217—57

5 Claims



1. A vault box for controlling access of an electrical outlet plug connected to an electrical appliance cord comprising:  
a plug retaining hollow lower section having a transversely extending bottom portion around the perimeter of which an annular sidewall portion extends upwardly terminating in an upper edge surface defining the perimeter of an open top portion of said lower section,  
a top cover section configured to overlie said lower section open top portion and said sidewall upper edge surface,  
said lower section sidewall portion having a pair of remotely located slots each extending downwardly from said upper edge surface,

each said slot having a width dimension greater than the diameter of said cord and less than the minimal cross sectional dimension of said plug,

said remote location of said slots being a separation such that said appliance cord can extend through both said slots with said plug located exteriorly of said lower section,

means movably interconnecting said lower and top cover sections for movement between an open position with said top cover section spaced from said sidewall portion upper edge surface and a closed position with said top cover section overlying said sidewall open top portion and upper edge surface and

lock attaching means affixed exteriorly of each said section and adapted for engagement by a lock for locking said sections in said closed position.

5,566,848

**SLOPED BOTTOM TANK**

Arthur D. Rude, Ash Grove, and Vinton F. Horine, Springfield, Mo., assignors to Custom Metalcraft, Inc., Springfield, Mo.

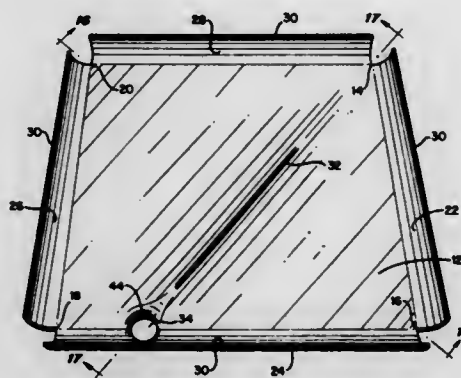
Division of Ser. No. 214,567, Mar. 18, 1994, Pat. No.

5,505,070. This application May 19, 1995, Ser. No. 446,059

Int. Cl.<sup>6</sup> B65D 6/00

U.S. Cl. 220—4.12

8 Claims



1. A tank for liquids, said tank having generally upwardly extending sides and a sloped bottom for drainage of liquid from the tank, wherein said sloped bottom includes a one-piece construction formed from a square or rectangular shaped plate member which is generally flat and has a plurality of corner portions and which is sheared to provide two adjacent sides, each of which is tapered inwardly along the length thereof and which together define one of said corner portions, and with the other two sides of said plate member being perpendicular to each other, each of said tapered sides being tapered inwardly from its respective end which defines said one of said corner portions, and with a notch having been cut in each corner portion, said plate member having been deformed to provide a bottom wall portion which slopes downwardly toward said one of said corner portions and upwardly extending side wall portions which extend around the periphery of said bottom wall portion, and with a drain opening and a crease formed in said bottom wall portion, said drain opening being located adjacent said one of said corner portions and with said crease being aligned with and spaced from said drain opening.

5,566,849

**HINGE STRUCTURE FOR A BOX**

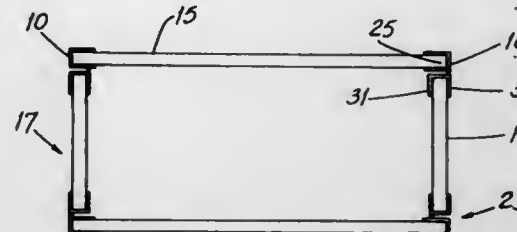
Steven J. Goehner, Hartland, Wis., assignor to Goehner Industries, Inc., Dousman, Wis.

Continuation-in-part of Ser. No. 262,685, Jun. 20, 1994, abandoned. This application Oct. 14, 1994, Ser. No. 322,995

Int. Cl.<sup>6</sup> B65D 6/12

U.S. Cl. 220—7

10 Claims



1. In a hinge structure having first and second flexibly-connected channels, the first channel receiving the inserted edge of a cover therebetween and the second channel receiving the inserted edge of a wall member therebetween and wherein each channel has a pair of substantially parallel side panels extending from a rib, the improvement wherein:

the channels are flexibly connected by a resilient strand permanently attached to each channel;  
the channels are spaced from one another when the cover and wall member are perpendicular to one another;  
the side panels of the second channel extend substantially the same distance from the rib of such second channel, whereby the side panels of the second channel engage the edge of the wall member substantially simultaneously upon wall member edge insertion.

5,566,850

**ROTOR-TYPE DISPENSER**

Michael J. Forsyth, Stow; Bruno A. Mediate, Independence, and David E. Pecot, Brecksville, all of Ohio, assignors to Weatherchem Corporation, Twinsburg, Ohio

Division of Ser. No. 104,854, Aug. 10, 1993, Pat. No.

5,402,921, which is a continuation of Ser. No. 808,372, Dec.

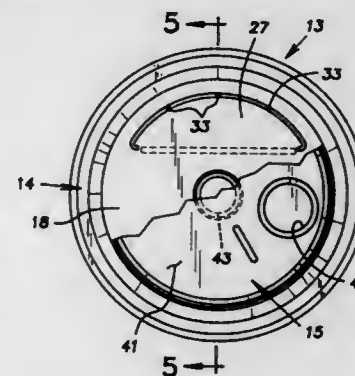
16, 1991, abandoned. This application Dec. 5, 1994, Ser. No.

349,626

Int. Cl.<sup>6</sup> B65D 51/18

U.S. Cl. 220—253

2 Claims



1. A container end wall being generally circular with a center and having an integral push-in tab that, when pushed in, forms an opening in the end wall for dispensing contents from the container, the push-in tab having a hinge line at which the tab is supported when pushed in, the push-in tab having a boundary line that defines a free edge of the tab when it is pushed into the container, the boundary line including lines in the end wall over substantially all of the length of the free edge where a discontinuity in the end wall exists between the tab and adjacent portions of the end wall, the

discontinuity being a gap that has a dimension substantially in the range of between 0.002 to 0.10 inches measured in a direction of the plane of the end wall, a sealant material coated and set in-situ in an arcuate pattern concentric with said end wall center across the tab and adjacent portions of the end wall where any discontinuity in the boundary line exists so as to form a hermetic seal at any such discontinuity, the sealant being applied by a process that includes the step of disposing a sealant material applying device for relative rotation with the end wall about said end wall center and applying the sealant material onto the end wall in a circumferentially continuous circle on said arcuate pattern while causing relative rotation between the applying device and the end wall about said end wall center.

5,566,851

**LIQUID CONTAINER AND MOUTH THEREOF**

Yasuyuki Sasaki, and Takehiko Bizen, both of Shinjuku-ku, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

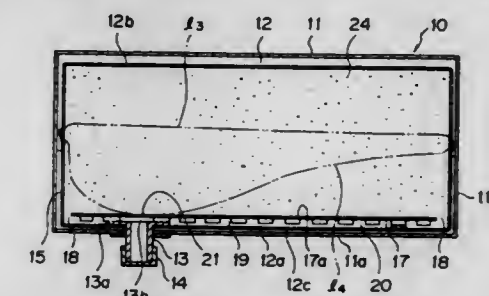
Continuation-in-part of Ser. No. 683,288, Apr. 10, 1991, abandoned. This application Jan. 11, 1994, Ser. No. 179,975

Claims priority, application Japan, Apr. 11, 1990, 2-95574

Int. Cl.<sup>6</sup> B65D 77/06

U.S. Cl. 220—441

20 Claims



1. A liquid container for containing a liquid therein which comprises:

a) an outer box having at least one flat wall;  
b) a flexible inner bag accommodated in the outer box;  
c) a mouth fixed to the inner bag so as to be projected outwardly of the flat wall of the outer box; and  
d) a path forming member in the shape of a flat wall provided along the flat wall of the outer box in the inner bag so as to cover almost all of the flat wall of the inner bag, including the mouth therewith for ensuring a liquid path between the flat wall of the inner bag and a flat base portion of the path forming member, all liquid paths being connected to the mouth, the path forming member having a plurality of liquid openings for communicating the liquid paths with an upper space over the path forming member in the inner bag, wherein the path forming member has a number of projections provided at predetermined intervals, and is accommodated in the inner bag with the projections directed toward the flat wall of the inner bag so as to form lattice-like liquid paths.

5,566,852

**CARRY OUT TRAY WITH FIXED PANEL**

Roy W. Emery, 1 Donino Court, Toronto, Ontario, Canada

Filed May 23, 1995, Ser. No. 448,183

The portion of the term of this patent subsequent to Jul. 27, 2013, has been disclaimed.

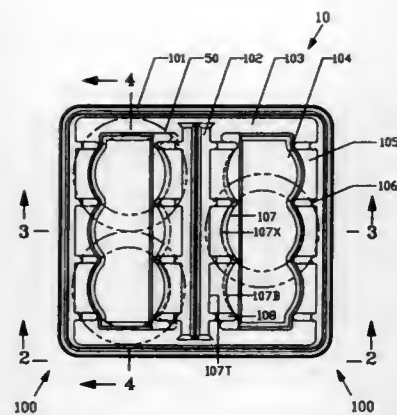
Int. Cl.<sup>6</sup> B65D 1/36

U.S. Cl. 220—556

4 Claims

1. A carry out tray fabricated of resilient material having at least one cell, each cell for receiving at least one cup, each cell having a vertical axis and being comprised of a top rim, a first side wall and a second side wall, two end walls and a supporting bottom panel,





each of said two side walls and two end walls being connected to each other at their adjacent edges to form a circumference of said cell, each of said first side wall and two end walls being connected to said bottom panel, whereby to form a supporting structure for said cell, said second side wall being left free of connection to said bottom panel to allow said second sidewall to flex outwardly of said cell when displaced by entry of a cup, thus forming a pressure wall to exert pressure upon said cup between said two side wall, said first side wall being formed with at least two ribs directed downwardly into, and inwardly, of said cell, designed to receive, and provide lateral stability to, said cup located respectively between a pair of said at least two ribs formed on said first side wall and an opposing pair of ribs of said second side wall; said second side wall being formed with at least two ribs directly opposing said at least two ribs of said first side wall, said at least two ribs of said second side wall projecting downwardly into, and inwardly of, said cell to a bottom edge, and at such an angle with said vertical axis of said cell as to project inwardly at said bottom edge into the area to be occupied by said cup, and with a top edge of said second side wall ribs and said second side wall spaced a sufficient distance from a top edge of said first side wall and related ribs to receive said cup, the lower edge of said second side wall being displaced and flexed outwardly of said cell by entry of said cup, thereby producing a supporting pressure upon said cup between said first side wall and said second side wall, with at least a point of contact with said cup at each rib of said opposing pair of ribs of each of said side walls; the areas between the ribs of said second side wall, and between each of two endmost ribs of said second side wall and the adjacent edge of an end wall being tapered from a substantially linear connection to said top rim at their respective top edges to a part cylindrical form at each of their bottom edges, thereby to provide both lateral and outward flexibility across the entire length of said second side wall in order to accommodate the containment of at least one cup.

5,566,853

#### APPARATUS FOR SEALING A VESSEL UNDER PRESSURE

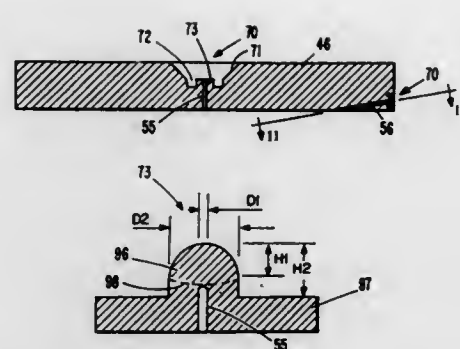
Alfred R. Schenker, Norristown, and Luken W. Potts, Merion, both of Pa., assignors to VIZ Manufacturing Co, Philadelphia, Pa.

Continuation-in-part of Ser. No. 5,584, Jan. 19, 1993, Pat. No. 5,296,659. This application Mar. 18, 1994, Ser. No. 210,718  
Int. Cl.<sup>6</sup> F17C 1/00; B60R 21/28

U.S. Cl. 220—581

10 Claims

6. Apparatus for sealing a container under pressure, comprising: a closed container having a plurality of imperforate metal walls for maintaining a gas under pressure, a capillary aperture extending outward through an exposed wall of said container, said capillary aperture providing part of an elongated cylindrical shape closure feature having an end opening for filling and sealing said container, said capillary aperture being smaller than ten one thousandths of an inch in diameter, and



said wall surrounding said capillary aperture and having an open end with the physical characteristic of collapsing and closing when the exposed wall surrounding the open end of said capillary aperture is raised to a molten state.

5,566,854

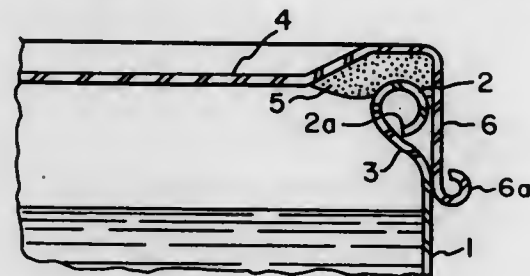
#### CANS FOR FOODSTUFF PACKING WITH EASILY REMOVABLE UNCLINCHED METAL COVERS

Arnaldo Rojek, São Paulo, Brazil, assignor to Metalgrafica Rojek Ltda., Brazil

Division of Ser. No. 219,653, Mar. 29, 1994. This application Jun. 7, 1995, Ser. No. 477,775  
Int. Cl.<sup>6</sup> B65D 43/10

U.S. Cl. 220—658

8 Claims



1. A can for foodstuff packing, comprising: a bottom; a cylindrical body, having an upper part, a lower part and a lateral external wall, therebetween said upper part and said lower part; said lateral external wall having a first diameter and said lower part is attached to said bottom; said upper part having an end extending beyond said lateral external wall and said upper part reducing in diameter from said lateral external wall which has said first diameter to said end of said upper part, wherein said end of said upper part has a second diameter which is less than said first diameter; and an outwardly wound cord having a lateral external border, said outwardly wound cord disposed on said end of said upper part with said lateral external border of said cord in vertical alignment with said lateral external wall of said cylindrical body.

5,566,855

#### TIMED CIGARETTE CASE

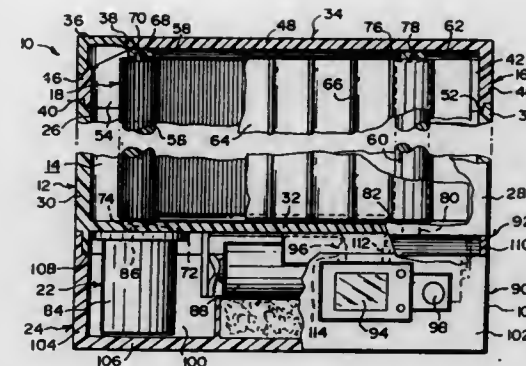
Thomas L. Bradach, 24135 W. Willow Creek Rd., Kaycee, Wyo. 82639

Filed Feb. 16, 1995, Ser. No. 393,123  
Int. Cl.<sup>6</sup> B65B 59/00

U.S. Cl. 221—15

12 Claims

1. A timed cigarette case comprising:



a) a housing having a compartment therein, said housing including a front wall, a rear wall, two side walls extending between said front wall and said rear wall, and a bottom wall, thereby forming said compartment therein;  
b) means for providing access to said compartment within said housing, said access means including a top cover, a lid hinged to one side of said top cover, and means for connecting said top cover to a top edge of said front wall, said rear wall and said two side walls of said housing;  
c) means rotatively mounted within said compartment of said housing, for storing a plurality of cigarettes therein;  
d) means for operating said rotatively storing means; and  
e) means for actuating said operating means at predetermined time intervals, so that one cigarette in said rotatively storing means will be in position at said access means to be removed therefrom.

5,566,856

#### HOT FOOD AND FROZEN FOOD VENDING MACHINE

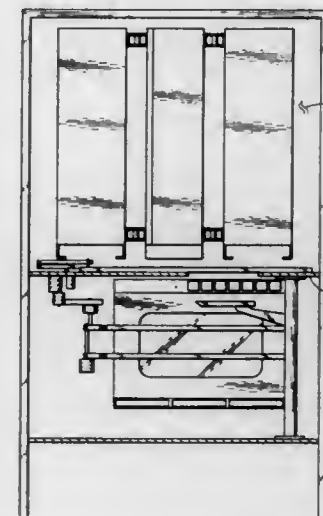
Norma Fallen; Tony Rivera, both of 130 Danette Cir., Reno, Nev. 89511; Doug Snyder, and David Travis, both of Benicia, Calif., assignors to Norma Fallen, and Tony Rivera, both of Reno, Nev.

Filed Jun. 6, 1991, Ser. No. 710,434

Int. Cl.<sup>6</sup> A24F 27/14

U.S. Cl. 221—150 HC

10 Claims



1. A vending apparatus comprising: a freezer area, at least one magazine disposed therein for holding food cartons, means for transporting said food carton out of said freezer area comprising elevator means, and means for dispensing said food carton to an operator, further comprising means for maintaining temperatures below freezing in said freezer area, further comprising microwave

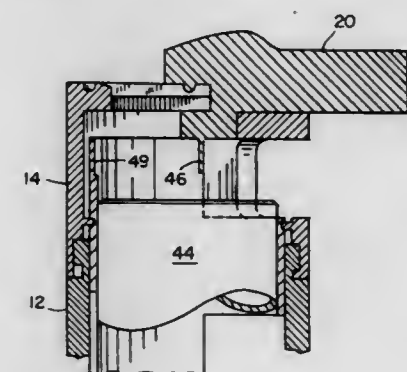
means for heating food contained in said food cartons through the use of microwaves, further comprising means for moving said food carton from said freezer area into said microwave means while maintaining an upright orientation wherein said means for moving said food carton comprises elevator means comprising means for moving said carton in a vertical direction and means for rotating said carton about a vertical axis of said elevator means, wherein said elevator means comprises a radially threaded gear and a platform with a follower disposed at a first end such that said follower is engaged with said threaded gear and is moved vertically when said threaded gear is rotated about its axis, wherein said elevator means further comprises a guide means such that said follower is constrained to travel by said guide means and said guide means is rotatable about said vertical axis of said elevator means.

5,566,857  
DISPENSER

Michael Rothman, 37 Grayson La., Newton, Mass. 02162  
Continuation-in-part of Ser. No. 29,668, Oct. 13, 1994, Pat. No. Des. 366,827, which is a continuation-in-part of Ser. No. 21,528, Apr. 19, 1994, abandoned. This application Dec. 30, 1994, Ser. No. 366,624  
Int. Cl.<sup>6</sup> B65H 1/08

U.S. Cl. 221—229

12 Claims



1. A dispenser comprising: a container having an open end and including means for urging items contained within said container proximate said open end; and a cover for said container including a slot in communication with the open end of said container, and a slidable top portion having means for dispensing an uppermost item within said container through said slot when said slidable top portion of said cover is extended, said cover being rotatable with respect to said container for covering the slot thereby sealing items within said container.

5,566,858

#### UNDERWATER TOOL ELEMENT KIT

Andrew L. Ducker, III, 9604 NW. 28th St., Coral Springs, Fla. 33065

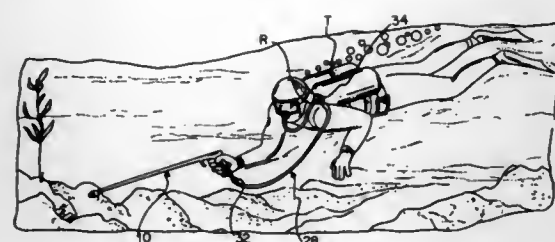
Continuation-in-part of Ser. No. 856,242, Mar. 25, 1992, Pat. No. 5,294,021. This application Mar. 15, 1994, Ser. No. 212,973

Int. Cl.<sup>6</sup> B67D 5/00

U.S. Cl. 222—3

14 Claims

1. A kit for underwater use, comprising: handle means including a hollow tube with a gripping end and a coupling end, first coupling means at said coupling end, gripping end coupling means at said gripping end,



air supply means comprising an air supply hose coupled to said gripping end coupling means for delivering air through said hollow tube and through said first coupling means, said air supply means additionally comprising a scuba compressed air tank having a regulator with a first stage, wherein said air hose is coupled to said regulator for more measured air discharge, an inflatable air buoy, air delivery means for delivering air from said first coupling means into said for inflating said buoy.

5,566,859

## FOIL PIERCING AND CLEARING NOZZLE

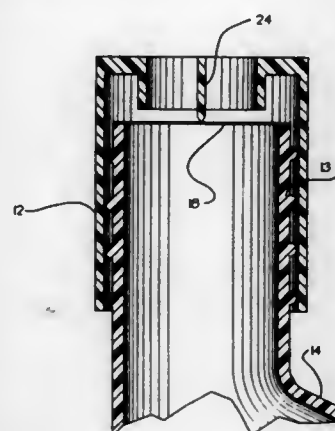
Charles M. Willis, and William V. Willis, both of 13534 Claudia Dr., Hudson, Fla. 34667

Continuation-in-part of Ser. No. 21,313, Apr. 13, 1994, abandoned, which is a continuation of Ser. No. 762,946, Sep. 19, 1991, abandoned. This application Dec. 27, 1994, Ser. No. 364,542

Int. Cl.<sup>6</sup> B67D 5/00

U.S. Cl. 222—83.5

5 Claims



1. A foil piercing and clearing nozzle comprising: a cylindrical main body means for positioning over a neck of a container; a piercing means mounted within the cylindrical main body means for piercing a frangible seal extending across an end of the neck of the container; and, a clearing means mounted within the cylindrical main body means for engaging and positioning the frangible seal into an abutting relationship with an interior surface of the neck of the container so as to clear the frangible seal from a path of fluid exiting from the container; wherein the piercing means comprises a piercing blade coupled to diametrically opposed interior surfaces of the clearing means, and wherein the clearing means comprises an annular wall fixedly surrounding the piercing means, said annular wall being fixedly located between said cylindrical main body means and terminating in a downwardly depending edge for engaging

said foil along a concentric path of constant radial distance between said piercing means and said cylindrical main body means.

5. A method of opening a container having a neck with a frangible foil seal extending across the neck, said method comprising the steps of:

providing a foil piercing and clearing nozzle comprising: a cylindrical main body means for positioning over a neck of a container;

a piercing means mounted within the cylindrical main body means for piercing a frangible seal extending across an end of the neck of the container;

and, a clearing means mounted within the cylindrical main body means for engaging and positioning the frangible seal into an abutting relationship with an interior surface of the neck of the container so as to clear the frangible seal from a path of fluid exiting from the container;

wherein the piercing means comprises a piercing blade coupled to diametrically opposed interior surfaces of the clearing means,

and wherein the clearing means comprises an annular wall fixedly surrounding the piercing means, said annular wall being fixedly located between said cylindrical main body means and terminating in a downwardly depending edge for engaging said foil along a concentric path of constant radial distance between said piercing means and said cylindrical main body means;

positioning the neck of the container into the cylindrical main body means; inverting the container with the cylindrical main body means positioned over the neck thereof;

placing the cylindrical main body means over an oil fill hole of an apparatus and into contact with a portion of the apparatus; and,

advancing the neck of the container into the cylindrical main body means, whereby the piercing means engages the frangible seal to effect creation of a fracture, and the clearing means engages the frangible seal to force the frangible seal into contact with an interior surface of the neck.

5,566,860

## DUAL COMPONENT CARTRIDGE

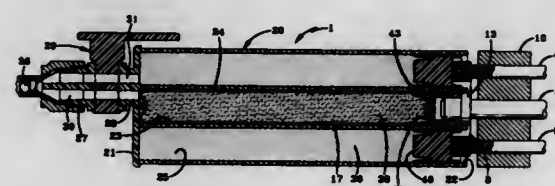
William C. Schiltz, Canton, and Frederick D. Wasmire, Alliance, both of Ohio, assignors to Liquid Control Corporation, North Canton, Ohio

Filed Sep. 8, 1994, Ser. No. 303,083

Int. Cl.<sup>6</sup> B65D 35/22

U.S. Cl. 222—94

21 Claims



1. A cartridge for use in a dispensing gun for simultaneously dispensing first and second fluid components contained separately in said cartridge, said cartridge including:

a body having a forward discharge end and a rear end, and first and second chambers for containing the first and second fluid components, respectively, separate from each other prior to dispensing said components from said chambers;

a dispensing nozzle extending from the forward end of the body; a collapsible container formed of a thin flexible film for placing and holding the first fluid component within the first chamber, with the second fluid component being freely contained within the second chamber;

first and second pistons located within the first and second chambers, respectively, and movable from adjacent the rear end of the body toward the discharge end for simultaneously discharging the fluid components from the flexible film and from the interior of the second chamber and outwardly through the nozzle; and

means for forming a void space in the first chamber adjacent the forward end of the body having a sufficient volume for collecting the flexible film therein after both of the pistons have reached said forward end to dispense substantially all of the fluid components from the flexible film and from the second chamber, and the first piston has compacted the film in said void space.

5,566,861

## POURING CONTAINER

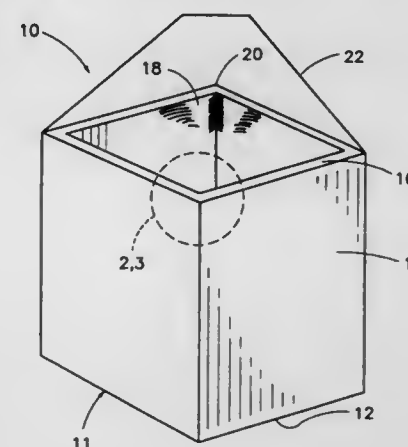
Andrew Serano, 224 E. Highland Ave., Philadelphia, Pa. 19118

Filed Jan. 10, 1995, Ser. No. 371,093

Int. Cl.<sup>6</sup> B67D 1/16; B65D 8/02; 25/40

U.S. Cl. 222—109

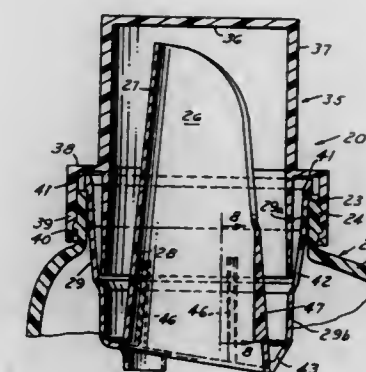
15 Claims



1. An article for containing and pouring a material, said article comprising in combination:

a container having an opening, a bottom, a wall extending from said bottom to said opening, a lip extending from said wall at said opening and toward a central axis of said container, and a pouring spout positioned on an interior surface of said wall adjacent said lip, said pouring spout having two or more inclined surfaces facing said central axis of said container and a valley defined by said inclined surfaces for directing material out of said opening; and

a lid having a shape adapted to cover said opening of said container and to create a seal with said container.



an integral annular connecting portion interconnecting said lower end of said inner wall and said lower end of said outer annular wall, said connecting portion having a drain back opening,

said spout extending axially beyond said outer wall, said spout having an arcuate upper portion which is generally C-shaped in transverse cross section defining an opening,

said spout having a lower annular portion, said annular connecting portion being inclined with respect to the axis of the spout and having its lowermost portion aligned with said opening of said C-shaped portion of said spout,

said outer annular wall including an upper portion having a near empty pour out opening aligned with the juncture of the C-shaped portion and the annular portion of said spout,

said upper portion of said outer annular wall which contains said near empty opening being radially offset with respect to the lower portion of the outer wall which is axially below said near empty opening thereby facilitating manufacture of said fitment, and

means on said upper end of said outer wall for engaging the neck of the container.

5,566,863

## CONDIMENT DISPENSER

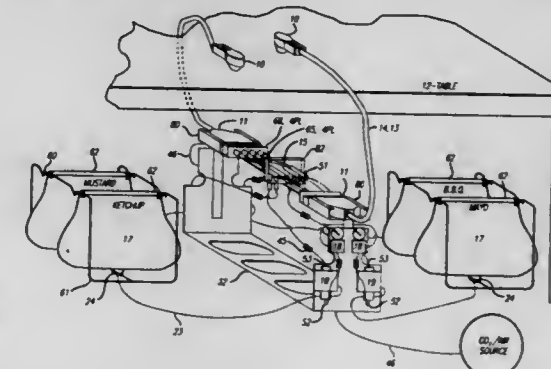
John M. Mesenbring, Westlake Village; Lawrence J. Patriquin, Phillips Ranch; Rory F. Ramirez, Yuba City, and Dell W. Smith, Burbank, all of Calif., assignors to Dispenser King, Inc., Los Angeles, Calif.

Continuation of Ser. No. 239,846, May 9, 1994, Pat. No. 5,366,117, which is a continuation of Ser. No. 864,406, Apr. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 689,630, Apr. 23, 1991, abandoned. This application Nov. 17, 1994, Ser. No. 341,439

Int. Cl.<sup>6</sup> B67D 5/46

U.S. Cl. 222—132

3 Claims



1. In a system for selectively dispensing condiments on demand from a plurality of collapsible condiment containers storing condiments at atmospheric pressure, the combination of: a support for each of said condiment containers;

5,566,862

## LIQUID CONTAINING AND DISPENSING PACKAGE

Eugene F. Haffner, Maumee, Ohio; Thomas P. Royce, Rockingham, N.C., and John M. Shingle, Maumee, Ohio, assignors to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Oct. 24, 1994, Ser. No. 327,950

Int. Cl.<sup>6</sup> B67D 1/16

U.S. Cl. 222—111

5 Claims

1. A liquid dispensing fitment for use on a container, the container having a neck, the fitment comprising a plastic body,

said body having an inner wall defining an axial spout extending from within the neck of the container and axially beyond the end of the neck, said inner wall having a lower end, said body having an outer annular wall spaced from said spout and said outer annular wall having a lower end,



a gas driven pump for each of said condiment containers, each of said pumps having a drive gas inlet, a drive gas outlet, a condiment inlet, and a condiment outlet;

a plurality of dispenser heads, each dispenser head having a plurality of input passages, an outlet nozzle, and a valve for each of said input passages for controlling condiment flow from the input passage to said outlet nozzle; and

for each of said pumps, first means for connecting a pump drive gas under pressure to said drive gas inlet, said drive gas outlet being vented,

second means for connecting said collapsible condiment container to said condiment inlet, and

third means for connecting said condiment outlet to one of said dispenser head input passages,

said third means including a plurality of manifolds each having a single manifold inlet connected to one of said pump condiment outlets, a plurality of manifold outlets connected to one of each of said dispenser head input passages, and

interengaging connectors for connecting each dispenser head to the manifold outlets and disconnecting the dispenser head from the manifold outlets;

whereby the connected pump is started by opening the corresponding dispenser head valve to draw condiment direct from said collapsible condiment container through said pump and said dispenser head valve to said outlet nozzle, collapsing said collapsible condiment container as the contents are withdrawn.

5,566,864

#### CHILDPROOF CLOSURE FOR A CONTAINER COMPRISING A LOWER PORTION WITH EXTENSIBLE SPOUT AND A SCREW CAP

Heinrich Stolz, Neunkirchen, Germany, assignor to Heinrich Stolz GmbH & Co. KG, Germany

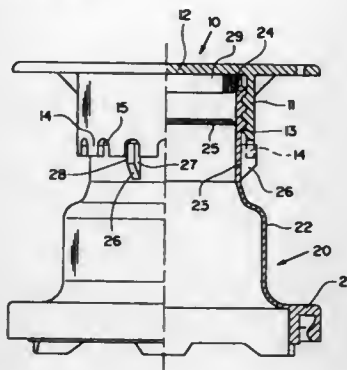
Filed Nov. 28, 1994, Ser. No. 307,736

Claims priority, application Germany, Mar. 26, 1992, 42 09 784.3

Int. Cl.<sup>6</sup> B67D 5/33

U.S. Cl. 222—153.14

14 Claims



1. A closure for a container, comprising: a lower closure member (20), a screw cap (10), and a base member (21), the lower closure member (20) comprising a pouring spout (23) connected to the base member (21) with an extendible bellows (22), the screw cap (10) having a cap bottom (12) and a cap side wall (11) including an internal thread (13), which is engageable with an external thread (24) of the pouring spout (23), the pouring spout (23) of the lower closure member (20), beyond the external thread (24) in a transitional region directed towards the bellows (22), carries at least one catch projection (26), the at least one catch projection (26) comprising a gradually rising flank (27) merging into a steep catch flank (28), the cap side wall (11) in a screwed-on position in positive engagement with the at least one catch projection (26), and by inwardly pressing the bellows (22) near the at least one catch projection (26), positive engagement between the screw cap (10) and the pouring spout (23) is cancelled and the screw cap (10) is released from positive engagement.

5,566,865

#### MANUAL ATOMIZING PUMP WITH ADJUSTABLE DOSAGE

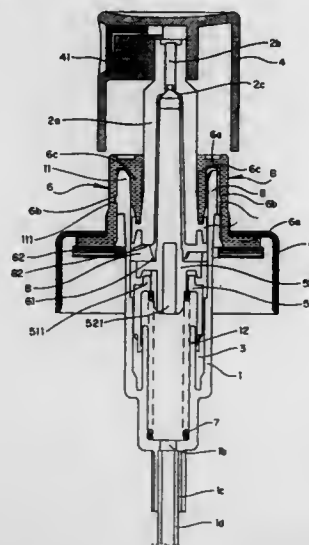
Claude Joullat, Montigny-Snr-Avre; Hervé Pennaneac'h, and Michel Theot, both of Verneuil-Sur-Avre, all of France, assignors to Valois S.A., Le Neubourg, France

Filed Dec. 20, 1994, Ser. No. 359,633

Claims priority, application France, Dec. 22, 1993, 93 15429 Int. Cl.<sup>6</sup> G01F 11/06

U.S. Cl. 222—287

4 Claims



1. A metering pump for dispensing a predetermined volume of a liquid or semi-liquid fluid contained in a tank, said pump being substantially symmetrical about a longitudinal axis, and comprising:

a pump body (1), a piston (51,52), and a fixed structural element (6) adapted to be secured to said tank, said pump body having a bottom end in communication with said tank and a top end (11) capable of being fixed in position on said fixed structural element, said piston being mounted for fluid-tight sliding movement in said pump body and having a rest position in which it defines a pump chamber (3), the piston being urged by a return spring (7) towards said fixed structural element, wherein in said rest position, said fixed structural element bears the force exerted by the return spring, the pump being provided with adjustment means (111) for axially displacing the top end (11) of the pump body relative to said fixed structural element without concurrently displacing the rest position of the piston relative to the fixed structural element, to attendantly adjust the volume of the pump chamber to said predetermined volume.

5,566,866

#### COMBINATION PORT FOR SURFACE CRACK FILLING

Kenneth H. Jacobsen, 921 N. Quentin Rd., Palatine, Ill. 60067, and Louis F. Cole, 21233 Silk Tree Cir., Plainfield, Ill. 60544

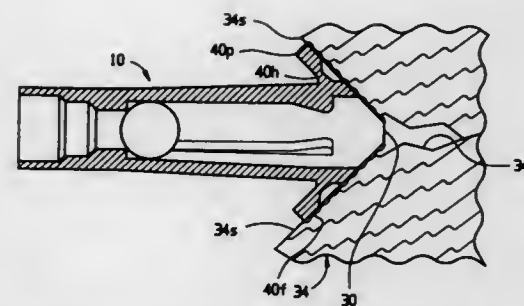
Continuation-in-part of Ser. No. 154,625, Nov. 18, 1993, Pat. No. 5,433,354. This application Jul. 18, 1995, Ser. No. 503,836

Int. Cl.<sup>6</sup> B65D 5/72

U.S. Cl. 222—495

12 Claims

4. A port device for funneling material into a surface crack, comprising the combination of a tube having a throughbore between its inlet and outlet ends; the tube at the inlet end being stepped, as several adjacent generally cylindrical axially extended inner diameter land areas of progressively smaller diameters in moving downstream toward the outlet end, suited to correspond to at least one set of outer diameter land areas of conventional universally available material mixing/dispersing tubes, operable when the corresponding land areas are snugged together to



establish a leakproof separable joint between the mixing/dispersing tube and the port device;

the tube near the outlet end having a base comprised of separate radial blades circumferentially spaced around the tube and connected at circumferential hinge regions from the tube, the blades being shaped to have spaced apart side edges allowing the blades to be folded back against the tube without binding against one another, and the blades defining faces that lie when the blades are radial and unfolded along a plane generally normal to the tube; and

the port device being alternatively suited to fit with the unfolded blade faces substantially flush against for bonding by adhesive to a flat surface with the tube throughbore aligned over the crack therein, or to fit with the back-folded blade faces defining a compact exterior into and be retained within a drilled somewhat cylindrical hole or a crack in the structure.

5,566,867

#### CUSTOMIZABLE GARMENT FORM SYSTEM

Jill Gory, 3323 Clay St., San Francisco, Calif. 94118

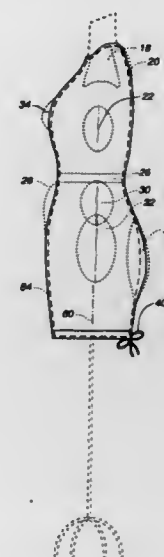
Continuation of Ser. No. 69,131, May 28, 1993, abandoned.

This application Apr. 4, 1995, Ser. No. 418,166

Int. Cl.<sup>6</sup> A41H 5/00

U.S. Cl. 223—66

1 Claim



1. A kit for modifying the shape of a body form to conform the body form to various human shapes; the kit comprising, a plurality of pairs of bust pads, each of said pairs of bust pads of a different shape, a plurality of pairs of hip pads, each of said pairs of hip pads of a different size, a plurality of pairs of buttock pads, each of said pairs of buttock pads of a different size, a plurality of pairs of stomach pads, each of said stomach pads of a different size, a plurality of pairs of shoulder pads,

a measurement chart for recording selected measurements of an actual human body for further transposition to the body form, thereby locating selected positions on said body form for placement of the at least some of a pair of bust pads, a pair of buttock pads, a stomach pad and a pair of shoulder pads on said body form,

elastic cover means for placement over said body form with at least some of said pads positioned on said body form at said selected positions.

5,566,868

#### BOOT PULLER

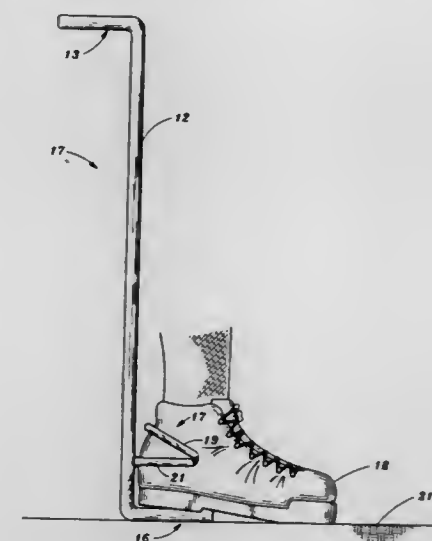
Jose Mariscal, 2703 Kenney Dr., San Pablo, Calif. 94806, and Fernando Mariscal, 152 Ashbury Ave., El Cerrito, Calif. 94530

Filed Aug. 18, 1995, Ser. No. 516,959

Int. Cl.<sup>6</sup> A47G 25/80

U.S. Cl. 223—113

11 Claims



1. A device for facilitating removal of a boot from a human foot which device has an elongated shaft with upper and lower ends, the upper end being adapted to be grasped by a person's hand, said device further having a pair of boot abutting arms which extend outward from said shaft for abutment with a rear portion of a boot at a location thereon that is above the bottom of the boot, the arms being shaped to extend along opposite sides of the rear portion of the boot, wherein the improvement comprises:

each of said arms being formed by a lower arm member and an upper arm member at least portions of which are spaced apart, the lower arms being convergent in the rearward direction towards said shaft and the upper arms also being convergent in the rearward direction towards said shaft, said arms being configured to abut the boot at a first location that is above the lower end of said shaft and spaced apart therefrom and wherein said shaft extends below that first location for a distance sufficient to enable contact of said lower end with the underlying ground at a second location while said arms abut the boot at said first location, said second location being spaced apart from said first location and being below said first location when said shaft is in an upward extending orientation.

5,566,869

## ARM SUPPORTED DRINKING CONTAINER

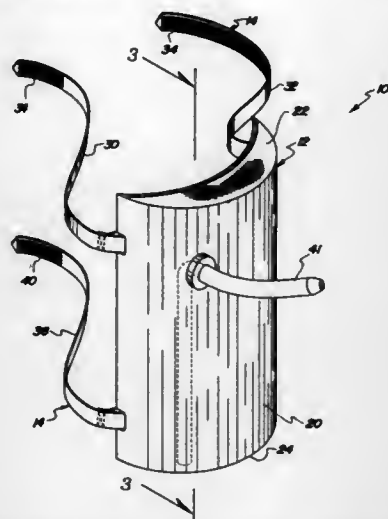
Adam J. Katz, 11231 Rocking Horse Rd., Cooper City, Fla. 33026

Filed Jun. 26, 1995, Ser. No. 494,326

Int. Cl.<sup>6</sup> A45F 5/00

U.S. Cl. 224-148.6

4 Claims



1. An arm supported drinking container comprising:  
 a container positionable against an exterior surface of a limb of an individual, the container comprises an arcuate inner side wall having a first radius of curvature and opposed longitudinal edges extending in a substantially parallel and spaced orientation, an outer side wall having a second radius of curvature substantially less than the first radius of curvature similarly includes opposed longitudinal edges extending in a substantially spaced and parallel orientation, the longitudinal edges of the inner side wall being sealingly secured to the longitudinal edges of the outer side wall, a top wall extending between the upper edges of the inner side wall and the outer side wall, and a bottom wall extending between the bottom edges of the inner side wall and the outer side wall;  
 an engaging pad secured to an interior surge of the inner side wall;  
 a securing means extending from the container circumferentially positioning about the container relative thereto, the securing means comprises a pair of upper straps and a pair of lower straps extending from opposed sides of the container which can be extended about an individual, the upper straps comprise a first upper strap secured to a first upper longitudinal edge of the container, a second upper strap secured to a second upper longitudinal edge of the container, hook and loop material secured to the upper straps so as to permit selective coupling of the first upper strap to the second upper strap when positioned about a limb of an individual, the lower straps comprise a first lower strap coupled to a first lower longitudinal edge of the container, a second lower strap extending from a second lower longitudinal edge of the container, hook and loop material secured to the lower straps so as to permit selective securement of the first lower strap to the second lower strap when positioned about the limb of the individual;  
 a dispensing valve mounted relative to the container and positioned in fluid communication with hollow interior of the container so as to permit selective dispensing of fluid therefrom for consumption by an individual;  
 a supply conduit removably mounted to an exterior of the outer side wall of the container, a dip tube extending into fluid communication with the supply conduit and projecting into the container to terminate proximal to the bottom wall thereof, the dispensing valve being positioned within the supply conduit, a threaded neck projects from the outer side wall of the container and is positioned over an aperture directed therethrough permitting communication through the threaded neck with the hollow interior of the container, a cap coupled to the

supply conduit and the dip tube, the cap being threadably engaged to the threaded neck of the container, the dispensing valve comprises a manifold positioned within the supply conduit, the manifold being shaped so as to define a central bore directed therethrough, the central bore including a reduced diameter portion defining a vacuum port extending into fluid communication with a free distal end of the supply conduit, an apertured abutment plate mounted to the manifold so as to extend transversely across an interior of the central bore thereof in a spaced orientation relative to the vacuum port, a sealing ball positioned within the central bore and normally biased into sealing engagement with the abutment plate so as to preclude fluid communication thereacross, a plurality of bypass ports formed in the manifold and extending into fluid communication with the central bore between the abutment plate and the vacuum port, the bypass ports extending through the manifold and into fluid communication with the free distal end of the supply conduit, whereby an application of a vacuum to the interior of the supply conduit will result in a biasing of the sealing ball towards the vacuum port such that as the sealing ball is removed from the aperture in the abutment plate, fluid communication is permitted between the bypass ports and the dip tube through the central bore of the manifold.

5,566,870

## AUXILIARY CARRYING HANDLE FOR GOLF BAGS

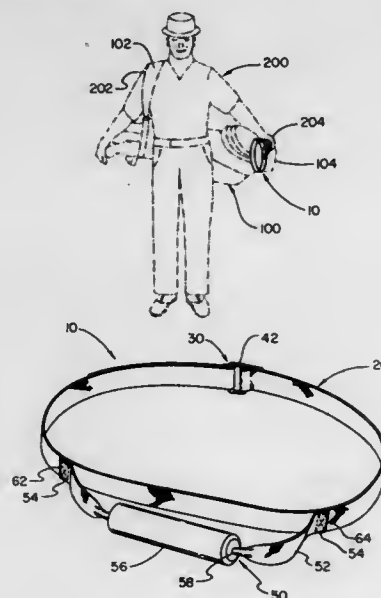
Roger Mejeur, 526 Campbell St., Kalamazoo, Mich. 49006

Filed May 5, 1994, Ser. No. 238,489

Int. Cl.<sup>6</sup> A63B 55/00

U.S. Cl. 224-218

5 Claims



1. A new auxiliary carrying handle for golf bags for facilitating carrying of a conventional golf bag having a single shoulder strap attached to the upper portion thereof with a new supplemental gripping handle connectable to the base of the golf bag whereby the weight of the golf bag is partially redistributed from a user's strap-bearing shoulder to the user's hand when grasping the auxiliary handle and elevating the golf bag so that the bag is held generally horizontally, the weight upon the user's shoulder being somewhat lessened by the weight carried by the user's hand, the auxiliary carrying handle for golf bags comprising:  
 a flexible belt having dimensions for encircling the golf bag proximal the base end thereof, the belt having securement means whereby the ends of the belt may be adjustably removably secured together for retaining the belt around different golf bags having various circumferential dimensions; and

a hand grip whereby the user may comfortably support the base of the golf bag in an elevated position, the hand grip comprising a resilient elongated cushion having a longitudinal hole therethrough and a flexible attachment strap extending through the longitudinal hole in the cushion, the strap being fixedly connected at both ends to the belt, the ends of the strap being spaced apart so the strap lies parallel to and slightly away from the belt intermediate the ends of the belt whereby a user may grip the cushion without touching the belt and golf bag to prevent chafing the user's hand.

5,566,871

## SHOULDER STRAP CUSHION

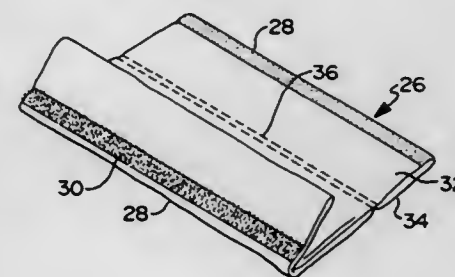
Marvin H. Weintraub, 5743 Kingsfield Dr., West Bloomfield, Mich. 48322

Continuation-in-part of Ser. No. 112,674, Aug. 26, 1993, Pat. No. 5,361,957. This application Nov. 7, 1994, Ser. No. 335,466

Int. Cl.<sup>6</sup> A45F 3/12

U.S. Cl. 224-264

8 Claims



1. A cushioning device for encircling a portion of a strap, comprising:  
 (a) a substantially planar member comprising first and second spaced apart layers and having a pocket formed between the layers, the planar member having a length and width and being segmented into a central pocket segment and a lateral segment on each side of the central pocket segment, the layers being formed from a pliant material, the lateral segments being foldable into an overlying relationship over the central pocket segment to thereby encircle a strap portion disposed therebetween,  
 (b) a cushioning member disposed in at least the central pocket segment,  
 (c) a fluid filled member insertingly disposed in at least the central pocket segment in abutment with the cushioning member, and  
 (d) means for releasably holding the lateral segments in the overlying relationship, the means being disposed on the lateral segments and in cooperable relationship when folded over the central pocket segment.

5,566,872

## VIAL FLOSS DISPENSER

John W. Dolan, Boothwyn, Pa.; John W. Spener, Jr., Rising Sun, and Rickey I. Hill, Elkton, both of Md., assignors to W. L. Gore &amp; Associates, Inc., Newark, Del.

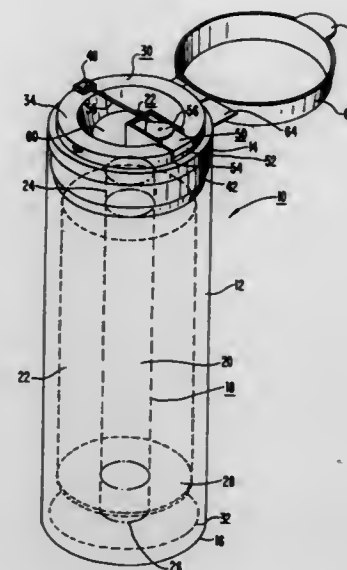
Filed Jul. 8, 1994, Ser. No. 272,163

Int. Cl.<sup>6</sup> A61C 15/04

U.S. Cl. 225-41

8 Claims

1. A floss dispenser that comprises  
 an essentially cylindrical vial case, the case including two ends and a longitudinal length and having an opening in at least one end;  
 a spool having floss wrapped around a hub, the spool rotatably disposed in the case and proportioned to be inserted into the case through the opening in its end with the hub of the spool mounted parallel to the length of the cylindrical case;



wherein the spool further includes a disc on one end of the hub, the disc assisting in centering the spool in the case while the spool is rotated within the case around a longitudinal axis of the hub, and a projection on the opposite end of the hub;  
 a cap removably mounted over the opening and sealing the opening in the end of the cylindrical case, the cap including a recess therein surrounded by a circular lip, the recess and lip receiving and centering the projection of the hub when the cap is sealing the opening in the case, and the cap further including at least one opening therein through which floss is threaded out of the end of the case, the opening in the cap being oriented outside of the lip in a groove between the lip and the case when the cap is mounted in place;  
 wherein when the spool is inserted within the case and the opening in the end of the case is sealed with the cap, the hub of the spool is retained within the recess in the cap and the spool spins easily within the case, with the floss paying-off freely through the opening in the cap.

5,566,873

## DISPENSER FOR FLEXIBLE WEBBING

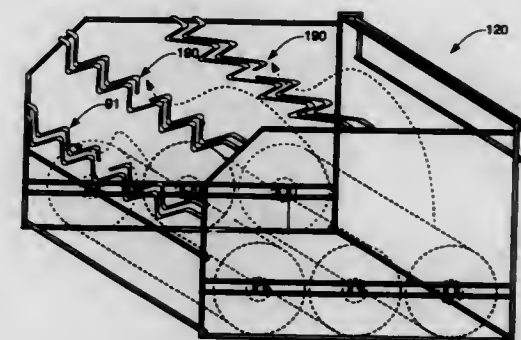
Joseph J. Guido, Hinsdale, Ill., assignor to Marguerite Guido, Trustee for Joseph J. Guido, Hinsdale, Ill.

Filed Dec. 15, 1993, Ser. No. 167,708

Int. Cl.<sup>6</sup> B26F 3/02

U.S. Cl. 225-106

24 Claims



17. A dispenser for flexible webbing having a free end and comprising a serial array of product units joined end to end along lines of weakness, the dispenser comprising:  
 a frame;  
 means for supporting the flexible webbing as the free end is withdrawn from the frame; and



a dispensing nozzle supported by the frame, for guiding the webbing and for supporting the webbing as product units are severed by tearing along lines of weakness, including a pair of generally coextensive wires spaced apart to form a nozzle opening through which the webbing passes, the wires being elongated and having an undulating pattern along their length so as to engage the webbing at a plurality of spaced apart points.

**5,566,874**  
**APPARATUS FOR FORMING AN END BUMPER FOR VEHICLES**

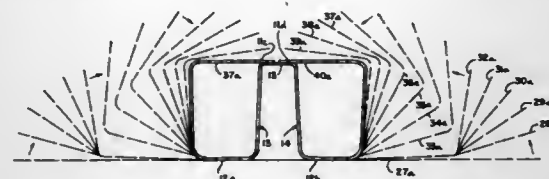
Peter Sturuss, Grand Haven, Mich., assignor to Shape Corporation, Grand Haven, Mich.

Continuation of Ser. No. 297,142, Aug. 29, 1994, Pat. No. 5,454,504, which is a division of Ser. No. 12,230, Feb. 2, 1993, which is a continuation-in-part of Ser. No. 499,100, Mar. 26, 1990, Pat. No. 5,306,058. This application Sep. 26, 1995, Ser. No. 534,123

Int. Cl.<sup>6</sup> B23K 31/02

U.S. Cl. 228—17

8 Claims



1. Apparatus for forming a bumper bar for a vehicle comprising a source of steel sheet for continuously providing a sheet of steel of a predetermined width;

a roll former having driven rollers for continuously roll-forming said sheet of high tensile strength steel;

said rollers including a first set of rollers for first forming a web in the longitudinal center section of said sheet and forming two inner side walls extending from said web, said web being located on a predetermined plane;

said rollers including a second set of rollers for bending said sheet at the outer ends of said inner side walls to form first walls extending away from and substantially parallel to said predetermined plane;

said rollers including a third set of rollers for bending the terminal lateral ends of said sheet in a direction toward said plane to form outer side walls and for bending said ends to form second walls located on said plane and having extensions overlapping and abutting said web;

a holder mechanism for holding said outer walls and said extension ends of said second walls in a position where said extensions overlap and abut said web;

a welder for welding said extensions to said web during said holding step to form a one-piece bumper having side-by-side tubular sections connected together by said web;

a sweep forming mechanism having curvilinear external guide mechanism and curvilinear internal mandrels conforming to the inner configuration of each of said tubular sections, said external guide mechanism and internal mandrels being spaced from each other to provide a passageway therebetween for receiving said bumper therebetween;

a drive mechanism for forcing said bumper through said passageway while the roll-forming by said sheet of steel upstream of said external guide mechanism and internal mandrels takes place;

a support for continuously supporting the internal mandrels in station and positions during the roll-forming of said sheet steel, said support for the internal mandrel including elongated members extending from said internal mandrel to a support member, said support member being located upstream of said sweep forming means where the bending of the terminal lateral ends of said sheet has not been completed

thereby providing an opening through which said support member extends for attachment to said elongated member; said step of forcing said bumper through said passageway producing a predetermined sweep in said bumper as determined by the longitudinal shape of said passageway; and a cutter for cutting said swept integral bumper at predetermined lengths after the sweeping of the bumper has been completed whereby said apparatus continuously forms in succession a series of bumpers during the roll-forming of said sheet upstream of said swept forming mechanism.

**5,566,875**  
**LEAD-OXIDE PREVENTING APPARATUS FOR AUTOMATIC LEAD-SOLDERING DEVICE**

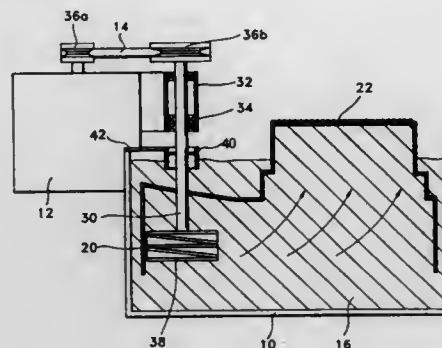
Byung-guk Hwang, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Jun. 7, 1995, Ser. No. 474,725

Int. Cl.<sup>6</sup> B23K 3/06

U.S. Cl. 228—37

4 Claims



1. A lead oxide preventing apparatus for an automatic soldering device having a container installed within a lead chamber, a plurality of nozzles being formed in the upper portion of the container, an impeller shaft rotatably supported by a bearing in one side of the container and being coupled to a motor, and an impeller for generating jets of molten lead being disposed on a lower portion of the impeller shaft, said apparatus comprising:

a ring member, said impeller shaft extends through said ring member into said lead chamber; and

an arm formed on said ring member and coupled to said lead chamber,

an oxidation preventing agent disposed in said ring member at a predetermined thickness from the surface of said molten lead in said ring member, whereby said molten lead is prevented from contacting portions of said impeller shaft which are inside and above said ring member.

**5,566,876**  
**WIRE BONDER AND WIRE BONDING METHOD**

Kimiji Nishimaki, and Takashi Kamiharako, both of Tokyo, Japan, assignors to Kaljo Corporation, Tokyo, Japan

Filed Mar. 29, 1994, Ser. No. 219,456

Claims priority, application Japan, Jul. 16, 1993, 5-199234 The portion of the term of this patent subsequent to Nov. 5, 2008, has been disclaimed.

Int. Cl.<sup>6</sup> H01L 21/60

U.S. Cl. 228—102

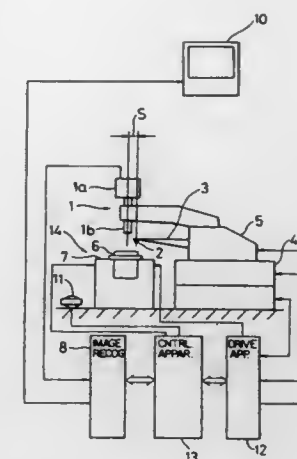
26 Claims

1. A wire bonder for bonding a wire to a first bonding point and a second bonding point, comprising:

a camera for photographing at least one of said first bonding point, said second bonding point and a wire spread therebetween, generating image data thereof;

memory means for storing the image data of at least one of said first bonding point, said second bonding point and said wire;

comparing the magnified image of the semiconductor device with the template to see if the characteristic of the semiconductor device falls within the acceptable range of values.



means for comparing the stored image data with predetermined positional data associated with a position of said at least one of said first and second bonding points and said wire, and adjusting the position based on the comparison;

a bonder for bonding the wire to said first and second bonding points; and

means for inspecting at least one of said first and second bonding points and said wire.

**5,566,877**  
**METHOD FOR INSPECTING A SEMICONDUCTOR DEVICE**

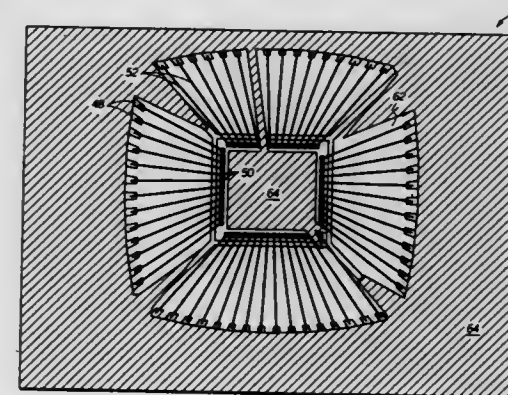
Dave W. McCormack, Austin, Tex., assignor to Motorola Inc., Schaumburg, Ill.

Filed May 1, 1995, Ser. No. 432,356

Int. Cl.<sup>6</sup> G01B 11/00

U.S. Cl. 228—105

22 Claims



1. A method for inspecting a semiconductor device comprising the steps of:

providing a semiconductor device having a characteristic to be inspected;

providing an inspection station having a magnification lens, a monitor, and a camera coupled to the magnification lens and the monitor for transmitting magnified images created by the magnification lens to the monitor;

creating a template which represents an acceptable range of values for the characteristic;

storing the template in a computer readable memory;

placing the semiconductor device under the magnification lens; displaying a magnified image of the semiconductor device on the monitor using the camera;

retrieving the template from the computer readable memory; displaying an image of the template on the monitor, superimposed with the magnified image of the semiconductor device; and

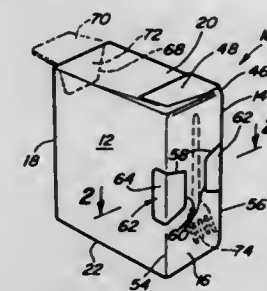
**5,566,878**  
**CARTON CONSTRUCTION**  
Norman A. Peiffer, Maumee, and Victor R. Simonyi, Lyndhurst, both of Ohio, assignors to The Andersons, Inc., Maumee, Ohio

Filed Mar. 28, 1995, Ser. No. 412,301

Int. Cl.<sup>6</sup> B65D 5/468

U.S. Cl. 229—117.16

2 Claims



1. A paper board carton for storage and dispensing a fluent solid product, said carton being formed from a sheet of paper board by blank cutting, forming cut lines, scoring, folding and gluing, said carton comprising:

parallel front and back panels;

a pair of parallel first and second side panels connecting said front and back panels;

parallel top and bottom panels connecting said front and back panels and said first and second side panels to form a finished closed carton;

a divider panel parallel to said first and second side panels adjacent to said first side panel and attached to said top and bottom panels to form with said first side panel a smaller auxiliary compartment and to form with said second side panel, a larger product compartment, said auxiliary and product compartments being isolated from each other by said divider panel;

said front, first side, and back panels having cut lines defining areas intermediate said top and bottom panels to produce, when said areas are punched and pushed inwardly to penetrate into said auxiliary compartment, a carton handle; and

a panel having cut lines defining an area when punched into said product compartment forming a pouring opening.

**5,566,879**  
**SYSTEM FOR CENTRALIZED CONTROLLING OF A PLURALITY OF TEMPERATURE REGULATING DEVICES**

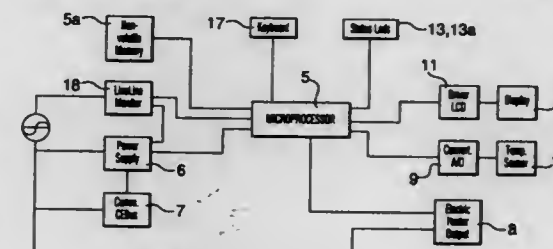
Pierre Longtin, Ville Vanier, Canada, assignor to Comptel Domotique Inc., Sainte-Foy, Canada

Filed Dec. 6, 1993, Ser. No. 161,806

Int. Cl.<sup>6</sup> G05D 23/00; H04M 11/04

U.S. Cl. 236—46 R

43 Claims



1. A system for centralized controlling of a plurality of temperature regulating devices by an existing network of power lines comprising:

- a central control means provided to send or receive predetermined commands to and from;
  - a plurality of temperature regulating devices, each of said temperature regulating devices comprising a communication means adapted to provide two way communication with said central control means;
  - a microprocessor means adapted to store predetermined information received from said central control means and to provide a proper functioning of said device;
  - a temperature sensor means adapted to send signals to said microprocessor means; and
  - an output supply means adapted to supply power to temperature varying units;
- wherein each of said temperature regulating devices further comprises a network protecting means adapted to regulate the supply of power to said output supply means during sudden changes in the power supply or due to changes in temperature conditions.

5,566,880

**PROCESS AND APPARATUS FOR HEATING THE PASSENGER COMPARTMENT OF A MOTOR VEHICLE**  
Noureddine Khelifa, Stuttgart; Karl-Gerd Krumbach, Burgstetten; Michael Löhle, Esslingen; Günter Abersfelder, Sindelfingen; Helmut Grantz, Sindelfingen; Wolfgang Odebrecht, Sindelfingen; Jürgen Wertenbach, Fellbach, and Oliver Wagner, Filderstadt, all of Germany, assignors to Behr GmbH & Co., and Mercedes-Benz Aktiengesellschaft, both of Stuttgart, Germany

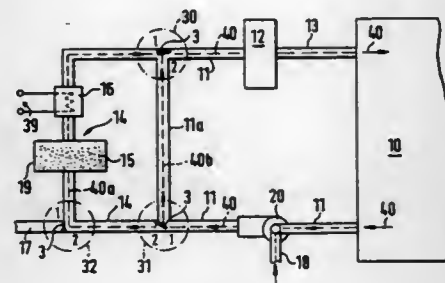
Filed Feb. 4, 1994, Ser. No. 192,094

Claims priority, application Germany, Feb. 11, 1993, 43 04 076.4

Int. Cl.<sup>6</sup> B60H 1/22; 3/00

U.S. Cl. 237—12.3 A

20 Claims



1. A process for heating the passenger compartment of a motor vehicle having a heating device, comprising the steps of:

- a) drawing an air current from a waste-air duct connected to said passenger compartment;
- b) supplying said heating device with said air current;
- c) discharging said air current from said heating device into an intake-air duct which is connected to said passenger compartment;
- d) branching-off a partial air current from said air current prior to supplying said heating device with said air current;
- e) dehumidifying said partial air current by flowing it through a sorbent; and
- f) directing said partial air current into said passenger compartment.

5,566,881

**AUTOMOTIVE HOT-WATER HEATING APPARATUS**

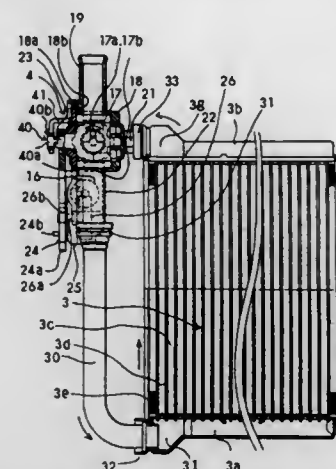
Yoshimitsu Inoue, Toyooka; Koichi Ito, Kariya, and Hikaru Sugi, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 28, 1995, Ser. No. 520,249

Claims priority, application Japan, Aug. 29, 1994, 6-203692 Int. Cl.<sup>6</sup> F24D 3/00

U.S. Cl. 237—12.3 B

24 Claims



16. A hot water type heating apparatus for a vehicle having a water cooled engine, said heating apparatus comprising:

- a heat exchanger constructed and arranged to heat a passenger compartment of said vehicle by heat exchanging air with hot water supplied from the engine, said heat exchanger having a hot water inlet portion and a hot water outlet portion; and
  - a flow quantity control valve for controlling a flow quantity of said hot water supplied from the engine to said heat exchanger, said flow quantity control valve being integrated with said heat exchanger as a unit and being in fluid communication therewith, said flow quantity control valve comprising:
- a valve housing constructed and arranged to be coupled between said heat exchanger and the engine;
  - a first hot water inlet pipe constructed and arranged such that one end is coupled to said valve housing and another end may be coupled to the engine such that hot water from the engine may flow into said first hot water inlet pipe;
  - a first hot water outlet pipe constructed and arranged to be fluidly connected between said heat exchanger and the engine, one end of said first hot water outlet pipe being connected to said valve housing and the other end being connectable to the engine, said first water to the engine;
  - a second hot water outlet pipe, one end thereof being coupled to said valve housing and another end thereof being coupled to said heat exchanger, said second hot water outlet pipe directing said hot water flowing from said first hot water inlet pipe to said hot water inlet portion of said heat exchanger;
  - a second hot water inlet pipe connected between said valve housing and said heat exchanger, which directs said hot water from said hot water outlet portion of said heat exchanger into said valve housing;
  - a bypass circuit defined in said valve housing which selectively connects said hot water from said first hot water inlet pipe directly to said first hot water outlet pipe; and
  - a valve body disposed in said valve housing between said first hot water inlet pipe and said second hot water outlet pipe and in fluid communication with said bypass circuit, said valve body being constructed and arranged to adjust an opening area between said first hot water inlet pipe and said second hot water outlet pipe while controlling flow through said bypass circuit,
- wherein said heat exchanger includes an inlet tank constructed and arranged to receive said hot water directed from said second hot water outlet pipe, an outlet tank constructed and

arranged to return said hot water to said second hot water inlet pipe, and a core portion between said inlet tank and said outlet tank which allows hot water to flow in only one direction from said inlet tank to said outlet tank,

said flow quantity control valve being disposed adjacent to one of said inlet tank and said outlet tank and mounted and in an axial direction of one of said inlet tank and said outlet tank, and said first hot water inlet pipe and said first hot water outlet pipe extending in a parallel and in a vertical direction with respect to said axial direction, said flow quantity control valve and said heat exchanger being constructed and arranged to be disposed in said passenger compartment, and each end of said first hot water inlet pipe and said first hot water outlet pipe being constructed and arranged to extend into an engine room where the engine is disposed.

5,566,882

**RAILWAY RAIL-FASTENING CLIP AND ASSEMBLY AND METHODS OF EMPLOYING THE SAME**

Trevor P. Brown, Orpington; Brian G. Conroy, Workshop; Stephen J. Cox, Richmond; Christopher Gardner, Sheffield; Roger D. Larke, Retford; Barry Marshall, Sheffield, all of United Kingdom, and Jan Svendsen, Tranby, Norway, assignors to Pandrol Limited, Surrey, United Kingdom

Division of Ser. No. 244,717, Aug. 11, 1994, Pat. No.

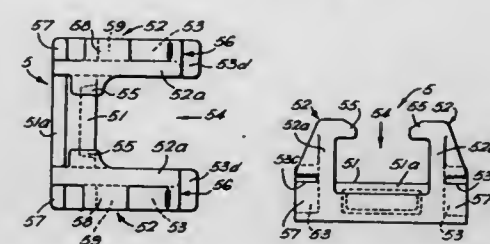
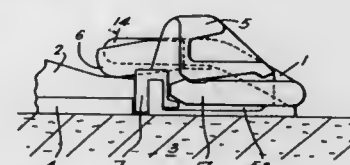
5,520,330. This application Jun. 7, 1995, Ser. No. 474,180

Claims priority, application United Kingdom, Dec. 18, 1991, 9126886; Mar. 17, 1992, 9205791

Int. Cl.<sup>6</sup> E01B 9/00

U.S. Cl. 238—343

11 Claims



1. An anchoring device for retaining an M-shaped railway rail fastening clip (1), the device (5) has a base member (51) and a pair of clip-retaining members (52) connected to said base member (51) wherein opposing side faces of said clip-retaining members (52) are connected together by said base member along only a portion of each said side face, the pair of clip-retaining members extending substantially upwardly with respect to the base member when the device (5) is in use, said clip-retaining members (52) being spaced apart so as to define an inner leg opening (54) between the pair of clip-retaining members for receiving the interconnected inner legs of such an M-shaped clip (1) and contiguous with respective guiding passageways (53) for receiving respectively the outer legs of the M-shaped clip (1), the device (5) being such that, as the clip (1) is driven into the device, the outer legs are forced downwardly with respect to the inner legs, thereby changing the clip (1) from an unstressed to a stressed operative configuration wherein a toe portion (14) of the clip connecting the inner legs together projects from a front face of the device to bear on a rail.

5,566,883

Patent Not Issued For This Number

5,566,884

**SUPERSONIC NOZZLE FOR A TURBOJET ENGINE**

Jean-Marie E. C. Hardy, le Mee Sur Seine; Gérard E. A. Jourdain, Saintry Sur Seine, and Marcel R. Soligny, Chevilly Larue, all of France, assignors to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation S.N.E.C.M.A., Paris, France

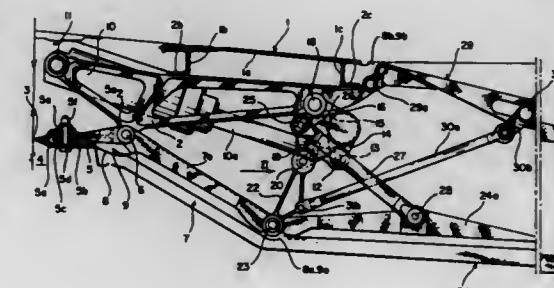
Filed Dec. 30, 1981, Ser. No. 336,491

Claims priority, application France, Dec. 30, 1980, 80 27788

Int. Cl.<sup>6</sup> F02K 1/12

U.S. Cl. 239—265.41

12 Claims



1. In a supersonic nozzle for a turbojet engine having a longitudinal axis having a plurality of convergent nozzle flaps forming an annular convergent nozzle portion and a plurality of divergent nozzle flaps forming an annular divergent nozzle portion downstream of the convergent nozzle portion, the improved flap attaching and actuating mechanism comprising:

- a) a plurality of cross-tie members attached internally to the engine structure oriented generally parallel to the longitudinal axis, each cross-tie member having first, second and third attachment points;
- b) a plurality of connecting rod members pivotally attached to the engine structure and to adjacent pairs of cross-tie members at their first attachment points;
- c) first attachment means to pivotally attach an upstream end of each convergent flap to the first attachment points of adjacent cross-tie members;
- d) an actuating lever pivotally attached to alternate pairs of cross-tie members at their second attachment points;
- e) actuating cylinder means having an extendable and retractable piston rod attached to the actuating lever and a cylinder attached to the third attachment points of the alternate pairs of cross-tie members such that extension and contraction of the piston rod causes the actuating lever to pivot about its attachment to the cross-tie members;
- f) first control rod means each having a first end connected to the actuating levers and a second end connected to a downstream end of a convergent nozzle flap; and,
- g) second control rod means, each having a first end connected to the actuating levers and a second end connected to a divergent nozzle flap.



5,566,885

**LOW COST TRIGGER SPRAYER HAVING PLUG WITH INTEGRAL VALVE ELEMENT**

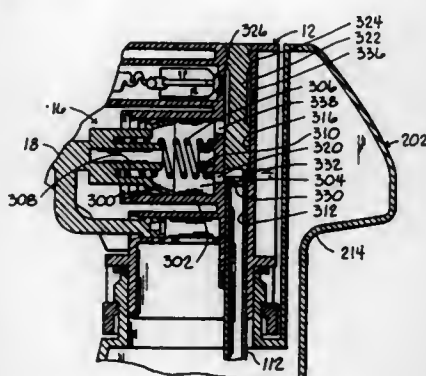
Donald D. Foster, St. Charles, and Philip L. Nelson, Ellisville, both of Mo., assignors to Contico International, Inc., St. Louis, Mo.

Division of Ser. No. 964,158, Oct. 21, 1992, Pat. No. 5,385,302, which is a continuation-in-part of Ser. No. 603,281, Oct. 25, 1990, Pat. No. 5,234,166. This application Jan. 12, 1995, Ser. No. 371,815

Int. Cl.<sup>6</sup> B05B 9/043

U.S. Cl. 239—333

19 Claims



12. A dispenser for dispensing a liquid substance in response to actuation of the dispenser, the dispenser comprising:
- a container for storing the liquid substance prior to being dispensed;
  - a housing having an exterior surface, the housing being attached to the container, the housing including an orifice through which the liquid substance is dispensed and a pump for drawing the liquid substance from the container and expelling the substance through the orifice in response to actuation of the dispenser, the housing further including a first and second cavity spaced by a valve seat;
  - an elongate dip tube having an upper end and a lower end, the upper end being received within the first housing cavity and the lower end extending into the container, the dip tube permitting communication of the liquid substance between the pump and the container;
  - a plug secured within the second cavity, the plug including a cap configured to set flush with the exterior surface of the housing when the plug is secured within the second housing cavity; and
  - a valve element attached to the plug and positioned adjacent the valve seat, the valve seat and valve element being configured to inhibit the liquid substance from flowing through the valve seat in a direction from the pump to the container but to permit the substance to flow in an opposite direction from the container to the pump.

5,566,886

**GARDENING-USED VARIATIONAL SPRINKLING HEAD WITH FULLY DISCHARGING OPENINGS**

King-Yuan Wang, Changhua Hsien, Taiwan, assignor to Yuan Mei Corp., Changhua Hsien, Taiwan

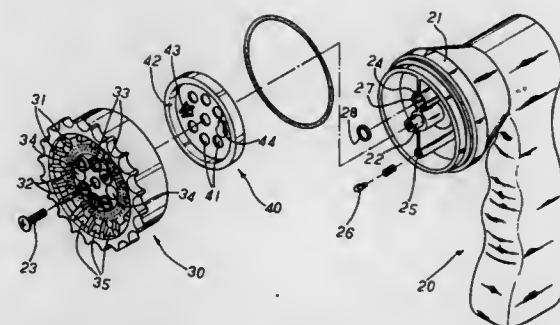
Filed Jan. 27, 1995, Ser. No. 379,933

Int. Cl.<sup>6</sup> A62C 31/02

U.S. Cl. 239—394

1 Claim

1. A gardening-used variational sprinkling head with fully discharging openings, comprising a variational water-discharging cover and a base member sealably connected therewith by ultrasonic wave, the sprinkling head being associated with a head portion of a sprinkling gun, a central stepped post of the sprinkling gun being passed through a central through hole of the sprinkling head to engage with a screw, the sprinkling gun having an inner water outlet and a locating hole, a pin member sleeved by a spring



being inserted in the locating hole, several axial ribs being formed on inner wall of the water outlet and spaced from an open end of the water outlet by a space, a watertight O-ring being disposed in the space, the water-discharging cover being formed with radial ribs inward projecting from inner periphery of the cover, a circular mesh plate being placed within and connected with the radial ribs, each two adjacent ribs defining a fully discharging opening, six different variational sprinkling holes and two close holes being integrally annularly arranged on a central portion of the mesh plate, the six variational sprinkling holes respectively having six rearward extending hollow posts which respectively abut against six water inlets annularly arranged on the base member, an outer periphery of the base member abutting against a peripheral portion of the mesh plate and being spaced from the radial ribs by a space so that water can pass through the fully discharging openings, the base member being connected with the mesh plate by ultrasonic fusion to form the variational sprinkling head, the base member further having a fine mesh water inlet, a locating recess being formed on an outer side of each water inlet, whereby the sprinkling head can be rotatable adjusted to make the pin member extend into one of the locating recesses and align one of the water inlets with the water outlet of the sprinkling gun, so that the water is guided to flow through the water outlet and the aligned water inlet to be discharged from the sprinkling head, said sprinkling head being characterized in that a key-shaped depression being formed on a back face of the base member, whereby when the sprinkling head is rotated to make the key-shaped depression of the base member aligned with the water outlet, a rectangular portion of the depression is located outside the water outlet so that the water is guided into the sprinkling gun to flow out from the fully discharging openings defined by the ribs and all the sprinkling holes.

5,566,887

**MULTI-VENT AIRBLAST ATOMIZER AND FUEL INJECTOR**

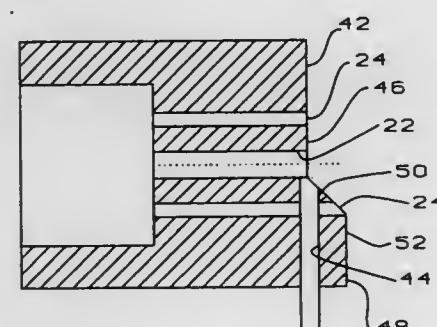
Andy Wymaster, Jr., 2831 Alne Dr., Hemet, Calif. 92343

Filed Aug. 8, 1994, Ser. No. 287,631

Int. Cl.<sup>6</sup> B05B 7/08

U.S. Cl. 239—419.3

2 Claims



1. A fuel injector nozzle 1 comprising:
- a body having a primary orifice which initially picks up and atomizes fuel and which is surrounded rounded by a plurality

5,566,889

**PROCESS FOR PRODUCTION OF RECYCLED PLASTIC PRODUCTS**

Joachim Preiss, Goldkronach, Germany, assignor to Montell North America Inc., Wilmington, Del.

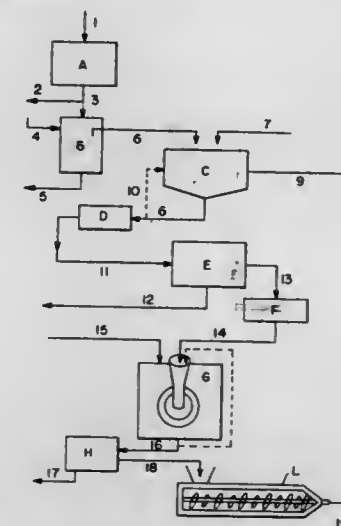
Filed May 20, 1993, Ser. No. 64,620

Claims priority, application Germany, May 22, 1992, 4217005.2

Int. Cl.<sup>6</sup> B02C 19/12;23/08

U.S. Cl. 241—19

17 Claims



5,566,888

**METHOD AND AN APPARATUS FOR RECYCLING A RESIN COMPONENT**

Hiroshi Yamamoto, Oota, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

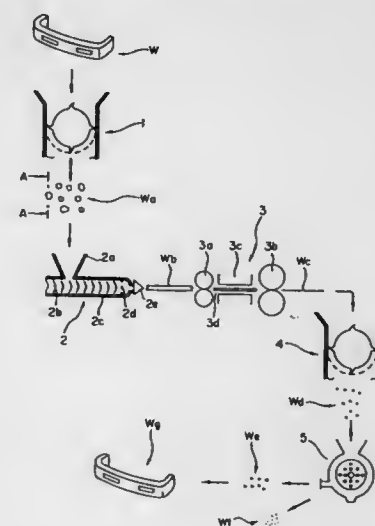
Filed May 16, 1994, Ser. No. 243,148

Claims priority, application Japan, May 21, 1993, 5-120121; May 21, 1993, 5-120122; May 21, 1993, 5-120123

Int. Cl.<sup>6</sup> B02C 19/12;23/08

U.S. Cl. 241—3

11 Claims



1. A method for recycling of a resin component having a finished surface said resin component being formed of a thermoplastic base resin having a film coating or deposit of a different resin thereon, comprising:

- rough grinding said resin component without removing said finished surface, to thereby prepare a roughly-ground form of said resin component;
- heating and extruding the roughly-ground form by means of an extruder, to thereby prepare an extruded form of said resin component;
- rolling and drawing the extruded form, with heating to a temperature lower than the melting point of the thermoplastic base resin, to thereby prepare a rolled film;
- pulverizing the rolled film, to thereby prepare a pulverized form; and
- separating the pulverized form into a thermoplastic base resin and said different resin.

5,566,890

**PROCESS FOR RECOVERING POST-CONSUMER WASTE PLASTICS**

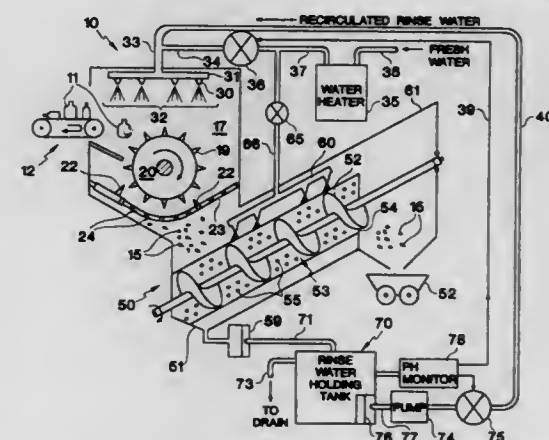
Thomas E. Ricciardelli, Hingham, Mass., assignor to Selectech, Incorporated, Hingham, Mass.

Filed Feb. 28, 1995, Ser. No. 395,819

Int. Cl.<sup>6</sup> B02C 23/18

U.S. Cl. 241—20

25 Claims



1. A process for making polymeric feed stock from an assortment of post-consumer polymer articles comprising the steps of:

assembling those articles of the assortment which are suitable for recycling into feed stock; feeding a succession of the articles to a granulator for successive granulations, granulating the articles into particles of size suitable for feed stock, forming a detergent solution of predetermined detergent concentration by admixing controlled amounts of clean water and detergent of sufficient quantity for cleaning the granulated particles, applying said solution to the articles during the of granulating, whereby the detergent solution mixes with the articles as the articles are being granulated to facilitate the cleaning and granulating thereof, recovering at least part of the solution from a granulating step, using at least some of the recovered solution in forming the detergent solution for reuse in a subsequent granulating step, monitoring the detergent concentration of the recovered solution for reuse in said subsequent granulating step, and adjusting the relative amounts of fresh water, detergent, or both in the mixture of the reused detergent solution as needed to maintain the predetermined concentration, and applying at least some of the reused solution to the articles during said subsequent granulating step.

5,566,891

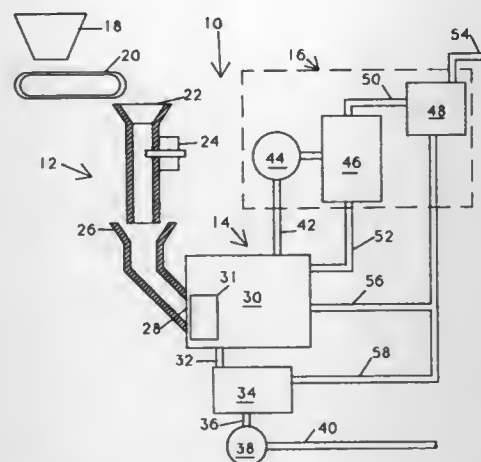
# METHOD FOR GRINDING HOT MATERIAL AND RECOVERING GASSES EMITTED THEREFROM

Paul S. Wallace, Katy, and Henry C. Chan, Bellaire, both of Tex., assignors to Texaco Development Corporation, White Plains, N.Y.

Division of Ser. No. 884,821, May 18, 1992, Pat. No. 5,340,037. This application Apr. 8, 1994, Ser. No. 225,274  
Int. Cl.<sup>6</sup> F23K 1/02; B02C 15/00

U.S. Cl. 241—21

5 Claims



1. A method of preparing hot coke for gasification, comprising the steps of:
  - feeding hot coke into a feed section for a grinding means at a controlled rate;
  - adding water to said coke to form a slurry and feeding said slurry to said grinding means;
  - maintaining said grinding means at a slight vacuum so that gasses with particulate matter entrained therein and generated as a result of the grinding operation are withdrawn from said grinding means as they are released during the grinding operation;
  - effecting fluid separation of said withdrawn gasses and recycling said fluids to said grinding means;
  - condensing and eliminating said gasses; and
  - feeding a refined slurry of ground coke and water from said grinding means to gasifier means.

5,566,892

# PROCESS FOR PREPARING COMPOSITE STRUCTURES

Robert D. Creehan, Arlington, Mass., assignor to Hyperion Catalysis Int'l, Inc., Cambridge, Mass.

Continuation of Ser. No. 896,317, Jun. 10, 1992, Pat. No. 5,445,327, which is a continuation of Ser. No. 386,912, Jul. 27, 1989, abandoned. This application Jun. 2, 1995, Ser. No. 456,658

The portion of the term of this patent subsequent to Aug. 29, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> B02C 19/00; 19/12

U.S. Cl. 241—22

30 Claims

1. A compounding process for preparing a composite comprising the steps of:
  - mixing at least one filler and a matrix material thereby forming a mixture; and
  - subjecting said fillers and said matrix material to a combination of shear and impacted forces under reaction conditions including reaction time sufficient to reduce the size of agglomerates formed by said fillers to a value no greater than 1000 times the size of said filler to disperse said fillers throughout said matrix material.

5,566,893

# PORTABLE RECYCLE CRUSHER

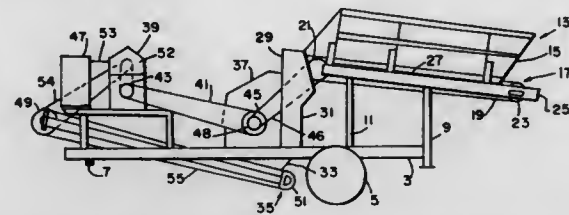
Roland A. Getz, 2800 W. Lincoln St., Phoenix, Ariz. 85009

Filed Mar. 22, 1993, Ser. No. 35,070

Int. Cl.<sup>6</sup> B02C 21/02

U.S. Cl. 241—27

15 Claims



15. A method of crushing materials comprising mounting a feed conveyor, a hopper and a crusher on a frame, and mounting the frame on an axle and wheels for towing the frame and the feed conveyor and the crusher to a desired location, dumping materials into the hopper, and conveying the materials with a feed belt sliding along a deck plate covered with a low wear, friction-reducing material, dumping the materials from the feed belt into a scalper for removing undersized materials, and flowing the oversized materials into the crusher, impacting the materials with spinning hammers, and driving the materials against abrasion-resistant plates in the crusher, dropping the materials through sizing grates and onto a delivery conveyor with the undersized materials from the scalper, and delivering the crushed and undersized materials with the delivery conveyor, said driving and conveying comprising drivingly connecting an engine to the frame and to the crusher and the conveyor.

5,566,894

# SLAB BREAKING APPARATUS AND METHOD OF USE

Earl G. Karch, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

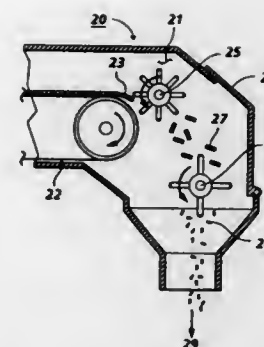
Filed Sep. 1, 1995, Ser. No. 522,909

Int. Cl.<sup>6</sup> B02C 13/02; 19/00

U.S. Cl. 241—29

20 Claims

15. A method of preventing accumulation and jamming of thermoplastic slab material and particulate material derived therefrom, within a slab breaker housing, the method comprising:
  - providing a thermoplastic slab breaker apparatus comprising a housing with a slab receiving aperture, and a slab fragment exit aperture on the base of said housing;



- a conveyor for conveying a continuous hot melt thermoplastic slab from a hot zone to a cool zone at ambient temperature within said housing;
  - a first rotatable slab breaker member comprising a pinwheel or a rigid rod with a plurality of rigid tines projecting radically outward therefrom and positioned in close proximity to the end of the conveyor in the cool zone, wherein the rod axis resides approximately in a plane defined by the conveyed slab perpendicular to a line defined by the conveyed slab; and
  - a second breaker member comprising a rigid rod with a plurality of rigid tines projecting radically outward therefrom and positioned approximately axially parallel and beneath the first slab breaker member;
- wherein the conveyor continuously transports the slab from the receiving aperture to the rotating first slab breaker and forces the slab into contact with the rotating tines of the slab breaker whereby the slab fragments into pieces, and wherein the pieces thereafter gravitationally fall downward and contact the rotating second breaker member so that the pieces are further fragmented into smaller pieces prior to exiting the housing through the exit aperture;
- providing a continuous feed of a thermoplastic resin monolithic slab from a melt mixing apparatus to the breaker apparatus receiving aperture, conveyor, slab breaker members; and operating the conveyor and breaker members at a rotational velocity differential which is sufficient to break substantially all the continuous feed slab material into fragmented primary pieces and fragmented secondary smaller pieces, wherein the largest dimension of the fragmented pieces is less than about 1.0 to about 5.0 square centimeters.

5,566,895

# DEVICE FOR CUTTING MEAT

Friedrich Otto, Hameln, and Friedhelm Eusterbarkey, Bad Pyrmont, both of Germany, assignors to A. Stephan u. Söhne GmbH & Company, Hameln, Germany

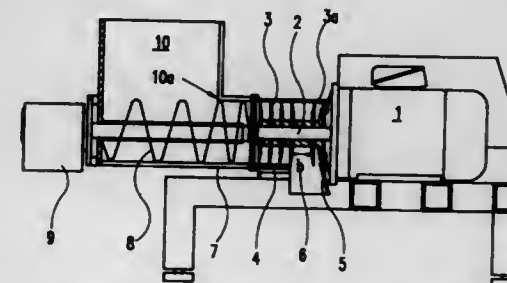
Filed Dec. 6, 1994, Ser. No. 354,151

Claims priority, application Germany, Dec. 7, 1993, 43 41 606.3

Int. Cl.<sup>6</sup> B02C 18/36

U.S. Cl. 241—82.7

12 Claims



1. A device for cutting edible products in the form of lumps, especially frozen pieces of meat having dimensions up to 250 mmx250 mmx250 mm, said device comprising:

- cutters for rotating in a cutter housing, said cutters being mounted nonrotatably but readily interchangeably on a shaft stub of a three-phase motor, said shaft stub being horizontal or inclined relative to a horizontal plane;
- each cutter of said cutters having an axial conveyor component; said cutters or rotating at rotational speeds between 500 rpm and 3,000 rpm;
- said cutters having a configuration and an axial spacing such that said frozen pieces of meat are cut to granulated meat having a grain size of 2 to 8 y mm;
- wherein a plurality of said cutters comprise double cutters having two blades, each blade of said blades including a chamfer provided at a leading edge, said chamfer having a grinding angle between approximately 25° and approximately 30°;
- said cutter housing having a delivery opening in a lowest area, for continuous delivery of said granulated meat by gravitational force only;
- said cutter housing being adjacent a continuously operating feeding device comprising a feed screw for feeding the frozen pieces of meat against a plane of rotation of a first cutter of said cutters;
- said feed screw for rotating at a rotational speed between 20 rpm and 200 rpm in a direction opposite to that of said cutters;
- said cutter housing having an inside wall circumferentially encompassing said cutters, and said inside wall being smooth, wherein a radial distance between ends of said rotating cutters and said inside wall comprises a gap distance of less than approximately 4 mm;
- wherein a lower edge of a housing of said feed screw is flush with a lower edge of said cutter housing; and
- wherein a first diameter of a feed screw housing corresponds to approximately half a second diameter of said cutter housing.

5,566,896

# AGITATOR MILL

Norbert Stehr, Grünstadt, and Philipp Schmitt, Lampertheim, both of Germany, assignors to EVV-Vermögensverwaltungs-GmbH, Wiesloch, Germany

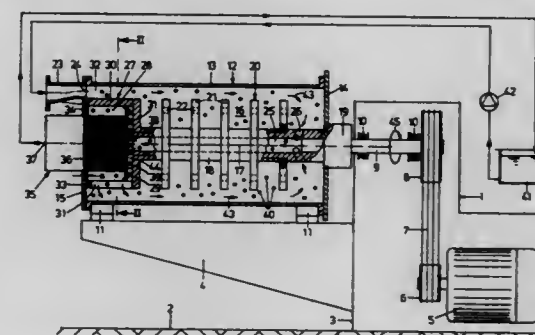
Filed Sep. 7, 1995, Ser. No. 524,778

Claims priority, application Germany, Sep. 9, 1994, 44 32 203.8

Int. Cl.<sup>6</sup> B02C 17/16

U.S. Cl. 241—171

11 Claims



1. An agitator mill, comprising
  - a grinding receptacle (12), of which a cylindrical wall (13) and a first end wall (14) and a second end wall (15) define a grinding chamber (16);
  - an agitator unit disposed in the grinding receptacle (12) and having an agitator shaft (18), which is cantilevered outside the grinding chamber (16) and finished by a free end inside the grinding chamber (16), and agitator elements (20) attached to the agitator shaft (18);
  - a drive motor (5) for a high-speed actuation of the agitator unit;
  - a cage-type section (27), which is attached to the free end of the agitator shaft (18) in vicinity to the second end wall (15) and defines an inner chamber (28);



an annular cylindrical grinding-stock inlet chamber (32) between the cage-type section (27) defining an inner chamber (28), and the wall (13) of the grinding receptacle (12); a grinding-stock inlet (24) disposed at least in vicinity to the second end wall (15) of the grinding receptacle (12) and opening into the annular cylindrical grinding-stock inlet chamber (32); an auxiliary-grinding-body retaining device (35) disposed in the inner chamber (28) of the cage-type section (27); a grinding-stock outlet (37) contiguous to the auxiliary-grinding-body retaining device (35) and passing through the second end wall (15); a grinding-stock/auxiliary-grinding-body return chamber (25), which is formed in the agitator shaft (18), and which, in vicinity to the first end wall (14) of the grinding receptacle (12), is connected with the grinding chamber (16) via at least one inlet passage (26) in the agitator shaft (18), and which opens via a junction (38) into the inner chamber (28) of the cage-type section (27); and passages (31) formed in the cage-type section (27) and connecting the inner chamber (28) with the grinding-stock inlet chamber (32).

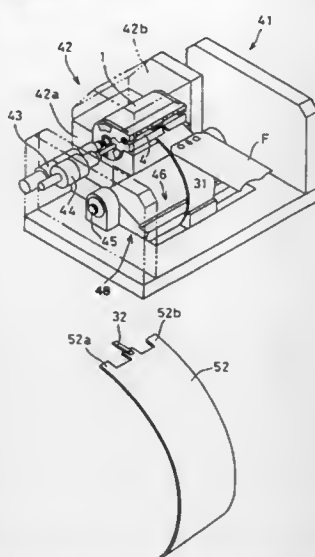
**5,566,897**  
**PHOTOGRAPHIC FILM TAKE-UP DEVICE AND METHOD**

Atsushi Yago, and Katsuhiko Tanaka, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 18, 1994, Ser. No. 245,007  
Claims priority, application Japan, May 18, 1993, 5-138920  
Int. Cl.<sup>6</sup> G03D 15/00

U.S. Cl. 242—348.1

13 Claims



1. A photographic film take-up device comprising: holding means for holding, in a fixed posture, a cartridge main body, said cartridge main body accommodating a spool having a trailing end engaging means in an interior thereof, said trailing end engaging means being adapted to engage a longitudinal direction trailing end portion of an elongated photographic film which has an engagement hole provided in a transverse direction central portion thereof, an interior portion of said cartridge main body being adapted to be maintained in a state of being shielded from light; and guiding means having an elongated plate member whose longitudinal direction is the direction of guiding photographic film to said spool, and having engaging means which is comprised of a single engaging projection adapted to engage into an engagement hole formed in a film, said engaging means is provided at a transverse direction central portion of said plate

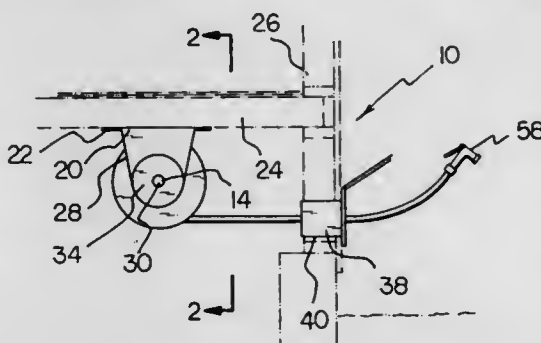
member at a leading end portion thereof in the direction of guiding a photographic film to said spool said guiding means guiding said engaging means to said spool via a film path provided in said cartridge main body to thereby provide for engaging a longitudinal direction trailing end portion of photographic film with said trailing end engaging means, said plate member being provided with a deterring means which includes a projection portion respectively provided at each transverse direction end of said plate member at the leading end portion thereof in the direction of guiding photographic film to said spool, said projection portions extending beyond the transverse direction ends in the direction of guiding the photographic film to said spool, for deterring formation of curls at both transverse direction ends of photographic film at a longitudinal direction trailing end portion thereof.

**5,566,898**  
**HOSE STORAGE SYSTEM**

Michael W. Cline, 678 Salem Quinton Rd., Salem, N.J. 08079  
Filed May 15, 1995, Ser. No. 440,670  
Int. Cl.<sup>6</sup> B65M 75/34

U.S. Cl. 242—379

3 Claims



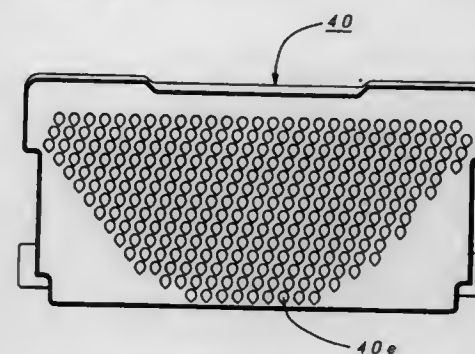
1. A new and improved hose storage system for supporting a hose in a closed system to facilitate its storage and usage comprising, in combination:  
a cylindrical core positionable in a horizontal orientation with opposed ends and a central hose supporting extent therebetween;  
a bracket having a centrally disposed horizontal central component positioned beneath the joist of a building and vertically disposed end components extending downwardly therefrom with apertures rotatably receiving the ends of the core;  
a drive controller coupled to one end component of the bracket for allowing the rotation of the core in a first direction to effect unwinding of a hose therefrom and for allowing the rotation of the core in a second direction to effect the rewinding of a hose onto the core;  
a box positionable in a vertical wall of a building adjacent to the bracket, the box having an open interior end and an open exterior end and a passage therethrough for the passage of portions of a hose supported on the core, the box having a long interior extent and a short exterior extent;  
a plurality of pairs of inner rollers rotatably mounted in the interior extent of the box about both horizontal and vertical axes and two pair of outer rollers rotatably mounted in the exterior extent of the box about horizontal and vertical axes, the outer rollers being wider spaced from each other than the inner rollers to allow receipt therebetween of a hose end and a nozzle in the exterior extent of the box;  
a door pivotally mounted to the box and movable between a raised open orientation allowing access to a hose and nozzle therein and a closed orientation;  
a spring-urged ball in the door located adjacent to the box with an associated detente in the box to hold the door in a raised orientation;  
a gasket located within the periphery of the door to effect the sealing closure of the box; and

a spring-urged lock formed in the door adapted to be coupled with respect to an adjacent portion of the box when the door is closed.

**5,566,899**  
**RETRACTOR WITH A CLAMPING MECHANISM FOR USE IN A SEAT BELT DEVICE**  
Takanobu Sasaki, and Kazumi Hirata, both of Kanagawa, Japan, assignors to NSK Ltd., Tokyo, Japan  
Filed Nov. 3, 1994, Ser. No. 334,368  
Claims priority, application Japan, Nov. 4, 1993, 5-063683  
Int. Cl.<sup>6</sup> B65H 75/30

U.S. Cl. 242—381.1

7 Claims



4. A retractor with a clamping mechanism for holding a webbing directly in a vehicle emergency, comprising:  
a retractor base;  
a winding shaft supported rotatably on said retractor base for winding a webbing therearound;  
a lower plate fixed to said retractor base;  
a movable wedge-shaped clamp member for holding a webbing between itself and said lower plate; and  
an upper plate for guiding said clamp member to a webbing holding position,  
wherein said clamp member includes on a webbing opposing surface thereof a plurality of clamp teeth for holding the webbing, and said clamp teeth being respectively formed in a substantially conical shape and being arranged to decrease in number toward said winding shaft from a webbing exit side.

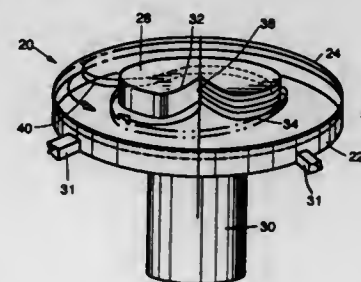
**5,566,900**  
**CABLE TAKEUP/PAYOUT SYSTEM FOR A MULTI-ROTATION ASSEMBLY**

Jay B. Betker; Anthony J. Scalise, both of Yorba Linda, and William E. Odor, Downey, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 8, 1994, Ser. No. 351,847  
Int. Cl.<sup>6</sup> B65H 75/00; H01R 39/00

U.S. Cl. 242—388

16 Claims



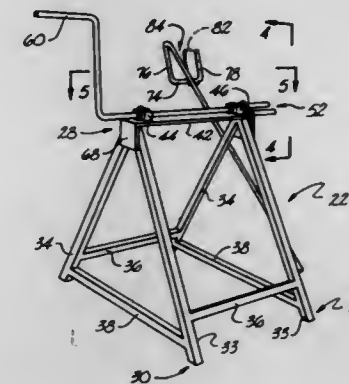
1. A cable connection/dispatching system for a multi-rotation assembly, comprising:  
a hollow housing;

a central hub centered within the housing and having a cross-sectional shape with two lobes and an acute cusp therebetween, at least one of the housing and the hub being rotatable; a first cable connector located on the hollow housing and facing an interior thereof;  
a second cable connector located on the central hub;  
an interconnect medium disposed between the hollow housing and the central hub, the interconnect medium comprising an interconnect cable attached at a first end to the first cable connector and at a second end to the second cable connector; and  
means for rotating the central hub and for holding the housing stationary with respect to rotation, the means for rotating permitting a preselected number of rotations of the hub.

**5,566,901**  
**METHOD AND APPARATUS FOR WINDING FIRE HOSE**  
Ray J. Wilder, 23 Transylvania St., Piedmont, S.C. 29676  
Filed Dec. 13, 1994, Ser. No. 354,510  
Int. Cl.<sup>6</sup> B65H 75/34

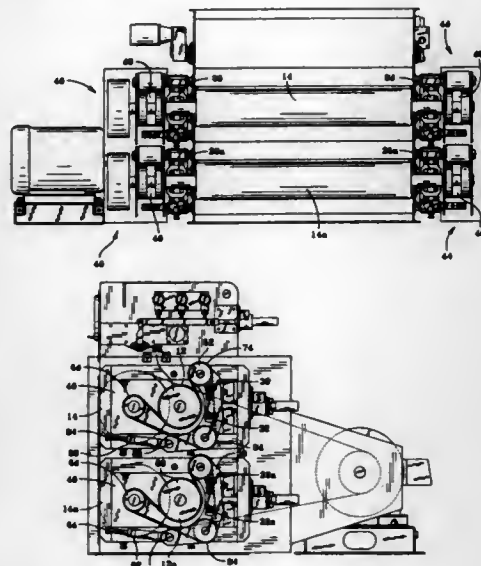
U.S. Cl. 242—532.6

9 Claims



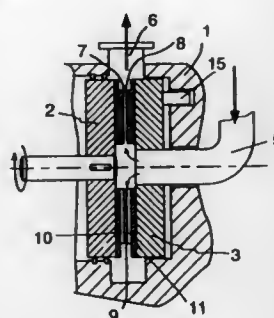
1. A self-supporting hose winding device for winding a fluid-carrying hose, the winding device being for placement on a support surface, the winding device comprising:  
a free-standing support structure having first and second spaced apart side portions, said support structure having a base for contacting the support surface, said base portion having a length dimension at least half of the width dimension of said base portion;  
a crankshaft extending substantially the length of said support structure and rotatably connected to said support structure, said crankshaft having first and second ends;  
a handle connected to said first end of said crankshaft for allowing a user to rotate said crankshaft;  
a hose end holder connected to said second end of said crankshaft for rotation therewith, said hose end holder extending outwardly from said second side portion and being adapted for receipt of an end of the hose and for winding the hose thereon as said crankshaft is rotated; and  
a hose guide member connected to said support structure and extending outwardly therefrom for guiding the hose as the hose is wound about said hose end holder, said hose guide member having spaced apart upstanding portions defining a hose passage therebetween and a substantially horizontally extending stationary hose-engaging member for frictionally engaging the underside of the hose during winding to simultaneously flatten the hose and force fluid from the hose as the hose passes over said hose-engaging member.

**5,566,902**  
**ROLL ARRANGEMENT FOR A MILLING MACHINE,**  
**AND AN INTER-ROLL DRIVE THEREFOR**  
 Kelsey C. Thom, Jr., Cedar Falls, Iowa, assignor to California  
 Pellet Mill Company, San Francisco, Calif.  
 Filed May 12, 1995, Ser. No. 440,149  
 Int. Cl.<sup>6</sup> B02C 4/02; 4/42  
 U.S. Cl. 241—227 9 Claims



1. A roll arrangement, for a milling machine, comprising:  
 a frame;  
 a first elongated roll rotatably mounted within the frame, the first roll having a first end and a second end, the first roll having first sheaves attached at each end;  
 a second elongated roll rotatably mounted within the frame, the second roll having a first end and a second end, the second roll having second sheaves attached at each end;  
 a first drive means coupled to the first and second roll first ends;  
 and  
 a second drive means coupled to the first and second roll second ends.

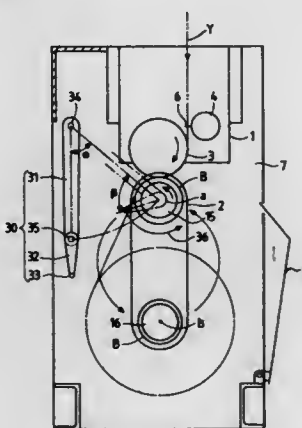
**5,566,903**  
**ROLLER MILL FOR MILLING SUSPENDED FIBROUS**  
**MATERIAL**  
 Frank P. Meltzer, Daisendorf, Germany, assignor to Sulzer-  
 Escher Wyss GmbH, Ravensburg, Germany  
 Filed Oct. 20, 1994, Ser. No. 327,787  
 Claims priority, application Germany, Nov. 6, 1993, 43 37  
 998.2  
 Int. Cl.<sup>6</sup> B02C 7/02; 7/12  
 U.S. Cl. 241—261.2 12 Claims



1. A roller mill for the milling of a fibrous material suspension, the roller mill comprising:

a housing having inlet and outlet openings for the fibrous material suspension;  
 at least two complementary milling tool carriers, including a rotor and a stator, for the attachment of milling tools for establishing at least one working surface and a complementary additional working surface, with the working surfaces being positioned, relative to each other, so as to define a milling aperture through which the fibrous material suspension flows during the operation of the roller mill;  
 at least one of the working surfaces including a plurality of raised areas acting as cutting edges and having channel shaped grooves therebetween, so that the fibrous material suspension is at least partially directed through the channel shaped grooves from the inside to the outside thereof, with a mechanical working of the fibrous material suspension being achieved via the relative motion between the two complementary working surfaces; and  
 on at least one side of the milling aperture, the raised areas of the at least one working surface extending radially outwardly at least 30 mm less than the extent of its associated milling tool carrier, thus producing a region in which the fibrous material suspension achieves a higher unit pressure and enables a reverse radial flow of the fibrous material back into the stator.

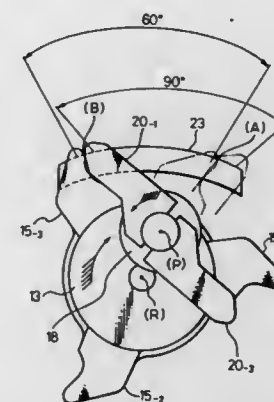
**5,566,904**  
**METHOD FOR SEQUENTIALLY WINDING ELASTIC**  
**YARN ON A PLURALITY OF BOBBIN HOLDERS**  
 Kinzo Hashimoto, Kyoto, Japan, assignor to Murata Kikai  
 Kabushiki Kaisha, Kyoto, Japan  
 Filed Apr. 14, 1994, Ser. No. 227,459  
 Claims priority, application Japan, Apr. 23, 1993, 5-120792;  
 Oct. 18, 1993, 5-284534  
 Int. Cl.<sup>6</sup> B65H 54/00; 67/044  
 U.S. Cl. 242—18 A 5 Claims



1. A method for winding elastic yarn in succession upon at least two bobbin holders, comprising the steps of:  
 a) providing at least two bobbin holders having bobbins thereon;  
 b) feeding an elastic yarn from an upstream location and winding the elastic yarn around a first of said bobbins until said first bobbin is full;  
 c) contacting a second of said bobbins, which is empty, against said yarn upstream of said first bobbin such that the yarn extends from the upstream location around the second bobbin and extends from the second bobbin to said first bobbin which is full;  
 d) positioning a portion of the yarn which, after said step c), extends from the second bobbin to said first bobbin in contact against a portion of the yarn upstream of the second bobbin such that the yarn surrounds the second bobbin, whereby the portions of elastic yarns become intertwined;  
 e) winding the elastic yarn around the second bobbin such that the elastic yarn which extends from the second bobbin to said

first bobbin is pulled until it breaks so as to complete the yarn transfer between said first and second bobbins.

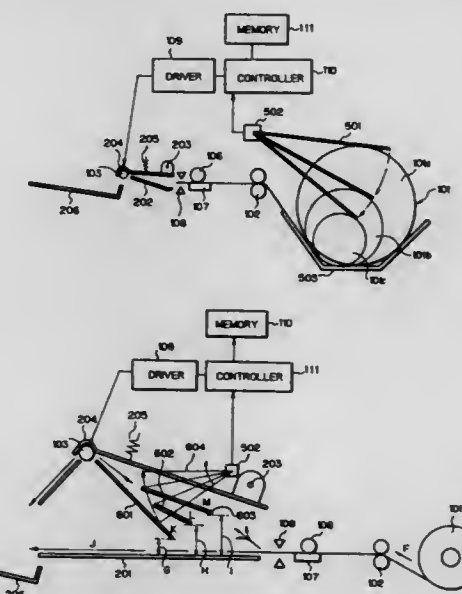
**5,566,905**  
**APPARATUS FOR WINDING A PLURALITY OF YARNS**  
 Takashi Iwade, Kyoto; Jun Takagi, and Yoshiro Migaki, both  
 of Otsu, all of Japan, assignors to Toray Engineering Co.,  
 Ltd., Japan  
 PCT No. PCT/JP93/01163, § 371 Date Apr. 12, 1994, § 102(e)  
 Date Apr. 12, 1994, PCT Pub. No. WO94/04452, PCT Pub.  
 Date Mar. 3, 1994  
 PCT Filed Aug. 19, 1993, Ser. No. 211,671  
 Claims priority, application Japan, Aug. 19, 1992, 4-244240;  
 Oct. 9, 1992, 4-297885  
 Int. Cl.<sup>6</sup> B65H 54/28  
 U.S. Cl. 242—43 A 8 Claims



1. In an apparatus for winding a plurality of running yarns, wherein said apparatus includes a spindle having an axial direction; bobbins mounted on said spindle; a machine frame for rotatably supporting said spindle; a frame body movably connected to said machine frame; a touch roller rotatably attached to said frame body and adjacent to said bobbins on said spindle, said touch roller being arranged to apply contact pressure to said bobbins, said touch roller also having an axis of rotation which is parallel to said spindle axis; a traverse-motion mechanism also supported by said frame body and having a plurality of yarn traversing units arranged at spacings from one another in a row in said axial direction of said spindle for obtaining traverse movement of the respective yarns, said yarn traversing units including two endmost yarn traversing units defining either end of said row of yarn traversing units; each of said yarn traversing units comprising a yarn guiding member extending in a plane in parallel to the axis of the spindle shaft while contacting a running yarn, so that a yarn guiding surface is defined at a peripheral end of the yarn guiding member, and a yarn traversing means positioned upstream from said touch roller and in the vicinity of the corresponding yarn guiding surface, the yarn traversing means being arranged to reciprocate the corresponding yarn along a traversal path on the corresponding yarn guiding surface, the yarn guiding surface being in a position such that a straight line connecting the opposite ends of the traverse path on the guiding surface is parallel to the spindle axis; a yarn separating guide defining a yarn separating fulcrum and positioned between endmost yarn traversing units and upstream from the row of yarn traversing units; yarn bending guides, each defining a yarn traversing fulcrum and positioned between said yarn separating fulcrum and the respective yarn traversing units, wherein said yarns are separated from each other at the yarn separating fulcrum and are, via the yarn traversing guides and the traversing units, supplied to and wound on the respective bobbins on the spindle, the combination wherein:  
 said yarn guiding member of at least one of the endmost traversing units is rotatable about an axis which is transverse to said plane of the corresponding yarn guiding member, and is rotated an angular distance  $\theta$  so that said straight line connect-

ing the opposite ends of the traverse path on the guiding surface is positioned at an angle corresponding to said angular distance  $\theta$  to said spindle axis,  
 and said yarn traversing fulcrum being positioned a predetermined length in a direction downstream from the yarn separating fulcrum.

**5,566,906**  
**DECURLING DEVICE FOR A ROLLED RECORDING**  
**PAPER**  
 Takeshi Kamada, Atsugi, and Kenichi Takehara, Tokyo, both  
 of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan  
 Filed Sep. 10, 1993, Ser. No. 118,649  
 Claims priority, application Japan, Sep. 16, 1992, 4-272430  
 Int. Cl.<sup>6</sup> B65H 23/34; G01D 15/24; B41J 11/00; G03B 1/48  
 U.S. Cl. 242—563 4 Claims



1. A device for decurling a recording paper in a form of a roll, the device comprising:  
 means for transporting the recording paper;  
 decurling means for decurling said recording paper while said recording paper is in transport, said decurling means comprising a decurling roller and decurling guide; and  
 control means for temporarily interrupting transport of said recording paper at said decurling means, said control means comprising a driver for driving the decurling roller and a controller which provides control signals to said driver;  
 wherein said controller controls said driver to temporarily stop a rotation of the decurling roller at a predetermined timing so as to control at least one of a duration and a frequency of interruption of the transport of the recording paper, and said controller controls the driver to temporarily stop said decurling roller rotation at said predetermined timing so as to permit a decurling of the recording paper at said decurling means;  
 the device further comprising curl sensing means for sensing a curl of the recording paper, wherein said control means controls the transport of the recording paper in response to an output of said curl sensing means.



**5,566,907**  
**COUNTER-TORQUE DEVICE WITH DUCTED ROTOR**  
**AND PHASE MODULATION OF THE BLADES, FOR**  
**HELICOPTER**

Henri-James R. Marze, Rognac; Vincent J. L. Routhieu, Aix-En-Provence; Gilles L. Arnaud, Marseille, and Rémy E. Arnaud, Vitrolles, all of France, assignors to Eurocopter France, Cedex, France

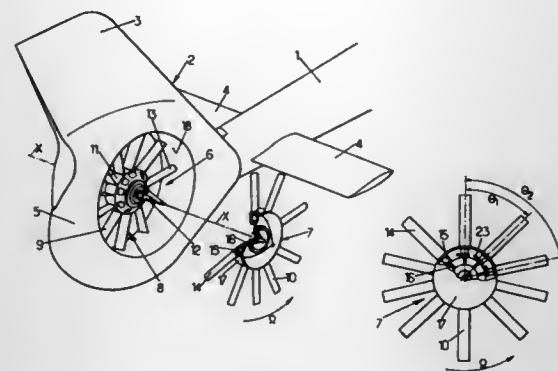
Filed Aug. 30, 1994, Ser. No. 298,555

Claims priority, application France, May 4, 1994, 94 05477

Int. Cl.<sup>6</sup> B64C 27/82

U.S. Cl. 244—17.19

18 Claims



1. Counter-torque device for a helicopter, comprising a variable-pitch multi-blade rotor mounted so that it can rotate substantially coaxially in a duct for a flow of air of axis substantially transversal to the helicopter and passing through a fairing incorporated into the tail part of the helicopter, so that the pitch change axes of the blades move in a plane of rotation substantially perpendicular to the axis of the fairing duct, the blades of the rotor having an angular distribution about the axis of the rotor with an uneven azimuth modulation,

wherein the azimuth modulation of the blades is substantially given by the following sinusoidal law:

$$\Theta_n = n \times 360^\circ / b + \Delta\Theta \sin(m \times n \times 360^\circ / b)$$

where  $\Theta_n$  is the angular position of the  $n$ th of the blades counted in series from an arbitrary origin,  $b$  is the number of blades,  $m$  is a whole number chosen from 1 to 4, which is not prime with the number  $b$  of blades, chosen from 6 to 12, and  $\Delta\Theta$  is chosen to be greater than or equal to a minimum value  $\Delta\Theta_{\min}$ , which is such that the product  $\Delta\Theta_{\min} \times b$  is chosen within a range of values extending from 1.5 radian to 1 radian.

**5,566,908**  
**AIR-LAUNCHABLE GLIDING SONOBUOY**  
 Samuel Greenhalgh, Doylestown, Pa., assignor to The United States of America as represented by the Secretary of the Navy, WA, D.C.

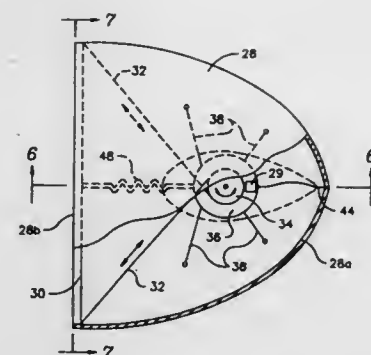
Division of Ser. No. 281,807, Jul. 25, 1994, Pat. No. 5,456,427. This application Jan. 30, 1995, Ser. No. 380,178

Int. Cl.<sup>6</sup> B64D 1/02; B64C 3/26; 31/02

U.S. Cl. 244—138 R

7 Claims

1. A gliding wing comprising:  
 an inflated enclosed membranous envelope having a streamlined control surface defined by a nose section and sides spreading aftward to a transverse trailing edge; and  
 steering means enclosed within said envelope and connected to said trailing edge, and pre-adjusted for skewing the control surface for a desired glide path.



**5,566,909**  
**SYSTEM AND METHOD FOR DEPLOYING MULTIPLE**  
**PROBES**

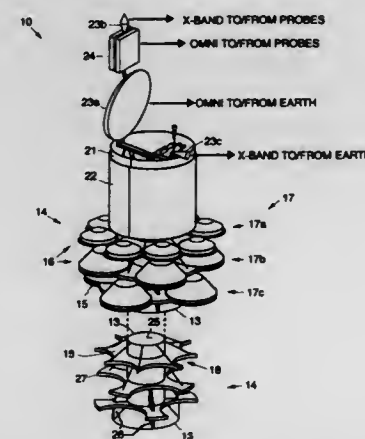
Uldis E. Lapins, Rancho Palos Verdes, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 8, 1993, Ser. No. 118,069

Int. Cl.<sup>6</sup> B64G 1/22; B64F 1/04

U.S. Cl. 244—158 R

7 Claims



1. A system for deploying multiple probes, said system comprising:

- a launch vehicle;
- a spin stabilized communications satellite;
- probe carrying means disposed between the satellite and the launch vehicle;
- a plurality of probes disposed on the probe carrying means, wherein symmetrically disposed probes have substantially the same mass;
- separation means coupled to the probe carrying means for separating the satellite, the probe carrying means and the plurality of probes from the launch vehicle;
- targeting means for orienting the spin axis of the satellite in a predetermined direction;
- deployment means for simultaneously deploying a selected number of probes from the satellite, such that the satellite remains dynamically balanced after deployment; and
- communication means disposed on the communication satellite for providing communications between an Earth station and each of the plurality of probes subsequent to deployment, wherein the satellite is caused to cruise toward a selected planet after separation from the launch vehicle, and wherein at a predetermined location relative to the planet, the deployment means simultaneously deploys a selected pair of probes along opposite flight paths from the satellite toward the planet, which probes land at predetermined locations on the planet, and wherein the satellite further comprises means for injecting the satellite into a predetermined orbit around the planet.

**5,566,910**  
**APPARATUS FOR ADJUSTING AIRCRAFT WING FLAPS**  
 Thomas Diekmann; Norbert Geyer, both of Bremen, and Wilhelm Martens, Delmenhorst, all of Germany, assignors to Daimler-Benz Aerospace Airbus GmbH, Hamburg, Germany

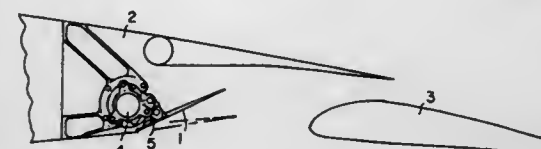
Filed Oct. 12, 1994, Ser. No. 322,055

Claims priority, application Germany, Oct. 12, 1993, 43 34 680.4

Int. Cl.<sup>6</sup> B64C 9/16

U.S. Cl. 244—216

10 Claims



1. An apparatus for controlling a wing gap in an aircraft wing having landing flaps (3) forming said wing gap, comprising at least one wing gap closure flap (1), at least one rotational positioning shaft (4) for operating said wing gap closure flap (1), bearings rotatably mounting said positioning shaft (4) in said aircraft wing, at least one lever mechanism (5) operatively connecting said positioning shaft (4) with said wing gap closure flap (1), at least one landing flap drive (7) and a drive coupling for transmitting power from said landing flap drive to said positioning shaft (4) for operating said at least one wing gap closure flap (1), wherein said positioning shaft (4) comprises a first hollow shaft section and a second hollow shaft section extending inside said first hollow shaft section and a torsion spring (20) inside said second hollow shaft section, said torsion spring (20) coupling said first and second hollow shaft sections to each other, for permitting a transfer of drive power from one hollow shaft section to the other and for permitting a limited continued rotation of one shaft section relative to the other shaft section when one shaft section is stopped, whereby in end positions of said wing gap closure flap (1) further rotation of one of said shaft sections is taken up by said torsion spring but not transmitted to said wing gap closure flap (1).

**5,566,911**  
**STAND FOR DRUM AND CYMBAL**  
 Yoshiki Hoshino, Aichi-Ken, Japan, assignor to Hoshino Gakki Co., Ltd., Japan

Filed Nov. 30, 1994, Ser. No. 346,899

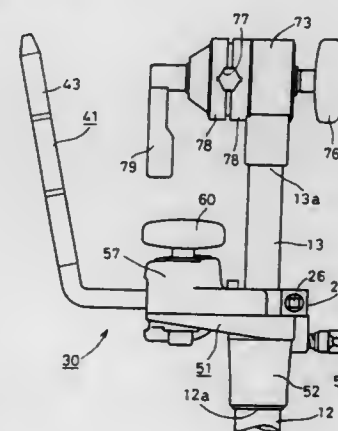
Claims priority, application Japan, May 16, 1994, 6-006628

U

Int. Cl.<sup>6</sup> A47G 29/00

U.S. Cl. 248—124.1

8 Claims



1. A stand for a tom tom drum and a cymbal, comprising:  
 a lower pipe with a leg part thereon for supporting the lower pipe;

171-208 O.G.-96-9: QL3

an intermediate pipe inserted into the lower pipe and protruding an adjustable first distance above the lower pipe, the intermediate pipe having a top end;  
 a tom holder fixed to the top end of the intermediate pipe,  
 an upper pipe inserted into the intermediate pipe and protruding an adjustable second distance above the intermediate pipe, the upper pipe being adjustable in height relative to the intermediate pipe and with reference to the tom holder; and  
 a cymbal holder on the upper pipe;  
 securing means on the tom holder for being tightened on the upper pipe where the upper pipe passes the tom holder for securing the adjusted height of the upper pipe protruding above the intermediate pipe.

**5,566,912**  
**DEVICE FOR LOCKING OF MOVABLE SWITCH PARTS**  
 Gerald Durchschlag, Zeltweg, Austria, assignor to VAE Aktiengesellschaft, Vienna, Austria

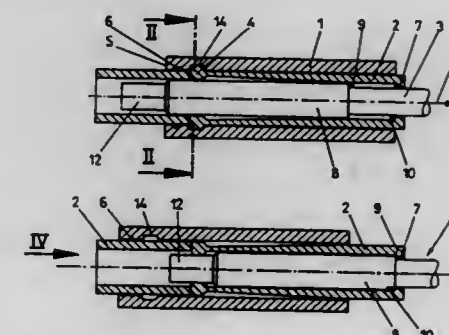
Filed May 16, 1995, Ser. No. 442,261

Claims priority, application Austria, May 16, 1994, 1009/94

Int. Cl.<sup>6</sup> F01B 7/00

U.S. Cl. 246—448

8 Claims



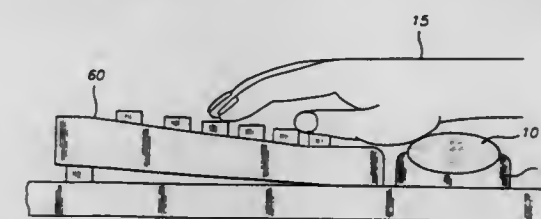
1. A switch part locking device comprising:  
 a stationary tube;  
 a displaceable tube disposed within the stationary tube and moveable with respect to the stationary tube in an axial direction;  
 a pin disposed within the displaceable tube and moveable with respect thereto in said axial direction so as to be operatively connected to a switch part; and  
 means responsive to positions of the pin relative to the displaceable tube for locking the displaceable tube to said stationary tube and unlocking it therefrom so as to lock said switch part in end positions.

**5,566,913**  
**WRIST REST APPARATUS**  
 David M. Prokop, 20713 NE. 38th St., Redmond, Wash. 98053  
 Filed May 31, 1995, Ser. No. 455,386

Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 248—118

19 Claims



1. A wrist rest and exercise apparatus, for a user's wrists, hands, and fingers comprising, in combination:

a thermally conductive gelatinous resilient means for providing a cushion for a user's wrist, said gelatinous resilient means having a generally deformable surface for providing a contact area shaped to said user's wrist; enveloping means for containing and protecting said gelatinous resilient means; covering means disposed about said gelatinous resilient means on which said user's wrists may be disposed.

5,566,914

## SIGN SUPPORT STAKE

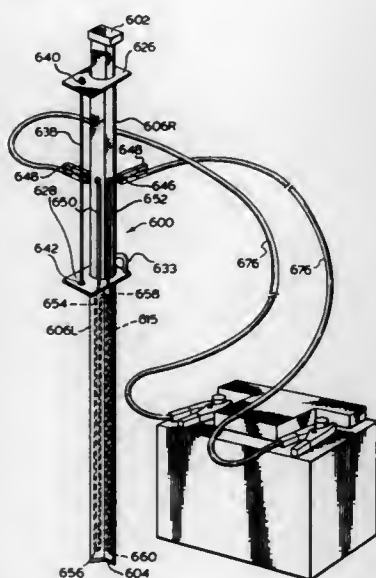
John E. Thomas, 50 Mary Street West, Lindsay, Ontario, Canada

Continuation-in-part of Ser. No. 223,231, Apr. 5, 1994, Pat. No. 5,489,076, which is a continuation-in-part of Ser. No. 93,660, Jul. 20, 1993, Pat. No. 5,340,065. This application Nov. 21, 1994, Ser. No. 345,400

Int. Cl.<sup>6</sup> A45F 3/44

U.S. Cl. 248—156

21 Claims



1. In combination, sign support member and jack therefor, longitudinally extending stake having a penetration end and a driving end, said penetrating end being adapted to penetrate the earth surface responsive to impact on said driving end, means on said stake for supporting the upright of a sign thereon, said jack comprising:

- a standard,
- a pad on one end thereof,
- said pad shaped to rest on said surface with said standard extending upward therefrom,
- a lever pivotally mounted toward the upper end of said standard to pivot about a substantially horizontal axis,
- said lever having a long, force input, end and a short, force output, end,
- cooperating means on said stake and said output end causing transfer of upward force supplied by said output end to said stake.

5,566,915

## STAND AND ACCESSORY FOR STAND

Lars Hansare, 1 Rue du Picardeau, Nemours, France  
PCT No. PCT/GB93/02176, § 371 Date Feb. 8, 1995, § 102(e)  
Date Feb. 8, 1995, PCT Pub. No. WO94/09307, PCT Pub.  
Date Apr. 28, 1994

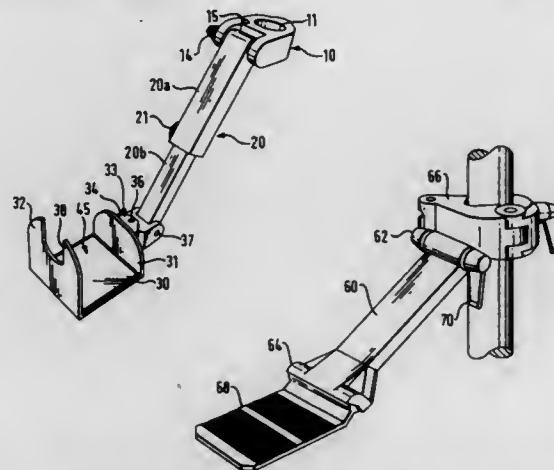
PCT Filed Oct. 22, 1993, Ser. No. 374,771

Claims priority, application Sweden, Oct. 22, 1992, 9203106

Int. Cl.<sup>6</sup> F16M 11/20

U.S. Cl. 248—188.8

18 Claims



1. A steadying device for use with a one legged stand or "monopod", the device comprising:  
a prop section having an upper end and a lower end;  
a baseplate connected to said lower end of said prop section, the baseplate having an upwardly facing surface forming a foot-plate for steadying the assembly;  
a clamp connected to said upper end of said prop section and adapted to fit around the one legged stand; and,  
a pivot connecting said clamp to said prop so that the monopod and the prop can be folded into a parallel relationship for transport purposes.

5,566,916

## ADJUSTABLE PIPE BRACE

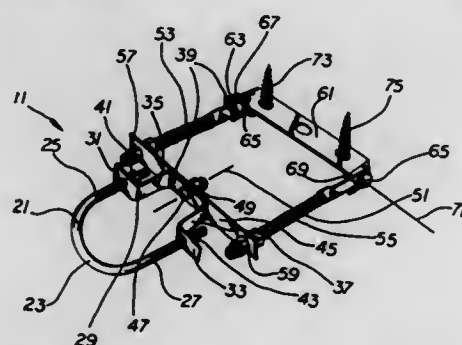
Michael E. Bailey, 1846 Rosemeade, #250, Carrollton, Tex. 75007

Filed May 26, 1995, Ser. No. 452,354

Int. Cl.<sup>6</sup> F16L 3/22

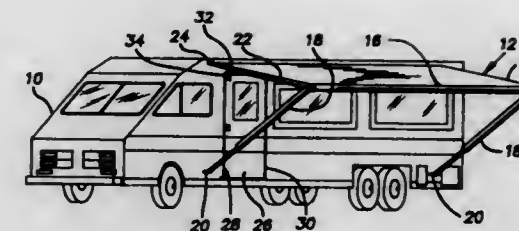
U.S. Cl. 248—230.1

19 Claims



1. An adjustable pipe brace for securing a pipe to a support surface, comprising:  
a U-bolt having a bight between a pair of legs;  
a clamp bracket, having a pair of wings, a pair of extension plates, attached to the wings, and a base attached between the extension plates;  
means for securing the U-bolt to the wings of the clamp bracket to hold the pipe between the U-bolt and the clamp bracket;

a support plate;  
attachment means for attaching the base to the support plate, wherein the attachment means can be loosened and retightened to allow the clamp bracket to be pivoted relative to the support plate; and  
connection means for connecting the support plate to the support surface.



5,566,917

## RECEPTACLE BRACKET

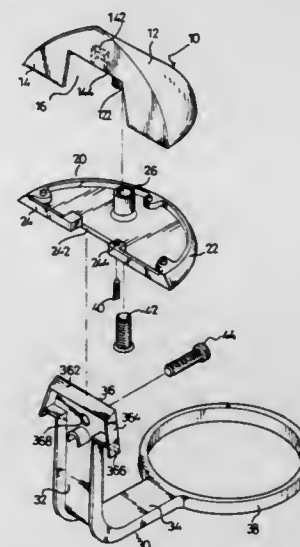
Shin-wang Wu, 19F1-2, No. 508, Sec. 5, Chungsiao E. Rd., Taipei, Taiwan

Filed Sep. 8, 1995, Ser. No. 525,009

Int. Cl.<sup>6</sup> A47K 1/08

U.S. Cl. 248—311.2

4 Claims



1. A receptacle bracket to be mounted to a wall, comprising:  
a support mounted in a stationary relationship to the wall, the support having an upright portion integrally formed with a perpendicular portion, said upright portion having a tongue defining an upper and a lower inclined surfaces, said perpendicular portion having a free end shaped to receive a receptacle;  
a cover having a semi-conical wall and a vertical wall integrally formed therewith, an opening defined in the vertical wall, a projection with an inclined face integrally formed on an inner side of the vertical wall to engage the upper inclined surface;  
a semi-circular plate securely mounted to a base of said cover and having a recess, said recess and said opening together matingly receiving the tongue of said upright portion of said support; and  
means for urging against the lower inclined surface to move the combination of the cover and the plate in a direction toward the wall.

said body, and a roller assembly having a roller and a bracket, said bracket having a mounting portion mounted to said body and a supporting portion rotatably supporting said roller and connected to said mounting portion, wherein said bracket positions said roller substantially above said edging strips near a top corner of said door assembly, whereby said roller assembly is adapted to support the canopy when said door assembly is opened to prevent interference between the door assembly and the canopy.

5,566,919

## MOTOR MOUNT FOR REDUCING VIBRATION AND NOISE AND METHOD OF USING THEREOF

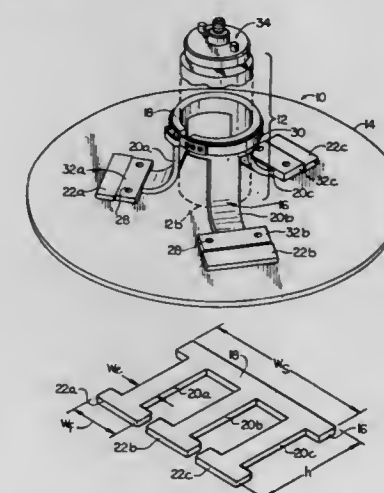
Larry E. Shephard, West Warwick, R.I., assignor to Norfolk Scientific, Inc., Norwood, Mass.

Filed Oct. 13, 1994, Ser. No. 322,597

Int. Cl.<sup>6</sup> F16M 13/00

U.S. Cl. 248—604

9 Claims



1. A mount for mounting a motor to a base, said mount comprising:

- a one-piece elastomeric support having a motor attachment portion and a plurality of legs, each one of said legs extending from said motor attachment portion to terminate at a corresponding foot, wherein prior to being attached to said motor, said support is planar, and during use, said motor attachment portion is adapted for being disposed around said motor and each said foot is adapted for attachment to said base.

5,566,918

## ANGLED DOOR ROLLER

Kent Becker, Rome City, Ind., assignor to The Dometic Corporation, LaGrange, Ind.

Filed Jul. 18, 1994, Ser. No. 276,530

Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 248—351

12 Claims

1. A door assembly for hinged mounting on a recreational vehicle and below a canopy, said door assembly comprising a generally-rectangularly shaped body, edging strips along edges of



5,566,920

# VALVE NEEDLE FOR AN ELECTROMAGNETICALLY ACTUABLE VALVE AND METHOD FOR MANUFACTURING THE VALVE NEEDLE

Peter Romann, Stuttgart; Ferdinand Reiter, Markgroeningen; Martin Maier, Moeglingen, and Thomas Naeger, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE93/00759, § 371 Date May 11, 1994, § 102(e) Date May 11, 1994, PCT Pub. No. WO94/07024, PCT Pub. Date Mar. 31, 1994

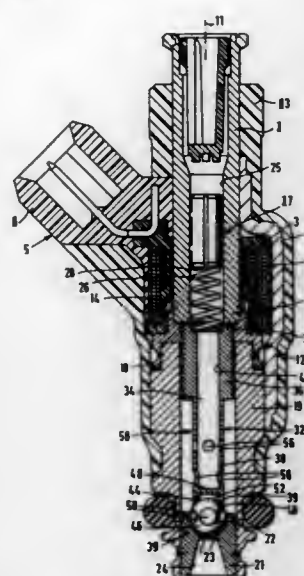
PCT Filed Aug. 20, 1993, Ser. No. 240,704

Claims priority, application Germany, Sep. 11, 1992, 42 30 376.1

Int. Cl.<sup>6</sup> F16K 31/06; F02M 51/06

U.S. Cl. 251—129.21

14 Claims



1. A valve needle for an electromagnetically actuable valve for an injection valve for fuel injection systems of internal combustion engines, said valve has a core, a magnet coil and a fixed valve seat with which the valve needle interacts, said valve needle (58) comprises an armature section (36), a valve sleeve section (38) and a valve closing element section (46), the valve sleeve section connects the armature section to the valve closing element section and a longitudinal opening extends through the armature section and the valve sleeve section, the armature section (36), the valve sleeve section (38) and the valve closing element section (46) of the valve needle (58) are formed as one part by injection moulding and subsequently sintered.

5,566,921

# SOLENOID VALVE

Toru Yokota, and Hiroshi Ishiwata, both of Higashimatsuyama, Japan, assignors to Zexel Corporation, Tokyo, Japan

Filed Aug. 8, 1994, Ser. No. 286,974

Claims priority, application Japan, Aug. 6, 1993, 5-047144 U; Sep. 16, 1993, 5-055011 U

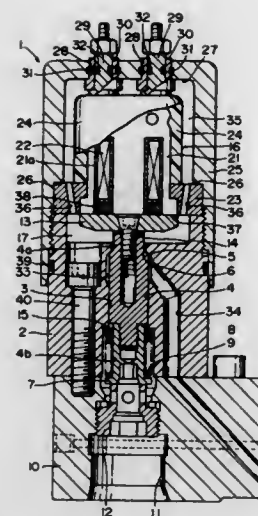
Int. Cl.<sup>6</sup> F16K 31/02

U.S. Cl. 251—129.22

18 Claims

1. A solenoid valve comprising:

- a housing defining a through hole, a fluid passage communicating with said through hole, and a chamber in fluid communication with said through hole;
- a plug valve slidably mounted in said through hole to control communication between said through hole and said fluid passage;
- an armature positioned in said chamber and connected to said plug valve;



- a solenoid including a synthetic resin mold and a stator positioned in said synthetic resin mold, said solenoid located so as to oppose a surface of said armature;
  - a spring operatively engaging said plug valve to bias said armature in a direction away from said stator; and
  - a retainer enclosing said synthetic resin mold and mounting said solenoid to said housing, wherein said retainer is spaced from said synthetic resin mold so as to form a gap therebetween and said chamber is in fluid communication with said gap.
2. The solenoid valve as claimed in claim 1, wherein said stator is formed of a plurality of thin plates and includes an open-ended groove formed therein, said solenoid further comprising:
- a plurality of coils provided in said grooves; and
  - a non-magnetic metal core plate connected to said stator so as to align an end surface of said stator with an end surface of said core plate.
6. The solenoid valve as claimed in claim 2, further comprising a communicating passage formed in said core plate to provide communication and pressure equalization between said chamber and said gap.

5,566,922

# GATE VALVE DEVICE

Yutaka Tanaka, Yokohama; Kunitaka Ozawa, Isehara; Takao Kariya, Hino, and Shunichi Uzawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 186,893, Jan. 27, 1994, abandoned, which is a continuation of Ser. No. 988,012, Dec. 9, 1992, abandoned, which is a continuation of Ser. No. 651,607, Feb. 6, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 481,826

Claims priority, application Japan, Feb. 9, 1990, 2-028494

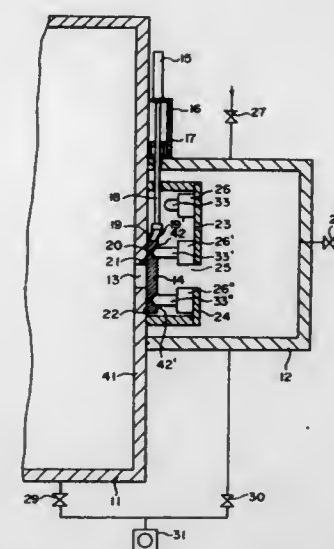
Int. Cl.<sup>6</sup> F16K 25/00

U.S. Cl. 251—157

6 Claims

1. A gate valve device, comprising:

- a reduced-pressure chamber having a partition wall with an opening;
- a valve member for opening and closing the opening;
- pressing means for pressing said valve member against said partition wall;
- a first actuator, coupled to said valve member by an elastic member and supporting said valve member;
- supporting means for supporting said first actuator away from said partition wall, said supporting means supporting said first actuator such that a clearance is defined between said valve member and said partition wall when said elastic member is in an undeformed state, said first actuator moving said valve member in a plane parallel to said partition wall and wherein said valve member is moved between an open position and a closing position through driving of said first actuator while maintaining said clearance; and



5,566,924

# PORTABLE POWERED STAKE PULLER

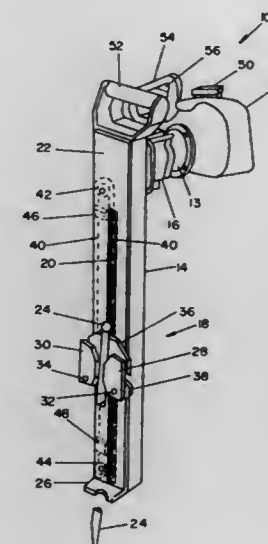
J. Edwin Shirk, 355 Hammertown Rd., Narvon, Pa. 17555

Filed Feb. 26, 1996, Ser. No. 606,802

Int. Cl.<sup>6</sup> B25C 11/00

U.S. Cl. 254—18

9 Claims



5,566,923

# FLUID VALVES

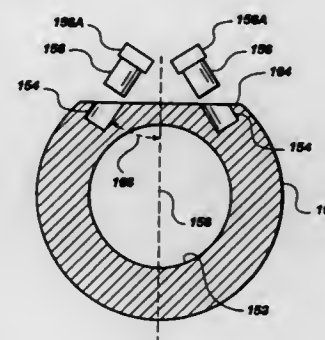
Dan O. Ennis, Sandy; Robert E. Gooch, Orem; Stephen R. Chipman, and Jonathan D. Nelson, both of Provo, all of Utah, assignors to Valtek, Inc.

Continuation-in-part of Ser. No. 80,281, Jun. 21, 1993, Pat. No. 5,386,967. This application Feb. 6, 1995, Ser. No. 384,707

Int. Cl.<sup>6</sup> F16K 5/06

U.S. Cl. 251—315.04

10 Claims



1. A coupling for use in a fluid control valve having a flow control element which controls the flow of fluid through the valve by rotation of the flow control element about an axis, the flow control element having a perimeter, the valve further comprising a shaft which is acted upon to cause rotation of the flow control element, the coupling comprising:

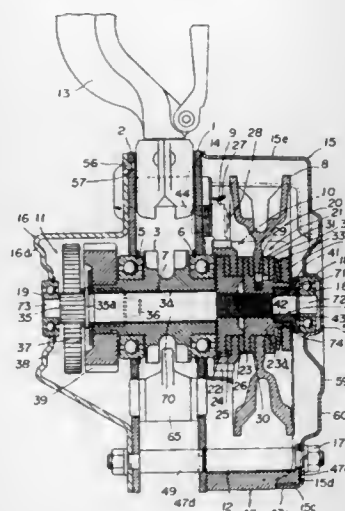
- first socket means, formed in the flow control element, for receiving a corresponding first finger means for conveying torque which is applied to the shaft, the first finger means being received into the first socket means; and

second socket means, formed in the flow control element, for receiving a corresponding second finger means for conveying torque which is applied to the shaft, the second finger means being received into the second socket means; wherein the first socket means and second socket means are each formed in the flow control element so as to be oriented at one or more nonparallel angles in relation to the axis of the flow control element such that as torque is applied to the shaft the flow control element is caused to rotate.

- 1. A stake pulling apparatus comprising:
- a gasoline engine;
- a speed reducing apparatus interconnected with and driven by the engine;
- a chain drive sprocket interconnected with and driven by the speed reducing apparatus;
- a frame supporting the chain drive sprocket;
- a chain idler sprocket supported by the frame, located at one end of the frame, and separated from the drive sprocket;
- an endless loop of chain stretched between the drive sprocket and the idler sprocket forming at least one unobstructed straight path of travel from the idler sprocket to the drive sprocket;
- a guide slot attached to the frame, with the slot aligned parallel to the chain's straight path from the idler sprocket to the drive sprocket, and the guide slot having an upper end adjacent to the drive sprocket and a lower end adjacent to the idler sprocket;
- a gripper assembly comprising:
- a lower portion, with an attachment means to attach the lower portion to the guide slot, so that the lower portion can slide within the guide slot;
- two clamp arms, each attached to the lower portion by a pivoting means, with each clamp arm including a curved slot, with each slot having a lower end and an upper end, with the lower end closer to the pivoting means than the upper end, and with the lower ends of the curved slots closer together than the upper ends;
- an upper portion, with an attachment means to attach the upper portion to the guide slot so that the upper portion can slide within the guide slot;
- two pins attached to the upper portion with one pin captured within each of the curved slots of the clamp arms;

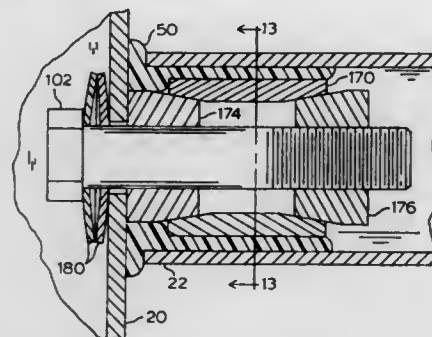
a chain engagement and disengagement means attached to the upper portion of the gripper assembly;  
 a disengagement control means attached to the frame and located at a predetermined height to which the gripper assembly is to travel, so that upper portion of the gripper assembly is disengaged from the chain when the gripper assembly approaches the predetermined height; and  
 an engagement control means attached to the frame and located adjacent the lower end of the frame, so that upper portion of the gripper assembly is engaged with the chain when the gripper assembly is at the bottom of its travel path.

**5,566,925**  
**MANUAL CHAIN BLOCK**  
 Yasuo Wada, Yoshio Ueno, and Munenobu Honda, all of Osaka Sayama, Japan, assignors to Elephant Chain Block Company Limited, Osaka, Japan  
 Filed Jun. 27, 1994, Ser. No. 265,780  
 Claims priority, application Japan, Jul. 2, 1993, 5-164895; Aug. 9, 1993, 5-197518  
 Int. Cl. B66D 1/28  
 U.S. Cl. 254—358 9 Claims



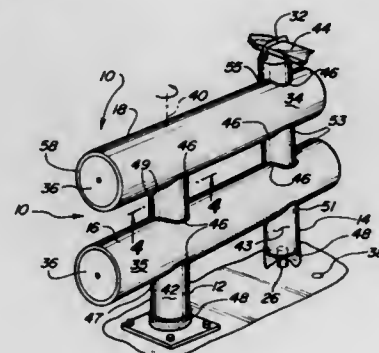
1. A manual chain block comprising:  
 a pair of first and second side plates;  
 a load sheave having a shaft bore and supported rotatably between said side plates;  
 an actuating mechanism comprising a hand wheel;  
 a driving shaft passing through said shaft bore of said load sheave and driven by means of said actuating mechanism, one end portion of said driving shaft being connected to said actuating mechanism;  
 a reduction gear mechanism disposed at an other end portion of said driving shaft;  
 a wheel cover, attached to said first side plate, for covering said actuating mechanism;  
 a gear cover attached to said second side plate, for covering said reduction gear mechanism,  
 wherein said driving shaft comprise a threaded shaft portion along which said hand wheel is threadably movable and an extending shaft portion extending axially outwardly from said threaded shaft portion;  
 a radial bearing for supporting said extending shaft portion of said driving shaft provided at a portion of said wheel cover;  
 a wheel stopping means having a restraint portion for controlling axial movement of said hand wheel and a stopper for fixing said wheel stopping means to said driving shaft provided at a portion of said driving shaft extending between said threaded shaft portion and an end portion of said extending shaft portion supported by said radial bearing.

**5,566,926**  
**RESILIENT SAFETY BARRIER**  
 William L. Voigt, Bermuda Run, N.C., assignor to Voight Products Incorporated, Bermuda Run, N.C.  
 Continuation-in-part of Ser. No. 292,855, Aug. 19, 1994, Pat. No. 5,468,093. This application May 18, 1995, Ser. No. 444,148  
 Int. Cl. E04H 17/14  
 U.S. Cl. 256—13.1 12 Claims



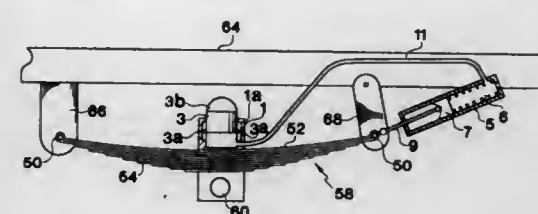
11. A resilient mounting for a guardrail comprising:  
 at least two support members;  
 a rail member extending substantially between the two support members;  
 a resilient member at each end of the rail member and separating the rail member from each support member; and  
 means for clamping the resilient member to the rail member.

**5,566,927**  
**GUARD RAIL ASSEMBLY**  
 Frank Venegas, Jr., 4165 Homestead, Howell, Mich. 48843  
 Filed Jan. 4, 1995, Ser. No. 368,645  
 Int. Cl. E04H 17/14  
 U.S. Cl. 256—59 10 Claims



1. A knock down gate assembly comprising:  
 two spaced apart vertical support stanchions  
 a horizontal rail supported by said vertical stanchions;  
 a polymerized sheath extending the length of each of said vertical support stanchions;  
 a polymerized sheath extending the length of said horizontal rail; and  
 a seal removably seated between each of said vertical support stanchions and said horizontal rail;  
 means for rotating said gate about one of said two vertical support stanchions comprising:  
 another of said two vertical support stanchions comprising a bar disposed within said stanchion and extending above said horizontal rail and also extending through at least the length of said stanchion for securing said gate assembly in place;  
 said bar comprising a handle means for receiving a forklift prong at one end extending above said horizontal rail.

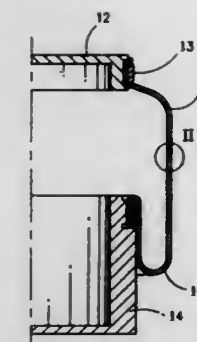
**5,566,928**  
**SUSPENSION DEVICE FOR A COMMERCIAL VEHICLE**  
 Choon-Guen Lee, Kyungsangnam-do, Rep. of Korea, assignor to Hyundai Motor Company, Ltd., Seoul, Rep. of Korea  
 Filed May 26, 1995, Ser. No. 453,065  
 Claims priority, application Rep. of Korea, May 28, 1994, 94-11738  
 Int. Cl. B60G 9/02  
 U.S. Cl. 267—31 4 Claims



1. A suspension device for a commercial vehicle, said suspension device comprising:  
 a pair of leaf springs fixed to opposing lateral sides of a frame through a spring hanger at one end of each said leaf spring, and pivotally connected to said frame through a shackle at the other end of each said leaf spring;  
 an axle fixed to a lower center portion of each said leaf spring;  
 a first cylinder attached to an upper center portion of each said leaf spring, said first cylinder including a first piston disposed therein;  
 a second cylinder operatively connected to the shackle through a connecting rod, said second cylinder including a second piston disposed therein for operatively connecting to the connecting rod; and  
 an oil conduit communicating with both said first and second cylinders for transferring an oil pressure therebetween, whereby during loading or unloading, when one end of the axle is in a bump state, and the opposing end is in a rebound state, the bumped end of the axle moves backward and the shackle pivotally moves in a counterclockwise direction and then the connecting rod compresses the second piston for generating the oil pressure, thereafter the oil pressure pushes up the first piston for forming a narrow bump clearance, and the rebounded end of the axle moves forward, such that the shackle pivotally moves in a clockwise direction, the connecting rod and the second piston return to the original position, and then the oil pressure returns and the second piston moves down for forming a wide bump clearance, so that the suspension device prevents the vehicle from rolling when the vehicle turns while fully loaded, and improves the feeling of entering the vehicle and handling of the vehicle.

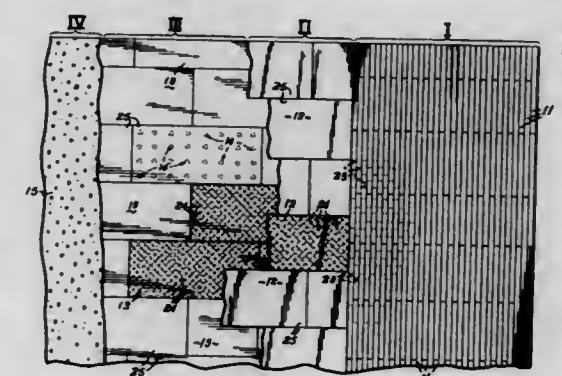
**5,566,929**  
**ROLLING-LOBE AIR SPRING HAVING A FLEXIBLE MEMBER MADE OF ELASTOMERIC MATERIAL**  
 Gerhard Thuro, Garbsen, Germany, assignor to Continental Aktiengesellschaft, Hanover, Germany  
 Filed Jul. 5, 1995, Ser. No. 498,443  
 Claims priority, application Germany, Jul. 6, 1994, 44 23 601.8  
 Int. Cl. F16F 9/04  
 U.S. Cl. 267—64.24 12 Claims

1. A rolling-lobe air spring for attachment to first and second attachment parts, the second attachment part including a roll-off piston, the rolling-lobe air spring comprising:  
 a flexible member defining a longitudinal axis and being made of elastomeric material;  
 said flexible member having a predetermined length and having first and second longitudinal end portions tightly held by said first and second attachment parts, respectively;  
 said flexible member having a pregiven longitudinal active portion within which a rolling lobe is formed as said longitudinal



active portion rolls back and forth over said roll-off piston during the operation of the air spring;  
 a composite reinforcement layer extending over all of said predetermined length of said flexible member;  
 said composite reinforcement layer including first, second and third rubberized cord fabric layers disposed one atop the other;  
 said first, second and third cord fabric layers likewise extending over all of said predetermined length of said flexible member so that said composite reinforcement layer is also tightly held by said attachment parts;  
 said first and third cord fabric layers having first and third sets of cord threads inclined with respect to the circumference of said flexible member;  
 said second cord fabric layer being sandwiched between said first and third cord fabric layers;  
 said second cord fabric layer having a second set of cord threads also inclined with respect to the circumference of said flexible member and the threads of said second set of cord threads being arranged crosswise with respect to the threads of both said first and third sets of cord threads; and,  
 said second cord fabric layer having a strength which corresponds to the sum of the strengths of said first and third cord fabric layers.

**5,566,930**  
**KERFED HARDWOOD FLOOR SYSTEM**  
 Michael W. Niese, Cincinnati, Ohio, assignor to Robbins, Inc., Cincinnati, Ohio  
 Division of Ser. No. 844,466, Mar. 2, 1992, Pat. No. 5,433,052, which is a continuation-in-part of Ser. No. 769,157, Sep. 27, 1991, abandoned, which is a continuation of Ser. No. 459,198, Dec. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 308,243, Feb. 8, 1989, Pat. No. 4,890,434. This application Feb. 28, 1995, Ser. No. 395,423  
 Int. Cl. F16F 7/12; 1/36  
 U.S. Cl. 267—153 21 Claims



16. A resilient, shock absorbing, vibration dampening pad for supporting a floor system on a base, said pad comprising:



a compressible material of predetermined volume having a flattened truncated first end and a larger cross-sectional contacting surface area at a second end;  
at least one tab connected to and extending laterally from one of the first and the second ends for securing the one of the first and the second ends to the floor system;  
the pad further including at least one internal hollow volume decreasing from one cross-sectional area near the second end of said material to a smaller cross-sectional area proximate said flattened truncated first end;  
said hollow volume having a cross-sectional area larger than the cross-sectional area of said first end; and  
said hollow volume being less than said predetermined volume.

5,566,931

# STRUCTURAL PANEL JIG APPARATUS AND METHOD OF USE

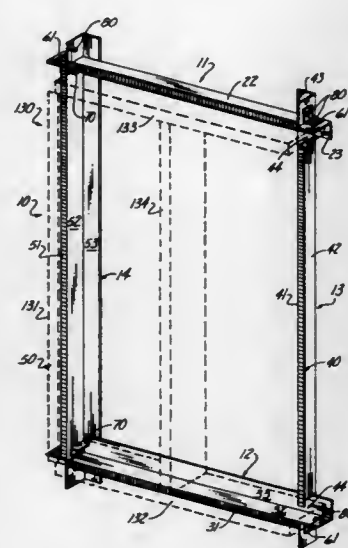
Richard Considine, Chestertown, N.Y., assignor to Cornucopia Products Inc., Chestertown, N.Y.

Filed Dec. 9, 1994, Ser. No. 324,139

Int. Cl.<sup>6</sup> B25B 5/14

U.S. Cl. 269—111

10 Claims



1. A structural panel jig apparatus for the fabrication of a variety of conventional structural panel segments including but not limited to: corner panel segments; window panel segments; standard panel segments; entry door panel segments; and, end wall panel segments wherein said jig apparatus comprises:

a top frame member, a bottom frame member, a right side frame member and a left side frame member; wherein, all of the frame members are provided with a front indexing portion, an intermediate portion, and a rear base portion; the top frame member and the bottom frame members are mirror images of one another; and, wherein, the rear base portion of the top frame member is provided with an elongated slit dimensioned to receive the intermediate, portion of the left side frame member; and,

fastening means for assembling the frame members into a generally rectangular configuration wherein the right side frame member is provided with a pair of enlarged slots dimensioned to receive the top plate and the shoe plate of said conventional structural panel segments.

## 5,566,932 APPARATUS AND METHOD FOR DESKEWING SHEETS

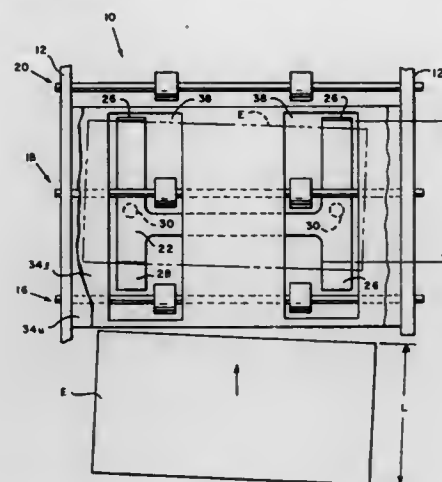
David W. Hubbard, Stamford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 15, 1994, Ser. No. 306,286

Int. Cl.<sup>6</sup> B05H 9/04

U.S. Cl. 271—245

13 Claims



1. An apparatus for deskewing sheets, comprising:

- a) an intake roller assembly;
- b) an urge roller assembly; and,
- c) a rotatable member having a pair of stop elements at a downstream end and a pair of deflecting elements at an upstream end; wherein,
- d) said intake roller assembly and said urge roller assembly define a path for transport of said sheets;
- e) said rotatable member is pivotably mounted on a common axis with said urge roller assembly proximate to said path for rotation in a plane normal to said path and biased so that said deflecting elements intersect said path and said stop elements are spaced from said path;
- f) said stop elements and said deflecting elements are each positioned along lines substantially normal to a direction of movement of said sheets along said path and substantially parallel to said path;
- g) passage of said sheets over said deflecting elements rotates said member so that said stop elements intersect said path; and
- h) upstream surfaces of said deflecting elements and downstream surfaces of said stop elements are separated by a distance substantially equal to, but not less than, the length of said sheets.

## 5,566,933 RAIL SUPPORT FOR DOCUMENT QUEUING STATION

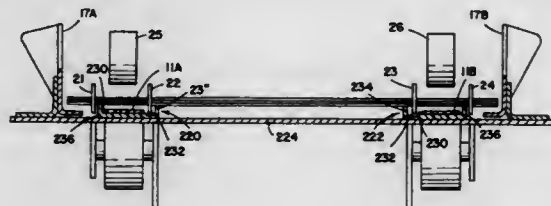
William A. Salancy, 20 Tod Rd., Norwalk, Conn. 06851

Filed Jan. 30, 1995, Ser. No. 380,169

Int. Cl.<sup>6</sup> B65H 5/04

U.S. Cl. 271—273

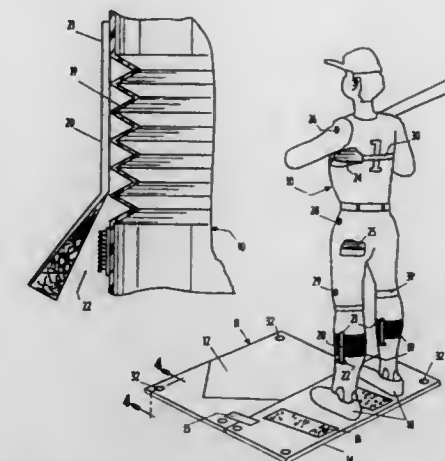
6 Claims



1. Document registration apparatus, comprising:

- a deck for supporting documents along a document path from an upstream position to a downstream position;

a pair of transport belts for transporting said documents along said document path;  
a plurality of laterally spaced registration stops defining a document registration position in said document path, said stops located at a downstream position substantially perpendicular to the document path for both stopping said documents at the document registration position and for aligning said documents relative to said document path;  
a pinch roller situated above each of said pair of transport belts at an upstream position for urging the stopped documents against said transport belts; and  
a pair of laterally spaced belt/paper supports secured to said deck, each of said supports having a belt supporting surface for supporting said transport belt and a pair of paper supporting rails for supporting said documents above said transport belt when said documents are against said registration stops.



5,566,934

# BASEBALL TRAINER

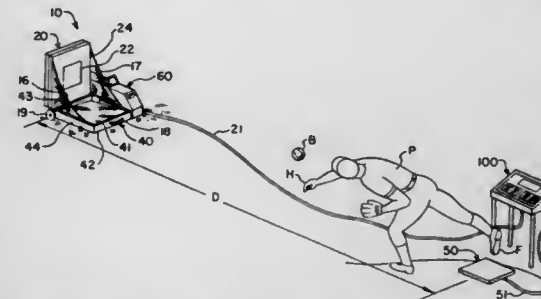
Wesley F. Black, and Charles D. Black, both of Williston, N. Dak., assignors to Stringliner Company, Williston, N. Dak.

Filed Jun. 17, 1994, Ser. No. 261,493

Int. Cl.<sup>6</sup> A63B 69/40

U.S. Cl. 273—26 A

59 Claims



1. Trainer and game apparatus for use by a person pitching a ball, comprising:  
start means for generating a start signal in response to a ball being pitched;  
target means for generating a stop signal in response to arrival of the ball at a target location;  
computer means connected to said start means and to said target means and receptive of said start signal and said stop signal, and operative for measuring time elapsed between the generation of the start signal and the generation of the stop signal; and  
reporting means connected to said computer means for reporting to the person information relating to the elapsed time;  
wherein said start means includes a foot-actuated switch means positioned a distance from said target means for generating the start signal in response to the person shifting his or her weight off one foot during the act of pitching the ball toward the target means, and wherein said computer means is further operative for calculating the approximate speed of the pitched ball by dividing said distance by said time.

5,566,935

# BATTER DUMMY FOR PITCHING PRACTICE

Stephen W. Meharg, 9869 Curries Crossing, Jonesboro, Ga. 30236

Filed Mar. 25, 1996, Ser. No. 621,346

Int. Cl.<sup>6</sup> A63B 69/40

U.S. Cl. 273—26 A

8 Claims

1. Apparatus for use in practicing pitching a baseball, said apparatus including a mat, a simulation of a home plate on said mat, and a dummy selectively attachable to said mat adjacent to said home plate, said dummy being inflatable and shaped to

simulate a batter, said dummy including at least one accordion folded section for selectively shortening and lengthening said dummy, and means for fixing the length of said accordion folded section.

5,566,936

# ELECTRONIC TABLE TENNIS GAME

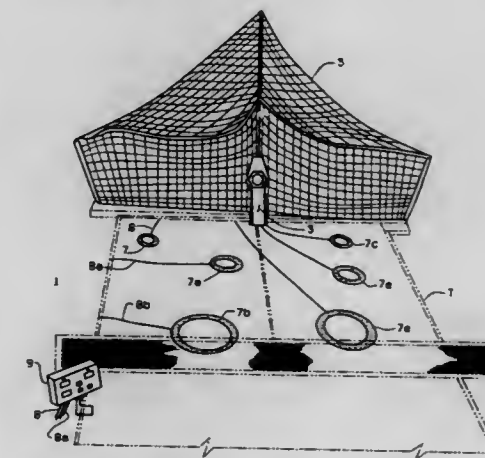
Joseph Newgarden, and Charles W. McDonald, both of Gallatin, Tenn., assignors to Joseph E. Newgarden, Jr., Gallatin, Tenn.

Continuation of Ser. No. 116,858, Sep. 7, 1993, abandoned, which is a continuation of Ser. No. 906,364, Jul. 6, 1992, abandoned. This application Feb. 8, 1995, Ser. No. 386,214

Int. Cl.<sup>6</sup> A63B 63/00

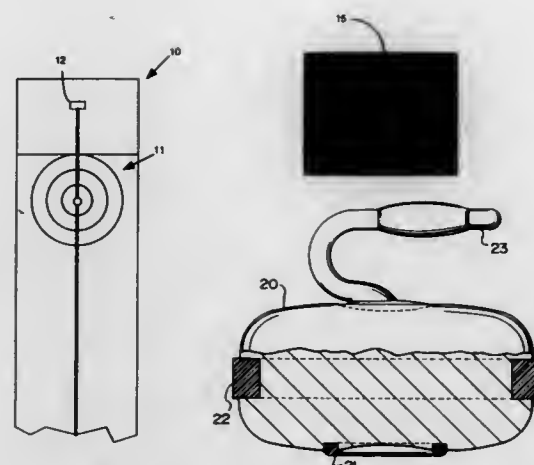
U.S. Cl. 273—30

4 Claims



1. Table tennis apparatus for playing a game to be used by a human player on conventional table tennis table equipped with a centrally positioned table tennis net, comprising:  
a table tennis ball serving device mounted to the table tennis table at one end thereof on one side of the table tennis net;  
a plurality of movable and variably sized low profile sensors, randomly arranged on a surface of the table tennis table on the same side of the table tennis net as the table tennis serving ball serving device so as to provide predetermined randomly arranged targets for such human player striking a table tennis ball at an opposite end of said table tennis table from the table tennis ball serving device;  
means within each sensor for converting the impact of a table tennis ball against each sensor into an electric impulse;  
each sensor being connected to a microprocessor for integrating the functions of the game;  
said microprocessor including means for preprogramming a score value for each sensor;

said microprocessor also including means for preprogramming an increment of time in which the human player must strike a sensor with a table tennis ball;  
 said microprocessor further including means for comparing the electrical impulse with the preprogrammed increment of time; and  
 said microprocessor additionally including means for calculating and displaying a digital score based on the comparison between the electrical impulse and the preprogrammed increment of time;  
 whereby an occurrence of an electrical impulse within the preprogrammed increment of time results in a digital score for the human player and no occurrence of the electrical impulse within the preprogrammed increment of time results in a digital score for the table tennis ball serving device.



5,566,937

## TAKRAW BALLS

Boonchai Lorhipipat, and Boonsakdi Lorpipatana, both of Bangkok THX, assignors to Satian Industries Co., Ltd., Naknonpathom THX

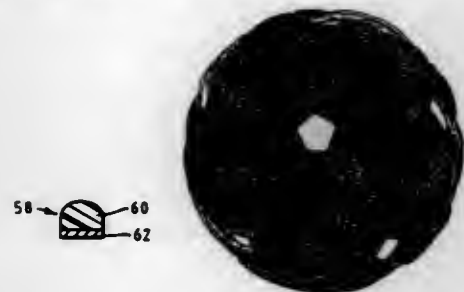
Filed Sep. 29, 1994, Ser. No. 314,807

Claims priority, application United Kingdom, Apr. 14, 1994, 9407421

Int. Cl.<sup>6</sup> A63B 39/00

U.S. Cl. 273—58 B

34 Claims



1. A takraw ball woven from strips wherein at least a majority of said strips comprise composite strips having one component part of softer material than any other component part and another component part of springier material than any other component part; the softer material and the springier material being chosen to produce a pre-selected bounce characteristic for the ball.

5,566,938

## ARTIFICIAL CURLING RINK

John A. MacDonald, Beaconsfield, Canada, assignor to Railtech Ltd., Baie d'Urfe, Canada

Filed Apr. 12, 1995, Ser. No. 420,568

Int. Cl.<sup>6</sup> A63B 67/14

U.S. Cl. 273—128 CS

20 Claims

1. An artificial curling surface comprising a rectangular-shaped sheet of plastic, said sheet of plastic having a target zone and a hack at each end thereof, said sheet of plastic having a pebbled surface adapted to emulate ice pebbles on a sheet of ice of a curling rink.

5,566,939

## CHEMICALLY REACTIVE RACING GAME

Murvel L. Smith, Jr., 1510 Broadmoor, Amarillo, Tex. 79106, and W. Todd Howard, Rte. 7, Box 880, Amarillo, Tex. 79118

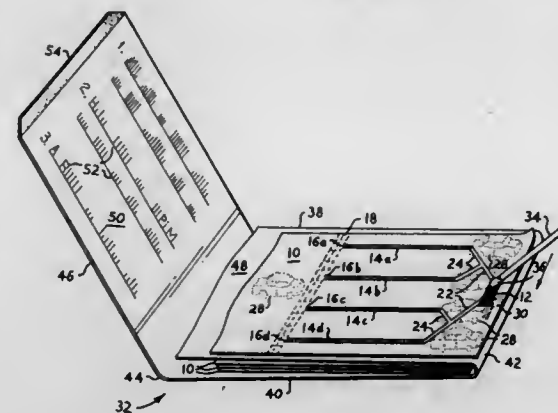
Filed Mar. 18, 1996, Ser. No. 617,189

Int. Cl.<sup>6</sup> A63F 9/00

U.S. Cl. 463—58

20 Claims

1. A chemically reactive racing game apparatus, comprising:



a racing sheet formed of a thin sheet of material having a plurality of equal length chemically combustible paths thereon, with each of said paths joined at a single common chemically combustible starting point and each having a separate individual end point;

said chemically combustible starting point having a first combustible chemical thereon having high reactivity and adapted to initiate the chemical combustion of said chemically combustible paths, with said paths having a second combustible chemical thereon having a low reactivity adapted to partially inhibit combustion thereof and to prolong the combustion of said paths, whereby;

said first combustible chemical of said starting point is ignited and the highly reactive combustion thereof ignites said second combustible chemical of said paths joined to said starting point, with said paths being slowly consumed by means of said low reactivity of said second combustible chemical thereon and with the reaction continuing along each of said paths as said paths are consumed.

5,566,940

## AIR DRIVEN LOTTERY GAME

John W. Powell, 1864 Haynie, Augusta, Ga. 30904

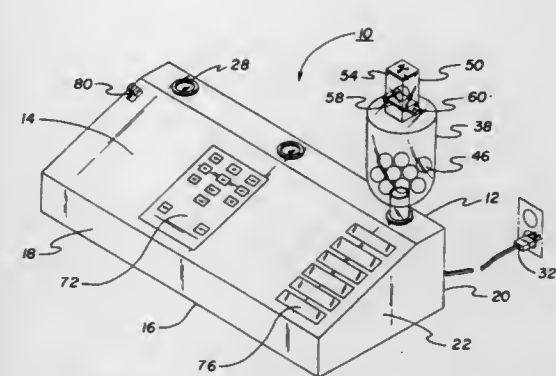
Filed Nov. 27, 1995, Ser. No. 562,831

Int. Cl.<sup>6</sup> A63F 3/06

U.S. Cl. 273—144 A

3 Claims

1. An air driven lottery game for simulating a lottery ball action picking machine used in state lotteries comprising, in combination: a control box having a generally rectangular configuration, the control box having a top surface, a bottom surface, a front surface, a rear surface, and two side surfaces, the top surface having a first portion being parallel with the bottom surface and a second portion angling downwardly from the first portion to the front surface, the first portion having three openings formed therein spaced equidistantly from each other,



each of the openings being fitted with a rubber stopping mechanism, the control box having a power source extending outwardly of the rear surface thereof, one of the two side surfaces having a vent formed therein;

at least one ball dispenser, the ball dispenser having a cylindrical configuration, the ball dispenser having an open first end and a closed second end, the open first end adapted for removably coupling within one of the openings in the first portion of the upper surface of the control box, the closed second end having an opening formed therethrough, the ball dispenser holding a plurality of lottery balls therein;

at least one ball display container having an open first end and an open second end, the open first end secured to the closed second end of the ball dispenser atop the opening formed therethrough, the open first end being adapted to receive one of the plurality of lottery balls therethrough, the open second end having a lid hingedly secured thereto, the container having a slot formed through an intermediate portion thereof, the slot receiving a sliding door therein, the sliding door separating the container into an upper portion and a lower portion, the sliding door selectively allowing one of the lottery balls to enter into the upper portion;

an electric or battery operated fan secured within the control box inwardly of the vent in the side surface thereof, the electric or battery operated fan being electrically coupled with an electric plug or with batteries;

a control panel secured within the second portion of the upper surface of the control box, the control panel being electrically coupled with an electric plug or with batteries for allowing a user to program numbers that the user will guess as to be the lottery balls that will be pulled from the ball dispenser;

a display panel secured within the second portion of the upper surface of the control box, the display panel being electrically coupled with an electric plug or with batteries for displaying the numbers that are programmed by the user into the control panel; and

an on/off switch secured within the second portion of the upper surface of the control box, the on/off switch being electrically coupled with an electric plug or with batteries, the on/off switch controlling the activation of the electric or battery operated fan, the control panel, and the display panel.

5,566,941

## SPHERICAL PUZZLE

Rudolf Destics, 1125 South St., Niles, Mich. 49120

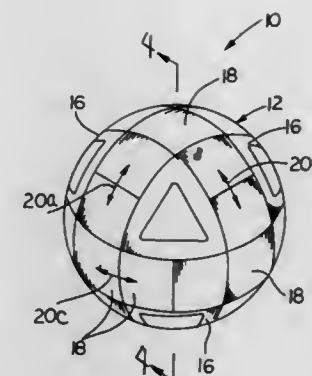
Filed Jul. 12, 1995, Ser. No. 501,501

Int. Cl.<sup>6</sup> A63F 9/08

U.S. Cl. 273—153 S

17 Claims

1. A spherical puzzle comprising a support sphere and an outer spherical shell carried on said support sphere, said shell including multiple surface members movable relative to each other and to said support sphere and an anchor member mounted for movement with said support sphere, said anchor member being moveable with a selected set of said surface members to move said selected set of surface members with said anchor member and with said support sphere relative to the rest of the surface members;



said selected set of surface members being one of multiple sets of surface members movable with said anchor member and wherein said multiple sets of surface members comprise three sets of opposing domes, said opposing domes being rotatable about three mutually orthogonal axes extending through the center of said support sphere;

said multiple surface members including a plurality of first surface members and a plurality of second surface members, said surface members further including interlocking means for joining said first surface members to said second surface members yet allowing relative movement therebetween, said second surface members being square and curved to conform to said inner support sphere, said second surface members arranged to form three mutually orthogonal circumferential bands about said support sphere.

5,566,942

## CROSSWORD PUZZLE GAME AND METHOD OF GENERATING THE SAME

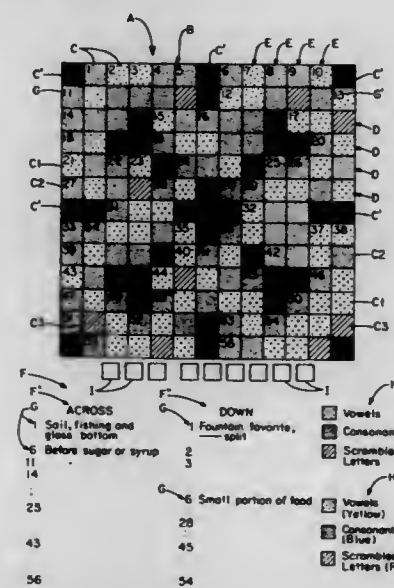
Charles R. Elum, 1772 State Rd., Cuyahoga Falls, Ohio 44223

Filed Sep. 26, 1995, Ser. No. 534,036

Int. Cl.<sup>6</sup> A63F 9/00

U.S. Cl. 273—153 R

21 Claims



1. A crossword puzzle game comprising: an answer grid upon which a player may indicate an answer to a provided clue comprising a plurality of interconnected squares wherein each of said squares is designed to contain one letter of at least one of said answers to said clues, and wherein at least one of said squares includes additional indicia indicating that the letter to be placed in said at least one



square is to be selected from a particular subset of an alphabet, said subset comprising a plurality of different letters of said alphabet; and  
a list of provided clues comprising at least one clue wherein said at least one clue provides information with respect to an answer to be placed on said answer grid by said player.

# 5,566,943 GOLF BALL

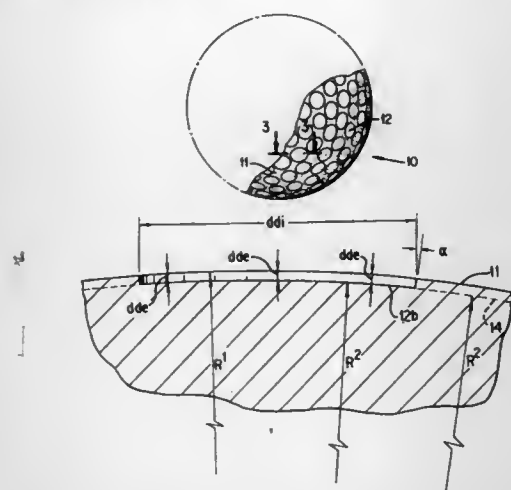
Herbert C. Boehm, Norwell, Mass., assignor to Acushnet Company, Fairhaven, Mass.

Filed Jan. 3, 1995, Ser. No. 367,630

Int. Cl.<sup>6</sup> A63B 37/14

U.S. Cl. 473—384

7 Claims



1. A golf ball in the shape of a sphere having a core and an outer cover, said cover defining an outer surface with a plurality of non-annular dimples in said outer surface, each dimple having a predetermined dimple perimeter on said outer surface to define an enclosed area having a diameter, the improvement wherein:

- each dimple has a bottom surface area spaced radially inwardly of said outer surface;
- said bottom surface area is substantially equal to the enclosed area defined by said perimeter; and
- said bottom surface area is at a constant depth from said outer surface along said diameter.

# 5,566,944 GAME APPARATUS

Richard M. K. Anderson, 6 Tuhoe Avenue, Whakatane, New Zealand

Continuation of Ser. No. 174,832, Dec. 29, 1993, abandoned.

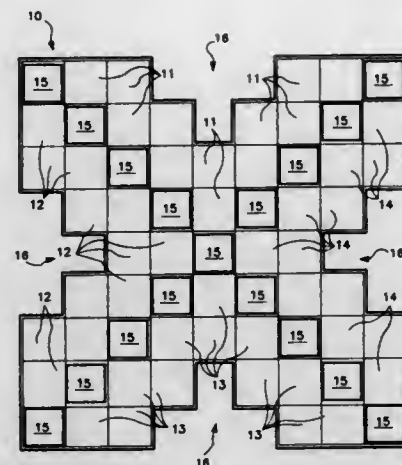
This application Sep. 8, 1995, Ser. No. 524,983

Int. Cl.<sup>6</sup> A63F 3/00

U.S. Cl. 273—242

5 Claims

1. A game apparatus comprising a board having a pattern of equal sized squares marked thereon, said squares being denoted by coding means such that there is one set of squares distinguishable from at least one other set of squares; the apparatus further includes sets of playing pieces, there being a set of playing pieces for each set of squares, said playing pieces being multi-faceted and of various shapes, each playing piece having a first surface of an area such that, when the playing piece engages the board at the first surface, the first surface covers a plurality of squares, each playing piece further having a second surface of the same area and shape as the first surface, said second surface parallel to and located above the first surface, said first and second surfaces being spaced apart by a distance equal to the length of the side of one of said squares;



each set of playing pieces further including at least one capping playing piece having a base equal in area and shape to one of said squares, said capping playing piece having an upward projection so that another playing piece is not permitted to engage the capping playing piece during playing of the game, further wherein the playing pieces that are not capping pieces are adapted to vertically engage other playing pieces.

# 5,566,945

## SYSTEM FOR PLAYING VARIETY OF GAMES

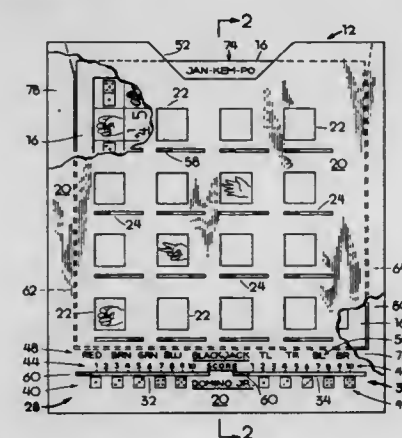
Esteban N. Sagulo, 200 N. Crickett Dr. (Apt. D), San Antonio, Tex. 78226-1648

Filed Nov. 13, 1995, Ser. No. 558,291

Int. Cl.<sup>6</sup> A63F 3/00

U.S. Cl. 273—284

5 Claims



1. A system for playing a variety of games the combination comprising:

- a card holder having a front plate being formed with a plurality of windows and associated shutters mounted for slidably covering or exposing the windows, said windows being arranged in horizontal and vertical rows, evenly spaced and numerically equal, and a playing pocket for removably positioning a game card selected for playing, said pocket being defined between a transparent plastic sheet and an intermediate plate and spaced apart by a bottom support means and marginal guides on either sides thereof; and
- a plurality of identical size, square shaped game cards having printed thereon a variety of sets of game-related characters, each particular set of said characters occupying a certain pattern on the card and arranged in horizontal and vertical rows, evenly spaced and numerically equal whereby, when

said game card is lodged in said playing pocket, a particular set of game characters are in registry with said windows and thus appear therethrough when said shutters are in open position, and conceal said characters when said shutters are in the close position.

# 5,566,946 METHOD OF PLAYING A CARD GAME

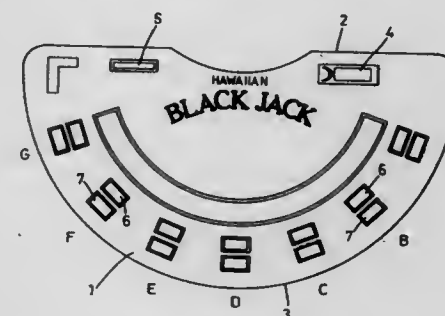
Alan G. Parker, Y-Fron, Peterston-Super-Ely, South Glamorgan, CF5 6LZ, United Kingdom

Filed Oct. 17, 1995, Ser. No. 543,940

Int. Cl.<sup>6</sup> A63F 1/00

U.S. Cl. 273—292

10 Claims



1. A method of playing a Blackjack type game using at least one standard pack of 52 playing cards and with a dealer and at least one player, the method comprising the steps of:

- Each player placing an Ante bet,
- The dealer dealing each player two cards and himself one or two cards,
- Each player electing in turn whether to fold or play, the player folding forfeiting his Ante bet to the dealer and the player playing placing a Play bet separately from his Ante bet,
- Each player so playing further electing either to stand or to draw with the option of standing after each draw but going bust if the total value of his cards, according to conventional Blackjack rules, exceeds 21, in which case both Ante and Play bets are forfeit to the dealer, and
- The dealer, provided there is at least one player standing, dealing further cards to himself to a stand or bust state, and
  - if the dealer's hand is bust, a multiple of each standing player's Ante bet being returned to that player, and the player recovering his Play bet,
  - if the dealer's stood hand exceeds any of the standing players' hands, all bets of those players being forfeit to the dealer,
  - if any standing player's hand exceeds the dealer's stood hand, that player being paid by the dealer a multiple of his Ante bet and a multiple of his Play bet, and
  - if the dealer's and player's hands are equal, there being a stand-off with each player with an equal hand having his bets returned.

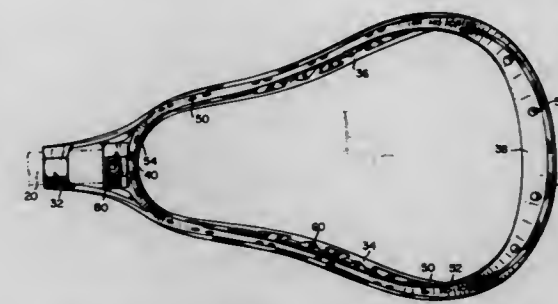
# 5,566,947 LACROSSE STICK HAVING OPEN SIDEWALL STRUCTURE

Richard B. C. Tucker, Baltimore; Fielding H. Lewis, Jr., Queenstown, and Jackie L. Davis, Aberdeen, all of Md., assignors to Wm. T. Burnett & Co. Inc., Baltimore, Md. Continuation of Ser. No. 193,640, Feb. 7, 1994, abandoned, which is a continuation of Ser. No. 49,654, Apr. 21, 1993, abandoned, which is a continuation of Ser. No. 918,789, Jul. 27, 1992, abandoned, which is a continuation of Ser. No. 770,726, Oct. 4, 1991, abandoned, which is a continuation of Ser. No. 647,697, Jan. 29, 1991, abandoned, which is a continuation of Ser. No. 778,067, Sep. 20, 1985, abandoned. This application Feb. 23, 1995, Ser. No. 392,688

Int. Cl.<sup>6</sup> A63B 59/02

U.S. Cl. 273—326

9 Claims



1. A head for a lacrosse stick which provides improved handling and playing characteristics comprising a generally V-shaped frame constructed of a synthetic polymeric material defined by two sidewalls joined at a juncture and diverging therefrom, a transverse wall joining the ends of said sidewalls opposite of said juncture, said frame being adapted to receive a web, and said sidewalls having openings therein, the area of said openings including string holes comprising in the range of from about 7% to 65% of the entire area of said sidewalls.

# 5,566,948 BOUNCING BALL GAME

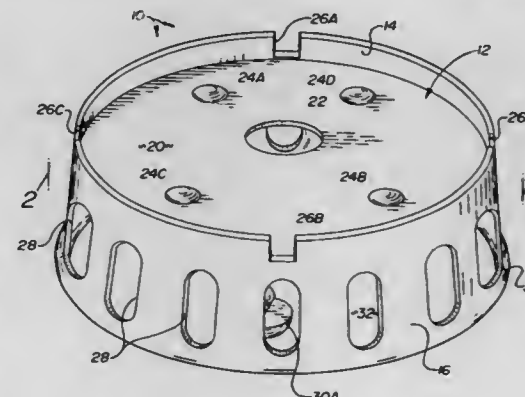
Bobby D. Kidd, 1906 E. 47th St., Texarkana, Ark. 75502

Filed May 23, 1996, Ser. No. 652,826

Int. Cl.<sup>6</sup> A63B 67/00

U.S. Cl. 273—342

20 Claims



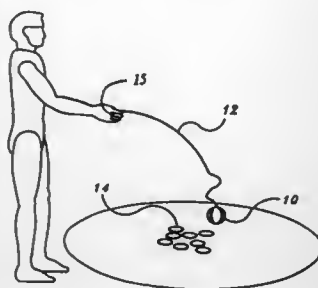
1. A game apparatus, comprising:  
a target area having an upper face and an aperture passing therethrough;  
a plurality of bumps disposed on said upper face;  
a lip disposed about an outer edge of said target area and extending above said upper face, said lip having a plurality of slots extending downwardly from an upper edge of said lip; and

a base secured to said target area for supporting said target area above a playing surface.

**5,566,949**  
**TETHERED BALL GAME DEVICE**  
Don Gorden, 994 E. New Hope Dr., Draper, Utah 84020  
Filed Apr. 17, 1995, Ser. No. 422,863  
Int. Cl.<sup>6</sup> A63B 67/10

U.S. Cl. 273—345

22 Claims



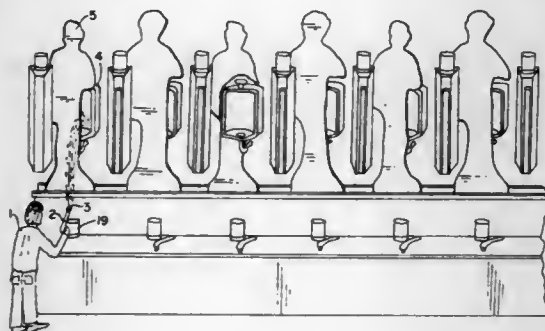
1. A game comprising:

- A. at least one cap, the cap comprising a small metal object capable of being attracted by a small magnet;
- B. a snagger comprising a spherical structure of energy absorbing material having an annular recess therearound and a magnet capable of attracting said cap, the magnet being received therein; and
- C. an elastic tether having a first end and a second end, the first end being secured to said snagger and the second end of the tether being capable of being received by the hand of a user, whereby the user holds said snagger and tether in one hand with said second end of said elastic tether secured to a portion of the hand and projects said snagger toward the cap, making contact one with another and attracting same, and said elastic tether providing a means for retrieving the combination, and wherein the annular recess is capable of receiving the elastic tether when coiled around the snagger.

**5,566,950**  
**URINAL ARCADE GAME**  
Randall Senna, 1 Rolling Knolls Dr., Middletown, N.J. 07748  
Filed Feb. 1, 1995, Ser. No. 384,522  
Int. Cl.<sup>6</sup> A63B 67/00

U.S. Cl. 463—60

1 Claim



1. An arcade game played by a plurality of participants under control of an operator comprising:

- (a) A front counter having a plurality of stations;
- (b) A water gun at each station connected by a hose to a water supply system, such that the water is released from the water gun upon activation by a participant and the initiation of the operator;

- (c) A target positioned, approximately three to 10 feet directly in front of each station, simulative of a urinal, containing a bottom drain, such that water from the water gun is directed by a participant at the simulative urinal;
- (d) A blocking mechanism being a plurality of male figures sequentially connected to each other and positioned in front of each simulative urinal;
- (e) A means of moving the blocking mechanism, such that it alternatively blocks and unblocks the simulative urinals;
- (f) A vertical sight tube connected to the drain of the simulative urinal such that it is placed parallel to the simulative urinal;
- (g) A plurality of floating balls contained within the vertical sight tube, such that the balls rise as water rises in the tube;
- (h) A win switch which is set when the participant who first causes the top floating ball to rise to predetermined position in the tube;
- (i) A win circuit which is activated when the win switch is set and thereupon activates background audio and lights, indicating that a player has won the game;
- (j) A means of recycling the water back to a holding tank, when the game is completed;
- (k) A player counting means which is updated by the win circuit;
- (l) An second audio and light system activated by the operator upon activation of game start.

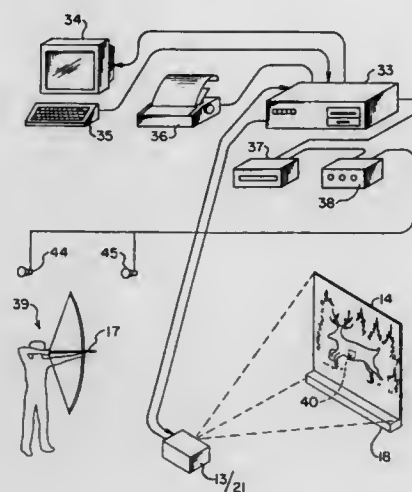
**5,566,951**  
**METHOD AND APPARATUS ENABLING ARCHERY PRACTICE**  
Peter J. Dart, Boulder; Howard F. Hall, Longmont, and David A. Johnson, Littleton, all of Colo., assignors to Dart International, Inc., Englewood, Colo.

Continuation-in-part of Ser. No. 926,539, Aug. 4, 1992, Pat. No. 5,328,190. This application Jun. 24, 1994, Ser. No. 265,303

Int. Cl.<sup>6</sup> F41J 9/14; 5/14; A63B 71/00

U.S. Cl. 273—358

28 Claims

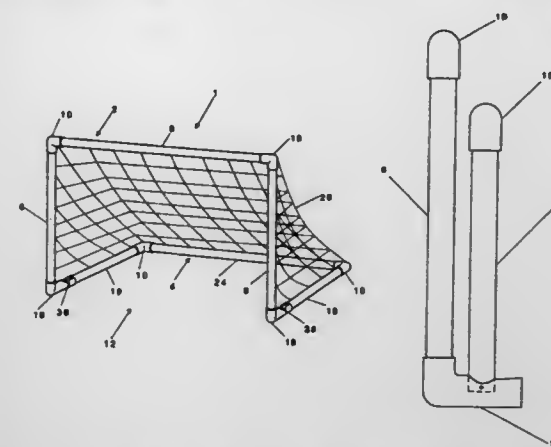


1. A method providing archery practice simulating a dynamic target scene as in an animal hunt, wherein an arrow is shot toward a screen, comprising the steps of:
- providing a screen having a front and a back;
  - providing an arrow having a tip, wherein penetration of said screen by said arrow tip is avoided when said arrow tip hits said screen;
  - projecting target scenes in sequence on said front of said screen for viewing as a dynamic target by an archer;
  - determining an arrow hit location relative to said screen showing a first target scene using said arrow shot by the archer;
  - permitting said arrow to fall from said screen between the archer and said front of said screen; and
  - informing the archer of said arrow hit location.

**5,566,952**  
**FOLDABLE SPORTS GOAL STRUCTURE**  
Carol Mullin, and James Mullin, both of Redwood City, Calif., assignors to Moving Target Sports, Inc., Belmont, Calif.  
Filed Jan. 24, 1996, Ser. No. 590,839  
Int. Cl.<sup>6</sup> A63B 63/04

U.S. Cl. 273—400

32 Claims



1. A foldable sports goal structure, comprising:

- a U-shaped goal frame including a horizontal crossbar member supported at each end by vertically extending posts having lower ends, the goal frame forming an upright rectangular goal opening when the lower ends of said posts are placed on a playing surface;
- a support frame including:
  - a pair of tubular shaped first support members, each rearwardly extending from the lower ends of each of said posts, each of said first support members having an inner diameter and a rear end,
  - a pair of tubular shaped second support members, each of said second support members having a front end with an outer diameter dimensioned so that each of said front ends is fittable within each of said rear ends,
  - each of said first supporting members having a shaped cut-out in a surface thereof, said cut-out shaped to permit rotation of said second support members from a first position through said shaped cut-out to a second position, wherein in said first position each of said front ends of said second support members being fitted within the inner diameter of each of said rear ends of said first support members and extending rearwardly from said rear ends, and wherein in said second position, said second support members extending substantially perpendicular to said first support members through said shaped cut-outs, and
  - a pair of pivot members each rotatably connecting said first support members to said second support members, and permitting said rotation between said first and second positions; and
  - a net means attached to said goal frame and said support frame.

**5,566,953**  
**GAME FOOTBAG WITH LOW REBOUND CHARACTERISTICS**  
Martin F. Arriola, Torrance, and Daniel M. Roddick, Pasadena, both of Calif., assignors to Mattel, Inc., El Segundo, Calif.

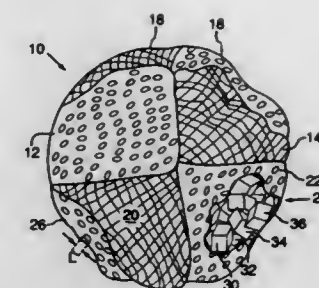
Filed Aug. 15, 1995, Ser. No. 515,278

Int. Cl.<sup>6</sup> A63B 43/00

U.S. Cl. 273—115

19 Claims

1. A low-rebound, impact-deformable footbag comprising:
- a plurality of panels, each of which includes a peripheral edge which is connected to a peripheral edge of at least one adjacent panel for defining a generally impact-deformable, semi-collapsible chamber, wherein such collapsibility permits

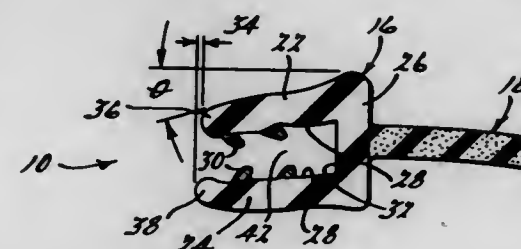


an arbitrarily-changing, random footbag shape in response to an applied deformation force, and further wherein at least a portion of one of the panels is formed from an apertured material for providing a view internally of the chamber; and a plurality of lightweight, impact-damping filler members disposed in the chamber, some of which are viewable through the apertured material, and all of which are positioned within the chamber for interacting with other such filler members for damping such applied deformation force.

**5,566,954**  
**FAN SHROUD ATTACHED AIR DEFLECTING SEAL**  
Thomas R. Hahn, Northville, Mich., assignor to Hahn Elastomer Corporation, Plymouth, Mich.  
Filed Nov. 8, 1993, Ser. No. 149,186  
Int. Cl.<sup>6</sup> F16J 15/02; F01P 5/06

U.S. Cl. 277—184

16 Claims



1. An air flow directing seal, the seal comprising:

- a semi-rigid C-shaped channel having two spaced-apart flanges connected by a common section, each of said flanges including interior surfaces, said common section having an exterior surface;
- resilient teeth coextensive with said interior surfaces; and
- a resilient deflector integral with said exterior surface, the deflector being substantially parallel to one of said spaced-apart flanges and substantially perpendicular to the common section.

**5,566,955**  
**SEAL BETWEEN TWO TELESCOPICALLY INSERTABLE CONCRETE COMPONENTS**

Gerhard Preisendoerfer, Heusenstamm, Germany, assignor to Forsboda-Stefa GmbH, Germany  
PCT No. PCT/DE93/00898, § 371 Date Dec. 27, 1994, § 102(e) Date Dec. 27, 1994, PCT Pub. No. WO94/07073, PCT Pub. Date Mar. 31, 1994

PCT Filed Sep. 21, 1993, Ser. No. 244,333  
Claims priority, application Germany, Sep. 21, 1993, 9212665 U

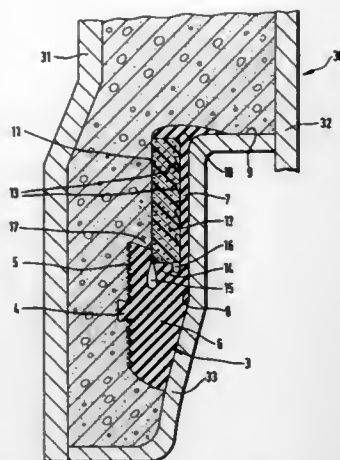
Int. Cl.<sup>6</sup> F16J 15/10

U.S. Cl. 277—207 A

13 Claims

1. A seal between two telescopically insertable concrete pipes comprising:

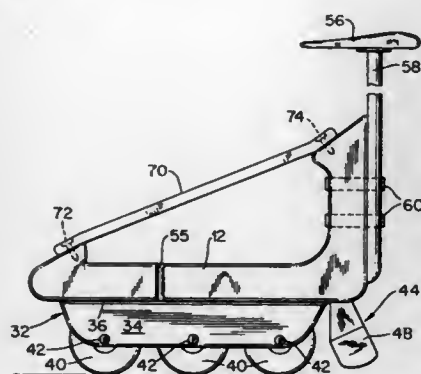




the concrete pipes each including a bell-shaped socket (1) having a socket end, an axially extending inner surface (8) and a radially extending inner surface (9), and a spigot end (2) which, when a gasket (3) is inserted, fit into one another; the gasket (3) being fixed by anchoring means (4, 5) within the socket (1) and includes a sealing area 6 of solid elastomer material and a yielding area (7, 12) which is adapted to support loads as occurring when concrete pipes are molded, yet being compressible under the loads as occurring when assembling and using telescopically inserted concrete pipes, characterized in that

the yielding area is formed by a lug-like extension which forms an annular space (11) adjacent to the socket and lines the axially extending inner surface (8) of the socket at the transition to the radially extending inner surface (9) thereof, and by a light material body (12) arranged within the annular space (11) between the solid elastomer material (7) and the axially extending inner surface (8) of the concrete pipe.

**5,566,956**  
**IN-LINE SKATEBOARD**  
Di Wang, 1 Lake Ridge Pl., Apt. C, Cockeysville, Md. 21030  
Filed May 30, 1995, Ser. No. 453,807  
Int. Cl.<sup>6</sup> A63C 17/06; 17/28  
U.S. Cl. 280—7.14 11 Claims

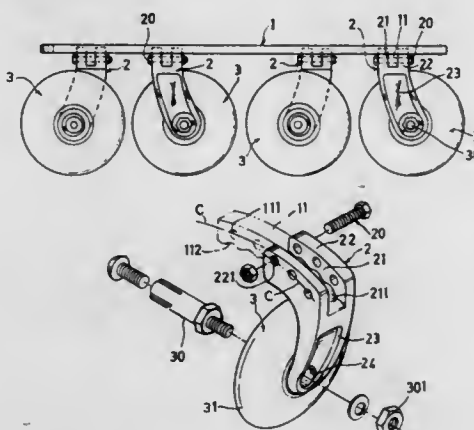


1. A skateboard comprising a rider support board having top and bottom surfaces, a front end portion and a rear end portion, and a width sufficient to support the two feet of a rider in side-by-side relation on said top surface one on each side of the longitudinal centerline of the board, a support frame mounted on said bottom surface, a front wheel and a rear wheel mounted in in-line relationship on said support frame for rotation in the longitudinal vertical centerplane of the board, toe abutment means extending across said front end portion and projecting upwardly therefrom in position to engage the toe

end portion of a rider's shoes to prevent forward movement of the rider's feet over said top surface of the board, and heel support means extending substantially across the full width of said rear end portion and projecting upwardly therefrom in position to engage and support the heel portion of a rider's shoes above said top surface when the rider's shoe toes are in abutting relation with said toe abutment means,

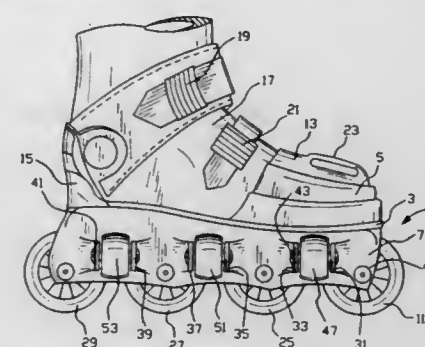
said front wheel being mounted for rotation about an axle supported on said wheel support frame at a location rearwardly of said toe abutment means, and said rear wheel being mounted on an axle supported on said wheel support frame at a location forward of said heel support means.

**5,566,957**  
**IN-LINE ROLLER SKATE HAVING ADJUSTABLE BIASING ANGLE FOR EACH INDIVIDUAL WHEEL**  
Diana Ho, Taichung, Taiwan, assignor to Monotype Supply Co., Ltd., Taichung, Taiwan  
Filed Jul. 18, 1995, Ser. No. 503,741  
Int. Cl.<sup>6</sup> A63C 17/04  
U.S. Cl. 280—11.22 5 Claims



1. An in-line roller skate comprising:  
a mounting plate having a footwear secured on an upper surface of the mounting plate, and having a plurality of arcuate guiding rails respectively juxtapositionally transversely formed on a bottom of the mounting plate, with a longitudinal axis defined along a center of the mounting plate and a vertical plane extending from the longitudinal axis to a skating surface under the mounting plate;  
a plurality of cantilever members each slidably engageable with and movably adjustable on each said arcuate guiding rail on the mounting plate;  
a plurality of wheels generally disposed under said mounting plate with an in-line relationship and each said wheel rotatably mounted on each said cantilever member; and means for connection of each said cantilever member on each said arcuate guiding rail to allow said cantilever to be angularly adjusted on said guiding rail based upon the vertical plane; whereby upon an angular adjustment of each said cantilever member on each said guiding rail, each said wheel as rotatably mounted on each cantilever member will be angularly biased from the vertical plane.

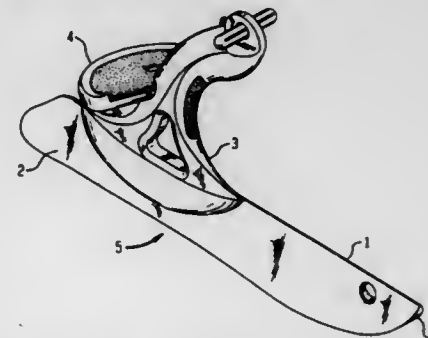
**5,566,958**  
**IN-LINE SKATES WITH SLIDE MOTION WHEELS**  
Alexander S. Sinelnikov, and Samuel D. Sinelnikov, both of 304 Larch Ct., Flemington, N.J. 08822  
Filed Jul. 26, 1995, Ser. No. 507,088  
Int. Cl.<sup>6</sup> A63C 17/06  
U.S. Cl. 280—11.22 20 Claims



1. In an in-line roller skate having a main frame with a front, a back, a top side and an underside, and having attachment means on the top side of said main frame for attachment of said in-line roller skate to the foot of a user and having an in-line skating wheel attachment frame on the underside of said main frame, and having a plurality of skating wheels in-line running from the front to the back along a longitudinal axis of the roller skate and rotatably attached to said wheel attachment frame for rotation about axes extending transverse to said longitudinal axis, the improvement which comprises:

having connected to at least one of said main frame and said skating wheel attachment frame, side motion wheel support means and a plurality of side wheels rotatably connected to said support means for rotation about a fixed axis extending parallel to said longitudinal axis and arranged at approximately right angles to said skating wheels, said side wheels being arranged such that when said roller skate is placed on a flat surface upright with said skating wheels vertical, said skating wheels contact said flat surface and said side wheels do not, and such that when said roller skate is placed on said flat surface and tilted beyond a predetermined contact angle from vertical, said side wheels do contact said flat surface.

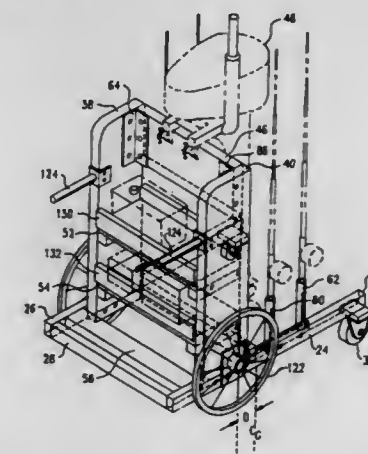
**5,566,959**  
**UNITARY MOLDED SINGLE BLADE SKI-SLED**  
Paolo M. B. Tiramanti, Greenwich, Conn., assignor to Snowblade Corporation, Franklin Lakes, N.J.  
Filed Feb. 1, 1994, Ser. No. 190,338  
Int. Cl.<sup>6</sup> B62B 13/00; 13/04  
U.S. Cl. 280—28.14 13 Claims



1. A single runner ski-sled comprising  
a) a rigid elongated runner assembly adapted to slide over a sliding contact surface having an upwardly curving front end, said runner being attached to a runner support means having

upwardly extending converging side members forming a substantially triangular or trapezoidal cross-section with said runner,  
b) column means for supporting means seating secured to said runner support means and extending upwardly, and  
c) means for seating secured to the column means above said runner support means,  
said column means extending above said means for seating and having handle means positioned above said means for seating being curved forward to forward curve which in combination with said runner support means provides shoulder support means for carrying the sled.

**5,566,960**  
**OUTBOARD MOTOR CADDY**  
Dennis McCrory, 211 E. 170th St., Spanaway, Wash. 98387  
Filed Jun. 8, 1994, Ser. No. 255,397  
Int. Cl.<sup>6</sup> B62B 3/00  
U.S. Cl. 280—47.35 13 Claims



1. A transport stand for carriage of a preselected outboard motor, said stand comprising:

(a) a base, said base comprising opposing elongate side portions and an elongate interior end portion arranged in a U-shape having an open end and a width along said elongate interior end portion suitable for locating an outboard motor therebetween;  
(b) a frame, said frame comprising  
(i) a pair of opposing, generally vertically extending upright members, said upright members each having a bottom end, each of said bottom ends of said frame affixed at a preselected longitudinal position to one of said elongate side portions of said base, and  
(ii) a transom, said transom generally vertically disposed, and at least a portion of said transom located transversely between said opposing upright frame members, and affixed to both of said upright frame members, said transom suitable for attachment of an outboard motor thereto; and  
(iii) at least one shelf portion, said at least one shelf portion extending substantially horizontally between said opposing, generally vertically extending upright members;  
(c) a pair of rearwardly facing handles, said rearwardly facing handles each affixed to one of said vertically extending upright members, said pair of rearwardly facing handles located so as to allow manipulation of said transport stand by application of force to said pair of rearwardly facing handles; and  
(d) a first set of fixed roller wheels, said first set of fixed roller wheels affixed to said base at a position rearward by a distance D from a center of gravity Cg, so that when said transport stand is supporting an outboard motor, by slight downward application force to said pair of handles, said base may be raised to roll on said first set of fixed roller wheels,

across a preselected substrate surface, to allow rolling movement of said transport stand.

5,566,961

## MODULAR STORAGE UNIT

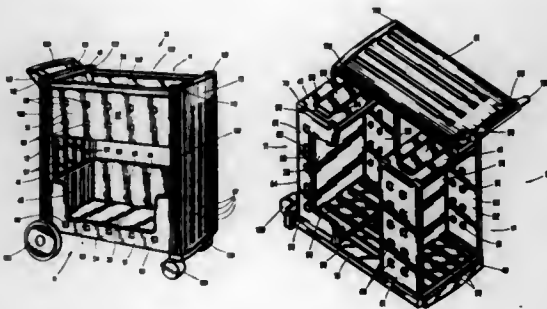
Rusty B. Snell, and Walter Drysdale, both of Maryville, Tenn., assignors to Rubbermaid Office Products Inc., Maryville, Tenn.

Filed Jul. 11, 1994, Ser. No. 273,335

Int. Cl.<sup>6</sup> B62B 3/02

U.S. Cl. 280—47.35

20 Claims



1. A modular storage unit comprising a plurality of shelf components including a bottom portion and at least one upstanding shelf end wall, each of said shelf components having an outer face; at least one of said shelf components being connected to an end wall of said modular storage unit said shelf components being removably secured together by a plurality of flange means and a plurality of flange receiving slot means; said plurality of flange means and said plurality of flange receiving slot means being individually and selectively carried on said shelf components such that a selected one of said components carrying one of said flange means is removably secured to another selected said component carrying one of said flange receiving slot means by said flange means being received within said flange receiving slot means; and each of said flange means not extending beyond said outer face of said shelf component such that when said flange means is received within said flange receiving slot means, said flange is selectively within or generally flush with said outer face.

5,566,962

## TRUCK STEP GUARD

Roy Burnham, 6109 Old Rt. 39 N.W., Apt. 1, Dover, Ohio 44622

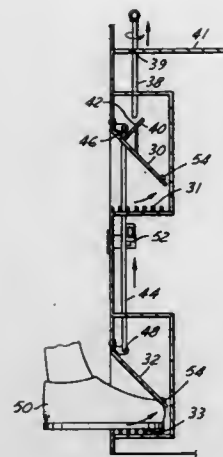
Filed Oct. 14, 1994, Ser. No. 324,398

Int. Cl.<sup>6</sup> B60R 3/00

U.S. Cl. 280—163

5 Claims

1. A vehicle step lock-up device for preventing access to steps formed within recessed portions of a vehicle body, comprising:  
a step access door pivotally mounted to an opening of the recessed portion, the access door having a bracket secured to an inner surface thereof; and  
a locking member slidably attached to the vehicle body, the locking member having a user engageable upper end located within the interior of the vehicle and a lower end selectively engageable with the bracket, the locking member being vertically movable between a raised position, in which the lower end of the locking member is disengaged from the bracket for permitting inward pivotal movement of the access door into the recessed portion by a user's foot, and a lowered position in which the lower end of the locking member is in locking engagement with the bracket for preventing inward pivotal movement of the access door thus preventing access to the vehicle step.



5,566,963

## FLOATING PIN FIFTH WHEEL HITCH

Marvin F. Johnson, Rte. 3, Box 287, Thief River Falls, Minn. 56701

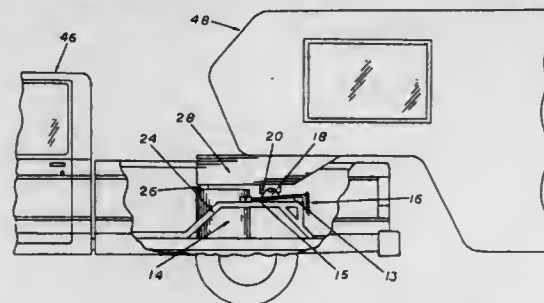
Continuation of Ser. No. 288,320, Aug. 10, 1994, abandoned.

This application Jul. 25, 1995, Ser. No. 507,654

Int. Cl.<sup>6</sup> B60D 1/00

U.S. Cl. 280—405.1

10 Claims



1. A floating pin hitch adapted to interlock with a fifth wheel type trailer comprising:  
a pickup type truck said truck having a front axle with a cab portion rearward of said front axle and a rear axle under an open low sided cargo bed with said cargo bed extending rearward of said cab;  
a kingpin and a slide pad mounted to said trailer;  
a pair of support frames fixedly mounted to the bed of said pickup type truck;  
a pair of cross member support arms pivotally mounted to said support frames;  
a cross member fixedly attached to said cross member support arms having a rearward opening throat for receiving said kingpin and a latch for engaging said kingpin, said throat being in a position above and rearward of said rear axle;  
a means for pivotally mounting in a horizontal axis said cross member support arms to said support frames;  
and a cylindrical weight bearing slide for receiving said slide pad fixedly mounted to the bed of the pickup forward of said rear axle and in front of said cross member.

5,566,964

## CONVERTIBLE TOWING DEVICE

Rodney L. Leonard, 230 Dulin Rd., Mocksville, N.C. 27028

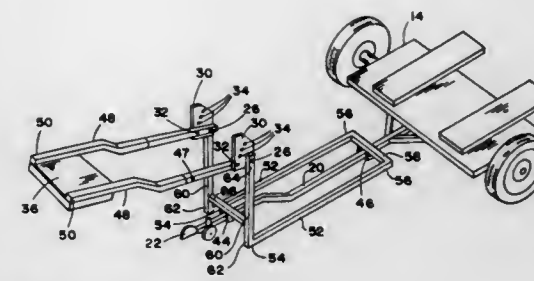
Filed Mar. 2, 1995, Ser. No. 398,219

Int. Cl.<sup>6</sup> B62D 53/06; 63/00

U.S. Cl. 280—417.1

10 Claims

1. A convertible towing device for use with a towing vehicle having a trailer connector and a trailer having a tongue comprising:



a base section;  
means for connecting the base section to said trailer;  
a pivot section pivoted on pivot means disposed on the base section and pivotable between a rearward position toward the trailer and a forward position toward said towing vehicle; and means for connecting the pivot section to the towing vehicle in the forward position; said pivot section being adjustably positionable in pre-selected forward positions for connection to said towing vehicle, and said pivot means further comprising means for adjustably positioning said pivot section in one of the pre-selected forward positions; said pivot means comprising a pivot pin mounted on said base section, and said pivot section having a front end and a rear end, wherein the pivot section rear end is pivoted on the pivot pin and the pivot section front end is pivotable over the pivot pin; and said pivot section having portions defining a hole, and said adjustable positioning means comprising a locking plate associated with said pivot pin and having portions defining a plurality of pre-positioned holes corresponding to said pre-selected forward positions of the pivot section and a locking pin insertable through the pivot section hole and into one of said pre-positioned holes of the locking plate.

5,566,965

## TRAILER SAFETY CHAIN ADAPTOR

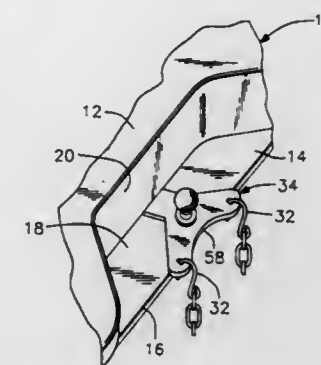
John M. Applegate, 510 6th Ave., Absecon, N.J. 08201

Filed Aug. 21, 1995, Ser. No. 517,358

Int. Cl.<sup>6</sup> B60D 1/06; 1/56

U.S. Cl. 280—500

8 Claims



1. In combination with a vehicle rear step bumper of the type including a center, low horizontal step plate having a free rear margin and terminating forwardly at an upstanding, upwardly projecting center face plate portion of said bumper and wherein said step plate includes a central, upstanding trailer hitch ball mounting shank receiving bore formed therethrough spaced intermediate said free rear margin and said center face plate portion, a trailer safety chain adaptor plate generally Y-shaped in plan including a pair of opposite side rearwardly divergent arms joined at their forward converging ends, said adaptor plate including a wide, forward stem portion projecting forwardly from said joined forward converging ends, the rear divergent ends of said arms having vertical openings formed therethrough through which safety chain section end hooks may be engaged, said adaptor plate including an

upstanding central bore formed therethrough adjacent the juncture of said arms and being disposed over said step plate with said central bore registered with said shank receiving bore, said stem portion at least closely opposing said face plate portion and said rear divergent ends projecting rearwardly of said free rear margin, said openings being spaced rearward of said free rear margin and said adaptor plate defining a rearwardly opening recess intermediate said rear divergent ends, a trailer hitch ball including a depending mounting shank removably secured downwardly through said bores and comprising the sole attachment of said adaptor plate to said step plate, a closely opposing relation of said stem portion to said face plate portion preventing angular displacement of said adaptor plate relative to said step plate about said shank.

5,566,966

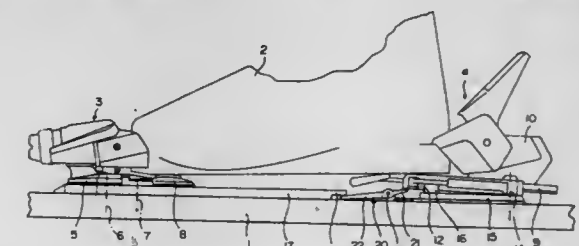
## DEVICE FOR MODIFYING THE PRESSURE DISTRIBUTION OF A SKI ALONG ITS SLIDING SURFACE

Bernard Couderc, Annecy; Pierre Szafranski, Pringy; Alain Bejean, Alby sur Cheran, and Joël Arduin, Metz-Tessy, all of France, assignors to Salomon S.A., Metz-Tessy, France  
Continuation-in-part of Ser. No. 911,702, Jul. 10, 1992, Pat. No. 5,332,253. This application Jul. 25, 1994, Ser. No. 280,548  
Claims priority, application France, Aug. 27, 1991, 91.10895; Feb. 16, 1994, 94.01898

Int. Cl.<sup>6</sup> A63C 9/08

U.S. Cl. 280—602

30 Claims



1. A device for modifying the pressure distribution of an alpine ski along a sliding surface of the ski, the ski having a front end and a rear end, the ski being equipped with a first binding element and a second binding element adapted to retain a boot, and at least one support element on which the sole of the boot rests, said device comprising:

a sensor element for contact with the sole of the boot, movable along a vertical direction;  
flexion means to generate a flexional moment on at least one of said front end and said rear end of the ski directed either upwardly or downwardly; and  
connection means connected between the sensor element and the flexion means for transmitting at least a portion of a vertical thrust of the boot captured by the sensor element to the flexion means for generating said flexional moment.

5,566,967

## FRONT JAW FOR A SAFETY SKI BINDING

Helmut Wladar; Kari Stritzl, both of Vienna; Andreas Janisch, Oeynhausen, and Hubert Wuerthner, Hainburg/Donau, all of Austria, assignors to HTM Sport-und Freizeitgeraete Aktiengesellschaft, Schwechat, Austria

PCT No. PCT/EP93/03592, § 371 Date Oct. 14, 1994, § 102(e) Date Oct. 14, 1994, PCT Pub. No. WO94/17873, PCT Pub. Date Aug. 18, 1994

PCT Filed Dec. 17, 1993, Ser. No. 325,190

Claims priority, application Austria, Feb. 15, 1993, 274/93

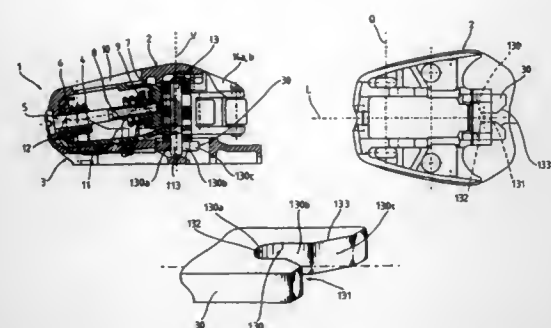
Int. Cl.<sup>6</sup> A63C 9/085

U.S. Cl. 280—625

3 Claims

1. In a front jaw for a safety binding comprising a housing adapted to be fastened on a ski, the housing having a lower part





and an upper part connected to each other at a front end of the housing, at least one adjustable release spring within the housing, two generally horizontally swingable sole holders arranged in the upper part of the housing and movable between first and second positions, and a common, generally vertically oriented bolt mounted in the housing, the sole holders being supported on the bolt and biased by the release spring towards the first position, the improvement comprising a centrally oriented guide plate mounted on the upper part of the housing, a pair of opposing rearwardly diverging guide surfaces each aligned in a longitudinal axis of the guide plate, wherein the bolt is supported for movement relative to the guide surfaces, and wherein a lower end section of the bolt is received between the guide surfaces and is guided thereby.

5,566,968

## ALPINE SKI BINDING ELEMENT EQUIPPED WITH A COMPENSATION DEVICE

Christian Challande, Cruseilles; Pierre Desarmaux, Evires, and Pascal Thomas, Chambéry, all of France, assignors to Salomon S.A., Metz-Tessy, France

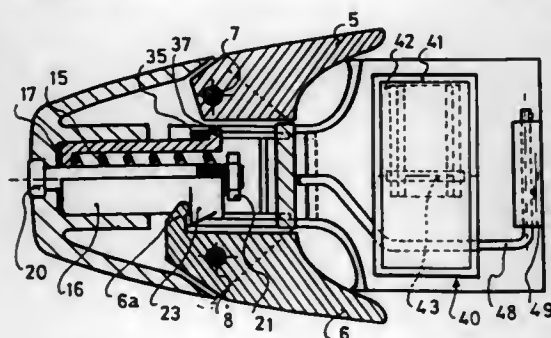
Filed Jan. 23, 1995, Ser. No. 377,106

Claims priority, application France, Feb. 9, 1994, 94 01657

Int. Cl.<sup>6</sup> A63C 9/08

U.S. Cl. 280—634

25 Claims



1. A binding for retaining a boot on an alpine ski, said binding comprising:

- a base for attachment to a ski;
- a body mounted on said base;
- a retention jaw borne by said body, said retention jaw comprising two lateral retention wings for laterally retaining the boot, at least one of said lateral retention wings being mounted for a horizontal component of movement during a boot release movement;
- a spring housed in said body for elastically opposing release movements of said jaw in response to forces transmitted by the boot;
- a compensation mechanism that reduces a return force exerted by said spring on at least one of said lateral retention wings in response to a force exerted by the boot;
- a support device comprising a support plate for supporting at least an end of a sole of the boot, said support plate having a support surface for the boot that is substantially horizontal in a nominal position of said support plate;

a sensor formed by at least one lateral end portion of said support plate operatively associated with said compensation mechanism for activating said compensation mechanism to reduce said return force exerted by said spring;

an arrangement for mounting said support plate for pivotal movement about a substantially longitudinal fixed axis relative to the ski in a predetermined direction from said nominal position to an inclined position having said one lateral end portion of said support plate lowered toward the ski, and for blocking an opposite lateral end portion of said support plate against movement from said nominal position in a direction opposite to said predetermined direction.

5,566,969

## REAR AXLE SUSPENSION WITH REDUCED OVERSTEER

Peter Tattermusch, Esslingen, Germany, assignor to Mercedes-Benz AG, Germany

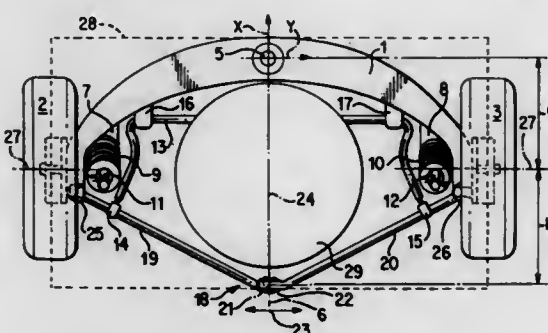
Filed Jun. 1, 1995, Ser. No. 457,695

Claims priority, application Germany, Jun. 1, 1994, 44 19 221.5

Int. Cl.<sup>6</sup> B60G 11/00

U.S. Cl. 280—688

4 Claims



1. A motor vehicle rear axle suspension having an inherently stiff axle guide member comprising an axle tube extending transversely to a direction of vehicle travel and at each of two ends thereof having a wheel mounted thereon, the axle guide member being supported on a vehicle body in a region of each of the two axle tube ends by a respective bearing spring and being articulated on the vehicle body by a universal joint in a region of the central longitudinal plane of the vehicle, rearwardly of an axis of rotation of the wheel, with reference to a forward direction of vehicle travel, said suspension having a lateral guide linkage comprising two individual links, in which one of the links is articulately supported, at one end thereof in a region of the wheel, on one end of the axle tube, and the other link is articulately supported, by an end thereof in the region of the wheel, on the other end of the axle tube, and in which other ends of the links are articulated to a coupling device configured and arranged to permit equalizing movements of the links in a transverse direction of the vehicle and fastened to the vehicle body in the region of the central longitudinal plane behind points of support of the links on the axle tube, with respect to the forward direction of vehicle travel, wherein the axle tube has a configuration curved in the forward direction of vehicle travel, and a distance between the axle tube, in a region of articulation of the axle tube on the vehicle body, and the axis of rotation of the wheel is substantially equal to a distance from the lateral guide linkage, in a region of articulation thereof on the vehicle body, to the axis of rotation of the wheel.

5,566,970

## CAR AUTOMATIC BALANCE DEVICE

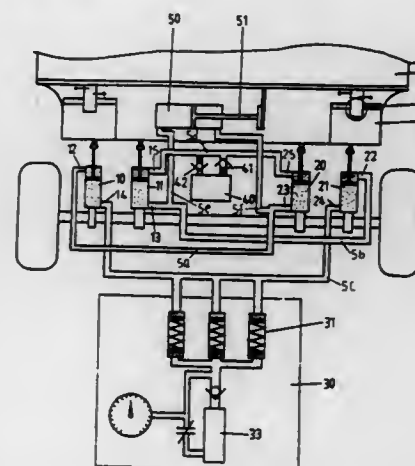
Chiou D. Lin, 12-6, Tien Hsin Alley, Yea Tan Road, Ta Yea Hsiang, Taichung Hsien, Taiwan

Filed May 12, 1995, Ser. No. 439,772

Int. Cl.<sup>6</sup> B60G 31/073

U.S. Cl. 280—689

4 Claims



1. A vehicle stabilizing system for a vehicle having a body and an axle, comprising:

- a) first and second left hydraulic cylinders mounted between a left side of the body and a left side of the axle;
- b) first and second right hydraulic cylinders mounted between a right side of the body and a right side of the axle;
- c) a first conduit connecting an oil feed port on the first left hydraulic cylinder to an oil discharge port on the first right hydraulic cylinder; and
- d) a second conduit connecting an oil discharge port on the second left hydraulic cylinder to an oil feed port on the second right hydraulic cylinder, thereby forming a hydraulic loop between the first and second left, and first and second right hydraulic cylinders.

5,566,971

## VEHICLE AIR SUSPENSION SYSTEM

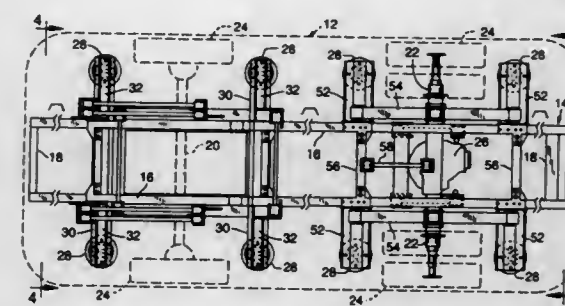
Gordon R. Perlot, Brownsville, Ore., assignor to Safari Motor Coaches, Inc., Harrisburg, Ore.

Filed Jul. 27, 1995, Ser. No. 508,036

Int. Cl.<sup>6</sup> B60G 11/26

U.S. Cl. 280—711

3 Claims



1. A motor home having an air bag suspension system comprising:

- a body having a length, width defining body sides and an underside, a frame having a pair of elongated beams extended along the length of the body and fixed to the underside of the body substantially inward of said body sides, wheels and a front axle and a rear axle each extended laterally of the body between a pair of the wheels, and a suspension system inter-

posed between the front axle and the frame and between the rear axle and the frame, each said suspension system comprising

an upper support assembly and a lower support assembly, said upper support assembly fixed to the frame and having an upper arm portion extended laterally outwardly of each of said beams toward the side of the body to a determined bag supporting position, said lower support assembly rigidly fixed to the axle and having at each side a lower arm portion extended under the upper arm portion of the upper support assembly, said lower arm portion through its rigid connection to the axle maintaining a fixed angular relation relative to said axle, and a compressible and expandable air bag positioned between the arm portions of the upper and lower support assemblies at the determined bag supporting positions at each side of the frame, said bag supporting positions located between the body sides and the frame beams as determined by the bag support capabilities in relation to a maximum road deviation to be encountered by the motor home wheels.

5,566,972

## AIR BAG DEVICE

Ryoichi Yoshida; Noriyuki Kosugi; Yoshihiko Tanaka, all of Shiga; Eiji Yanagi, Kanagawa; Tadayuki Atoh, Shiga; Akira Kokeguchi, Shiga, and Yoshihiko Minami, Shiga, all of Japan, assignors to Takata Corporation, Tokyo, Japan

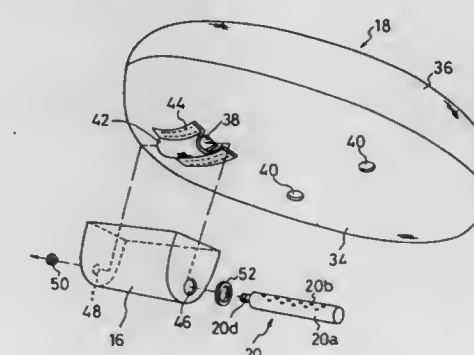
Filed Nov. 1, 1994, Ser. No. 332,760

Claims priority, application Japan, Nov. 25, 1993, 5-294930

Int. Cl.<sup>6</sup> B60R 21/16

U.S. Cl. 280—728.2

6 Claims



1. An air bag attached to an air bag device having a casing and an inflator situated inside the casing, comprising:

- a panel member for constituting the air bag and having an elongated opening for allowing gas to flow therethrough from the inflator to inflate the panel member upon actuation of the inflator, and
- a one piece retaining member having a main portion and two side portions on opposite sides of the main portion, said side portions being fixed to the panel member at side areas of the elongated opening, said main portion projecting outwardly from the panel member and forming an elongated hole with side openings between the panel member and the retaining member, said main portion facing the elongated opening so that when the air bag is assembled with the air bag device, only the inflator is located in the elongated hole while projecting outwardly through the side openings and faces the elongated opening to thereby easily attach the panel member to the inflator.

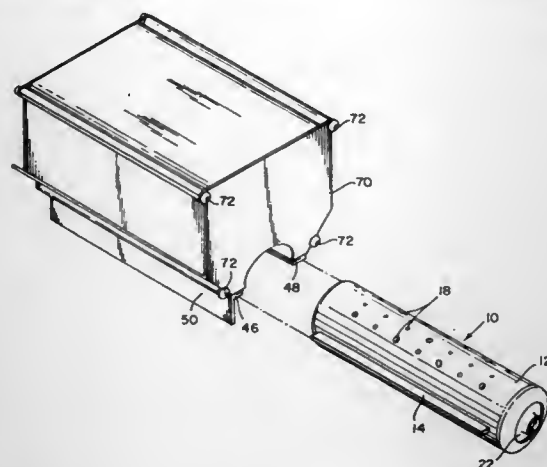
5,566,973

## ADVANCED PASSENGER INFLATOR WITH SLIDE IN ATTACHMENT TO EXTRUDED MODULE

David J. Green, Brigham; Donald R. Lauritzen, Hyrum; S. Mark Bunker, Ogden, and Larry D. Rose, Layton, all of Utah, assignors to Morton International, Inc., Chicago, Ill.  
Filed Oct. 4, 1995, Ser. No. 539,206  
Int. Cl.<sup>6</sup> B60R 21/16

U.S. Cl. 280—728.2

17 Claims



1. In an automotive airbag assembly comprising a trough-shaped reaction canister including a floor and first and second sidewalls; first and second end plates closing the ends of said canister, an inflator chamber carried by said canister, means for passing gases generated from within said inflator chamber into said canister, and an airbag within said canister adapted to be inflated by gases from said inflator chamber, the improvement comprising:

- at least one channel integral with, and extending along the length, of said canister; and
- at least one wing integral with, and extending along the length, of said inflator chamber, said wing being insertable in said channel for sliding therein to a desired operative position and retained therein by staking of said channel to said wing.

5,566,974

## METHOD AND APPARATUS FOR RESTRAINING AN OCCUPANT DURING A SIDE IMPACT

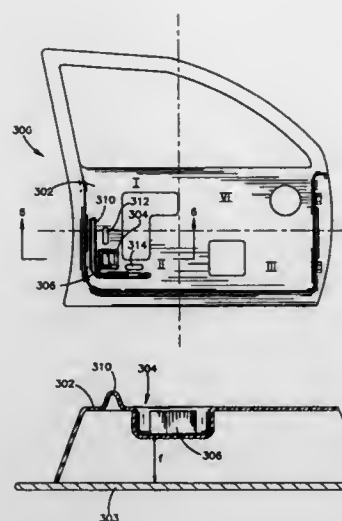
Joseph F. Mazur, Washington; Brian K. Blackburn, Rochester; Scott B. Gentry, Romeo, and Charles E. Steffens, Jr., Washington, all of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio  
Filed Mar. 22, 1993, Ser. No. 34,722  
Int. Cl.<sup>6</sup> B60R 21/16

U.S. Cl. 280—730.2

24 Claims

1. An apparatus for restraining an occupant of a vehicle during a side impact of the vehicle with an object, said apparatus comprising:

- deployable restraining means mounted to be operative between the occupant and a side assembly of the vehicle adjacent the occupant, said side assembly having an outside panel and an inside panel spaced from said outside panel;
- an accelerometer for measuring sideways vehicle acceleration, said accelerometer being mounted to the inside panel of said side assembly, said accelerometer providing an output signal having a value functionally related to the sideways acceleration of the vehicle;
- means for monitoring said output signal of said accelerometer;
- means for determining a vehicle velocity value in a sideways direction from said monitored output signal of said accelerometer; and
- means for deploying said restraining means if said determined velocity value is indicative of the occurrence of a deployment crash condition.



5,566,975

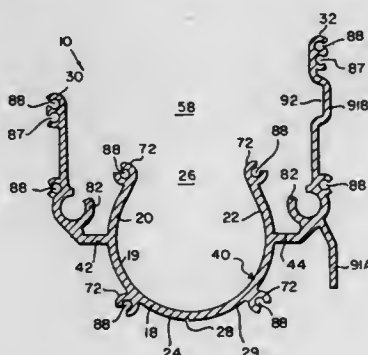
## CONTROLLED PRESSURE RELIEF OF AN INFLATABLE RESTRAINT REACTION CANISTER

Mark W. Stull, Layton; Michael J. Ravenberg, Corinne; Donald R. Lauritzen, Hyrum; Larry D. Rose, Layton, and David J. Green, Brigham, all of Utah, assignors to Morton International, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 46,692, Apr. 12, 1993, Pat. No. 5,407,227, and Ser. No. 43,960, Apr. 13, 1993, Pat. No. 5,407,226, which is a continuation-in-part of Ser. No. 840,238, Feb. 24, 1992, Pat. No. 5,332,256, said Ser. No. 46,692 is a continuation-in-part of Ser. No. 840,238. This application Apr. 10, 1995, Ser. No. 419,302  
Int. Cl.<sup>6</sup> B60R 21/16

U.S. Cl. 280—732

18 Claims



1. In an inflatable restraint system reaction canister, the improvement comprising:

- a conventionally extruded one-piece canister structure body part wherefrom an air bag is deployable in a first direction, said body part having first and second opposite side walls spaced apart to form an air bag retaining cavity and a bridging portion joining said first and second opposite side walls wherein at least one of said bridging portion, first side wall and second side wall comprises a tear seam adapted to tear under the influence of a build-up of pressure thereagainst to provide venting of such pressure in a direction away from the first direction.

5,566,976

## DUAL STAGE AIR BAG INFLATOR WITH TOROIDAL CHAMBER FOR COMBUSTIBLE GAS MIXTURE

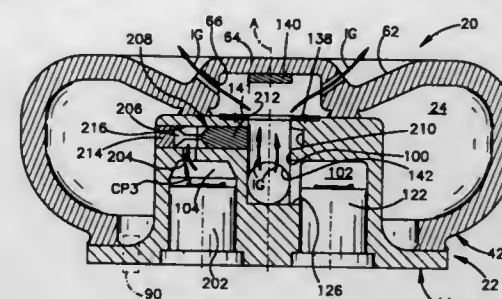
Jess A. Cuevas, Scottsdale, Ariz., assignor to TRW Inc., Lyndhurst, Ohio

Filed Sep. 1, 1995, Ser. No. 523,017

Int. Cl.<sup>6</sup> B60R 21/26

U.S. Cl. 280—737

21 Claims



1. An apparatus comprising:

- an inflatable air bag;
- a container defining a chamber;
- a mixture of gases in the chamber and comprising a combustible fuel gas portion and a noncombustible inflation gas portion;
- an outlet passage in said container for providing fluid communication through a flow area between the chamber and the air bag, said outlet passage being initially blocked to prevent fluid flow through said outlet passage;
- an actuable first initiator for, when actuated, effecting the ignition of the combustible fuel gas portion of the mixture of gases to unblock said outlet passage and allow gas to flow into said air bag; and
- an actuable second initiator for, when actuated, changing the flow area defined by said outlet passage.

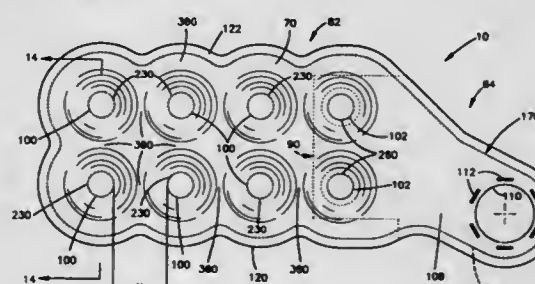
5,566,977

## AIR BAG INCLUDING RESTRAINT

Pongdet P. Wipasuramont, Rochester, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio  
Filed Jun. 1, 1995, Ser. No. 457,854  
Int. Cl.<sup>6</sup> B60R 21/22

U.S. Cl. 280—743.1

20 Claims



1. An inflatable vehicle occupant restraint such as an air bag for, when inflated, protecting a vehicle occupant, said inflatable restraint having an uninflated condition and an inflated condition, said inflatable restraint comprising:

- a first panel having a central portion and an outer peripheral portion;
- a second panel having a central portion and an outer periphery portion;
- said outer peripheral portions of said first and second panels being sewn together along an outer stitching line to join said first and second panels to form a body portion of said inflatable restraint;
- said central portions of said first and second panels being at least partially spaced apart from each other when said inflatable

restraint is in the inflated condition to define an inflation fluid volume between said central portions of said first and second panels; and

a plurality of non-extensible assemblies disposed within said outer stitching line and joining said central portion of said first panel to said central portion of said second panel at a plurality of spaced apart locations to control the width of said inflation fluid volume as measured between said first and second panels, each one of said assemblies comprising:

- (a) a first section of said central portion of said first panel;
- (b) a second section of said central portion of said second panel; and

a stitching section extending around and enclosing said first section and said second section, said stitching section joining said first section to said second section in an overlying relationship, said stitching section blocking flow of inflation fluid from said inflation fluid volume between said first section and said second section.

5,566,978

## VEHICLE SEAT BELT SYSTEM

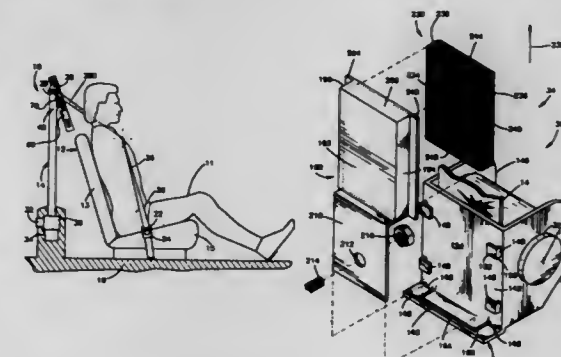
William J. Fleming, Rochester Hills, and Barney J. Bauer, Fenton, both of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Apr. 26, 1995, Ser. No. 429,052

Int. Cl.<sup>6</sup> B60R 22/20; 22/28; 22/46

U.S. Cl. 280—801.2

20 Claims



9. A vehicle safety apparatus for use in a vehicle having a seat for an occupant of the vehicle, comprising:

- a length of seat belt webbing for restraining the vehicle occupant in the event of sudden vehicle deceleration such as occurs in a vehicle collision;

a webbing guide for guiding said seat belt webbing;

support means for supporting said webbing guide for movement on the vehicle;

an actuable device for, when actuated, moving said webbing guide on the vehicle in response to a condition indicative of the sudden vehicle deceleration;

means for connecting an end portion of said seat belt webbing to the vehicle in a force-transmitting relationship, said means for connecting including energy absorber means for reducing shock load on the vehicle occupant in the event of sudden vehicle deceleration by enabling the occupant to move when the force applied by the occupant to said belt webbing exceeds a predetermined force;

first sensing means for sensing a vehicle occupant characteristic; and

control means responsive to said sensed vehicle occupant characteristic for limiting movement of said webbing guide upon the occurrence of the sudden vehicle deceleration, by said actuable device, to a relocated position that is selected based upon said sensed vehicle occupant characteristic.



5,566,979

## DOCUMENT HOLDER INSERT

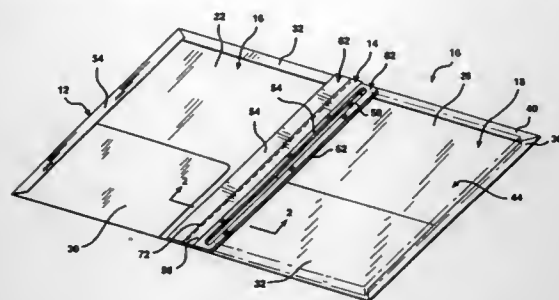
Bon S. Ong, P.O. Box 4247, Torrance, Calif. 90510

Filed Dec. 5, 1994, Ser. No. 349,563

Int. Cl.<sup>6</sup> B42D 1/00

U.S. Cl. 281—21.1

18 Claims



8. In combination, a folder formed with front and back covers each having an inside and an exterior surface, an elongated holder for soft documents including a stiff, flat member defining entirely within its structure a narrow, elongated document slot that delineates an elongated document retaining bar and an attachment margin wherein said retaining bar and said attachment margin are joined together at opposite longitudinally separated ends, and wherein said document holder further includes an elongated hinge with an elongated, anchoring leaf and an elongated mounting leaf disposed parallel to said anchoring leaf and joined thereto in articulated fashion, wherein said mounting leaf is joined throughout its length to said attachment margin of said stiff, flat member and said anchoring leaf is secured throughout its length to at least one of said inside surfaces of said front and back covers.

5,566,980

## MOTOR VEHICLE DOCUMENT ORGANIZER

John Fizer, P.O. Box 13772, Fort Wayne, Ind. 46865-3772,

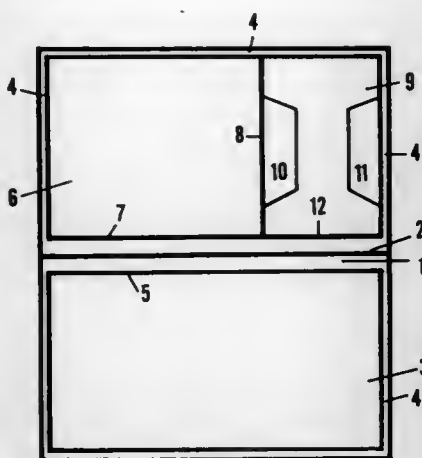
assignor to John Fizer, Fort Wayne, Ind.

Filed Jun. 29, 1994, Ser. No. 267,438

Int. Cl.<sup>6</sup> A45C 1/06; B42F 5/00

U.S. Cl. 281—31

2 Claims



1. A motor vehicle document organizer for storing in a glove compartment of a motor vehicle comprising:  
an exterior of flexible material having a fold which defines a first panel and a second panel,  
an interior having first, second and third pockets formed by affixing transparent flexible material to the exterior, the first pocket affixed along three sides to the first panel, the second and third pockets each affixed along three sides to the second panel with a seam formed between the second and the third pockets and perpendicular to the fold, and

a first flap and a second flap each cut in the transparent flexible material of the third pocket, the first flap attached to the flexible material at the seam and the second flap attached to the flexible material at an exterior edge of the second panel and parallel to the seam, the first and second flaps being adapted to receive and securely hold a motor vehicle document outside of the third pocket.

5,566,981

## POSTCARD BANK CHECK

Isabelo S. Alcorido, 613 Summit St., Waculla, Fla. 33873

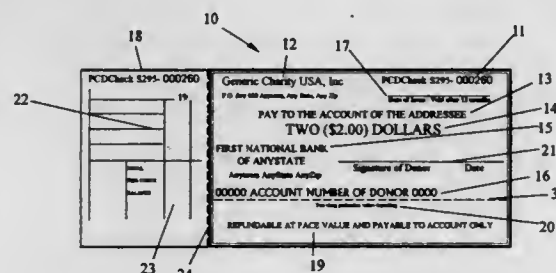
Continuation-in-part of Ser. No. 270,736, Jul. 5, 1994, abandoned.

This application Mar. 23, 1995, Ser. No. 409,159

Int. Cl.<sup>6</sup> B42D 15/00

U.S. Cl. 283—58

2 Claims



1. A post card bank check for sending contributions by mail comprising:

a sheet of card stock having a face side and a reverse side and a first and second perforation means for separating portions of said card stock into a first, a second, and a third severable part,

an image of a check printed on said face side of said first severable part, said image including a plurality of check information items, said check information items including, the check number, the addressee's name and address, instructions to bank with reference to addressee, the amount of the donation, the address of the financial institution, the account number, the date of the donation and period of validity of the check, a notice limiting negotiability of the check, donor's signature and date, a space for the donor to record details of a check,

an image of a postcard printed on said reverse side of said first severable part of said point card, said image including a notice signifying space for donor's name and address, a note to caution donor, a space for addressee's name and address, and a space for addressee's endorsement,

an image of a donation record printed on said face side of said second severable part, including a space for donor to record details of the check, a space for updating account information after donation,

an image of instructions printed on said face side of said third severable part including instructions for removing said third severable part, and a notice limiting negotiability of the check, and,

an image of instructions printed on said reverse side of said third severable part including instructions to donor for using said reverse side.

5,566,982

## FLEXIBLE CARD WITH VALIDITY CHECKING DEVICE

Jean C. Leheureau, Ste Genevieve Des Bois; Francis Massie, Paris, and Claude Bricot, Villejuif, all of France, assignors to Idmatix S. A., Colombes, France

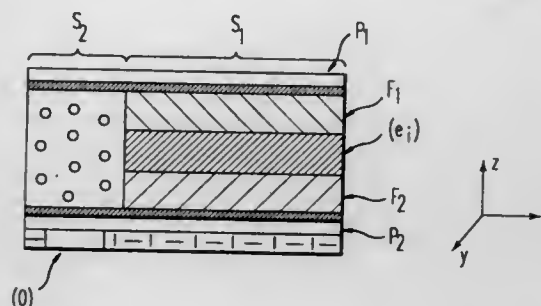
Filed Jul. 15, 1994, Ser. No. 275,530

Claims priority, application France, Jul. 16, 1993, 93 08759

Int. Cl.<sup>6</sup> B42D 15/00

U.S. Cl. 283—83

10 Claims



1. A flexible card provided with a validity-checking device comprising, inserted between flexible electrodes:

a structure  $S_1$  comprising at least one layer of piezoelectric material;

a structure  $S_2$  comprising a layer of material capable of switching electrically between two optical states (I) and (II) that are different in terms of ocular perception, said structures  $S_1$  and  $S_2$  being electrically connected.

5,566,983

## FLUID INTERFACE

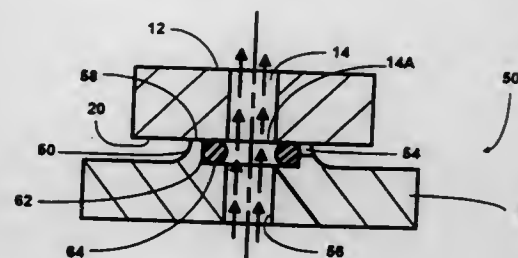
James D. Gluys, Portage, and William R. Chene, Kalamazoo, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 21, 1995, Ser. No. 517,513

Int. Cl.<sup>6</sup> F16L 55/00

U.S. Cl. 285—14

13 Claims



1. A fluid coupling for two members assembled in surface-to-surface contact, comprising a first fluid conduit defined in the first member and having a first opening at a first exterior surface defined on said first member, a second fluid conduit defined in the second member and having a second opening at a second exterior surface defined on said second member, said members adapted to be attached in first-surface-to-second-surface contact with said openings in register, and a resilient seal member adapted to be resiliently deformably received between said members in registration with said openings to provide a sustaining, substantially fluid-tight seal between said conduits, and a test passage extending from one of said openings to an outer surface of one of said members, said first and second exterior surfaces being flat adjacent said first and second openings and, other than for said passage, urged into sealing contact about said registered openings, said passage sealed by said seal member and allowing limited fluid flow between said openings and said outer surface in the absence of said seal member whereby the presence or absence of fluid flow through said passage

to said exterior is indicative of the absence or presence, respectively, of said seal member.

5,566,984

## CYLINDRICAL CORROSION BARRIER FOR PIPE CONNECTIONS

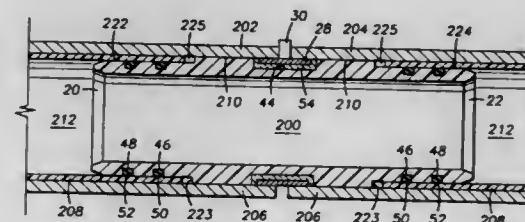
William D. Abbema, Rte. 3 Box 3344, Pearland, Tex. 77581, and John K. Lewis, 5870 Hwy. 6 N. Suite 200, Houston, Tex. 77084

Continuation-in-part of Ser. No. 221,834, Apr. 1, 1994. This application Jul. 26, 1994, Ser. No. 280,858

Int. Cl.<sup>6</sup> F16L 13/02

U.S. Cl. 285—22

18 Claims



1. A continuous corrosion barrier for interconnections of adjacent ends of lengths of pipe, wherein the pipe includes an internal tubular barrier extending longitudinally therein to block access of the materials flowing through the pipe with the pipe material, comprising:

a sleeve having a cylindrical outer surface, a cylindrical inner surface, and opposed first and second ends, said cylindrical outer surface having at least a first minor diameter portion extending inwardly of said outer cylindrical surface and extending along said outer cylindrical surface inwardly of said end;

a first seal extending circumferentially about said first minor diameter portion;

a second seal extending circumferentially about said first minor diameter portion intermediate of said first seal and said first end;

said first seal extending a first height from said first minor diameter portion and said second seal extending a second height from said first minor diameter portion, said first height exceeding said second height; and

said minor diameter portion received within the inner diameter of the internal barrier in the pipe and at least one of said first seal and said second seal engaging the inner diameter of the internal barrier.

5,566,985

## FIBERGLASS PIPE WITH ROUGH WRENCH SURFACES

Lawrence P. Moore, 49 Cascade Springs, The Woodlands, Tex. 77381, and John P. Biro, 1707 Woodland Park, Houston, Tex. 77077

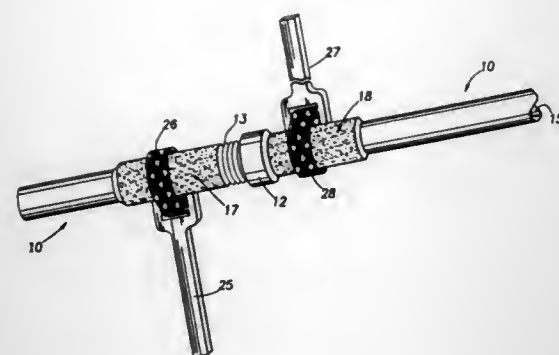
Filed Jul. 25, 1994, Ser. No. 279,401

Int. Cl.<sup>6</sup> F16L 35/00

U.S. Cl. 285—39

4 Claims

1. A joint of fiberglass pipe comprising: an elongated tubular body having threaded ends; and external surface areas adjacent each of said threaded ends having particulate abrasive material only partially embedded therein.



5,566,986

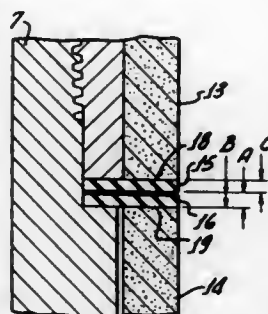
**DUAL GASKET LINED PIPE CONNECTOR**

William C. Allen, Pasadena; William M. Rickard, Palm Desert; Daniel P. Hoyer, Santa Rosa, all of Calif.; David E. Stickers, Reno, Nev., and Matthew J. Kelley, Windsor, Calif., assignors to Union Oil Company of California, El Segundo, Calif.  
Continuation of Ser. No. 68,770, Jun. 1, 1993, Pat. No. 5,405,171, which is a continuation-in-part of Ser. No. 713,551, Jun. 7, 1991, Pat. No. 5,236,231, which is a continuation of Ser. No. 427,758, Oct. 26, 1989, Pat. No. 5,069,485, said Ser. No. 68,770 is a continuation-in-part of Ser. No. 753,612, Aug. 30, 1991, Pat. No. 5,240,293, which is a continuation of Ser. No. 713,551, Jun. 7, 1991, Pat. No. 5,236,231, and Ser. No. 427,758, Oct. 26, 1989, Pat. No. 5,069,485. This application Jan. 23, 1995, Ser. No. 376,254

Int. Cl.<sup>6</sup> F16L 19/03

U.S. Cl. 285—55

31 Claims



1. A connector apparatus for containing a fluid, the apparatus comprising:

- a duct having an interior passageway and a first sealing surface;
- a duct mating element having a second sealing surface which is substantially oppositely located from said first sealing surface when said duct is joined to said duct mating element;
- a means for joining said duct and duct mating element while compressing a seal located between said sealing surfaces and while rotating the duct relative to the duct mating element; and
- at least two deformable seal elements compressed between a substantial proportion of said sealing surfaces, said two deformable seal elements slidably contacting each other at a substantial slidable interface.

5,566,987

**HOSE FITTING ASSEMBLY**

Mohammad S. Mazhar, 3537 Jasper Dr., Sterling Heights, Mich. 48310

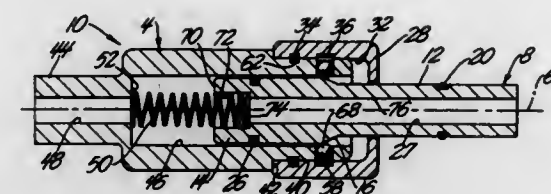
Filed Jun. 12, 1995, Ser. No. 489,518

Int. Cl.<sup>6</sup> F16L 37/10; 37/18

U.S. Cl. 285—86

11 Claims

1. A hose fitting assembly for quickly connecting or disconnecting hose ends, comprising:



5,566,988

**HEAT SHRINKABLE HOSE CLAMP WITH INDICATOR**

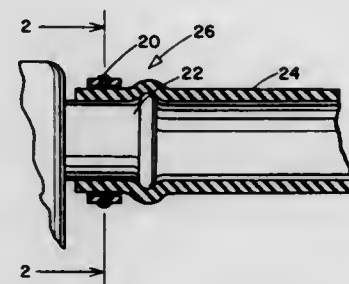
Jonathan A. Johnston, Northglenn; Michael V. Peake, Evergreen, and Keith M. Krause, Westminster, all of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Apr. 30, 1993, Ser. No. 57,242

Int. Cl.<sup>6</sup> F16L 35/00

U.S. Cl. 285—93

10 Claims



1. An improved hose clamp for clamping about an elastomeric hose of the type formed of a band of heat shrinkable polymer having a diameter reducing release temperature, an inside band surface and an outside band surface, wherein the improvement comprises, said clamp including means for indicating shrinkage thereof.

5,566,989

**SOLIDS PIPELINE HAVING MULTIPLE ROTARY CONNECTORS**

Eberhard Bolng, Hagen, and Rainer Moratschke, Dortmund, both of Germany, assignors to Vacmetal Gesellschaft für Vakuum-Metallurgie mbH, Dortmund, Germany

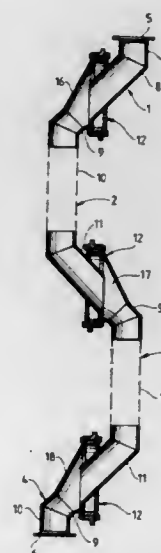
Filed May 17, 1995, Ser. No. 443,406

Claims priority, application Germany, May 24, 1994, 44 18 145.0

Int. Cl.<sup>6</sup> F16L 27/00

U.S. Cl. 285—163

6 Claims



1. A pipeline for conveying solids along a generally vertical conveying path from a first location to a treatment vessel disposed below said first location, said pipeline comprising:

- a plurality of pipe elements, each of said pipe elements having first and second ends and comprising at least two pipe sections fixedly connected to each other such that the longitudinal axes of said connected pipe sections form an obtuse angle; each of said pipe elements being connected at one end thereof to an end of another of said pipe elements;
- at least two rotary connectors connecting said connected ends of said pipe elements together, said rotary connectors being vertically arranged along said vertical connecting path to thereby allow relative rotation between said connected ends of said pipe elements about a horizontal axis whereby the vertical length of the conveying path defined by said connected pipe elements can be shortened from a stretched state extending between said first location to said treatment vessel and a shortened state, by rotation of at least one of said pipe elements about the horizontal axis of rotation of a rotary connector connecting said pipe element to another of said pipe elements.

5,566,990

**LATCH DEVICE**

Masayuki Watabe, and Kenji Nishiumi, both of Saitama, Japan, assignors to Kabushiki Kaisha Nippon Conlux, Japan

Division of Ser. No. 218,636, Mar. 28, 1994, Pat. No.

5,505,289. This application May 16, 1995, Ser. No. 442,114

Claims priority, application Japan, Feb. 4, 1993, 5-16415 U; Mar. 31, 1993, 5-74126

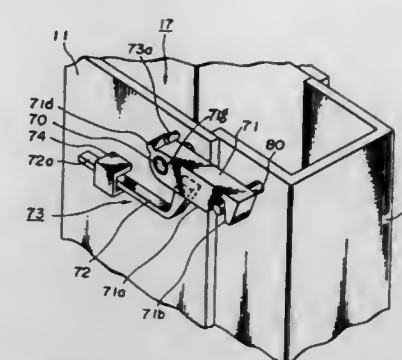
Int. Cl.<sup>6</sup> E05C 19/12

U.S. Cl. 292—95

5 Claims

1. A latch device for connecting and releasing a first body (11) relative to a second body (13) comprising:

- a lever (71) formed at one end portion thereof with a bearing hole (71g) through which a shaft (70) fixed to the first body (11) is detachably inserted and at another end portion thereof



with a recess (71b) for detachably engaging with a pin (80) fixed to the second body (13);

- a strip member (72) of a substantially J-shaped configuration including a base end and a free end (72a), the strip member (72) being formed integrally with the lever (71), the base end being fixed to a side of the lever (71) at which the recess (71b) is located and the free end (72a) extending across the bearing hole (71g); and
- an engagement member (74) of a substantially U-shaped configuration, defined by a bight portion and a pair of leg portions, said leg portions being fixed to the first body (11) thereby forming a hole through which the free end (72a) of the strip member (72) is slidably inserted.

5,566,991

**LOCK WITH CAM OPERATED MECHANISM**

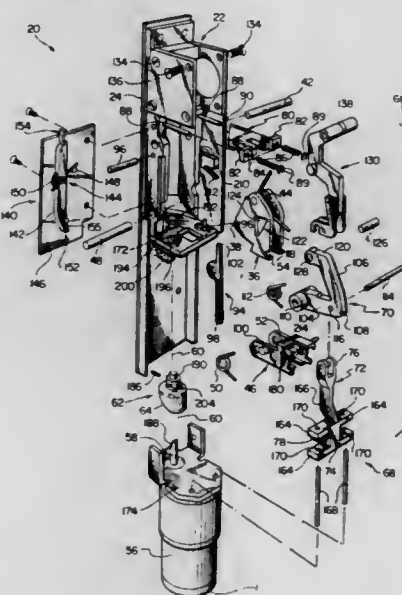
Quentin Young, Channahon, Ill., assignor to R R Brink Locking Systems, Inc., Shorewood, Ill.

Filed Oct. 28, 1994, Ser. No. 330,471

Int. Cl.<sup>6</sup> C05C 3/06

U.S. Cl. 292—201

22 Claims



3. A lock mechanism for use with a door assembly having a door and a frame, said lock mechanism being attached to one of said door and said frame, the other of said door and frame having an aperture therein positioned opposite said lock mechanism, said lock mechanism comprising:

- a chassis for attachment to said door assembly;
- a face plate attached to said chassis and having a latch aperture formed therein;
- a latch bolt operatively connected to said chassis for movement between an extending position wherein a tip portion of said



latch bolt extends from said chassis through said latch aperture and a retracted position where said tip portion is retracted into said chassis through said latch aperture;

deadlock structure operatively associated with said chassis for selectively blocking movement of said latch bolt;

a drive motor attached to said chassis for providing a driving force to operate said latch bolt;

cam structure operatively associated with said motor for producing a mechanical advantage in driving said latch bolt;

a linkage assembly operatively associated with said chassis, said linkage assembly operatively linking said latch bolt, said deadlock structure and said cam structure for transferring driving forces from said motor to operate said lock mechanism;

said cam structure including a cylindrical cam body being connected to said drive motor, said drive motor having a drive shaft defining a coaxially extending central axis, said cylindrical cam body being attached to said drive shaft and being axially rotatable along said central axis for acting on said linkage assembly to operate said latch bolt;

said cylindrical cam body having a driving surface lying in a plane generally disposed at an angle to said central axis, said linkage assembly having a cam follower operatively engaged with said driving surface of said cylindrical cam body, whereby said cam follower is displaced axially generally parallel to said central axis upon rotary operation of said cylindrical cam body.

5,566,992

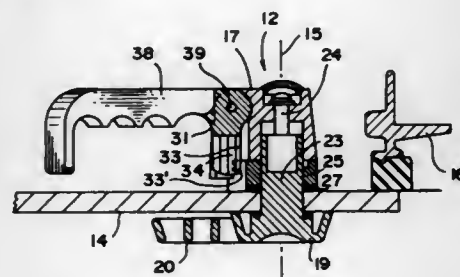
# MECHANISM FOR LATCHING AND UNLATCHING A HATCH ASSEMBLY

Andrew Anderson, Chester, Vt., and Gregory S. Fallon, Charlottesville, Va., assignors to Pompanette, Inc., Charlestown, N.H.

Filed Oct. 4, 1994, Ser. No. 317,545  
Int. Cl.<sup>6</sup> E05C 3/04

U.S. Cl. 292-241

3 Claims



1. A mechanism for latching and unlatching a hatch comprising a locking plate adjacent to the hatch and a hub assembly having a central axis and means for attaching said hub assembly to the hatch, said hub assembly including a rotatable hub and a stationary hub having a first stop member on the outer periphery thereof, said rotatable hub including an outwardly extending handle and an eccentric element including an outwardly extending locking lug extending from said hub and rotatable about said central axis in response to the rotation of said handle to thereby bring said locking lug into engagement with said locking plate when said handle is rotated about said central axis in a first direction and to move said locking lug out of engagement with said locking plate when rotated in the opposite direction, means including a recess and a pair of shoulders in said stationary hub and a second stop member on said rotatable hub extending into said recess for limiting the rotation of said handle about said central axis to about 75°, means for rotating said handle independently of said locking lug about a second axis which is essentially perpendicular to said central axis and motion limiting means extending from said handle for engaging said first stop member on the outer periphery of said stationary hub to

prevent rotation of said handle about said central axis when said handle is in a first position with respect to said second axis and permitting rotation of said handle about said central axis when said handle is in a second position with respect to said second axis and means for limiting the rotation of said handle about said second axis to about 30° and wherein said handle includes a projecting locking member and said rotatable hub includes a U-shaped channel and a pair of inwardly directed projections which are constructed and arranged to receive said locking member therebetween and wherein said locking member is constructed and arranged to force said inwardly directed projections apart so that the resiliency of the U-shaped channel biases the handle into an open or closed position.

5,566,993

# DOOR LOCKING DEVICE

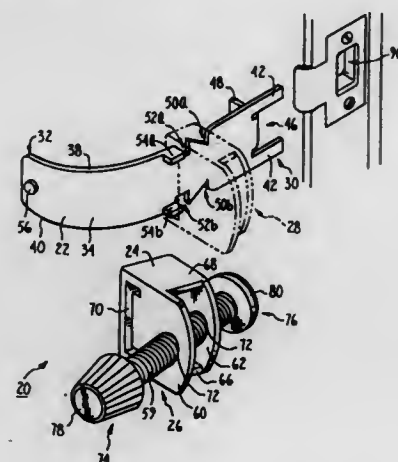
George Olivas, P.O. Box 7411, Las Vegas, Nev. 89125

Filed May 25, 1994, Ser. No. 248,604

Int. Cl.<sup>6</sup> F05C 19/18

U.S. Cl. 292-288

18 Claims



1. A portable door locking device, comprising:

- a generally rigid, elongated, flat strap having a forward end portion and opposite rearward end portion, first and second parallel longitudinal edges and a transverse projection at a forward end portion thereof adapted to engage an opening in a striker plate;
- a frame slidably mounted on the strap, said frame having a vertical notch-engaging wall portion;
- stop means at the rearward end portion of the strap to preclude the frame from sliding off of the strap;
- a retaining bolt threadedly mounted on the frame, said bolt having a foot portion adapted to abut the surface of a door when the locking device is in place; and
- releasable engagement means for retaining the frame in an operating position on the strap between the forward and rearward end portions, said engagement means comprising a first set of aligned notches extending inwardly respectively from the first and second edges, and first and second aligned tab means extending transversely to the strap rearward of the first set of notches for engaging a tab stop portion of the frame.

5,566,994

# BREAKAWAY LEVER WITH RESET MECHANISM

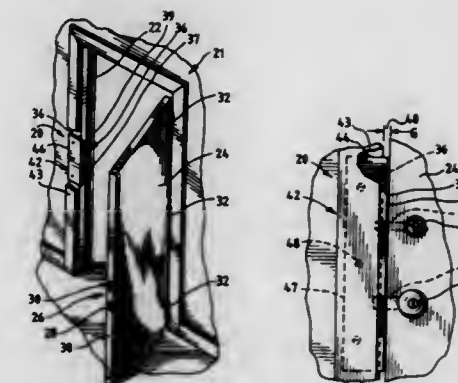
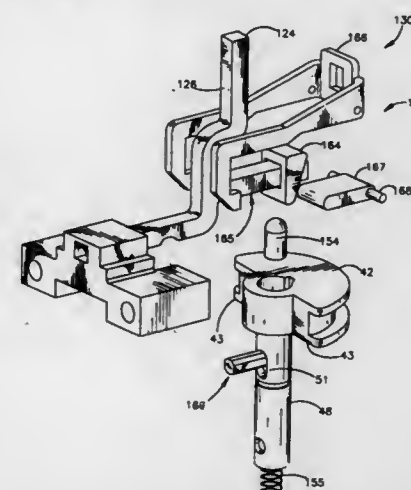
Gerald E. Mader, Indianapolis, Ind., assignor to Von Duprin, Inc., Indianapolis, Ind.

Division of Ser. No. 173,883, Dec. 27, 1993, Pat. No. 5,520,427. This application Jul. 31, 1995, Ser. No. 509,272

Int. Cl.<sup>6</sup> E05B 3/00

U.S. Cl. 292-336.3

7 Claims



extending from said door frame into said gap such that said first edge is disposed in said gap when said interior plate portion is disposed on said inner side of said door frame; and means for securing said interior plate portion to said door frame.

5,566,996

# METHOD AND APPARATUS FOR ATTACHMENT OF A DOOR LOCK TRIM ROSE

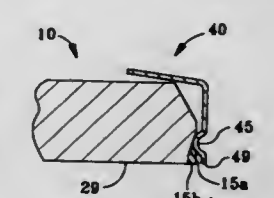
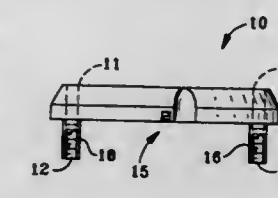
William S. Massey, Yoder, and Rocco A. Carestia, Colorado Springs, both of Colo., assignors to Schlage Lock company, San Francisco, Calif.

Filed Apr. 28, 1995, Ser. No. 431,161

Int. Cl.<sup>6</sup> E05B 15/02

U.S. Cl. 292-357

4 Claims



1. A door lever assembly having a locked and an unlocked position for controlling a door latch assembly, the door lever assembly comprising:

- a trim housing and a stop plate projecting therefrom;
- a lever handle rotatably connected to the trim housing;
- a cam configured for rotation;
- a shaft extending between the lever handle and the cam, the shaft defining a connection groove therethrough to provide access to a shaft interior, with a cam drive pin projecting from the shaft interior for connecting the cam and the shaft and a plunger positioned adjacent to the cam drive pin to extend from the shaft interior;

A slider assembly engaged to move in response to cam rotation, the slider assembly having an angle block and a pivotally mounted blocking pivot, with the blocking pivot frictionally engaged with the angle block until abnormally high force applied by the cam causes the blocking pivot to slip from its connection with the angle block to depress the plunger and its connected cam drive pin, breaking connection between the shaft and the cam; and

a compressible lift spring positioned between the stop plate and the slider assembly for compression as the slider assembly moves toward the stop plate and expansion away from the stop plate to return the lever handle to an initial position upon release of the lever handle.

5,566,995

# DOOR SECURITY SYSTEM

Walter J. Jagiela, Merrillville, Ind., assignor to Mercury Enterprises, Inc., Hammond, Ind.

Filed Apr. 28, 1995, Ser. No. 430,877

Int. Cl.<sup>6</sup> E04B 17/00

U.S. Cl. 292-346

20 Claims

1. For use in combination with a door apparatus comprising a door frame, a door, a latch, and a hinge, said door frame including an inner side and a latch receiving portion including a latch bolt receiving plate, said door including a latch edge partially containing said latch, said latch edge and said latch bolt receiving plate defining a gap therebetween when said door is in a closed position, a security device comprising:

- a door frame reinforcing member having a substantially planar interior plate portion disposable on said inner side of said door frame, said interior plate portion defining a first edge and

1. A system for attaching door lock trim roses on inside and outside faces of a door, comprising:

- a mounting chassis comprising an outside member and an inside member, said members each having two opposed cylindrical arc portions together with means for joining said outside member to said inside member to secure said mounting chassis to the door with both members firmly positioned against the outside and inside faces, respectively, of said door;
- a hollow inside trim rose and an outside trim rose interchangeable therewith, both trim roses having same means of attachment to said mounting chassis, each said trim rose having two diametrically opposed pips projecting radially inwardly to a given radial extent, said pips lying in close proximity to an edge of said trim rose which contacts a face of said door after installation of said trim rose thereon;
- detent means on said outside member of said mounting chassis for receiving the pips of said outside trim rose and for thereby securing said outside trim rose against the outside face of said door; and
- groove means on said inside member of said mounting chassis for receiving the pips of the inside trim rose, said groove means comprising at least two undercut sites, oppositely spaced on oppositely spaced cylindrical sector arcs on the periphery of a projecting portion of the inside member, undercut to a depth less than the radial extent of said pips of said inside trim rose, adjacent an edge of the inside member which is in contact with the face of the door when mounted thereon, to capture the pips and to maintain the rose against said inside face of said door and under a constant elastic stress when said rose is installed on said mounting chassis.

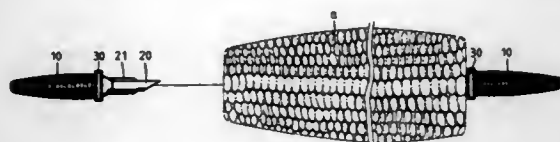
5,566,997

## CORN SKEWER

Cheng T. Lin, Tainan Hsien, Taiwan, assignor to Jyudung Plastics Corporation, Tainan Hsien, Taiwan  
 Filed Feb. 5, 1996, Ser. No. 597,034  
 Int. Cl.<sup>6</sup> A47G 21/00

U.S. Cl. 294—5

1 Claim



1. A corn skewer comprising:

- a grip;
- a blocking ring disposed at a proximal end of said grip;
- a hollow insert extending forward from said blocking ring;
- said hollow insert having a tapered end;
- a plurality of positioning ribs abutting said hollow insert to reinforce said hollow insert; and
- said corn skewers is made in one piece by injection molding.

5,566,998

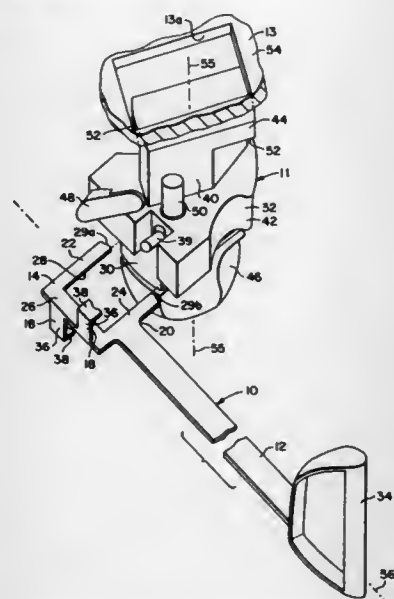
CARGO CONTAINER SWIVEL-STACKING-PIN TOOL  
 William H. Gray, 11080 Emmanuel Church Rd., Smithfield, Va. 23430

Filed Oct. 25, 1995, Ser. No. 547,862

Int. Cl.<sup>6</sup> B25J 1/04

U.S. Cl. 294—24

17 Claims



1. A swivel-stacking-pin tool for insertion and removal of swivel stacking pins into and from cargo containers, said swivel stacking pins being employed to provide spacing support for stacking said cargo containers and being of a type comprising a pin housing with a spacer section and top and bottom insert sections on opposite sides of the spacer section, top and bottom locking heads respectively on opposite sides of the housing adjacent the respective top and bottom insert sections, and a movable locking-head trigger for being manipulated to enable at least said top locking head to rotate about a rotation axis passing through said top and bottom locking heads when said top insert section is inserted in an engagement hole in a cargo container, said swivel locking pin tool comprising:

- a rigid elongated handle;
- a pin-engaging member attached to a pin end of said elongated handle, said pin-engaging member forming substantially a U-shaped frame with opposite first and second fork members

on first and second sides, a base member attached to said first and second fork members on a third side, with a fourth side thereof, opposite the base member, being open so that the first and second fork members define a slot for receiving the bottom insert section of the swivel stacking pin; and

a trigger actuator rigidly attached to said pin-engaging member for engaging said locking-head triggers of said swivel stacking pins and for manipulating said locking-head triggers for enabling said top locking heads to rotate about said rotation axis when said top insert sections are inserted in said engagement holes in said cargo containers.

5,566,999

## DIFFERENTIAL HOIST FIXTURE

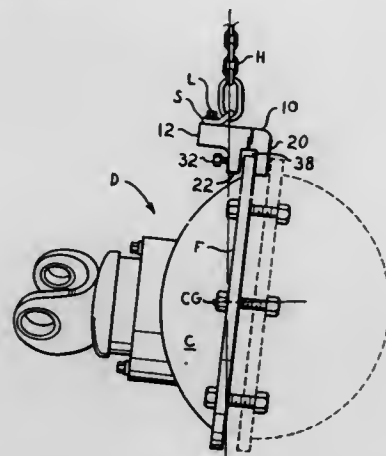
David R. Goettl, 729 Illinois St., Sheridan, Wyo. 82801

Filed Oct. 6, 1994, Ser. No. 319,068

Int. Cl.<sup>6</sup> B66C 1/42

U.S. Cl. 294—103.1

19 Claims



1. A differential hoist fixture comprising:

- a clamping end comprising a fixed first jaw having an inner surface and a fixed second jaw substantially parallel to said first jaw and spaced apart therefrom to form a jaw opening therebetween, with said clamping end having a lifting arm extending therefrom and disposed at substantially right angles to said first jaw and said second jaw;
- said second jaw including a threaded clamping bolt hole formed therethrough, with said clamping bolt hole having an axis in the plane of said first jaw and said second jaw;
- said lifting arm including lifting bolt attachment means therein, adapted for the attachment of a lifting bolt thereto and providing for said lifting bolt to pass through said lifting arm substantially parallel to said first jaw and said second jaw;
- a clamping bolt threadedly installed within said clamping bolt hole and serving to clamp a differential flange between said first jaw and said second jaw when said clamping bolt is tightened, with said first jaw and said second jaw adapted to fit over the flange of a differential and to secure the flange therebetween, whereby;
- said clamping end of said fixture is affixed to a differential flange by means of said clamping bolt threadedly advanced against the flange to secure the flange between said first jaw and said second jaw and against said inner surface of said first jaw, and said differential hoist fixture is secured to a hoist means by means of a lifting bolt secured to said lifting bolt attachment means of said lifting arm, to provide for the lifting of the differential by the differential flange.

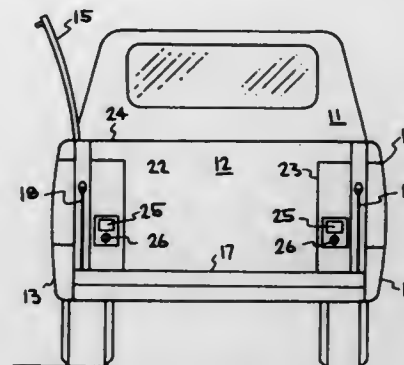
5,567,000

## HIDDEN STORAGE/UTILITY SYSTEM

Scott Clare, 3381 Shawn Ct., Hayward, Calif. 94541  
 Filed Jul. 26, 1995, Ser. No. 506,893  
 Int. Cl.<sup>6</sup> B60R 11/06

U.S. Cl. 296—37.6

16 Claims



1. A hidden storage/utility system for a bed without substantially altering an external appearance of overall side panels of the bed, and the bed being adapted to be mounted on wheels, said system comprising:

- a storage box mounted on at least one side of said bed and having side walls and end walls enclosing an interior;
- at least a substantial portion of one said overall side panel on said at least one side of said bed comprising one said side wall of said storage box and being hinged horizontally at an upper portion thereof, whereby said hinged side panel portion can be raised to expose the interior of said storage box and lowered to cover the interior of said storage box without substantially altering the external appearance of said one overall side panel; and
- a lock and latch mechanism mounted in one said end wall and said side panel portion to releasably secure said portion of said one overall side panel.

5,567,001

## AUTOMOTIVE VEHICLE SEAT FOR DISABLED PERSONS

Wojciech Zalewski, Belmont, Mass., assignor to Enhancements Unlimited, Inc., Cambridge, Mass.

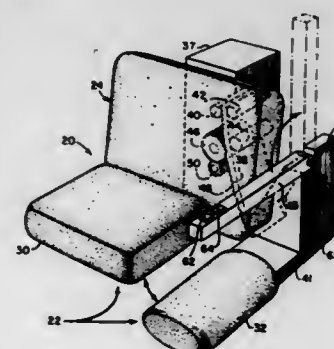
Continuation of Ser. No. 942,312, Sep. 9, 1992, Pat. No. 5,301,993, which is a continuation-in-part of Ser. No. 745,944, Aug. 16, 1991, Pat. No. 5,147,104, which is a continuation-in-part of Ser. No. 490,086, Mar. 7, 1990, Pat. No. 5,040,832.

This application Apr. 7, 1994, Ser. No. 224,259

Int. Cl.<sup>6</sup> B60M 1/10

U.S. Cl. 296—65.1

4 Claims



1. A seat only for a single driver or single passenger of an automotive vehicle, said seat comprising:

- (a) a back cushion presenting a geometrical contour only for said single driver or single passenger;

- (b) a seat cushion presenting a geometrical contour only for said single driver or single passenger;
- (c) electromechanical means;
- (d) operational means coupled to said electromechanical means;
- (e) said seat cushion including a primary stationary portion and an auxiliary transport portion;
- (f) a driven component attached to said transport portion;
- (g) said driven component being constrained for movement in a path between a retracted position and an extended position when actuated by said operational means;
- (h) said operational means including manual actuating means for maintaining movement between said retracted position and said extended position when under constant manual control;
- (i) said actuating means being accessible to constant manual control in close proximity to said transport portion; and
- (j) said transport portion being immovably affixed to said driven component.

5,567,002

## VEHICLE COVER AND TENT DEVICE

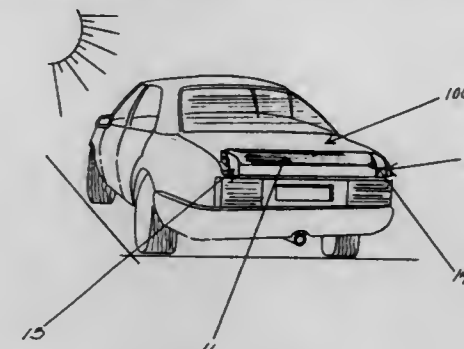
Yasser Tair, P.O. Box 343, Westminster, Calif. 92684

Filed Aug. 29, 1994, Ser. No. 297,577

Int. Cl.<sup>6</sup> B60J 11/00

U.S. Cl. 296—136

4 Claims



1. A cover device for a vehicle wherein the vehicle includes a trunk lid having an edge, the device comprising:

- a cover including a main portion and side portions;
- a housing assembly for the cover including a roller onto which the cover is selectively wound and a roller housing which houses the roller and the cover;
- means for mounting the housing assembly to the edge of the trunk lid;
- said means including a pair of hinge hooks, wherein each of said hinge hooks is comprised of an arm portion and a mounting hook portion and a hinge connecting the arm and mounting hook portions; said arm portion including a roller mounting portion for securing the roller thereto and said mounting hook portion mounts the hinge hook to the trunk lid edge;
- wherein through rotation of the hinges of the hinge hooks the housing assembly may be rotated between a position outside of the trunk for deployment of the cover out of the housing and a position inside of the trunk for storage.

5,567,003

## TENT CAMPER WITH SLIDE-OUT ROOM

Jeffrey J. Gill, Argos, Ind., assignor to Damon Ventures, LLC, Elkhart, Ind.

Filed Apr. 29, 1994, Ser. No. 235,057

Int. Cl.<sup>6</sup> B60P 3/32

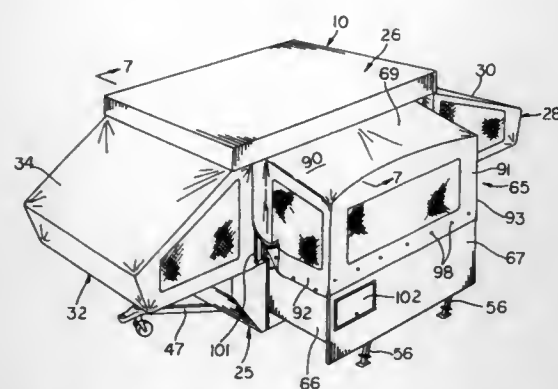
U.S. Cl. 296—173

14 Claims

1. A tent camper for use with a towing vehicle, wherein during towing the tent camper is pulled in a longitudinal direction, the tent camper comprising:

- a structural framework connectable to the towing vehicle;





at least two ground engaging wheels operationally mounted to said structural framework;

a camper main body supported by said structural framework;

a roof aligned above said camper main body, said roof movable between a lowered, storage position and a raised, camping position;

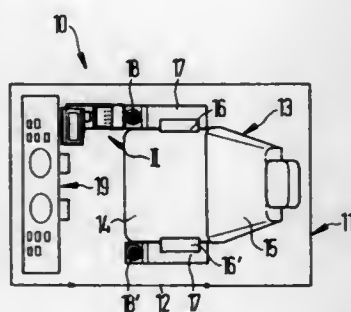
enclosure means extending between said camper main body and said roof when said roof is in its raised, camping position;

a lateral slide-out room coupled to said camper main body, said lateral slide-out room movable in a lateral direction between a retracted, storage position and an extended, operational position to provide additional living space; and

two extendable rooms coupled to said camper main body, one at each end of said camper main body, each extendable room being movable along said longitudinal direction relative to said camper main body between a retracted position and an extended position to provide a sleeping berth.

5,567,004  
COCKPIT FOR OPERATING VEHICLES AND HEAVY  
EQUIPMENT  
Ludwig Pietzsch, Karlsruhe, Germany, assignor to Pietzsch  
Automatisierungstechnik GmbH, Ettlingen, Germany  
Filed Mar. 17, 1994, Ser. No. 210,308  
Claims priority, application Germany, Mar. 18, 1993, 43 08  
556.3

U.S. Cl. 296—190      Int. Cl.<sup>6</sup> B60K 37/06      13 Claims

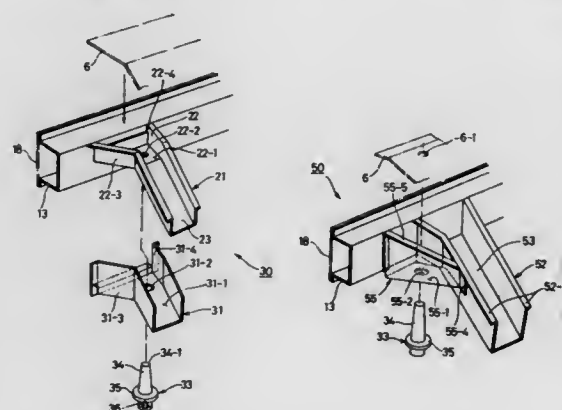


1. A cockpit for operating vehicles and heavy equipment, comprising: a seat for an operator, a coverable display traveling up and down; instruments in view of the operator; at least one multiple-function machinery control directly accessible by a seated operator, said display pivoting and tilting around two non-parallel axes and being directly viewable and accessible by the operator.

5,567,005  
CAR BODY WORK SUB-FRAME MOUNTING  
STRUCTURE

**Masami Kosuge; Satoshi Takemoto, and Masami Suzuki, all of Saitama-ken, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**  
**Filed Feb. 28, 1995, Ser. No. 396,152**  
**Claims priority, application Japan, Mar. 18, 1994, 6-048676**  
**Int. Cl.<sup>6</sup> B62D 25/20**

U.S. Cl. 296—204 21 Claims



1. In a car frame having right and left side members disposed in a longitudinal direction and a cross member extending laterally between the side members in a breadth direction, a car body work sub-frame mounting structure, comprising:

a bracket which is fitted at a joint section of one of the side members and the cross member,

said bracket being secured to said one of said side members and said cross member.

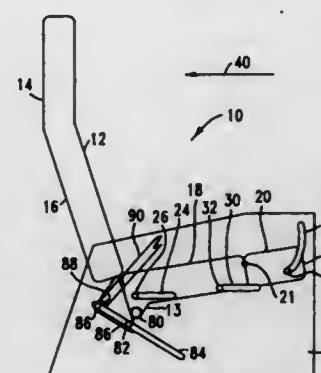
said bracket having a sub-frame attached thereto, said one side member, said cross member and said bracket forming an enclosed box-shaped structure, said enclosed box-shaped structure as viewed in the longitudinal direction having a cross-section with said one side member and said cross member delineating upper, left and rights sides of said cross-section and with said bracket having a bottom plate extending generally horizontally across and delineating a lower side of said cross-section,

a single nut member having a screw hole at a bottom thereof for securing and supporting said sub-frame therebelow, said single nut member extending between and connected to both said bottom plate of said bracket and a bottom plate of one of said one side member and said cross member, said single nut member being located in a selected position along said bracket.

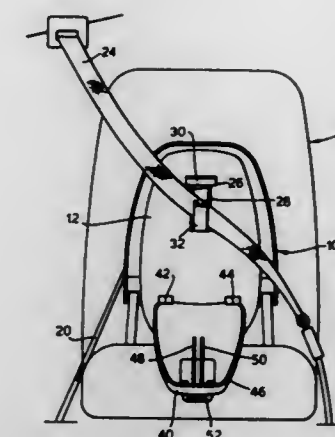
3. In a car frame having right and left side members which are disposed in a longitudinal direction of a car body work and a cross member which is spanned between the side members in a breadth direction of the body work, a car body work sub-frame mounting structure, comprising:

a bracket which is fitted at a joint section of one of the side members and the cross member,  
said bracket being secured to said one of said side members and said cross member,  
said bracket having a sub-frame attached thereto, to which suspensions and other are secured,  
wherein a floor panel is placed on said side members, said cross member, and said bracket.

**5,567,006**  
**VEHICLE SEAT WITH ARTICULATED SECTIONS**  
**Joseph McCarthy, 1725 North Talbot, R.R. #1, Windsor,**  
**Ontario, Canada**  
**Filed Oct. 1, 1993, Ser. No. 130,579**  
**Int. Cl.<sup>6</sup> B60N 2/42**  
**U.S. Cl. 297—216.15** **15 Claims**



1. A seat for supporting a passenger in a vehicle comprising a seat base including a first section and a second section, the first section defining a first point on the first section and the second section defining a second point on the second section, the seat including first means adapted to be coupled between the first section and the vehicle for controlling motion of the first section relative to the vehicle such that, upon a sudden acceleration of the vehicle, at least a portion of the acceleration being directed from forward to rearward relative to the orientation of the seat and having a magnitude greater than a predetermined threshold level, the first section of the seat base moves away from a first section rest position so that the first point on the first section moves along a first predetermined path and wherein the seat further includes second means for controlling motion of the second section relative to the vehicle, the second means being adapted to be coupled between the second section and the vehicle such that, upon a sudden acceleration of the vehicle, at least a portion of the acceleration being directed from forward to rearward relative to the orientation of the seat and having a magnitude greater than a predetermined threshold level, the second point on the second section moves away from a second section rest position along a second predetermined path, wherein the first path is different than the second path and wherein as the first and second sections move away from their respective rest positions, the distance between the first and second points changes and the elevation of at least a portion of the second section is changed relative to the elevation of a portion of the first section, and wherein, as the first and second sections move away from their respective rest positions, a hip restraining portion of the second section, adapted to restrain a forward motion of a passenger's hips, is raised.

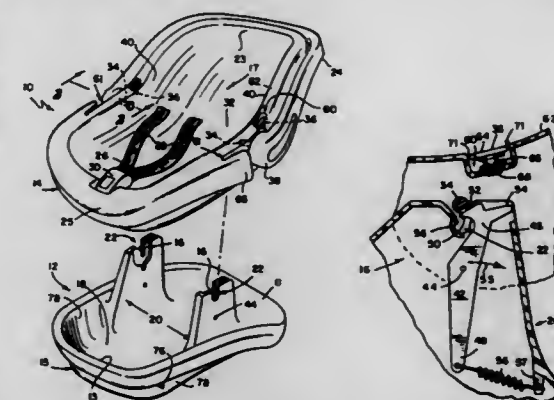


clamping means on the side of the seat back facing away from the occupant for inhibiting movement of the shoulder portion of the adult seat belt relative to the seat back, and  
a cover arranged, when in a closed position to enclose the guide means and to cause engagement of said clamping means, wherein the clamping means comprises first and second clamping elements mounted on the seat back, the first clamping element being movable relative to the second clamping element, and the cover carries camming means for moving the first clamping element into a clamping position relative to the second clamping element, wherein the first and second clamping elements have a plurality of mutually parallel ribs arranged to provide a sinuous path for the shoulder portion so as to increase the friction resisting movement of the shoulder portion relative to the seat back.

**5,567,008**  
**PORTABLE INFANT SEAT HAVING A DETACHABLE**  
**BASE**

Richard E. Cone, II, Athens, Ohio, assignor to Cosco, Inc.,  
Columbus, Ind.  
Filed Nov. 4, 1994, Ser. No. 334,743  
Int. Cl.<sup>6</sup> B60N 2/28

a U.S. Cl. 297-256.16 52 Claims



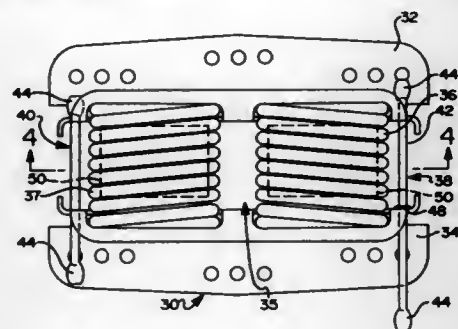
1. A restraining system for a child comprising a base including a base shell, an infant carrier including a shell formed to be received by the base, the shell formed to include a mounting site, and a clamp arm pivotably mounted and located within the base shell and positioned to engage the mounting site, the clamp arm being arranged to limit both vertical and horizontal movement of the mounting site relative to the clamp arm when the mounting site is engaged by the clamp arm, the clamp arm being provided with a release surface located within the base shell adjacent the mounting site and adapted to be actuated by a user to pivot the clamp arm to release the mounting site.

**5,567,007**  
**INFANT SAFETY SEAT**  
**Waldemar Czernakowski, Blaustein; Hermann Wetter, Ulm,**  
**both of Germany, and David W. Burtleigh, Aldwick, England,**  
**assignors to Britax Romer-Kindersicherheit GmbH, Ulm,**  
**Germany, and Britax-Excelsior Limited, Andover, England**  
**Filed Mar. 2, 1995, Ser. No. 397,476**  
**Claims priority, application United Kingdom, Mar. 24, 1994,**  
**9405860**

U.S. Cl. 297—250.1 Int. Cl.<sup>6</sup> A47C 1/08 1 Claim

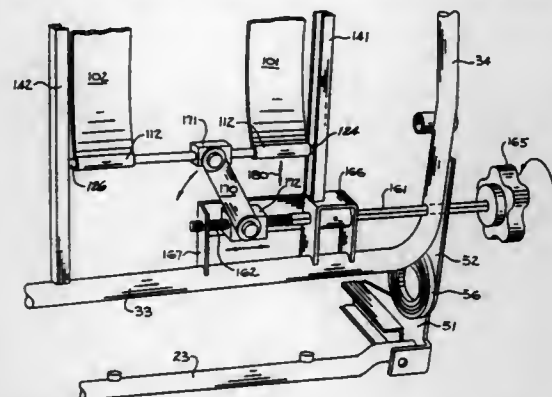
1. An infant safety seat, adapted to be mounted in a vehicle so that a seated occupant faces rearwardly, comprising:  
a rigid seat back,  
a seat portion,  
guide means on the side of the seat back facing away from the occupant for receiving a shoulder portion of an adult seat belt,

**5,567,009**  
**ROCKING/RECLINING CHAIR HAVING LIMIT MEANS AND NOISE SUPPRESSION MEANS**  
 Judy E. Fay, Newport; Larry P. LaPointe, Temperance, and Chad S. Stetler, Carleton, all of Mich., assignors to La-Z-Boy Chair Company, Monroe, Mich.  
 Filed Oct. 13, 1994, Ser. No. 322,788  
 Int. Cl.<sup>6</sup> A47C 3/02  
 U.S. Cl. 297—258.1 16 Claims



1. A rocking chair comprising:  
 a base;  
 a chair frame supported on said base for rocking movement relative to said base;  
 a rocker spring assembly coupling said base and said chair frame, said rocker spring assembly having an upper bracket secured to said chair frame, a lower bracket secured to said base, spring means disposed between and secured to said upper and lower brackets for biasing said chair frame in an upright, neutral position and for enabling a seat occupant to rock forwardly and rearwardly, and a first and second limit rod disposed between said upper and lower brackets, each of said first and second limit rods having a shaft portion and a stop member disposed at each end of said shaft portion, said upper and lower brackets having apertures formed there-through for receiving said shaft portion of each of said first and second limit rods such that said stop members are engageable with said upper and lower brackets to define a range of rocking movement; and  
 means for suppressing noise generated by said spring means as said chair frame is rocked.

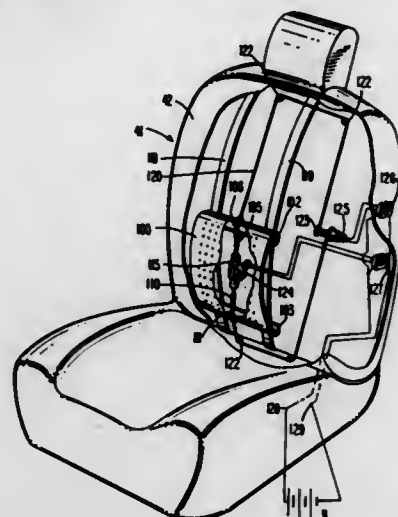
**5,567,010**  
**ADJUSTABLE LUMBAR SUPPORT**  
 Michael Sparks, Jacksonville, Ala., assignor to Bostrum Seating, Inc., Piedmont, Ala.  
 Filed Aug. 29, 1994, Ser. No. 297,312  
 Int. Cl.<sup>6</sup> A47C 3/025  
 U.S. Cl. 297—284.4 18 Claims



supporting an inwardly curved lumbar portion of a spine of an individual, the seat comprising:

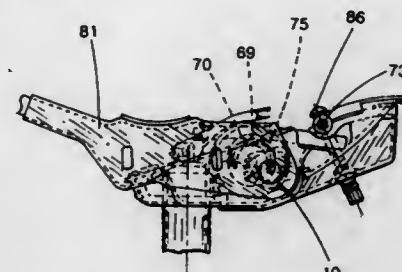
- a lower frame having a rearmost portion;  
 an upper frame borne by the lower frame and operable to support the spine of the individual, the upper frame having a lowermost portion which is pivotally mounted on the rearmost portion of the lower frame;  
 a lumbar support borne by the upper frame and having a first end, a second end, and a middle portion, and wherein the middle portion is operable to curve outwardly from the upper frame;  
 a first supporting member supporting the first end of the lumbar support, and a second supporting member supporting the second end of the lumbar support, and wherein the first and second members are borne by the upper frame; and  
 an adjustment assembly for changing the curvature of the lumbar support by moving the first support member relative to the second support member, the adjustment assembly having a rotatable shaft and a link that is pivotally coupled to one of either the rotatable shaft and one of the support members, and wherein the first support member is fixed relative to the frame and the second support member is movable along a predetermined path of travel in the direction of the first member.

**5,567,011**  
**CUSHION FOR ANATOMICAL SUPPORT, ESPECIALLY FOR THE LUMBAR AND CERVICAL REGIONS, TO FIT ONTO SEAT BACKS**  
 Lorenza Sessini, Via Calmi, 32, Vallate, Italy  
 Continuation-in-part of Ser. No. 917,060, Jul. 30, 1992, Pat. No. 5,335,965. This application May 12, 1994, Ser. No. 241,733  
 Claims priority, application Italy, Mar. 9, 1990, 19632/90  
 Int. Cl.<sup>6</sup> A47C 3/25  
 U.S. Cl. 297—284.7 5 Claims



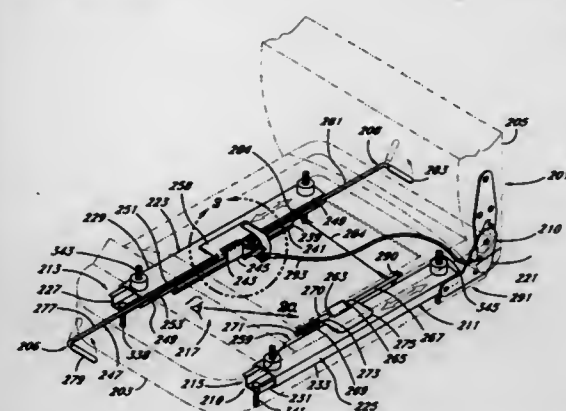
1. Adjustable cushion for anatomical support mountable on a back of a seat, said adjustable cushion comprising:  
 a curved elastic plate having longitudinal ends, said longitudinal ends of said plate being curved backwards so as to form an upper channel and a lower channel and said elastic plate being mountable on said back of said seat projecting convexly from said back;  
 means for adjusting a convexity of said curved elastic plate including a posterior vertical central brace consisting of a pair of aligned threaded rods having posterior ends and threaded in opposite directions and a cylindrical scroll means receiving said aligned threaded rods so that said posterior ends of said threaded rods are securable in said upper and lower channels and said convexity of said curved elastic plate can be varied by rotating said scroll means; and  
 an electric ratio motor connected to said scroll means to drive said scroll means rotatably.

**5,567,012**  
**CHAIR CONTROL**  
 Glenn A. Knoblock, Kentwood, Mich., assignor to Steelcase, Inc., Grand Rapids, Mich.  
 Continuation-in-part of Ser. No. 797,717, Nov. 25, 1991, Pat. No. 5,333,934, which is a continuation of Ser. No. 738,808, Jul. 31, 1991, which is a continuation of Ser. No. 850,528, Apr. 10, 1986, Pat. No. 4,776,333. This application Aug. 1, 1994, Ser. No. 285,632  
 Int. Cl.<sup>6</sup> A47C 3/026  
 U.S. Cl. 297—303.3 19 Claims



1. A tilt assembly for a chair, said assembly comprising:  
 a control housing;  
 a back support lever pivoted to said control housing;  
 a torsion spring disposed within said control housing, said torsion spring having first and second ends, said first end engaging said back support lever;  
 an adjuster plate having a forward end pivoted to said control housing, said adjuster plate further having a rearward end;  
 an adjuster nut engaging the rearward end of said adjuster plate, said second end of said torsion spring engaging said adjuster plate; and  
 an adjuster screw mounted on said control housing and engaging said adjuster nut.

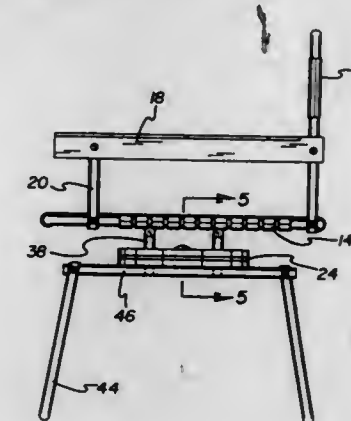
**5,567,013**  
**SEAT SUPPORT AND SLIDE MECHANISM**  
 Chung L. Chang, 22834 Lazy Trail Rd., Diamond Bar, Calif. 91765  
 Filed Feb. 17, 1995, Ser. No. 390,708  
 Int. Cl.<sup>6</sup> A47C 1/02; B60N 2/12  
 U.S. Cl. 297—341 11 Claims



1. A support assembly for a seat having a sitting platform and a back rotatably secured thereto, comprising:  
 a first slide mechanism adapted to be mounted under one side of a seat, comprising:  
 an elongate first support defining a first track having a first end and a second end;  
 a first seat bracket slidable along said first track in a first direction of relative motion;  
 a second slide mechanism adapted to be mounted under a seat opposite said first slide mechanism, comprising:

- an elongate second support defining a second track having a first end and a second end;  
 a second seat bracket slidable along said second track in a direction of relative motion parallel to said first direction of relative motion;  
 a first latch mounted on one of said first slide mechanism and said second slide mechanism selectively engageable to prevent movement of said one of said first or said second slide mechanism;  
 a first actuator extending beyond said first end of said first bracket;  
 a first linkage connecting said first actuator to said first latch such that a predetermined manual manipulation of said first actuator causes said first latch to disengage;  
 a second actuator extending beyond said second end of said first bracket;  
 a second linkage connecting said second actuator to said first latch such that a predetermined manual manipulation of said second actuator causes said first latch to disengage;  
 a third actuator adapted to be secured to a seat back; and  
 a third linkage connecting said third actuator to said first latch such that a predetermined movement of said third actuator causes said first latch to disengage.

**5,567,014**  
**FOLDING SWIVEL CHAIR**  
 James G. Fitch, 2290 Adrian St., Napa, Calif. 94558  
 Filed Oct. 2, 1995, Ser. No. 537,525  
 Int. Cl.<sup>6</sup> A47C 1/02  
 U.S. Cl. 297—344.21 1 Claim



1. A folding swivel chair that provides a chair having both foldability and swiveling features comprising, in combination:  
 an upper section having a seat portion fabricated of crossing plastic strips, the seat portion having a back rest portion foldably secured to a distal end thereof with the back rest capable of folding inwardly on top of the seat portion in a folded orientation, the upper section having a pair of arm rest portions foldably secured to the back rest portion and extending inwardly therefrom, each arm rest portion having a bracket foldably secured to the seat portion for allowing the arm rest portions to fold atop the seat portion in the folded orientation;  
 a swivel mechanism comprised of an upper plate, a lower plate, and a neoprene layer therebetween, the upper plate and the lower plate and the neoprene layer being coupled together by a nut and bolt extending through a bushing through the coupled together upper plate, lower plate, and neoprene layers with the upper plate and lower plate being of similar dimensions, the upper plate having two pairs of outwardly extending brackets secured to opposing sides thereof, the brackets secured to the seat portion of the upper section, the lower plate having two pairs of outwardly extending brackets secured to opposing sides thereof; and



a lower section having a pair of folding leg sections foldably secured together by two cross bars, the two cross bars being secured to the two pairs of outwardly extending brackets of the lower plate of the swivel mechanism, wherein the pair of folding legs can be both folded inwardly to a position adjacent to the seat portion of the upper section.

5,567,015

## INFLATABLE HEADREST APPARATUS

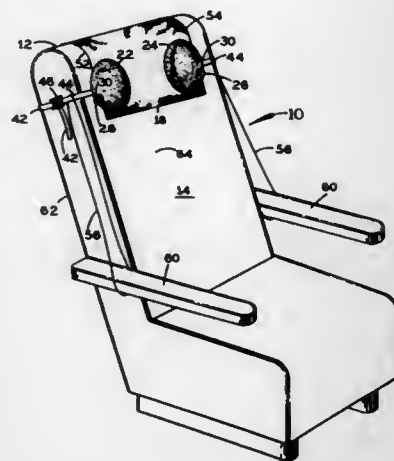
Antonio Arias, P.O. Box 7878, Panama 9, Panama

Filed Mar. 1, 1995, Ser. No. 396,768

Int. Cl.<sup>6</sup> A47C 1/10; 7/36

U.S. Cl. 297—397

6 Claims



1. A headrest apparatus for use with a seat having a backrest with an upper end, a rear face, a front face, a left seat arm and a second seat arm, the headrest apparatus, comprising:

a flexible sheet member formed from a blanket material for wrapping over said upper end having a sheet member first end having a first length and a first thickness for extending down said rear face of said back rest and a sheet member second end having a second length and a second thickness for extending down said front face of said back rest, the first length of the sheet member first length being shorter than the second length of the sheet member second length, and the first thickness of the sheet member first end being thicker than the second thickness of the sheet member second thickness,

a pair of lateral head support cushion members, each of the head support cushion members having an inflatable sack and valve means for separately inflating and deflating each inflatable sack, each head support cushion secured to said sheet member and spaced apart from each other a sufficient distance to receive between them the head of a user on the sheet member, for comfortably retaining said head against lateral movement and rotation, means for securing said sheet member to said back rest,

a first pair of belt means for securing a left side of the sheet member first end to a left side of the sheet member second end,

a second pair of belt means for securing a right side of the sheet member first end to a right side of the sheet member second end,

a first strap means for securing the first pair of belt means to the left seat arm, and

a second strap means for securing the second pair of belt means to the right seat arm.

5,567,016

## HANDICAPPED ACCESSIBLE AUDITORIUM SEAT

Richard A. Koprowski, New Franken, Wis., assignor to Krueger International, Inc., Green Bay, Wis.

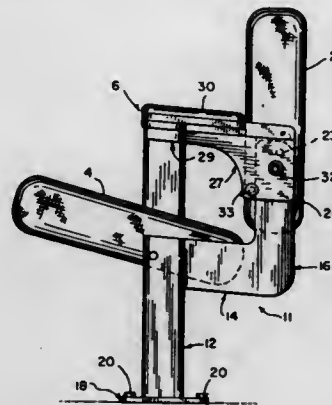
Continuation of Ser. No. 186,432, Jan. 25, 1994, abandoned.

This application Sep. 27, 1995, Ser. No. 534,346

Int. Cl.<sup>6</sup> A47C 7/54

U.S. Cl. 297—411.32

10 Claims



1. A handicapped accessible seating assembly, comprising:

a seat;

a back;

a movable arm, the arm being movable between a first user position in which the arm extends forwardly of the back and is disposed above the seat, and a second transfer position in which the arm is positioned so as not to extend forwardly of the back, for providing access to the seating assembly from an aisle upon horizontal movement of a user from the aisle onto the seat;

wherein the seat and back are movably mounted to a support for movement independent of each other, wherein the support includes a base adapted for mounting to a support surface; a transverse member extending rearwardly from the base; and an upwardly extending member located adjacent the back extending upwardly from a rearward portion of the transverse member;

wherein the seating assembly includes a substantially vertical plate-like mounting member pivotally mounted to the upwardly extending support member and to which the arm is mounted; and stop structure interposed between the mounting member and the upwardly extending support member for controlling the range of movement of the arm; and

wherein the seat is pivotally mounted between an inoperative position and an operative position, wherein the seat in its operative position is adapted to receive a user, and wherein the base and the transverse member are disposed below the uppermost extent of the seat when the seat is in its operative position.

5,567,017

## FRAMEWORK ELEMENT FOR A SEAT, COMPONENT MAKING USE THEREOF, AND ITS USE ESPECIALLY FOR VEHICLE SEAT

Bernard Bourgeois, Champvert; Francois Fauray, Montargis; David Quenel, Glen, and Eric Zunino, Montargis, all of France, assignors to Cesa-Compagnie Europeenne De Sieges Pour Automobiles, Levallois-Perret Cedex, France

Filed May 19, 1995, Ser. No. 444,773

Claims priority, application France, May 20, 1994, 9406197

Int. Cl.<sup>6</sup> A47C 7/02

U.S. Cl. 297—452.2

15 Claims

1. A framework component for a seat made from a substantially cylindrical tube with a closed outline, said tube being bent into a U-shaped configuration with two substantially parallel branches (10), two elbows (30), and a transverse bridge (20) which joins the

5,567,019

## WHEEL FOR IN-LINE ROLLER SKATES

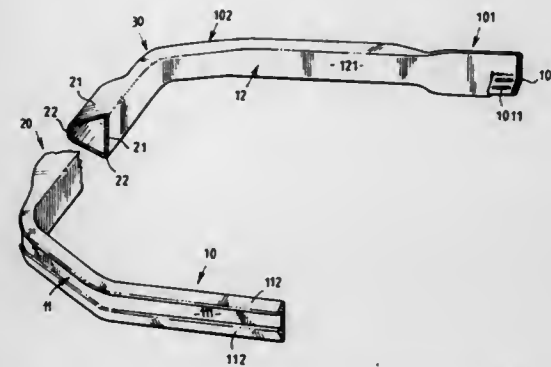
Irfan F. Raza, Utica; Thomas F. Preczewski, New Baltimore, and Ronald D. Walther, Algonac, all of Mich., assignors to U.S. Farathane Corporation, Utica, Mich.

Filed Sep. 23, 1994, Ser. No. 311,354

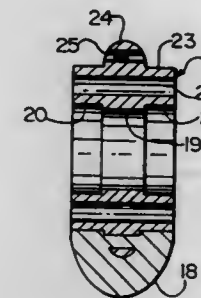
Int. Cl.<sup>6</sup> A63C 7/06

U.S. Cl. 301—5.3

29 Claims



branches together with said elbows (30), each branch (10) having, in cross section, a channel configuration with a dish face (11) and a substantially flat opposite face (12) which is locally in contact with the dish face (11), said dish face (11) comprising a substantially flat bottom (111) and two lateral rims (112) delimited by two, inner and outer, flanks (1121, 1122), one of which is substantially perpendicular to the bottom (111) and the other of which is oblique with respect to the bottom (111), said opposite face (12) forming a substantially flat back (121) in contact with the substantially flat bottom (111), both said back (121) and said bottom (111) extending, perpendicularly to an overall plane of said U-shaped configuration to the branches of said U-shaped configuration, from a free end of the branch up to the corresponding elbow (30) joined to said branch.



1. A wheel construction comprising:

a hub section formed of a thermoplastic polyurethane material having a first durometer hardness; and

a tire section formed of a thermoplastic polyurethane material having a second durometer hardness, molded onto said hub section to form a molecularly adhered, integral hub and tire structure.

5,567,018

## CONTINUOUS MINING LINEAR ADVANCE SYSTEM

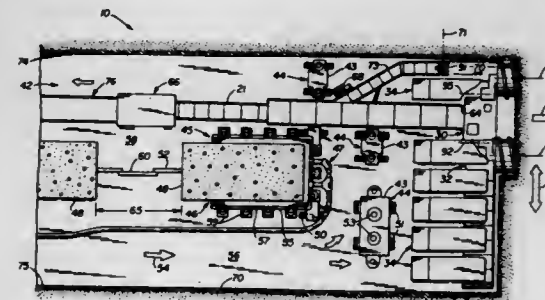
Wm. Mark Hart, Littleton, Colo., assignor to Cyprus Amax Minerals Company, Englewood, Colo.

Filed Apr. 17, 1995, Ser. No. 423,382

Int. Cl.<sup>6</sup> F21C 41/04

U.S. Cl. 299—11

17 Claims



1. A method of developing an entry in a coal body, comprising the steps of:

removing coal from a face of the entry, the face exposing a roof, a floor, and two opposed ribs as it is advanced into the coal body;

carrying away coal removed from the face of the entry in a continuous, non-interrupted manner;

removing coal from a web remaining between the floor and one of the opposed ribs;

carrying away coal removed from the web in a continuous, non-interrupted manner;

applying an upward pressure to the roof;

installing a plurality of roof bolts into the roof;

constructing a plurality of pillars extending substantially between the floor and the roof and positioned about midway between the two opposed ribs, the plurality of pillars dividing the entry into two sides; and

providing air isolation between the two sides of the entry defined by the plurality of pillars.

5,567,020

## QUICK-RELEASE BICYCLE AXLE FASTENER

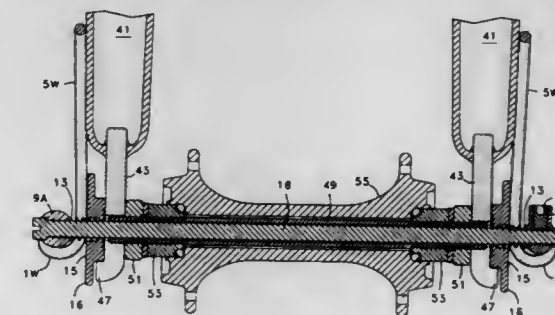
Cal M. Phillips, Platteville, Wis., and John V. Stewart, Orlando, Fla., assignors to S.A.F.E.-Q.R. Corporation, Platteville, Wis.

Filed Jun. 26, 1995, Ser. No. 494,031

Int. Cl.<sup>6</sup> B60B 27/00

U.S. Cl. 301—124.2

16 Claims



1. A quick-release axle fastener for attaching a hollow axle to a pair of safety drop-outs on a velociped, comprising:

a control rod inside the axle, having two ends extending therefrom;

a pivot mount attached to at least one end of the control rod;

a safety interlock washer with a finger grip, slidably mounted on the control rod inboard of the pivot mount, which engages the safety drop-out when pressed against it;

a compression spring between the pivot mount and the interlock washer, urging the washer inward;

a lever pivotally attached to the pivot mount, having a fastening position and a releasing position; and

means attached to the lever for pressing the washer inward when the lever is rotated from the releasing position to the fastening position;

whereby the pressing means forces the washer against the drop-out when the lever is in the fastening position, and, when the lever is in the releasing position, the washer continues to be

urged against the drop-out by the spring until the washer is pulled outward by the fingers of a user, providing an automatic safety backup.

5,567,021

## POWER-ASSISTED BRAKE SYSTEM

Alain Gaillard, Karlsruhe, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE94/01476, § 371 Date Jul. 14, 1995, § 102(e) Date Jul. 14, 1995, PCT Pub. No. WO95/16593, PCT Pub. Date Jun. 22, 1995

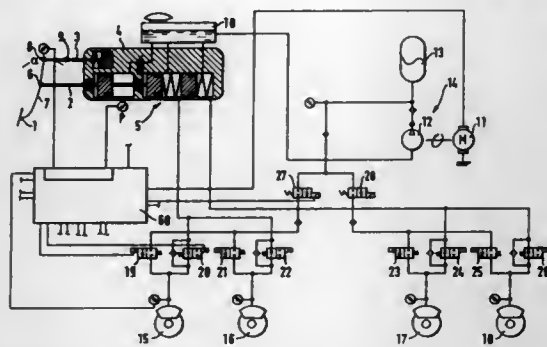
PCT Filed Dec. 13, 1994, Ser. No. 491,898

Claims priority, application Germany, Dec. 18, 1993, 43 43 314.6

Int. Cl. B60T 13/14; 8/40; 7/06; 13/66

U.S. Cl. 303—3

20 Claims



1. A power-assisted brake system having a valve arrangement which is controlled electrically by means of a pedal, for adjusting wheel brake pressures which are derived from a power-assistance pressure source, a travel simulator which is assigned to the pedal and an emergency brake cylinder which is activated by means of the pedal and at least one piston remains in a region of an initial position during braking with power assistance, from which initial position, an emergency brake pressure is produced during a working stroke of the piston and is fed to wheel brakes through at least one emergency brake line, a cylinder (38) includes a locking piston (35) which is displaced therein and arranged between the pedal (1) and a piston (36) which is constructed as a pressure rod piston, an emergency piston-side locking chamber (41) is connected to a reservoir (10) via a first 2/2-way solenoid valve (43) which is closed during a power-assistance mode, and wherein the 2/2-way solenoid valve (43) is open in an emergency operation and connects the locking chamber (41) to the reservoir (10).

5,567,022

## DUAL CIRCUIT ATTENUATORS AND NETWORK FOR ANTI-LOCK BRAKE SYSTEM

Herbert L. Linkner, Jr., Dexter, Mich., assignor to Kelsey-Hayes Company, Livonia, Mich.

Continuation-in-part of Ser. No. 163,658, Dec. 7, 1993. This application Dec. 30, 1994, Ser. No. 366,750

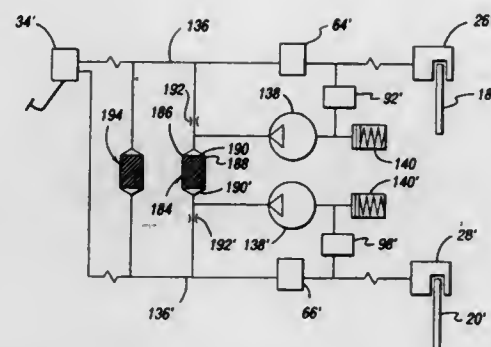
Int. Cl. B60T 8/32; 8/36; 8/48

U.S. Cl. 303—87

6 Claims

1. An anti-lock brake system for a wheeled vehicle having fluid pressure actuated wheel brakes comprising a brake master cylinder, first and second brake pressure passages respectively connecting said brake master cylinders with separate ones of said wheel brakes;

a first pressure isolation solenoid valve means in said first pressure passages for alternatively blocking and establishing fluid pressure distribution to one of said wheel brakes and a second pressure isolation solenoid valve means in said second pressure passage for alternatively blocking and establishing fluid pressure distribution to another of said wheel brakes,



each pressure isolation solenoid valve means having a fluid pressure flow inlet side and a fluid pressure flow outlet side; a first brake pump assembly having a high pressure side and a low pressure side, said high pressure side being connected to said flow inlet side of said first pressure isolation solenoid valve means and a second brake pump assembly having a high pressure side and a low pressure side, said high pressure side of said second brake pump assembly being connected to said flow inlet side of said second pressure isolation solenoid valve means;

first and second solenoid operated hold-and-dump valve means respectively connected between said low pressure side of said first brake pump assembly and said flow outlet side of said first pressure isolation solenoid valve means and between said low pressure side of said second brake pump assembly and said flow outlet side of said second pressure isolation valve;

a common pressure pulse attenuator assembly communicating directly with said flow inlet side of each of said pressure isolation solenoid valve means, said attenuator assembly comprising a compressible member, an attenuator container surrounding said compressible member, two attenuator cavities at spaced regions of said attenuator container, one attenuator cavity being connected to said high pressure side of said first brake pump assembly and the other of said attenuator cavities being connected to said high pressure side of said second brake pump assembly;

said compressible member being cylindrical with first and second end walls defining in part first and second attenuator cavities, said container having a cylindrical wall, said compressible member having a cylindrical surface that is sized to effect sealing engagement with said cylindrical wall thereby hydraulically isolating said high pressure sides of said pump assemblies, one with respect to the other, whereby noise energy is absorbed as a function of length-to-diameter ratio of said compressible member and the Young's modulus of said compressible member during deflection.

5,567,023

## 3-POSITION 3-WAY SOLENOID VALVE

Jang-Yeol Yoo, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Sep. 28, 1995, Ser. No. 535,579

Claims priority, application Rep. of Korea, Sep. 28, 1994, 94-24459

Int. Cl. B60T 8/36

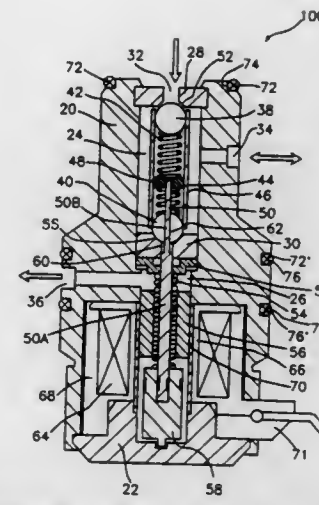
U.S. Cl. 303—119.2

9 Claims

1. A 3-position 3-way solenoid valve comprising:

a valve body having a housing with an inlet port for receiving fluid from a fluid generating source, an outlet port for admitting/discharging said fluid and an exhaust port for exhausting said fluid, and a cover airtightly coupled to said housing for closing one end of said housing;

a barrier wall for dividing chambers formed by said housing and cover within said valve body into a first chamber communicated with said inlet port and outlet port and a second cham-



ber communicated with said exhaust port, having a barrier-wall hole for communicating said first chamber with said second chamber;

opening/closing means movable along the lengthwise direction of said valve body for selectively opening and closing said barrier-wall hole and inlet port in accordance with an electric signal, functioning by allowing said inlet port to communicate with said outlet port, said outlet port to communicate with said exhaust port and said inlet port, outlet port and exhaust port to be closed, and being placed at a first position of closing said barrier-wall hole in a normal state that said electric signal is not supplied, at a second position of closing said barrier-wall hole and inlet port in a first active state that a first electric signal being a half of maximum current is supplied and at a third state of opening said barrier-wall hole in a second active state that a second electric signal having the maximum current is supplied; and

a solenoid assembly having a ring-shaped solenoid coil, a bobbin wound by said solenoid coil and an electrode electrically connected to said solenoid coil to be exposed to the outside of said valve body for moving said opening/closing means on said first position when said electric signal is not supplied to said second position upon the supply of said first electric signal and then to said third position upon the supply of said second electric signal.

5,567,024

## METHOD AND SYSTEM FOR DAMPING WHEEL SPEED OSCILLATION ON VEHICLES HAVING ANTI-LOCK BRAKE SYSTEMS

Bernard W. Johnson, Brighton, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Dec. 13, 1994, Ser. No. 354,514

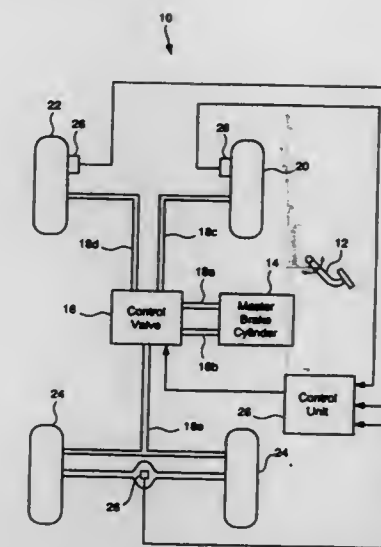
Int. Cl. B60T 8/74

U.S. Cl. 303—158

13 Claims

1. For use with a vehicle having a plurality of wheels each having a brake, and an anti-lock braking system having an electronic control unit capable of cyclic control of brake pressure to the brake, a method of damping wheel speed oscillation of any one of the wheels during an anti-lock brake system event wherein brake pressure is decreased as the wheel speed decelerates from a vehicle speed and brake pressure is maintained at a steady-state level until the wheel speed accelerates to the vehicle speed, the method comprising:

sensing a speed of the one wheel; determining a wheel slip based on the sensed wheel speed and a vehicle speed reference; determining whether the wheel slip has exceeded a predetermined slip threshold representing a pre-lock-up condition; determining whether the wheel is accelerating; while the wheel slip has exceeded the predetermined slip threshold, determining whether the acceleration of the wheel speed



has begun within a first predetermined time limit if the wheel is accelerating; and in response to the acceleration of the wheel speed beginning within the first predetermined time limit, increasing brake pressure applied to the wheel from the steady-state level in a step-wise fashion during acceleration of the wheel before the wheel speed reaches the vehicle speed reference.

5,567,025

## PORT SYSTEM FOR STERILE TRANSFER

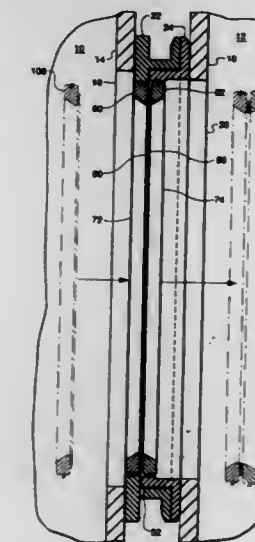
Earl C. Haag, III, 2933 Herrlyn Ct., Dallastown, Pa. 17313

Filed Oct. 6, 1994, Ser. No. 319,125

Int. Cl. A61G 11/00

U.S. Cl. 312—1

9 Claims



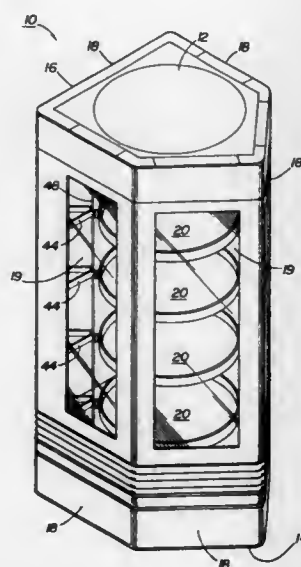
1. A port system for allowing the transfer of material between sterile environments maintained in first and second walled enclosures which have been positioned such that a wall of the first enclosure faces and is proximate to a wall of the second enclosure, the facing walls of the first and second walled enclosures having respectively first and second openings formed therein and facing each other, the port system comprising:

a) first and second outer frame members for mounting in the first and second openings respectively, each outer frame member being adapted to sealingly engage the enclosure wall around the opening in which it is mounted, the first and second outer frame members respectively defining first and second cylinders



- dical outer ports of equal diameters which are axially aligned when the outer frame members are mounted in the openings, each outer frame member having an exterior surface portion surrounding its outer port and located so as to lie in a plane exterior to the enclosure in which it is mounted;
- b) first and second cylindrical inner frame members sized to be closely receivable in either of the outer ports, the first and second inner frame members respectively defining first and second pass-through ports of substantially identical size and shape, each inner frame member including an exterior surface which surrounds its pass-through port and lies in a plane perpendicular to its cylindrical axis;
- c) means for removably and sealingly mounting the first and second inner frame members within the first and second outer ports respectively in positions such that the exterior surface of each inner frame member is flush with the exterior surface portion of its respective outer frame member and faces the exterior surface of the other inner frame member;
- d) first and second impermeable film members attached respectively to the exterior surfaces of the first and second inner frame members and sealingly covering the first and second pass-through ports respectively, each film member forming a planar surface over its respective pass-through port;
- e) adhesive means applied to at least one of the planar surfaces and capable of causing the planar surfaces to adhere when brought into contact with each other;
- f) means for enabling separation of the portion of each film member covering its respective pass-through port from the remainder of the film member; and
- g) joining means for bringing and holding the first and second outer frame members together in such relationship that the planar surfaces make adhering contact with one another.

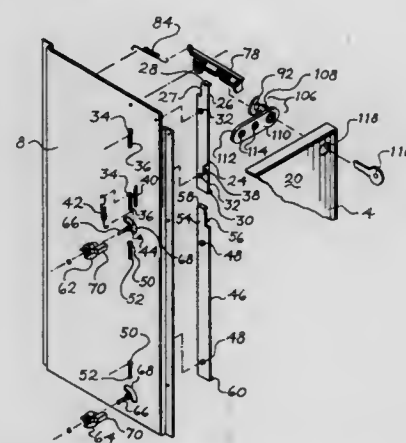
**5,567,026**  
**APPARATUS FOR DISPLAYING PRODUCTS**  
 Edward L. Lacewell, Pontotoc, Miss., assignor to Master-Bilt, Pontotoc, Miss.  
 Filed Nov. 2, 1994, Ser. No. 333,422  
 Int. Cl.<sup>6</sup> A47F 3/10  
 U.S. Cl. 312—135



1. A display, comprising:
- a. a housing having a plurality of upstanding side walls defining therein an enclosure, the enclosure having a front half and a back half;
- b. a circular rotatable shelf having a vertical axis, the shelf disposed within the enclosure, a portion of the shelf being disposed in the back half of the enclosure, with the vertical

- axis of the shelf in alignment with a plane defining an interface between the front half and the back half of the enclosure; and
- c. means disposed within the enclosure, only in the back half of the enclosure, for supporting the shelf for rotation about the vertical axis of the shelf, wherein the supporting means comprises:
- i. at least three vertical members disposed within the back half of the enclosure and secured to the side walls of the back half of the housing;
- ii. a plurality of mounting pegs, each detachably secured to a vertical member;
- iii. at least three bottom axles, each being affixed to one of the mounting pegs and laterally extending into the enclosure;
- iv. at least three horizontally spaced apart co-planar bottom support rollers disposed in the back half of the enclosure and rotatable about a horizontal axis, each bottom support roller having a first cylindrical member coaxial with and rotatably mounted on an axle, the first cylindrical member having a rear edge adjacent the side wall terminating in a flanged portion;
- v. a top axle affixed to one of the mounting pegs and laterally extending into the enclosure; and
- vi. a top support roller disposed in the back half of the enclosure above the bottom support rollers and laterally disposed between at least two of the bottom support rollers, the top support roller being rotatable about a horizontal axis and having a second cylindrical member rotatably mounted on the top axle, the second cylindrical member having a front edge terminating in a flanged portion.

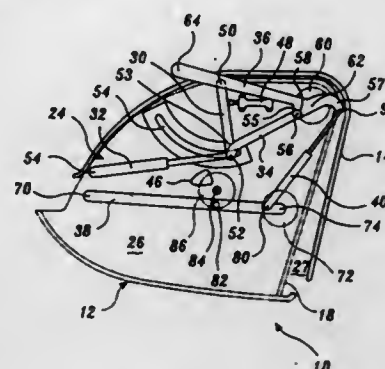
**5,567,027**  
**CABINET DRAWER LOCK**  
 Duane G. McClung, Kalamazoo, and Paul G. Dame, Holland, both of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.  
 Filed Jun. 11, 1993, Ser. No. 75,970  
 Int. Cl.<sup>6</sup> E05B 65/46  
 U.S. Cl. 312—219



1. A lock system for a container having a first side wall and a second side wall, said lock system comprising:
- a first component;
- a first track supporting said first component and defining a path for said first component to move from a closed position to an open position;
- a first locking bar movable along a direction of movement from a first position to a second position allowing said first component to move along said first track to said open position;
- a second component;
- a second track supporting said second component and defining a path for said second component to move from a closed position to an open position;

- a second locking bar movable from a first position to a second position allowing said second component to move along said second track to said open position;
- a locking mechanism engaging a ramp surface of a moving mechanism that rotates about an axis so that the rotating ramp surface causes said locking mechanism to move a first distance substantially parallel to said axis to a locking position so as to prevent said first locking bar from moving from said first position to said second position and preventing said second locking bar from moving from said first position to said second position whereby said first component and said second component are each locked in said closed position.

**5,567,028**  
**MECHANISM FOR TRANSLATING STORAGE BIN**  
 Arnold J. Lutovsky, Federal Way, and Richard Dahlen, Kirkland, both of Wash., assignors to The Boeing Company, Seattle, Wash.  
 Filed Feb. 27, 1995, Ser. No. 396,159  
 Int. Cl.<sup>6</sup> A47F 5/08  
 U.S. Cl. 312—246

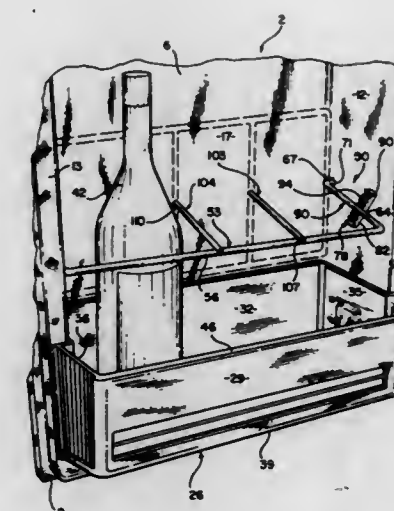


1. An over head storage compartment for use in an aircraft, the storage compartment comprising:
- an overhead support structure coupled to an interior of an aircraft fuselage;
- a storage bin movably coupled to the overhead support structure; and
- a retraction mechanism connected between the storage bin and the overhead structure to allow the storage bin to move between a stowed position approximately linearly downward to a lowered position in a first configuration and to move between a stowed position downward and outward to a lowered position in a second configuration wherein the storage bin is spaced farther outward in the lowered position in the second configuration than in the first configuration and, wherein the retraction mechanism includes upper and lower links both pivotally connected between the support structure and the storage bin, the lower link being reconfigurable to pivotally attach to the storage bin at one of two different locations depending upon whether the retraction mechanism is in the first configuration or the second configuration.

**5,567,029**  
**ADJUSTABLE RETAINER ASSEMBLY FOR A REFRIGERATOR DOOR SHELF**  
 Thomas J. Haenisch, Galesburg; Douglas A. Helms, Knoxville, and Warren F. Johnson, Galesburg, all of Ill., assignors to Maytag Corporation, Newton, Iowa  
 Filed Dec. 22, 1994, Ser. No. 361,542  
 Int. Cl.<sup>6</sup> A47F 7/00; F25D 11/00  
 U.S. Cl. 312—405.1

20 Claims

1. In a refrigerator door including an inner liner having an upstanding wall portion with laterally spaced dike portions project-



13 Claims

- ing therefrom and at least one shelf including a base for supporting various food items located between said dike portions, an adjustable retainer assembly comprising:

an elongated retainer member including an intermediate section and first and second bent sections extending from opposing end portions of said intermediate section and defining terminal ends of said retainer member;

means for pivotally connecting said terminal ends for rotation relative to the base of said shelf about an axis that is located directly adjacent the upstanding wall portion of said inner liner such that said retainer member is rotatable between a non-use condition wherein said retainer member is arranged substantially coplanar with and juxtaposed to the upstanding wall portion in order to permit unobstructed access to and removal of food containers placed on said shelf and an in-use condition wherein said retainer member extends across said dike portions, vertically spaced from the base of said shelf and outwardly of the upstanding wall of the liner; and

detent means for selectively maintaining said retainer member in one of a plurality of vertically spaced positions when said retainer member is in said in-use condition.

**5,567,030**  
**METHOD FOR CONTROLLING PICTURE SIZE IN AN LCD PROJECTOR**

Jong-Keun Shin, Kyungsangbook-Do, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea  
 Filed Mar. 29, 1994, Ser. No. 219,265  
 Claims priority, application Rep. of Korea, Mar. 30, 1993, 5103/1993

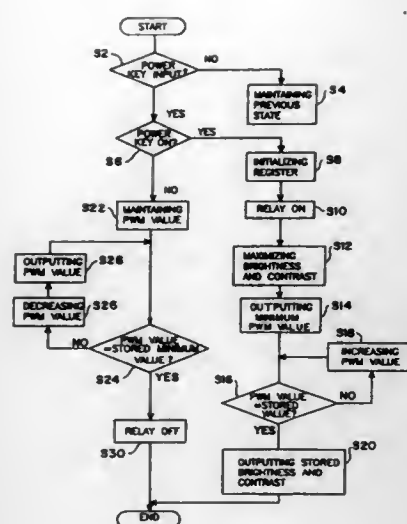
Int. Cl.<sup>6</sup> G03B 21/14

U.S. Cl. 353—85

21 Claims

1. A method for automatically controlling picture size in an LCD projector during a warm-up period of a lighting source of the projector, comprising the steps of:

- a) detecting whether power is turned ON or OFF;
- b) initially projecting a minimum picture size, when the power is turned on; and
- c) gradually increasing, during a warm-up period, the picture size from the minimum picture size to a predetermined picture size.



5,567,031

## HIGH EFFICIENCY DUAL OUTPUT LIGHT SOURCE

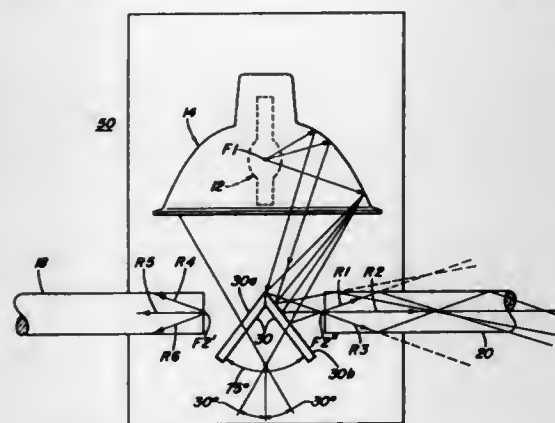
John M. Davenport, Lyndhurst; Richard L. Hansler, Pepper Pike, and William J. Cassary, Richmond Heights, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 20, 1993, Ser. No. 139,378

Int. Cl.<sup>6</sup> F21V 8/00

U.S. Cl. 362—32

8 Claims



1. A centralized lighting system comprising:
  - a source of high intensity light generating a light output;
  - a reflector member shaped in a curved manner and having first and second optical focal points, said reflector having a reflector axis which passes through said first and second optical focal points, said light source being disposed at the first optical focal point, said reflector being configured to reflect said light output in a predetermined angular beam spread relative to said reflector axis;
  - a v-shaped mirror member disposed between said first and second optical focal points, said v-shaped mirror member comprising first and second mirror segments, each of said mirror segments positioned at a predetermined angle relative to said reflector axis to direct said light output and wherein each mirror segment defines a reflected second focus point, said mirror member configured for receiving said light output and configured for dividing said light output into first and second beam portions which are reflected from said mirror segments, respectively, up to 90 degrees relative to said reflector axis;
  - first and second optical transmission members each having an optical transmission axis, each optical transmission member configured for receiving one of said beam portions and trans-

mitting the beam portion along its transmission axis to a location remote from said light source;

wherein an input surface area of each optical transmission member is disposed substantially at one of said reflected second focus points to maximize the light input into the optical transmission member; and

wherein the predetermined angle of each mirror segment is set such that an angle of one of said first and second beam portions entering the optical transmission member is minimized relative to the transmission axis so as to maximize light transmission along each transmission axis to said location remote from said light source.

5,567,032

## ILLUMINATING DEVICE FOR VEHICLES

Frieder Heizmann, Denens, Switzerland, assignor to Robert Bosch GmbH, Stuttgart, Germany

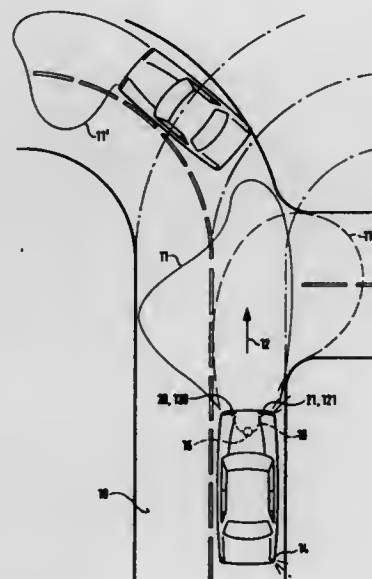
Filed Nov. 16, 1994, Ser. No. 340,223

Claims priority, application Germany, Dec. 3, 1993, 43 41 234.3

Int. Cl.<sup>6</sup> B60Q 1/12

U.S. Cl. 362—37

14 Claims



1. An illuminating device for a vehicle, having at least one light generating unit; at least one light distributing unit arranged separately from said at least one light generating unit; at least one light conducting element composed of light conducting fibers and connecting said units with one another, said light distributing unit being provided with at least one lens element for projecting and distributing light exiting from an end of said light conducting element associated with said light distributing unit, said units and said element being arranged so that a relative arrangement between said end of said light conducting element associated with said light distributing unit and also said lens element is changeable in a substantially horizontal direction for changing a distribution of light exiting said light conducting elements; and an adjusting device provided for changing said arrangement and activated by steering of the vehicle so that an illumination provided by said light distributing unit is increased in an actual driving direction.

5,567,033

## VEHICULAR HEADLAMP HAVING THERMALLY PROTECTED FRONT LENS

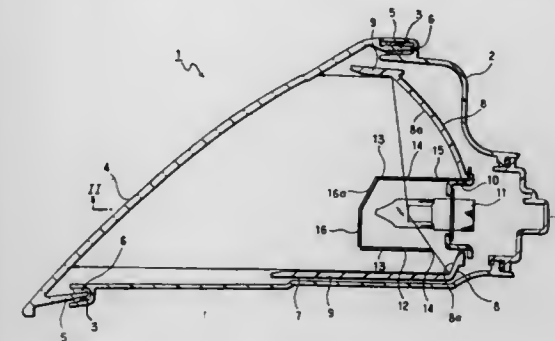
Toshio Tanaka, and Takaaki Nishizawa, both of Shizuoka, Japan, assignors to Kofu Manufacturing Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1995, Ser. No. 419,694

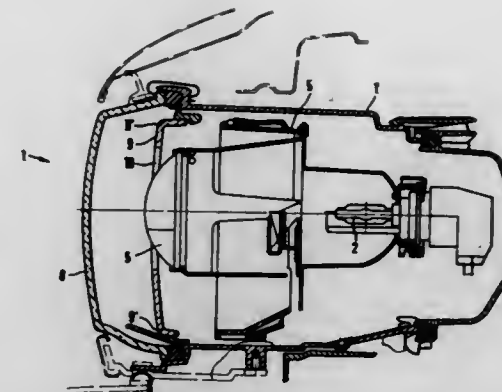
Claims priority, application Japan, Apr. 15, 1994, 6-101568 Int. Cl.<sup>6</sup> F21M 3/14

U.S. Cl. 362—61

7 Claims



1. A vehicular headlamp comprising:
  - a lamp body having a front opening;
  - a lens covering said front opening of said lamp body, said lens being inclined with respect to an optical axis of said headlamp;
  - a reflector disposed in a lamp chamber defined by said lamp body and said lens, said reflector comprising an effective reflection region;
  - an electric bulb supported by said reflector; and
  - a substantially cylindrical shade for shielding light emitted from said bulb and directing said light toward a part of said reflector other than said effective reflection region thereof, said shade comprising a cut-out portion formed at a side part thereof for transmitting light emitted from said bulb and an inclined portion at a front end portion of said shade, the shape of said inclined portion substantially corresponding to a shape of said inclined lens surface.



means for adjusting the light source assembly within the housing to allow the light source assembly to be aimed in different lateral directions; and

wherein the central opening in the diffuser is of a size to accommodate the adjusting movement of the light source assembly including the projecting lens.

5,567,035

## HEADLIGHT FOR VEHICLES WITH REFLECTOR ADJUSTING DEVICE

Karl-Otto Dobler, Reutlingen; Gustav Klett, Moessingen; Horst Dahm, Neuhengstett, and Rainer Jocher, Aidingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

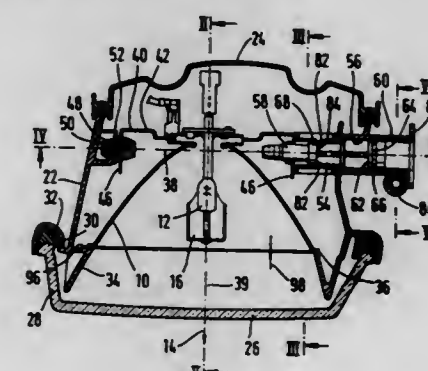
Filed Jun. 19, 1995, Ser. No. 491,782

Claims priority, application Germany, Jun. 17, 1994, 44 21 355.7

Int. Cl.<sup>6</sup> B60Q 1/04

U.S. Cl. 362—66

21 Claims



5,567,034

## MOTOR VEHICLE HEADLAMP

Horst Dietewich, Petershausen; Joachim Ripperger, Unterföhring; Tassilo Stempf, München, and Albert Gröber, Eichenau, all of Germany, assignors to Bayerische Motoren Werke AG, Muenchen, Germany

Continuation-in-part of Ser. No. 98,031, Jul. 28, 1993, abandoned. This application Feb. 1, 1995, Ser. No. 382,264

Claims priority, application Germany, Jul. 28, 1992, 42 24 856.5

Int. Cl.<sup>6</sup> B60Q 1/06

U.S. Cl. 362—66

6 Claims

6. A motor vehicle headlamp comprising:
  - a housing;
  - a separate light source assembly comprising a light source, a reflector for reflecting light from the light source in a forward direction, and a projecting lens in front of the reflector for projecting the light forwardly;
  - a cover plate arranged in front of the projecting lens;
  - a diffusing lens which has a central opening which is at least partially penetrated in a forward direction by the projecting lens, said diffusing lens being configured to effect transmission of only light emitted laterally by the projecting lens to form a corona which, together with the projecting lens, forms an apparently effective light area of the headlamp as viewed from the front which is equivalent to the area of the diffusing lens and its central opening penetrated by the projecting lens;

1. A headlight for vehicles, comprising a holder; an adjusting device; a reflector which is at least indirectly mounted on said holder and is swivelable relative to said holder about at least one swivel axis by means of said adjusting device, said adjusting device having an adjustment element rotatably mounted on said holder and rotatable about said swivel axis and having an eccentric portion formed eccentrically to said swivel axis, said adjustment device also having a transmission element which is mounted on said holder for swiveling about an additional axis and is at least indirectly swivelably connected to said reflector in a connecting point which is eccentric to said additional axis, said transmission element being coupled, eccentrically to said additional axis, to said eccentric portion of said adjustment element in a tangential direction relative to said additional axis so that during rotation of said adjustment element about said swivel axis via said eccentric portion said transmission element, due to its coupling with said eccentric portion, swivels about said additional axis and thereby said reflector is swiveled about said swivel axis because said



transmission element is connected with said reflector in the connecting point which is eccentric to said additional axis.

5,567,036

## CLEARANCE AND SIDE MARKER LAMP

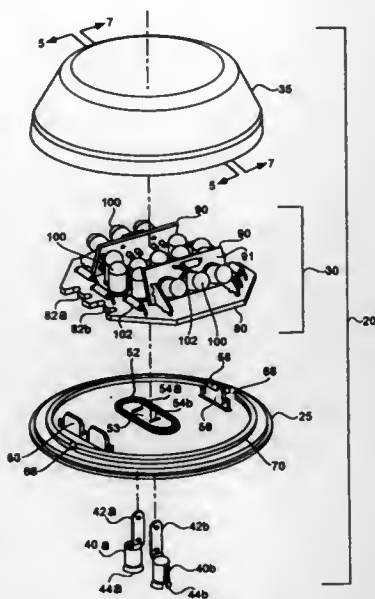
Greg Theobald, Aurora, Ind.; Luigi Tavernese, Brantford, Canada; Fred Boles, and Edwin Sugg, both of Madison, Ind., assignors to Grote Industries, Inc., Madison, Ind.

Filed Apr. 5, 1995, Ser. No. 417,656

Int. Cl.<sup>6</sup> B60Q 1/00

U.S. Cl. 362—80

19 Claims



1. A clearance/side marker lamp for a motor vehicle comprising:
  - a rigid housing;
  - a first plurality of light emitting diodes arranged within said housing and collectively operable to emit light generally in a first direction;
  - a second plurality of light emitting diodes arranged within said housing and collectively operable to emit light generally in a second direction, said second direction being arranged at an acute angle relative to said first direction;
  - a third plurality of light emitting diodes arranged within said housing and collectively operable to emit light generally in a third direction, said third direction being arranged at an acute angle relative to said first direction and at an obtuse angle relative to said second direction; and
  - a lens positioned in front of said plurality of light emitting diodes, said lens configured to receive light emitted in said first, second and third directions and spread said light in an arc of continuous light spanning approximately 180 degrees.

5,567,037

## LED FOR INTERFACING AND CONNECTING TO CONDUCTIVE SUBSTRATES

Andrew R. Ferber, New York, N.Y., assignor to Ferber Technologies, L.L.C., Roseland, N.J.

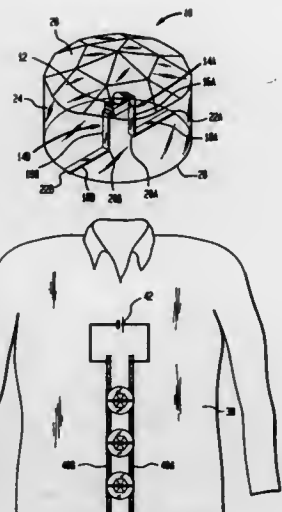
Filed May 3, 1995, Ser. No. 434,370

Int. Cl.<sup>6</sup> F21L 15/08

U.S. Cl. 362—104

19 Claims

1. An illumination device comprising:
  - An LED having a diode body and a pair of leads connected to said diode body said lead having a first portion extending along a first plane away from said diode body; encapsulating material forming a housing having external walls defining boundaries, said housing completely surrounding said diode



body, said first portion of said leads extending along said first plane and being arranged within said housing, each of said leads having a second portion extending outside of said housing and being arranged substantially flush against one of said external walls of said housing and extending along a second plane substantially transverse to said first plane, said second portion of said leads terminating at a location within the boundary defined by said external wall along which said second portion of said leads extend and connector means for affixing said housing to a given piece of apparel, said connector means comprising a socket having means for engaging said housing and the apparel to which said housing is being affixed, said apparel having a first surface and a second surface and current conducting means arranged on said first surface for transmitting current from a power source to said LED, said second portion of said leads being arranged adjacent said first surface of said apparel for electrical communication with said current conducting means, said socket being arranged adjacent said second surface of said apparel in alignment with said housing and being in engagement therewith.

5,567,038

## CAP WITH REMOVABLE FLUORESCENT LIGHT

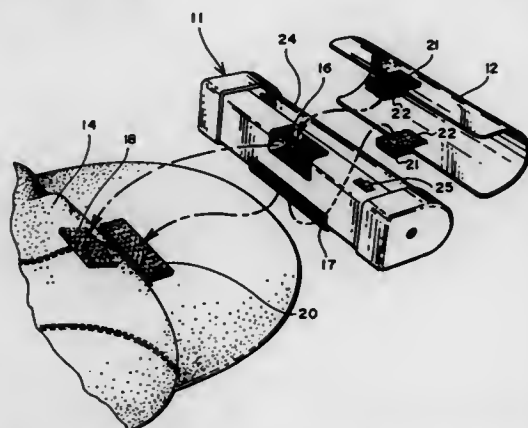
Banning G. Lary, 6370 S.W. 87th Ter., Miami, Fla. 33143

Filed Mar. 13, 1995, Ser. No. 402,860

Int. Cl.<sup>6</sup> F21L 15/14

U.S. Cl. 362—106

6 Claims



1. A lighting apparatus for illuminating darkness which comprises:
  - a cap having a crown and a bill;

said cap having a first series of fixedly attached hooks engaged to said crown and said bill; and  
a fluorescent lighting device having a second series of fixedly attached hooks which is removably attached to said first series of fixedly attached hooks.

central portion of said film lamp, said power unit being in electrical communication with said film for supplying power thereto.

5,567,039

## CAP FOR HOLDING FLASHLIGHTS

B. Kelly Sims, 19 Elkins Lake, Huntsville, Tex. 77340

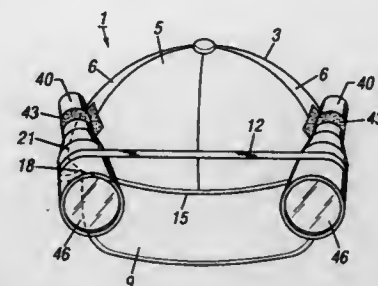
Filed Dec. 4, 1995, Ser. No. 567,647

Int. Cl.<sup>6</sup> F21L 15/14

U.S. Cl. 362—106

12 Claims

U.S. Cl. 362—148



1. A cap for holding at least one flashlight on the head of a user, comprising:
  - a baseball type cap having a crown and a forwardly extending bill;
  - said crown having side portions;
  - flashlight attachment means secured to each of said side portions; and
  - a flashlight attached to said flashlight attachment means.

5,567,040

## ELECTROLUMINESCENT JACKET AND BAG

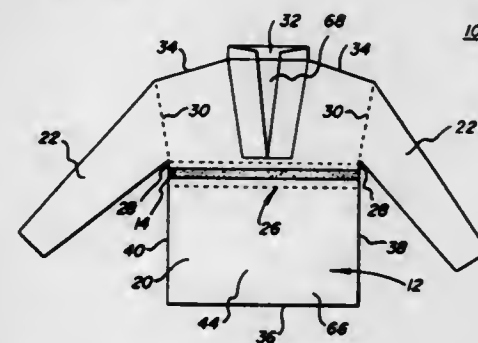
Dennis A. Tabanera, 228 Willowdale Rd., Morgantown, W. Va. 26505

Filed Apr. 11, 1995, Ser. No. 419,798

Int. Cl.<sup>6</sup> F21L 15/06

U.S. Cl. 362—108

6 Claims



1. A jacket comprising:
  - (a) a fabric shell having an interior and an exterior,
  - (b) a power unit held by said shell,
  - (c) an electroluminescent film lamp releasably retained by said shell and on the exterior of said shell, said shell comprising a retainer said retainer comprises an upper flap, a lower flap and a back section, said lower flap spaced apart from said upper flap and extending toward said upper flap, and a back section associated with said flaps and overlaid by said flaps, said film lamp being retained between said flaps and said back section, said flaps being spaced apart thereby exposing a

5,567,041

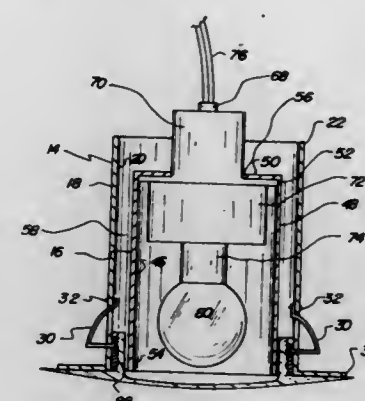
## SELF SUPPORTING RECESSED CEILING FIXTURE

Karl Slocum, 21 Greenwood Ave., Trenton, N.J. 08611

Filed Aug. 14, 1995, Ser. No. 514,683

Int. Cl.<sup>6</sup> F21S 1/02

10 Claims



2. A self supporting recessed ceiling fixture comprising:
  - a can formed of an exterior cylinder with four spring clips attached thereto and an interior cylinder, the exterior cylinder having an interior surface, an exterior surface, a top opening and a bottom edge with a bottom opening adjacent thereto, each spring clips being capable of movement between the interior and exterior surface of the exterior cylinder, the exterior cylinder capable of being positioned within a pre-cut hole of a ceiling, the spring clips being capable of supporting the exterior cylinder within the hole by clipping onto an interior surface of the ceiling when the exterior cylinder being position within the hole;
  - the interior cylinder being sized for positioning within the exterior cylinder being positioned within the hole of the ceiling, the interior cylinder being supported within the exterior cylinder by three supporting spokes, the supporting spokes being attached to the interior cylinder and the interior surface of the exterior cylinder,
  - a bulb support formed of a connector, a housing, a fitter and a bulb receptacle and sized for positioning within the interior cylinder, the housing and the connector of the bulb support projecting above the interior cylinder and beyond the top opening of the exterior cylinder, the fitter and the bulb receptacle being positioned within the interior cylinder;
  - a diffusing lens having external threads and capable of being positioned within the bulb support; and
  - a support ring having internal machine threads and a securing bearing, the ring being positionable within the exterior cylinder and exterior the interior cylinder with the securing bearing locking onto the interior surface of the exterior cylinder, the machine threads of the ring capable of coupling the external threads to support the lens within the can positioned through the ceiling.

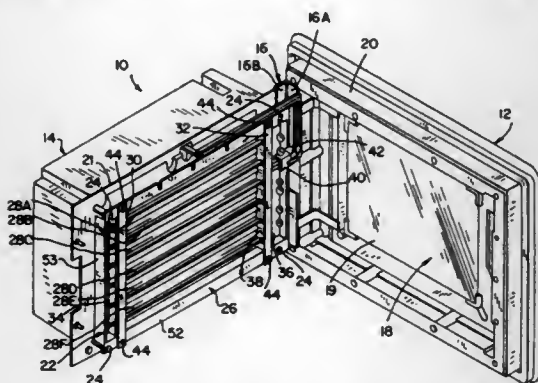
**5,567,042**  
**REFLECTOR FOR FLAT PANEL DISPLAY BACKLIGHT UNIT**

David W. Farchmin, Grafton, and John S. Clark, Cudahy, both of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed May 27, 1994, Ser. No. 250,131  
Int. Cl.<sup>6</sup> F21V 7/09

U.S. Cl. 362—241

20 Claims



1. In a reflector for multiple parallel cylindrical light sources of the type having an arcuate reflective surface section for each parallel light source, each surface section defining an apex ridge directly behind the corresponding light source and said surface section extending from both sides of said apex ridge in arcuate surfaces, the improvement wherein said arcuate surfaces extending from said apex are defined by a constant radius surface, and wherein at least one of said constant radius surfaces is joined at its edge opposite from said apex ridge by a hyperbolic surface.

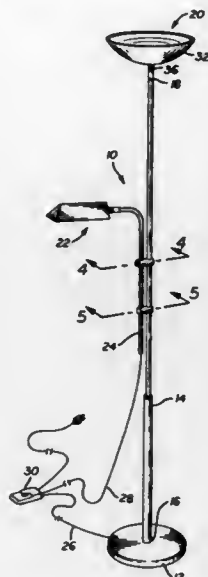
**5,567,043**  
**TORCHIERE LAMP WITH VERTICALLY ADJUSTABLE TASK LIGHT**

Dennis K. Swanson, Woodland Hills, Calif., assignor to Lamps Plus, Inc., Chatsworth, Calif.

Filed Nov. 14, 1995, Ser. No. 557,893  
Int. Cl.<sup>6</sup> F21V 21/14

U.S. Cl. 362—250

10 Claims



1. A torchiere lamp comprising:

- (1) a base member;
- (2) a stem member connected to and rising centrally from said base member;

- (3) a general area lighting means connected to said stem member at an end thereof opposite said base member;
- (4) a rod disposed adjacent to and substantially parallel with said stem member;
- (5) attachment means for securing said rod to said stem and having first and second positions, said rod being vertically movable relative to said stem member when said attachment means is in said first position but being non-movable when said attachment means is in said second position; and
- (6) task light means affixed to and movable with said rod.

**5,567,044**  
**SMOOTH HEADLIGHT GLASS, IN PARTICULAR FOR A MOTOR VEHICLE, AND A METHOD OF MANUFACTURING THE REFLECTOR OF SUCH A HEADLIGHT**

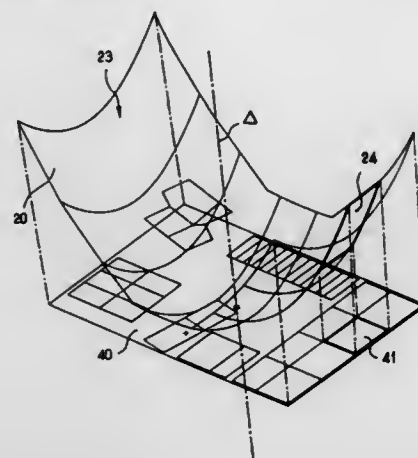
Francois Lopez, Bondy, France, assignor to Valeo Vision, Bobigny, France

Filed Sep. 23, 1994, Ser. No. 311,552

Claims priority, application France, Sep. 24, 1993, 93 11403  
Int. Cl.<sup>6</sup> F21V 7/10

U.S. Cl. 362—348

10 Claims



1. A headlight, in particular for a motor vehicle, the headlight comprising:

- a light source;
- a reflector having a base surface such that a determined distribution of images of the source is formed in a lighting direction that is axial and horizontal; and
- a closure glass that is essentially free of light distribution stripes; the reflector including, over at least a portion of said base surface, a plurality of zones in which light-spreading stripe surfaces are superimposed onto said base surface, each of said zones having an outline and said outlines being defined by projecting a plane array of polygonal, and in particular rectangular, zones along said axial direction onto said base surface, said array being defined as a function of a predetermined distribution of light flux and corresponding to a notional array of striped zones on said closure glass that would have generated the same light distribution, and a differential offset in a horizontal plane between the base surface and each light-spreading stripe surface corresponding to a profile of a respective notional zone of said notional array on said closure glass.

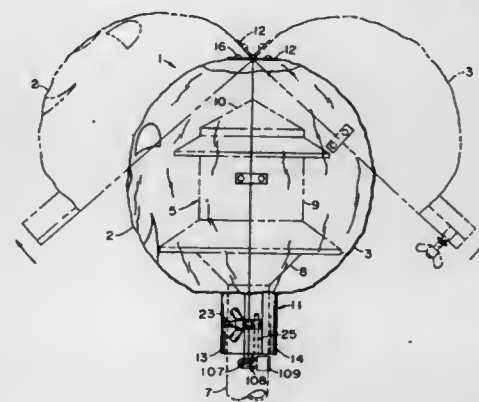
**5,567,045**  
**DECORATIVE LIGHT FIXTURE COVERS FOR OUTDOOR AND INDOOR LIGHTS**

James R. Bucek, 5700 Fresheorn Rd., Cranberry Township, Butler County, Pa. 16066

Filed Feb. 8, 1996, Ser. No. 598,700  
Int. Cl.<sup>6</sup> F21S 1/10

U.S. Cl. 362—363

21 Claims



1. A decorative cover for enclosing a covered light mounted on a post comprising at least two sections forming the decorative cover, said sections being joined together in a hinged relationship to permit the sections to mate forming the decorative cover and to open sufficiently away from each other to permit removal from the covered light, means at the bottom of at least one of said sections and extending downwardly therefrom constructed and arranged to engage the covered light post and form a mounting sleeve thereon when the sections mate to form the decorative cover and means to clamp said sleeve to the post to maintain the decorative cover above the post and enclosing the covered light.

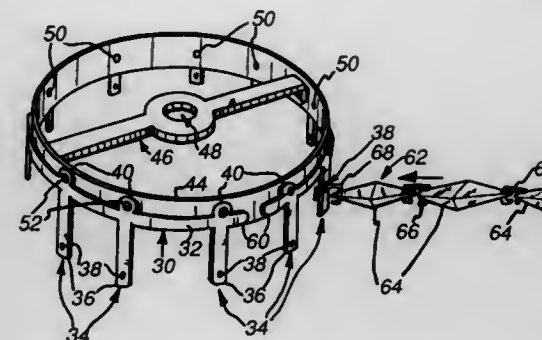
**5,567,046**  
**STRETCHABLE CHANDELIER ORNAMENT STRING ASSEMBLY**

John M. Lucas, Cadyville, N.Y., assignor to Schonbek Worldwide Lighting Inc., Plattsburgh, N.Y.

Filed Jun. 16, 1995, Ser. No. 491,265  
Int. Cl.<sup>6</sup> F21V 5/06; 17/00

U.S. Cl. 362—405

20 Claims



1. A stretchable chandelier ornament string assembly comprising:

- a first chandelier ornament string having a first end and a second end;
- a second chandelier ornament string having a first end and a second end; a chandelier frame, the first end of each of the first ornament string and the second ornament string being attached to attachment locations on the chandelier frame, the chandelier frame including a rigid frame member; and
- a spring assembly attached to the rigid frame member comprising a first spring element and a second spring element inter-

connected by a common runner and extending transversely from the common runner, each of the first spring element and the second spring element defining attachment locations engaging a respective second end of each of the first ornament string and the second ornament string and providing spring tension to each of the first ornament string and the second ornament string and the common runner being deformed into a deformed shape about a portion of the rigid frame member under spring force wherein the spring force and the deformed shape of the common runner are maintained by the rigid frame member.

**5,567,047**  
**TOOL COUPLING ASSEMBLY FOR A HANDHELD BLENDER**

Thomas Fritsch, Eppstein, Germany, assignor to Braun Aktiengesellschaft, Kronberg, Germany

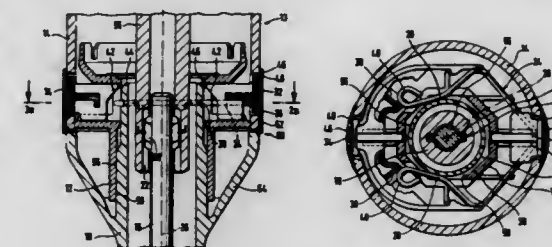
Filed Jun. 14, 1995, Ser. No. 490,467

Claims priority, application Germany, Jul. 12, 1994, 44 24 501.7

Int. Cl.<sup>6</sup> A47J 43/07

U.S. Cl. 366—129

11 Claims



1. A handheld blender comprising a motor assembly and a tool assembly releasably connectable to said motor assembly, said tool assembly including a tool shaft and a tool shank rotatably receiving said tool shaft, said motor assembly having a drive shaft and an approximately U-shaped expansion clamp, said tool shaft being non-rotatably coupled to the drive shaft when said tool assembly is connected to said motor assembly, said tool shank having a mounting groove, wherein connection of the tool assembly with the motor assembly is accomplished by the approximately U-shaped expansion clamp engaging the mounting groove.

**5,567,048**  
**APPARATUS AND METHOD FOR INJECTING DRY PARTICULATE MATERIAL IN A FLUID FLOW LINE**

Carl L. Hammonds, Humble, Tex., assignor to Hammonds Technical Services, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 323,434, Oct. 14, 1994, Pat. No. 5,468,066. This application Jun. 16, 1995, Ser. No. 491,481

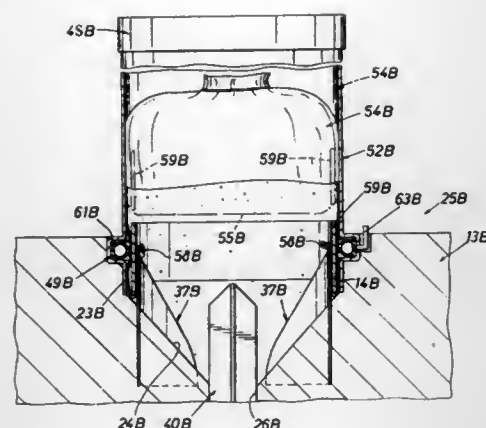
Int. Cl.<sup>6</sup> B01F 13/06

U.S. Cl. 366—139

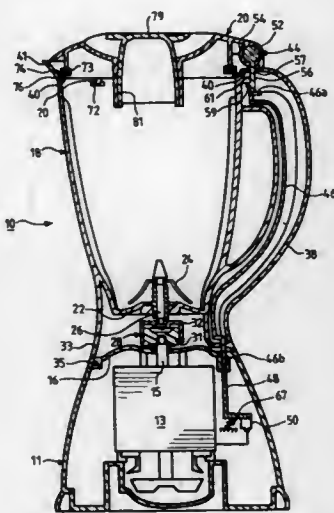
12 Claims

1. A container for dry particulate material comprising: a flexible cylindrical bag having an inner surface and a closed end; and a rigid cylindrical support member positioned within said flexible cylindrical bag adjacent said closed end, said support member being of a rigidity sufficient to permit sealing contact against said inner surface of said bag and said support member within said bag.



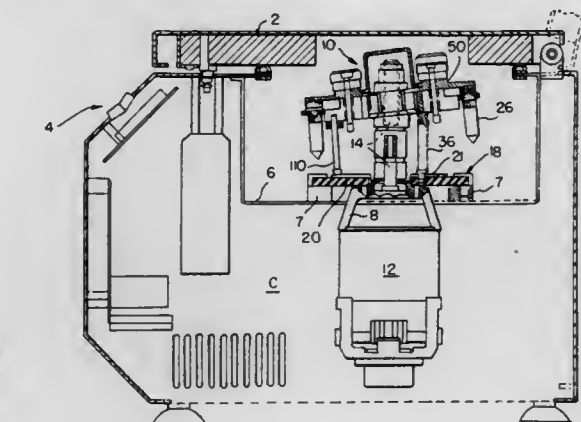


**5,567,049**  
**DOMESTIC MIXER WITH SAFETY DEVICE**  
 Jean-Yves Beaudet, Halcine; Marc Marriere, Ambrières Les Vallées, and Jean-Pierre Trocherie, St Pierre des Nids, all of France, assignors to Moulinex S.A., Paris, France  
 Filed Sep. 5, 1995, Ser. No. 523,253  
 Claims priority, application France, Sep. 2, 1994, 94 10586  
 Int. Cl.<sup>6</sup> B01F 13/04; B02C 23/04  
 U.S. Cl. 366—206



1. In a domestic mixer comprising a base (11) enclosing an electric motor (13) having an output shaft (15) that projects upwardly from an upper portion (16) of the base, and an open bowl (18) closed by a cover (20), said bowl being mounted removably on the base (11) and having a bottom (22) that bears a rotatable tool (24) secured to a vertical shaft (26) passing through said bowl and adapted to couple with the output shaft (15) of the motor; the improvement wherein the cover (20) and an upper edge (40) of the bowl (18) are releasably interconnected by a bolt (44) which is disposed in a recess (54) provided in the cover (20) and which is connected, by a transmission member (46) which is completely integrated in the bowl (18) and actuated by the bolt (44), to a control member (48) movably mounted through the upper portion (16) of the base (11) between a working position to which the control member is brought when the cover (20) is secured by the bolt (44) and in which, under the influence of the transmission member (46) controlled by the bolt (44), the control member actuates a safety switch (50) in an electric supply circuit of the motor (13) so as to permit operating the motor, and a rest position to which the control member is brought when the cover (20) is open and in which the control member does not actuate said safety switch (50), whereupon the motor (13) stops.

**5,567,050**  
**APPARATUS AND METHOD FOR RAPIDLY OSCILLATING SPECIMEN VESSELS**  
 Yury Zlobinsky, Massapequa; Michael Glater, Brooklyn, and Frank Grave, Albertson, all of N.Y., assignors to Savant Instruments, Inc., Farmingdale, N.Y.  
 Filed Aug. 23, 1994, Ser. No. 294,544  
 Int. Cl.<sup>6</sup> B01F 11/00  
 U.S. Cl. 366—209



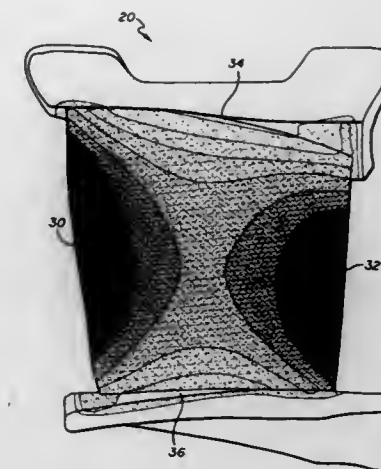
6 Claims

1. Apparatus for rapidly reciprocally vibrating specimen containing vessels to accelerate specimen material in the vessels to relatively high g levels, said apparatus comprising:  
 a disc shaped vessel holder, the vessel holder having vessel receptive structure arrayed thereon at a plurality of circularly spaced locations proximal a disc edge periphery for receiving and holding up to a corresponding plurality of specimen vessels thereon,  
 a vertically oriented rotary shaft rotatable about a fixed axis,  
 a mounting collar fixed on the rotary shaft to rotate therewith, the mounting collar having an outer surface, the said outer surface being symmetrical about an axis skewed longitudinally of the fixed axis, said vessel holder being mounted on said collar outer surface such that the vessel holder vessel receptive structure is symmetrically arrayed with respect to said skewed axis and such that there is relative rotatability between said mounting surface and said vessel holder, the vessel holder when the mounting collar is rotated by rotary shaft rotation and the vessel holder not held, tending to rotate in unison with said mounting collar about the skewed axis but if said vessel holder be held against tendency to rotate with said mounting collar, the vessel holder being caused to oscillate vertically up and down symmetrically of the fixed axis with any given point at the disc edge periphery undergoing one complete oscillation for each rotary shaft revolution,  
 means for rotating said rotary shaft about said fixed axis, and  
 means for halting the vessel holder so that it cannot rotate in unison with the mounting collar.

**5,567,051**  
**THERMAL TESTING OF CERAMIC COMPONENTS USING A THERMAL GRADIENT**  
 Richard E. Annati, Phoenix; Allan J. Rodrigue, Chandler; James T. Sublett, Mesa, and Craig W. Irwin, Tempe, all of Ariz., assignors to AlliedSignal Inc., Morris Township, N.J.  
 Filed Aug. 8, 1994, Ser. No. 287,396  
 Int. Cl.<sup>6</sup> G01N 3/60; 25/00  
 U.S. Cl. 374—57

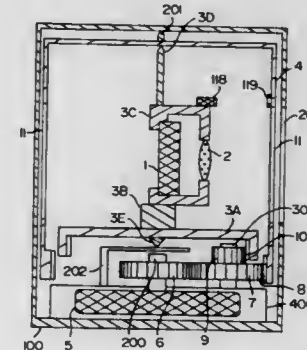
1. A non-destructive evaluation method for a ceramic member comprising the steps of:  
 generating a thermal gradient across said ceramic member;  
 measuring said thermal gradient;  
 comparing said measured thermal gradient with a preselected thermal gradient;

22 Claims



adjusting said generating step until said measured thermal gradient is sufficiently like said preselected thermal gradient; and observing said ceramic member for any cracks.

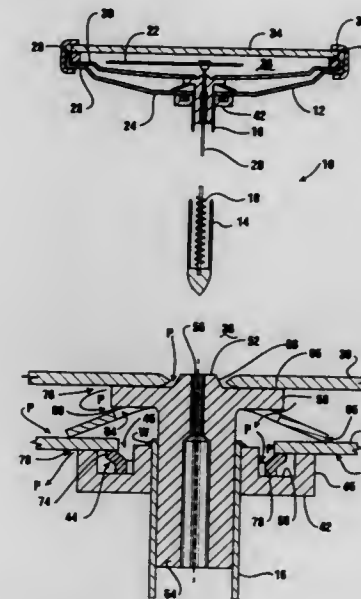
**5,567,052**  
**TEMPERATURE DISTRIBUTION MEASUREMENT APPARATUS**  
 Nobuyuki Yoshiike, Ikoma; Koji Arita, Osaka, and Katsuya Morinaka, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan  
 Continuation of Ser. No. 91,374, Jul. 15, 1993, abandoned.  
 This application Jan. 13, 1995, Ser. No. 372,855  
 Claims priority, application Japan, Aug. 3, 1992, 4-205841; Feb. 26, 1993, 5-037748  
 Int. Cl.<sup>6</sup> G01J 5/08; 5/62  
 U.S. Cl. 374—124



1. A temperature distribution measurement apparatus comprising:  
 (a) an infrared array temperature sensor, which provides temperature output signals from which a temperature distribution is measured, disposed on a rotation member,  
 (b) a focusing means for focusing incident infrared rays on said infrared array temperature sensor,  
 (c) a chopping means for intermittently shielding incident infrared rays from said infrared array temperature sensor, said chopping means rotating around said infrared array temperature sensor, and  
 (d) a driving means for continuously rotating said rotation member, said infrared array temperature sensor and said chopping means while synchronizing the rotation of said chopping means with said rotation member.

**5,567,053**  
**TEMPERATURE SENSING APPARATUS**  
 John B. Ashe, Asheville, N.C., assignor to Figgie International Inc., Willoughby, Ohio  
 Filed Dec. 23, 1994, Ser. No. 366,661  
 Int. Cl.<sup>6</sup> G01K 1/14; 5/62  
 U.S. Cl. 374—155

20 Claims



20. An apparatus for indicating a condition in an environment comprising:  
 a body enclosing a chamber;  
 an indicator in said chamber indicating a condition in the environment;  
 a case wall bounding said chamber, said wall having an opening therethrough;  
 a closure wall surface extending externally of said chamber and in overlying relation with said opening;  
 a member extending in closing relation of said opening, said member including a deformable lip portion engaging said closure wall surface and wherein pressure in said chamber deforms said lip portion to disengage said wall surface to relieve pressure from said chamber.

**5,567,054**  
**ILLUMINATED BAG**  
 Rick Dagleish, 14 Pine St., Sherwood Park, Edmonton, Alberta, Canada  
 Filed Dec. 17, 1992, Ser. No. 992,058  
 Int. Cl.<sup>6</sup> B65D 33/08; 33/00  
 U.S. Cl. 383—10

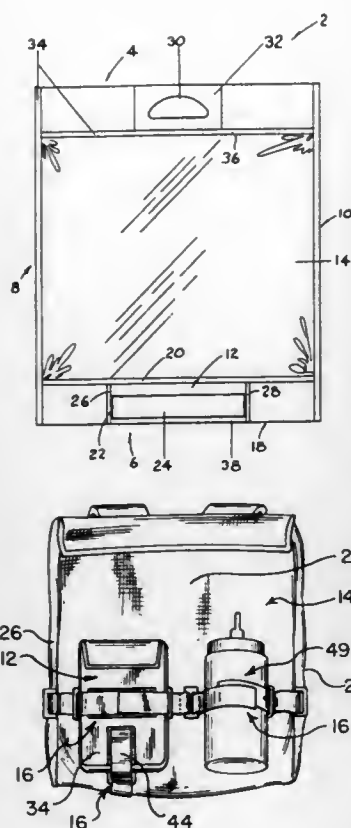
8 Claims

1. A bag with a chemiluminescent wand for illuminating said bag, said bag having: an open top end and sealed bottom end and sealed opposite side ends; a transparent pouch spaced substantially parallel from one of said sealed ends, an opening into said pouch, said chemiluminescent wand disposed within said pouch for illumination upon activating said chemiluminescent wand.

**5,567,055**  
**SYSTEM FOR LASHING COMPONENTS TO MATERIAL**  
 Patrick D. Smith, Golden, Colo., assignor to Mountainsmith, Inc., Golden, Colo.  
 Filed Aug. 15, 1994, Ser. No. 291,588  
 Int. Cl.<sup>6</sup> B65D 30/22  
 U.S. Cl. 383—38

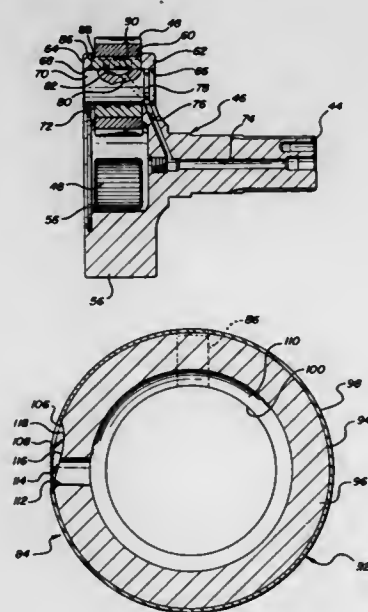
11 Claims

1. A lashing system for selectively attaching a component to a piece of material, the system comprising:



having two mating surfaces, with one of the mating surfaces being attached to the front side of the component, and the other of the mating surfaces being attached to an elongated strap, a terminal end of the strap being attached to the component at a location on the back side of the component and the strap having an opposite free end, wherein one of the second pair of releasable connectors is located on the left side of the component and the other of the second pair of releasable connectors is located on the right side of the component, the distance between the attachment locations of the terminal ends being approximately equal to the distance between the two anchors of the second pair, wherein the strap of each of the second pair of releasable connectors is threaded around the corresponding one of the second pair of anchors with the free end of each strap threaded around the corresponding one of the second pair of anchors and folded back over the front side of the component to form a loop of material from the folded-over strap, to encircle the anchor and allow the other mating surface on the stop to engage with the mating surface on the front side of the component, to tightly lash and anchor the component to the piece of material.

**5,567,056**  
**TURBOCHARGER DRIVE AND PLANET BEARING THEREFOR**  
 James L. Blase, Lemont, and Charles H. McCreary, Oak Park, both of Ill., assignors to General Motors Corporation, Detroit, Mich.  
 Filed Sep. 29, 1994, Ser. No. 315,205  
 Int. Cl.<sup>6</sup> F16C 33/10  
 U.S. Cl. 384—286 7 Claims



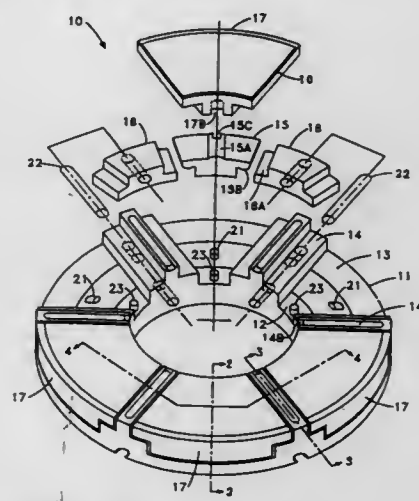
1. A planet bearing for rotatably supporting a planet gear in an engine turbocharger drive, said bearing including an annular ring having an outer bearing surface coaxial with a cylindrical inner wall and opposite first and second ends, an oil supply groove recessed below the bearing surface and bounded axially by shoulders adjacent the ends, oil supply means through the bearing from the inner wall to the supply groove, and the improvement comprising:

passage means in at least one of said shoulders connecting said oil supply groove with an adjacent one of said ends and defining a path for expulsion of dirt-carrying oil from the bearing lubrication oil supply, wherein said passage means are provided in both of said shoulders, and

a piece of material;  
 a first pair of anchors attached to the piece of material at a spaced apart relationship, the two anchors of the first pair being separated from each other by a predetermined distance;  
 a component removably and selectively attached to the piece of material, the component having a front side, a back side, a right side, and a left side, the component having a first pair of releasable connectors attached to the component, each releasable connector having two mating surfaces, with one of the mating surfaces being attached to the front side of the component, and the other of the mating surfaces being attached to an elongated strap, a terminal end of the strap being attached to the component at a location on the back side of the component and the strap having an opposite free end, wherein one of the first pair of releasable connectors is located on the left side of the component and the other of the first pair of releasable connectors is located on the right side of the component, the distance between the attachment locations of the terminal ends being approximately equal to the predetermined distance between the two anchors of the first pair, wherein the strap of each of the first pair of releasable connectors is threaded around the corresponding one of the first pair of anchors with the free end of each strap threaded around the corresponding one of the first pair of anchors and folded back over the front side of the component to form a loop of material from the folded-over strap to encircle the anchor and allow the other mating surface on the strap to engage with the mating surface on the front side of the component, to tightly lash and anchor the component to the piece of material; and  
 a second pair of anchors attached to the material at a spaced apart relationship, the two anchors of the second pair being separated from each other by a distance approximately equal to the predetermined distance between the two anchors of the first pair, the second pair of anchors being separated from the first pair of anchors by a second predetermined distance;  
 wherein the component further includes a second pair of releasable connectors attached to the component, the second pair of releasable connectors being separated from the first pair of releasable connectors by a distance approximately equal to the second predetermined distance, each releasable connector

wherein said passage means comprise flats formed along otherwise convex peripheries of said shoulders to effectively increase local clearance between the shoulders and an associated planet gear.

**5,567,057**  
**TILTING PAD THRUST BEARING ASSEMBLY**  
 C. William Boller, 1380 Gordon Dr., Naples, Fla. 33940  
 Filed Sep. 29, 1995, Ser. No. 536,632  
 Int. Cl.<sup>6</sup> F16C 17/06  
 U.S. Cl. 384—122 3 Claims

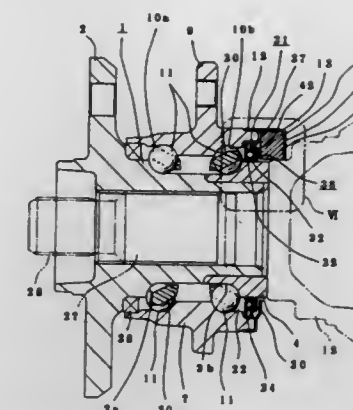


1. An equalizing tilting pad thrust bearing assembly comprising a plurality of similar arcuate shaped tilting pads each having flat upper and lower surfaces,  
 a retaining ring comprising concentric inner and outer retaining rings joined together by a plurality of similar radial spokes designed to house a plurality of upper and lower equalizing links and to support the tilting pads,  
 a plurality of upper equalizing links each having a raised radial cylindrical surface on its otherwise flat upper surface and also having a pair of downwardly facing slightly crowned radial cylinders located along the opposite ends of the link,  
 a plurality of lower equalizing links each having a pair of flat upwardly facing surfaces located at the opposite ends of the link,  
 a plurality of spaced apart stub pivot pins each of which is fixed in the inner wall of the outer retaining ring and extends radially to engage an axial slot in one of the upper equalizing links in order to pivotally support the upper link, and  
 a plurality of radially oriented pivot pins whose opposite ends are fixed in the inner and outer retaining rings each designed to pivotally support one of the lower equalizing links.

**5,567,058**  
**ROLLING BEARING UNIT WITH ROTATING SPEED SENSOR**

Kouichi Morita, Junshi Sakamoto, both of Fujisawa, and Takamichi Okada, Hannou, all of Japan, assignors to NSK Ltd., Tokyo, and Shindengen Electric Manufacturing Co., Ltd., Saitama-Ken, both of Japan  
 Filed Jul. 14, 1995, Ser. No. 502,801  
 Claims priority, application Japan, Jul. 15, 1994, 6-164264  
 Int. Cl.<sup>6</sup> F16C 19/08 2 Claims

1. A rolling bearing unit with a rotating speed sensor comprising:  
 a hub having an axially inner end portion and an axially outer end portion to which a flange is provided for mounting a

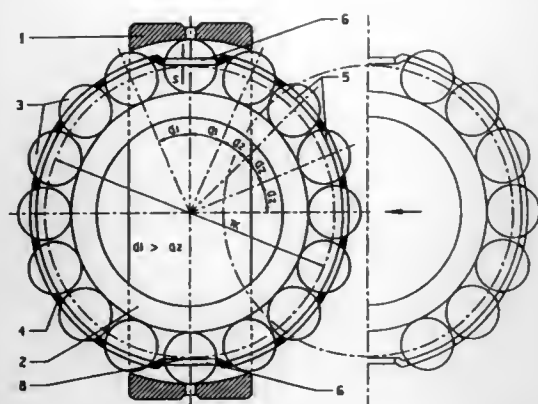


vehicle wheel and an outer peripheral surface on which an inner ring raceway is provided,  
 an outer ring having an axially inner end portion, an outer peripheral surface to which a mount portion is provided for supporting a suspension apparatus and an inner peripheral surface on which an outer ring raceway is formed,  
 a plurality of rolling members provided between the inner ring raceway and the outer ring raceway,  
 a sensor supported by the outer ring and having a detecting portion,  
 a tone wheel mounted to the axially inner end portion of the hub so as to be faced to the detecting portion of the sensor,  
 a support frame made of a metal plate in a generally annular shape, and having a cylindrical mount portion, a flanged portion and a support portion, the cylindrical mount portion having an inner end edge and fitted onto the axially inner end portion of the outer ring, the flanged portion bent inwards at right angles at the inner end edge of the mount portion and having an inner side face, the support portion having a circumferential end face and projected from the inner side face of the flanged portion, so that the sensor is supported within the support portion, and  
 a conductive member projected from the circumferential end face of the support portion to output signals from the sensor, the circumferential end face of the support portion and part of the flanged portion conjointly defining a through-hole, so that the conductive material is extended through the through-hole and projected from the circumferential end face of the support portion, and the support portion being filled with a non-magnetic insulating material, so that the sensor is embedded in the non-magnetic insulating material.

**5,567,059**  
**WINDOW CAGE**  
 Michael Weigand, Elfershausen; Werner Ganss, Schweinfurt, and Martin Grehn, Dittelbrunn, all of Germany, assignors to FAG Kugelfischer Georg Schafer AG, Germany  
 Filed May 24, 1995, Ser. No. 449,420  
 Claims priority, application Germany, Jul. 19, 1994, 44 25 381.8  
 Int. Cl.<sup>6</sup> F16C 33/46 15 Claims

1. A window cage for a spherical roller bearing, wherein the cage includes annular ribs extending around the cage and axially spaced apart and includes transverse ribs axially across the cage defining pockets in which the bearing spherical rollers may be received, wherein the annular and transverse ribs are located at a radially outward location which would be outside the pitch circle of cage with the rollers in respective cage pockets so that the ribs will positively secure the rollers in their pockets against falling outward radially;  
 at least one of the pockets in the cage being a loading pocket, with the annular ribs at the loading pocket being recessed inwardly with respect to the remainder of the cage so that the





annular ribs at the loading pocket are located approximately on the pitch circle, whereby a roller may be loaded into the loading pocket.

5,567,060

# DIFFERENTIAL GEARING FOR AN AUTOMOTIVE VEHICLE

Wolfgang Steinberger, Herzogenaurach; Rudolf Folk, Burghaslach, and Reinhart Malik, Herzogenaurach, all of Germany, assignors to Ina Walzinger Schaeffler KG, Germany

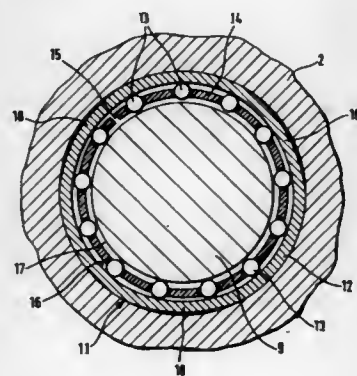
Filed Feb. 8, 1995, Ser. No. 385,314

Claims priority, application Germany, Feb. 28, 1994, 9403308 U

Int. Cl.<sup>6</sup> F16C 19/46

U.S. Cl. 384—569

11 Claims



1. A differential gearing comprising a differential case (2) mounted in a gearbox casing (1) and connected via a crown wheel (6) to a drive pinion (4) of a third motion shaft (5), axle shafts (9) being mounted in the differential case (2) on a clearance-free or pre-tensioned rolling bearing (11), characterized in that the axle shafts (9) are mounted in a thin-walled needle roller bush (12) of uniform wall thickness whose raceway (16) when seen in cross-section, comprises in at least one peripheral region, an elastically yielding convexity (18) which deviates from a circular shape of the raceway so that the axle shafts (9) are radially pre-tensioned between the raceway convexity (18) and an opposite raceway (17) by at least one needle roller (13).

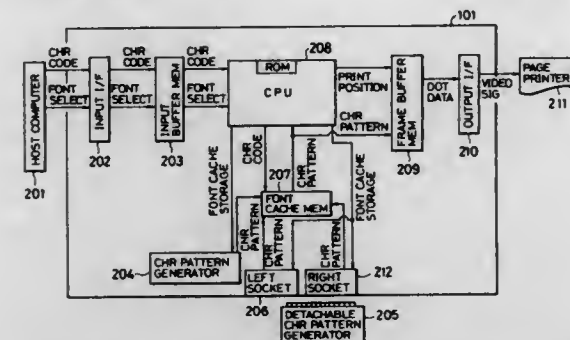
## 5,567,061 OUTPUT APPARATUS WITH DETACHABLE CHARACTER STORING CARTRIDGE

Satoshi Nagata, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 136,989, Oct. 18, 1993, abandoned, which is a continuation of Ser. No. 632,623, Dec. 26, 1990, abandoned, which is a continuation of Ser. No. 337,564, Apr. 13, 1989, abandoned. This application Jan. 11, 1995, Ser. No. 371,442

Claims priority, application Japan, Apr. 18, 1988, 63-095845  
Int. Cl.<sup>6</sup> B41J 5/00

U.S. Cl. 400—61

104 Claims



1. An output apparatus to which a detachable character storing means can be attached, comprising:

first character storing means which is provided in an output apparatus main body and which stores vector type character pattern information;  
attaching means for detachably attaching second character storing means which stores vector type character pattern information;  
converting means for converting vector type character pattern information stored in said first and/or in said second character storing means into a dot type character pattern; and  
caching means for caching in a memory the dot type character pattern converted by said converting means,  
wherein said converting means converts the vector type character pattern information stored in the second character storing means rather than converting the vector type character pattern information stored in the first character storing means in the case where the second character storing means has been attached.

5,567,062

# PRINTING MACHINE HAVING A MENU WITH MODE SELECTION

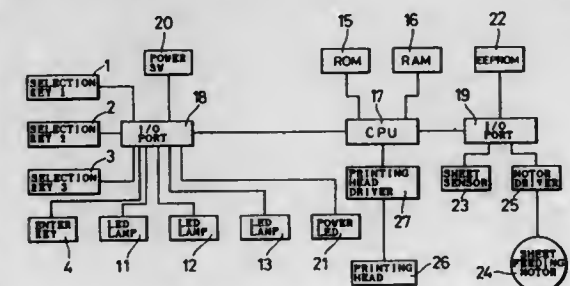
Yoshiaki Tanaka, Sakai, and Masashi Tanimoto, Yamatoko-riyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 1, 1995, Ser. No. 431,766

Claims priority, application Japan, May 16, 1994, 6-100477  
Int. Cl.<sup>6</sup> B41J 5/30

U.S. Cl. 400—62

3 Claims



1. A printing apparatus comprising:

a mode selection menu sheet to be referred to in setting at least one desired mode of operation, on which sheet are successively listed, in the direction of feeding of said sheet into said apparatus, a plurality of groups including a setting item, mode options and a plurality of marks for specifying a mode option; sheet feeding means for feeding the mode selection menu sheet in such a manner which allows successive viewing of the plurality of setting item groups listed on the sheet; selection keys provided to match the number of the marks for specifying a mode option; lamp means, corresponding to the selection keys; display control means for indicating an established mode for each setting item for the printing apparatus with the ON/OFF state of the lamp mean, sequentially as the mode selection menu sheet proceeds; and mode-setting means for changing the ON/OFF state by operation of the selection keys to change the established mode for the printing apparatus in response to the operation of changing the ON/OFF state, wherein the selection keys are operable with reference to the mode specifying marks listed on the mode selection menu sheet to set desired modes of the respective setting items.

5,567,063

# CORDLESS PRINTING HEAD CONTROL SYSTEM

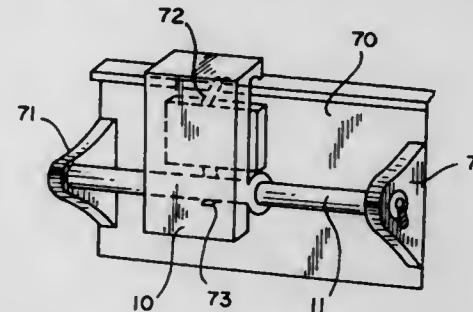
Shun-Pui Chiu, Kowloon, Hong Kong, assignor to NK Technology Ltd., Hong Kong

Filed Mar. 28, 1995, Ser. No. 412,152

Int. Cl.<sup>6</sup> B41J 1/00

U.S. Cl. 400—174

16 Claims



1. A printer comprising printer control means and a cordless printer head, wherein said printer head comprises printer head drive control means and memory means for storing data to be printed, said memory means having sufficient capacity to store print data relating to at least one journey of the printer head across the width of the paper to be printed on, and wherein data transfer means are provided at least at one end of the movement of the printer head for transferring data from said printer control means to said memory means at intervals.

5,567,064

# RIBBON CARTRIDGE

Wong C. Yeong, Jurong Town, Singapore, assignor to Fullmark Pte Ltd., Singapore

Filed Jul. 7, 1995, Ser. No. 499,473

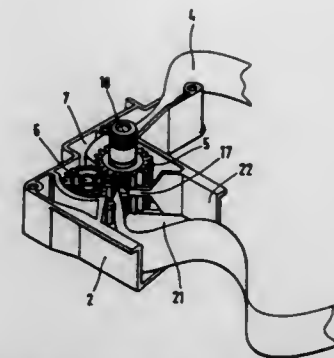
Claims priority, application European Pat. Off., Aug. 7, 1994, 94110664

Int. Cl.<sup>6</sup> B41J 32/02

U.S. Cl. 400—235.1

13 Claims

1. A ribbon cartridge for longitudinally feeding a ribbon, comprising:  
(a) a sectional housing (1) containing a chamber (21) having inlet and outlet openings, said housing including bottom (2) and top (3) sections;



(b) driving means arranged in said chamber for longitudinally transporting the ribbon through said chamber, said driving means including first and second generally parallel cylindrical cooperating driving gears (5,6) between which the ribbon is received, said first driving gear (6) containing intermediate its ends a peripheral groove (12) having opposed side walls and a bottom wall defining in said first gear a center support shaft (24); and

(c) means supporting said first driving gear for pivotal adjustment relative to said second driving gear about an axis normal to a plane containing the longitudinal axes of said driving gears, said support means including a support protrusion (8) carried by said housing and extending within said chamber adjacent said first driving gear, said support protrusion having:

(1) a body portion (14) connected with said housing and extending within said chamber and within said first gear groove in spaced relation relative to said groove side walls; and  
(2) a thickened end portion (13) in supporting engagement with said center support shaft.

5,567,065

# INK RIBBON CASSETTE

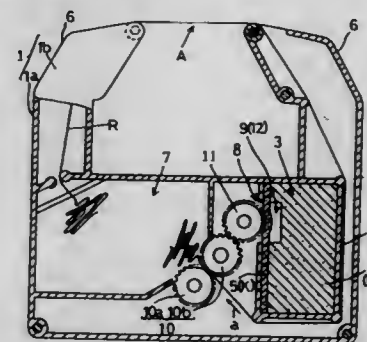
Zheng L. Cai, and Yasuhito Imae, both of Osaka, Japan, assignors to Fujicopian Co., Ltd., Osaka, Japan

Filed Dec. 13, 1995, Ser. No. 572,208

Claims priority, application Japan, Dec. 27, 1994, 6-324856  
Int. Cl.<sup>6</sup> B41J 31/16; 32/02

U.S. Cl. 400—202.4

9 Claims



1. An ink ribbon cassette comprising:  
a cassette casing;  
an ink-storing member disposed within the cassette casing and storing ink liquid as absorbed therein;  
an ink-absorbing member disposed within the cassette casing for absorbing the ink liquid from the ink-storing member through contact thereof with the ink-storing member;  
a wall member disposed within the cassette casing and encasing the ink-storing member and the ink-absorbing member, the wall member defining an opening for allowing a portion of the ink-absorbing member to be exposed therethrough to the outside;

a replenishing roll rotatable while elastically contacting the ink-absorbing member through the opening so as to replenish the ink liquid to an ink ribbon being moved; and wherein, the ink-storing member and the ink-absorbing member together form a gap at mutually contacting portions thereof registered with the opening so as to allow flexion of the portion of the ink-absorbing member toward the ink-storing member in association with the contact therebetween.

5,567,066

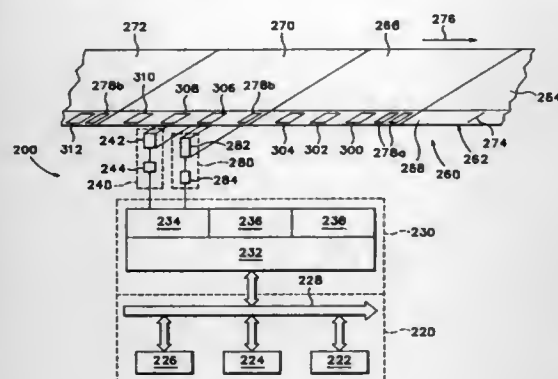
# NONIMPACT PRINTER WITH READ AND WRITE SYSTEMS FOR MONITORING RIBBON USAGE

Suresh C. Paranjpe, 5625 Summit Dr., W. Linn, Oreg. 97068  
Continuation-in-part of Ser. No. 73,169, Jun. 7, 1993, abandoned, which is a continuation-in-part of Ser. No. 57,538, May 4, 1993, abandoned, which is a continuation-in-part of Ser. No. 47,144, Apr. 12, 1993, which is a continuation-in-part of Ser. No. 39,871, Mar. 30, 1993, Pat. No. 5,445,463. This application May 2, 1994, Ser. No. 236,423

Int. Cl.<sup>6</sup> B41J 35/36

U.S. Cl. 400—249

13 Claims



1. A method of reducing wasted ribbon in a non-impact printing system, the method comprising the steps of:
  - loading an elongate ribbon into the printing system, the ribbon comprising a series of panels of transfer material disposed on one side of a medium;
  - printing image data in the printing system by using the transfer material at particular locations along the ribbon to transfer an image to a substrate;
  - determining an actual area of the ribbon used in said printing step;
  - the actual area of the ribbon used comprising an area from less than a full width of the ribbon up to a full width of the ribbon in a transverse direction;
  - responsive to said printing step and said determining step, marking the ribbon adjacent said particular locations with usage marks to indicate the actual area of the ribbon used in said printing step;
  - subsequently reading the usage marks along the ribbon to identify to the printing system which areas of the ribbon remain unused and therefore available for subsequent printing, including unused areas laterally adjacent to used areas of the ribbon; and using the identified unused areas of the ribbon in a subsequent printing step, thereby minimizing wasted ribbon.

5,567,067

# KEYBOARD POSITIONING SYSTEM

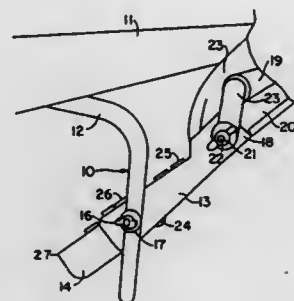
Frederic C. Ambrose, 13 Pilgrim Heights Rd., Provincetown, Mass. 02657

Continuation of Ser. No. 303,582, Sep. 9, 1994. This application Aug. 4, 1995, Ser. No. 511,535

Int. Cl.<sup>6</sup> B41J 5/08

U.S. Cl. 400—472

28 Claims



1. A device for mounting a keyboard to a base, the keyboard having a front surface and a top surface, the device comprises:
  - (a) a bracket mounted on the base;
  - (b) a clamp comprising a front portion, a rear portion, and a support surface, said support surface being engagable with the keyboard, said rear portion being in closer proximity to the base than said front portion when said bracket is mounted on the base, said clamp being connected to said bracket and disposed such that said rear portion is disposed below said front portion; and
  - (c) a hand support member being movably mounted on said clamp from a position at least substantially adjacent the front surface of the keyboard to a position above the top surface of the keyboard while said rear portion of said clamp is below said front portion of said clamp.

5,567,068

# MULTIFUNCTION PRINTER

Yasuo Egashira, Saga, and Isao Yamasaki, Kurume, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

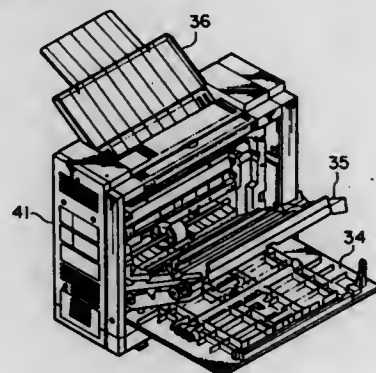
Filed Jun. 27, 1995, Ser. No. 495,108

Claims priority, application Japan, Jun. 30, 1994, 6-149194

Int. Cl.<sup>6</sup> B41J 11/58

U.S. Cl. 400—625

3 Claims



1. A multifunction printer comprising:
  - a device body having first and second opposite sides;
  - a first cover journaled at its one end to said device body on said first side so as to be rotatable, and adapted to be opened and closed; and
  - a second cover located in said device body, inside of said first cover, journaled at its one end to said device body so as to be rotatable, and adapted to be opened and closed;

a first paper transfer path defined in said device body between said first cover and said second cover; and  
a second paper transfer path defined in said device body inside of said second cover.



5,567,069

# RECORDING MEDIUM TRANSPORT MECHANISM AND INK JET RECORDING APPARATUS USING THE MECHANISM

Tetsuo Suzuki, Yokohama; Masahiro Taniguro, Ushiku; Hiroyuki Saito, Yokohama; Koichi Tanno, Kawasaki; Haruyuki Yanagi, Machida; Makoto Kawamura, Ayase; Hiroyuki Kinoshita, Kawasaki; Masaya Shinmachi, Kawasaki, and Tan A. Ming, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

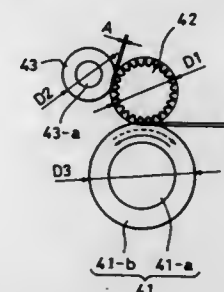
Filed Jan. 23, 1995, Ser. No. 376,746

Claims priority, application Japan, Jan. 25, 1994, 6-006595; Jan. 18, 1995, 7-005550

Int. Cl.<sup>6</sup> B41J 13/076

U.S. Cl. 400—636

28 Claims



1. A recording medium transport mechanism for discharging from a recording area a recording medium used for recording with ink ejected from an ink jet recording head, said recording medium transport mechanism comprising:
  - first rotary means provided downstream of the recording area in a direction of transport of the recording medium and on a side of a recording surface of the recording medium; and
  - second rotary means provided downstream of the recording area and on the side opposite from the recording surface side of the recording medium, said second rotary means for guiding the recording medium in association with said first rotary means to discharge the recording medium out of the recording area, said second rotary means including a liquid absorbing member provided on its circumferential surface portion and capable of contacting said first rotary means.

5,567,070

# CONTAINER WITH APPLICATOR OF NAIL-VARNISH INTERPOSED BETWEEN FINGERS

Maurizio Ficcacanti, Grottammare, Italy, assignor to Inovo di Ficcacanti Maurizio & C. Snc., Grottammare, Italy

Filed Apr. 7, 1995, Ser. No. 419,053

Claims priority, application Italy, Apr. 12, 1994, TO94A0269

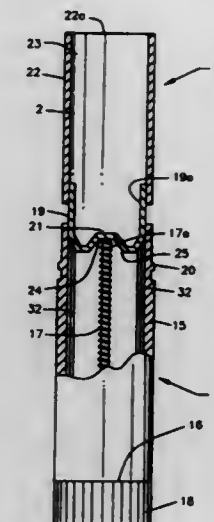
Int. Cl.<sup>6</sup> A45D 34/00

U.S. Cl. 401—7

20 Claims

1. A container for nail-varnish which can be held interposed between fingers, said container comprising a tank including a reservoir for containing nail-varnish, and a plug cap closure member having an axial brush attached thereto for drawing nail-varnish from the reservoir and applying the varnish to nails, wherein the tank has two arcuate shaped recesses spaced from said plug cap closure member, each recess being dimensioned to accommodate a finger of a user's hand and being spaced from one another on opposite sides of said tank in order to keep adjacent fingers which are seated in the recesses spaced apart during the application of the nail-varnish.

3. A refill cartridge for a dispenser for stick adhesive which releases adhesive by application of an end of said stick adhesive to a surface, said dispenser including a holder which is designed for closure by a cap, an opening at at least one end, an internal replaceable plunger designed for axial displacement upon a rotatable screwthreaded spindle over the length of the holder to apply said stick adhesive accommodated in the holder, wherein the improvement comprises said refill cartridge including:
  - a tube having a closed end, and an open end;
  - a molding of the material of said stick adhesive adapted to the internal volume, designed to accommodate said stick adhesive and internal configuration of the holder, said molding being formed with a central axially aligned blind hole and contained in said tube with the blind hole exiting at the open end of said tube; and
  - said replaceable plunger being secured to said molding at the open end of said tube, wherein said plunger is formed throughout with a central screwthreaded bore, said plunger being aligned with said bore opposing the exit of said blind hole.





5,567,072

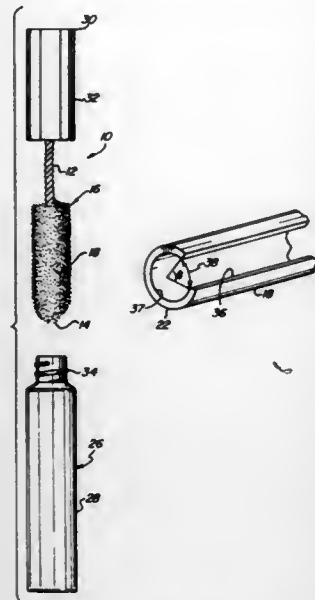
**MASCARA APPLICATOR HAVING SLOTTED BRISTLES**  
Thomas J. Dunleavy, North Salem, and Walter K. Kemmerer,  
Cortlandt Manor, both of N.Y., assignors to Risdon Corporation,  
Naugatuck, Conn.

Filed Jun. 7, 1995, Ser. No. 477,919

Int. Cl.<sup>6</sup> A63B 11/00; A45D 40/26

U.S. Cl. 401—129

12 Claims



1. An applicator for the application of a cosmetic medium, comprising: a central core having a brush section at one end thereof, the brush section comprising a plurality of radially extending bristles gripped by the central core, at least some of the bristles comprising a filament having a predetermined length and rigidity and comprising three sidewalls, each of the sidewalls having opposing ends, each of the sidewalls joined at the ends to form a substantially triangular shape and a slot extends substantially longitudinally and through at least a portion of one of the sidewalls between its ends, the slot being sufficiently sized to allow the passage of cosmetic medium into the slot into a substantially hollow interior, the rigidity of the filaments being such that the gripping thereof by the core causes them to flare outwardly in a generally random direction so as to be substantially uniformly distributed throughout the brush section.

5,567,073

**APPLICATOR DEVICE FOR LIQUID**

Vincent de Laforcade, Rambouillet; Fanny Guillaumat-Louvard, Levallois-Perret, and Laurent Dubois, Paris, all of France, assignors to L'Oreal, Paris, France

Filed Nov. 28, 1994, Ser. No. 348,983

Claims priority, application France, Nov. 29, 1993, 93 14235

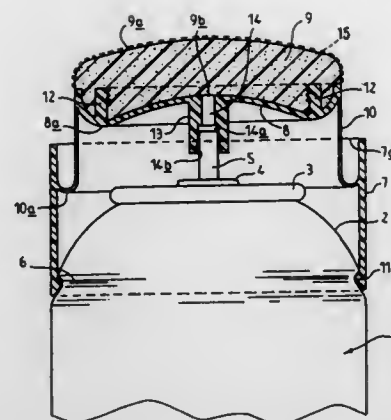
Int. Cl.<sup>6</sup> A45D 34/00; 34/04

U.S. Cl. 401—190

24 Claims

1. Applicator device for liquid to be applied to a surface to be treated, comprising:

- (a) a container for the liquid, the container being a pressurized reservoir equipped with a dispenser valve;
- (b) a head operatively connected to the container, the head being made of a porous material for applying the liquid by rubbing an outer face of the head on the surface to be treated; wherein the porous material is a sintered body; and
- (c) a one piece cap for operatively connecting the head to the container, the cap including:
  - (1) a support for the head,
  - (2) a joining piece connected to the support and including a channel for cooperating with the valve to cause the valve to open and discharge liquid, when a mechanical stress is



exerted on the head in any direction, wherein the liquid discharged from the valve passes through the channel of the joining piece towards an inner face of the head which is opposite the outer face of the head,

- (3) a rigid coupling member for connecting the head to the container, the coupling member including a skirt and a fastening member to connect the cap to a connection zone on the container, and
- (4) a flexible element extending between the rigid coupling member and the support, allowing the head and the support with the joining piece to move relative to the coupling member and cause the valve to open, when the mechanical stress is exerted on the head.

5,567,074

**TUBE CLIP**

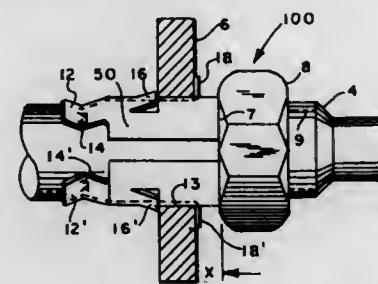
James Dovak, Strongsville, Ohio; Thomas E. Bazil, Northville, Mich., and Todd H. Christian, Clinton, Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 19, 1995, Ser. No. 530,773

Int. Cl.<sup>6</sup> F16L 41/08

U.S. Cl. 403—197

7 Claims



1. A clip for securing a tube having an external threaded section to a frame having an opening therethrough through which the tube extends with the threaded section adjacent one side of the frame and having a nut threadingly engaged therewith, said clip disposed about the tube within the opening and extending therefrom to opposite ends respectively disposed a predetermined distance away from opposite sides of the frame, at least one resilient finger extending away from an end of the clip facing away from the nut on one side of the frame, said finger receivable through the opening and having a prong extending therefrom in a direction angularly inwardly toward the frame and operative to engage the tube and inhibit movement of the clip in a direction toward the frame;

at least one tab bent outwardly from the clip on an opposite side of the frame, said tab disposed a predetermined distance from the end of the clip facing toward the nut and operative to abut against a side of the frame facing toward the nut;

5,567,076

**WELDING CHAMBER**

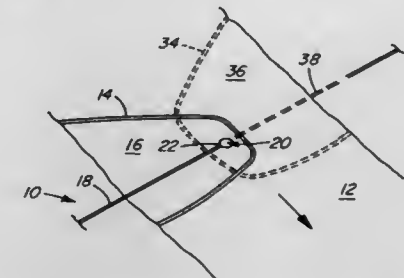
Kerry Leong, Okanagan Mission, and Dennis A. Connolly, Langley, both of Canada, assignors to Arthon Construction Ltd., British Columbia, Canada

Filed Dec. 3, 1993, Ser. No. 160,758

Int. Cl.<sup>6</sup> E02D 19/04; 23/00

U.S. Cl. 405—11

6 Claims



5,567,075  
**OFFSET SCREED SYSTEM AND QUICK CONNECT MOUNTING THEREFORE**

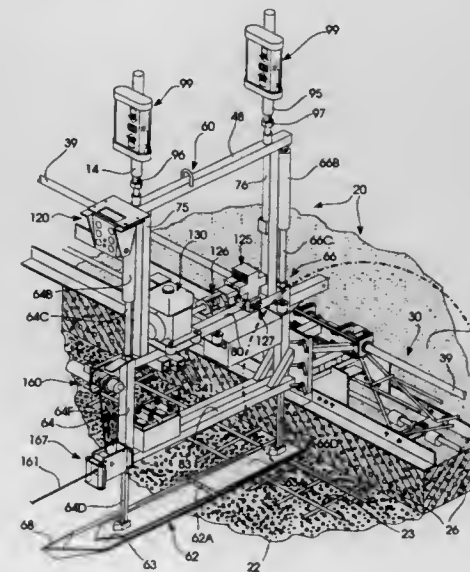
J. DeWayne Allen, Paragould, Ark., assignor to Allen Engineering, Inc., Paragould, Ark.

Filed Jul. 7, 1995, Ser. No. 499,559

Int. Cl.<sup>6</sup> E01C 19/00

U.S. Cl. 404—84.5

10 Claims



1. An offset laser-operated, automatic grade control screed for treating plastic concrete, said screed having a direction of screed travel and comprising:

- an elongated concrete finishing mechanism adapted to be deployed in physical contact with said concrete, said finishing mechanism comprising strike-off means for cutting, striking off and leveling rough, freshly poured concrete and vibrator means for vibrating said finishing mechanism and said concrete to smooth and settle the concrete;
- vertical tower means for controlling the finishing mechanism, said tower means adapted to vary in height to control an orientation and elevation of the finishing mechanism, and said tower means comprising a front facing the direction of screed travel and a rear;
- stanchion means for extending or and contracting said tower means;
- control means for controlling the extending and contracting of said tower means in response to laser means;
- ski means for being disposed upon a floor or upon a subgrade for supporting the tower means and enabling the screed to be drawn through freshly poured concrete in the direction of screed travel; and,
- means for dynamically mounting said finishing mechanism to said tower means rear wherein furrows caused by movement of the rear of the tower means through the concrete are finished.

5,567,077

**DRAINAGE NETWORK**

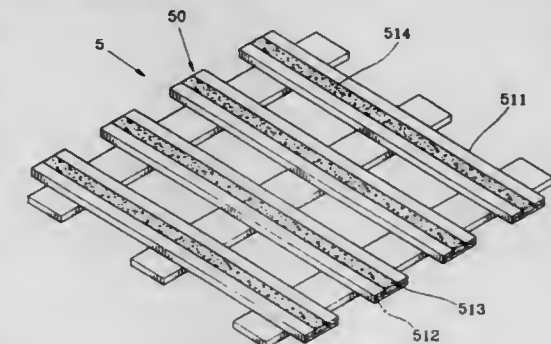
Jesse S. Yang, No 1, Lane 36, Avenue 357, Sec 2, Nan-Shan Rd., Lu-Jwu Shiang, Taur Yuan Hsien, Taiwan

Filed Feb. 17, 1994, Ser. No. 198,021

Int. Cl.<sup>6</sup> E02B 11/00

U.S. Cl. 405—45

3 Claims



1. A drainage network, comprising:

- a plurality of drainage strips joined together to form said drainage network wherein each drainage strip includes:
- a side-notched strip including means to receive a drainage belt,
- a slot-containing strip including at least one set of high tensile-strength fiber bundles embedded in a polymeric material,

and at least one drainage belt installed on said side-notched strip.

# 5,567,078 METHOD FOR FORMING A SLOPED FACE ICE CONTROL STRUCTURE

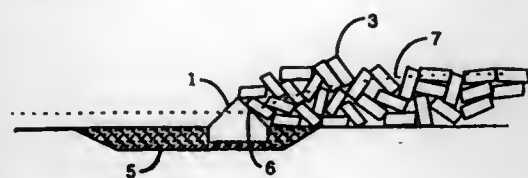
James H. Lever, Lebanon; Gordon E. Gooch, Enfield, and Edward P. Folton, Meriden, all of N.H., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 2, 1995, Ser. No. 382,695

Int. Cl.<sup>6</sup> B63B 35/08

U.S. Cl. 405—61

4 Claims



1. A method for forming a flood preventive barrier along a river for a town prone to flooding by ice jams in floodplain regions comprising the steps of:

locating an upstream construction site: i) upstream of the town, and ii) at locations near the town that are natural floodplains that have land based barriers along the river's shoreline; and constructing multiple artificial ice-resisting elements at spaced apart distances from each other at the upstream construction site, each artificial ice-resisting element comprising materials attached by a foundation to the river's bed and stabilized by rip-rap, spacing between each artificial ice-resisting element being preselected relative to an average ice piece size diameter for the river to induce a retained and stabilized ice jam at the barrier,

whereby the artificial ice-resisting elements hold the ice jam throughout a breakup period and reduce the volume of ice available to jam that cause flooding downstream.

# 5,567,079 METHOD FOR THE HYDRAULIC BRANCHING OF AN OPEN STREAM AND HYDRAULICALLY WORKING CHANNEL BRANCH

Anton Felder, Schillerstr. 48, D-87435 Kempten, Germany  
PCT No. PCT/EP93/03195, § 371 Date May 16, 1995, § 102(e)  
Date May 16, 1995, PCT Pub. No. WO94/11580, PCT Pub.  
Date May 26, 1994

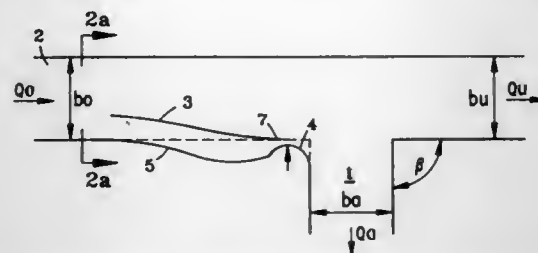
PCT Filed Nov. 15, 1993, Ser. No. 436,197

Claims priority, application Germany, Nov. 17, 1992, 42 38 830.9

Int. Cl.<sup>6</sup> E02B 3/02

U.S. Cl. 405—80

21 Claims



1. Method for the hydraulic branching of an open stream having at least one straight main stream of a specific momentum and having one or more branch streams, said method comprising the steps of:

directing a momentum stream having a momentum of a smaller order of magnitude than that of said at least one straight main stream toward a branching point, said branching point having a common rounded corner between said main stream and said branch stream; and

causing branching to take place without secondary streams and a dead-water region by creation of conditions to cause deflection of a portion of said main stream into each of said one or more branch streams, said deflection being by a utilization of the Coanda effect.

# 5,567,080 TRAY TABLE WITH DETENT CONTROL FOR INVALID CHAIRS AND METHODS OF OPERATING AND MAKING SUCH TRAY TABLES

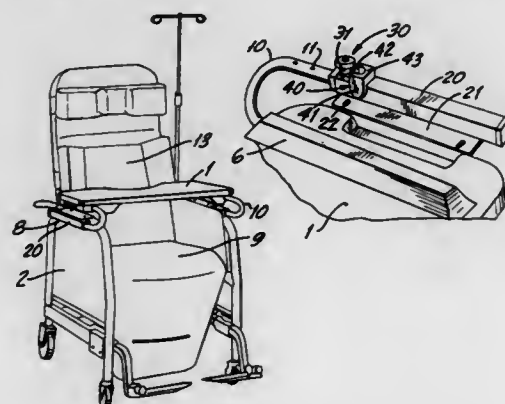
George Sterlacchi, 1388 Ocean Ave., Bohemia, N.Y. 11716

Filed Nov. 24, 1993, Ser. No. 157,969

Int. Cl.<sup>6</sup> A47B 83/02; F16B 7/10

U.S. Cl. 403—322

30 Claims



1. A tray table for a chair comprising:

a tray;  
at least one runner mounted to the tray wherein holes are disposed in the runner;  
a bracket capable of mounting to a chair, the bracket having a cavity in which the runner is positioned;  
a detent mounted to the bracket which selectively engages the holes of the runner; and  
a block having an upper ledge and a lower ledge slidingly mounted to the detent wherein the lower ledge and the upper ledge can be selectively positioned between the detent and the bracket.

# 5,567,081 JOINT FORMING DEVICE

William E. T. Vallance, Marlow, England, assignor to Titus International Limited, Buckinghamshire, England  
Filed Dec. 20, 1994, Ser. No. 359,461

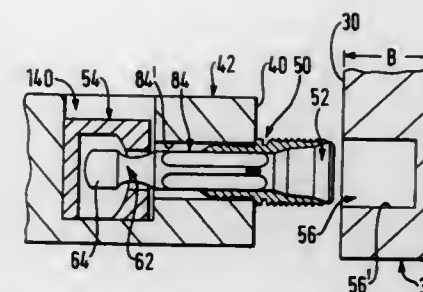
Claims priority, application United Kingdom, Dec. 23, 1993, 9326352

Int. Cl.<sup>6</sup> F16B 12/20

U.S. Cl. 403—406.1

45 Claims

1. A device for use in forming a joint, the device comprising:  
a female part to be at least partially installed in a recess in one joint member, said female part defining a centrally disposed through-passageway;  
a male part having a first end portion and a second end portion, said first end portion having an expander region adapted to be received in said through-passageway; and  
adjusting means to be installed in another joint member in operative relationship with the male part second end portion and being adapted for adjustably pulling on the male part in use of the device to cause relative axial movement between



said male and female parts, said expander region comprising a plurality of taper portions for expanding the female part when said male part is pulled by said adjusting means such that said second end portion moves away from the female part whereby the female part is securable in said recess and said through passage being provided with a mating region comprising a plurality of taper portions arranged to cooperate with said male part taper portions.

# 5,567,082 FASTENING ARRANGEMENTS

Craig E. Ball, and David J. Oliver, both of Preston, United Kingdom, assignors to British Aerospace Public Limited Company, Farnborough, United Kingdom

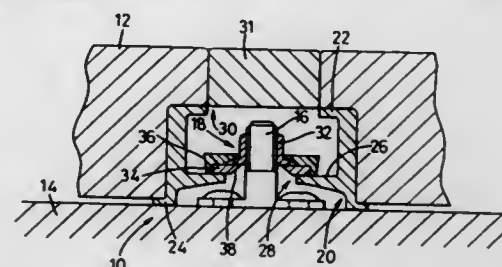
Filed Nov. 10, 1994, Ser. No. 339,154

Claims priority, application United Kingdom, Nov. 10, 1993, 9323156

Int. Cl.<sup>6</sup> F16B 21/00

U.S. Cl. 403—407.1

12 Claims



8. A captive nut arrangement including means defining a recess having a tool access opening and a threaded member access aperture, and a captive nut assembly disposed within said recess, said captive nut assembly comprising an internally threaded element and a retaining element for being attached to said internally threaded element, wherein the recess, said internally threaded element and said retaining element are dimensioned so that, when separate, the internally threaded element and the retaining element may be passed through at least one of the access opening and the access aperture, but when attached together within said recess, said elements resist withdrawal therefrom, and so that said nut assembly may be engaged with a tool via said tool access opening and rotated to assist threaded engagement in use with a threaded male member.

# 5,567,083 DOUBLE-CONTAINMENT UNDERGROUND PIPING SYSTEM

Kelth J. Osborne, Glen Ellyn, Ill., assignor to Intelpro Corporation, Chicago, Ill.

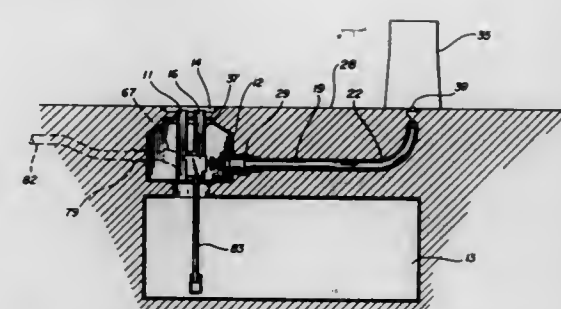
Continuation of Ser. No. 286,893, Dec. 20, 1988. This application Jun. 6, 1995, Ser. No. 469,651

Int. Cl.<sup>6</sup> F16L 1/00

U.S. Cl. 405—154

2 Claims

1. A secondarily contained piping system comprising:  
(a) a flexible inner supply pipe;



(b) an outer secondary containment pipe;  
(c) two spaced access chambers designed for underground use which are interconnected in a fluid tight manner through the side wall of one chamber just above the chamber base by the secondary containment pipe;  
(d) all flexible inner supply pipe couplings and associated fittings being disposed within the access chambers;  
(e) a fluid source fitting at one end providing an originating interface to the flexible inner supply pipe;  
(f) a fluid outlet at the other end providing a terminating interface to the flexible inner supply pipe;  
(g) one access chamber being of sufficient size to permit manual or mechanical removal or replacement of the flexible inner supply pipe; and  
(h) the flexible inner supply pipe having sufficient bend radius to be removed and replaced through the access chamber.

# 5,567,084 BUOYANCY COMPENSATOR WITH A TRACTION PRESSURE PAD

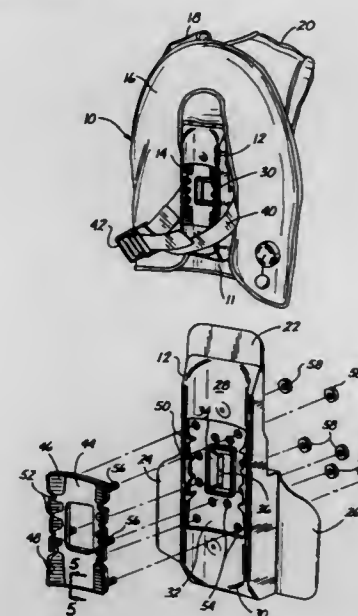
Bill N. Oliver, Dana Point, Calif., assignor to Sea Quest, Inc., Carlsbad, Calif.

Filed Feb. 24, 1995, Ser. No. 394,361

Int. Cl.<sup>6</sup> A45F 3/08

U.S. Cl. 405—186

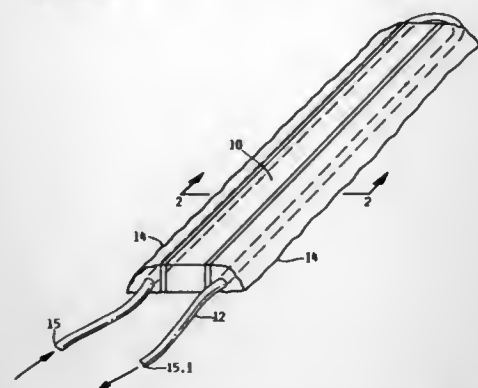
20 Claims



1. A backpack means for supporting a breathing gas tank comprising:  
an elongated upright support member;  
a recess disposed within said support member;  
a resilient pad disposed within said recess for surface contact with said breathing gas tank; and  
means for securing said breathing gas tank in surface contact with said resilient pad.

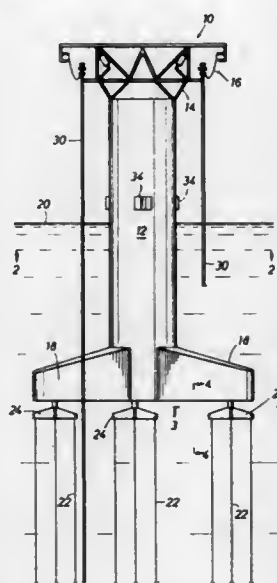


**5,567,085**  
**METHOD FOR THAWING FROZEN GROUND FOR LAYING CONCRETE**  
 Mark Bruckelmyer, 5617 Mc Quade Rd., Duluth, Minn. 55804  
 Filed Jul. 20, 1995, Ser. No. 504,526  
 Int. Cl.<sup>6</sup> E02D 3/11; E04G 21/00  
 U.S. Cl. 405—229 9 Claims



1. A method of laying concrete onto frozen ground comprising:
  - (a) setting a concrete form on frozen ground;
  - (b) placing a continuous length of circulating hose on the ground adjacent to the concrete form;
  - (c) covering the circulating hose adjacent the concrete form with a layer of aggregate leaving the ends of the circulating hose protruding from the aggregate;
  - (d) circulating warm liquid through the circulating hose whereby the frozen ground is thawed; and
  - (e) laying concrete in the concrete form.

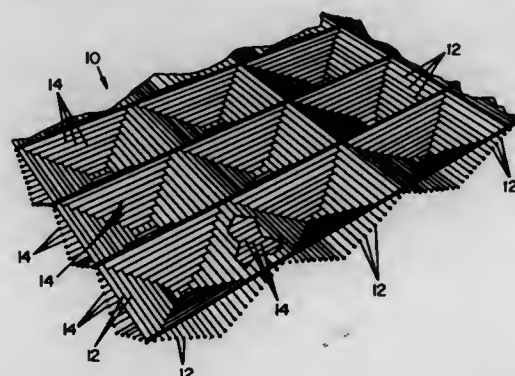
**5,567,086**  
**TENSION LEG CAISSON AND METHOD OF ERECTING THE SAME**  
 David A. Huete, Spring, Tex., assignor to Shell Oil Company, Houston, Tex.  
 Filed Dec. 23, 1994, Ser. No. 370,766  
 Int. Cl.<sup>6</sup> E02D 23/00  
 U.S. Cl. 405—223.1 15 Claims



4. A tension leg caisson for providing surface facilities for conducting hydrocarbon recovery operations from the ocean floor from a deepwater location, comprising:
  - an elongated, buoyant central vertical column;
  - a deck supported by the central vertical column;

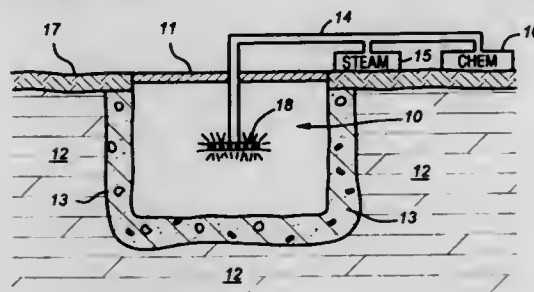
a plurality of outrigger pontoons connected to the central vertical column; and  
 a plurality of tendons, each connected on one end to one of the outrigger pontoons at a location spaced apart from the vertical column and anchored to the ocean floor on the other end.

**5,567,087**  
**METHOD OF USING HIGH PROFILE GEOTEXTILE FABRICS WOVEN FROM FILAMENTS OF DIFFERING HEAT SHRINKAGE CHARACTERISTICS FOR SOIL STABILIZATION**  
 Marc S. Theisen, Signal Mountain, Tenn., assignor to Synthetic Industries, Inc., Chickamauga, Ga.  
 Division of Ser. No. 145,461, Oct. 29, 1993. This application May 19, 1995, Ser. No. 445,177  
 Int. Cl.<sup>6</sup> E02D 17/20; B32B 3/12  
 U.S. Cl. 405—258 5 Claims



1. A method of stabilizing soil and reinforcing vegetation comprising:
  - placing a single-layered, three-dimensional, high-profile woven geotextile fabric into soil, wherein said fabric comprises two sets of monofilaments interwoven in a substantially perpendicular direction to each other, each said monofilament of each set being arranged so as to shrink upon heating to a predetermined level dependent upon the position of said filament in the woven fabric, thereby forming a single-layer, three-dimensional, cusped profile.

**5,567,088**  
**METHOD FOR TREATING POROUS MEDIA**  
 Noel J. Shotts, Bakersfield, Calif.; Billy W. Surles, and Philip D. Fader, both of Houston, Tex., assignors to Texaco, Inc., White Plains, N.Y.  
 Filed Dec. 16, 1994, Ser. No. 357,958  
 Int. Cl.<sup>6</sup> E02D 3/12  
 U.S. Cl. 405—270 9 Claims

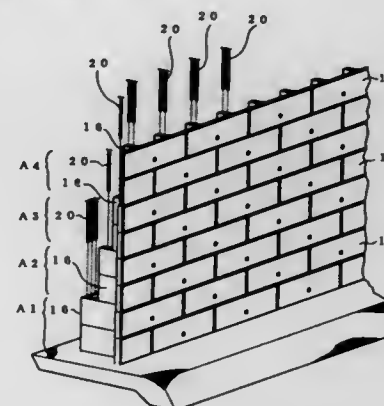


1. A method for treating a volume of porous medium forming the side and bottom walls of a pit excavation to render a layer thereof immediately adjacent the side and bottom of said pit, relatively

impermeable to form a secondary permeability barrier for a storage tank to be placed in said pit, comprising the steps of:
 

- providing a chemical treatment fluid comprising a polymerization monomer, a diluent for the monomer, and a nonvolatile strong acid catalyst capable of causing polymerization of the monomer at fluids injection temperatures;
- mixing said chemical treatment fluid with steam to form a multiphase treating fluid;
- temporarily covering said pit but providing an injection opening in said temporary cover;
- injecting said multiphase treating fluid into said pit through said temporary cover and contacting the side walls and bottom of the pit with said treating fluid; and
- allowing said treating fluid to remain in contact with the side walls and bottom of said pit for a period of time sufficient to allow polymerization of said monomer to form an impermeable zone of treated medium about the side walls and bottom of said pit as a secondary permeability barrier.

**5,567,089**  
**BLOCK FOR CONSTRUCTING RETAINING WALL AND CONSTRUCTED RETAINING WALL STRUCTURE**  
 Masumi Akamine, 7-61, Demachi, Kumamoto-shi, Kumamoto, Japan  
 Filed Oct. 12, 1994, Ser. No. 321,706  
 Claims priority, application Japan, Oct. 15, 1993, 5-281601; Dec. 16, 1993, 5-344434  
 Int. Cl.<sup>6</sup> E02D 29/02; E04C 1/00  
 U.S. Cl. 405—285 6 Claims



1. A block, for constructing a retaining wall, comprising:
  - a front wall having a top and a bottom end and a counterfort protruding from a back side of the front wall and extending from said top to said bottom end of said front wall in a vertical direction;
  - the counterfort being formed of a plurality of partition walls defining a plurality of reinforcing steel bar insertion holes extending substantially vertically therein each having upper and lower ends thereof open-ended;
  - a neutral stress plane defined by a virtual plane in said block whereat stress due to a lateral stress applied to said back side of said block toward said front wall is neither tensile nor compressive;
  - each one of said reinforcing steel bar insertion holes disposed on a front wall side of said neutral stress plane having one of a tapered hole contour increasing in a diameter thereof from the upper end to the lower end thereof and a straight hole contour having a uniform diameter throughout; and

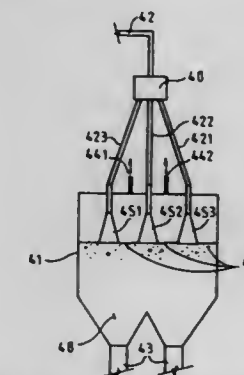
each one of said reinforcing steel bar insertion holes disposed rearward of the neutral stress plane having an inverse-tapered hole contour increasing a diameter thereof from the lower end to the upper end.  
 3. A retaining wall structure comprising:
 

- blocks, each having a front wall with a top and bottom end and a counterfort protruding from a back side of the front wall and extending from said top to said bottom end in a substantially vertical direction;
- the counterfort being formed of a plurality of partition walls defining a plurality of reinforcing steel bar insertion holes extending substantially vertically therein, each having upper and lower ends thereof open-ended;
- a neutral stress plane defined by a virtual plane in said block whereat stress due to a lateral stress applied to said back side of said block toward said front wall is neither tensile nor compressive;
- each one of said reinforcing steel bar insertion holes disposed on a front wall side of said neutral stress plane having one of a tapered hole contour increasing in a diameter thereof from the upper end to the lower thereof and a straight hole contour having a uniform diameter throughout; and
- each one of said reinforcing steel bar insertion holes disposed rearward of the neutral stress plane having an inverse-tapered hole contour increasing in a diameter thereof from the lower end to the upper end;

 the blocks are laid upon an upper surface of a footing foundation made of concrete reinforced by steel bars and stacked in such a manner that said reinforcing steel bar insertion holes vertically align and communicate with those thereunder;
 

- a plurality of anchoring steel bars protruding from the footing foundation and a plurality of connecting steel bars connecting said blocks via the reinforcing steel bar insertion holes; and
- a filler filling the reinforcing steel bar insertion holes to integrally connect the blocks for constructing the retaining wall.

**5,567,090**  
**METHOD AND APPARATUS FOR SEPARATING SOLIDS FROM GAS IN A HIGH PRESSURE SOLIDS-GAS STREAM UTILIZING A PACKED BED OF THE SOLIDS**  
 Arun K. Basak, Karhula, Finland, and Karukkampalayam M. Sellakumar, San Diego, Calif., assignors to Foster Wheeler Energia OY, Karhula, Finland  
 Filed Apr. 22, 1993, Ser. No. 51,969  
 Int. Cl.<sup>6</sup> B65G 53/60  
 U.S. Cl. 406—155 23 Claims



1. A method, for a solids-gas stream having a high pressure, of reducing the pressure of the solids-gas stream, and separating solids from the solids-gas stream, utilizing a de-entrainment vessel including a packed bed of the solids having an upper level, a solids outlet, a low pressure open space above the level of the packed bed, a gas outlet adjacent the low pressure open space and above the level of the packed bed, and two or more inlets for the solids-gas stream into the vessel, the inlets having outlets at or below the upper level of the packed bed of the solids, said method comprising the steps of substantially continuously:
  - reducing the pressure of the solids-gas stream;
  - separating solids from the solids-gas stream;

- (a) introducing the high pressure solids-gas stream into the de-entrainment vessel through the inlets so that gas of the solids-gas stream flows faster than the solids, to provide a pressure drop of the gas;
- (b) causing the gas from the solids-gas stream of step (a) to flow from above the packed bed of the solids through the packed bed of the solids so that the packed bed of the solids dissipates kinetic energy of the solids-gas stream, and to flow into the low pressure open space;
- (c) causing a velocity of the gas to decrease during, or just prior to, introduction of the gas into the packed bed of the solids, to minimize a possibility of fluidization of the solids in the packed bed;
- (d) after the gas has passed through the packed bed and entered the low pressure open space, discharging the gas separated from the solids-gas stream through the gas outlet and transporting it to a low pressure area; and
- (e) discharging the solids through the solids outlet from the vessel below the level of the packed bed.
6. Apparatus, for a high pressure solids-gas stream having a superatmospheric pressure, for reducing the pressure of the solids-gas stream and separating solids from the solids-gas stream, said apparatus comprising:
- a substantially vertical de-entrainment vessel having a packed bed of the solids disposed at a level within said vessel, an open space above the level, and a side wall;
  - a transporting pipe containing the solids-gas stream therein at the superatmospheric pressure;
  - an inlet connected to said transporting pipe where the pipe has a first cross-sectional area, and disposed within said de-entrainment vessel and extending from above the level of the packed bed to at least the level of the packed bed of the solids, and including two or more discharge openings at or below the level of the packed bed of the solids, said discharge openings having a combined second effective cross-sectional area significantly greater than said first cross-sectional area of said transporting pipe, to minimize a possibility of fluidization of the solids in the packed bed;
  - a gas outlet from said vessel located above the level of the packed bed of the solids and in communication with the open space in the vessel, and connected to an area having a lower pressure than the pressure in said transporting pipe, wherein a pathway for gas separated from the solids-gas stream is defined from the inlet, through the packed bed of the solids, through the open space in the vessel, and to the gas outlet; and
  - a solids outlet from said vessel located below the level of the packed bed of the solids, and connected to an area having a lower pressure than the pressure in said transporting pipe.

5,567,091

# SWING-ARM AIR CONVEYOR AND FLEXIBLE GUIDE JOINT FOR CONVEYING BOTTLES WITH NECK FLANGES

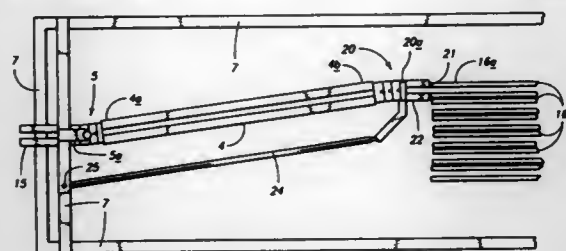
Mike Johnson, and Richard R. Lile, both of Spokane, Wash., assignors to R. A. Pearson Company, Spokane, Wash.

Filed May 2, 1995, Ser. No. 432,798

Int. Cl.<sup>6</sup> B65G 51/03

U.S. Cl. 406—182

15 Claims



1. A flexible guide joint for operatively connecting two air conveyors which convey bottles which are suspended by their neck flanges, the flexible guide joint comprising:

a plurality of joint members, each of which includes:

- (a) an upper body portion forming a recipient link and an engaging link, the engaging link of each joint member being pivotally connected to the recipient link adjacent said joint member; and
- (b) a lower body portion forming a conveyance chamber having two neck flange guide rails, the two neck flange guide rails including inner edges extending in opposition to one another and spaced transversely apart to support the neck flanges of the bottles, inner edges of the neck flange guide rails forming a conveyance channel for the bottles when the adjacent joint members are connected;

wherein an angle between the inner edges of the neck flange guide rails of the adjacent joint members is adjustable about vertical axes while still forming a substantially continuous conveyance channel along the respective neck flange guide rails.

5. An air conveyor apparatus for conveying bottles which are suspended by their neck flanges, between a single bottle path and a plurality of parallel bottle paths, the air conveyor apparatus comprising:

a rigid framework;

a swing-arm air conveyor having a first end angularly movable relative to the framework about a vertical axis, the first end of the swing-arm conveyor including a first flexible guide joint connected to a first end of the framework to define the single bottle path, a remaining end of the swing-arm conveyor being positioned adjacent to a selected bottle path of the plurality of parallel bottle paths, being arranged side-by-side across the framework, such that the bottles flow between the single bottle path and the selected bottle path through the swing-arm air conveyor, the swing-arm conveyor further comprising:

- (a) a conveyance chamber having two neck flange guide rails, the two neck flange guide rails including inner edges extending in opposition to one another and spaced transversely apart to support the neck flanges of the bottles; and
- a drive mechanism operably connected to the swing-arm conveyor to selectively move the remaining end thereof from one of the plurality of parallel bottle paths to another.

5,567,092

# MILLING CUTTER PROVIDING MULTIPLE ADJUSTMENTS FOR INSERTS CARRIED THEREBY

Yogve Post, Sandviken, Sweden, assignor to Sandvik AB, Sandviken, Sweden

Filed Aug. 31, 1994, Ser. No. 299,063

Claims priority, application Sweden, Sep. 6, 1993, 9302852

Int. Cl.<sup>6</sup> B23C 5/24

U.S. Cl. 407—38

15 Claims

1. A milling cutter comprising:

- a rotary body having first and second opposing sides interconnected by an annular peripheral envelope surface, grooves formed in said body and arranged in an annular pattern about an axis of rotation of said body, said grooves intersecting at least one of said sides of said body, and each groove having a curved first side wall defining an axis of said groove, said first side wall being of constant radius with reference to said groove axis, said groove axis intersecting respective planes of said sides and extending non-parallel to said axis of rotation of said body;
- a cartridge disposed in each groove and including a curved second side wall shaped correspondingly to said first side wall so that said cartridge is adjustable rotatably about said groove axis, said cartridge including a seat for receiving a cutting insert;
- a retainer for retaining the cartridge in selected positions of rotational adjustment about said groove axis;
- a manual actuator for adjustably rotating each of said cartridges about its groove axis, and
- a manual actuator for axially displacing each of said cartridges along its groove axis;

5,567,094

# SPEED CHANGE CONTROL MECHANISM OF A VERTICAL MILLING MACHINE

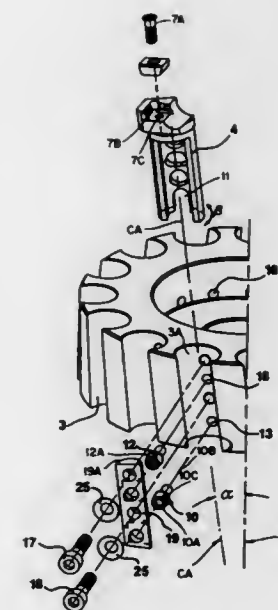
Liao Y. Chung, P.O. Box 82-144, Taipei, Taiwan

Filed Nov. 29, 1995, Ser. No. 563,975

Int. Cl.<sup>6</sup> B23Q 5/16; B23B 39/00; F16H 7/00

U.S. Cl. 409—183

3 Claims



wherein each manual actuator for axially displacing a cartridge comprises a rotary element having an eccentric head disposed in contact simultaneously with surfaces of said cartridge which are spaced apart in a direction parallel to said cartridge axis, said head of said rotary element being rotatable about an axis oriented perpendicular to said axis of rotation of said body.

5,567,093

# SEAL FOR COOLANT-FED TOOLS

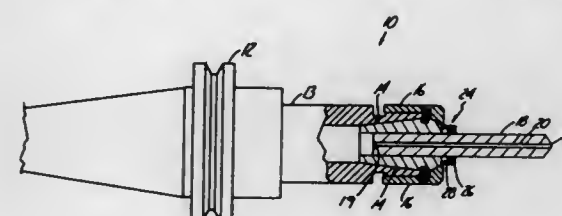
Daryl E. Richmond, 17623 Marmoset St. NW, Ramsey, Minn. 55303

Filed Apr. 11, 1995, Ser. No. 420,073

Int. Cl.<sup>6</sup> B23C 5/28; B23B 31/20; 51/06

U.S. Cl. 409—136

6 Claims



1. A fluid seal device for preventing fluid from flowing around a tool, the tool having an inner channel having an entrance opening and an exit opening through which fluid is fed to a tip of the tool, the tool being secured to a tool holder by a combination of a collapsible collet having slots extending from a first end of the collet to a second end of the collet and a collet nut, the fluid seal comprising:

- an O-ring positioned around the tool between the tool tip and the first end of the collet, the first end of the collet being remote from the tool tip; and
- a rigid seal positioned about the tool and the O-ring, and positioned between the first end of the collet and the collet nut such that fluid flowing within the slots of the collet is prevented from flowing past the fluid seal.

5,567,095

# VEHICULAR MOBILE OCCUPANT CARRIER

David R. James, 418 Shawnee Cir., Byron, Ga. 31008, and Thomas D. Turner, Rte. 2, Box 780, Fort Valley, Ga. 31030

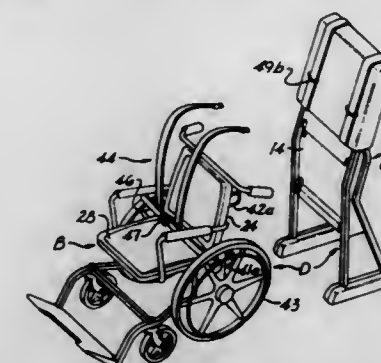
Continuation of Ser. No. 11,896, Feb. 1, 1993, abandoned.

This application Nov. 21, 1994, Ser. No. 343,012

Int. Cl.<sup>6</sup> B60P 7/08

U.S. Cl. 410—7

8 Claims



1. A vehicular mobile occupant carrier system for providing transportation of a physically impaired individual within a transportation vehicle, comprising:



a wheeled mobile occupant carrier for carrying said individual which includes a non-folding, unitary carrier frame having an occupant support frame and a bottom frame, and said occupant support frame includes a back frame and seat frame;

spaced junction frames rigidly connecting said occupant support frame and said bottom frame on spaced opposing sides of said carrier frame to provide an integral wheeled occupant carrier; each of said junction frames including a rigid structural interconnecting plate;

a plurality of wheels carried by said bottom frame including a pair of directional wheels pivoting about a vertical axis; a pair of driving wheels rotating about a rear wheel axis carried by said junction frames for providing said occupant carrier with mobility;

lower horizontally spaced latch bars carried by said spaced junction frames above said rear wheel axis and extending outwardly beyond the profile of said back frame;

each of said lower horizontally spaced latch bars being firmly affixed to said spaced junction frames at spaced attachments and including outwardly projecting latching apertures;

upper horizontally spaced latch bars carried by said back frame and extending outwardly from said back frame beyond the profile of said back frame;

said upper horizontally spaced latch bars being vertically spaced from said lower horizontally spaced latch bars providing at least four spaced points of securement of said occupant support frame;

each of said upper horizontally spaced latch bars being firmly affixed to said back frame at spaced attachments and including outwardly projecting latching apertures;

an upstanding securement stanchion extending from a floor of said transportation vehicle generally along a back side of said back frame of said occupant support frame;

said securement stanchion including a base disposed rearwardly of said occupant support frame for securing said stanchion to said vehicle floor;

a carrier securing section included in said securement stanchion, spaced rearwardly from said occupant support frame for receiving said upper and lower latch bars, and said carrier securing section extending vertically above said base at least to a height nearly above said back frame so that said occupant carrier and securement stanchion may be secured together in a uniform force resisting manner;

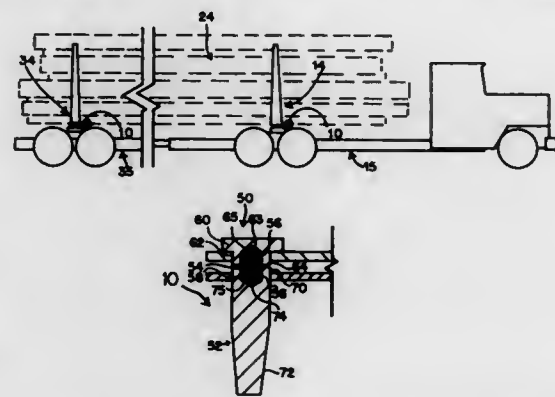
lower latch elements carried by said carrier securing section at a position generally equal to the position of said lower latch bars for receiving and securing said lower latch bars to said carrier securing section for restraining movement of said mobile occupant carrier in three degrees of freedom;

upper latch elements carried by said carrier securing section at a position generally equal to the position of said upper latch bars for receiving and securing said upper latch bars for securing to said carrier securing section for restraining movement of said mobile occupant carrier in three degrees of freedom;

said upper and lower latch elements cooperating with said upper and lower latch bars to interlock said occupant carrier to said upstanding stanchion at four spaced points of vertical and horizontal engagement so that forces exhibited on said mobile occupant carrier are distributed generally in a uniform manner between said carrier frame and said securement stanchion; and

said upper and lower latch bars being arranged in horizontal alignment with said upper and lower latch elements so that said occupant carrier interlocks with said upstanding securement stanchion when said occupant carrier is moved in a translational rearward motion along a vehicle floor to engage said securement stanchion.

5,567,096  
SHEAR-PIN SYSTEM FOR LOGGING TRUCK BUNK  
Douglas D. Howard, 2565 20th St., Clarkston, Wash. 99403  
Filed Sep. 13, 1994, Ser. No. 306,190  
Int. Cl.<sup>6</sup> B60P 7/12  
U.S. Cl. 410-42 5 Claims



1. A shear-pin system for a logging truck tractor or trailer, the shear-pin system comprising a log bunk system and a shear-pin, wherein the log bunk system comprises:

a bunk for receiving logs and a bridge for being connected to a tractor or trailer, the bunk having a substantially horizontal crossbar connected to the bridge so that the bunk may swivel relative to the bridge with the cross-bar rotating in a horizontal plane,

bunk-ear connected to the bunk, and

bunk-ear connected to the bridge, wherein each bunk-ear has a hole and the bunk-ear holes are aligned when the bunk is generally perpendicular to the tractor or trailer

wherein the shear-pin is received in the aligned bunk-ear holes for restraining movement of the bunk relative to the bridge during loading and unloading of logs, and

wherein the shear-pin comprises:

a pin cap having a head portion and a shaft portion extending downwardly from the head portion, the shaft portion having a bottom end and a shaft open interior space extending from the bottom end of the shaft portion up into the shaft portion,

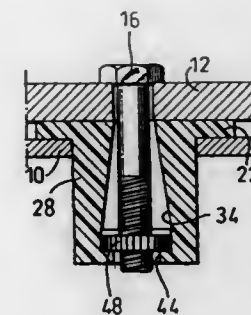
an elongated shoulder pin having a top end and having a shoulder pin open interior space extending from the top end down into the shoulder pin,

an insert having a first end received in binding relationship inside the shaft open interior space and having a second end received in binding relationship inside the shoulder pin open interior space to removably connect the pin cap to the shoulder pin,

wherein opposite sideways forces placed on the pin cap and the shoulder pin by the bunk-ears, caused by road travel of the logging truck, will separate the pin cap and the shoulder pin by breaking the insert.

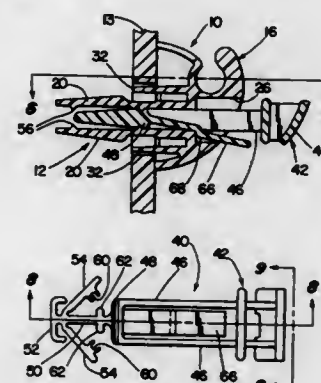
5,567,097  
DEVICE FOR FASTENING AN ASSEMBLY ON THE BODYWORK OF A MOTOR VEHICLE, AND A SCREEN WIPER MODULE INCLUDING SUCH A DEVICE  
Pascal Morin, Chatelleraut, France, assignor to Valeo Systemes D'Essuyage, La Verriere, France  
Filed May 23, 1995, Ser. No. 447,696  
Claims priority, application France, May 26, 1994, 94 06517  
Int. Cl.<sup>6</sup> F16B 13/04; 13/06  
U.S. Cl. 411-34 1 Claim

1. A fastening device for fastening a plate having a first hole formed through the plate, on to a structural element having a second hole formed through the structural element, the latter defining a first surface and a second surface on the opposite side thereof from its first surface, the fastening device comprising a damping



ring to be interposed between the said plate and said first surface, the damping ring having a third hole formed through it; a fastener assembly comprising a threaded body and a nut, the threaded body being adapted to pass through said first hole, and a hollow cage for retaining the nut therein beyond the said second surface of the panel prior to being engaged by the threaded body, wherein the fastening device includes a one-piece assembly member comprising the said damping ring and cage formed integrally with each other in a resilient material, the cage being adapted to extend through the said second hole whereby to be deformed in expansion as the nut is tightened on to the threaded body and wherein the portion of the assembly member that defines the said cage has a stepped bore comprising a first bore portion, in which the said threaded body is rotatable, and a second bore portion of larger size than the first bore portion, the nut being received in the said second bore portion, the assembly member defining substantially a body of revolution about a screwing axis and further defining a conical junction zone between the said first and second bore portions.

5,567,098  
RELEASEABLE FASTENER ASSEMBLY  
Gary Gordon, Southfield, Mich., assignor to TRW Inc., Cleveland, Ohio  
Filed Feb. 1, 1995, Ser. No. 382,484  
Int. Cl.<sup>6</sup> F16B 13/06  
U.S. Cl. 411-48 11 Claims



1. A fastener assembly for joining a first component to a panel comprising:

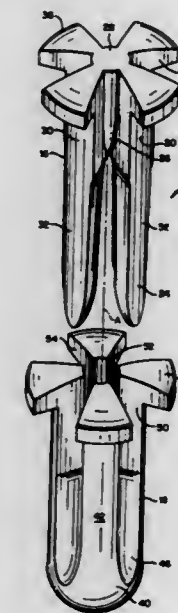
a fastener body having a central opening therethrough with a pair of legs extending therefrom on opposite sides of the central opening, said legs adapted for receipt in a hole in the panel, at least one of the legs being resilient radially of the central opening and carrying a latch portion for engagement with the panel to retain the fastener body joined to the panel;

a pin member in the central opening for selective axial movement between an axially outer first position wherein said at least one resilient leg can deflect radially inward to allow removal of the fastener body from the panel and a second position axially inward of the first position wherein the said at least one resilient leg is prevented from deflecting radially inward;

at least one resilient finger carried by one of the pin member and the fastener body to extend laterally of the pair of legs to permit the fastener assembly to be preassembled to the first component prior to joining the fastener assembly to the panel; and,

selectively operable stop means for preventing inadvertent movement of the pin member from the first position to the second position, the stop means comprising a resilient lever carried by one of the main body and the pin.

5,567,099  
TWO-PART BLIND RIVET  
John DaFoe, 1809 Maritime Mews, Vancouver, B.C., Canada  
Filed Jul. 20, 1995, Ser. No. 504,426  
Int. Cl.<sup>6</sup> F16B 13/06; 15/00  
U.S. Cl. 411-54 12 Claims



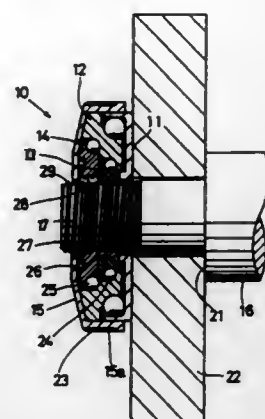
1. A two-part rivet comprising:

an elongated first part having an intermediate body portion, a head adjacent one end of the body portion, and at least a pair of legs extending along said intermediate portion and from an opposite end of said body portion and spaced one from the other, said first part having a central axis passing through said body portion and said head with said legs spaced radially from said axis, said head having at least a pair of flanges spaced from one another about said axis and projecting laterally outwardly of said legs;

an elongated second part having a central axis, a base and at least a pair of legs extending from said base terminating in distal end portions thereof, said legs being circumferentially spaced from one another and from the axis of said second part, said legs of said second part having at least a pair of flanges projecting from distal end portions and spaced from one another about the axis thereof and projecting laterally outwardly of the legs of said second part;

said first part being axially receivable in said second part with the legs of said first part disposed between the legs of said second part, said base including a pair of cam surfaces and distal portions of the legs of said first part including cam follower surfaces, said cam follower surfaces engaging said cam surfaces in response to axial movement of said first part into said second part for displacing the distal portions of the legs of said first part laterally outwardly from between the legs of said second part to project laterally beyond the legs of said second part.

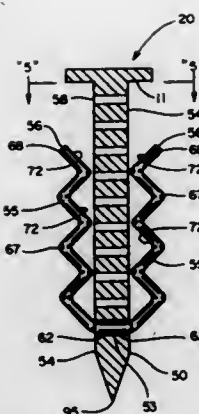
**5,567,100**  
**TORQUE ENHANCING CLAMPING NUT**  
 Daijiro Nakamura, Ono, Japan, assignor to Power Tool Holders Incorporated, Wilmington, Del.  
 Continuation-in-part of Ser. No. 194,089, Feb. 9, 1994, which is a division of Ser. No. 31,311, Mar. 15, 1993. This application Mar. 22, 1994, Ser. No. 216,220  
 Int. Cl.<sup>6</sup> F16B 37/08; 37/16  
 U.S. Cl. 411—433 14 Claims



1. A torque enhancing tightening screw configured to be received on a threaded drive spindle to hold a rotary tool relative to the drive spindle, said screw comprising:  
 at least a first screw member defining an inner diameter opening for receipt of said threaded drive spindle, said inner diameter opening having female threads defined therein for engagement with male threads defined on said drive spindle, said inner diameter opening having a diameter greater than the diameter of said drive spindle so as to be eccentric relative to said drive spindle;  
 a rotating ring disposed about said screw member, said screw member in driving contact with said rotating ring and rotatable and revolvable within said rotating ring; and  
 a mechanism configured for rotating said rotating ring such that rotational forces are imparted to said screw member through driving contact with said rotating ring causing said screw member to rotate about said drive spindle in an eccentric path, a portion of said female threads thereby engaging with said male threads in said eccentric path causing said screw to advance along said drive spindle.

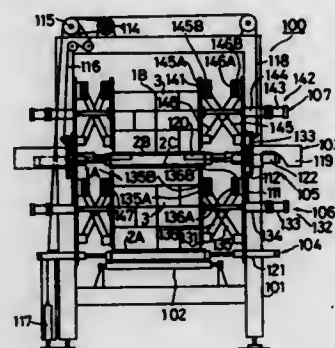
**5,567,101**  
**LOCK-IN GRIP ARM SHANK NAIL**  
 Donald A. Martin, 1411 N. Dugdale Rd., North Chicago, Ill. 60064  
 Continuation-in-part of Ser. No. 602,429, Oct. 23, 1990, abandoned. This application Jul. 21, 1995, Ser. No. 505,064  
 Int. Cl.<sup>6</sup> F16B 15/00; 15/06  
 U.S. Cl. 411—447 8 Claims

1. A locking nail fastener comprising a shank, a point, and a head, the locking nail fastener further comprising:  
 (a) the shank being centrally located on the locking nail fastener with the head at one end thereof and the point at an oppositely disposed end thereof;  
 (b) the shank further including a locking means for securing the nail in a position after the nail is driven into a surface;  
 (c) the locking means including a plurality of apertures in the shank and a locking clip inserted through at least one aperture in the locking apertures;  
 (d) the series of apertures being divided into a first set of apertures and a second set of apertures;  
 (e) the first set of apertures having mutually parallel axes;  
 (f) the second set of apertures having mutually parallel axes; and



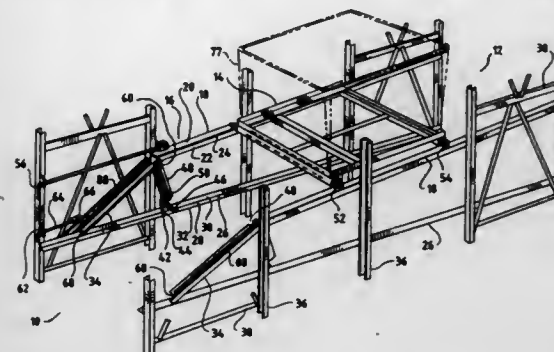
(g) the first set of apertures and the second set of apertures being at an angle in relation to each other.

**5,567,102**  
**METHOD AND APPARATUS FOR CORRECTING LOAD APPEARANCE**  
 Nobuhiro Tanaka, Saitama, Japan, assignor to Kao Corporation, Tokyo, Japan  
 PCT No. PCT/JP93/00570, § 371 Date Jan. 10, 1994, § 102(e)  
 Date Jan. 10, 1994, PCT Pub. No. WO93/22318, PCT Pub. Date Nov. 25, 1993  
 PCT Filed Apr. 28, 1993, Ser. No. 178,285  
 Claims priority, application Japan, May 13, 1992, 4-146906; May 13, 1992, 4-146907; May 13, 1992, 4-146908; May 13, 1992, 4-146909  
 Int. Cl.<sup>6</sup> B65G 59/00  
 U.S. Cl. 414—274 7 Claims



2. An apparatus for correcting the appearance of each of a plurality of vertically stacked load stages each comprising a load appearance placed on a pallet, the apparatus comprising:  
 upper stage pallet lift means for raising and lowering an upper stage pallet between a stack position and a load appearance correction position;  
 pallet securing means for each stage load appearance correction position for securing each stage pallet;  
 load appearance correcting means at each stage load correction position for correcting the appearance of each stage pallet load;  
 the pallet securing means at each stage being capable of driving separately at each stage; and  
 the load appearance correcting means at each stage being capable of driving separately at each stage.

**5,567,103**  
**UNLOADING DEVICE**  
 Anthony N. Konstant, 920 Fisher Ln., Winnetka, Ill. 60092  
 Filed Oct. 21, 1994, Ser. No. 335,301  
 Int. Cl.<sup>6</sup> B65G 1/18  
 U.S. Cl. 414—276 7 Claims



1. A container unloading system having an unloading front end and loading rear end comprising:  
 a two-tiered rail system having a set of parallel feed rails and a set of parallel return rails positioned below said feed rails; said feed rails having sections of increased angularity near said front end;  
 at least one cart having a load bearing surface adapted to carry a unit load and further including support means for the attachment of front and rear wheels; said wheels positioned on said cart for rolling engagement with said feed rails and said return rails of said two-tiered rail system;  
 a first set of passageways located above said return rails, said first passageways adapted to permit said rear wheels of said cart to move from rolling engagement with said feed rails to rolling engagement with said return rails;  
 a second set of passageways located above said return rails, said second passageways adapted to permit said front wheels of said cart to move from rolling engagement with said feed rails to rolling engagement with said return rails;  
 said cart selectively retained on said feed rails during the unloading of said cart;  
 said rail system adapted for said cart to be supported on said sections of increased angularity during the unloading of said unit load; and  
 a speed reduction means for controlling said cart's descent down said sections of increased angularity.

**5,567,104**  
**APPARATUS FOR THE TRANSPORT AND STOCKING OF CIGARETTES**  
 Heinz Focke; Harald Gosebruch, both of Verden, and Hans-Jürgen Bretthauer, Bremen, all of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Germany  
 Filed Feb. 22, 199



a conveyor mounted to and within said interior circular frame for moving the container into said interior circular frame;  
a container lid lifter mounted to an upper portion of said outer frame for raising and lowering a lid of said container;  
positioning clamps mounted to and disposed within said interior frame for maintaining said container within said interior circular frame while said car is moving and while said interior circular frame is rotated; and  
means for powering said car for horizontal travel.

5,567,106

# APPARATUS FOR CHARGING A TRASH SORTING DEVICE WITH THE CONTENTS OF TRASH BAGS

Benno Gassner, P.O. Box 60, DE-85655 Grosshelfendorf, Germany

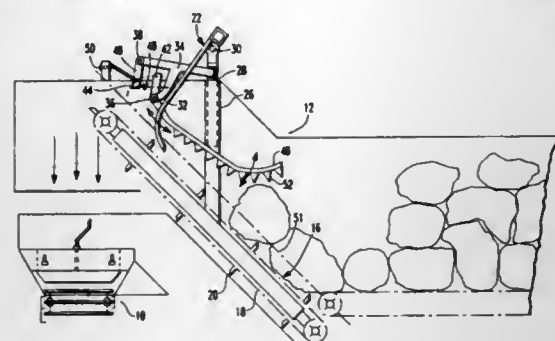
Filed Jul. 15, 1994, Ser. No. 275,765

Claims priority, application Germany, Jul. 16, 1993, 43 2952.8

Int. Cl.<sup>6</sup> B65B 69/00

U.S. Cl. 414-412

19 Claims



1. An apparatus for charging a trash sorting device with contents of trash bags, having a feed apparatus, and the trash sorting device having a sorting conveyor, the sorting conveyor traversing a sorting area, and the sorting conveyor having a charging point, comprising:

- (a) an inclined conveyor belt suitable for bearing and transporting trash bags and their contents, which conveyor belt having an upper end above the charging point of the sorting conveyor, having a lower end near the feed apparatus, said inclined conveyor belt having a direction of transport which is towards the upper end;
- (b) a deflector rake having tines, said tines having gaps therebetween, and said deflector rake located a distance above the inclined conveyor belt and near the upper end of the inclined conveyor belt, said deflector rake swiveling around a first axle traversing the conveyor belt, said tines having a free end and a pickup position, and when in the pick up position the free end of the tines approaches the inclined conveyor belt at a downward angle in a direction opposite the direction of transport of the inclined conveyor belt and said deflector rake can be moved from the pick up position to a reject position above the inclined conveyor belt, the deflector rake driveable in a back-and-forth motion between the pick up position and the reject position;
- (c) ripping devices facing the trash bags and extending in a direction opposite the direction of transport, and a distance from the deflector rake, with a distance from the conveyor belt increasing in the direction opposite the direction of transport, said ripping devices projecting through the gaps in the tines, said ripping devices can be moved from an initial position, against a return force, and around a common second axle traversing the inclined conveyor belt, said second axle being mounted at a bearing post positioned downstream of and a distance from the deflector rake; and
- (d) a device which monitors the flow of material along the conveyor belt and which regulates transport along the feed apparatus.

5,567,107

# EXTRAVEHICULAR APPARATUS FOR LOADING AND SECURING CARGO

Michael R. Bruno, 3950 Southwood Dr., Oconomowoc, Wis. 53066, and Robert M. Boyd, W2740 Rock River Paradise, Watertown, Wis. 53094

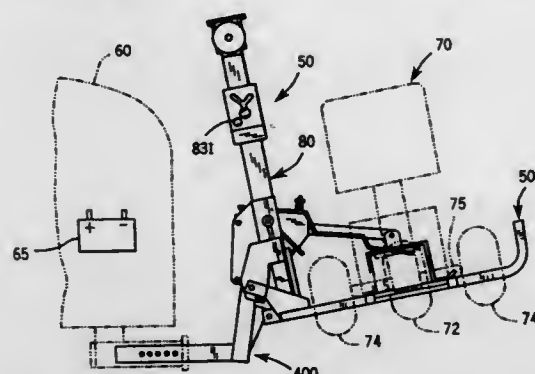
Continuation of Ser. No. 976,896, Nov. 16, 1992, abandoned.

This application Aug. 1, 1994, Ser. No. 284,043

Int. Cl.<sup>6</sup> B60P 3/06; B60R 9/06

U.S. Cl. 414-462

15 Claims



8. A device for selectively raising and securing cargo, said device comprising:

- A) a fixed unit comprising a first member having a ramp;
- B) a lifting unit vertically movable between a raised position and a lowered position, said lifting unit comprising:
  - 1) a second member having
    - a) a spring loaded follower, said ramp providing resistance to upward movement of said follower; and
    - b) a platform, said platform being pivotable between a closed position and an open position; and
  - 2) a third member slidable into said second member, and having a pair of rollers at the base of said third member, wherein during upward movement of said lifting unit said rollers engage said platform to urge pivoting of said platform to said closed position;
- C) a drive unit connected to said lifting unit to selectively raise and lower said lifting unit relative to said fixed unit;
- D) means for detecting whether a preselected minimum weight is present on said platform, said detecting means including said ramp and said follower; wherein said platform is in its open position whenever said lifting unit is in said lowered position; further wherein said platform pivots into said closed position when said detecting means does not detect a preselected minimum weight on said platform and said lifting unit is raised; and further wherein said platform remains in said open position when said detecting means detects a preselected minimum weight on said platform and said lifting unit is raised.

5,567,108

# TRANSFER APPARATUS FOR TRANSFERRING ARTICLE HOLDERS, PARTICULARLY FOR TRANSFERRING CART CARRIERS IN A STORAGE COMPARTMENT

David Luria, Tel Aviv, Israel, assignor to Fuselage Engineering Services Ltd., Tel Aviv, Israel

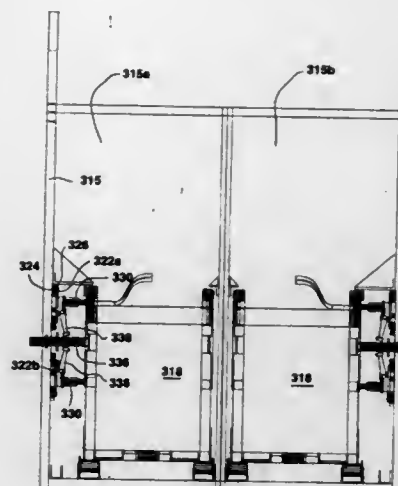
Continuation-in-part of Ser. No. 121,407, Sep. 15, 1993, Pat. No. 5,413,292. This application Apr. 15, 1994, Ser. No. 228,287

Claims priority, application Israel, Apr. 18, 1993, 105451 Int. Cl.<sup>6</sup> B64D 11/04

U.S. Cl. 414-518

20 Claims

1. Transfer apparatus for transferring an article holder from one location to another location in a compartment, comprising:



a framework extending longitudinally of said compartment;  
a carriage movable longitudinally of said framework;  
a drive for said carriage;  
a coupling device carried by said carriage and having a coupling position and a released position with respect to said article holder;  
a locking device carried by said framework and having a locking position and a released position with respect to said article holder;  
and an actuator for actuating said coupling device and said locking device  
said actuator comprising an actuator member movable to a plurality of positions when actuated, including: (a) a first position wherein the locking device is in said locking position of the locking device and the coupling device is in said released position of the coupling device; (b) a second position, wherein the locking device is in said locking position of the locking device, and the coupling device is in said coupling position of the coupling device; and (c) a third position, wherein the locking device is in said released position of the locking device, and the coupling device is in said coupling position of the coupling device.

5,567,109

# SELF-LOADING TOBACCO TRAILER

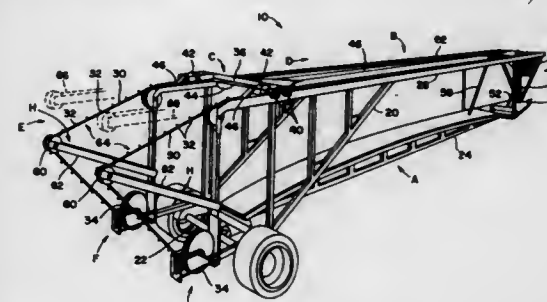
Jay S. Eaton, Rte. 2, Buladean, Bakersville, N.C. 28705

Filed Apr. 5, 1995, Ser. No. 417,086

Int. Cl.<sup>6</sup> B60P 1/00

U.S. Cl. 414-679

25 Claims



1. A self-loading transportable tobacco trailer for transporting tobacco laden tobacco rods, said trailer comprising:  
a wheeled undercarriage configured to be connected to a work vehicle;  
a generally upright side structure supported by said wheeled undercarriage; and  
a tobacco rod carrying assembly supported by said side structure, said rod carrying assembly comprising,

oppositely faced parallel rod carrying members supported by said side structure at a height such that tobacco stalks impaled on the tobacco rods hang freely within said structure between said carrying members,  
at least one movable member supported by the trailer and configured to move in either lengthwise direction with respect to said carrying members and to position and propel the tobacco carrying rods with respect to said carrying members,  
a drive mechanism in communication with, and configured to move, said at least one movable member in at least one lengthwise direction along said carrying members to permit at least one of the placement and removal of the tobacco rods at said at least one movable member and to permit the loading of the trailer with tobacco rods at a single loading point; and  
wherein said tobacco rod carrying assembly further comprises tobacco rod guides affixed to said at least one movable member and configured to transversely position the tobacco carrying rods at predetermined intervals with respect to said carrying members.

5,567,110

# ROBOT ARM STRUCTURE

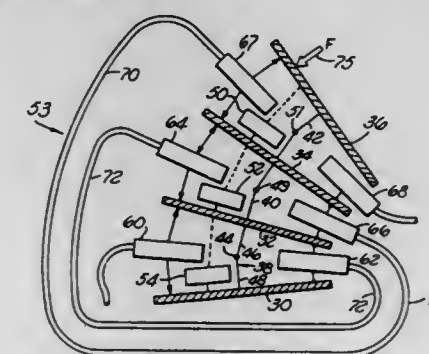
Ivan E. Sutherland, 5139 Penton Rd., Pittsburgh, Pa. 15213

Continuation of Ser. No. 838,365, Feb. 19, 1992, abandoned, which is a continuation of Ser. No. 622,469, Dec. 5, 1990, abandoned, which is a continuation of Ser. No. 415,739, Oct. 2, 1989, abandoned, which is a division of Ser. No. 746,222, Jun. 18, 1985, Pat. No. 4,900,218, which is a continuation of Ser. No. 483,021, Apr. 7, 1983, abandoned. This application May 19, 1995, Ser. No. 446,009

Int. Cl.<sup>6</sup> B25J 9/00

U.S. Cl. 414-735

6 Claims



6. A robot arm structure for transporting load pieces and accordingly being subjected to variable loads, said robot arm structure comprising:

- at least one arm component comprising:
  - an elongate skeletal frame member including a plurality of elemental segment defined by a plurality of discs positioned in a concentric stack, said elemental segments aligned to provide at least a first segment, a second segment and a third segment;
  - a plurality of deflection bellows configured within said frame member for deflecting said frame member toward a curvature, said deflection bellows being arranged in groups, each of said groups being positioned within a distinct elemental segment, said deflection bellows containing deflection fluid;
  - a plurality of A distribution bellows positioned within said first segment;
  - a plurality of B distribution bellows and a plurality of A-mate distribution bellows all positioned within said second segment, said A-mate distribution bellows being equal in number to said A distribution bellows with one positioned oppositely from each said A distribution bellows in said first segment;

a plurality of B-mate distribution bellows positioned within said third segment and said B mate distribution bellows being equal in number to said B distribution bellows with one positioned oppositely of each said B distribution bellows in said second segment,

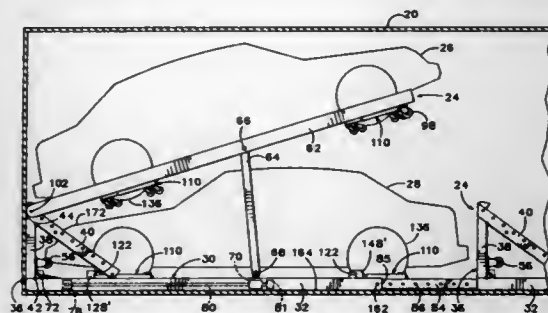
a set of A fluid conduits each interconnecting a distinct one of said A distribution bellows with a distinct one of said B fluid conduits each interconnecting a distinct one of said B distribution bellows with a distinct one of said B-mate distribution bellows, wherein each interconnected distribution bellows and its respective mate distribution bellows contain a fixed volume of distribution fluid that is separate and distinct from the fluid any other interconnected distribution bellows and its respective mate distribution bellows and from said deflection fluid notwithstanding the application of load; and an effector affixed at one end of said arm component for grasping said load.

**5,567,111**  
**METHOD FOR HANDLING AND TRANSPORTING WHEELED VEHICLES**  
Peter Gearin, and David J. Miller, both of Portland, Oreg., assignors to G & G Intellectual Properties, Inc., Portland, Oreg.

Filed Dec. 28, 1993, Ser. No. 175,281  
Int. Cl.<sup>6</sup> B60P 3/08

U.S. Cl. 414—786

16 Claims



1. A method for supporting a wheeled vehicle, comprising:
  - (a) moving a rack along a generally planar surface with said rack in a collapsed configuration, to a predetermined location;
  - (b) placing said rack, supported by said generally planar surface, in a vehicle receiving configuration;
  - (c) thereafter moving a wheeled vehicle separately along said generally planar surface into a predetermined location with respect to said rack, with said wheeled vehicle supported at least in part by a wheeled cradle supported by said generally planar surface and engaging a wheel of said wheeled vehicle; and
  - (d) fastening said wheeled vehicle to said rack by interconnecting said wheeled cradle with said rack.

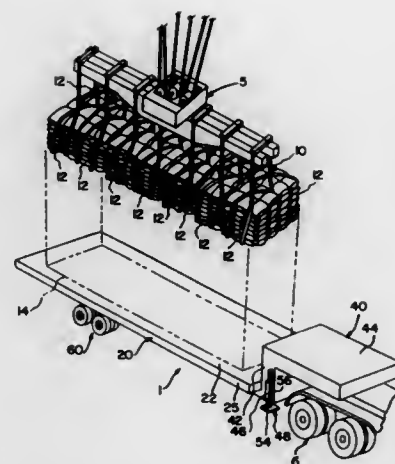
**5,567,112**  
**CARGO SHIP OFF-LOADING METHOD AND CARGO CARRIER**  
Joseph A. Balzano, Woodbury, N.J., assignor to South Jersey Port Corporation, Camden, N.J.

Filed Feb. 8, 1994, Ser. No. 193,243  
Int. Cl.<sup>6</sup> B63B 27/00

U.S. Cl. 414—786

15 Claims

1. A method for unloading slings loads of break bulk goods from a docked ship which has a crane having at least a ten sling capacity



and for transporting the break bulk goods from a debarkation area on a dock adjacent the ship within the reach of the ship's crane, each of said sling loads having a footprint of approximately five and a half feet by six feet, the method comprising:

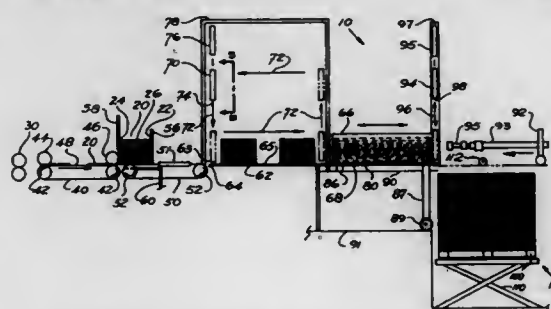
- providing a selectively configured cargo carrier having a deck configured for receiving a group of at least ten sling loads of break bulk goods arranged in multiple rows of slings and transporting the goods over land;
- positioning said cargo carrier in the debarkation area directly beneath an unloading position of the ship's crane;
- using the ship's crane to transfer at least ten sling loads of break bulk goods arranged in multiple rows of slings from the ship to the positioned cargo carrier in a single operation; and
- removing the loaded cargo carrier from the debarkation area.

**5,567,113**  
**APPARATUS AND METHOD FOR PALLETIZING WORK PIECES**  
Richard G. Mumper, W331 N6200 Hwy. C, Nashotah, Wis. 53058

Filed Jul. 31, 1995, Ser. No. 509,593  
Int. Cl.<sup>6</sup> B65G 57/03; 57/22

U.S. Cl. 414—791.6

11 Claims



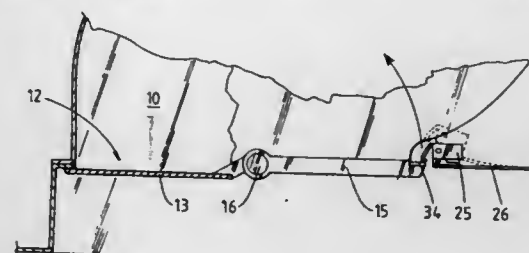
1. An apparatus for palletizing work pieces from a storage table to a pallet, the apparatus comprising:
  - a frame;
  - a track connected to the frame, the track extending from the storage table over the pallet;
  - a load table movably mounted on the track;
  - a sweep plate for pushing the work pieces from the storage table onto the load table, the sweep plate connected to a sweep plate moving mechanism, the sweep plate moving mechanism connected to the frame;
  - a wipe plate for retaining the work pieces above the pallet, the wipe plate connected to a wipe plate moving mechanism, the wipe plate moving mechanism connected to the frame;

a hydraulic lift for supporting and lowering the pallet, the hydraulic lift located below an edge portion of the track; a back stop mounted to a pair of sliding rods, the sliding rods actuated by air cylinders.

**5,567,114**  
**FAN CLOSURE FLAP**  
Allen K. Wallace, Hindmarsh, Australia, assignor to F F Seeley Nominees Pty Ltd, St. Marys, Australia  
Filed Apr. 26, 1995, Ser. No. 427,794  
Claims priority, application Australia, Apr. 27, 1994, PM 5302

Int. Cl.<sup>6</sup> F04D 29/00  
U.S. Cl. 415—146

6 Claims



1. Closure means for closing an outlet opening of a casing of a fan assembly having a motor driven air flow impeller within the casing, comprising a flap, hinge means hinging the flap to the casing for movement between a normally closed position wherein said flap at least partly closes said outlet opening and an open position wherein there is a free flow of air from said opening, a counterweight arm associated with said flap and hinge means urging said flap towards its normally closed position, and a latch releasably retaining said flap in its closed position, wherein said latch includes resilient means deflected upon latch release.

5,567,115

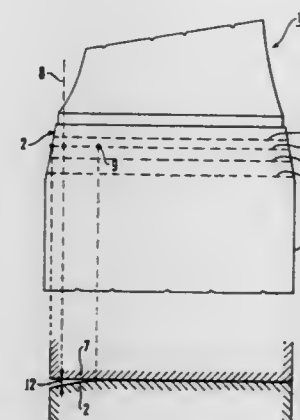
Patent Not Issued For This Number

**5,567,116**  
**ARRANGEMENT FOR CLIPPING STRESS PEAKS IN A TURBINE BLADE ROOT**  
Pierre Bourcier, Paris, France, assignor to GEC Alsthom Electromecanique SA, Paris, France  
Filed Sep. 22, 1995, Ser. No. 532,103  
Claims priority, application France, Sep. 30, 1994, 94 11724  
Int. Cl.<sup>6</sup> F01D 5/30

U.S. Cl. 416—219 R

3 Claims

1. An arrangement for clipping stress peaks in the anchoring of a turbine blade defining a leading edge and a trailing edge and including a root that is shaped like a Christmas tree and which defines an extrados side and an intrados side, that includes tangs, and that is received in a correspondingly-shaped groove in a disk so as to anchor said turbine blade thereto, wherein each tang has an outline, on the extrados side of the root, such that a clearance for mounting the root in the groove, on the extrados side, is non-uniform so as to include at least one zone in which the clearance varies, said at least one zone corresponding to a zone of the tang where, when the disk-and-blade assembly is rotating at its rated speed of rotation, there would otherwise occur a stress peak relative to a mean stress along the tang when the turbine blade is

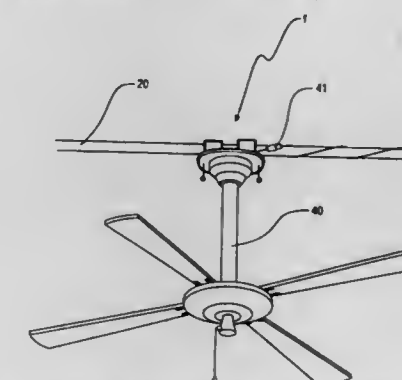


mounted with a constant clearance along the entire length of the tang, said varying clearance varying along said at least one zone with the same sign as said stress peak.

**5,567,117**  
**RECIRCULATION FAN PORTABLE MOUNTING APPARATUS**  
Doyle M. Gunn, 2225 Hulman St., Terre Haute, Ind. 47803, and Larry A. Ramsey, RR#1 Box 268B, Rockville, Ind. 47872-9768

Filed Oct. 3, 1995, Ser. No. 538,383  
Int. Cl.<sup>6</sup> F04D 29/64  
U.S. Cl. 416—244 R

4 Claims



1. A fan mounting apparatus, said fan mounting apparatus being portable and removable, said fan mounting apparatus comprising:
  - a generally flat mounting plate having an upper surface and a lower surface;
  - a central aperture penetrating said mounting plate between said upper surface and said lower surface;
  - a first grasping hook mounted to said upper surface at a plane offset from the centerline of said mounting plate and having a first vertical wall connected to and protruding from said upper surface and a first horizontal tongue protruding parallel to said upper surface;
  - a first threaded bolt hole penetrating said mounting plate and aligned directly beneath said first horizontal tongue;
  - a first bolt for threadingly engaging said first bolt hole such as to penetrate from said lower surface, past said upper surface;
  - a second grasping hook mounted to said upper surface at a plane offset from the centerline of said mounting plate and having a second vertical wall connected to and protruding from said upper surface and a second horizontal tongue protruding parallel to said upper surface;
  - a second threaded bolt hole penetrating said mounting plate and aligned directly beneath said second horizontal tongue;



a second bolt for threadingly engaging said second bolt hole such as to penetrate from said lower surface, past said upper surface; and  
second connection means for affixing a ceiling-type circulation fan to said lower surface.

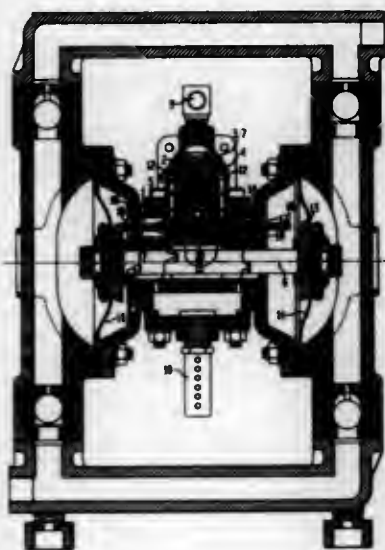
**5,567,118**  
**NON-LUBRICATED, AIR-ACTUATED, PUMP-OPERATING, SHUTTLE VALVE ARRANGEMENT, IN A RECIPROCATING PUMP**

Keith A. Grgurich, Cincinnati, and Graydon W. Cole, West Chester, both of Ohio, assignors to ITT Fluid Technology Corporation, Midland Park, N.J.

Filed Feb. 14, 1995, Ser. No. 388,091  
Int. Cl.<sup>6</sup> F04B 49/00; 17/00

U.S. Cl. 417-46

6 Claims



1. A non-lubricated, air actuated, pump-operating, shuttle valve arrangement, in a reciprocating pump, comprising:  
a pump housing having a first bore and a second bore formed therein;  
a pump-operating shuttle valve slidably disposed in said first bore;  
a source of energized air;  
a first passageway, formed in said housing, for conducting air from said source to one end of said first bore;  
a second passageway, formed in said housing, for conducting air from said source to the opposite end of said first bore;  
reciprocating means, interposed between said source and said passageways, for preventing an operative stall of said shuttle valve due to a dead centering thereof, in said first bore, substantially equidistant from said one and said opposite ends of said first bore, said reciprocating means comprising a spool slidably disposed in said second bore, said spool having unitarily formed extended portions at opposite ends thereof; and  
translating pumping means within said housing, said pumping means, during translation thereof, engaging said unitarily formed portions of said spool, alternatively, causing reciprocation of said spool.

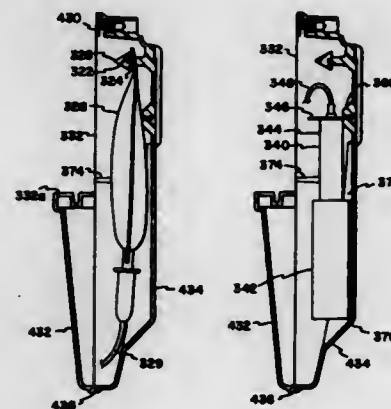
**5,567,119**  
**BAG/SYRINGE ENCLOSURE ARRANGEMENTS AND METHODS**

Jay G. Johnson, Maple Plain, Minn., assignor to SIMS Deltec, Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 145,371, Oct. 28, 1993, Pat. No. 5,540,561. This application Feb. 13, 1995, Ser. No. 388,200

Int. Cl.<sup>6</sup> F04B 23/02; A61M 1/00  
U.S. Cl. 417-53

19 Claims



1. A method of using an enclosure arrangement comprising the steps of:  
providing a wall construction defining an internal chamber, the wall construction including an opening into the chamber;  
placing a fluid bag into a chamber of the wall construction through the opening into the wall construction;  
hanging the fluid bag from a bag post of the wall construction;  
placing a first end of a pump into the chamber of the wall construction through the opening into the wall construction;  
and  
attaching a second end of the pump to the wall construction to close off at least a portion of the opening into the wall construction.

**5,567,120**  
**ELECTRONIC INFUSION DEVICE AND NOVEL ROLLER CLAMP HOLDEN THEREFOR**

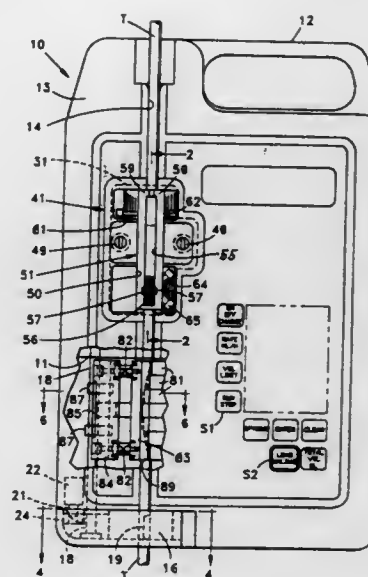
Roger L. Hungerford, Medina; Christopher D. Cimerman, Cheektowaga; Paul J. Hufnagel, Clarence, and Robert J. Pieroni, Lewiston, all of N.Y., assignors to Sigma International, Medina, N.Y.

Filed Oct. 13, 1994, Ser. No. 322,432  
Int. Cl.<sup>6</sup> F04B 49/00; 43/09

U.S. Cl. 417-63

20 Claims

1. A device for infusing IV fluids into a patient through an IV set of the type including an IV tube and associated clamp having mounted thereon a manually operable crimping element movable on the clamp selectively between an open positioning which it permits the flow of fluid through the tube and a closed position in which it compresses the tube and blocks the flow of fluid there-through, comprising  
a housing having therein an IV tube channel and a mechanism for infusing fluid through an IV tube seated in said channel and operatively connected to said mechanism,  
a clamp holder removably secured in said housing, and having therein a recess opening on the exterior of said housing, and configured removably to support therein the clamp of an IV set with the IV tube thereof seated in said channel and operatively connected to said infusing mechanism, and with said crimping element facing outwardly of said opening to permit manual operation thereof,



first sensing means on said holder for detecting the presence of said clamp when the latter is supported in said holder, second sensing means on said holder operative, when said clamp is supported in said recess, to detect when said crimping element of the clamp is in its closed position, and safety means on said housing controlled by said sensing means and operable to enable said IV tube to be disconnected from said mechanism only when said crimping element is in its closed position.

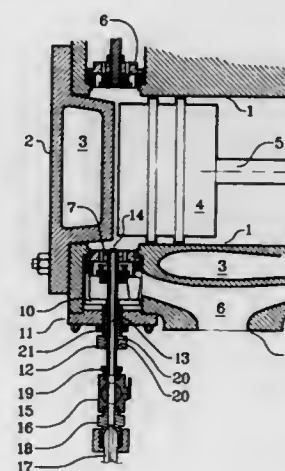
**5,567,121**  
**INDICATOR-PORTED DISCHARGE VALVES FOR RECIPROCATING COMPRESSORS**

William C. Peterson, 301 Park Dr., Severna Park, Md. 21146-4415

Filed Jan. 23, 1995, Ser. No. 376,234  
Int. Cl.<sup>6</sup> F04B 39/10

U.S. Cl. 417-63

10 Claims



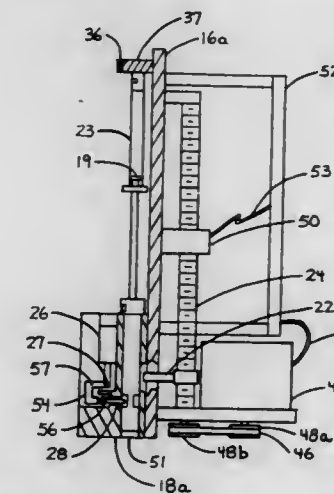
1. A valve for a compressor cylinder comprising a valve body and a valve center bolt, said valve center bolt defining a passage through said valve body, said passage adapted to open to the interior of said compressor cylinder and having an exterior terminus at the exterior of said valve center bolt.

**5,567,122**  
**CYLINDER PUMP HAVING CONTROLLABLE PISTON/DRIVE DETACHMENT**

Harvey Schulte, Los Altos, Calif., assignor to Barry J. Walter, Fremont, Calif.

Filed Oct. 13, 1994, Ser. No. 322,214  
Int. Cl.<sup>6</sup> F04B 49/00; A61M 5/20  
U.S. Cl. 417-214

22 Claims



1. A cylinder pump, said cylinder pump including an interior piston with attached piston rod and an exterior cylinder wall having top and bottom ends, a fluid orifice disposed on said top end and a rod opening on said bottom end wherein said piston rod passes therethrough, said cylinder pump comprising:  
a) a frame having an orifice seat means for receiving said fluid orifice and placing said cylinder in fluid communication with a predetermined fluid depository;  
b) a movable rod engagement means slidably disposed on said frame which selectively engages and disengages said piston rod;  
c) drive means disposed on said frame for movement of said rod engagement means.

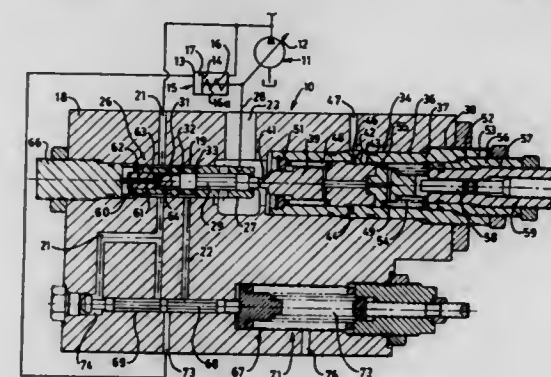
**5,567,123**  
**PUMP DISPLACEMENT CONTROL FOR A VARIABLE DISPLACEMENT PUMP**

Dale B. Childress, Plainfield, Ill., and Noah D. Manring, Roland, Iowa, assignors to Caterpillar Inc., Peoria, Ill.

Filed Sep. 12, 1995, Ser. No. 526,830  
Int. Cl.<sup>6</sup> F04B 49/08

U.S. Cl. 417-222.1

20 Claims



1. A pump displacement control for a variable displacement pump having a swash plate movable between maximum and minimum displacement positions and a servo actuator including a servo

piston operatively connected to the swash plate, a means for biasing the swash plate toward its maximum displacement position, and an actuator chamber at one end of the piston for controllably receiving a control pressure to move the swash plate toward its minimum displacement position, comprising:

a body having a bore therein, a discharge passage communicating discharge pressure to the bore, a control passage communicating the bore with the actuator chamber, and an exhaust passage communicating with the bore;

a torque control valve disposed within the bore for controlling fluid flow into and out of the actuator chamber and including a sleeve slidably disposed within the bore and operatively mechanically coupled to the piston, and a valve spool slidably disposed within the sleeve, the valve spool and the sleeve being movable relative to each other to establish a first condition communicating the second condition communicating the control passage with the exhaust passage;

a variable torque limiter disposed within the bore in axial alignment with the torque control valve for applying a remotely controllable variable resilient force biasing the valve spool in a first direction to establish the second condition; and means for applying a control force against the valve spool proportional to the discharge pressure of the variable displacement pump so that the valve spool moves in a second direction to establish the first condition when the control force exceeds the biasing force exerted by the torque limiter.

5,567,124

#### VARIABLE CAPACITY SWASH-PLATE TYPE COMPRESSOR WITH AN IMPROVED CAPACITY CONTROL MEANS

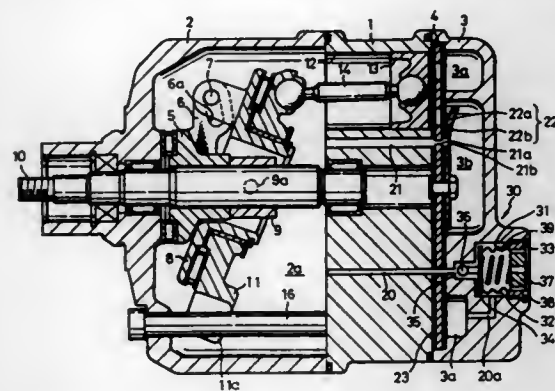
Kenji Takenaka; Hiroaki Kayukawa, and Shigeyuki Hidaka, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Dec. 16, 1993, Ser. No. 168,773

Claims priority, application Japan, Dec. 21, 1992, 4-340276

Int. Cl.<sup>6</sup> F04B 1/29

U.S. Cl. 417—222.2



1. A variable capacity swash-type refrigerant compressor comprising:

an axial cylinder block means having front and rear ends, and a plurality of parallel cylinder bores arranged around a central axis thereof;

a front housing means airtightly attached to said front end of said cylinder block and defining a crank chamber therein;

a rear housing airtightly attached to said rear end of said cylinder block via a valve plate and defining therein a suction chamber for a refrigerant gas before compression and a discharge chamber for a compressed refrigerant gas;

a suction valve assembly arranged for communication between said cylinder bore and said suction chamber;

a discharge valve assembly arranged between said rear end of said cylinder block and said rear housing, said discharge valve assembly including said valve plate, a discharge valve element arranged so as to be in contact with said valve plate and a valve retainer element disposed in said discharge chamber so as to support said discharge valve element;

an axial drive shaft rotatably held by said front housing means and said cylinder block means, and having an axis of rotation thereof extending through said crank chamber;

a swash-plate means rotatably arranged in said crank chamber and rotating with said drive shaft, said swash-plate means being pivotally held by said drive shaft so as to be able to change an angle of inclination thereof with respect to a plane perpendicular to the axis of rotation of said drive shaft;

a plurality of reciprocating pistons operatively connected to said swash-plate means and reciprocating in said plurality of cylinder bores in response to a nutating motion of said swash-plate means; and

a capacity control means including a control valve unit controlling a pressure differential between a pressure prevailing in said crank chamber and that prevailing in said suction chamber so as to adjustably change the angle of inclination of said swash-plate to thereby vary the discharge capacity of said compressed refrigerant gas of said compressor,

wherein said capacity control means further comprises:

a single diameter fluid passageway arranged so as to axially pierce a portion of said cylinder block to thereby provide a constant fluid communication between said discharge chamber and said crank chamber; and

a flow choke means provided in said discharge valve assembly, said flow choke means being arranged at a position in direct communication with said fluid supply passageway.

5,567,125

#### PUMP ASSEMBLY WITH TUBULAR BYPASS LINER WITH AT LEAST ONE PROJECTION

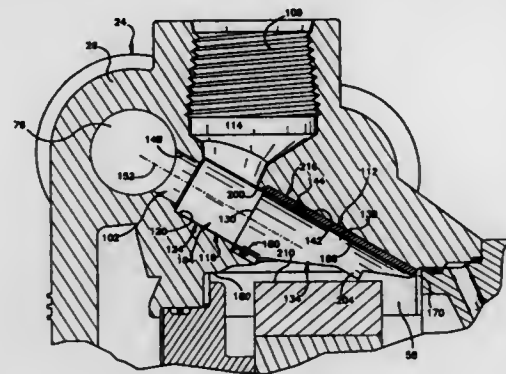
Bruce C. Noah, W. Lafayette; Robert S. Phillips, and Frederick D. Venable, both of Lafayette, all of Ind., assignors to TRW Inc., Lyndhurst, Ohio

Filed Jan. 6, 1995, Ser. No. 369,369

Int. Cl.<sup>6</sup> F04B 49/00

U.S. Cl. 417—310

8 Claims



1. A pump assembly comprising:

a housing having an inlet through which fluid is conducted into said housing and an outlet through which fluid is conducted from said housing;

a rotor disposed within said housing;

a stator extending around said rotor and cooperating with said rotor to at least partially define a plurality of pumping chambers;

an inlet cavity disposed within said housing and from which fluid is conducted into said pumping chambers;

an inlet passage disposed in said housing for conducting fluid from said inlet to said inlet cavity;

an outlet cavity disposed in said housing to receive fluid from said pumping chambers;

a bypass passage for conducting fluid which flows from said outlet cavity to said inlet passage; and

a tubular passage liner at least partially disposed in said inlet passage and having an inlet opening at a first end of said tubular passage liner through which fluid from said bypass passage enters said tubular passage liner and an outlet opening at a second end of said tubular passage liner opposite from said first end and through which fluid flow from said inlet and from said bypass passage is conducted to said inlet cavity, said second end of said tubular passage liner having projections which are engageable with said stator to limit movement of said tubular passage liner relative to said stator.

the improvement wherein:

each slot has a width and each vane has a thickness such that the difference between the width and the thickness is 0.8% to 5.5% of the vane thickness.

5,567,127

#### LOW NOISE AIR BLOWER

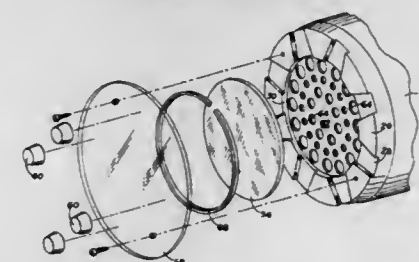
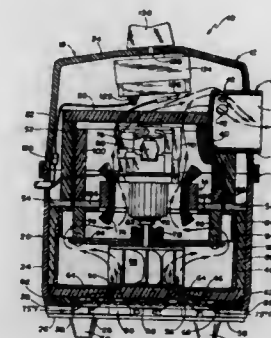
Kenneth W. Wentz, 2604 Tracee Way, Springdale, Ark. 72764

Filed Nov. 9, 1994, Ser. No. 337,953

Int. Cl.<sup>6</sup> F04B 39/12

U.S. Cl. 417—312

28 Claims

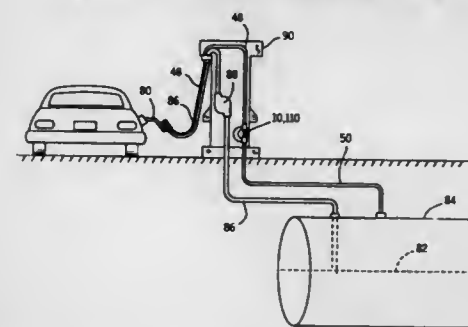
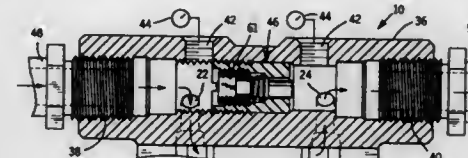


5,567,126  
SYSTEM AND METHOD FOR PREVENTING THE RELEASE OF VAPOR INTO THE ATMOSPHERE  
Meredith W. Meece, and William T. Thurmon, both of Monroe, La., assignors to Thomas Industries Inc., Monroe, La.  
Continuation of Ser. No. 188,761, Jan. 31, 1994, abandoned.  
This application Nov. 8, 1995, Ser. No. 555,344  
Int. Cl.<sup>6</sup> F04B 49/00

U.S. Cl. 417—310

5 Claims

1. In a pump having a cylindrical housing, a cylindrical rotor



rotatably positioned within the housing in an offset manner such that a generally crescent-shaped chamber is defined between the rotor and the housing, a fluid inlet at a first narrow portion of the crescent-shaped chamber, a fluid outlet at a second narrow portion of the crescent-shaped chamber, and a plurality of vanes, each of which is slidably mounted in an associated slot in the rotor, such that a plurality of pockets are defined in the crescent-shaped chamber between adjacent vanes, each pocket increasing in volume as it passes the inlet, and decreasing in size as it passes the outlet,

1. A low-noise air blower for use as a source of pressurized air for hydro-therapy systems, air filtration systems or other appliances comprising:

an outer casing having a lower section with at least one air inlet and an upper section with at least one air outlet,

a flow-thru motor and fan unit located inside of said casing and adapted to pull air in through said air inlet and force air out through said air outlet, and

a layer of noise and vibration dampening resilient foam located between said flow-thru motor and fan unit and said casing, said layer of foam separating said motor and fan unit from said casing, supporting and suspending said motor and fan unit, and including upper and lower cup-like foam elements each having respective air permeable porous areas to allow for the passage of air from said air inlet of said casing to said flow-thru motor and fan unit and from said flow-thru motor and fan unit to said air outlet in said casing,

whereby said flow-thru motor and fan unit is encapsulated and suspended within said casing by said layer of foam without any rigid connection between said casing and said flow-thru motor and fan unit.



5,567,128

**PUMP CONTAINING A PRESSURE VALVE**

Peter Volz, Darmstadt; Georg Obersteiner, Königstein, and Albrecht Otto, Hanau, all of Germany, assignors to IIT Automotive Europe GmbH, Germany  
PCT No. PCT/EP92/02864, § 371 Date Jul. 20, 1994, § 102(e)  
Date Jul. 20, 1994, PCT Pub. No. WO93/14960, PCT Pub. Date Aug. 5, 1993

PCT Filed Dec. 11, 1992, Ser. No. 256,695

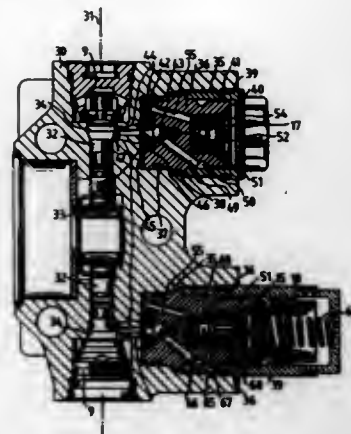
Claims priority, application Germany, Jan. 24, 1992, 42 01 826.9

Int. Cl.<sup>6</sup> F04B 23/00

U.S. Cl. 417—313

6 Claims

1. A pump, comprising:



a pump casing and carrier element within said casing,  
a pressure valve formed within the carrier element, the carrier element further defining a channel leading to a chamber located at a front side of said carrier element,  
a restrictor communicating with said chamber and in communication with a brake circuit to be energized, wherein the carrier element is of a cylindrical configuration wherein said channel leads to an annular groove and to said chamber said carrier element residing within a cup-shaped closure member.

5,567,129

**THRUST CONTROL SYSTEM FOR GAS-BEARING TURBOCOMPRESSORS**

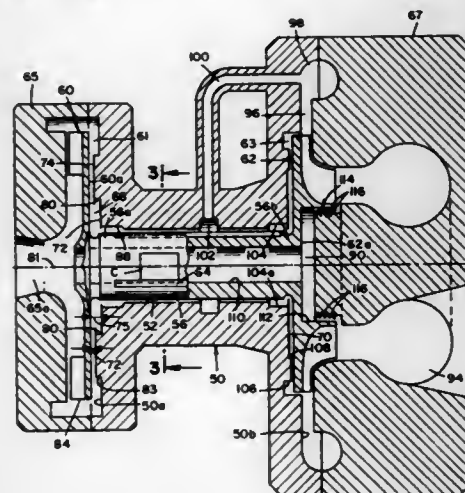
G. Fonda Bonardi, 2075 Linda Flora Dr., Los Angeles, Calif. 90077

Filed May 25, 1995, Ser. No. 452,640

Int. Cl.<sup>6</sup> F01D 3/00; F04B 17/00; F04D 29/04

U.S. Cl. 417—365

11 Claims



1. A turbocompressor comprising:

- a support having a longitudinally extending bore, generally circular in cross section at any point, said bore being of a predetermined diameter and defining an inner surface, said support being disposed within a fluid atmosphere and including longitudinally spaced first and second faces, each of said faces having a recess provided therein which is concentric with said bore and in fluid communication therewith;
- an elongated, generally cylindrical shaft rotatable within said bore of said support, said shaft having first and second ends and including a longitudinally extending bore therethrough, said shaft being of a predetermined diameter less than the diameter of said bore in said support and having an outer surface provided with a plurality of circumferentially spaced, longitudinally extending grooves;
- a first closure member connected to said support to define in cooperation with said first face, a first chamber, said first chamber being at an average static first pressure;
- a first wheel disposed within said first chamber and connected to said first end of said shaft for rotation therewith, said first wheel being subjected to a first axial force;
- a second closure member connected to said support to define, in cooperation with said second face, a second chamber, said second chamber being at an average static second pressure;
- a second wheel disposed within said second chamber and connected to said second end of said shaft for rotation therewith, said second wheel being subjected to a second axial force; and
- equalizing means for substantially equalizing said first and second axial forces upon rotation of said shaft within said bore in said support, whereby said shaft will remain substantially axially centered within said bore in said support.

5,567,130

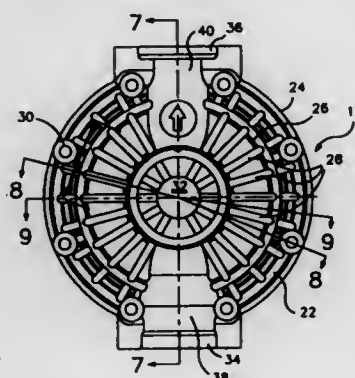
**REINFORCED COVER CONFIGURATION FOR A DIAPHRAGM PUMP**

Daniel J. Kvinge, Canton, Mich., and Harold D. Johnson, Buffalo, Minn., assignors to Graco Inc., Minneapolis, Minn.  
Filed Nov. 9, 1994, Ser. No. 337,328

Int. Cl.<sup>6</sup> F04B 53/16

U.S. Cl. 417—393

8 Claims



1. A diaphragm pump fluid cover having a domed fluid chamber surface, said diaphragm pump fluid cover comprising:  
a generally uniform thickness;  
an outer circumferential rib;  
a plurality of radially extending ribs; and  
a plurality of fastener apertures located in said outer circumferential rib and intermediate all of said radially extending ribs, the number of said radially extending ribs being greater than the number of said fastener apertures.

5,567,131

**SPRING BIASED CHECK VALVE FOR AN ELECTROMAGNETICALLY DRIVEN OSCILLATING PUMP**

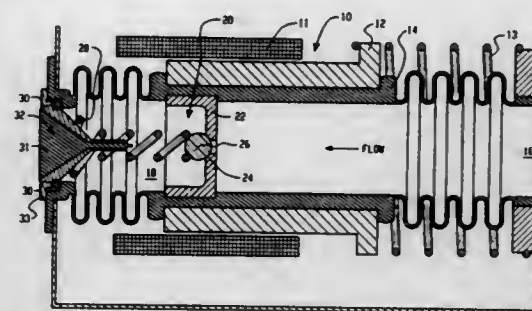
Michael H. McNaul, Ashland, Ohio, assignor to Gorman-Rupp Industries, Bellville, Ohio

Filed Apr. 20, 1995, Ser. No. 425,288

Int. Cl.<sup>6</sup> F04B 17/04

U.S. Cl. 417—417

17 Claims



1. A valve assembly for an oscillating pump of the type having a reciprocating armature carrying an elastomeric impeller that defines a pump chamber for the flow of fluid from an inlet end to an outlet end, the valve assembly comprising:

a valve body attached to the impeller for reciprocation within the pump chamber and having an inlet side that faces the inlet end of the pump chamber and an outlet side that faces the outlet end of the pump chamber;  
a means for plugging the flow of fluid from the outlet side of the valve body to the inlet side of the valve body during a forward reciprocation of the impeller and passing fluid from the inlet side of the valve body to the outlet side of the valve body during a reverse reciprocation of the impeller.

rotation of said rotor and said shaft and a housing seal between said means for effecting rotation and said rotor, a pump means mounted on said rotatable shaft in a pump end of said pump, means for introducing a liquid into said pump end, means for removing said liquid from said pump end, means for introducing pressurized gas into said wear end, an internal pump positioned between said pump end and said wear end on said rotatable shaft, said internal pump comprising a rotatable ring connected to said shaft and having a first face contacting a second face on a pump housing mounted stationary ring, said first face and second face having a surface configuration which effects transfer of said gas in said wear end to said pump end while preventing said liquid in said pump end from entering said wear end when said shaft is rotated and said internal pump sealing said wear end from said pump end when said shaft is not rotated, spring means for biasing said stationary ring in contact with said rotating ring and sealing means comprising a U-shaped housing positioned about said stationary ring, at least one O-ring positioned in a space between said U-shaped housing and said stationary ring on a radially outer surface of said stationary ring, said O-ring being positioned between said liquid being pumped in said pump end and said spring, and a push plate in contact with said spring, to bias said push plate to effect sealing between said space and said spring.

5,567,133

**CANNED MOTOR AND PUMP EMPLOYING SUCH CANNED MOTOR**

Makoto Kobayashi; Masakazu Yamamoto; Yoshio Miyake, and Koji Isemoto, all of Kanagawa-ken, Japan, assignors to Ebara Corporation, Tokyo, Japan

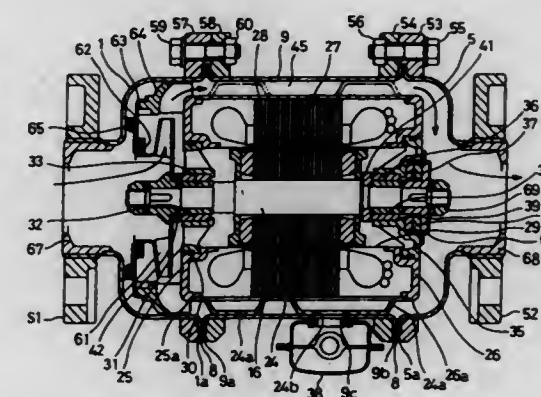
Filed Jul. 15, 1994, Ser. No. 275,528

Claims priority, application Japan, Jul. 16, 1993, 5-199291

Int. Cl.<sup>6</sup> F04B 35/04

U.S. Cl. 417—423.7

20 Claims



1. A canned motor for use in a pump, comprising:  
a stator;  
an outer frame casing disposed around said stator and having a pair of axial open ends;  
a pair of side frame members welded to said open ends, respectively, of the outer frame casing;  
a can fitted in said stator and joined to said side frame members;  
a shaft rotatably disposed in said stator;  
a rotor mounted on said shaft and disposed in said can; and  
an outer cylinder made of sheet metal disposed around said outer frame casing with an annular space defined therebetween, said outer cylinder being welded to said outer frame casing;  
wherein said outer cylinder has a pair of flanges disposed respectively on axially spaced open ends thereof for attachment to components of a pump assembly and holding a fluid being handled within said outer cylinder, said outer cylinder having a hole defined in an outer circumferential wall thereof for passing leads for connection to a power supply.

5,567,132

**SEAL FOR PUMP HAVING AN INTERNAL GAS PUMP**

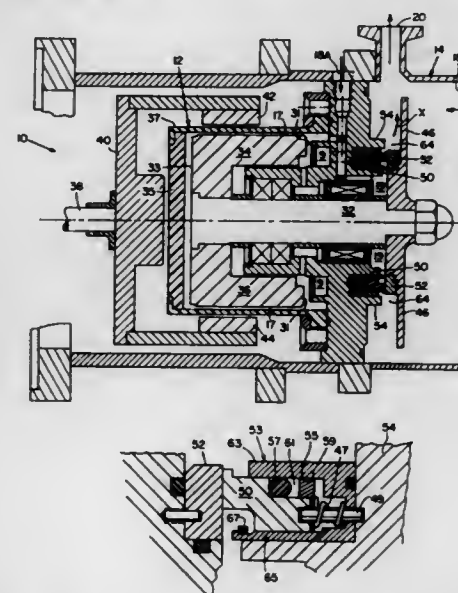
Francis A. Dupuis, Lebanon, and Ali M. Nasr, Summit, both of N.J., assignors to Endura Pumps International, Inc., Garwood, N.J.

Filed Dec. 6, 1994, Ser. No. 349,940

Int. Cl.<sup>6</sup> F04B 53/00

U.S. Cl. 417—420

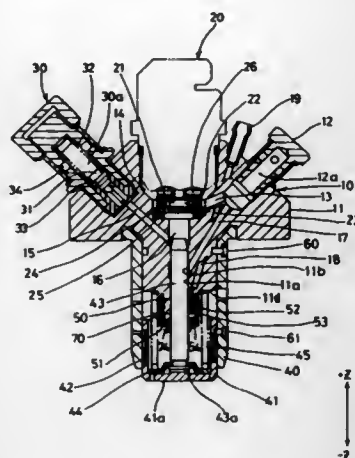
19 Claims



1. A pump comprising a rotatable shaft mounted in a wear end of said pump, said wear end including a rotor, means for effecting



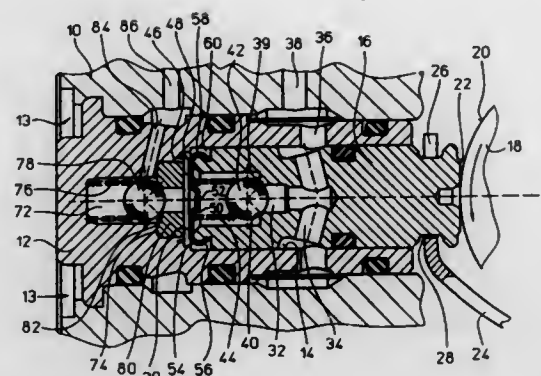
**5,567,134**  
**HIGH-PRESSURE FUEL-FEED PUMP**  
 Hiroshi Inoue, Chiryu, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan  
 Filed Jun. 23, 1995, Ser. No. 494,180  
 Claims priority, application Japan, Jan. 24, 1994, 6-143626  
 Int. Cl.<sup>6</sup> F02M 59/44; F02D 1/02  
 U.S. Cl. 417—490 14 Claims



1. A high-pressure fuel-feed pump, comprising:
  - a cylinder having a bore defined therein and formed to define a fuel pressurization chamber in communication with an intake passage and discharge passage for fuel;
  - a protruding portion protruding from said cylinder, said bore being defined so as to extend coaxially through said protruding portion;
  - a plunger supported reciprocally and slidably by an inner wall that defines said bore;
  - a discharge-timing control valve for determining discharge timing of fuel pressurized by reciprocating motion of said plunger, the discharge-timing control valve defining pressurizing timing of fuel in the pressurization chamber by closing communication between the pressurization chamber the intake passage; and
  - a seal member for covering said protruding portion from the axial center of said bore and having a hole to receive said plunger and an annular member to liquid-tightly seal an outer peripheral wall of said plunger,
- wherein an inner wall of said sealing member, an outer peripheral wall of said plunger and a tip end surface of said protruding portion form a fuel pool for pooling fuel.

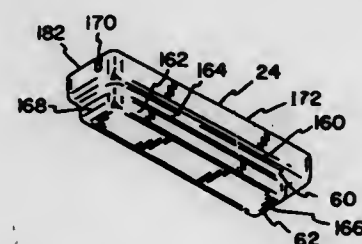
**5,567,135**  
**RECIPROCATING PUMP**  
 Erwin Mueller, Renningen, and Wolfgang Schuller, Sachsenheim, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany  
 Filed Nov. 29, 1995, Ser. No. 564,523  
 Claims priority, application Germany, Dec. 1, 1994, 44 42 737.9  
 Int. Cl.<sup>6</sup> F04B 1/04; 53/12  
 U.S. Cl. 417—549 25 Claims

1. A reciprocating pump comprising a piston which is driven to make a stroke movement in a cylinder bore, an inlet valve which has an inlet valve element and an inlet valve spring, both of which are housed in a longitudinal bore in the piston, the inlet valve spring presses the inlet valve element against an inlet valve seat formed in the longitudinal bore in the piston, wherein the inlet valve spring (44) is supported against a cap-shaped support element (48) which is attached to one end (30) of the piston (16) and,



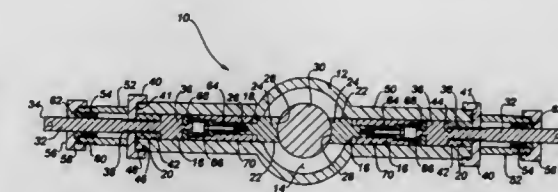
from an outside, engages therearound behind an undercut (58) in an external peripheral surface of the piston (16).

**5,567,136**  
**PRESSURE PLATE FOR PUMP AND RESERVOIR ENCLOSURE**  
 Jay G. Johnson, Maple Plain, Minn., assignor to SIMS Deltec, Inc., St. Paul, Minn.  
 Division of Ser. No. 145,371, Oct. 28, 1993, Pat. No. 5,540,561.  
 This application Jun. 2, 1995, Ser. No. 460,059  
 Int. Cl.<sup>6</sup> F04B 23/02; A61M 1/00  
 U.S. Cl. 417—572 5 Claims



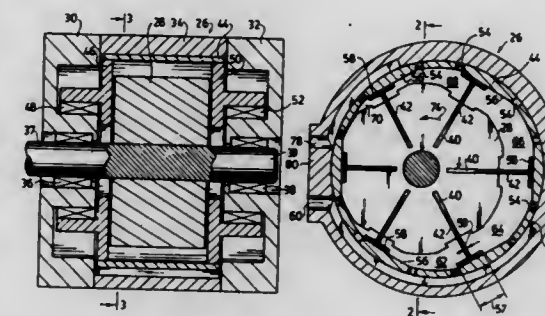
1. A pressure plate for use with a pump comprising:
  - body construction including:
    - a top surface configured for receipt of a tube, the top surface including two longitudinal edges, and two side edges extending between the two longitudinal edges, the tube having a section extending in a direction generally parallel to the two longitudinal edges;
    - a bottom surface with a first portion facing in an opposite direction to the top surface, the bottom surface including a three sided ridge configuration in a U-shape projecting outwardly from the first portion, the U-shape including first and second arms joined by a connecting section, the connecting section being a longitudinal surface extending in a direction generally parallel to the two longitudinal edges, and the first and second arms being two side surfaces extending from opposite ends of the longitudinal surface transverse to the longitudinal surface, and
  - wherein the longitudinal surface and the first portion intersect forming a continuous, angled interface.

**5,567,137**  
**SCROLL COMPRESSOR WITH SHAFT SEAL LUBRICATION**  
 Masafumi Nakashima, Anjo; Takeshi Sakai, Chiryu; Yasushi Watanabe, and Tetsuhiko Fukunuma, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., and Kabushiki Kaisha Toyoda Iidoshokki, both of Kariya, Japan  
 Continuation of Ser. No. 356,731, Dec. 15, 1994, abandoned.  
 This application Nov. 13, 1995, Ser. No. 558,936  
 Claims priority, application Japan, Dec. 16, 1993, 5-316762  
 Int. Cl.<sup>6</sup> F04C 18/04; 27/00; 29/02  
 U.S. Cl. 418—15 7 Claims



1. A scroll compressor comprising:
  - a housing defining an inlet passageway for a gas including lubricant to be compressed and an outlet passageway for exhausting the gas;
  - a drive shaft;
  - a bearing unit for rotatably supporting the drive shaft in the housing;
  - a shaft seal unit arranged adjacent to the bearing unit for sealing the housing with respect to the shaft;
  - a stationary scroll member which is fixed to the housing, the stationary scroll member having a base plate and a scroll portion extending axially from the base plate;
  - a movable scroll member which is arranged movably in the housing and is arranged eccentric with respect to the drive shaft, the movable scroll member having a base plate and a scroll portion extending axially from the base plate;
  - a drive member connected to the drive shaft so that the drive member is eccentric with respect to the drive shaft, the drive member being rotatably connected to the movable scroll member, thereby obtaining an orbital movement of the movable scroll member about the axis of the shaft;
  - a mechanism for blocking the rotating movement of the movable scroll member about its axis;
  - the scroll portion of the movable scroll member cooperating with the scroll portion of the stationary scroll member for creating compression chambers between the scroll members;
  - the orbital movement of the movable scroll member causing the compression chambers to be radially inwardly moved while the volume of the chambers is reduced,
  - the chambers being in direct communication with the inlet for receiving the gas from the inlet when the chambers are located at radially outermost positions, the chambers being then sealingly closed for executing a compression of the gas therein while moving radially inwardly, the chambers being finally in communication with the outlet for discharging the compressed gas into the outlet when the chambers are located radially at innermost positions; and
  - a sub-intake passageway for connecting, via the shaft seal unit, the inlet with at least one of the chambers before the chamber is sealingly closed, thereby generating a flow of the gas, and allowing the lubricant in the gas to be positively contacted with the shaft seal unit, the sub-intake passageway comprising a first portion connecting the inlet with the shaft seal unit and a second portion connecting the shaft seal unit with at least one of the chambers, the second portion of the sub-intake passageway being directly opened to the at least one chamber.

**5,567,139**  
**TWO ROTOR SLIDING VANE COMPRESSOR**  
 Roger C. Weatherston, 8412 Hidden Oaks, East Amherst, N.Y. 14051  
 Filed Jun. 21, 1995, Ser. No. 492,983  
 Int. Cl.<sup>6</sup> F04C 18/348  
 U.S. Cl. 418—173 2 Claims



1. A two-rotor, sliding vane rotary compressor for compressing fluid comprising an inner rotor, an outer rotor, means for rotating said inner rotor and said outer rotor at the same angular velocity, and at least one sliding vane disposed between said inner rotor and said outer rotor, wherein:
  - (a) said outer rotor is comprised of an inner surface, and said inner surface is comprised of at least one flat portion, whereby, as said inner rotor rotates, said sliding vane contacts said outer rotor;
  - (b) said inner rotor is supported by support shafts on each of its ends;
  - (c) said compressor is comprised of a first end plate located on a first end of said inner rotor and a second end plate located on a second end of said inner rotor, wherein each of said first end plate and said second end plate supports said inner rotor through a first set of bearings;

**5,567,138**  
**METHOD AND APPARATUS FOR LIMITING ECCENTRIC DEVIATIONS OF A ROTATING POLISHED ROD IN ROTARY PUMPING APPLICATIONS**  
 Hille Newton, 233 Grand Ave., Sylvan Lake, Alberta, Canada  
 Filed Jun. 26, 1995, Ser. No. 494,782  
 Int. Cl.<sup>6</sup> F04C 2/107; E21B 43/00; F16C 23/02; 27/06  
 U.S. Cl. 418—48 3 Claims

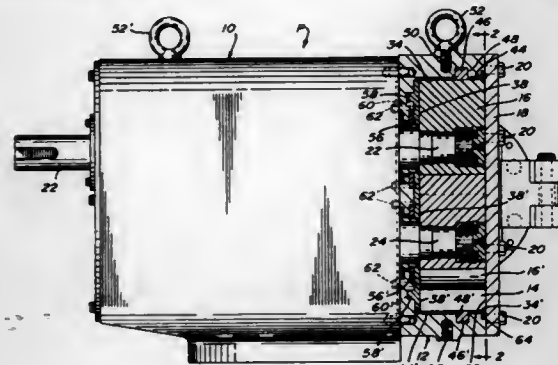
1. An apparatus for limiting eccentric deviations of a rotating polished rod, comprising:
  - a housing having a central polished rod receiving passage;
  - at least two centralizing members extending radially inwardly into the central polished rod receiving passage, each of the



- (d) said compressor is comprised of a center housing with a circular interior that is eccentric to said inner rotor, said housing being disposed between said first end plate and said second end plate;
- (e) said outer rotor has a circular exterior that surrounds said inner rotor but is eccentric thereto;
- (f) said outer rotor is mounted on a second set of bearings disposed in said first end plate and said second end plate.

**5,567,140**  
**KEYED INSERT PLATE FOR CURVED ROTARY LOBE PUMP CHAMBER WALLS**  
 Ian Dodd, Rigaud, Canada, assignor to ITT Corporation, New York, N.Y.

Filed Apr. 24, 1995, Ser. No. 426,965  
 Int. Cl.<sup>6</sup> F04C 2/18  
 U.S. Cl. 418—178 13 Claims

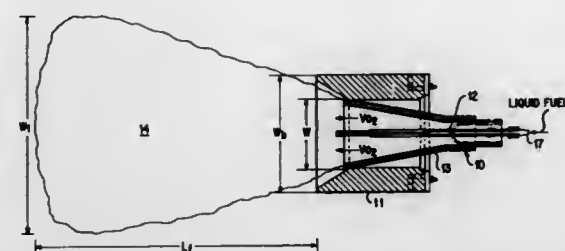


1. A curved wear plate for use in a rotary lobe pump of the type comprising a pump housing, a pump chamber defined in the housing and having input and output ports provided in a side wall of the pump chamber, a pair of rotors rotatably mounted in the pump chamber and having a continuous rolling sealing contact with each other, the rotors having parallel axes of rotation, the pump chamber also having end walls perpendicular to the axes and the side wall, the side wall of said pump chamber being adapted to removably receive said curved wear plate at locations in the pump chamber where peripheral surfaces of the rotors are required to make sliding sealing contact, said curved wear plate defining a smooth inner arcuate surface where said sealing contact with a respective rotor occurs, said curved wear plate comprising an arcuate key means projecting outwardly of an outer surface of said curved wear plate, said key means being adapted to be removably engaged in a corresponding keyway means defined in the pump housing and comprising mounting means for removably securing said arcuate key means and thus said curved wear plate to the pump housing.

**5,567,141**  
**OXY-LIQUID FUEL COMBUSTION PROCESS AND APPARATUS**  
 Mahendra L. Joshi, Altamonte Spring; Lee Broadway, Eustis; Patrick J. Mohr, Mims, and Jack L. Nitzman, Altamonte Spring, all of Fla., assignors to Combustion Tec, Inc., Apopka, Fla.

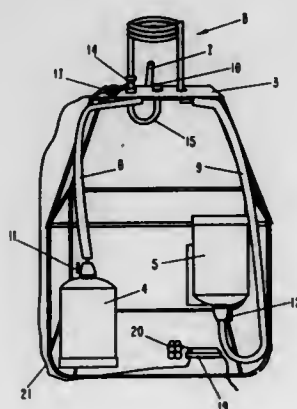
Continuation-in-part of Ser. No. 366,621, Dec. 30, 1994. This application Aug. 9, 1995, Ser. No. 512,956  
 Int. Cl.<sup>6</sup> F23C 5/00  
 U.S. Cl. 431—8 22 Claims

8. A method for combustion of a liquid fuel, said method comprising the steps of:  
 atomizing said liquid fuel;  
 discharging said atomized liquid fuel from a liquid fuel conduit, said discharged atomized liquid fuel having an outwardly divergent, fishtail configuration; and



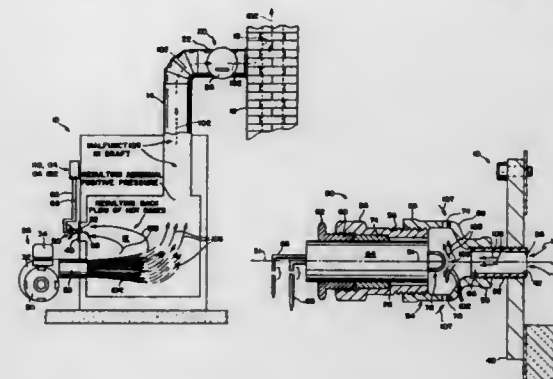
discharging oxygen from an oxygen conduit surrounding said liquid fuel conduit, said discharged oxygen encircling said outwardly divergent, fishtail configuration of liquid fuel, thereby forming upon ignition a liquid fuel flame having an outwardly divergent, fishtail shape.

**5,567,142**  
**BURNER SYSTEM FOR A RADIO-CONTROLLED HOT AIR BALLOON**  
 Bruce Purdy, 2840 El Cerquito NW, Albuquerque, N.M. 87120  
 Filed Aug. 26, 1994, Ser. No. 297,309  
 Int. Cl.<sup>6</sup> F23N 1/00  
 U.S. Cl. 431—18 14 Claims



1. A burner system for a radio-controlled hot air balloon, comprising:  
 a frame;  
 a first fuel tank held by said frame in a right side up state;  
 a second fuel tank held by said frame in an inverted or upside down manner;  
 a pilot burner mechanism mounted to said frame and connected by a first fuel line to said first fuel tank for receiving fuel in vapor form therefrom;  
 a burner coil means mounted to said frame and connected by a second fuel line to said second fuel tank for receiving fuel in liquid form therefrom, said burner coil means being adapted to be partially heated by a flame from said pilot burner mechanism and having an outlet orifice for the discharge of fuel in a vaporous mist form for ignition by said flame of said pilot burner mechanism;  
 a valve member provided in said burner coil means for controlling flow of fuel therethrough; and  
 a radio-controlled servo mounted on said frame and connected to said valve member for operating same.

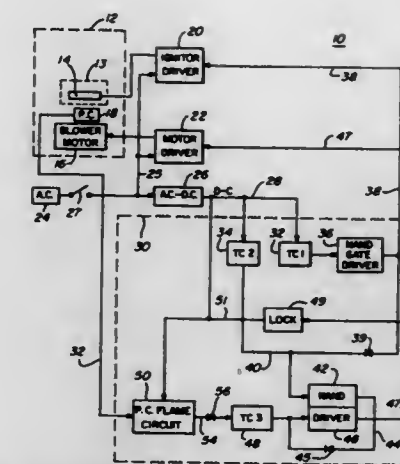
**5,567,143**  
**FLUE DRAFT MALFUNCTION DETECTOR AND SHUT-OFF CONTROL FOR OIL BURNER FURNACES**  
 Patrick F. Servidio, 12 Thistle La., Greenwich, Conn. 06831  
 Filed Jul. 7, 1995, Ser. No. 499,569  
 Int. Cl.<sup>6</sup> F23N 5/10; H01H 37/76  
 U.S. Cl. 431—22 20 Claims



1. A flue-draft-malfunction detector and shut-off control for an oil burner furnace for automatically stopping operation of the oil burner in event of draft malfunction, said control comprising:  
 mounting means having a passageway therein with an inlet into said passageway and at least one outlet from said passageway, said mounting means being mountable on a furnace with said inlet being in communication with a combustion chamber within the furnace and with the outlet being in communication with ambient air near the furnace,  
 a melttable, electrically-conductive element having first and second terminals,  
 first and second electrical conductors connected to said first and second terminals,  
 positioning means for said element for holding said element exposed to said passageway,  
 said element being melttable at a temperature in said passageway exceeding a predetermined level due to positive pressure within the combustion chamber causing hot combustion gases to blow from the combustion chamber into said inlet and through said passageway and out from said outlet, and  
 said first and second electrical leads being connectable in a circuit between terminals of a control device of an oil burner for including said element in said circuit to complete said circuit between said terminals of the control device for enabling operation of the oil burner and for preventing operation of the oil burner upon interruption of said circuit by melting of said element.

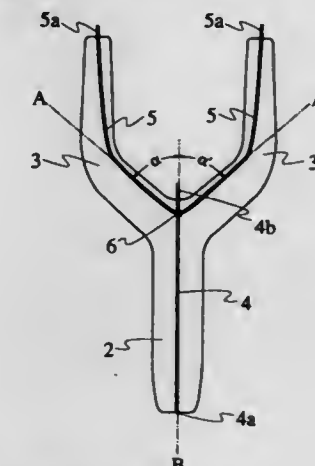
**5,567,144**  
**HOT SURFACE IGNITION CONTROLLER FOR FUEL OIL BURNER**  
 Hugh W. McCoy, Bowling Green, Ky., assignor to Desa International Inc., Bowling Green, Ky.  
 Filed Oct. 5, 1995, Ser. No. 538,988  
 Int. Cl.<sup>6</sup> F23N 5/08  
 U.S. Cl. 431—79 12 Claims

1. A fuel oil type burner including:  
 a fuel oil combustion chamber;  
 a power source for providing at least 100 volts AC;  
 a hot surface ignitor electrode associated with said combustion chamber, said ignitor electrode being sintered to full density with essentially no porosity;  
 a fan blower driven by a motor for providing fuel oil and air to said combustion chamber;  
 an AC/DC converter coupled to said AC power supply for providing a DC voltage output;  
 a first controllable switch coupled between said AC power source and said hot surface ignitor;



a second controllable switch coupled between said AC power source and said fan blower motor;  
 a flame detector associated with said combustion chamber for generating an electrical signal if a flame is detected; and  
 a control assembly coupled to said DC output voltage, said flame detector and said first and second controllable switches for energizing said first controllable switch to heat said hot surface ignitor with said AC voltage for both a first predetermined preheat period and a second predetermined trial ignition period, energizing said second controllable switch to operate said blower motor with said AC voltage only during a second predetermined trial ignition period, said fan blower motor being energized with said AC voltage only at the beginning of said trial ignition period and continuing for a flame test period immediately following said trial ignition period and de-energizing said fan blower motor if no ignition occurs during said flame test period.

**5,567,145**  
**CELEBRATION CANDLE**  
 Clifford A. White, 30 Coldwater Tavern Rd., East Nassau, N.Y. 12062  
 Filed May 19, 1995, Ser. No. 444,403  
 Int. Cl.<sup>6</sup> F23D 3/16  
 U.S. Cl. 431—288 5 Claims



1. A candle comprising:  
 a shaped mass including an upper and lower portion, said shaped mass including combustible fuel;  
 wick means disposed substantially within said shaped mass for permitting controlled burning of said combustible fuel; and  
 said wick means including a wick in said lower portion, and at least one branch wick disposed in said upper portion and extending from said wick at an angle therefrom, wherein said

wick is substantially vertical and said at least one branch wick includes a pair of branch wicks, each of said pair substantially symmetrically divergent from said wick;  
said pair of branch wicks extends from said wick at a point below a top of said wick;  
said pair of branch wicks extend into said lower portion proximate said wick;  
said wick and said pair of branch wicks are knotted together at said point below said top of said wick.

5,567,146

## DISPOSABLE LIQUID FUEL BURNER

Robert J. Blankenship, Conroe; Richard H. Lee, San Antonio, and Ernesto E. Jergins, New Braunfels, all of Tex., assignors to Heat-It International Sales, Inc., San Antonio, Tex.

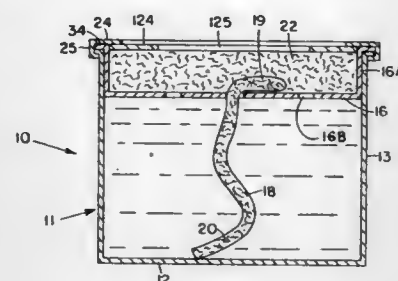
PCT No. PCT/US89/02189, § 371 Date Sep. 21, 1992, § 102(e) Date Sep. 21, 1992, PCT Pub. No. WO89/11620, PCT Pub. Date Nov. 30, 1989

Continuation-in-part of Ser. No. 197,510, May 23, 1988, Pat. No. 4,850,858. This PCT application May 10, 1990, Ser. No. 613,635

Int. Cl.<sup>6</sup> F23D 3/24

U.S. Cl. 431—320

9 Claims



## 1. A disposable fuel burner comprising:

a container with an enclosing sidewall, a closed bottom, and an open top;

divider means for defining and substantially sealing a fuel chamber within said container, said divider means with a wick opening for receiving a wick therein and capable of supporting a porous layer thereon, wherein said divider means further includes vent means, said vent means for substantially equalizing pressure between the atmosphere and the fuel chamber to prevent leakage of fuel thereby;

said porous layer located atop and substantially parallel to said divider means for feeding a fuel to the atmosphere for combustion therewith and further for retaining fuel during accidental tip-over;

said wick means having a first end in the fuel chamber and in contact with the fuel and having a second end extending through the wick opening and onto the upper surface of said divider means, the second end in contact with said porous layer for feeding fuel thereto;

wherein the combination of said container, said divider means, said wick and said porous layer support the combustion of fuel across the top surface of said porous layer during normal use and substantially prevent the spillage of fuel during accidental tip-over.

5,567,147

## BURNER FOR BURNING APPARATUS

Gordon W. Fenn, Brevard, N.C., and Yong S. Lee, Ansan, Rep. of Korea, assignors to Frontier, Inc., Ann Arbor, Mich.

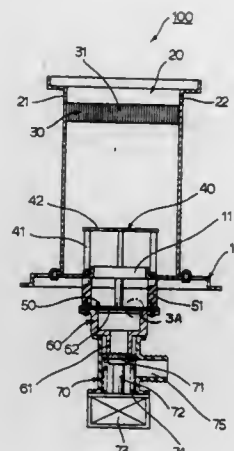
Filed Jun. 7, 1995, Ser. No. 482,832

Int. Cl.<sup>6</sup> F23D 14/12

U.S. Cl. 431—328

5 Claims

1. A burner for a burning apparatus comprising:



a mixing liner support formed with an intake hole for receiving gas ejected from a nozzle and first air at the center;

a mixing liner, for mixing supplied gas and first air, which is installed above said mixing liner support, and on either upper sidewall of which an ignition plug installation hole and flame sensor installation hole are formed, respectively;

a matrix inserted into the inner upper portion of said mixing liner and having numerous flame holes in a gauze form;

a mixing plate installed above said intake hole of said mixing liner support and spaced apart upward from said mixing liner support with a plurality of spacers, and for radially dispersing gas and the first air;

a nozzle plate installed under said mixing plate and spaced downward from said mixing plate with said spacers, and having a plurality of injection holes disposed at predetermined intervals on the same circumference;

a gas chamber installed under said nozzle plate and formed with a gas intake in the lower portion; and

a gas valve installed under said gas chamber and for opening/closing said gas intake of said gas chamber.

5,567,148

## GASEOUS FUEL BURNER ASSEMBLY AND METHOD OF CONNECTING SAME

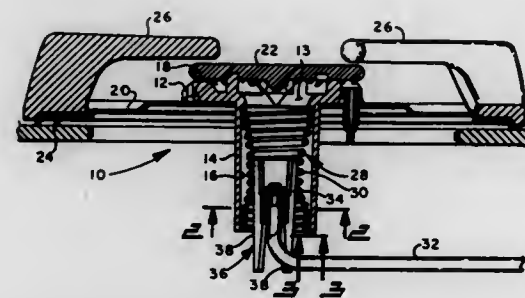
Donald M. Krueger, Westchester, and David J. Kwiatek, LaGrange, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 20, 1994, Ser. No. 359,754

Int. Cl.<sup>6</sup> F23D 14/62

U.S. Cl. 431—354

12 Claims



## 1. A gaseous fuel burner assembly comprising:

(a) a burner manifold or body having an inlet passage and a plurality of flame-generating outlets communicating with said inlet passage;

(b) a venturi member defining a converging inlet and diverging outlet with a throat region therebetween said member disposed in said body inlet passage;

(c) a gaseous fuel supply tube including an aspirator at one end thereof, said aspirator inserted in and frictionally engaging

said venturi member for retaining said tube connected to said manifold; wherein said venturi member diverging outlet section includes turbulating surfaces.

5,567,149

## EXHAUST SYSTEM FOR HIGH TEMPERATURE FURNACE

Richard R. Hansotte, Jr., Richmond; Dieter K. Neff, Cambridge; Dennis A. Rock, St. Albans; Jeffrey A. Walker, Hyde Park, and Roland M. Wanser, Bolton, all of Vt., assignors to IBM Corporation, Armonk, N.Y.

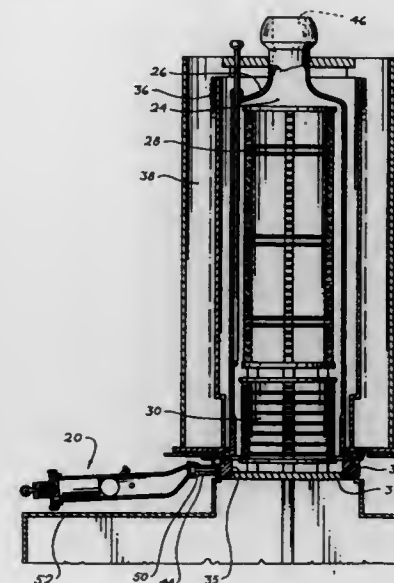
Division of Ser. No. 7,699, Jan. 22, 1993, Pat. No. 5,407,349.

This application Dec. 14, 1994, Ser. No. 355,571

Int. Cl.<sup>6</sup> F27D 5/00

U.S. Cl. 432—6

19 Claims



1. An exhaust system for a high-temperature furnace having a process chamber in which corrosive gases are present, the furnace having an exhaust port through which gases in the process chamber may be evacuated, the system comprising:

a first member having first and second ends and an elongate hollow interior defined by an inner wall, said first end being couplable with the exhaust port so that gases may be drawn from the process chamber into said interior, said first member having an outlet aperture in fluid communication with said interior;

a piston slidably mounted in said interior and an actuator coupled with said piston for moving said piston along the longitudinal axis of said interior between first and second positions, said piston coupled with said first member and operable between open and closed positions, for restricting to a predetermined amount the extent of fluid communication between said outlet aperture and said interior when said valve means is in said closed position; and

wherein portions of said first member and said valve means are made from materials that substantially do not react chemically and physically with gaseous hydrochloric acid.

5,567,150

## METHOD FOR MAKING SINTERED ABRASIVE GRAIN

Stanley L. Conwell, Anoka, and William P. Wood, Golden Valley, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

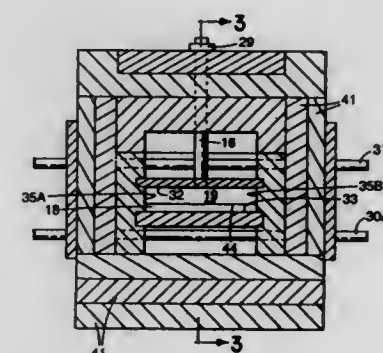
Division of Ser. No. 173,992, Dec. 28, 1993, Pat. No.

5,489,204. This application May 19, 1995, Ser. No. 445,396

Int. Cl.<sup>6</sup> F27B 15/00

U.S. Cl. 432—14

21 Claims



1. A method of making sintered abrasive grain, said method comprising the steps of:

(a) providing unsintered abrasive grain precursor derived from a dispersion comprising liquid medium and an alumina source;

(b) providing a sintering apparatus comprising non-rotating kiln including

wall means having inner surfaces for defining a sintering chamber, said inner surfaces including a generally planar support surface, said wall means having each of (i) a feed opening through said wall means and said inner surface affording introducing unsintered abrasive grain precursor onto said support surface in said sintering chamber, and (ii) a discharge opening through said wall means affording discharging sintered abrasive grain from said sintering chamber,

a pusher plate having a pushing surface, means mounting said pusher plate on said kiln for relative movement between a first position with said pusher plate spaced from said support surface and a second position with said pushing surface adjacent said discharge opening with said pushing surface moving along said support surface during movement of said pusher plate from said first position to said second position, and means for moving said pusher plate from said first position to said second position;

(c) heating said sintering chamber to a temperature in the range from about 1000° C. to about 1600° C.;

(d) feeding a quantity of said unsintered abrasive grain precursor onto said support surface in said sintering chamber through said feed opening;

(e) allowing said unsintered abrasive grain precursor to be heated in said sintering chamber at a temperature and for a time sufficient to provide sintered abrasive grain; and

(f) moving said pusher plate from said first position to said second position to move said sintered abrasive grain to said discharge opening and thereby discharge said sintered abrasive grain from said sintering chamber.



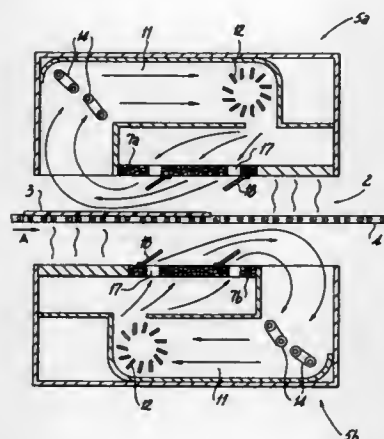
# 5,567,151 REFLOW FURNACES WITH HOT AIR BLOW TYPE HEATERS

Naotake Mizoguchi, and Tadao Takahashi, both of Tokyo, Japan, assignors to Senju Metal Industry Company Limited, Tokyo, Japan

Filed Oct. 21, 1994, Ser. No. 326,860  
Int. Cl.<sup>6</sup> F27B 9/00

U.S. Cl. 432—145

6 Claims



1. A reflow furnace for soldering electrical components comprising an upper portion and a lower portion, said upper and lower portions being vertically spaced apart above and below a gas tunnel, said gas tunnel extending along a horizontal axis between an entry end and an exit end, a conveyor for moving electrical components from said entry end to said exit end and at least one hot air blower heater in said upper portion and at least one hot air blower heater in said lower portion;

each said heater comprising means including a gas outlet for blowing out hot gas into said tunnel and means including a gas inlet for suctioning back into said heater the hot gas blown out by said blowing means into said tunnel and means at said gas outlet for directing the hot gas blown out into said tunnel a) toward said axis, b) toward one of said entry end and said exit end to impinge upon electrical components moving on said conveyor and c) in a direction toward said suctioning means;

said directing means in said heater in said upper portion comprising means for directing gas toward one said end above said axis and to said suctioning means in said heater in said upper portion and said directing means in said heater in said lower portion comprising means for directing gas toward the other of said ends below said axis and to said suctioning means in said heater in said lower portion;

said heaters in said furnace thereby comprising means for substantially stabilizing the gas pressure in said tunnel by inhibiting the hot gas blown out into said tunnel from leaving said tunnel with moving electrical components and by inhibiting ambient air outside said tunnel from being drawn into said tunnel.

# 5,567,152 HEAT PROCESSING APPARATUS

Tamotsu Morimoto, Yamanashi-ken, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

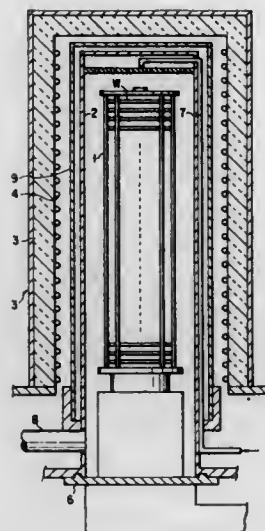
Filed Apr. 11, 1995, Ser. No. 420,075

Claims priority, application Japan, Apr. 12, 1994, 6-099348  
Int. Cl.<sup>6</sup> F27D 3/12

U.S. Cl. 432—241

14 Claims

1. A heat processing apparatus for subjecting heat processing to an object to be processed by heating, comprising:  
a reaction tube for containing the object;



a heating element provided around said reaction tube, for heating an inside of said reaction tube;  
a heat radiating member provided around said heating element with an airtight space therebetween; and  
pressure-reducing means for reducing pressure of said airtight space for achieving heat transfer mainly by radiation at least when a temperature inside said reaction tube is increased.

# 5,567,153 TRANSDUCER ACTIVATED TOOL TIP

Harvey B. Foulkes, Commack; George E. Warrin, North Merrick; Huy-Can Dao, Linden, and Rene Perdreaux, Brooklyn, all of N.Y., assignors to Dentsply Research & Development Corp., Milford, Del.

Filed Aug. 25, 1994, Ser. No. 296,296

Int. Cl.<sup>6</sup> A61C 17/02

U.S. Cl. 433—119

33 Claims



1. A transducer activated tool for contacting workpiece surfaces and directing a fluid adjacent to said surfaces, comprising:  
an activated tip having distal surfaces shaped to contact said workpiece surfaces and a fluid passageway internal to tip formed generally along the longitudinal center axis of the tip but offset such that a fluid discharge orifice is formed displaced from said distal tip axis;  
an activating transducer connecting body connecting said tip to an activating transducer; and  
a fluid source connecting to said tip fluid passageway and providing a flow of fluid discharging from said tip fluid passageway discharge orifice, said passageway being formed by electric discharge machining said passageway in a cylindrical rod, beginning at the center axis of an end of said rod and continuing at an angle of less than about 3 degrees from the center axis of said rod such that the passageway forms a discharge orifice 2–8 mm from the opposite distal end of said rod.

# 5,567,154 DENTAL TURBINE DRIVE HAVING MEANS FOR AUTOMATIC SPEED CONTROL

Juergen Wohlgemuth, Darmstadt, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

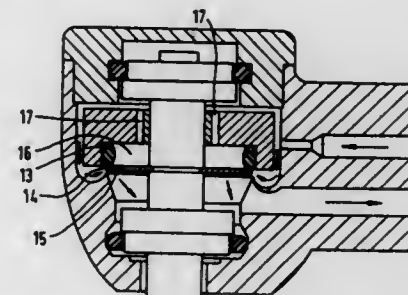
Filed Jul. 21, 1995, Ser. No. 505,759

Claims priority, application Germany, Aug. 8, 1994, 44 28 039.4

Int. Cl.<sup>6</sup> A61C 1/05

U.S. Cl. 433—132

11 Claims



1. In a dental turbine drive containing a rotor disk being mounted for rotation by bearings in a rotor disk chamber of a housing, said rotor disk having turbine blades being chargeable with compressed air via a drive air nozzle connected to an inlet air channel, said housing having an exhaust air channel, the improvements comprising first means for throttling air flow comprising an elastic control element being arranged at the rotor disk in the flow path of the exhaust air, said control element deforming under the influence of a centrifugal force dependent on the speed of the rotor to constrict the effective flow cross section with increased speeds and to enlarge the effective flow cross section with decreasing speeds so that the air pressure in the rotor disk chamber facing toward the air drive nozzle raises or drops corresponding to the throttling effect and additional means for aiding the first means including a part of the rotor chamber facing toward the drive air nozzle being connected via a channel to an additional chamber that at least is partially limited by a second element that yields under pressure so that a change in pressure in the rotor disk chamber acts on said second element and produces a movement of said second element that supports the effect of the control element.

# 5,567,155 SYSTEM FOR BRACING DENTAL IMPLANTS OR NATURAL TOOTH ROOTS TO SECURE ARTIFICIAL TEETH

Gorm P. Hansen, 1501 S.E. 23rd Ave., Pompano Beach, Fla. 33062

Division of Ser. No. 67,801, May 27, 1993, Pat. No. 5,427,906.

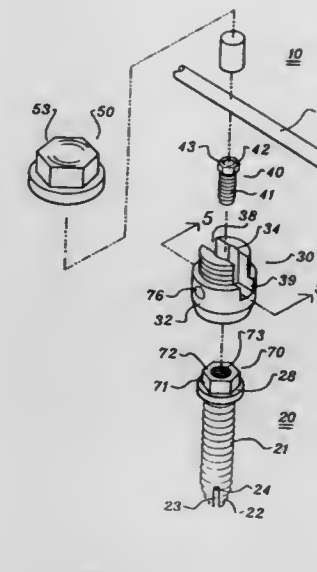
This application Dec. 12, 1994, Ser. No. 355,335

Int. Cl.<sup>6</sup> A61C 13/12; 13/225; 8/00

U.S. Cl. 433—172

8 Claims

1. An implant head comprising an implant body having upper and lower end portions each terminating in respective upper and lower terminal faces, said upper end portion including a peripheral face, a bore at least in said lower end portion and an upwardly opening slot in said upper end portion, said slot opening upwardly through said upper terminal face and diametrically oppositely through said peripheral face, said slot including a bottom, said bore opening through said slot bottom, and means for securing a denture attachment bar in spanning relationship to said slot and bore.



# 5,567,156 INLAY, INLAY HOLDER, METHOD FOR TOOTH RESTORATION, AND TOOTH RESTORATION SET FOR CARRYING OUT THE METHOD

Leif Hagge, Skene, and Rolf Greven, Ljungskile, both of Sweden, assignors to Nordiska Dental AB, Helsingborg, Sweden  
PCT No. PCT/SE99/00002, § 371 Date Aug. 12, 1994, § 102(e)  
Date Aug. 12, 1994, PCT Pub. No. W093/13726, PCT Pub. Date Jul. 22, 1993

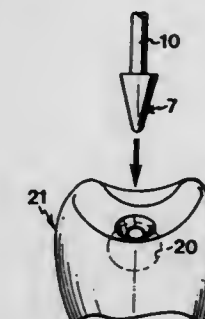
PCT Filed Jan. 4, 1993, Ser. No. 256,277

Claims priority, application Sweden, Jan. 7, 1992, 9200020; Aug. 25, 1992, 9202428

Int. Cl.<sup>6</sup> A61C 5/04; 5/00

U.S. Cl. 433—226

9 Claims



1. A method for restoring a tooth by applying and fixing a prefabricated inlay (1; 11) in a cavity (20) prepared in the tooth and having essentially the same shape as the inlay adapted for insertion, comprising the steps of preparing at least a portion of the cavity by means of a conical burr (7-9) so as to impart an at least partly conical shape to said portion; and applying and fixing in the cavity an inlay (1; 11) which has a part corresponding to said portion and having the same cone angle as the conical burr.

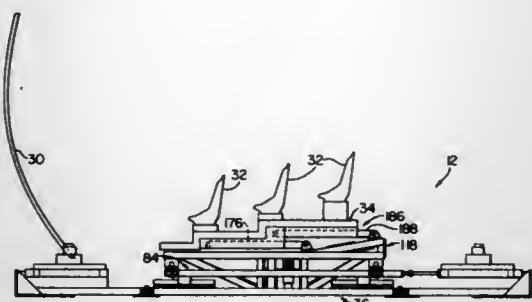
5,567,157  
COMPLIANT ORTHOGONAL MOTION BASE AND  
SIMULATOR SYSTEM

Roland A. Salmon, Jr., Great Barrington, Mass.; James H. Payne, Woodbridge, Va., and Thomas R. Culnan, Clifton Park, N.Y., assignors to Ridefilm Corporation, South Lee, Mass.

Filed Mar. 15, 1995, Ser. No. 404,721  
Int. Cl.<sup>6</sup> G09B 9/00

U.S. Cl. 434—29

16 Claims



1. A motion base for use with a simulator system having a system controller that generates command signals for presentation of a sequence of audio-visual image signals to a simulator system passenger synchronously with the movement of the motion base, said motion base comprising:

a base frame fixed to provide a foundation to the room floor, said base frame having a perimeter formed by base frame members affixed to one another by means of a mortice in a first member received by a complimentary tenon in a second member, with opposed ones of said base members having substantially parallel upper surfaces;

a middle frame positioned relative to said base frame to be displaceable along a first axis, said middle frame having a perimeter formed by middle frame members affixed to one another by means of a mortice in a first member received by a complimentary tenon in a second member, with opposed ones of said middle frame members having substantially parallel upper and lower surfaces;

cooperatively engaging base and middle displacement guide elements respectively affixed to said base frame upper surface and said middle frame lower surface for constraining said base and middle frames to linear relative movement along said first axis;

first actuator means communicating with said base and middle displacement guide elements for effecting displacement of said middle frame relative to said base frame in response to received first actuator drive signals;

a upper frame positioned relative to said middle frame to be displaceable along a second axis, said upper frame having a perimeter formed by upper frame members affixed to one another with opposed ones of said middle frame members having substantially parallel lower surfaces;

an actuator carriage affixed to a central region of said upper frame;

an elevated stabilizer mount affixed to said upper frame members such that stabilizer receptacles mounted on an upper stabilizer mount surface are inclined with respect to said upper frame perimeter;

cooperatively engaging middle and upper displacement guide elements respectively affixed to said middle frame member upper surfaces and said upper frame member lower surfaces for constraining said middle and upper frames to linear relative movement along said second axis;

second actuator means communicating with said middle and upper displacement guide elements for effecting displacement of said middle and upper frames relative to one another in response to received second actuator drive signals;

a lift carriage positioned relative to said upper frame to be displaceable substantially along a third axis orthogonal to

both said first and second axes, and having stabilizer receptacles mounted on a lift carriage lower surface;  
a third actuator means communicating with said upper frame and lift carriage displacement guide elements for effecting displacement of said lift carriage relative to said upper frame in response to received third actuator drive signals, said third actuator having a first end affixed to said actuator carriage; and  
a stabilizer rotably mounted in said stabilizer receptacles for providing lateral stability to said lift carriage during displacement.

5,567,158

Patent Not Issued For This Number

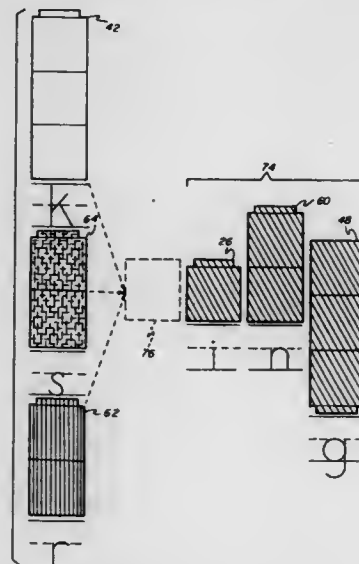
5,567,159

METHOD AND APPARATUS FOR TEACHING READING  
Margaret A. Tehan, 119 Marlboro Pl., Dayton, Ohio 45420

Filed Feb. 3, 1995, Ser. No. 383,593  
Int. Cl.<sup>6</sup> G09B 17/00

U.S. Cl. 434—178

12 Claims



7. A method for teaching reading skills using a plurality of colored visual indicator members for representing letters, said visual indicator members grouped into sets according to a physical characteristic of letters the visual indicator members represent, and each visual indicator member of each said set having a unique color characteristic for distinguishing it from other visual indicator members of the same set, the method comprising the steps of:

providing a first set of six visual indicator members representing vowel letters wherein said visual indicator members of said first set all have a common height dimension;

providing a second set of seven visual indicator members representing consonant letters extending above a middle line on ruled penmanship paper wherein said visual indicator members of said second set all have a common height dimension different from said height dimension of said visual indicator members of said first set;

providing a third set of four visual indicator members representing consonant letters extending below a lower line on ruled penmanship paper wherein said visual indicator members of said third set all have a common height dimension different from said height dimension of said visual indicator members of said first set;

providing a fourth set of nine visual indicator members representing consonant letters not represented by said second and third sets of visual indicator members wherein said visual indicator members of said fourth set all have a common height dimension different from said height dimension of said visual indicator members of said first, second and third sets; selecting said visual indicator members from said sets and arranging the selected visual indicator members to form a word sound; and identifying the word sound formed by the visual indicator members.

a safety member constructed and arranged to be movable between a safety position wherein the safety member prevents manual movement of said engageable member and a non-safety position which permits the engageable member to be manually moved between said activated position and said storage position.

5,567,161

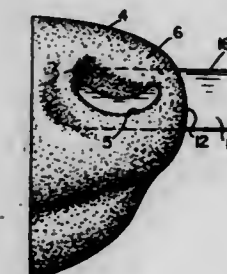
METHOD, KIT, AND ARTIFICIAL SEPTUM FOR THE  
PREPARATION OF A SEPTUM FOR A TAXIDERMIST  
MANIKIN

Carl A. Kallina, Box 122, Nada, Tex. 77460

Filed Nov. 18, 1994, Ser. No. 344,655  
Int. Cl.<sup>6</sup> G09B 23/00

U.S. Cl. 434—295

22 Claims



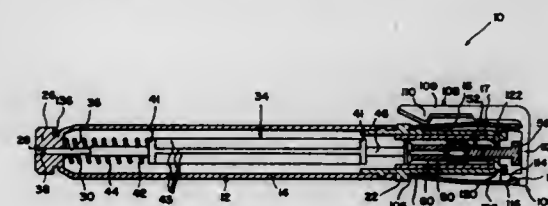
5,567,160  
AUTOINJECTOR TRAINING DEVICE

Frank Massino, Rockville, Md., assignor to Survival Technology, Inc., Rockville, Md.

Filed Oct. 26, 1995, Ser. No. 548,858  
Int. Cl.<sup>6</sup> G09B 23/28

U.S. Cl. 434—262

2 Claims



1. An automatic injector training device comprising:

an outer structure having i) a rearward end, ii) a forward end arranged to be engaged with an injection site of the user, and iii) an intermediate generally cylindrical portion disposed between said forward and rearward ends and constructed and arranged to be manually gripped by the user;

a movable manually engageable member extending outwardly from the rearward end of the outer structure and adapted to be manually engaged and depressed by the user while said intermediate portion is being gripped by the user, said engageable member being movable between a storage position and an activated position by being manually depressed by the user;

a prod member movable within said outer structure between a retracted position wherein a forward portion thereof is disposed retracted within the outer structure and an outwardly extending position wherein said forward portion thereof extends outwardly from the forward end of the outer structure, said prod member being movable from said retracted position to said outwardly extending position when said engageable member is manually moved from said storage position to said activated position and being movable from said outwardly extending position to said retracted position when said engageable member is manually moved from said activated position to said storage position;

a spring member disposed within said outer structure and arranged so as to tend to bias said prod member rearwardly within said outer structure to thus move said prod member from said outwardly extending position to said retracted position when the engageable member is moved from the activated position to the storage position, said engageable member being disposed so that manual movement thereof from said storage position to said activated position moves said prod member against the bias of said spring member so that said forward end of the prod member is moved to extend outwardly from the forward end of the outer structure;

releasable locking elements disposed within said outer structure constructed and arranged to retain said prod member in said outwardly extending position when said engageable member is moved from the storage position to the activated position and to permit said prod member to be moved by said spring member from said outwardly extending position to said retracted position when said engageable member is moved from the activated position to the storage position; and

19. A method for the preparation of a septum for a taxidermy manikin, comprising the steps of:

drilling out the nostrils through a nose of the taxidermy manikin; placing a septum tool off center from the tip of and in front of the nose of the manikin, said septum tool comprising a semi-pointed rounded, convex edge for insertion into said manikin;

pushing said septum tool straight back, wherein said septum tool passes behind the nostril opening, with the curvature of said tool behind and facing the open nostril, therein forming a C cut behind and facing the open nostril;

feeding an artificial septum for use in taxidermy manikins through the C cut formed by the septum tool, said artificial septum comprising a flat, rectangular sheet, said sheet comprising of a material selected from the group consisting of plastic and cardboard, said sheet having two sides, one said side having vascular markings, and the other said side having a solid color mimicking the natural colors of a septum in a mammalian species; and

repeating the process with the other nostril of the manikin.

5,567,162

KARAOKE SYSTEM CAPABLE OF SCORING SINGING  
OF A SINGER ON ACCOMPANIMENT THEREOF

Chan Soo Park, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 4, 1994, Ser. No. 334,113

Claims priority, application Rep. of Korea, Nov. 9, 1993, 93-23724; Nov. 30, 1993, 93-25869

Int. Cl.<sup>6</sup> G10H 1/36; G09B 5/08

U.S. Cl. 434—307 A

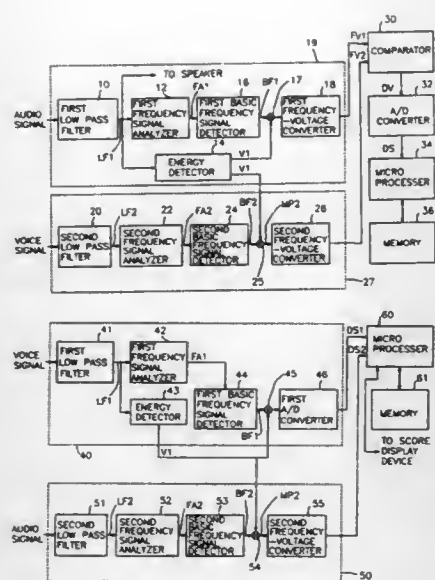
2 Claims

1. A karaoke system capable of scoring singing of a singer on accompaniment thereof comprising:

a voice signal processing means for generating a first basic frequency signal which is obtained by adopting Fourier Transformation to a voice signal generated by the singer, and outputting a first voltage signal which corresponds to a voice frequency signal existing in a voice signal section of the first basic frequency signal;

an audio signal processing means for generating a second basic frequency signal obtained by adopting Fourier Transformation





to an audio signal generated by the karaoke system, and outputting a second voltage signal which corresponds to an audio frequency signal existing in a voice signal section of the second basic frequency signal;

a comparator for comparing the first and second voltage signals respectively inputted from the voice signal processing means and the audio signal processing means so as to output a difference signal therebetween;

an A/D converter for converting the difference signal inputted from the comparator to a digital signal; and

a microprocessor for summing the first and second digital signals continuously inputted thereto in order to output a score display signal calculated on the basis of the sum of the first and second digital signals into a score display device,

wherein the voice signal processing means comprises:

a first low pass filter for filtering the voice signal generated by the singer and generating a first low pass filter signal;

a first frequency signal analyzer for analyzing a frequency of the first low pass filter signal and generating a first frequency analysis signal;

an energy detector for detecting the level of the first low pass filter signal and generating a voice section signal to determine a voice signal section of the first low pass filter signal;

a first basic frequency detector for detecting the first basic frequency signal having a level above a predetermined value in the voice signal section of the first frequency analysis signal;

a first multiplier for multiplying the first basic frequency signal and the voice section signal and generating a first multiplication signal;

a first frequency-voltage converter for converting the first multiplication signal into a first voltage signal corresponding to the first multiplication signal as a first frequency-voltage conversion signal to the comparator, and

wherein the audio signal processing means comprises:

a second low pass filter for filtering the audio signal generated by the karaoke system and generating a second low pass filter signal;

a second frequency signal analyzer for analyzing a frequency of the second low pass filter signal and generating a second frequency analysis signal;

a second basic frequency detector for detecting the second basic frequency signal having a level above a predetermined value in the voice signal section of the second frequency analysis signal;

a second multiplier for multiplying the second basic frequency signal and the voice section signal and generating a second multiplication signal; and

a second frequency-voltage converter for converting the second multiplication signal into a second voltage signal cor-

responding to the second multiplication signal as a second frequency-voltage conversion signal to the comparator.

2. A karaoke system capable of scoring singing of a singer on accompaniment thereof comprising:

an audio processing means for generating a first basic frequency signal which is obtained by adopting Fourier Transformation to an audio signal voice signal generated by the karaoke system, and outputting a first digital signal which corresponds to an audio frequency signal existing in a region of an audio signal section of the first basic frequency signal;

a voice signal processing means for generating a second basic frequency signal obtained by adopting Fourier Transformation to a voice signal generated by the singer, and outputting a second digital signal existing in the region of the audio signal section of the second basic frequency signal; and

a microprocessor for summing the first and second digital signals continuously inputted thereto respectively from the voice signal processing means and the audio signal processing means to output a score display signal calculated on the basis of the sum of the first and second digital signals to a score display device,

wherein the audio signal processing means comprises:

a first low pass filter for filtering the audio signal generated by the karaoke system and generating a first low pass filter signal;

a first frequency signal analyzer for analyzing a frequency of the first low pass filter signal and generating a first frequency analysis signal;

an energy detector for detecting the level of the first low pass filter signal and generating an audio section signal to determine an audio signal section of the first low pass filter signal;

a first basic frequency detector for detecting the first basic frequency signal having a level above a predetermined value in the audio signal section of the first frequency analysis signal;

a first multiplier for multiplying the first basic frequency signal and the audio section signal and generating a first multiplication signal; and

a first A/D converter for converting the first multiplication signal into a first digital signal corresponding to the first multiplication signal to the microprocessor, and

wherein the voice signal processing means includes:

a second low pass filter for filtering the voice signal generated by the singer to the voice signal processing means and generating a second low pass filter signal;

a second frequency signal analyzer for analyzing a frequency of the second low pass filter signal and generating a second frequency analysis signal;

a second basic frequency detector for detecting the second basic frequency signal, which is the voice signal existing in the audio signal section of the second frequency analysis signal;

a second multiplier for multiplying the second basic frequency signal and the audio section signal inputted thereto from the energy detector of the audio signal processing means and generating a second multiplication signal; and

a second A/D converter for converting the second multiplication signal into a second digital signal corresponding to the second multiplication signal to the microprocessor.

5,567,163

TALKING BOOK

Suey Ku, 6th Floor, #1 Lane 60, Ning-An St., Taipei, Taiwan

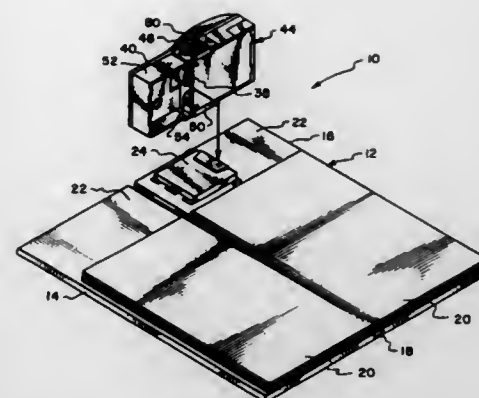
Filed Jun. 26, 1995, Ser. No. 494,685

Int. Cl. G09B 5/06

U.S. Cl. 434-317

4 Claims

1. In combination with a book that is movable from a closed position to an open position, said book having a pair of outer covers with a plurality of pages located therebetween, said outer covers being connected at a spine, said outer covers having inner surfaces which are located in juxtaposition when said book is



closed, said inner surfaces being in substantial alignment when said book is open, an audio player apparatus connected to said book, said audio player apparatus comprising:

said outer covers being larger in size than said pages forming a head area not occupied by said pages, a cassette fixedly mounted on one of said inner surfaces at said head area, said cassette including a prerecorded continuous audio tape; and a separate, hand holdable, playback device, said playback device including a switch assembly manually movable between an activating position and a deactivating position, with said switch assembly in said deactivating position said playback device being capable of being moved into engagement or moved out of engagement with said cassette, with said playback device in engagement with said cassette said switch assembly to be movable to said activating position which results in playing of said audio tape.

5,567,164

METHOD OF FACILITATING LEARNING USING A LEARNING COMPLEX

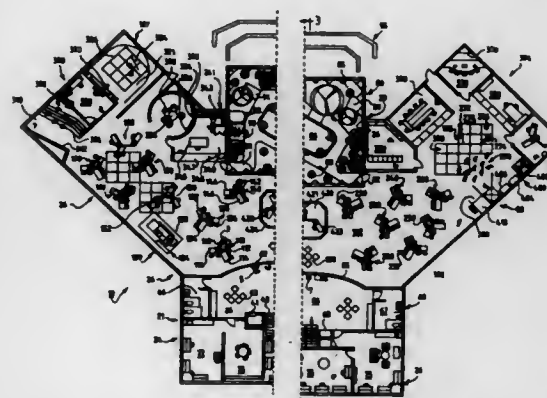
James C. Durkin, and Francine P. Foster, both of Poway, Calif., assignors to Creative Learning Systems, Inc., San Diego, Calif.

Filed Mar. 11, 1994, Ser. No. 209,945

Int. Cl. A47B 39/00

U.S. Cl. 434-432

13 Claims



1. In a learning complex including a building having walls defining a large open interior space and an entrance way thereto, a method of facilitating learning, comprising:

configuring a plurality of individually spaced apart work/learn islands into a re-configurable low complexity level learning zone disposed within the interior space adjacent to the entrance way and spaced from the walls for facilitating individual learning at each of said islands by attracting learners entering the interior space via the entrance way to specific ones of said islands;

configuring a plurality of individually spaced apart advanced work/learn islands into a re-configurable high complexity level learning zone disposed within the interior space adjacent to said low complexity level learning zone and spaced apart from the walls for facilitating individual learning of advanced topics at each one of said advanced islands by attracting learners from said low complexity level learning zone, said advanced topics being more challenging than said topics, said low complexity level learning zone being intermediate the entrance way and said high complexity level learning zone for initially introducing said topics to the learners to help provide them with a more comfortable feeling upon entering and progressing through the learning environment to said advanced topics;

configuring a plurality of rooms into a fixed learning zone disposed generally along the periphery of the walls and spaced from said high complexity level learning zone for attracting learners to serve as group activity areas to help facilitate the sharing of information between a group of advanced learners who have progressed from said low complexity level learning zone and said high complexity level learning zone to participate with one another for cooperating in team projects, wherein the learners enter the interior space via the entrance way and are exposed unobstructedly to substantially the entire context of the relationship between said low complexity level learning zone, said high complexity level learning zone and said fixed learning zone;

permitting the learners entering the entrance way to move to an infield area at said low complexity level learning zone where the learners are exposed immediately to an unobstructed view of a variety of said topics being undertaken at said islands so that the learners can decide which ones of said topics are of specific interest to them;

permitting the learners to move to the selected ones of said islands for low complexity level learning facilitation purposes, whereby the learners can perform work and receive information of a relatively easy and less threatening content;

permitting the learners at said islands to move from said low complexity level learning zone upon termination of learning experiences thereat to an outfield area at said high complexity level learning zone to provide an unobstructed view of a variety of said advanced topics being undertaken at said advanced islands so that the learners can decide which ones of said advanced topics are of specific interest to them, wherein the learners utilize the knowledge obtained in said low complexity level learning zone to help them learn said advanced topics;

permitting the learners to move to the selected ones of said advanced islands for high complexity level learning facilitation purposes, whereby the learners can perform work and receive more challenging information;

providing the learners within the interior space with an unobstructed view of a variety of said group activities being undertaken at said rooms so that the learners can decide which ones of said group activities are of specific interest to them; and

permitting the learners to move to the selected ones of said rooms for group interaction purposes, wherein the learners utilize the knowledge obtained in said low complexity level learning zone and said high complexity level learning zone to help them cooperate with one another for preparing a group project;

whereby the learning experience is facilitated and enriched to achieve a balance between the complexity levels of said topics and said advanced topics being learned, and the configuration of the learning environment for a relatively large number of learners being exposed and enticed into involvement with the learning process.



5,567,165

# FLUID ACTUATED CONNECTOR/CARRIER FOR ELECTRIC PART

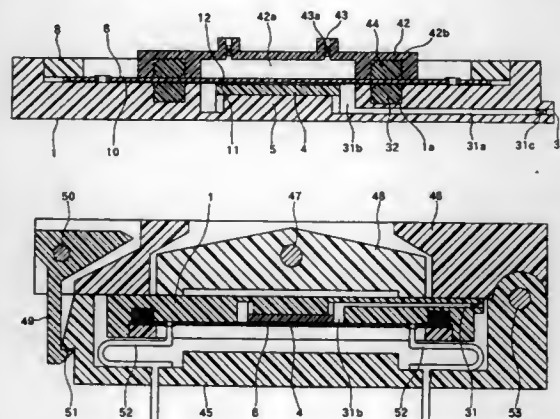
Noriyuki Matsuoka, Yokohama, Japan, assignor to Yamaichi  
Electronics Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1994, Ser. No. 362,855

Claims priority, application Japan, Dec. 28, 1993, 5-354670  
Int. Cl.<sup>6</sup> B65D 73/02

U.S. Cl. 439—42

18 Claims



1. An apparatus comprising:  
a connector body having an IC receiving portion at a central portion thereof for receiving an IC having IC terminals, and a wiring sheet receiving seat disposed about said IC receiving portion, said IC receiving portion having an opening which opens in a first direction;  
a wiring sheet mounted on said wiring sheet receiving seat so as to cover said opening of said IC receiving portion, said IC receiving portion covered by said wiring sheet defining a pressure reduction chamber;  
wherein said wiring sheet comprises a flexible sheet having first contact pads at an inner portion thereof, second contact pads at an outer portion thereof and conductive leads extending generally radially between said first contact pads and said second contact pads, respectively; and  
wherein a pressure reduction passage opens into said pressure reduction chamber for allowing gas to be drawn out of said pressure reduction chamber to cause said wiring sheet to flex in a second direction, opposite said first direction, toward said IC receiving portion so as to cause mutual contact between one of said first and second contact pads and the IC terminals, respectively, when the IC is received in said IC receiving portion of said connector body.

5,567,166

# LOW PROFILE CONNECTOR AND PROCESSES FOR MAKING AND USING THE SAME

Timothy Lemke, Carlisle, Pa., assignor to Berg Technology,  
Inc., Reno, Nev.

Filed Apr. 8, 1994, Ser. No. 225,242

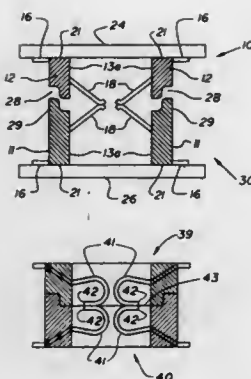
Int. Cl.<sup>6</sup> H01R 9/09

U.S. Cl. 439—74

41 Claims

1. A low profile connector system for use in electrically connecting circuit boards together in a stacked arrangement, said circuit boards having a plurality of electrical leads, the low profile connector comprising:

- a first connector comprising:  
a first set of electrical contacts, each electrical contact having a first end capable of being electrically interfaced with one of the electrical leads of one circuit board and a second end; and  
a housing having a lateral face in which said first set of electrical contacts are secured and having a mounting means for use in mounting said housing to said one circuit



board with said lateral face disposed in an angular relationship with respect to said circuit board so that said first set of contacts extends from said lateral face with at least said second ends of said first set of electrical contacts being unsupported and substantially parallel to said circuit board; and a mating connector capable of mating with said first connector comprising:

- a mating set of electrical contacts, each electrical contact of said mating set having a first end capable of being mated to one of the electrical leads on another circuit board and a second end for mating with one of said second ends of the first set of contacts; and  
a mating housing having a lateral face in which said mating set of electrical contacts are secured and having a mounting means for use in mounting said mating housing to said other circuit board so that said mating set of contacts extends from said lateral face of said mating housing with at least said second ends of said mating set of electrical contacts being unsupported and substantially parallel to said other circuit board.

5,567,167

# PRINTED WIRING BOARD CONNECTION APPARATUS Akihiko Hayashi, Kawasaki, Japan, assignor to MacEight Co., Ltd., Yokohama, Japan

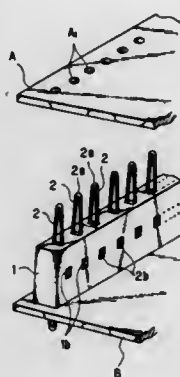
Filed Dec. 12, 1994, Ser. No. 354,229

Claims priority, application Japan, Dec. 14, 1993, 5-072201  
U; Sep. 14, 1994, 6-247342

Int. Cl.<sup>6</sup> H01R 9/09

U.S. Cl. 439—75

13 Claims



1. A printed wiring board connection apparatus comprising a spacer of synthetic resin material, said spacer having a pin support space bored therethrough and a pin engagement hole extending perpendicular to and in communication with said pin support space, said pin support space having two opposite openings; and a connection pin, said connection pin including a length of elastic metal wire with first and second ends and having a first contact section on a side of said elastic metal wire near said first end and a second contact section on a side of elastic metal wire near said

5,567,169

# ELECTROSTATIC DISCHARGE CONDUCTOR TO SHELL CONTINUITY

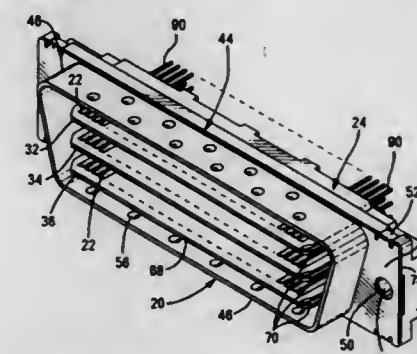
Earl W. McCleerey; George R. DeFibaugh, both of Mechanicsburg, Pa.; Edward K. Marsh, Kernersville, N.C.; Richard A. Nelson, Ellyn, Ill., and Gary J. Verdun, Houston, Tex., assignors to The Whitaker Corporation, Wilmington, Del., and Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 947,079, Sep. 17, 1992, abandoned, and a continuation-in-part of Ser. No. 836,155, Feb. 13, 1992, abandoned, which is a continuation of Ser. No. 658,135, Feb. 20, 1991, abandoned, said Ser. No. 947,079 is a continuation of Ser. No. 771,871, Oct. 1, 1991, abandoned, which is a continuation of Ser. No. 589,143, Sep. 27, 1990, abandoned. This application Nov. 17, 1992, Ser. No. 977,800

Int. Cl.<sup>6</sup> H01R 13/53

U.S. Cl. 439—181

17 Claims



1. A plug type multiple contact electrical connector comprising:  
a body portion formed from an insulative material, said body portion having a base and at least one outwardly projecting blade member extending from said base and terminating in a leading edge;  
a plurality of electrical contacts mounted to each of said at least one projecting blade members;  
an outer housing formed from an electrically conductive material and attached to said insulative body portion, said conductive outer housing at least partially surrounding said at least one projecting blade member;  
a conductive material mounted on the leading edge of at least one of said projecting blade members, said conductive material extending along the surface of said insulative body portion and terminating at an electrical connection with said conductive outer housing.

5,567,170

# PLUG-IN POTHEAD

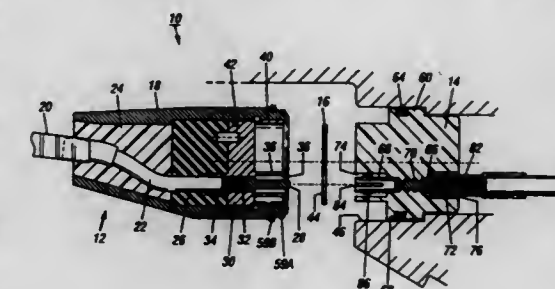
Richard B. Kroeber, Bartlesville, Okla., assignor to Camco  
International Inc., Houston, Tex.

Filed Dec. 7, 1994, Ser. No. 350,794

Int. Cl.<sup>6</sup> H01R 13/53

U.S. Cl. 439—186

15 Claims



1. An electrical connector for use with an electrical submergible pumping system, comprising:

second end, said first contact section being bent over into a hair pin configuration to form a first resilient bent portion, said first end being bent outwardly perpendicular to said first contact section to form a first stopper, said connection pin being inserted into said pin support space with said stopper being inserted into said pin engagement hole such that said connection pin is resiliently secured within said spacer with said first and second contact sections protruding out from the pin support space at said two opposite openings thereof, wherein said second contact section is bent over into a hair pin configuration to form a second resilient bent portion, said second end being bent outwardly perpendicular to said second contact section to form a second stopper, and said second stopper being inserted into said pin engagement hole.

5,567,168

# ELECTRICAL CONNECTOR HAVING ELECTROSTATIC DISCHARGE PROTECTION

Edward K. Marsh, Kernersville, N.C.; Richard A. Nelson, Glen Ellyn, Ill.; Earl W. McCleerey; George R. DeFibaugh, both of Mechanicsburg, Pa., and Gary J. Verdun, Houston, Tex., assignors to The Whitaker Corporation, Wilmington, Del., and Compaq Computer Corporation, Houston, Tex.

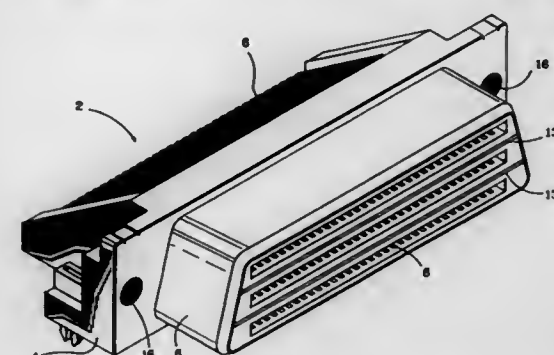
Continuation of Ser. No. 836,155, Feb. 13, 1992, abandoned, and a continuation-in-part of Ser. No. 977,800, Nov. 17, 1992, which is a continuation of Ser. No. 947,079, Sep. 17, 1992, abandoned, which is a continuation of Ser. No. 771,871, Oct. 1, 1991, abandoned, which is a continuation of Ser. No. 589,143, Sep. 27, 1990, abandoned, said Ser. No. 836,155 is a continuation of Ser. No. 658,135, Feb. 20, 1991, abandoned.

This application Dec. 22, 1992, Ser. No. 994,669

Int. Cl.<sup>6</sup> H01R 13/53

U.S. Cl. 439—181

16 Claims



1. A shielded electrical connector, comprising:  
an insulating housing comprising a front mating face and a conductor connecting face, and platform means defining at least two discrete horizontal planar terminal support platforms spaced parallel to each other;  
terminal means supported by each of said platforms and having a forward mating contact section adjacent the front mating face, and a conductor connecting section adjacent to the conductor connecting face;  
shielding means attached to said insulating housing, forming an annular shielding shroud around said platform means, adjacent to the front mating face; and  
grounding means commoned to said shielding means and extending intermediate two discrete horizontal, parallel arrays of said terminal means on said platforms.



a pothead having a first electrical connector member surrounded by a coaxial and spaced sleeve of insulative material extending from the pothead;

a terminal block with a recess therein adapted to receive there into the sleeve on the pothead and with a second electrical connector member set within the recess, the sleeve and the recess configured and sized to form a circuitous arc path, and the second electrical connector member adapted to form an electrical connection with the first electrical connector member; and

means to fluidically seal an interface formed when the pothead is operatively connected to the terminal block.

5,567,171

**ELECTRICAL CONNECTOR WITH A LATCH**

Shinji Mizuguchi, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

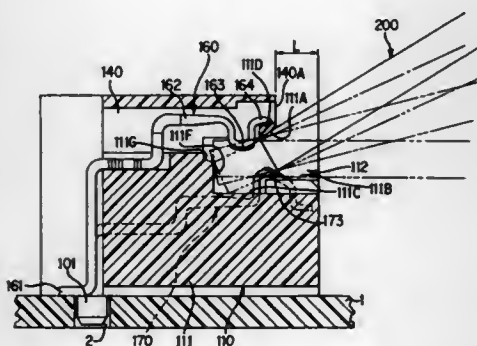
Filed Sep. 9, 1994, Ser. No. 303,759

Claims priority, application Japan, Oct. 8, 1993, 5-054867

Int. Cl.<sup>6</sup> H01R 13/62

U.S. Cl. 439—326

4 Claims



1. An electrical connector with a latch, into which a circuit board is inserted at an angle and then rotated to a latch position, comprising:

an insulating housing having a base which has an elongated groove, and first and second contact element receiving cavities provided on upper and lower sides of said elongated groove;

first and second discrete contact elements arranged in said first and second contact receiving cavities, respectively, such that contact portions of said first and second contact elements exposed in said elongated groove respectively;

a front end face of said first contact element receiving cavities being offset from a front end face of said second contact element receiving cavities by a predetermined length (L);

a guide slope provided on an upper front edge of said elongated groove for guiding said circuit board into said elongated groove;

said contact portions of said first contact elements project into said elongated groove beyond an extended line of said guide slope;

a shortest distance between said contact portions of said first and second contact elements being set slightly less than a thickness of said circuit board so that when said circuit board is inserted into said elongated groove along said guide slope, said contact portions are cleaned by wiping action of said circuit board before said circuit board is rotated to a latch position; and

Wherein said contact portions each has a C-shaped rolled surface so that when a circuit board is inserted into said elongated groove, said C-shaped rolled surface make a smooth sliding contact with said circuit board, thus providing improved cleaning action by wiping.

5,567,172  
**UNIVERSAL STRAIN RELIEF DEVICE FOR CONNECTORS**

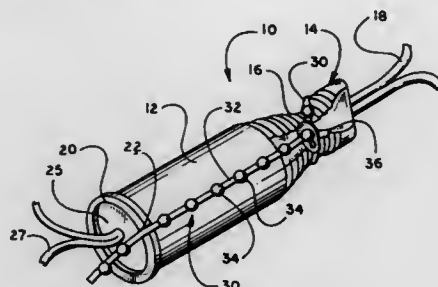
William C. Thibault, Powder Springs, and Lawrence A. Tinker, Woodstock, both of Ga., assignors to AER Energy Resources, Inc., Atlanta, Ga.

Filed Sep. 26, 1994, Ser. No. 312,566

Int. Cl.<sup>6</sup> H01R 13/62

U.S. Cl. 439—371

6 Claims



1. A secured electrical connection, comprising:

a first male connector;

a second female connector shaped to receive said first connector within a sleeve defined by said second connector;

one of said first and second connectors defining a projection including a catch positioned to be accessible when said connectors are engaged; and

an elastic, beaded securing line defining an opening at a first end thereof to enable formation of a loop in said securing line;

a bead of said securing line being trapped in said catch of said one connector, and said loop engaging said other connector, such that said elastic securing line is held in tension.

5,567,173

**ELECTRICAL CONNECTOR**

Joris I. Franckx, Bonheiden, Belgium, assignor to N.V. Raychem S.A., Kesselro, Belgium

PCT No. PCT/GB92/02063, § 371 Date May 12, 1994, § 102(e)

Date May 12, 1994, PCT Pub. No. WO93/10575, PCT Pub.

Date May 27, 1993

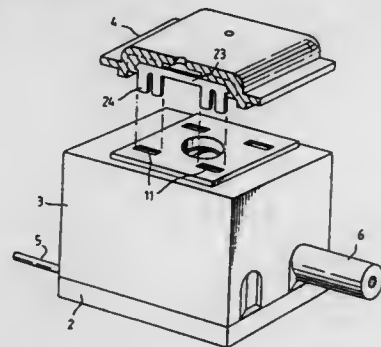
PCT Filed Nov. 9, 1992, Ser. No. 244,011

Claims priority, application United Kingdom, Nov. 14, 1991, 9124180

Int. Cl.<sup>6</sup> H01R 4/24

U.S. Cl. 439—418

15 Claims



1. A connector for interconnecting first and second electrical conductors, comprising

(a) a first part;

(b) a second part; the first and/or second parts forming a housing;

(c) a first contact attached to the first part and capable of making contact with the first conductor; and

(d) a second contact temporarily attached to the first part and capable of making contact with the second conductor;

the second part having means for receiving the second contact when the first and second parts are brought together such that the second contact remains thus received on subsequent separation of the first and second parts, and the first and second parts and the first and second contacts being arranged such that when the first and second parts are brought together, the first contact makes electrical contact with the first conductor and the second contact makes electrical contact with the second conductor, and when the first and second parts are subsequently separated, the electrical contact between the first contact and the first conductor is broken and that between the second contact and the second conductor is retained.

5,567,174

**WATER TIGHT GREASE FILLED CONNECTOR WITH STRAIN RELIEF**

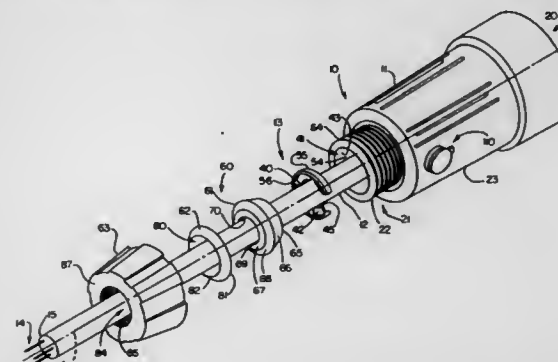
John E. Ericson, Jr., Gates Mills, Ohio; Eric F. Wilson, Punta Gorda, Fla.; Michael L. Gordzelik, Cookeville, Tenn., and Martin C. Ignasiak, Sarasota, Fla., assignors to The Ericson Manufacturing Co., Willoughby, Ohio

Filed Jun. 2, 1994, Ser. No. 253,150

Int. Cl.<sup>6</sup> H01R 13/58

U.S. Cl. 439—462

30 Claims



1. Apparatus for holding an elongate member relative to a device, comprising

a retainer for at least partially circumscribing at least a portion of said elongate member, said elongate member comprising an electrical cable having at least one electrical conductor, said retainer including means for engaging said elongate member to prevent relative axial movement of said retainer and said elongate member,

receiving means positionally associated with said device for receiving at least a part of said retainer and at least a part of said elongate member,

said receiving means including means for preventing such loosening of said retainer relative to said elongate member that would permit substantial relative axial movement of said retainer and elongate member,

a holder for blocking withdrawal of said retainer from said receiving means in at least one direction,

an electrical connector comprising a connector housing and means for making electrical connections, said means for making electrical connections being connected to at least one electrical conductor of said cable and being connectable to further means for making electrical connections,

at least one signal conductor located at least partly in said housing for making connections, and

a port for providing access to the interior of said housing to permit the delivery of fluidic material into said housing, said fluidic material having water resistant and anti-bacterial qualities.

5,567,175

**PREMOLD INSERT FOR A TRANSPARENT PLUG**

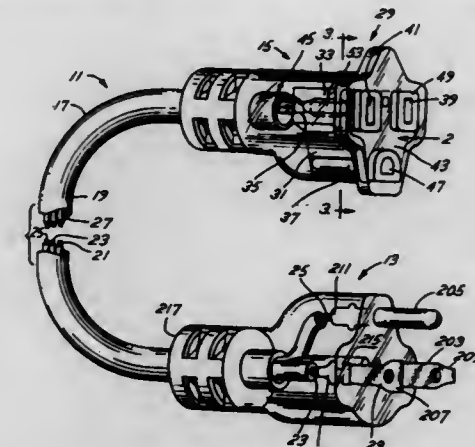
Harold Warden, Carmel, and Sherman Cooper, Noblesville, both of Ind., assignors to Woods Industries, Inc., Carmel, Ind.

Filed May 1, 1995, Ser. No. 432,100

Int. Cl.<sup>6</sup> H01R 3/00

U.S. Cl. 439—490

14 Claims



1. A premold insert for insertion into the female end of a molded transparent plug comprising:

a transparent front wall;

a pair of opposing transparent side walls;

a transparent rear wall;

a first channel formed in said front wall for receiving the hot blade receiving terminal of a conventional plug;

a second channel formed in said front wall for receiving the neutral blade receiving terminal of a conventional plug;

a light source which indicates when power is available to said plug which is positioned on said insert prior to molding and which will remain positioned during said molding process to protect the mechanical and electrical integrity of said plug.

5,567,176

**TWO-PURPOSE POWER SUPPLY DEVICE FOR COMPUTERS**

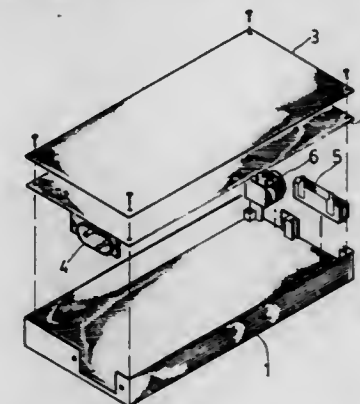
Ming D. Chiou, 3F, No. 4, Alley 11, Lane 327, Sec. 2, Chung Shan Rd., Chung Ho City, Taipei, Taiwan

Filed Dec. 20, 1994, Ser. No. 359,763

Int. Cl.<sup>6</sup> H01R 11/00

U.S. Cl. 439—500

1 Claim



1. A power supply device for use with a mobile computer having a battery chamber, the device comprising:

a housing, a circuit board securely mounted inside said housing, an AC receptacle securely fixed to said housing and electrically connected to said circuit board for connecting an AC

power supply to said circuit board, wherein said circuit board has a DC output terminal connected in parallel with an electric connector and a socket, said electric connector being securely fixed to said housing for electrical connection to the battery chamber of said mobile computer, said socket being securely fixed to said housing for connection to the external power input socket of said mobile computer by a cable, the size of said housing allowing said housing to be contained in the battery chamber of said mobile computer.

5,567,177

## SURFACE MOUNT CHIP CARRIER

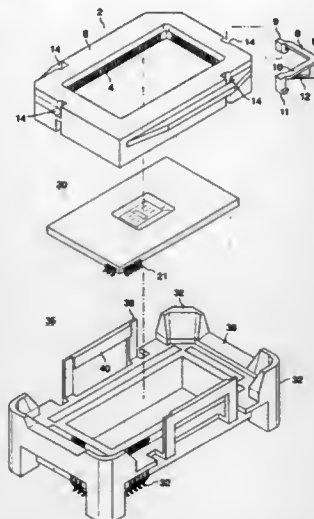
Joseph W. Foerstel, Sunnyvale, and Sandeep Vij, San Jose, both of Calif., assignors to Altera Corporation, San Jose, Calif.

Continuation of Ser. No. 10,260, Jan. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 874,281, Apr. 24, 1992, Pat. No. 5,301,416. This application Jan. 30, 1995, Ser. No. 381,005

Int. Cl.<sup>6</sup> H01R 23/72

U.S. Cl. 439—526

17 Claims



1. Apparatus for holding and handling by hand a standard electronic component during manufacturing, testing, and prototyping, the component having a three dimensional body with the larger two dimensions designated the horizontal dimensions forming a polygon with no protuberances and defining an upper surface and a lower surface and the third dimension being a vertical thickness of said component, said component having a plurality of leads defining a lead footprint, said leads extending outward from the component in one of the horizontal dimensions and bent to extend vertically in the thickness dimension, the apparatus comprising:

a carrier including

- a cavity having a shape and dimensions to at least partially surround and immobilize the electronic component said carrier having dimensions nearly the same as the dimensions of said component to allow easy manual handling of the carrier without the user touching the electronic component, said carrier including receiving grooves for partially surrounding and immobilizing said leads in said outward and said vertical dimensions; and
- a plurality of indentations in the body of said carrier for receiving a plurality of clips, said clips engaging the carrier on at least an upper surface and engaging the device on at least a lower surface and holding the device firmly in place in the carrier, and

a prototype socket comprising:

- means for engaging the carrier and the electronic component,

a plurality of contacts arranged within the socket to make electrical contact between the contacts and the plurality of leads of the electronic component when the socket engages the carrier, and

a plurality of socket leads arranged in the lead footprint of the electronic component, each lead having an extended stem for electrically coupling with one of said contacts, wherein said lead, including a lead portion for coupling with a printed circuit board and a portion of said stem, is substantially exposed and accessible from outside the socket; and

a manufacturing and testing socket comprising:

a cavity for engaging the carrier and the integrated circuit package;

a plurality of contacts arranged within the socket to make electrical contact with the leads of the integrated circuit package while said package is housed in said carrier; and

a plurality of socket leads arranged to effectively engage the socket in a manufacturing device said socket leads not necessarily arranged in the lead footprint of the integrated circuit package

wherein said carrier is capable of engaging both the prototype socket and the manufacturing and testing socket.

5,567,178

## APPARATUS FOR THE ARRANGEMENT OF PATCH PANELS, SUPPORTING OPTICAL WAVEGUIDE PLUG SYSTEMS

Edmond Grässer, Rossbergstrasse 3, 67269 Grünstadt, Germany

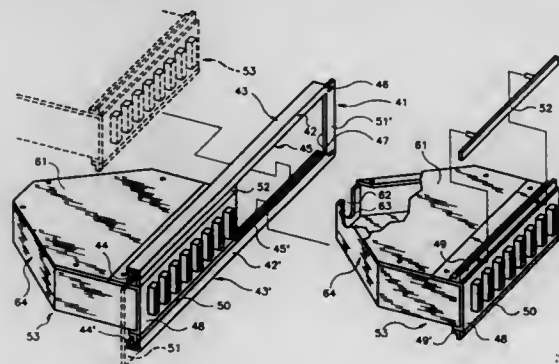
Filed May 3, 1994, Ser. No. 237,135

Claims priority, application Germany, May 17, 1993, 93 07 334.8 U; Aug. 20, 1993, 93 12 492.9 U; Sep. 3, 1993, 93 13 279.4 U; European Pat. Off., Dec. 11, 1993, 93120049

Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 439—532

29 Claims



1. An apparatus for the arrangement of patch panels comprising a distribution rack and patch panel cabinet;

an upper horizontally running-shaped rail having two ends, wherein the upper U-shaped rail is furnished with two arms, directed downwardly, and with a longitudinal slot, open in downward direction and formed by the two downwardly directed arms, and with a first rail floor at a bottom of the longitudinal slot open in downward direction, and wherein the upper U-shaped rail is horizontally supported at the two ends with, the distribution rack and patch panel cabinet;

a lower horizontally running U-shaped rail having two ends, wherein the lower U-shaped rail is furnished with two arms, directed upwardly, and with a longitudinal slot, open in upward direction and formed by the two upwardly directed arms, and with a second-rail floor at a bottom of the longitudinal slot open in upward direction, and wherein the lower U-shaped rail is horizontally supported at the two ends within the distribution rack and patch panel cabinet, wherein the upper horizontally running U-shaped rail and the lower horizontally running U-shaped rail are disposed facing each other with open sides of the longitudinal slots, wherein lower edges

of the two arms directed downwardly and upper edges of the two arms directed upwardly are disposed facing each other, wherein the upper horizontally running U-shaped rail is disposed above the lower horizontally running U-shaped rail in a vertical direction;

patch panel having longitudinal edges are disposed with its longitudinal edge between the upper U-shaped rail the lower U-shaped rail;

a first flat rail fixedly disposed at a rear side of a lower part of the patch panel, and a second flat rail fixedly disposed at a rear side of an upper part of the patch panel, wherein a patch panel assembly is formed by the patch panel with the first flat rail and the second flat rail;

wherein the two arms directed downwardly of the upper U-shaped rail are longer than the two arms directed upwardly of the lower U-shaped rail and wherein the width of the patch panel assembly extending in a vertical direction is larger than an open distance between the lower edges of the two arms directed downwardly and the upper edges of the two arms directed upwardly, however, wherein the width of the patch panel extending in a vertical direction is smaller than an open distance of the first rail floor from the second rail floor;

a frame plate, wherein the upper U-shaped rail and the lower shaped rail are formed by parts of the frame plate, and wherein the frame plate exhibits a rectangular opening for receiving the patch panel;

wherein the frame plate is furnished with an upper connection web for forming the upper U-shaped rail and with a lower connection web for forming the lower U-shaped rail,

wherein the upper connection web supports an upper web bent rearwardly at a right angle, wherein an upper angle rail is disposed inside the upper web under providing a distance the upper connection web and under formation of an upper U-shaped longitudinal opening,

wherein the lower connection web supports a lower web bent rearwardly at a right angle, wherein a lower angle rail is disposed inside the lower web under providing a distance to the lower connection web and under formation of a lower U-shaped longitudinal opening.

5,567,179

## CONNECTOR SYSTEM FOR COAXIAL CABLES

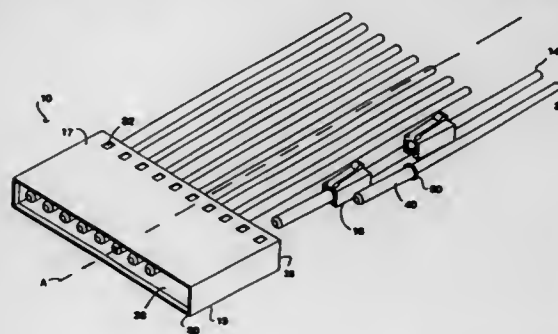
John Voltz, Hockessin, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Feb. 10, 1995, Ser. No. 387,146

Int. Cl.<sup>6</sup> H01R 13/434

U.S. Cl. 439—578

24 Claims



1. An electrical connector system comprising:

a housing having formed therethrough at least one retention window and at least one shaped aperture which is formed through a rear portion of the housing, the housing defining an internal cavity portion having an interior wall;

at least one electrical cable assembly having an electrical cable defined by a conductor and an insulator, a ground shell surrounding the insulator, the ground shell defining a circumferentially disposed flange, the insulator separating the ground shell from the conductor, the flange engaging the interior wall

when the resistant locking member is disposed in the first, retention window engaging position to limit insertion of the electrical cable assembly into the housing;

at least one retaining member which is dimensioned to substantially mirror the dimension of the at least one shaped aperture, the at least one retaining member having an internal surface which defines a channel portion having a predetermined width dimension, the channel portion terminating to a slot formed in a retaining member bottom portion, the slot having a narrower width dimension than the width dimension of the channel portion, the at least one retaining member snap-fittingly engaging an individual said electrical cable; and

a resilient locking member made integral with each at least one retaining member, the resilient locking member being resiliently moveable, back and forth, from a first, retention window engaging position to a second, retention window disengaging position.

5,567,180

## CABLE MANAGER SYSTEM OF A COMPUTER

Yeol G. Seo, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

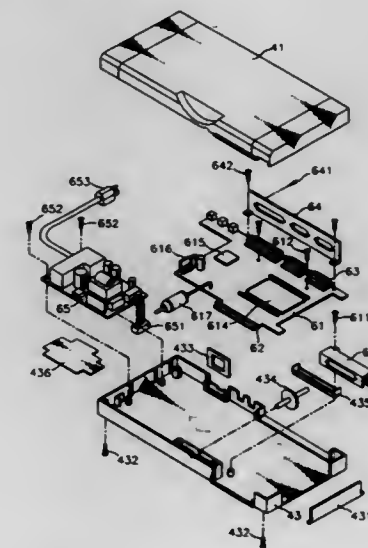
Filed Jul. 7, 1994, Ser. No. 271,728

Claims priority, application Rep. of Korea, Jul. 7, 1993, 93-12735; May 25, 1994, 94-11425

Int. Cl.<sup>6</sup> H01R 25/00

U.S. Cl. 439—638

17 Claims



1. A cable manager system of a computer comprising:

a connecting body including a plurality of first ports, for being connected with computer-side ports, on one side of the connecting body, a plurality of second ports, for being connected with peripheral equipment-side ports, on the other side of the connecting body, and means for electrically connecting said first ports to respective one of said second ports, and thus connecting said peripheral equipment-side ports with said computer-side ports integrally and electrically when said computer side ports are connected with said first ports and said peripheral equipment-side ports are connected to said second ports;

an outer case disposed around said connecting body for protecting said connecting body from dust and impact;

coupling means for fixing said connecting body to the outer case;

a cover disposed on the outer case to cover a mounting screw of said coupling means.



5,567,181

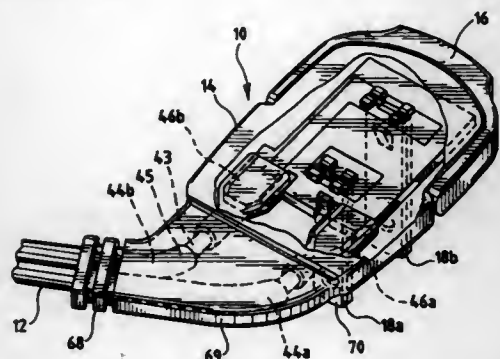
**LOW PROFILE ELECTRICAL PLUG**

Mark Lentz, Indianapolis; Steven R. Moses, Carmel; Eloy F. Pettiford, Indianapolis; Craig Stewart, Noblesville, and Douglas D. Wright, Clermont, all of Ind., assignors to Woods Industries, Inc., Carmel, Ind.

Continuation of Ser. No. 385,077, Feb. 7, 1995, which is a continuation-in-part of Ser. No. 216,920, Mar. 23, 1994, abandoned, and a continuation-in-part of Ser. No. 28,115, Sep. 7, 1994. This application May 8, 1995, Ser. No. 436,700  
Int. Cl.<sup>6</sup> H01R 13/04

U.S. Cl. 439—694

38 Claims



1. A low profile electrical plug and power cord for mating with a conventional electrical outlet, comprising:
  - a planar support plate having a low profile;
  - at least two electrically conductive outlet prongs rigidly secured to said support plate and extending perpendicularly therefrom;
  - a first path of electrically conductive material disposed on said support plate and being in electrical contact with one of said conductive prongs;
  - a second path of electrically conductive material disposed on said support plate and being in electrical contact with the other of said conductive prongs;
  - a power cord having at least a first conductor and a second conductor, said first conductor being in electrical contact with said first path of electrical conductive material and said second conductor being in electrical contact with said second path of electrical conductive material;
  - a non-conductive housing encasing said planar support plate and a portion of said power cord, said housing including a bottom surface through which said prongs extend a sufficient distance for engagement into an electrical outlet.

5,567,182

**ULTRA MULTIPLE CONNECTOR**

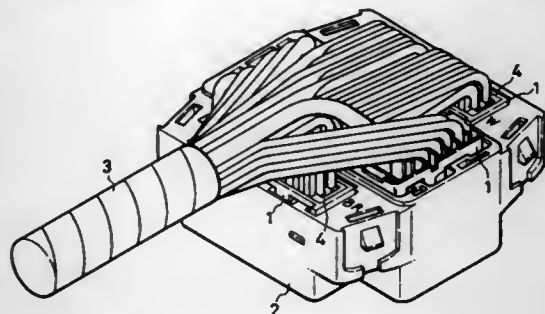
Takashi Ishii; Tamio Watanabe, and Toru Nagano, all of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Oct. 4, 1994, Ser. No. 317,394

Claims priority, application Japan, Oct. 5, 1993, 5-054014 U  
Int. Cl.<sup>6</sup> H01R 13/502

U.S. Cl. 439—701

4 Claims



1. An ultra multiple connector comprising:

a frame to be connected to a mating connector and having a plurality of hollows opened upwardly and downwardly; at least one connector housing disposed in said each hollow, a rear holder removably mounted on an end surface of said connector housing;

said hollow of said frame having a depth shorter than a length of said connector housing, so that a portion of said connector housing in its mounted state forming an exposing portion exposed from the hollow,

wherein an amount of projection by which said connector housing in its mounted state is caused to expose from an end surface of said frame is detected to check the state of mounting of said connector housing with respect to said frame.

5,567,183

**TERMINAL RETAINING CONNECTOR**

Takahiro Sano, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

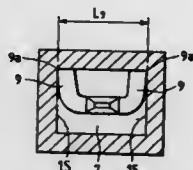
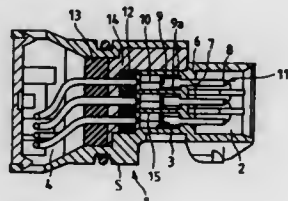
Continuation of Ser. No. 171,624, Dec. 22, 1993, abandoned.

This application Jun. 2, 1995, Ser. No. 459,626

Claims priority, application Japan, Dec. 24, 1992, 4-344034  
Int. Cl.<sup>6</sup> H01R 13/42

U.S. Cl. 439—751

3 Claims



1. A terminal retaining connector, comprising:
  - a connector housing having a terminal accommodating chamber defined by opposing side walls separated from one another by a first distance; and
  - a male terminal receivable in said terminal accommodating chamber, said male terminal including a base plate and a pair of bent, elastic, deflecting arms extending upwardly from opposite sides of said base plate in a U-shaped manner, outermost surfaces of said arms being separated by a second distance which is greater than said first distance,
 wherein when said male terminal is inserted into said accommodating chamber said arms are deflected inwardly toward each other so that after insertion said outermost surfaces of said arms respectively abut against said side walls of said housing in a spring-like manner and in a face-to-face relationship to positively position and retain said terminal within said accommodating chamber.

5,567,184

**CONNECTOR WITH INTEGRAL RETAINER, CONNECTOR CONVEYING AND POSITIONING DEVICE, AND METHOD FOR CONVEYING AND POSITIONING A CONNECTOR**

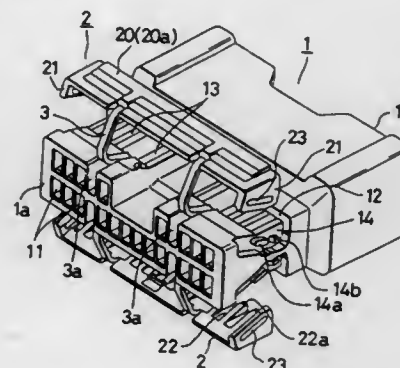
Osamu Sasai; Masaji Suzuki, and Atsushi Sakatani, all of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie, Japan

Filed Nov. 22, 1994, Ser. No. 347,150

Claims priority, application Japan, Dec. 9, 1993, 5-341385  
Int. Cl.<sup>6</sup> H01R 13/436

U.S. Cl. 439—752

11 Claims



1. A connector comprising an integral retainer that is molded on a connector housing through flexible hinge pieces, wherein:
  - said connector housing comprises tubular shaped terminal receiving chambers for receiving metal terminals that are each connected to an end of a wire, retainer insertion holes open to one side of said terminal receiving chambers, and recesses formed by substantially parallel walls within the connector housing for receiving said hinge pieces;
  - said retainer includes a retainer body having terminal lock portions each insertable into respective ones of said retainer insertion holes to retain and engage a side of each said inserted metal terminal, and retaining pieces formed respectively at opposite ends of said retainer body in such a manner that said retainer has a gate-shape, said retaining pieces being attached respectively to opposite sides of said connector housing; and

said retainer is attachable in a provisionally-retained position where said hinge pieces are protectively disposed within said recesses in said connector housing, said retaining pieces are attached to said connector housing, and terminal lock portions formed on said connector housing being disengaged from said metal terminals, said retainer also being attachable in a completely-retained position where said terminal lock portions engage with respective said metal terminals, said retainer being slidably movable along an outer surface of said connector housing into said completely-retained position.

5,567,185

**ELECTRICAL CONNECTOR AND METHOD OF MAKING SAME**

Kevin G. Henderson, Gastonia, N.C.; Timothy A. Jones, Spartanburg; Jeffrey C. Howland, Inman, both of S.C.; Robert W. Brush, Jr., Rocky Mount, N.C., and Phil B. Parker, Gowensville, S.C., assignors to Thomas & Betts Corporation, Memphis, Tenn.

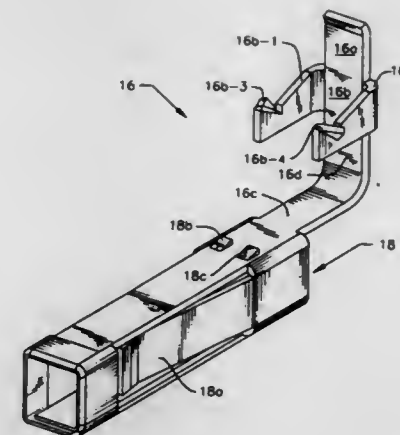
Filed Oct. 19, 1994, Ser. No. 326,177

Int. Cl.<sup>6</sup> H01R 13/40

U.S. Cl. 439—733.1

13 Claims

1. An electrical connector comprising a molded housing of electrically insulative material which is subject to warpage during molding, and contact members resident in said housing, said contact members defining contact portions and means for retaining said contact members in said housing, said means for retaining said



contact members in said housing, said housing and contact member retaining means being cooperatively configured to permit variable positioning of said contact member within said housing, whereby said contact member contact portions are coplanarly positionable in said housing irrespective of warp present in the housing.

5,567,186

**ELECTRICAL CABLE CONNECTOR**

Milton E. Diniz, Braganca Paulista, and Alexandre M. Soriano, Pedra Bela, both of Brazil, assignors to The Whitaker Corporation, Wilmington, Del.

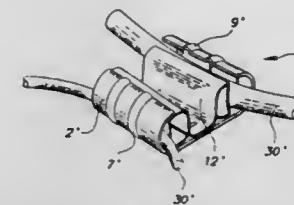
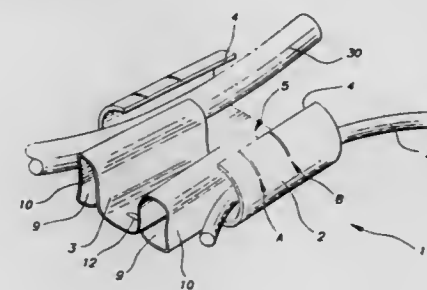
Filed Nov. 1, 1994, Ser. No. 332,683

Claims priority, application Brazil, Nov. 16, 1993, 7302209-80 U; Nov. 22, 1993, 7302224-10 U

Int. Cl.<sup>6</sup> H01R 4/50

U.S. Cl. 439—783

7 Claims



1. An electrical connector having a generally C-shaped member for electrically connecting wires with a wedge member, the electrical connector comprises:
  - radially arranged recesses and holding teeth formed on said C-shaped member, said teeth provide increased friction for retaining the wires, and said recesses comprise means for stiffening said C-shaped member and thereby increasing the frictional retention of said wires by said teeth.

5,567,187

**REVERSE INSULATION GRIP BLADE**

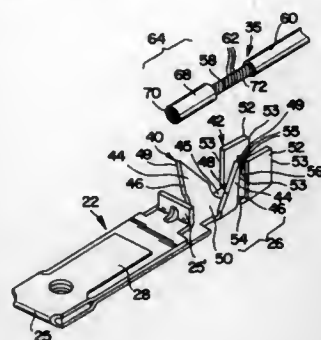
Ray M. Bellinger, Franklin, N.C., assignor to Belden Wire &amp; Cable Company, Richmond, Ind.

Filed Jun. 16, 1994, Ser. No. 260,766

Int. Cl.<sup>6</sup> H01R 4/10

U.S. Cl. 439—877

9 Claims



## 1. An electrical connector comprising:

- a contact pin having a terminal at one end of the contact pin and a crimp at the other end of the contact pin, the crimp being electrically connected to the terminal, the crimp having a base with opposing sides and two pairs of opposing crimp arms attached to the opposing sides to form a channel in the crimp;
- a wire having opposing ends, one end being connected to the contact pin by the crimp and the other end extending out from the contact pin, the wire having a conductive core, the conductive core having a cross-section, an exposed region, and conductive strands extending through the conductive core, the conductive strands terminating in a strand end region; and
- a segment of wire insulation surrounding the conductive core at the strand end region, the segment having opposite edges, the first edge substantially at the tip of the wire and the second edge spaced longitudinally along the conductive core from the first edge, the insulation segment having a bore with a cross-section substantially equal to the cross-section of the conductive core to retain the conductive strands from straying outside the conductor core at the strand end region; the exposed region being located adjacent to the second edge and extending longitudinally therefrom, said first pair of crimp arms being crimped over the insulation segment at the strand end region; said second pair of crimp arms being crimped over the exposed region to form a conductive path between the conductive core and the contact pin.

5,567,188

**JET POWERED WATER VEHICLE**

Christian Allebosch, Ruelle de l'Onot, 4, B-5170 Profondeville, Belgium

Filed Jun. 27, 1995, Ser. No. 495,078

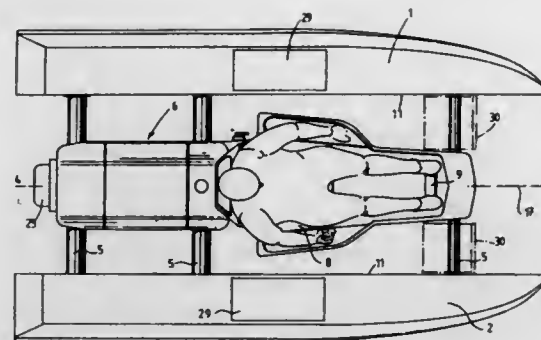
Int. Cl.<sup>6</sup> B63H 11/00

U.S. Cl. 440—38

9 Claims

1. A hydro-jet powered water vehicle comprising two hulls provided with planing means so that, when a minimum forward speed is reached, the hulls substantially plane on the water surface, said vehicle being adapted for carrying at least one passenger with a load lower to a maximum authorized load, said vehicle when unloaded having an unloaded floating line and comprising:

- two hulls having each a vertical face extending between a front end, a back end and a lower end line, said hulls being angled so that the vertical faces are parallel together and so as to define between the vertical parallel faces an open channel having a front open end, a back open end and a vertical symmetrical plane, the lower end lines of the hulls defining there between a surface which is substantially horizontal when the minimum planing forward speed is reached and



being inclined with respect to the horizontal when the vehicle is unloaded, the inclination of said lower end lines with respect to the horizontal being such that the part of said lower end lines adjacent to the front end is less immersed than the part of the said lower end lines adjacent to the back end, said hulls having each an underneath face comprising planar parts which substantially define all together a plane forming an angle of 70°–85° with the vertical symmetrical plane of the open channel, said planar parts acting as planing means;

- a jet motor with a motor, a turbine driven by said motor and a water nozzle, said motor being attached to the hulls, in the vicinity of their back end and so as to be located between the two vertical parallel faces of the hulls, said turbine sucking water through an opening extending below the surface defined between the lower end lines of the hulls and expelling water in the nozzle, said nozzle being located between the said two vertical parallel faces of the hulls defining the open channel, the water nozzle being at least substantially under the water level for a forward speed of the vehicle lower to the minimum forward speed required for the planing of the vehicle, while, for a forward speed of the vehicle higher than the minimum forward speed required for than planing of the vehicle, the water nozzle is above the water level;
- at least one seat for a passenger, said seat being attached to the hulls and so as to be located between the two vertical parallel faces of the hulls, said seat being provided with means on which rest the feet of the passenger;
- means for controlling the motion of the vehicle, and
- a shaped plate comprising two parts which are located between the opening of the turbine and the front open end of the channel, a first part being inclined with respect to the surface defined between the lower end lines of the hulls and having a lower end line perpendicular to the symmetrical plane of the channel and situated just below the surface defined between the lower end lines of the hulls, while the second part located between the opening of the turbine and the lower end line of the first part is parallel to the surface defined between the lower end lines of the hulls;

said water vehicle, when unloaded having such a floating center that the seat is located between, on the one hand, the vertical plane perpendicular to the symmetrical plane and passing through the floating center and, on the other hand, the front open end of the channel,

while the channel is—such that for the unloaded water vehicle, at most 50% of the vertical open surface of the channel extending in a vertical plane perpendicular to the symmetrical plane, and passing through the floating center is located under the unloaded floating line, and—such that, for the vehicle carrying the maximum authorized load, the channel has a passage above the floating line from the front open end of the channel up to the back open end of the channel, for each open vertical surface of the channel perpendicular to the symmetrical plane thereof, the minimum vertical surface of the said passage being at least 10% of the considered open vertical surface of the channel.

5,567,189

**SAILBOAT RUDDER-MOTOR PROP GUARD**

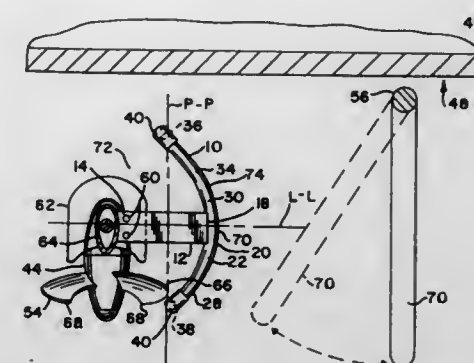
Douglas P. Sehl, 6633 Harbor Dr., Hudson, Fla. 34667

Filed Sep. 11, 1995, Ser. No. 526,443

Int. Cl.<sup>6</sup> B63H 5/16

U.S. Cl. 440—71

9 Claims



## 1. A guard particularly adapted for use with sailboat side-mounted outboard motors, said guard comprising:

- a mounting plate having an inner end prepared for ready attachment to said motor, and
- a convex-like shaped tube attached to an outer end of said mounting plate to form a protective barrier a selective distance about a side of said motor, said protector tube defined in part by spaced apart forward and rear curved sections connected by a middle curved section with said mounting plate attached to said middle section, wherein for use said guard is attached to said motor to extend toward a rudder of said boat, and then during travel of said boat by operation of said motor said guard tube may intercept movement of a blade of said rudder toward a propeller of said motor to prevent contact between said rudder blade and said motor propeller with said middle and rear curved sections forming a primary area for engagement by said rudder blade when said motor is vertically positioned.

5,567,190

**VARIABLE ANGLE OF ATTACK FINBOX ASSEMBLY FOR SURFBOARDS AND THE LIKE**

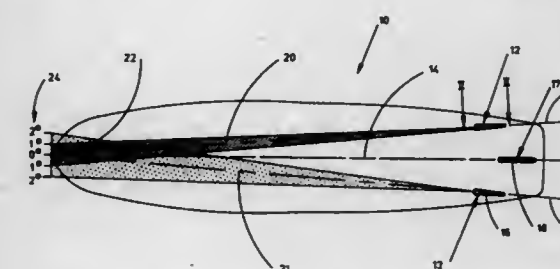
Kenneth W. Oates, 3915 Mission Blvd., San Diego, Calif. 92109

Filed May 22, 1995, Ser. No. 446,419

Int. Cl.<sup>6</sup> A63C 15/00

U.S. Cl. 441—79

20 Claims



- A variable angle fin and fin mounting box assembly for surfboards and other like boards comprising: a longitudinal fin box capable of being embedded fixedly in the underside of said surf board; said fin box having a vertical, longitudinally-extending closed-end channel to receive and house a base end of a fin; means in said box for angularly adjusting said fin within the fin box about a vertical centerline with respect to the longitudinal axis of the board to change the angle of attack of the fin to the water flow, and

means for securing said fin in the fin box in a selected fixed angular position.

5,567,191

**IMPROVEMENTS RELATING TO LIFE JACKETS**

Peter C. Gordon, 10 Hollytree Road, Woolton, Liverpool L25 5PA, United Kingdom

PCT No. PCT/GB93/00066, § 371 Date Jan. 20, 1995, § 102(e)

Date Jan. 20, 1995, PCT Pub. No. WO93/13978, PCT Pub.

Date Jul. 22, 1993

PCT Filed Jan. 14, 1993, Ser. No. 256,563

Claims priority, application United Kingdom, Jan. 15, 1992, 9200851

Int. Cl.<sup>6</sup> B63C 9/08

U.S. Cl. 441—117

8 Claims



- An inflatable life jacket (10) comprising two buoyancy sections (34, 36) respectively for location at opposite sides of the chest but which are asymmetric one relative to the other, characterized in that the sections (34, 36) communicate with one another in a selectable combination of overlap and interfit in the central region of the chest thereby to prevent the creation of a channel for the flow of water towards the user's mouth when in in-use condition.

5,567,192

**METHOD AND APPARATUS FOR PROCESSING ELECTRON GAS DISCHARGE TUBING**

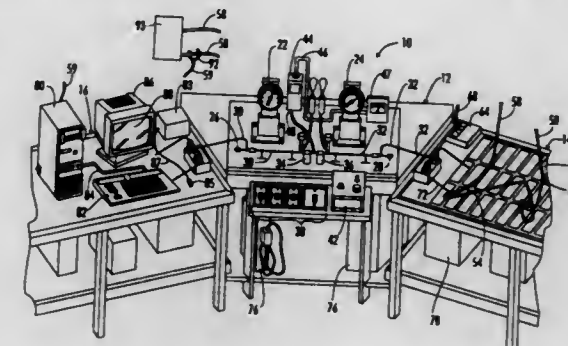
Timothy Cummings, Nashville, and Mark Walker, Shelbyville, both of Tenn., assignors to Cummings Incorporated, Nashville, Tenn.

Filed May 31, 1994, Ser. No. 177,059

Int. Cl.<sup>6</sup> H01J 9/42; 9/44

U.S. Cl. 445—3

20 Claims



- A method of manufacturing illuminatable tubing in accordance with a prescribed set of manufacturing parameters, comprising the steps of:
  - providing a length of glass tubing having spaced apart ends;
  - sealing off the ends of the glass tubing by attaching an electrode to each of the spaced apart ends;
  - tubulating the glass tubing;
  - attaching the tubulated glass tubing to a manifold and evacuating the glass tubing;
  - attaching a current source to the electrodes;



- (f) heating the glass tubing by introducing an electric arc between the electrodes inside the glass tubing to enable the electrodes to burn off impurities;
- (g) monitoring and recording information corresponding to the current to the electrodes as a function of time and comparing the information to the prescribed set of manufacturing parameters;
- (h) monitoring and recording information relating to the temperature of the glass tubing as a function of time and comparing the information to the prescribed set of manufacturing parameters;
- (i) evacuating the glass tubing;
- (j) monitoring and recording information relating to the vacuum within the glass tubing as a function of time and comparing the information to the prescribed set of manufacturing parameters;
- (k) filling the glass tubing with an inert gas; and
- (l) sealing the glass tubing.

5,567,193

# ARRANGEMENT FOR VACUUM-TIGHT SEALING OF ELECTRON TUBES

Armin Blecker, Asslar, Germany, assignor to Balzers-Pfeiffer GmbH, Asslar, Germany

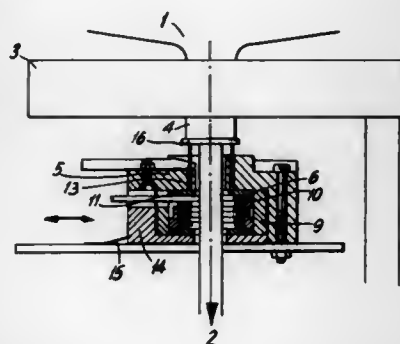
Filed Jun. 5, 1995, Ser. No. 464,484

Claims priority, application Germany, Jul. 18, 1994, 44 25 160.2

Int. Cl.<sup>6</sup> H01J 9/385; 9/40

U.S. Cl. 445—70

2 Claims



1. An arrangement for vacuum-tight sealing of an electron tube, which comprises:
- a vacuum pump system;
  - a tubular-shaped connecting element connectable between the electron tube and said vacuum pumping system;
  - a thermal seal-off unit, wherein said thermal seal-off unit is equipped with a heating coil;
  - a housing, wherein said housing further comprises a component which can be removed sideways; and
  - an arresting element;
- wherein the electron tube is permanently sealed in a vacuum-tight manner by said thermal seal-off unit after the electron tube has been evacuated, wherein said heating coil is radially and axially embraced by said housing, wherein said heating coil can also be removed together with said component of said housing without having to disconnect bolt connections, and wherein said arresting element exists for one of holding and retaining said component of said housing.

5,567,194

# MULTI-FACETED NESTING MODULES

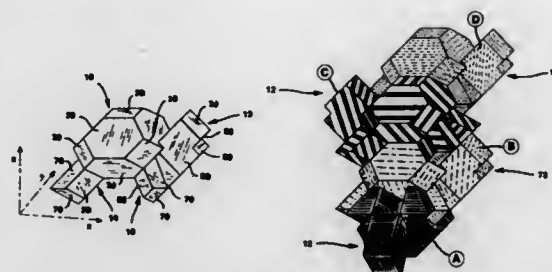
Jonathan W. Stapleton, 25 Glacier Ct., Bozeman, Mont. 59715

Filed Apr. 19, 1995, Ser. No. 426,931

Int. Cl.<sup>6</sup> A63H 33/06

U.S. Cl. 446—124

5 Claims



1. A multi-faceted module for constructing nested structures of identical modules each module comprising:
- a body shaped to have at least three planar faces each coplanar with a face of a three-dimensional geometrical lattice; and
  - appendages attached to the body wherein each appendage has at least one planar face coplanar with a face of the lattice and has at least one other planar face parallel to but not coplanar with a face of the lattice.

5,567,195

# METHOD AND APPARATUS FOR GRINDING BARS

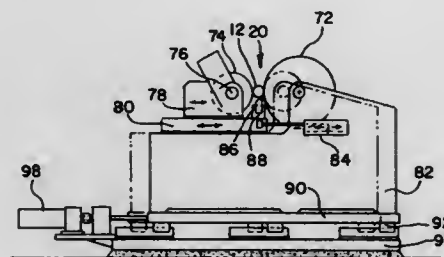
Arthur W. Tufts, Crete; Mark Jellema, Lynwood, and Blair Haddle, Landin, all of Ill., assignors to Tufts Grinding, Inc., South Chicago Heights, Ill.

Filed Jan. 10, 1995, Ser. No. 370,620

Int. Cl.<sup>6</sup> B24B 49/04

U.S. Cl. 451—11

6 Claims



1. An adjustable grinding system for grinding a bar to a predetermined diameter including a main support, a platform movably mounted relative to said main support, a grinding wheel rotatably mounted on said platform, a regulating wheel, means movably mounting said regulating wheel relative to said main support, means for biasing said regulating wheel against the bar into contact with the grinding wheel, means for sensing the diameter of the bar being ground and means responsive to said sensing means and movement of the regulating wheel to move the grinding wheel to insure proper grinding of the bar.

5,567,196

# RAIL GRINDING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

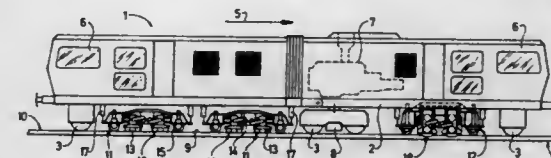
Filed Sep. 30, 1994, Ser. No. 316,569

Claims priority, application Austria, Oct. 18, 1993, 2083/93

Int. Cl.<sup>6</sup> B24B 23/00; 27/08

U.S. Cl. 451—347

10 Claims



a plurality of sleeves concentrically disposed about a forward portion of said hub and said shaft and slidable longitudinally between said rearward body and said lens;  
means for independently biasing each of said sleeves forwardly into abutment with said lens, each of said sleeves being slit along the length thereof whereby said sleeves are resiliently compressible to different diameters;  
means disposed about an outermost of said sleeves for sequentially compressing each of said sleeves against a next inwardly concentric sleeve until an innermost of said sleeves firmly clamps said hub and said block therein whereby said sleeves are locked in abutment with said lens; and  
a pin engaged with said compressing means and extending diametrically snugly through said spindle shaft and slidably through longitudinal slots in said sleeves and received in said block seats to align said block in relation to said spindle shaft and to assure simultaneous rotation of said compressing means, said sleeves and said block with said shaft.

5,567,199

# WORKPIECE HOLDER FOR ROTARY GRINDING MACHINES FOR GRINDING SEMICONDUCTOR WAFERS, AND METHOD OF POSITIONING THE WORKPIECE HOLDER

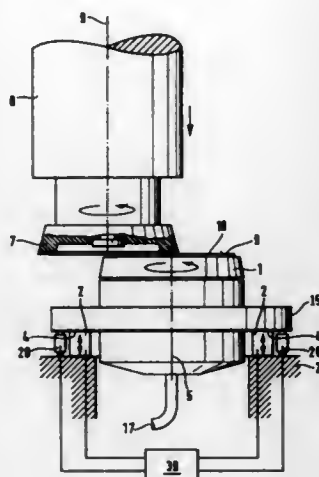
Anton Huber, Burghausen, and Robert Weiss, Winhöring, both of Germany, assignors to Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe AG, Burghausen, Germany  
Filed Sep. 21, 1994, Ser. No. 310,048

Claims priority, application Germany, Oct. 21, 1993, 43 3980.9

Int. Cl.<sup>6</sup> B24B 5/00

U.S. Cl. 451—398

9 Claims



4. A method of positioning a workpiece holder for a rotary grinding machine for grinding semiconductor wafers, having a rotatable work surface which points toward a rotating grinding tool and on which the semiconductor wafer to be machined is laid, and having piezoelectric elements on which the workpiece holder is axially supported at its periphery, each piezoelectric element being equipped with a measuring probe recording its linear dimension, wherein the piezoelectric elements can be operated independently of one another by a central control unit and, when operated, undergo a change in their linear dimension, an operated piezoelectric element axially raising or lowering the workpiece holder at the point at which it supports the workpiece holder;

said method comprising

operating said piezoelectric elements in such a manner that an axis of rotation of the workpiece holder and an axis of rotation of the grinding tool are oriented parallel or assume a defined position relative to one another.

5,567,200

# METHOD AND APPARATUS FOR CIRCULATING AIR

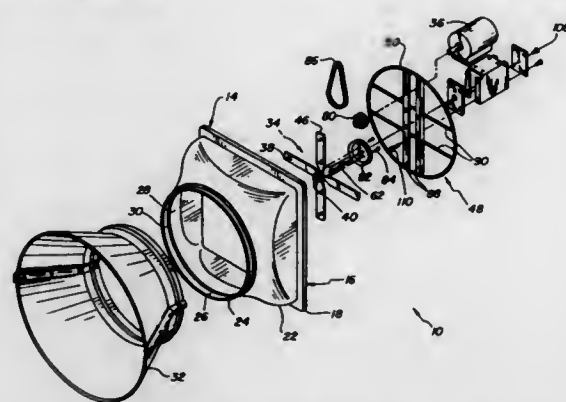
Ray E. Swartzendruber, Syracuse, Ind., assignor to CTB Inc., Milford, Mich.

Filed Dec. 1, 1993, Ser. No. 160,397

Int. Cl.<sup>6</sup> F24F 7/06

U.S. Cl. 454—338

49 Claims



1. An apparatus for circulating air using a fan having a plurality of blades, each of said blades including an end portion, said apparatus comprising:

a motor for rotating said blades;

a housing for said fan having a generally annular wall disposed proximate to said end portions of said blades in a space relationship thereto, said annular wall defining an opening for circulating air through said housing; and

means for mounting said motor to said housing, said means for mounting said motor extending generally between said annular wall and said fan and being operable to provide support to said annular wall at substantially all locations on said annular wall so as to substantially maintain said spaced relationship between said annular wall and said blades.

5,567,201

# FIVE-SPEED TRANSMISSION ASSEMBLY EMPLOYING COMPOUNDED PLANETARY GEAR SETS

Craig S. Ross, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 24, 1994, Ser. No. 327,944

Int. Cl.<sup>6</sup> F16H 3/44

U.S. Cl. 475—280

11 Claims

1. A five-speed vehicular transmission assembly comprising:

input shaft means;

output shaft means;

first and second planetary gear sets;

said first and second planetary gear sets each having first, second and third gear means;

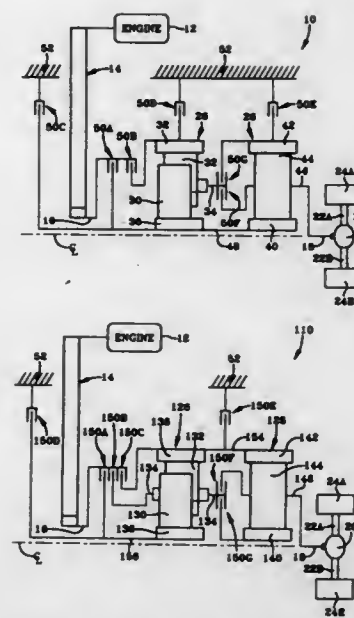
said first and second gear means in each planetary gear set being a sun gear and a ring gear such that the transmission assembly has a pair of sun gears and a pair of ring gears, one said sun gear and one said ring gear being included in each planetary gear set;

said sun and ring gears in each said first and second planetary gear sets being operatively connected in each respective planetary gear set through said third gear means;

said third gear means in said first planetary gear set being a plurality of planet gear members mounted on a first carrier; said third gear means in said second planetary gear set being a plurality of planet gear members mounted on a second carrier; one of said pairs of sun and ring gears being continuously connected;

another of said pairs of sun and ring gears being relatively rotatable with respect to each other;

said carrier in said first planetary gear set being selectively, and independently, connected to said carrier in said second planetary gear set as well as to that paired gears member in said



second planetary gear set that is relatively rotatable with respect to the corresponding member of that same pair in said first planetary gear set;

said carrier in said second planetary gear set being continuously connected to said output shaft means;

a torque transfer device selectively connecting that pair of sun and ring gears which are continuously connected to each other to said input shaft means;

a second torque transfer device selectively grounding that pair of sun and ring gears which are continuously connected; and, a third torque transfer device selectively connecting that gear means in said first planetary gear set that is relatively rotatable with the corresponding gear means in said second planetary gear set to said input shaft means.

5,567,202

# FITNESS DEVICE

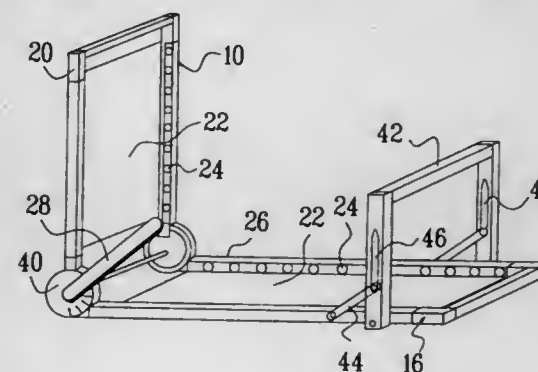
Kathleen Hager, 25 Putnam Rd., Courtland Manor, N.Y. 10566

Filed Jan. 9, 1995, Ser. No. 370,130

Int. Cl.<sup>6</sup> A63B 21/00

U.S. Cl. 482—131

21 Claims



1. A fitness device for use by a user having a back, legs, a torso, a waist and a chest, comprising:

a) a first contacting member for contacting at least a portion of the user's back, said first contacting member defining a first plane;

b) a second contacting member for contacting at least a portion of the legs of the user, said second contacting member defining a second plane relative to said first plane;

c) a pivotable connecting member for connecting said first contacting member with said second contacting member so that said first contacting member is pivotable relative to said second contacting member, said pivotable connecting member defining an axis; and

d) a lever pivotable about said axis and fixed to said first contacting member, said lever being positionable outside of said first and second planes, and operable by the user for engaging and urging said first contacting member against the back of the user, driving the back of the user in an angular direction towards his legs.

5,567,203

# BALLOON DILATATION CATHETER WITH PROXIMAL HYPOTUBE

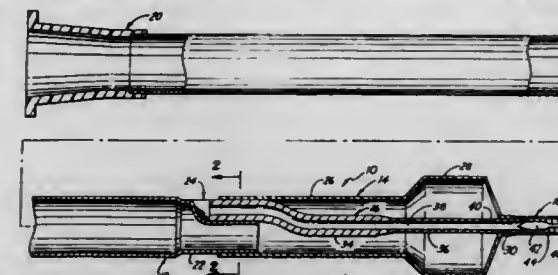
Charles L. Euteneuer, St. Michael; Richard C. Mattison, Corcoran; Daniel O. Adams, Blaine; Thomas R. Hektner, Minnetonka, and Peter T. Keith, Edina, all of Minn., assignors to SCIMED Life Systems, Inc., Maple Grove, Minn.

Continuation of Ser. No. 782,242, Oct. 23, 1991, which is a continuation of Ser. No. 433,711, Nov. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 162,004, Feb. 29, 1988, Pat. No. 4,943,278. This application Jun. 7, 1995, Ser. No. 473,477

Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 604—96

30 Claims



1. An intravascular balloon catheter, comprising:

a) a balloon having a proximal waist segment, an inflatable segment and a distal waist segment;

b) a metallic tube having a proximal end, a distal end and an inflation lumen extending therethrough, the distal end of the metallic tube connected to the proximal waist segment of the balloon, the distal end of the metallic tube having a crimped portion; and

c) a hollow core member having a proximal end, a distal end and a lumen therein, the proximal end of the hollow core member connected to the distal end of the metallic tube such that the lumen of the hollow core member is in communication with the exterior of the balloon catheter, the distal end of the hollow core member connected to the distal balloon waist.

5,567,204

Patent Not Issued For This Number



# CHEMICAL

5,567,205

## WET TREATMENT OF LEATHER HIDES

Michael W. Counts, Ambler, Pa.; John A. Thompson, Milwaukee, Wis.; Jack O. Lavole, Epping, N.H., and Robert A. Aleksejczyk, Newtown, Pa., assignors to Henkel Corp., Plymouth Meeting, Pa.

Division of Ser. No. 150,508, Nov. 10, 1993, Pat. No. 5,503,754. This application Jun. 6, 1995, Ser. No. 470,730  
Int. Cl.<sup>6</sup> C14C 1/06; 1/08; 3/00; 11/00

U.S. Cl. 8—94.18

6 Claims

1. A process for unhairing and cleaning leather hides comprising contacting said hides with a formulation which is free of volatile organic compounds and which comprises:

- a leather hide unhairing and cleaning composition containing an alkaline mixture,
- water, and
- an alkylpolyglycoside having formula 1:



wherein R<sup>1</sup> is a monovalent organic radical having from about 6 to about 30 carbon atoms, Z is a saccharide residue having 5 or 6 carbon atoms, and a is a number having a value from 1 to about 6.

5,567,206

## STAIN AND METHOD FOR STAINING WOOD

Axel Jankewitz, Fürth, and Gerhard Lugert, Nürnberg, both of Germany, assignors to A.W. Faber-Castell Unternehmensverwaltung GmbH & Co., Stein, Germany

Filed Jul. 31, 1995, Ser. No. 509,300

Claims priority, application Germany, Aug. 2, 1994, 44 27 299.5

Int. Cl.<sup>6</sup> D06P 1/02; 1/39; 3/00; 5/00

U.S. Cl. 8—402

12 Claims

1. A method for staining wood, comprising

- placing the wood and a wood stain into an autoclave composed of non-rust-resistant steel;
- submerging the wood in the wood stain, wherein the wood stain is water-based, which is suitable for staining wood, and is comprised of:  
water;  
at least one dye selected from the group consisting of azo, diazo and triarylmethane dyes; and  
a stabilizing agent which is effective to reduce free iron ion concentration in the stain;
- staining the wood under pressure and temperature conditions effective therefor.

5,567,207

## METHOD FOR MARKING AND FADING TEXTILES WITH LASERS

William J. Lockman, Longwood, and Frank J. Clayson, Apopka, both of Fla., assignors to Icon, Inc., Apopka, Fla.

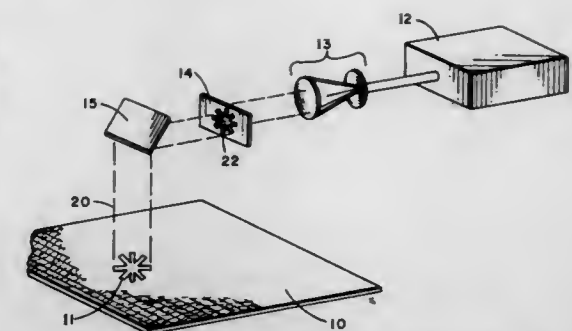
Filed Jul. 31, 1994, Ser. No. 274,473

Int. Cl.<sup>6</sup> D06P 5/20

U.S. Cl. 8—444

33 Claims

1. A method for color fading, dyed textile materials with a laser, comprising the steps of:  
placing under a laser beam a dyed textile material; and



scanning the laser beam generated by the laser with a selected set of parameters to fade the dye of the textile material to replicate a uniformly faded textile or a stone washed, acid washed or acid ball washed textile.

5,567,208

## VENETIAN BLIND ASSEMBLY MACHINE LADDER GUIDE MECHANISM

Jeanette M. Larsson, Svanesund, and Lars S. Gudmundson, Ödsmål, both of Sweden, assignors to Hunter Douglas International N.V., Netherlands

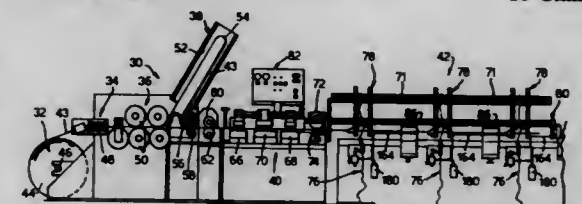
Filed Mar. 16, 1995, Ser. No. 405,545

Claims priority, application European Pat. Off., Mar. 21, 1994, 94200704.8

Int. Cl.<sup>6</sup> B23P 19/04

U.S. Cl. 29—24.5

10 Claims



1. A ladder lacing unit for a venetian blind assembly machine, comprising a movable carrier, a first ladder support guiding means and a second ladder support guiding means mounted to said movable carrier, for selective activation, ladder support advancing means associated with each of said first and second ladder support guiding means and means for moving and indexing said movable carrier into a first position, in which said first ladder support guiding means is accurately located to receive venetian blind slat material, and in a second position in which said second ladder support guide means is accurately so-positioned.

5,567,209

## METHOD OF MANUFACTURING SOLID ELECTROLYTIC CAPACITOR

Atsushi Kobayashi, and Satoshi Arai, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 335,388, Nov. 3, 1994, abandoned.

This application Jun. 7, 1995, Ser. No. 487,633

Claims priority, application Japan, Nov. 4, 1993, 5-275337

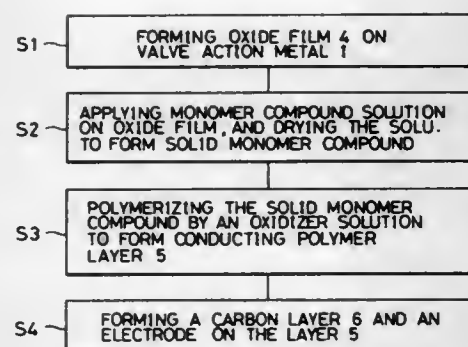
Int. Cl.<sup>6</sup> H01G 9/02

U.S. Cl. 29—25.03

1 Claim

1. A method for manufacturing a solid electrolytic capacitor having an oxide film of valve action metal as a dielectric substance and polyaniline as a solid electrolyte, said method comprising the steps of:

- anodizing a pellet composed of sintered tantalum powder to form said oxide film of said valve action metal on a surface thereof;
- drying said anodized pellet;
- immersing said pellet in an aniline p-toluenesulfonate solution to precipitate a solid aniline p-toluenesulfonate on said surface of and inside of said pellet; then



- (d) drying said pellet at room temperature;
- (e) immersing said pellet precipitated with said solid aniline p-toluenesulfonate in an oxidant solution, and drying said pellet to polymerize aniline on said surface of and inside of said pellet to form a polyaniline layer on said surface of and inside of said pellet;
- (f) immersing said pellet having said polyaniline layer in an acid solution and then drying said pellet at room temperature; and
- (g) repeating steps (c) to (f) a number of times.

5,567,210

## METHOD FOR MAKING AN ELECTROCHEMICAL CELL

John B. Bates, Oak Ridge, and Nancy J. Dudney, Knoxville, both of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

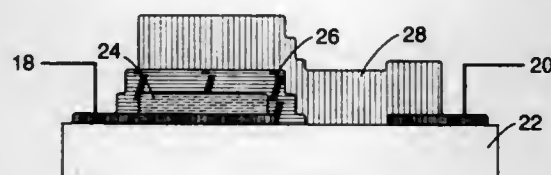
Division of Ser. No. 921,538, Jul. 29, 1992, Pat. No. 5,338,625.

This application Jul. 12, 1994, Ser. No. 248,891

Int. Cl.<sup>6</sup> H01M 10/04; 10/08

U.S. Cl. 29—623.5

5 Claims



1. A method for making a thin-film electrochemical cell comprising the steps of:

- a) depositing a first and a second horizontally displaced film of electrically conductive material on a substrate surface such that a portion of said substrate surface separates said first and second films, said first film being larger than said second film;
- b) depositing a third film of electrically conductive material on said first film;
- c) depositing a fourth film of an electrolyte having nitrogen contained therein on said third film to overlap said third film, the overlap of said fourth film extending onto said first film and partially onto said portion of said substrate separating said first and second films; and
- d) depositing a fifth film of electrically conductive material over the remainder of said substrate separating said first and second films and over a portion of all of said second film and substantially all of said third film.

5,567,211

## MOTOR FUEL DETERGENT ADDITIVES

Joseph M. Russo; Christopher S. Llu, both of Poughkeepsie, N.Y.; Thomas F. DeRosa, Passaic, N.J.; Benjamin J. Kaufman, Hopewell Junction, N.Y.; Scott O. Lindholm, Novi, Mich., and James R. Ketcham, Salt Point, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 3, 1995, Ser. No. 507,899

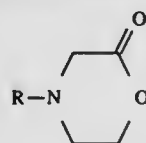
Int. Cl.<sup>6</sup> C01L 1/22

U.S. Cl. 44—412

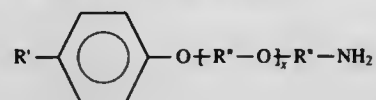
18 Claims

10. A motor fuel composition comprising a major portion of a hydrocarbon fuel boiling in the gasoline range between 90° F. and about 370° F., and a minor portion, sufficient to reduce the formation of intake valve and combustion chamber deposits, upon combustion of the motor fuel composition in an internal combustion engine, of an additive composition comprising a mixture of

- a) an amido alkanolamine, comprising the condensation product of 4-alkyl-2-morpholinone represented by the formula:



in which R represents a monovalent aliphatic radical having from 1 to 10 carbon atoms, and an alkylphenoxypolyoxyalkylene amine represented by the formula:



in which R' is a saturated hydrocarbyl radical having from about 4 to 30 carbon atoms, x represents a number from about 4 to 50, and R'' represents a saturated C<sub>2</sub>-C<sub>4</sub> hydrocarbyl radical or any combination of C<sub>2</sub>-C<sub>4</sub> hydrocarbyl radicals, such that the polyoxyalkylene radical can comprise any combination of repeating C<sub>2</sub>-C<sub>4</sub> oxyalkylene units to form block or random copolymers; and

- b) a polyisobutylene amine having a molecular weight less than about 5000 and a low polydispersity; and wherein the amido alkanolamine and the polyisobutylene amine are present in a weight ratio of between about 2:1 to about 10:1.

5,567,212

## USE OF OLEFINIC IMINES TO SCAVENGE SULFUR SPECIES

David R. Gentry; Gerald T. Pancio, both of St. Louis, and Jerry J. Weers, Ballwin, all of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

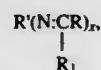
Filed Apr. 27, 1995, Ser. No. 430,208

Int. Cl.<sup>6</sup> C10L 1/22

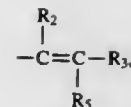
U.S. Cl. 44—420

39 Claims

1. A method for scavenging sulfur species from a petroleum-derived fluid medium, the method comprising contacting the medium with a sulfur species scavenging amount of an imine of the formula



wherein x is an integer from 1 to 10, R' is an organic moiety having a number of valences equal to x, R corresponds to the formula



and R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are independently selected from the group consisting of hydrogen and monovalent organic moieties, provided that R and R<sub>1</sub> contain a combined total of from about four to about forty carbon atoms.

5,567,213

## USE OF OLEFINIC IMINES TO SCAVENGE SULFUR SPECIES

David R. Gentry; Gerald T. Pancio, both of St. Louis, and Jerry J. Weers, Ballwin, all of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

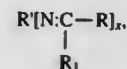
Continuation of Ser. No. 430,208, Apr. 27, 1995. This application Apr. 25, 1996, Ser. No. 636,813

Int. Cl.<sup>6</sup> C10L 1/22

U.S. Cl. 44—420

25 Claims

1. A method for scavenging elemental sulfur from a petroleum-derived fluid medium, the method comprising contacting the medium with an elemental sulfur scavenging amount of an imine of the formula



wherein x is an integer from 1 to 10, R' is an organic moiety having a number of valences equal to x, R<sub>1</sub> is selected from the group consisting of hydrogen and mono-valent organic moieties and R is a mono-valent olefin moiety, provided that R and R<sub>1</sub> contain a total of from about four to about forty carbon atoms, the imine thereby scavenging elemental sulfur in the medium.

5,567,214

## PROCESS FOR PRODUCTION OF ALUMINA/ZIRCONIA MATERIALS

Peter J. Ashley, Madison, Ala., assignor to Saint-Gobain/Norton Industrial Ceramics Corporation, Worcester, Mass.

Filed May 3, 1995, Ser. No. 434,087

Int. Cl.<sup>6</sup> C09C 1/68

U.S. Cl. 51—309

6 Claims

1. A process for the production of an alumina/zirconia material which comprises forming a melt comprising AZS scrap and adding to the melt an amount of a reducing agent selected from the group consisting of carbon, aluminum, magnesium zirconium and mixtures thereof sufficient to reduce the silica content to a level below about 1.0% by weight.

5,567,215

## ENHANCED HEAT EXCHANGER FLUE GAS TREATMENT USING STEAM INJECTION

Gregory T. Bielawski, Wadsworth; Dennis W. Johnson, Barberton, and Robert B. Myers, Norton, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

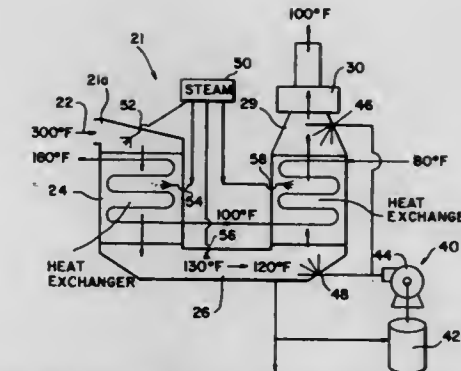
Filed Sep. 12, 1994, Ser. No. 304,741

Int. Cl.<sup>6</sup> B01D 5/00

U.S. Cl. 55—222

7 Claims

1. A system for treating a flue gas comprising: a housing having an inlet and an outlet, the flue gas entering the inlet and traveling through the housing and exiting through the outlet; first heat exchanger means near the inlet in the housing for cooling the flue gas;



second heat exchanger means near the outlet in the housing for further cooling the flue gas; collection means between the first heat exchanger means and the second heat exchanger means for collecting liquids and particulate, the flue gas traveling downwardly in the housing past the first heat exchanger means and through the collection means and upwardly in the housing past the second heat exchanger means; and means for injecting steam into the housing for increasing condensate loading on the first and second heat exchanger means, the steam injecting means including a first port for injecting steam in the inlet in the housing prior to the first heat exchanger means and a second injection port for injecting steam situated in the first heat exchanger means.

5,567,216

## GREASE FILTER ASSEMBLY

Daryl Mirza, Zion, and Robert A. Barasa, Lake Forest, both of Ill., assignors to DGA Industries, Inc., Zion, Ill.

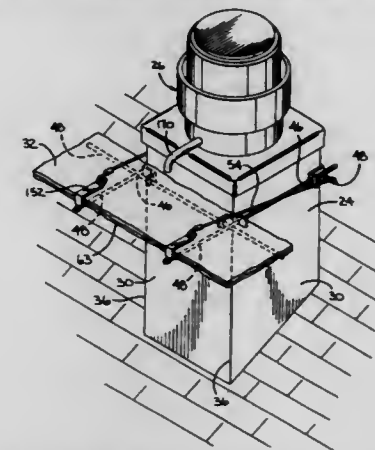
Continuation-in-part of Ser. No. 293,154, Aug. 19, 1994, Pat. No. 5,512,073. This application Jun. 7, 1995, Ser. No. 476,717

Int. Cl.<sup>6</sup> B01D 35/00

U.S. Cl. 55—323

9 Claims

1. A grease filter assembly for absorbing grease from an opening



or spout in a grease discharge vent having a duct extending from a roof, the assembly comprising:

a support grid capable of being mounted to a grease discharge vent duct in spaced relation to a roof; grease absorbing material supportable on top of the support grid and positionable adjacent a side of a discharge vent duct; and retaining means for retaining the grease absorbing material on the support grid adjacent a side of a discharge vent duct and in spaced relation to a roof, wherein the support grid comprises a plurality of support rods for being positioned generally horizontally adjacent sides of a discharge vent duct and a plurality of mounting brackets each having means for engaging respective support rods for clamping of the mounting brackets and support rods to a vent duct to support rods adjacent their respective sides of a duct, and

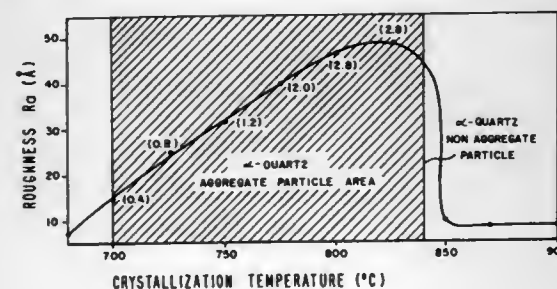


the retaining means includes a pair retaining clips each including a rod receiving portion and a tension cord receiving portion and a pair of tension cords for pulling the clips towards a side of a duct into engagement with the grease absorbing material to maintain the grease absorbing material in abutment with a side of a duct below a spout to absorb grease discharged therefrom with the portions of the clips receiving respective rods and tension cords.

**5,567,217**  
**METHOD FOR MANUFACTURING A CRYSTALLIZED GLASS MAGNETIC DISK SUBSTRATE**  
 Naoyuki Goto, and Katsuhiko Yamaguchi, both of Sagami, Japan, assignors to Kabushiki Kaisha Ohara, Japan  
 Division of Ser. No. 307,889, Sep. 16, 1994. This application May 16, 1995, Ser. No. 442,381  
 Claims priority, application Japan, May 19, 1993, 5-139989  
 Int. Cl.<sup>6</sup> C03B 32/00

U.S. Cl. 65—33.1

2 Claims



1. A method for manufacturing a magnetic disk substrate comprising the steps of:  
 melting a base glass consisting essentially in weight percent of:

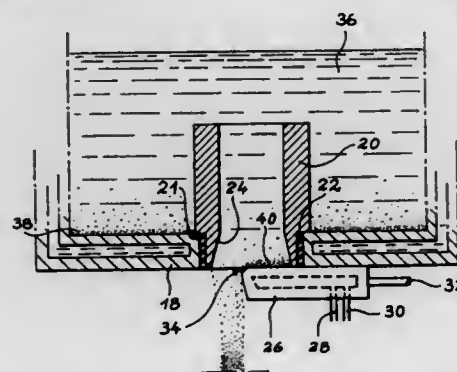
Li <sub>2</sub> O	8-13%
K <sub>2</sub> O	0-7%
MgO + ZnO + PbO	0.5-5.5%
in which MgO	0.5-5.5%
ZnO	0-5.5%
PbO	0-5.5%
P <sub>2</sub> O <sub>5</sub>	1-4%
Al <sub>2</sub> O <sub>3</sub>	0-7%
As <sub>2</sub> O <sub>3</sub> + Sb <sub>2</sub> O <sub>3</sub>	0-2%

forming the molten glass into a desired shape;  
 heating the formed glass to produce a crystal nucleus under a temperature within a range from 450° C. to 540° C.;  
 heating the glass at a temperature within a range from 700° C. to 840° C. to further crystallize the glass; and  
 polishing the surface of the glass to a surface roughness within a range of 15 Å to 50 Å to produce a magnetic disk substrate having crystal phases which consist of lithium disilicate Li<sub>2</sub>O<sub>2</sub>Si<sub>2</sub>O and alpha quartz (SiO<sub>2</sub>), said crystal phase of alpha-quartz being formed of grown crystal grains each having a globular grain structure made of aggregated particles and said crystal grains of alpha-quartz being randomly scattered in the finer particles of lithium disilicate, and said magnetic disk substrate having a polished surface having a surface roughness within a range of 15 Å to 50 Å.

**5,567,218**  
**DEVICE FOR EXTRACTION BY POURING WITH A REGULATABLE FLOW RATE OF A MATERIAL MELTED IN A MELTER HAVING COLD WALLS**  
 Christian Ladirat, Saint Laurent des arles; Henri Pilliol, Avignon, and Jean-Pierre Gnika, Bagnols Sur Ceze, all of France, assignors to Commissariat a l'Energie Atomique, Paris, and Compagnie Generale Des Matieres Nucleaires, Velizy-Villacoublay, both of France  
 Filed Apr. 19, 1994, Ser. No. 229,575  
 Claims priority, application France, Apr. 29, 1993, 93 05079  
 Int. Cl.<sup>6</sup> C03B 5/26

U.S. Cl. 65—327

4 Claims



1. Device for the extraction by pouring at a regulatable flow rate a molten material in a cold structure melter, said melter having a floor at least a portion of which is cooled by a flow of water and a heat source able to melt material to be melted, said device comprising:  
 an orifice in the floor of the melter having side walls and a diameter equal to or larger than the thickness of the wall forming the melter;  
 a metal sleeve having an end extending within said melter for penetrating the molten material and a base at least a portion of which extends within said orifice, said sleeve having a central passage forming a pouring tube for the molten material, a clearance being provided between the side walls of the orifice and the base of the sleeve in order to receive an insulating material between said sleeve and the floor of the melter; and means for regulating the flow rate of molten material through said pouring tube including a cooled, sliding blade beneath the floor of the melter and an actuator controlling movement of the blade in translation along the orifice and the degree to which said blade closes said orifice to regulate the flow rate of the molten material through said pouring tube.

**5,567,219**  
**POLYIMIDE COATED HEAVY METAL FLUORIDE GLASS FIBER AND METHOD OF MANUFACTURE**  
 Lubos Vacha, and Peter J. Melling, both of Sturbridge, Mass., assignors to Galileo Electro-Optics Corporation, Sturbridge, Mass.  
 Filed Jul. 20, 1994, Ser. No. 277,870  
 Int. Cl.<sup>6</sup> C03C 25/02; G02B 6/02; 6/16

U.S. Cl. 65—432

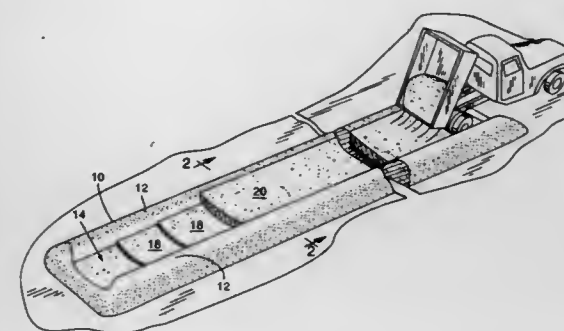
30 Claims

1. A method of making a polyimide coated heavy metal fluoride fiber comprising the steps of:  
 forming a coated optical fiber by drawing a heavy metal fluoride fiber through a polyimide solution, said fiber having a glass transition temperature in a range of about 200° and about 400° C. and said coating having a curing temperature in a range of about 200° and about 390° C.;  
 drawing said coated fiber through a curing oven to form a cured coated fiber, said oven having a temperature profile which exposes said coated fiber to a temperature above the glass transition temperature of the heavy metal fluoride fiber sufficient to cure said coating, said step of drawing through said oven occurring at a rate sufficient to minimize crystallization of said fiber and optical losses caused by crystallization.

**5,567,220**  
**COMBINATION PLANT FOOD SUPPLEMENT AND COMPOST MATERIAL AND PROCESS**  
 James W. Thorpe, and Dennis E. Thorpe, both of 89518 Poodle Creek Rd., Noti, Oreg. 97461  
 Filed Mar. 20, 1995, Ser. No. 406,528  
 Int. Cl.<sup>6</sup> C05F 9/04; 1/00

U.S. Cl. 71—9

12 Claims



1. A process of making a combination plant food supplement and compost material, comprising the steps, conducted at atmospheric temperature and pressure, of

- mixing a carbonaceous material with a nitrogenous material to form a bacterial biomass,
- including activated carbon and perlite dust in the mixture for limiting the loss of ammonia nitrates as well as to lock nitrogen in the biomass and to limit fly larva and odors,
- adding water to the mixture to maintain a moisture content of about 60-70 percent, and
- periodically mixing the mixture for a time to bring the temperature of the mixture first to at least about 131° F. and thereafter down to about 100° F.

**5,567,221**  
**COMPOSITIONS AND METHODS FOR USE IN AQUACULTURE**  
 Steven D. Larson, Houston, Tex., and Richard J. Kastner, Gulfport, Mich., assignors to OMS Investments, Inc., Wilmington, Del.  
 Filed Jan. 3, 1995, Ser. No. 368,046  
 Int. Cl.<sup>6</sup> C05C 9/00; A01K 61/00; C05G 5/00

U.S. Cl. 71—28

14 Claims

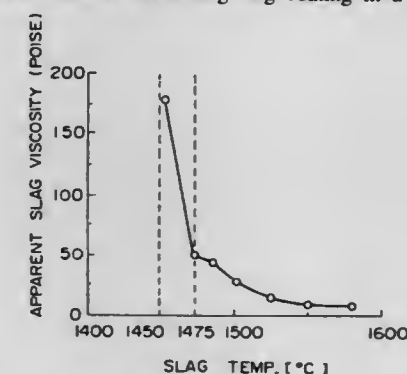
1. A method for promoting marine life populations in a closed aquatic ecosystem comprising applying a controlled release fertilizer composition into said ecosystem, said controlled release fertilizer composition being formed from a particulate core material and a release material reacted with or coated on said core material, said core material being selected from the group consisting of phosphorus, nitrogen and potassium sources and mixtures thereof and said controlled release fertilizer composition being formulated to provide slow release of a sufficient amount of said core material from said release material into said closed aquatic ecosystem, in a single application of said controlled release fertilizer composition thereto, to promote stable growth of phytoplankton algae in said ecosystem without causing overly dense growth of said phytoplankton algae, whereby marine life populations in said closed aquatic ecosystem are maintained over an extended period of time.

**5,567,222**  
**METHOD OF CONTROLLING SLAG COATING OF A STEEL CONVERTER**  
 Katsunori Takahashi; Eizo Maeda; Hajime Suzuki; Sumio Yamada; Taichi Nakazawa, and Yasuo Imalida, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Japan  
 Filed Mar. 21, 1995, Ser. No. 408,066  
 Claims priority, application Japan, Mar. 24, 1994, 6-054138; Jun. 17, 1994, 6-135967  
 Int. Cl.<sup>6</sup> C21C 5/54

U.S. Cl. 75—376

8 Claims

1. In a method of controlling slag coating in a converter in



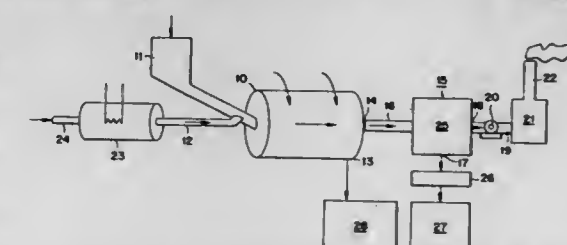
which a liquid volume fraction of slag is retained in a converter after tapping in preparation for the introduction of a subsequent charge of steel into said converter at a tapping temperature, and wherein a slag solidifying agent is added to the retained slag to form a coated slag which is used to coat the inner surfaces of said converter, the steps comprising:

- determining the composition of a slag at the time of tapping;
- determining, based upon said composition of said slag at said time of tapping, and through equilibrium determination using thermodynamic data, the amount of said slag solidifying agent to be added per unit weight of said slag, which amount is required for maintaining said liquid volume fraction of said coated slag at a value up to but not greater than about 40% at said tapping temperature for said subsequent charge of steel;
- determining the amount of charge of said slag solidifying agent based on the required amount of said slag solidifying agent and the amount of said slag remaining in said converter; and
- adding said determined amount of said slag solidifying agent to said slag after said tapping to form said coated slag.

**5,567,223**  
**METHOD FOR DEALING WITH MERCURY-CONTAINING WASTE**  
 Per-Olov Lindgren, Skellefteå; Karin Paulsson, Skelleftehamn, and Anna Svedberg, Skellefteå, all of Sweden, assignors to Boliden Mineral AB, Skelleftehamn, Sweden  
 Filed Nov. 1, 1994, Ser. No. 332,742  
 Claims priority, application Sweden, Nov. 25, 1993, 9303905  
 Int. Cl.<sup>6</sup> C22B 43/00

U.S. Cl. 75—401

21 Claims



1. A method for treating mercury-containing waste, the method comprising the steps of:  
 (a) agitating and heating the mercury-containing waste in a furnace in the presence of elementary selenium vapor in an amount effective to form mercury selenide from essentially all

- of the mercury in the mercury-containing waste at a temperature at which mercury and selenium will exist in the gas phase and at which no solid mercury selenide will form to produce (i) a process gas comprising mercury and selenium, and (ii) a substantially mercury-free waste;
- (b) maintaining a sufficiently low partial pressure of oxygen in the furnace to avoid selenium oxidation;
- (c) separating the process gas from the substantially mercury-free waste to form a separated process gas;
- (d) cooling the separated process gas and extracting therefrom solid, stable mercury-selenide dust;
- (e) extracting any gaseous mercury remaining in the separated process gas from step (d) to produce a cleansed process gas; and
- (f) releasing the cleansed process gas into the atmosphere.

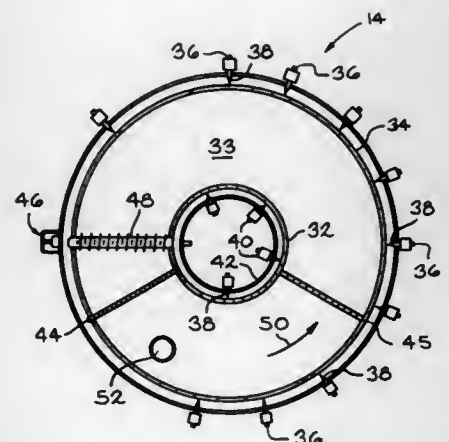
**5,567,224**  
**METHOD OF REDUCING METAL OXIDE IN A ROTARY HEARTH FURNACE HEATED BY AN OXIDIZING FLAME**

David M. Kundrat, Cincinnati, Ohio, assignor to Armco Inc., Middletown, Ohio

Filed Jun. 6, 1995, Ser. No. 470,311  
 Int. Cl.<sup>6</sup> C21B 13/14

U.S. Cl. 75—414

20 Claims

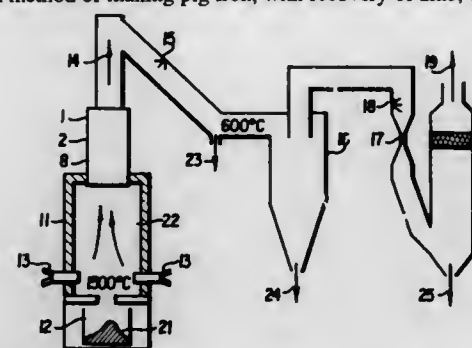


20. A method of reducing metal oxide, comprising: providing a furnace having an annular platform and at least one fuel burner, placing a first layer of a mixture containing a reductant and oxygen-bound chromium and iron onto an upper surface of the platform, rotating the platform past the burner to heat the first layer with an oxidizing flame to a temperature of at 1200° C., charging a second layer of the reductant covering the heated first layer, continue heating the layers to at least 1300° C. to partially reduce the oxygen-bound chromium and iron, the partially reduced mixture containing at least 40% chromium or a chromium carbide and at least 70% of iron or an iron carbide, whereby the second layer prevents reoxidation of the chromium or iron within the furnace, providing a refining vessel containing an iron bath, feeding the partially reduced mixture into the bath, refining the bath until the oxygen-bound chromium and oxygen-bound iron are reduced to chromium and iron thereby forming a stainless steel.

**5,567,225**  
**METHOD OF MAKING PIG IRON WITH ZINC RECOVERY**  
 Johannes G. Bernard, Delft; Hendrikus K. A. Meijer, Uitgeest, and Cornelis P. Teerhuis, Marken, all of Netherlands, assignors to Hoogovens Staal. B.V., CA IJmuiden, Netherlands  
 Filed May 24, 1995, Ser. No. 449,575  
 Claims priority, application Netherlands, Jun. 9, 1994, 9400936

Int. Cl.<sup>6</sup> C21B 11/00; C22B 7/02; 19/34  
 U.S. Cl. 75—453 10 Claims

1. A method of making pig iron, with recovery of zinc, comprising the steps of:



- i) producing pig iron by an in-bath direct reduction process performed in a metallurgical vessel, said direct reduction process providing a hot reducing gas,
- ii) performing a pre-reduction of iron-oxide-containing material in a melting cyclone located above said metallurgical vessel, by feeding said iron-oxide-containing material into said melting cyclone and allowing said hot reducing gas to pass from said metallurgical vessel upwardly into said melting cyclone, while allowing molten material pre-reduced in said melting cyclone to pass downwardly into said metallurgical vessel, said iron-oxide-containing material comprising a dust containing at least one of zinc and zinc oxide,
- iii) allowing zinc to vaporize out of said dust in said melting cyclone,
- iv) discharging hot gas containing zinc from said melting cyclone, and
- v) extracting zinc-containing material from said hot gas discharged from said melting cyclone.

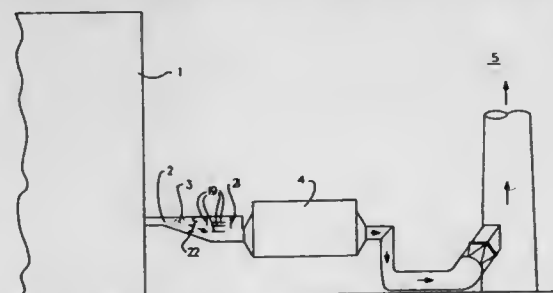
**5,567,226**  
**APPARATUS AND METHOD FOR ENHANCING THE PERFORMANCE OF A PARTICULATE COLLECTION DEVICE**

Aziz A. Lookman, Apt. 5, 4 Bayard Rd., Pittsburgh, Pa. 15213; Roger W. Glickert, 1757 Q St., Apt. E, Washington, D.C. 20029, and James E. Gabrielson, 2741 Comstock La., Plymouth, Minn. 55447

Continuation of Ser. No. 958,994, Oct. 9, 1992, abandoned.  
 This application Nov. 14, 1994, Ser. No. 338,362  
 Int. Cl.<sup>6</sup> B03C 3/013

U.S. Cl. 95—3 19 Claims

1. An improved apparatus for injecting gaseous ammonia into a waste gas for enhancing the performance of a particulate collection device comprising:



waste gas for enhancing the performance of a particulate collection device comprising:

- (a) a source of gaseous ammonia;
- (b) a manifold that receives a primary gaseous ammonia flow from said source of gaseous ammonia and splits said primary gaseous ammonia flow into a plurality of secondary gaseous ammonia flows;
- (c) an array comprising a plurality of injectors for said secondary gaseous ammonia flows, said array located upstream from a particulate collection device through which said waste gases pass, wherein said array is located in a position to introduce varying feed rates of said secondary gaseous ammonia across said array into said waste gases;
- (d) one or more control valves to control said secondary gaseous ammonia flows to one or more injectors of said array;
- (e) one or more sensing devices to measure gas phase sulfur trioxide concentrations in a plurality of locations, wherein said one or more sensing devices are located downstream from said array and wherein each of said one or more sensing devices generates one or more output signals that are based upon the concentration of said gas-phase sulfur trioxide;
- (f) one or more controllers which receive said output signals and which generate one or more control signals to adjust one or more of said control valves such that said secondary gaseous ammonia flows from said array maintain the downstream concentration of sulfur trioxide at an optimum level.
19. An improved method for enhancing the performance of a particulate collection device comprises the steps of:
- a) generating a primary gaseous ammonia flow from an ammonia source;
- (b) splitting said primary gaseous ammonia flow into a plurality of secondary gaseous ammonia flows;
- (c) delivering said secondary gaseous ammonia flows to an array comprising a plurality of injectors;
- (d) introducing said secondary gaseous ammonia flows into waste gas;
- (e) measuring a gas-phase sulfur trioxide concentration of said waste gas in one or more locations downstream from said array;
- (f) generating one or more output signals that are based upon the measurement of said gas-phase sulfur trioxide concentration as in step (e); and
- (g) controlling said secondary gaseous ammonia flows from said array in varying feed rates across said array to maintain downstream concentration of sulfur trioxide at an optimum level.

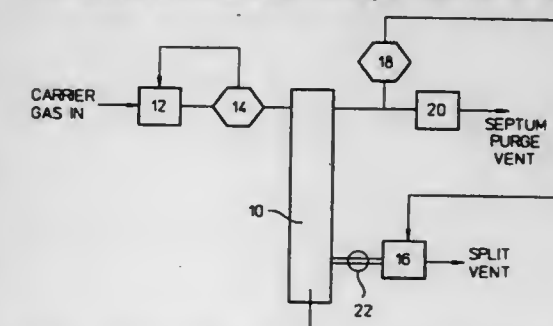
**5,567,227**  
**METHOD FOR IMPROVING THE RANGE OF STABLE CONTROL OF THE PNEUMATIC SYSTEM OF A GAS CHROMATOGRAPH**

Robert C. Henderson, Avondale, Pa., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 23, 1995, Ser. No. 376,616  
 Int. Cl.<sup>6</sup> B01D 15/08

U.S. Cl. 95—22 8 Claims

1. A method for dynamically varying a controller to vary the frequency response characterizing a closed-loop pneumatic system associated with a chromatograph comprising the steps of:



characterizing the optimum controller coefficients of the closed-loop pneumatic system with respect to pressure and flow setpoints to determine the frequency response of the closed-loop pneumatic system as a controller algorithm; and

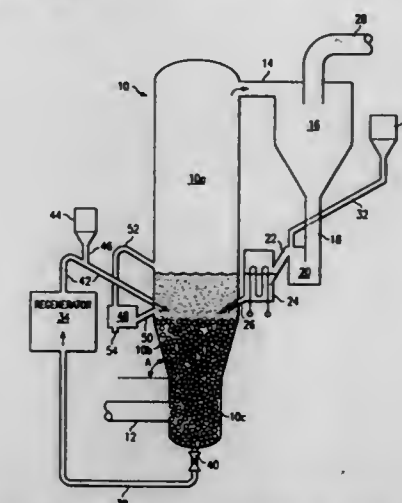
dynamically varying the controller according to the controller algorithm wherein the controller coefficients are altered as a function of the pressure and flow setpoints to provide a controller having optimized controller coefficients for selected pressure and flow setpoints.

**5,567,228**  
**SYSTEM FOR COOLING AND CLEANING SYNTHESIZED GAS USING A HOT GRAVEL BED**  
 Iqbal F. Abdullally, Randolph, N.J., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.

Filed Jul. 3, 1995, Ser. No. 498,040  
 Int. Cl.<sup>6</sup> B01D 53/12

U.S. Cl. 95—109

40 Claims



1. A method for treating gas comprising the steps of: passing the gas into a vessel containing a static gravel bed, which bed distributes the gas and supports a fluidized bed of relatively fine particulate material, the material being at a temperature less than that of the gas so that the material reduces the temperature of the gas and the gas entrains at least a portion of the material;
- separating the entrained material from the gas;
- cooling the separated material; and returning the cooled separated material back to the vessel.

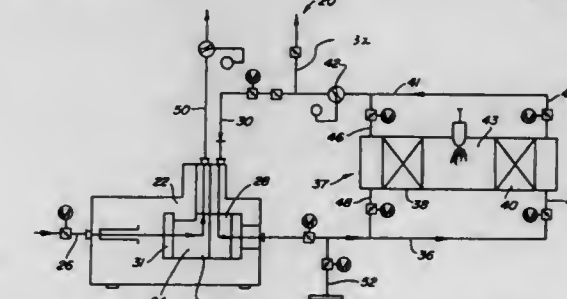
**5,567,229**  
**ROTARY ADSORPTION UNIT WITH REGENERATIVE THERMAL OXIDIZER**

Joseph M. Klobucar, Plymouth, and Dinesh Bhushan, Ann Arbor, both of Mich., assignors to Durr Industries, Inc., Plymouth, Mich.

Filed Oct. 27, 1994, Ser. No. 330,191  
 Int. Cl.<sup>6</sup> B01D 53/04

U.S. Cl. 95—113

6 Claims



1. A method of cleaning a gas flow comprising the steps of: (1) providing a rotary adsorption unit, and rotating said rotary adsorption unit;



- (2) passing a gas to be cleansed over the majority of the circumferential extent of said rotary adsorption unit, said rotary adsorption unit removing impurities from said gas to be cleaned;
- (3) passing a desorb gas, from a regenerative thermal oxidizer as recited in step (4), and over said rotary adsorption unit over a portion of its circumferential extent, said desorb gas removing said impurities from said rotary adsorption unit as step (2) is occurring;
- (4) directing said desorb gas from said rotary adsorption unit with entrained impurities to a regenerative thermal oxidizer, passing said desorb gas from said rotary adsorption unit through a first heat exchanger on said regenerative thermal oxidizer, and into a combustion chamber, combusting impurities within said desorb gas from said rotary adsorption unit, passing that combusted gas from said combustion chamber and into a second heat exchanger, said gas passing through said second exchanger then being returned as desorb gas in step (3), above, then
- (5) switching said desorb gas flow from the rotary adsorption unit into said second heat exchanger, into said combustion chamber, and then into said first heat exchanger, and then sending said desorb gas flow back to said rotary adsorption unit as the desorb gas of step (3); and
- (6) cyclically repeating steps (4) and (5).

**5,567,230**  
**AIR FILTER FOR USE WITH AIRCRAFT VENTILATION SYSTEMS**

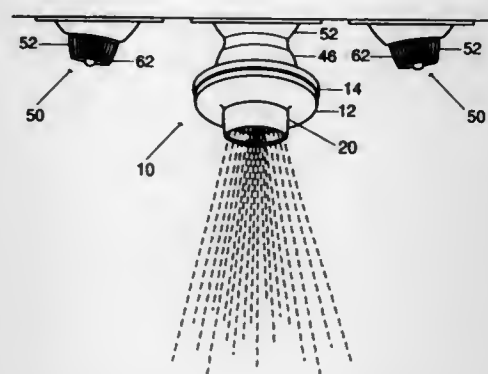
Hugh J. Sinclair, 30 Palmer Green, Baltimore, Md. 21210

Filed Apr. 5, 1995, Ser. No. 416,973

Int. Cl.<sup>6</sup> B01D 46/00

U.S. Cl. 95—273

14 Claims



1. A method of filtering air entering into the cabin of an aircraft over an individual passenger seat via an air control nozzle comprising the steps of:
- sizing an inlet port of a filter housing to frictionally engage an air ventilation nozzle used to direct an air flow into a passenger space of an aircraft;
- securing a filter within said housing; and,
- placing said housing over said air ventilation nozzle to filter air entraining therethrough.

**5,567,231**  
**DEODORANTS, DEODORANT SHEETS, FILTER SHEETS AND FUNCTIONAL PAPERS AS WELL AS FILTERING MEDIUMS FOR EXHAUST GAS**

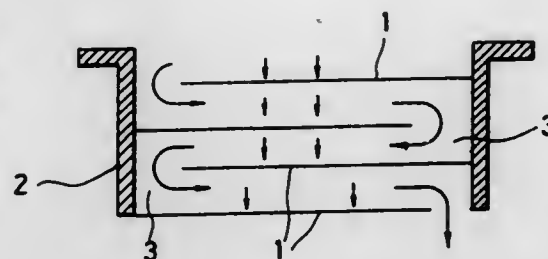
Akihiko Yokoo, and Tetsuro Ogawa, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan Division of Ser. No. 197,173, Feb. 16, 1994, which is a continuation of Ser. No. 840,586, Feb. 26, 1992, Pat. No. 5,310,548, which is a continuation of Ser. No. 512,323, Apr. 23, 1990, abandoned. This application Feb. 14, 1995, Ser. No. 388,586

Claims priority, application Japan, Apr. 21, 1989, 1-102355; Apr. 28, 1989, 1-110993; Nov. 2, 1989, 1-286120; Jan. 10, 1990, 2-003198

Int. Cl.<sup>6</sup> B01D 53/04

U.S. Cl. 96—153

12 Claims



1. A filter sheet which comprises a sheet-like matrix of organic polymeric material having dispersed therein a calcium phosphate compound having a molar ratio of calcium to phosphorus of 0.8 to 2.0.

**5,567,232**  
**Patent Not Issued For This Number**

**5,567,233**  
**PROCESS FOR PREPARING BALLPOINT PEN PASTES WITH COLORED METAL OXIDE PIGMENTS**

Karin H. Beck; Helmut Bellaire, both of Ludwigshafen; Claudius Kormann, Schifferstadt, and Rainer Dillck-Brenzinger, Weinheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jun. 7, 1995, Ser. No. 476,580

Claims priority, application Germany, Jun. 14, 1994, 44 20 644.5

Int. Cl.<sup>6</sup> C09D 11/18

U.S. Cl. 106—20 R

16 Claims

1. A process for preparing ballpoint pen pastes comprising at least one colored metal oxide pigment and customary ballpoint pen paste resin and organic solvent as essential components and also, if desired, further customary additives, which comprises kneading the metal oxide pigment, present as a suspension in water or an organic solvent or in the form of a water- or solvent-containing presscake, into the resin at elevated temperature, subsequently removing the water or solvent by further increasing the temperature, and then grinding the cooled pigment-resin preparation and dissolving it in the organic solvent used for the final ballpoint pen paste while, if desired, adding further additives.

**5,567,234**  
**LOW MISTING SPRAYABLE DISPERSION OF COLLOIDAL SILICA WITH XANTHAN GUM**  
Robert A. LaBrash, Roseville, and Stephen M. Willging, Minneapolis, both of Minn., assignors to H. B. Fuller Licensing & Financing, Inc., Arden Hills, Minn.  
Continuation of Ser. No. 81,543, Jun. 23, 1993, abandoned.  
This application Dec. 20, 1995, Ser. No. 575,586  
Int. Cl.<sup>6</sup> C09D 105/00; C08L 5/00

U.S. Cl. 106—205.9

9 Claims

1. In a sprayable non-skid composition consisting essentially of an aqueous dispersion of colloidal silica, the improvement comprising including a quantity of xanthan gum in an amount effective to prevent substantial phase-out of the silica dispersion and to limit misting when the composition is sprayed, wherein the amount of gum is in the amount effective to prevent substantial phase out of the silica dispersion and to limit misting when the composition is sprayed.

**5,567,235**  
**METHOD FOR STRENGTHENING A BRITTLE OXIDE SUBSTRATE, SILANE-BASED COMPOSITIONS, AND A POLYMERIZED CROSS-LINKED SILOXANE COATED BRITTLE OXIDE SUBSTRATE**

Stephen W. Carson, Downingtown; Ryan R. Dirks, Glenmoore; Victor D. Papanu, Doylestown, all of Pa., and Neal D. Conrad, Trenton, N.J., assignors to Elf Atochem North America, Inc., Philadelphia, Pa.

Division of Ser. No. 344,621, Nov. 17, 1994, and a continuation-in-part of Ser. No. 986,894, Dec. 8, 1992, abandoned, which is a continuation of Ser. No. 738,030, Jul. 30, 1991, abandoned, which is a division of Ser. No. 575,052, Aug. 30, 1990, abandoned, said Ser. No. 344,621 is a continuation of Ser. No. 78,811, Jun. 21, 1993, abandoned, which is a continuation-in-part of Ser. No. 43,980, Apr. 7, 1993, abandoned, which is a continuation of Ser. No. 873,315, Apr. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 575,052, Aug. 30, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 468,663

Int. Cl.<sup>6</sup> C04B 41/49; C03C 17/30

U.S. Cl. 106—287.16

13 Claims

9. A composition useful for coating a brittle oxide substrate comprising a mixture of a) an effective amount of 2-(3,4-epoxycyclohexyl)ethyltrimethoxysilane, 3-glycidoxypropyltrimethoxysilane, or both, to improve or restore strength and labelability to said brittle oxide substrate and b) an effective amount of vinyltrimethoxysilane, 3,3-dimethoxypropyltrimethoxysilane, methyltrimethoxysilane, or mixtures thereof, to improve or restore strength and humidity resistance in said brittle oxide substrate.

**5,567,236**  
**COMPOSITION CONTAINING MATERIALS IMPROVING THE RHEOLOGICAL PROPERTIES OF CEMENT-BASED PRODUCTS**

Joseph Schapira, Paris; Jean-Claude Cheminaud, Herblay; Jean-Jacques Gasse, Gaillon; Eric Hadzemann, Mouy, and Joël Bonnin, Saint Denis, all of France, assignors to C F P I, Gennevilliers, France

Filed Dec. 28, 1993, Ser. No. 174,954

Claims priority, application France, Dec. 29, 1992, 92 15864

Int. Cl.<sup>6</sup> C04B 24/00; 24/04; 24/12

U.S. Cl. 106—728

17 Claims

1. Composition used to improve rheological properties of cement products containing calcium ions and to increase workability of ready to use concrete, comprising, in a ternary mixture: from 5 to 95% by weight of a superplasticizing or water-reducing agent having a dispersing effect,

from 0.1 to 50% by weight of a stabilizing agent capable of forming a chelate with the calcium ions of the cement product, and from 5 to 95% by weight of a polycarboxylic polymer dispersing agent.

**5,567,237**  
**CONTINUOUS DRIER FOR BOARD-SHAPED PIECE MATERIAL AND COATING INSTALLATION COMPRISING SUCH A CONTINUOUS DRIER**

Diethard Kapp-Schworer, Inzlingen, and Rainer Krauss, Flein, both of Germany, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

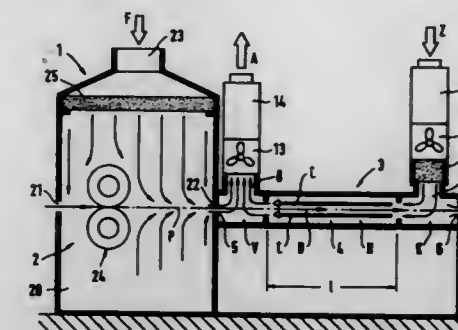
Filed Jun. 14, 1994, Ser. No. 259,641

Claims priority, application Switzerland, Jun. 22, 1993, 1868/93

Int. Cl.<sup>6</sup> B05C 11/00

U.S. Cl. 118—58

16 Claims



1. A continuous drier for board-shaped piece material, especially for coated in-layers or printed circuit boards, comprising a drying chamber, in which the board-shaped piece material to be dried is exposed to a guided essentially laminar air stream while being transported along a transport path in a transport plane from an entrance to an exit of said drying chamber by transport means acting preferably at its longitudinal edges, further comprising an inlet and an outlet for the air, wherein there are arranged above and below said transport plane for said board-shaped piece material infrared radiators the radiation of which acts directly on said coated piece material and which, at the same time, form a heat source for said guided laminar air stream; and wherein said laminar air stream is guided inside said drying chamber counter to the transport direction of said board-shaped piece material and substantially parallel to said transport plane; the drying of said coated piece material is performed both by the infrared radiation of said infrared radiators directly acting on said coated piece material and by said guided laminar air stream in such a manner that near said entrance of said drying chamber the drying is mainly effected by said guided laminar air stream and near said exit of said drying chamber the drying is mainly effected by the infrared radiation of said infrared radiators directly acting on said coated piece material.

**5,567,238**  
**OSCILLATING BED SEED COATING MACHINE FOR PARTICULATE MATERIAL**

Richard L. Long, Jr., and Donald E. Barber, both of Ames, Iowa, assignors to Coating Machinery Systems, Inc., Ames, Iowa

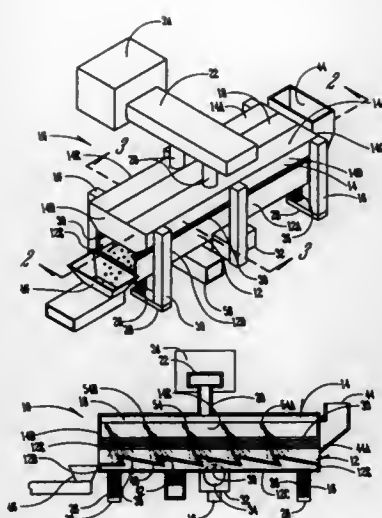
Filed Dec. 6, 1994, Ser. No. 350,229

Int. Cl.<sup>6</sup> B05B 17/00; A01C 1/06

U.S. Cl. 118—303

11 Claims

1. An apparatus for coating particular material, comprising: a support frame;



an elongated tray mounted on the frame and having opposite inlet and outlet ends;  
said tray having a perforated support surface extending from the inlet end to the outlet end;  
the support surface including a plurality of alternating treads and risers from the inlet end to the outlet end of the tray;  
a plurality of spray nozzles mounted above the tray to direct a spray of coating solution onto particulate material carried on the support surface;  
an air system on the frame for supplying a flow of air onto and around the particulate material and through the perforated support surface so as to enhance drying of the coating solution on the particulate material; and  
means on the frame for oscillating the tray and thereby causing the particulate material to traverse the treads and risers from the inlet end to the outlet end of the tray so as to be coated by the sprayed solution.

5,567,239

# MASKING PROFILE FOR USE IN PAINTING CAR BODIES

Harald Ribic, Jr., Planetenfeldstrasse 103a, 4600 Dortmund 70, Germany

Continuation of Ser. No. 142,290, May 3, 1994, abandoned.

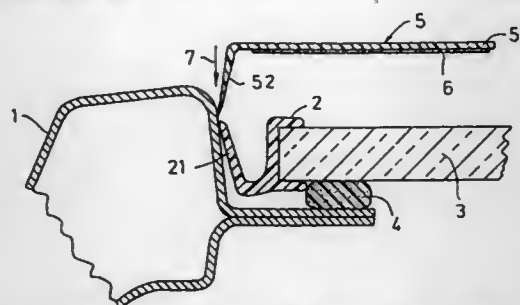
This application Oct. 20, 1995, Ser. No. 545,885

Claims priority, application Germany, May 18, 1991, 9106206 U

Int. Cl.<sup>6</sup> B05C 21/00

U.S. Cl. 118—504

7 Claims



1. A masking profile for use in painting a transitional area between a motor vehicle windshield embedded in a profile member and a motor vehicle body, the masking profile comprising: two profile legs which form a rigid element with an L-shaped cross section and define an angle relative to one another, in a use position; and an adhesive coating provided on at least one of the profile legs, the profile legs including a shorter leg that is engageable behind a lip of the profile member holding the vehicle windshield, which lip contacts a region of the vehicle body to be painted, the profile legs further including a longer leg on which the adhesive coating is provided so that the longer leg is adhereable to

at least one of an outer surface of the windshield and a body surface of the vehicle, the longer leg having regions that are removed to define bendable sections of the longer leg that can bend in a plane defined by the longer leg.

5,567,240

# APPARATUS FOR MANUFACTURING CERAMIC GREEN SHEET LAMINATE FOR AN ELECTRONIC COMPONENT

Toshihiko Kogame, and Mitsuro Hamuro, both of Kyoto-fu, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Division of Ser. No. 682,346, Apr. 9, 1991, Pat. No. 5,316,602.

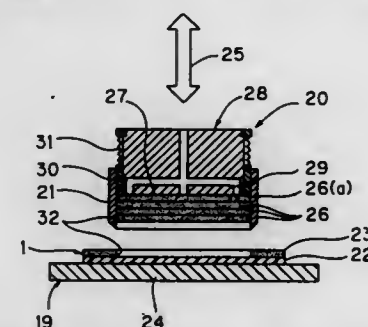
This application Mar. 2, 1994, Ser. No. 205,316

Claims priority, application Japan, Apr. 19, 1990, 2-103530

Int. Cl.<sup>6</sup> B05K 11/00; B26D 7/00; B32B 31/00

U.S. Cl. 118—665

8 Claims



1. An apparatus for manufacturing a ceramic green sheet for a laminated ceramic electronic component, comprising:  
a supply source for supplying a long composite comprising a long carrier film and a green ceramic layer continuously formed thereon along its longitudinal direction, the green ceramic layer having a surface;  
a printing station for printing a conductor film on the surface of said green ceramic layer with conductive paste;  
a drying station for drying said conductor film printed on the surface of said green ceramic layer; and  
a punching station for punching said green ceramic layer, after said green ceramic layer passes through said drying station, at a predetermined position with respect to said conductor film, and separating a punched out ceramic green sheet from said carrier film, thereby extracting a ceramic green sheet for a laminated ceramic electronic component;  
wherein said punching station is provided with a head having a contact surface to be in contact with said green ceramic layer, and a cutting edge at the contact surface and structured and arranged to project from said contact surface for punching said green ceramic layer;  
wherein a space within said head is defined by said cutting edge and by said contact surface, and said space has a capacity for receiving and retaining a plurality of stacked ceramic green sheets; and further comprising a device for enabling said plurality of stacked ceramic green sheets to be retained in said space, said device comprising a heater associated with said punching station and arranged for heating said ceramic green sheets before they are stacked within said space in said head.

5,567,241

# METHOD AND APPARATUS FOR THE IMPROVED MICROWAVE DEPOSITION OF THIN FILMS

David V. Tsu, Rochester Hills; Rosa Young, Troy, and Stanford R. Ovshinsky, Bloomfield Hills, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

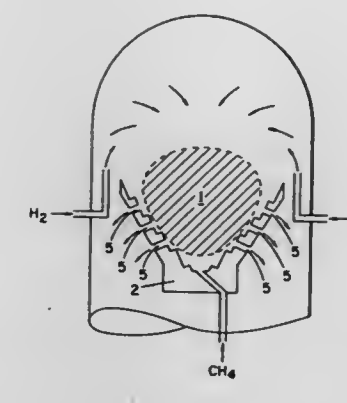
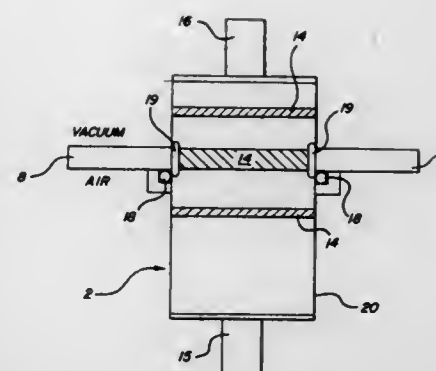
Division of Ser. No. 56,156, Apr. 30, 1993, abandoned. This application May 16, 1995, Ser. No. 442,146

Int. Cl.<sup>6</sup> C23C 16/00

U.S. Cl. 118—723 MW

12 Claims

1. A microwave energy feed-through device for coupling microwave energy from a microwave wave guide in a substantially



5,567,243

# APPARATUS FOR PRODUCING THIN FILMS BY LOW TEMPERATURE PLASMA-ENHANCED CHEMICAL VAPOR DEPOSITION USING A ROTATING SUSCEPTOR REACTOR

Robert F. Foster, Phoenix; Joseph T. Hillman, Scottsdale, both of Ariz., and Rene E. LeBlanc, East Haven, Conn., assignors to Sony Corporation, Tokyo, Japan, and Materials Research Corporation, Orangeburg, N.Y.

Division of Ser. No. 253,393, Jun. 3, 1994. This application

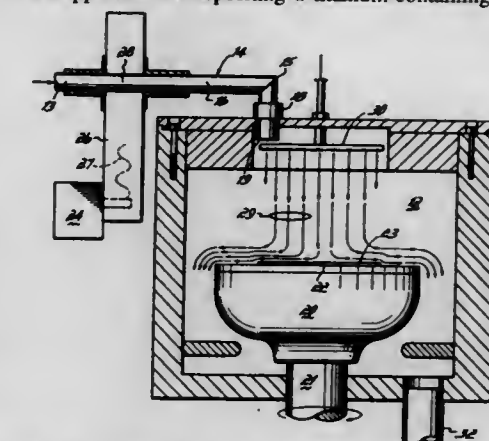
Jun. 6, 1995, Ser. No. 468,350

Int. Cl.<sup>6</sup> C23C 16/00

U.S. Cl. 118—730

5 Claims

1. An apparatus for depositing a titanium-containing film on a



# APPARATUS FOR DEPOSITING DIAMOND COATING IN REACTOR EQUIPPED WITH A BOWL-SHAPED SUBSTRATE

Staffan Soderberg, Huddinge; Hamid Shahani, Solna, and Mats Sjostrand, Kista, all of Sweden, assignors to Sandvik AB, Sandviken, Sweden

Division of Ser. No. 251,661, May 31, 1994, Pat. No.

5,482,748, and a continuation of Ser. No. 929,380, Aug. 14,

1992, abandoned. This application Oct. 4, 1995, Ser. No.

538,851

Claims priority, application Sweden, Aug. 16, 1991, 9102378

Int. Cl.<sup>6</sup> C23C 16/00

U.S. Cl. 118—723 MN

13 Claims

1. A bowl-shaped substrate table for use in microwave plasma excited gas mixture coating processes, said table having a concave inner surface including means for placing components to be coated on the inner surface of said table, the geometrical shape and configuration of said table adapted to conform with the plasma and to stabilize and control its shape and position so that the outer surface of the plasma conforms substantially to the surfaces of the components to be coated.

substrate by chemical vapor deposition utilizing an upstream microwave plasma comprising:

a reaction chamber for receiving a substrate;  
a remote first gas supply containing a first gas including at least one of hydrogen and nitrogen;

a passage for connecting the remote first gas supply to the reaction chamber, the passage defining an outlet which directs the first gas in said passage proximate to a substrate in the reaction chamber;

an energy source coupled to said connecting passage upstream of said passage outlet for creating a plasma-generating region in the passage, the passage plasma-generating region operable to excite the first gas and form activated radicals of the first gas, the activated radicals having a tendency to recombine with each other within the plasma to form stable molecules and thereby having a limited active life;

a rotating susceptor within the reaction chamber for supporting a substrate, the susceptor operable to rotate the substrate and reduce recombinations of the activated first gas radicals by drawing the first gas radicals through the passage and out of the passage outlet to produce a laminar flow of the first gas radicals proximate the substrate, the susceptor further operable to rotate the substrate and draw a sufficient number of activated first gas radicals to the substrate surface before they recombine so that they are available to provide energy to a reaction at the surface and reduce the amount of thermal energy necessary for the surface reaction;



a heating device coupled to the susceptor for heating a substrate thereon in the range of approximately 200° C. to 800° C.; a second gas supply containing a titanium tetrahalide coupled to the deposition chamber to direct said titanium tetrahalide gas below said outlet and proximate the substrate and above said rotating susceptor, the rotating susceptor further operable to draw said titanium tetrahalide gas to the substrate surface in a laminar flow to mix with said sufficient number of unrecombined first gas activated radicals and then operable to draw the mixture downward over the substrate surface such that the titanium-containing gas chemically reacts with the unrecombined radicals at the substrate surface and the radicals provide energy to the chemical reaction to deposit a titanium-containing film on the substrate surface at the desired temperature range.

5,567,244

**PROCESS FOR CLEANING SEMICONDUCTOR DEVICES**  
Chang-Jae Lee, and Hyeung-Tae Kim, both of Seoul, Rep. of Korea, assignors to Goldstar Electron Co., Ltd., Cheongju, Rep. of Korea

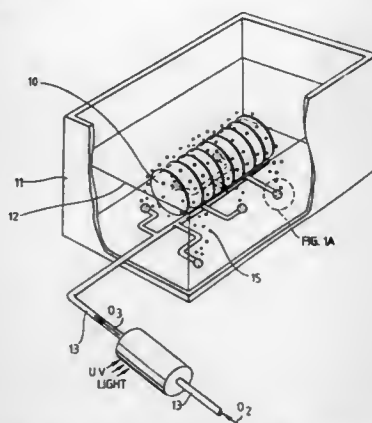
Filed Dec. 23, 1993, Ser. No. 172,463

Claims priority, application Rep. of Korea, Dec. 24, 1992, 92-25455

Int. Cl. B08B 3/08

U.S. Cl. 134—3

14 Claims



1. A process for cleaning semiconductor devices contaminated by Cu, comprising the steps of:  
immersing a semiconductor device in an HF solution;  
supplying O<sub>2</sub> bubbles into the HF solution, wherein Cu is removed from the semiconductor device and converted to cupric fluoride precipitates; and  
flushing the cupric fluoride precipitates from the HF solution.

5,567,245

**METHOD FOR SEPARATING VINYLIDENE CHLORIDE POLYMER FROM OTHER POLYMERS**

Dana L. Watson, 1921 10th St., Wichita Falls, Tex. 76301

Continuation-in-part of Ser. No. 29,898, Mar. 11, 1993, abandoned, which is a continuation-in-part of Ser. No. 655,300, Feb. 14, 1991, Pat. No. 5,225,045. This application Nov. 22, 1994, Ser. No. 343,200

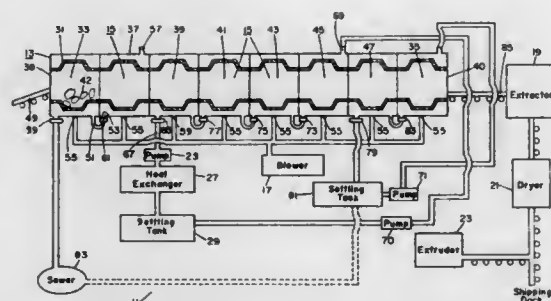
Int. Cl. B08B 3/04

U.S. Cl. 134—7

13 Claims

9. A method of processing a layered plastic material having a polypropylene layer with a polymeric vinylidene chloride layer, comprising the steps of:

providing a washing machine having a basket that is perforated so as to pass water and said polymeric vinylidene chloride therethrough after said layered plastic material has been processed while retaining said polypropylene inside said basket; wetting said layered plastic material by rotating said basket so as to agitate said layered plastic material in water and sand;



washing said layered plastic material by rotating said basket so as to agitate said layered plastic material in a wash liquor comprising hot water between 170–200 degrees Fahrenheit, caustic, sand, and a surfactant, said wash liquor having a pH of 12 or greater, to strip said polymeric vinylidene chloride layer away from said polypropylene material; and  
draining said wash liquor and said stripped vinylidene chloride material through said basket while retaining said polypropylene material in said basket.

5,567,246

**INDUSTRIAL PARTS CLEANING METHOD AND SYSTEM**

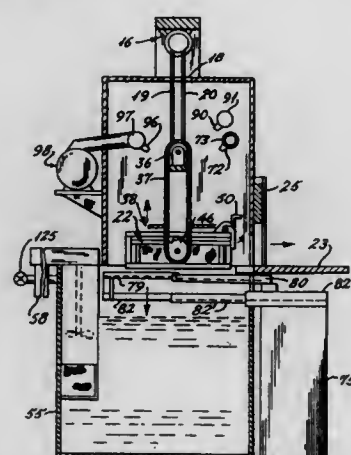
Donald R. Bowden, Huntsville, Ala., assignor to Bowden Industries, Inc., Huntsville, Ala.

Division of Ser. No. 212,776, Mar. 15, 1994, Pat. No. 5,421,883. This application Mar. 9, 1995, Ser. No. 401,933

Int. Cl. B08B 5/02; 7/04

U.S. Cl. 134—25.4

16 Claims



1. A method of cleaning industrial parts, comprising the steps of:  
a) placing the parts in an open mesh basket having an open top;  
b) placing the basket on a vertically adjustable hoist disposed within a housing;  
c) lowering the basket through an opening in a wash tank containing an agitated wash solution;  
d) rotating the basket within the wash solution;  
e) raising the basket from the wash solution through said opening to within the housing above said wash tank;  
f) rotating the raised basket while spraying the parts with a rinse liquid supplied from a rinse liquid source;  
g) simultaneously with the step of spraying a liquid collection means into a horizontal position below the raised basket intermediate said housing and said wash tank to cover said wash tank and to collect the sprayed rinse liquid and discharge the collected sprayed rinse liquid into the rinse liquid source, said liquid collection means being displaced from the opening of said wash tank and horizontally spaced relative to the basket during the steps of lowering and raising the basket; and  
h) removing the basket from the hoist.

5,567,247

**METHOD FOR CLEANING OUTDOOR PAINTED/ARTIFICIALLY STAINED SURFACE**

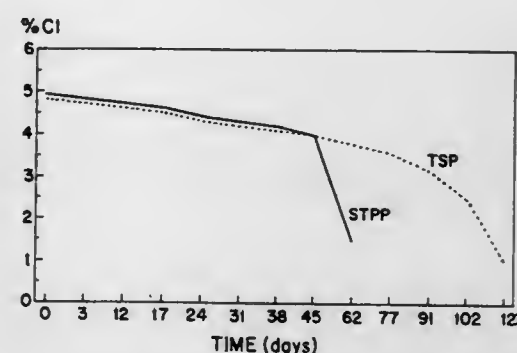
Charles Hawes, Summerville, and Mark Thompson, Charleston, both of S.C., assignors to Armor All Products Corporation, Aliso Viejo, Calif.

Continuation-in-part of Ser. No. 383,769, Feb. 3, 1995. This application Aug. 11, 1995, Ser. No. 514,245

Int. Cl. C11D 3/08; 3/39; 7/56; 7/16

U.S. Cl. 134—36

17 Claims



1. A method for cleaning material such as mold, mildew, algae, dirt and/or stains from a soiled outdoor painted or artificially stained surface selected from the group consisting of brick, concrete, wood and metal, comprising the steps of:

forming a diluted cleaning composition by feeding a concentrated cleaning composition from a container and water under pressure from a water hose into a mixing chamber of a spray gun attached to the container and the water hose, the concentrated cleaning composition consisting essentially of an aqueous chlorinated bleach solution and the concentrated cleaning composition having a hypochlorite content of about 3.0 to 10.0%;

spraying the diluted cleaning composition from the spray gun onto the soiled surface;  
allowing the diluted cleaning composition to remain on the soiled surface for a period of time sufficient to loosen material to be removed from the soiled surface; and  
removing the loosened material together with the diluted cleaning composition from the soiled surface by spraying rinsing water onto the soiled surface.

5,567,248

**MODULAR SOLAR CELL CONTACT ARRANGEMENT**  
Darius Chung, 861 Haddock St., Foster City, Calif. 94404

Filed Sep. 5, 1995, Ser. No. 523,150

Int. Cl. H01L 31/05

U.S. Cl. 136—244

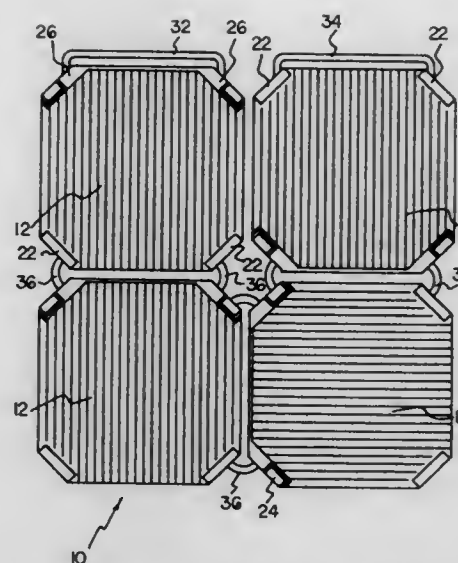
20 Claims

1. A modular solar cell having a contact arrangement, comprising:

a solar cell having a top surface and a plurality of angled corner edges;  
a first pair of negative contacts secured to the top surface of the solar cell proximal to a first adjacent pair of the angled corner edges;  
a pair of positive contacts secured to the top surface of the solar cell adjacent a second adjacent pair of the angled corner edges.

12. A modular solar cell array having a contact arrangement, comprising:

a first solar cell having a top surface and a plurality of angled corner edges; a first pair of negative contacts secured to the top surface of the solar cell proximal to a first adjacent pair of the angled corner edges; a pair of positive contacts secured to the top surface of the solar cell adjacent a second adjacent pair of the angled corner edges; a second pair of negative contacts secured to the top surface of the solar cell proximal to the second adjacent pair of the angled corner edges;



a second solar cell having a top surface and a plurality of angled corner edges; a first pair of negative contacts secured to the top surface of the solar cell proximal to a first adjacent pair of the angled corner edges; a pair of positive contacts secured to the top surface of the solar cell adjacent a second adjacent pair of the angled corner edges; a second pair of negative contacts secured to the top surface of the solar cell proximal to the second adjacent pair of the angled corner edges, the positive contacts of the second solar cell being positioned adjacent to the first pair of negative contacts of the first solar cell;

a first pair of bridge conductors extending into electrical communication between the positive contacts of the second solar cell and the first pair of negative contacts of the first solar cell.

5,567,249

**PHOTOELECTRIC CONVERSION DEVICE**

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

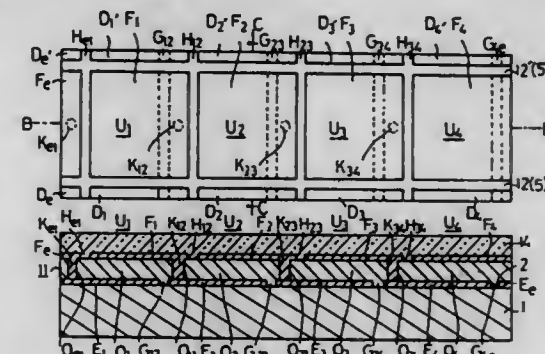
Division of Ser. No. 222,954, Apr. 5, 1994, which is a division of Ser. No. 13,209, Feb. 1, 1993, Pat. No. 5,332,450, which is a continuation of Ser. No. 839,067, Feb. 20, 1992, abandoned, which is a continuation of Ser. No. 800,666, Nov. 22, 1985, abandoned, which is a division of Ser. No. 630,063, Jul. 12, 1984, Pat. No. 4,594,471. This application Jul. 24, 1995, Ser. No. 505,960

Claims priority, application Japan, Jul. 13, 1983, 58-128270; Oct. 31, 1983, 58-204441; Mar. 26, 1984, 59-57713

Int. Cl. H01C 31/05

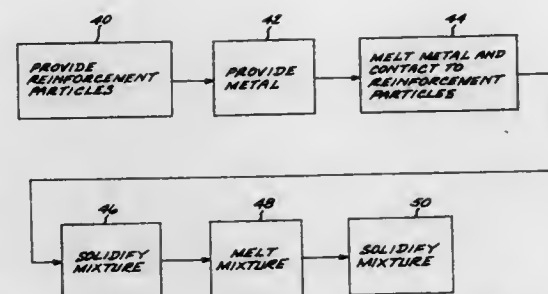
U.S. Cl. 136—249

8 Claims



1. A photoelectric conversion device comprising:  
a substrate having an insulating surface thereon; and  
a plurality of photoelectric conversion cells formed on said substrate and connected in series in one direction, each of said

photoelectric cells comprising a first electrode formed on said substrate, a semiconductor layer formed on said first electrode, and a second electrode formed on said semiconductor layer, said first electrodes having side edges extending along said one direction, said second electrodes having side edges extending along said one direction, wherein said semiconductor layer extends beyond the side edges of at least said first electrodes and series electrical connection first and second electrodes of adjacent cells is made at an inner portion of said semiconductor layer between side edges of said semiconductor layer extending along said one direction.



solidifying the mixture at a cooling rate no less than the critical cooling rate.

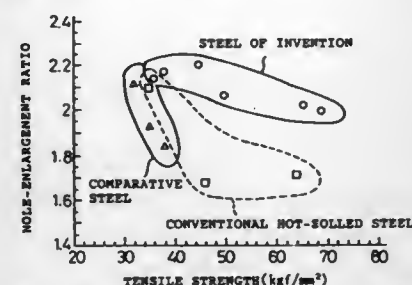
#### 5,567,250 THIN STEEL SHEET HAVING EXCELLENT STRETCH-FLANGE ABILITY AND PROCESS FOR PRODUCING THE SAME

Satoshi Akamatsu, and Yoshikazu Matsumura, both of Futtsu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan PCT No. PCT/JP94/00699, § 371 Date Dec. 20, 1994, § 102(e) Date Dec. 20, 1994, PCT Pub. No. WO94/25635, PCT Pub. Date Nov. 10, 1994

PCT Filed Apr. 26, 1994, Ser. No. 356,280  
Claims priority, application Japan, Apr. 26, 1993, 5-099891  
Int. Cl.<sup>6</sup> E21D 8/04

U.S. Cl. 148—320

6 Claims



1. A thin steel sheet having an excellent stretch-flange ability, comprising, in terms of % by weight, 0.01 to 0.20% of C, 0.005 to 1.5% of Si, 0.05 to 1.5% of Mn and not more than 0.03% of S with the balance consisting of Fe and unavoidable impurities, said thin steel sheet having a structure comprising at least one member selected from a transgranular acicular ferrite and a bainite having a packet size of 30 to 300 μm in a proportion of not less than 95% of the structure and a sheet thickness in the range of from 0.5 to 5 mm.

#### 5,567,251 AMORPHOUS METAL/REINFORCEMENT COMPOSITE MATERIAL

Atakan Peker; William L. Johnson, both of Pasadena, Calif.; Robert Schafer, Worthington, Ohio, and David M. Scruggs, Oceanside, Calif., assignors to Amorphous Alloys Corp., Laguna Niguel, Calif.

Continuation-in-part of Ser. No. 284,153, Aug. 1, 1994. This application Apr. 6, 1995, Ser. No. 417,749  
Int. Cl.<sup>6</sup> C22C 9/00

U.S. Cl. 148—522

13 Claims

1. A method of forming a reinforcement-containing metal-matrix composite material, comprising the steps of:  
providing a metal having a capability of retaining the amorphous state when cooled from its melt at a critical cooling rate of no more than about 500° C. per second;  
providing at least one piece of reinforcement material, separate from the metal;  
melting the metal and dispersing the at least one piece of reinforcement material throughout the melt to form a mixture; and

#### 5,567,252 NONTOXIC PRIMING MIX

George C. Mel, St. Louis, Mo., and James W. Pickett, Gillespie, Ill., assignors to Olin Corporation, Cheshire, Conn.  
Filed Jan. 9, 1992, Ser. No. 818,583  
Int. Cl.<sup>6</sup> C06B 47/10; 25/04; 33/00

U.S. Cl. 149—22

8 Claims

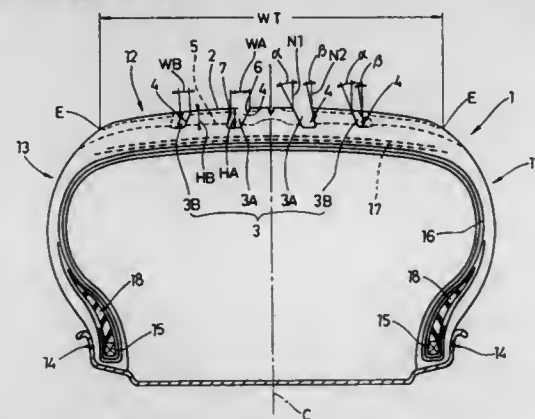
1. A nontoxic primer composition comprising diazodinitrophenol, iron oxide and boron.

#### 5,567,253 PNEUMATIC TIRE

Wako Iwamura, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan  
Filed Oct. 19, 1994, Ser. No. 325,595  
Claims priority, application Japan, Oct. 19, 1993, 5-285979  
Int. Cl.<sup>6</sup> B60C 101/02; 103/04; 115/00

U.S. Cl. 152—209 R

7 Claims



1. A pneumatic tire comprising:  
a tread portion having tread edges, said tread portion provided with an axially inner straight circumferential groove and an axially outer wavy circumferential groove on each side of a tire equator, each of said axially inner straight circumferential grooves and axially outer wavy circumferential grooves having an axially inner groove wall and an axially outer groove wall that radially extends from a groove bottom to a tread face;  
each of the axially inner and outer groove walls being inclined toward the tire equator so that a radially outer edge of each groove wall at the tread face is located axially inward of the radially inner edge of each groove wall at the groove bottom;  
each of the axially inner groove walls intersecting the tread face at an inclination angle in the range of from 25 to 45 degrees with respect to a line normal to the tread face;  
each of the axially outer groove walls intersecting the tread face at an inclination angle in the range of from 0 to 20 degrees with respect to a line normal to the tread face; and

a plurality of axial grooves for channelling water from the circumferential grooves toward the tread edges to increase aquaplane resistance, each axial groove having an open v-shaped configuration, extending continuously across the tread portion between the tread edges and intersecting the axially inner straight circumferential grooves and the axially outer wavy circumferential grooves.

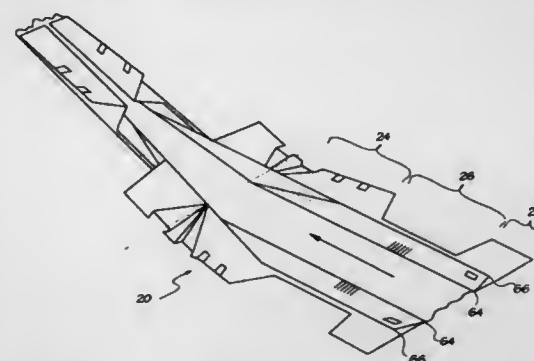
#### 5,567,254 PROCESS FOR MAKING AN ABSORBENT ARTICLE HAVING INFLECTED BARRIER LEG CUFF

David M. Sageser; Stanley G. Jurgens, and Mark D. Midkiff, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 260,638, Jun. 16, 1994, Pat. No. 5,496,428. This application Jun. 6, 1995, Ser. No. 470,935  
Int. Cl.<sup>6</sup> A61F 13/15

U.S. Cl. 156—73.1

6 Claims



1. A method for making a wearable, absorbent article having a longitudinal centerline comprising:
  - (a) providing a topsheet of indefinite length, the topsheet having a first waist region, a second waist region and a crotch region located between the first waist region and the second waist region;
  - (b) attaching a pair of longitudinally extending barrier leg cuffs to the topsheet, each of the barrier leg cuffs having a proximal portion fixed to the topsheet and a distal portion being unsecured to at least a portion of the topsheet, the distal portion secured to the topsheet outwardly of the longitudinal centerline in the first waist and second waist regions;
  - (c) associating the topsheet with a backsheet and a centrally positioned absorbent core to form a chassis having a first waist region, a second waist region and a crotch region located between the first waist region and the second waist region;
  - (d) cutting leg notches in the crotch region of the chassis;
  - (e) providing a bonding agent on the proximal half of the barrier leg cuffs in the crotch region of the chassis;
  - (f) folding the chassis so that no more than a bottom half of each barrier leg cuff becomes secured to the topsheet in the crotch region; and
  - (g) cutting the chassis transversely into individual articles.

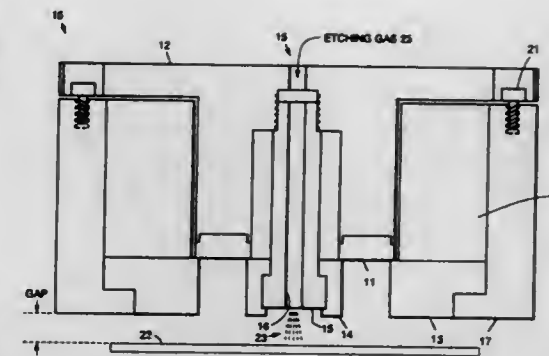
#### 5,567,255 SOLID ANNULAR GAS DISCHARGE ELECTRODE

George N. Steinberg, Westport, Conn., assignor to Integrated Process Equipment Corp., Phoenix, Ariz.  
Filed Oct. 13, 1994, Ser. No. 322,820  
Int. Cl.<sup>6</sup> H01L 21/3065

U.S. Cl. 156—345

13 Claims

1. Gas discharge apparatus for use in plasma etching apparatus, said gas discharge apparatus comprising:  
a housing;  
an annular electrode having a predetermined outer diameter and a predetermined inner diameter secured to the housing;



an annular outer chimney disposed against a face of the annular electrode adjacent its outer diameter;  
an annular inner chimney disposed against the face of the annular electrode adjacent its inner diameter, and wherein the inner chimney and the outer chimney are insulators and confine plasma discharge from the annular electrode to the face thereof;  
a hollow bolt secured to the housing and passing through the inner chimney and the annular electrode, said hollow bolt conveying etching gas through said electrode and dispersing said gas in a radially symmetric flow pattern.

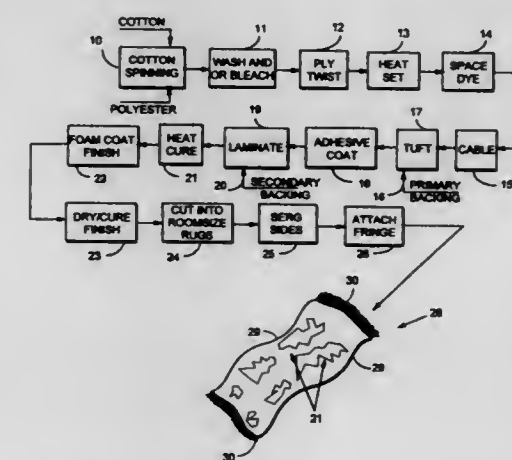
#### 5,567,256 PROCESS OF MAKING COTTON ROOM-SIZE RUGS

Lawrence E. Queen, Greensboro, N.C., and Roy E. Guess, Roanoke, Va., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Dec. 21, 1994, Ser. No. 360,153  
Int. Cl.<sup>6</sup> B32B 31/16

U.S. Cl. 156—72

19 Claims



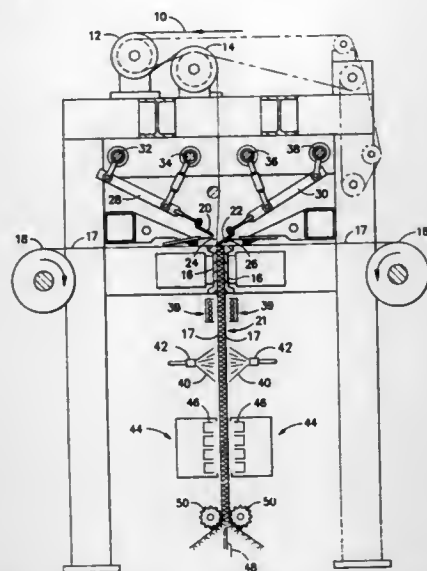
1. A method of making cotton room sized rugs, comprising the steps of substantially sequentially:
  - (a) spinning about 70–90% cotton fibers with about 30–10% low melting temperature polyester fibers, to produce blended yarns;
  - (b) heat setting the polyester fibers in the blended yarns without harming the cotton fibers so that the cotton fibers are impregnated, reinforced, and strengthened by the polyester;
  - (c) tufting the blended yarns into a primary rug backing web;
  - (d) attaching the primary backing web to a secondary backing web to produce a rug web; and
  - (e) cutting the rug web into individual room sized rugs, each having a surface area corresponding to quadrate rugs having dimensions of between about 3 feetx5 feet and 12 feetx15 feet.



# 5,567,257 METHOD FOR FORMING HEAT STABILIZED PILE FABRIC

Kenneth B. Higgins, LaGrange, Ga., and Benjamin A. Gaddis, Clemson, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.  
Division of Ser. No. 91,309, Jul. 14, 1993, Pat. No. 5,443,881, which is a continuation-in-part of Ser. No. 674,427, Mar. 22, 1991, abandoned, which is a continuation of Ser. No. 457,612, Dec. 27, 1989, abandoned. This application May 25, 1995, Ser. No. 450,023

Int. Cl.<sup>6</sup> D04H 11/00; B32B 31/18  
U.S. Cl. 156—72



1. A method for forming an adhesive bonded pile fabric comprising the steps of:

- placing pile forming yarn adjacent to and in contacting relationship with the surface of a liquid permeable base layer without tufting said yarn substantially through said base layer;
- tacking said yarn to said base layer through the application of heat;
- applying an adhesive through said base layer into contact with said yarn after said yarn has been tacked to said base layer; and
- solidifying said adhesive while in contact with said yarn such that said yarn is bound to said base layer.

# 5,567,258

## MANUFACTURE OF INSULATED GLASS UNITS

Timothy C. P. Lee, Kenilworth, and George B. Lowe, Anstey, both of England, assignors to Morton International Limited, England

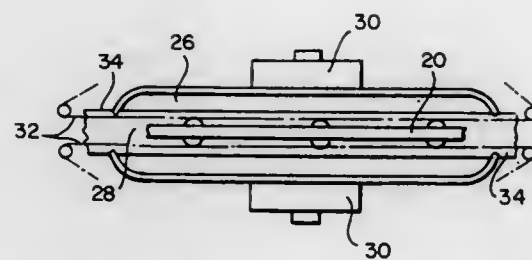
Continuation of Ser. No. 153,010, Nov. 15, 1993, abandoned, which is a continuation of Ser. No. 850,219, Mar. 12, 1992, abandoned, which is a continuation of Ser. No. 589,461, Sep. 27, 1990, abandoned. This application May 17, 1995, Ser. No. 442,911

Claims priority, application United Kingdom, Sep. 29, 1989, 89222046

Int. Cl.<sup>6</sup> B32B 31/28; B29C 71/04; G5/14; H05B 6/64  
U.S. Cl. 156—109

2 Claims

1. In a method of manufacturing an insulated glass unit wherein two glass sheets are positioned adjacent one another and spaced apart by aluminum strips positioned parallel to each of the peripheral edges of the sheets to define an air gap between them and wherein an uncured sealant is applied between the edges of the sheets to form a sealed unit and subsequently heated to bond it, an improvement comprising connecting the aluminum strips with metal corner keys to prevent arcing and subjecting the sealant,



5 Claims

aluminum strips and corner keys to microwave energy to effect said heat-bonding wherein the corner keys are made of aluminum tape.

# 5,567,259

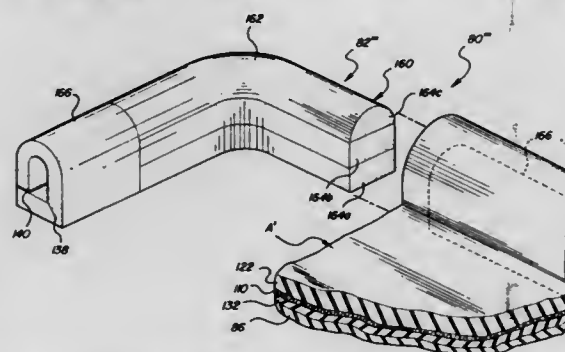
## METHODS OF MAKING A PORTABLE LIQUID CONTAINMENT

David B. Gregory, Kawkawlin, and Dan A. Oliver, West Branch, both of Mich., assignors to ReNew Roof Technologies, Inc., Bay City, Mich.

Continuation-in-part of Ser. No. 247,137, May 20, 1994, Pat. No. 5,464,492. This application Apr. 13, 1995, Ser. No. 421,197

Int. Cl.<sup>6</sup> B05D 3/02; 5/10; B32B 31/00  
U.S. Cl. 156—242

17 Claims



14. A method of making a portable liquid containment comprising:

- providing an upstanding perimetrical containment curb from resilient synthetic plastic material having an elastic memory enabling the curb to recover its shape after repeated deformations;
- enveloping said curb between an elastomeric liquid impervious polymer base layer and an elastomeric liquid impervious polymer skin layer by applying one of said layers as a fluid layer and curing it, said curb bounding and surrounding a containment area comprising said skin layer and base layer.

# 5,567,260

## METHOD FOR ATTACHING A WEB OF MATERIAL TO THE SIDE EDGES OF AN ABSORBENT ARTICLE

Ronald R. McFall, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 293,770, Aug. 19, 1994, abandoned, which is a continuation of Ser. No. 83,428, Jun. 28, 1993, abandoned. This application Jul. 12, 1995, Ser. No. 501,515

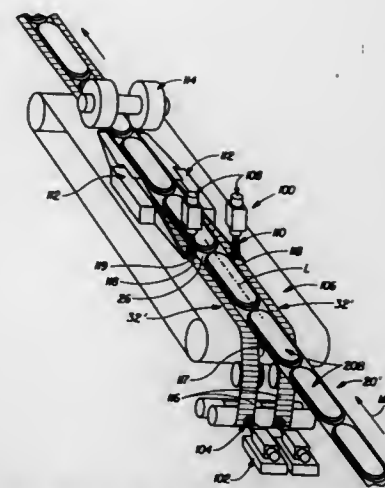
Int. Cl.<sup>6</sup> B32B 3/04; 7/14

U.S. Cl. 156—201

12 Claims

1. A method of attaching a web of material to an edge of an absorbent article comprising the steps of:

- providing an absorbent article having an edge, a first face, and a second face;
- providing a web of material, having a first edge, a second edge, and a width;



- applying adhesive to a first portion of the width of said web of material adjacent the first edge of said web of material through a nozzle using a first adhesive application mechanism;
- bringing said first portion of the width of the web of material into contact with the first face of the absorbent article so that the remaining portion of the width of the web of material comprises a second portion, and said second portion of the width of the web of material extends outward beyond the edge of said absorbent article;
- applying adhesive to a second portion of said web of material and a portion of the second face of the absorbent article adjacent the edge of said absorbent article through a nozzle using a second adhesive application mechanism;
- folding the second portion of the width of the web of material onto said second face of the absorbent article to wrap the edge of said absorbent article;
- securing the wrapped web of material to the absorbent article.

# 5,567,261

## METHOD AND APPARATUS FOR DECORATING ARTICLES HAVING A CONICAL PERIPHERAL SURFACE PORTION

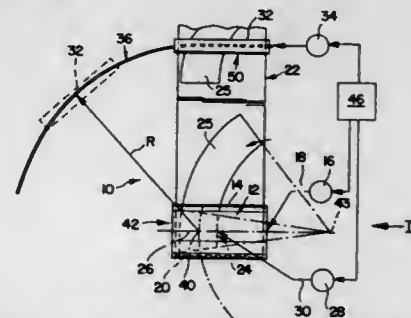
Claus Schoetz, Fuerth, Germany, assignor to Leonhard Kurz GmbH & Co., Fuerth, Germany

Continuation-in-part of Ser. No. 88,321, Jul. 7, 1993, abandoned. This application Nov. 4, 1994, Ser. No. 334,219  
Claims priority, application Germany, Aug. 6, 1992, 42 26 002.7

Int. Cl.<sup>6</sup> B44C 1/17

U.S. Cl. 156—238

6 Claims



1. A method of decorating articles having at least a generally conical peripheral surface portion with a decoration of a stamping foil, wherein the foil which is successively provided with a plurality of said decorations is unwound from a supply roll and fed to a stamping station for receiving a respective article to be decorated, in which station the decoration is transferred from the foil on to said surface portion of said article by means of a stamping roller

having a cylindrical peripheral surface and drivable by a first drive means; wherein said foil is guided around a direction-changing guide roller which is combined with the supply roll and which is arranged upstream of said station in the direction of forward feed movement of said foil; wherein the foil is passed from said guide roller to said station; wherein the guide roller is displaced into a position which is adapted to the respective rotary angular position of said article to be decorated, by said guide roller being moved by a second drive means along an at least substantially arcuate guide means arranged in a plane containing the common generatrix of the cylindrical peripheral surface of the stamping roller and said surface portion of said article, the plane further being tangent to the cylindrical peripheral surface of the stamping roller, the center of curvature of said guide means being disposed at said common generatrix of said stamping roller and said article; wherein during the stamping operation said article is driven by an associated third drive means and said stamping roller is undriven by said first drive means which serves for positioning of said stamping roller prior to the stamping operation during which the stamping roller is driven only by frictional engagement.

# 5,567,262

## TWO STAGE PRESSURE DIFFUSER

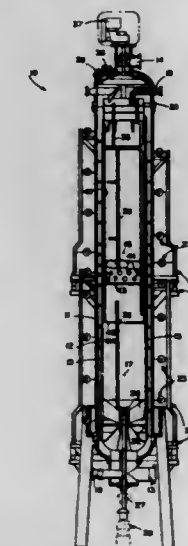
Joseph Phillips, and John Weston, both of Glens Falls, N.Y., assignors to Ahlstrom Machinery Inc., Glens Falls, N.Y.

Filed Apr. 16, 1991, Ser. No. 685,400

Int. Cl.<sup>6</sup> D21C 9/04

U.S. Cl. 162—251

15 Claims



1. A pull treating apparatus comprising:

- a general upright, liquid-tight, pressurized vessel defining, a first interior volume for containing pulp to be treated under pressure;
- a pulp inlet to the vessel;
- a pulp outlet from the vessel, the pulp flowing generally vertically between said pulp inlet and said pulp outlet;
- a screen assembly defining a surface of revolution upstanding within the vessel and defining, in part, said first interior volume containing pulp;
- extraction means for withdrawing liquid from the pulp, through said screen, and including means defining a second interior volume within the vessel for receiving the extracted liquid;
- said extraction means comprising dividing means for dividing said second interior volume, within the surface of revolution of said screen, into at least first and second subvolumes, one located above the other; and a first extraction conduit associated with said first subvolume, and a second extraction conduit associated with said second subvolume;
- first treatment liquid introduction means for introducing a first treatment liquid into said first interior volume adjacent said first subvolume; and

second treatment liquid introduction means vertically spaced from said first treatment liquid introduction means, and for introducing a second liquid, distinct from the first liquid, into said first interior volume adjacent said second subvolume.

5,567,263

# METHOD OF MANUFACTURING A PALLET OF CARDBOARD

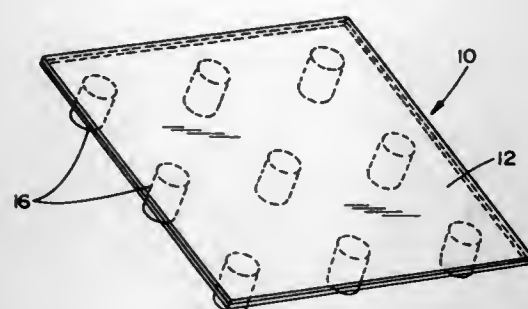
Joseph P. Giasi, 20 West Park Ave., Long Beach, N.Y. 11561

Filed Aug. 25, 1995, Ser. No. 533,138

Int. Cl.<sup>6</sup> B65D 19/34; B32B 1/00

U.S. Cl. 156—252

1 Claim



1. A method of manufacturing of cardboard construction material preliminarily a work-in-process at a manufacturer's site and subsequently a completed article-of-manufacture at a user's site a pallet of a type consisting of a weight-supporting platform having plural legs adhesively secured in depending relation therefrom to provide clearance beneath said weight-supporting platform for tines of a fork lift truck, said manufacturing method comprising the steps of removing from a cardboard substrate constructed of an undulating flute interposed between opposite surface plies a rectangular blank of a size selected to be twice the size of a weight-supporting platform of a pallet, cutting in a medial location transversely of said blank to a selected depth through one said surface ply and said undulating flute and leaving intact said other surface ply so as to allow the folding along said medial location of one half of said blank upon said other half of said blank, die-cutting in one said half blank at select locations nine openings of three rows of three openings for receiving therein cooperating leg supports for said pallet, applying a first adhesive along said three rows of three openings and folding said halves of said blank in superposed relation to each other for adhesive attachment thereof into a two ply construction to provide a work-in-process weight-supporting platform for said pallet, applying a two-part adhesive of a type chemically inert except in contacting relation to each other of which one said part is applied to a surface of said one half panel exposed through an opening of said other half panel and of which the other said part is applied to a peripheral edge of a cylindrical pallet leg support sized to be seated in a cooperating die-cut opening, and transporting in a compact condition a select number of work-in-process weight-supporting platforms and pallet leg supports in unassembled relation to each other from a manufacturer's site to a user's site, whereby each said work-in-process pallet platform and pallet leg supports are readily assembled into an article-of-manufacture pallet incident to contact of said two parts of said second adhesive thereon resulting in an embodiment having a full-sized condition for weight-supporting service.

5,567,264

Patent Not Issued For This Number

5,567,265

# METHOD FOR PRODUCING ABSORBENT GARMENT WITH CONFORMABLE PADS

Peter Zajackowski, 778 Glenridge Rd., Spartanburg, S.C. 29301

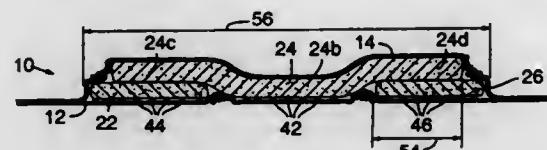
Division of Ser. No. 210,360, Mar. 17, 1994, Pat. No.

5,464,402. This application Sep. 25, 1995, Ser. No. 534,236

Int. Cl.<sup>6</sup> B32B 31/04; 31/10

U.S. Cl. 156—256

9 Claims



1. A method for producing a disposable garment comprising the steps of forming a back sheet, a liner sheet, a first elongate absorbent pad having a longitudinal center region, and a second elongate absorbent pad, placing the first pad on one of said sheets, placing the second pad on said one sheet in a position laterally offset from the center region of said first pad with an edge margin portion of said second pad loosely overlying an edge margin portion of the first pad to produce an overlap relationship therebetween, placing the other of said sheets over said first and second pads, securing the first pad to one of said sheets in a region spaced from the region of overlap between the pads, securing the second pad to one of said sheets in a region spaced from the region of overlap between the pads to permit relative lateral shifting movement between the overlapping edge margins of said first and second pads, and securing said back and liner sheets together in a region outside said first and second pads.

5,567,266

# NON-ENVIRONMENTALLY HAZARDOUS, NON-VOLATILE ADHESIVE PROMOTER COMPOSITION FOR CURING ADHESIVES

Ju-Chao Liu, West Hartford, Conn., assignor to Loctite Corporation, Hartford, Conn.

Filed Oct. 13, 1994, Ser. No. 322,936

Int. Cl.<sup>6</sup> B32B 7/00

U.S. Cl. 156—310

25 Claims

12. A method of bonding substrate surfaces with an adhesive composition consisting essentially of: treating a surface of at least one of said substrates with an adhesive promoter composition comprising a fluid carrier which remains present during the cure of said adhesive composition, said fluid carrier being selected from the group consisting of an acetic ester of a C<sub>2</sub>-C<sub>18</sub> alkenyl or aryl alcohol, an acetic ester of C<sub>3</sub>-C<sub>18</sub> allyl alcohols, an acetic ester of C<sub>7</sub>-C<sub>18</sub> alkylaryl alcohol, an acetic ester of C<sub>7</sub>-C<sub>18</sub> arylalkyl alcohol and mixtures thereof, and an adhesive promoter component which is capable of promoting the cure and/or enhancing adhesion of said adhesive and is miscible in said fluid carrier, applying an adhesive composition to the surface of at least one of the substrates, and bonding said substrate surfaces by placing them in contact with each other prior to evaporation of said fluid carrier.

5,567,267

# METHOD OF CONTROLLING TEMPERATURE OF SUSCEPTOR

Kouichi Kazama, Yamanashi-ken; Mitsuaki Komino, Tokyo; Kenji Ishikawa, Sagami-hara, and Yoichi Ueda, Yokohama, all of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

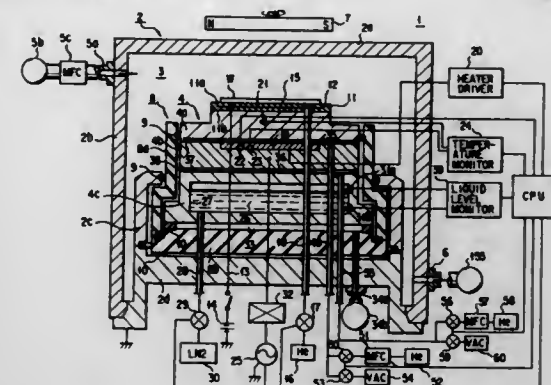
Filed Nov. 19, 1993, Ser. No. 154,451

Claims priority, application Japan, Nov. 20, 1992, 4-333786; Dec. 22, 1992, 4-356442; Mar. 1, 1993, 5-064678

Int. Cl.<sup>6</sup> C23F 1/02

U.S. Cl. 156—345

13 Claims



1. A method of controlling a temperature of a susceptor for supporting a substrate to be processed in a process chamber of a processing apparatus including a first block arranged in said process chamber and including said susceptor for supporting the substrate, a second block, arranged in said process chamber, for supplying cold to said first block, a boundary clearance being formed between said first and second blocks and on a heat transfer path, supplying means for supplying a heat transfer gas into said boundary clearance, and exhausting means for exhausting said boundary clearance, said method comprising the steps of: executing an idle mode, the idle mode including the step of exhausting said boundary clearance to set said boundary clearance in a vacuum state so as to sever the heat transfer path; shifting a state in which the heat transfer path is severed in the idle mode to a process mode, the process mode including the steps of filling said boundary clearance with the heat transfer gas to complete the heat transfer path and the step of processing the substrate on said susceptor while cooling the substrate by cold from said second block, and observing a change in temperature of said first block; and executing an initialization mode before the idle mode is executed, the initialization mode including the step of filling said boundary clearance with the heat transfer gas to complete the heat transfer path, and wherein, after a temperature of said first block reaches a set value by cold transferred from said second block through the heat transfer path, the initialization mode is directly shifted to the idle mode.

5,567,268

# PLASMA PROCESSING APPARATUS AND METHOD FOR CARRYING OUT PLASMA PROCESSING BY USING SUCH PLASMA PROCESSING APPARATUS

Shingo Kadomura, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 19, 1995, Ser. No. 374,822

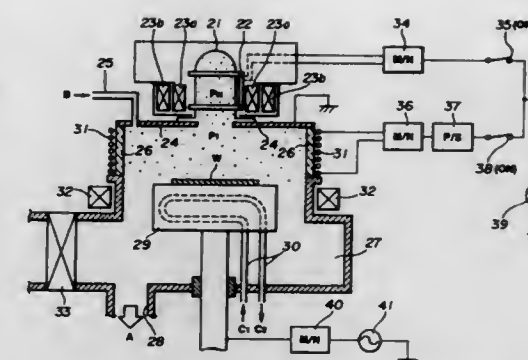
Claims priority, application Japan, Jan. 31, 1994, 6-027286

Int. Cl.<sup>6</sup> H01L 21/00

U.S. Cl. 156—345

11 Claims

1. A plasma processing apparatus comprising: a vacuum vessel for containing a wafer;



a helicon wave plasma producing section having a plasma production chamber circumferentially surrounded by a first high frequency antenna and magnetic field producing means and connected to the vacuum vessel, and adapted for supplying helicon wave plasma into the vacuum vessel; an inductively coupled plasma producing section having a second high frequency antenna which circumferentially surrounds the vacuum vessel, and adapted for producing inductively coupled plasma within the vacuum vessel; and control means for controlling operations of the helicon wave plasma producing section and the inductively coupled plasma producing section.

5,567,269

# TIRE BEAD MAKING APPARATUS WITH TWO WINDING TENSION LEVELS

Ralph W. Golightly, Gadsden, Ala., assignor to The Goodyear Tire &amp; Rubber Company, Akron, Ohio

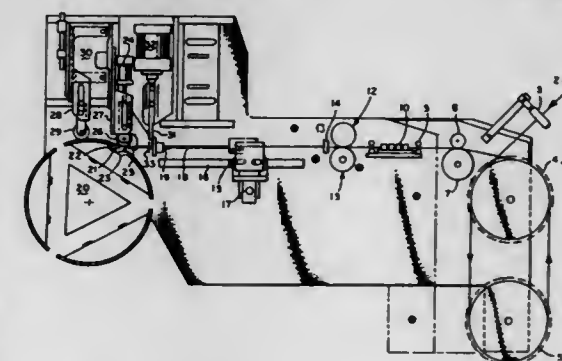
Division of Ser. No. 125,523, Sep. 23, 1993, Pat. No. 5,385,621.

This application Oct. 19, 1994, Ser. No. 325,606

Int. Cl.<sup>6</sup> B29D 30/48; B32B 31/00

U.S. Cl. 156—361

6 Claims



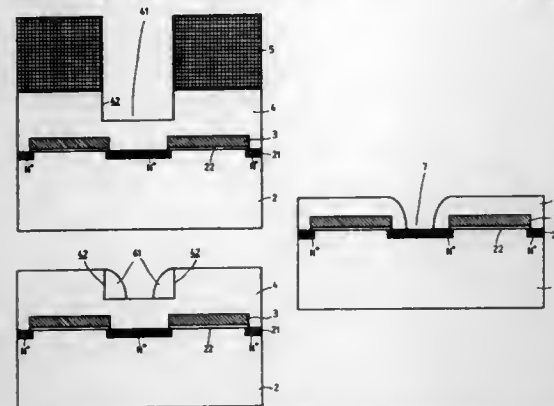
1. Apparatus for making tire beads on a forming wheel from a ribbon having a plurality of parallel wires coated with a resilient elastomeric material connecting said wires with webs of said material comprising: a. a braking pulley for supplying and controlling tension in said ribbon; b. a slitter positioned between said braking pulley and said forming wheel for cutting said webs between said wires; c. means for clamping said wires and guiding them to said forming wheel; d. means for clamping the ends of said wires on said forming wheel and helically winding separate bead bundles one from each wire under an initial low tension during the initial winding and at a higher tension after said initial winding by actuation of said braking pulley; e. means for cutting said wires and jamming the cut end of each wire into its bundle thereby completing said beads; and, f. means for removing said beads from said forming wheel.



**5,567,270**  
**PROCESS OF FORMING CONTACTS AND VIAS HAVING TAPERED SIDEWALL**  
 Ming-Hsi Liu, Chung Li City, Taiwan, assignor to Winbond Electronics Corp., Hsin-Chu, Taiwan  
 Filed Oct. 16, 1995, Ser. No. 543,525  
 Int. Cl.<sup>6</sup> H01L 21/28

U.S. Cl. 156-644.1

9 Claims



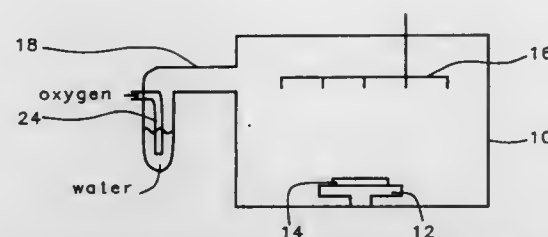
1. A process of forming a contact hole having a tapered sidewall in an integrated circuit comprising the steps of:
  - preparing a semiconductor substrate having a gate dielectric and a plurality of polysilicons on the top surface of said substrate and a plurality of doped regions inside the top surface of said substrate;
  - establishing a multi-layer insulating structure above said substrate and said polysilicons, said multi-layer insulating structure having a top insulating layer;
  - forming a photo-resist layer over said multi-layer insulating structure, said photo-resist layer having an opening defining an area for forming said contact hole and the size of said opening being slightly larger than the size of said contact hole;
  - anisotropically etching into said multi-layer insulating structure to remove about one half of the thickness of said multi-layer insulating structure through said opening, and forming a void having a vertical sidewall in said multi-layer insulating structure;
  - removing said photo-resist layer to expose said multi-layer insulating structure;
  - depositing a temporary insulating layer having the same composition as said top insulating layer uniformly over the surface of said multi-layer insulating structure;
  - anisotropically etching said temporary insulating layer to expose the top surface of said multi-layer insulating structure and forming a sidewall spacer having a tapered shape on said vertical sidewall, said spacer being a remaining part of said temporary insulating layer;
  - and anisotropically etching said multi-layer insulating structure and said spacer until said substrate is exposed in said opening and said spacer is removed.

**5,567,271**  
**OXYGEN REACTIVE ION ETCH (RIE) PLASMA METHOD FOR REMOVING OXIDIZED ORGANIC RESIDUES FROM SEMICONDUCTOR SUBSTRATES**  
 Ron F. Chu, Chet P. Lim, and Sheau-Tan Loong, all of Singapore, Singapore, assignors to Chartered Semiconductor Manufacturing Pte Ltd, Singapore, Singapore  
 Filed Jul. 26, 1995, Ser. No. 507,531  
 Int. Cl.<sup>6</sup> H01L 21/311

U.S. Cl. 156-659.11

14 Claims

1. A method for removing an oxidized photoresist residue from a semiconductor substrate comprising:
  - providing into a reaction chamber a semiconductor substrate, the semiconductor substrate having formed upon its surface an oxidized photoresist residue, the oxidized photoresist residue



being formed through implanting dopant ions into a corresponding non-implanted photoresist residue; providing into the reaction chamber a concentration of oxygen; providing into the reaction chamber a concentration of water vapor, the concentration of water vapor being introduced into the reaction chamber through desorption of an amount of water sorbed within and upon the surface of the oxidized photoresist residue formed upon the semiconductor substrate; providing a radio frequency excitation to the concentration of oxygen and the concentration of water vapor contained within the reaction chamber, the radio frequency excitation being sufficient to form a plasma; and etching the semiconductor substrate until the oxidized photoresist residue is removed.

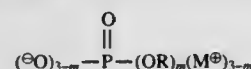
**5,567,272**  
**PROCESS FOR RECYCLING SILICONE-COATED PAPER**  
 Peter Hentzschel, Oberursel; Walter Kamutzki, Dieburg, and Dieter Wolf, Darmstadt, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt Am Main, Germany  
 Filed Aug. 28, 1995, Ser. No. 520,165  
 Claims priority, application Germany, Sep. 10, 1994, 44 32 252.6

Int. Cl.<sup>6</sup> D21H 21/02

U.S. Cl. 162-9

9 Claims

1. In a process of recycling silicone-coated paper by disintegration and the formation of new sheets of paper, the improvement comprising carrying out the disintegration in the presence of one or more salts of monophosphoric esters having the formula I



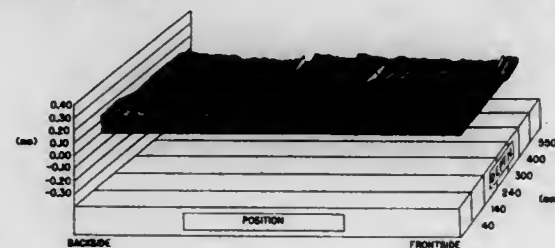
in which

R is (C<sub>8</sub>-C<sub>18</sub>)-alkyl or (C<sub>8</sub>-C<sub>18</sub>)-ethoxyalkyl;  
 m is 1 or 2; and  
 M is hydrogen, ammonium or an alkali metal.

**5,567,273**  
**METHOD OF REDUCING SURFACE IRREGULARITIES IN PAPER MACHINE HEADBOX COMPONENTS**  
 Douglas H. Offerhaus, James E. Lilburn, and Hugh D. Silver, all of Campbell River, Canada, assignors to Fletcher Challenge Canada Limited, Canada  
 Filed Jun. 17, 1994, Ser. No. 261,480  
 Claims priority, application Canada, Apr. 22, 1994, 2121967  
 Int. Cl.<sup>6</sup> D21F 1/32

U.S. Cl. 162-199

12 Claims



1. A method of reducing streaking in paper produced by a paper machine having a headbox slice beam clamp face, said method comprising the steps of:

- (a) measuring said slice beam clamp face to obtain an initial profile of surface irregularity as a function of position on said slice beam clamp face;
- (b) lapping said slice beam clamp face by driving a lap levelly on and over said slice beam clamp face while applying abrasive material and coolant therebetween;
- (c) measuring said slice beam clamp face to obtain an updated profile of surface irregularity as a function of position on said slice beam clamp face; and,
- (d) repeating steps (b) and (c) with progressively finer grades of said abrasive material until comparison of said initial and updated profiles reveals attainment of a desired flatness tolerance of said slice beam clamp face.

**5,567,274**  
**METHOD OF CONTROLLING PRESSURIZED OZONE TO A PULP DELIGNIFICATION REACTOR**

Erwin D. Funk, Glens Falls, N.Y.; Kaj Henricson, Kotka, Finland, and Stephen J. Dunn, Glens Falls, N.Y., assignors to Ahlstrom Machinery Inc., Glens Falls, N.Y.

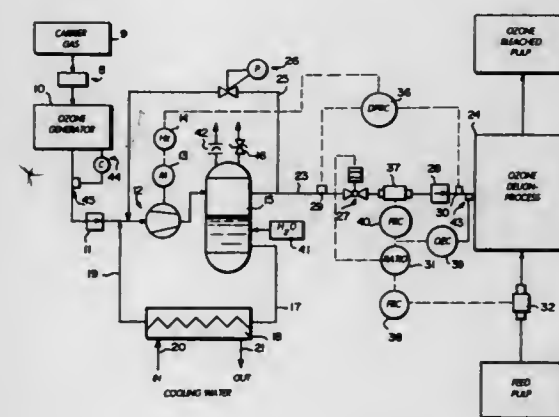
Division of Ser. No. 989,932, Dec. 7, 1992, Pat. No. 5,364,505.

This application Jul. 15, 1994, Ser. No. 275,392

Int. Cl.<sup>6</sup> D21C 7/12; 9/153

U.S. Cl. 162-49

8 Claims



1. A method of supplying ozone in a carrier gas under superatmospheric pressure to effect ozone delignification of cellulose pulp in an ozone delignification process practiced in a reactor, utilizing a compressor, comprising the steps of:

- (a) controlling the speed of operation of the compressor so that it compresses as much ozone per unit time at desired superatmospheric pressure as the ozone delignification process utilizes, with essentially no excess;
  - (b) feeding the ozone in carrier gas from the compressor essentially directly to the ozone delignification process; and
  - (c) sensing the pressure between the compressor and the reactor; and
- wherein step (a) is practiced in response to step (c) and so that the superatmospheric pressure of the ozone is greater than the pressure in the reactor.

**5,567,275**  
**PROCESS FOR MANUFACTURING PAPER FROM SEAWEED**

Clemente Nicolucci, Carmignano di Brenta, and Achille Monagato, Loria, both of Italy, assignors to Cartiera Favini S.p.A., Italy

Division of Ser. No. 327,892, Oct. 24, 1994, Pat. No. 5,472,569, which is a continuation of Ser. No. 46,270, Apr. 14, 1993, abandoned. This application Aug. 8, 1995, Ser. No. 512,641

Claims priority, application Italy, Apr. 16, 1992, VA92A0011  
 Int. Cl.<sup>6</sup> D01C 1/00

U.S. Cl. 162-99

4 Claims

1. A process for manufacturing paper from seaweed comprising of algal material, comprising the steps of:

- (a) washing algal material with water;
- (b) draining the water from the washed algal material;
- (c) treating the washed algal material with an antifungal agent to prevent putrefaction;
- (d) grinding the treated algal material to a particle size not more than 500 μm;
- (e) filtering the ground algal material particles to remove particles larger than 500 μm in size;
- (f) refining the filtered algal material particles in a paper refiner;
- (g) mixing the refined algal material particles with cellulose fiber to form a homogenous mixture; and
- (h) placing the homogenous mixture in a papermaking machine to make paper.

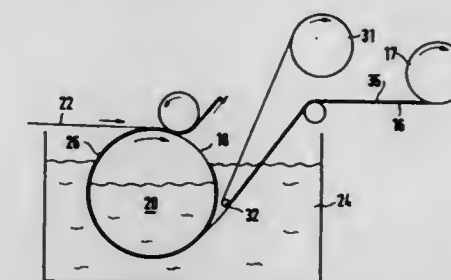
**5,567,276**  
**PAPER OF VALUE AND A METHOD OF PRODUCING IT**  
 Michael Boehm, Heimstetten, and Wittich Kaule, Emmering, both of Germany, assignors to GAO Gesellschaft fuer Automation und Organisation mbH, Munich, Germany  
 Continuation of Ser. No. 792,256, Nov. 15, 1991, abandoned.  
 This application Jul. 20, 1994, Ser. No. 278,114

Claims priority, application Germany, Nov. 16, 1990, 40 36 637.5

Int. Cl.<sup>6</sup> D21D 3/00; D21H 5/10

U.S. Cl. 162-103

17 Claims



1. A method of producing a paper of value with an optical variable element, comprising:

- (a) providing a transfer band carrying an optical variable element;
- (b) feeding the transfer band to a wet paper web being formed on a paper making machine and embedding the transfer band on a surface of the wet paper web;
- (c) calendering the paper web in the paper machine together with the transfer band lying on the surface of the paper web;
- (d) bonding the optical variable element to the paper web with sufficient strength by drying and hardening the paper web to permit removal of the transfer band; and
- (e) removing the transfer band from the paper web.

5,567,277

**CELLULOSIC, MODIFIED LIGNIN AND CATIONIC POLYMER COMPOSITION AND PROCESS FOR MAKING IMPROVED PAPER OR PAPERBOARD**

David L. Elliott, Imperial; Wood E. Hunter, Pittsburgh, and Ronald J. Falcione, Canonsburg, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.  
Continuation-in-part of Ser. No. 483,645, Jun. 7, 1995, Pat. No. 5,501,773, which is a continuation of Ser. No. 69,258, May 28, 1993, abandoned. This application Dec. 4, 1995, Ser. No. 566,469

Int. Cl.<sup>6</sup> D21H 21/10

U.S. Cl. 162-163

12 Claims

1. A process in which paper or paperboard is made by forming an aqueous cellulosic paper furnish having improved properties in the areas of drainage, retention, and formation which comprises adding to said furnish at least about 0.1 pounds per ton, based on the dry weight of the solids of said furnish, of (A) a high molecular weight cationic polymer having a weight average molecular weight greater than about 1 million wherein said cationic polymer is a copolymer derived from a cationic monomer that is selected from a group consisting of a methacryloyloxyethyl trimethyl ammonium chloride, acrylamido propyl trimethyl ammonium chloride, and methacrylamido propyl trimethyl ammonium chloride, and a non-ionic monomer that is acrylamide wherein the weight ratio of said cationic monomer: said nonionic monomer is from about 99:1 to 1:99, and at least about 0.1 pounds per ton, based on the dry weight of the solids of said furnish, of (B) a modified lignin which is a sulfonated lignin having a weight average molecular weight greater than about 10,000, draining the furnish to form a sheet, and drying said sheet, wherein the weight ratio of said cationic polymer (A): said modified lignin (B) is from about 10:1 to 1:10, on an active basis.

5,567,278

**PROCESS AND APPARATUS FOR CIRCULATING BACKWATER IN A PAPERMAKING MACHINE**

Paul O. Meinander, Grankulla, Finland, assignor to POM Technology Oy Ab, Grankulla, Finland  
PCT No. PCT/FI93/00214, § 371 Date Nov. 3, 1994, § 102(e) Date Nov. 3, 1994, PCT Pub. No. WO93/23612, PCT Pub. Date Nov. 25, 1993

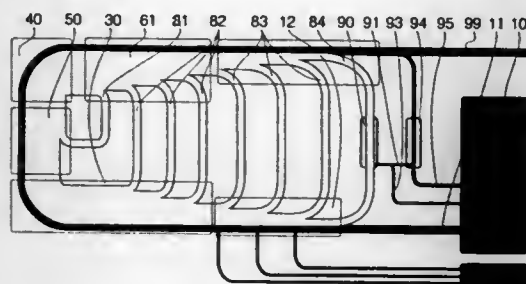
PCT Filed May 19, 1993, Ser. No. 331,537

Claims priority, application Finland, May 19, 1992, 922285

Int. Cl.<sup>6</sup> D21F 1/66

U.S. Cl. 162-190

31 Claims



1. A process for making paper or board while recycling backwater in a papermaking machine, the machine including a short circulation wherein the backwater draining through a paper forming fabric of the machine is used for papermaking stock dilution, the process comprising:

splitting at least a portion of the backwater draining through the forming fabric into at least two separate backwater flows; and pumping each of said backwater flows directly and separately without passing through any open air-containing vessels, such that said backwater flows are substantially air free separate flows to at least two essentially separate points of short circulation stock dilution.

5,567,279

**VARIABLE STAGE PRESSURE DIFFUSER**

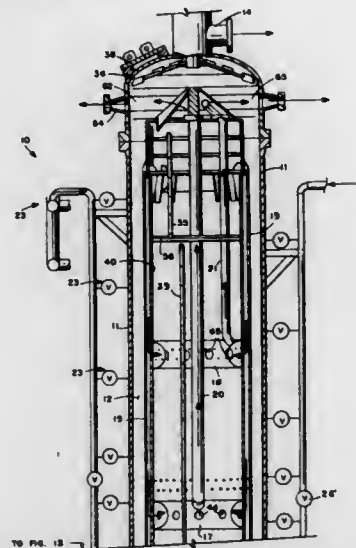
Joseph R. Phillips; John D. Weston; Victor L. Blodeau; Ronald G. Bain; Mark D. Barrett; Brian F. Greenwood, and John Pietrangolo, all of Glens Falls, N.Y., assignors to Ahlstrom Machinery Inc., Glens Falls, N.Y.

Continuation-in-part of Ser. No. 685,400, Apr. 16, 1991. This application Dec. 2, 1991, Ser. No. 801,651

Int. Cl.<sup>6</sup> D21C 9/04

U.S. Cl. 162-232

21 Claims



1. A screen and baffle assembly for a treatment vessel, comprising:

an annular screen assembly elongated in a first dimension about an axis and having first and second ends, and defining an interior volume; bearing means disposed at the first end of said screen assembly; connection means disposed at the second end of said screen assembly, connecting said screen assembly to a power source; said power source comprising means for reciprocating said screen assembly up and down within said vessel; an inner hollow cylinder, solid walled along the vast majority of the length thereof, mounted within said screen assembly and elongated in the same dimension of elongation as said screen assembly, and coaxial therewith and having a first end and a second end;

said inner cylinder and said screen assembly bearing means engaging at said first end of each;

said cylinder having a length roughly about 55-75% of the screen assembly length; and means defining a first plurality of radially extending openings in said cylinder adjacent said second end thereof, communicating with a first header disposed interiorly of said inner cylinder, with a first conduit extending from said headers to the exterior of the treatment vessel.

5,567,280

**DIGESTER FOR COOKING PULP HAVING STAGGERED CIRCULAR SCREENS FOR ISOTHERMAL COOKING**

Ake Backlund; Kenneth Bellstrom; Finn Oulie; Johanna Svanberg, and Soren Soderqvist, all of Karlstad, Sweden, assignors to Kvaerner Pulpning Aktiebolag, Karlstad, Sweden

Continuation of Ser. No. 130,558, Oct. 1, 1993, abandoned.

This application Mar. 31, 1995, Ser. No. 415,203

Claims priority, application Sweden, Nov. 18, 1992, 9203462

Int. Cl.<sup>6</sup> D21C 7/14

U.S. Cl. 162-237

9 Claims

1. A pulp digesting vessel having a generally cylindrical wall having a plurality of openings separated circumferentially about said wall, a screening apparatus comprising a plurality of screen housings each fitted in an opening in said wall for accommodating

5,567,282

**ON-CAPILLARY ELECTROPHORETIC IMMUNOSUBTRACTION FOR CLASSIFICATION AND TYPING OF M-PROTEINS**

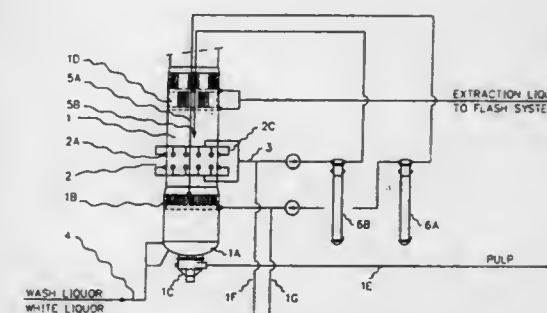
Hann-Ping Wang, 5230 Via Primaria, Yorba Linda, Calif. 92686, and Cheng-Ming Liu, 5855 Via Del Bisonte, Yorba Linda, Calif. 92687

Filed Jan. 25, 1994, Ser. No. 186,347

Int. Cl.<sup>6</sup> C25B 7/00

U.S. Cl. 204-450

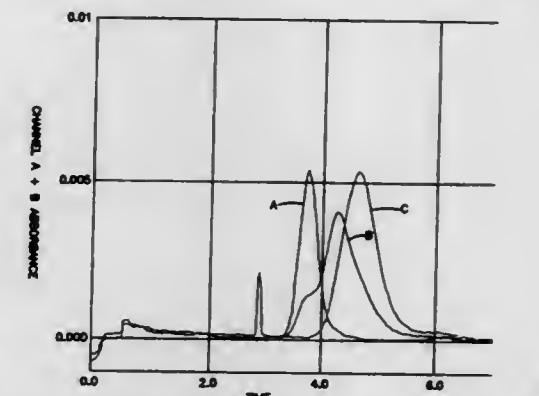
25 Claims



liquid flow to and from the vessel, at least some of said screen housings comprising a peripheral wall mounted in a said opening in the wall of the digesting vessel, said peripheral wall of each said housing defining a passageway having one side for facing the interior of the vessel and an opposite side, said opposite side being closed by a transverse wall having a passage therethrough for communication with the interior of said housing, said one side of said passageway of said peripheral wall having support means supporting a plurality of barrier members so as to extend across said opposite side of said housing in a spaced array to prevent ingress of non-liquid material into said screen housing;

said vessel having a vertically extending longitudinal axis, said plurality of openings comprising a first row of openings and a second row of openings spaced along said longitudinal axis from said first row with said openings of said second row being out of vertical alignment with each of said openings of said first row and with said openings in each row being substantially evenly spaced about said wall. Wherein said screening apparatus includes number of screens to withdraw displaced liquid for supply to said passage of each said screen housing to a central pipe, which discharges in said vessel immediately above said number of screens, and

said vessel having a lowermost screening arrangement having an upper edge, said screening apparatus having a lower edge and a distance between said upper edge of the lowermost screening arrangement and the lower edge of the screening apparatus being less than 2 meters.



1. A method for capillary electrophoretic analysis of a sample comprising at least one analyte as a constituent part, said method comprising the steps of:

- separating a first portion of the sample into constituent analyte parts by capillary electrophoresis, and detecting said parts;
- admixing a second portion of said sample with at least one specific binding partner to a predetermined candidate analyte, said specific binding partner having an electrophoretic mobility different from that of said candidate analyte;
- separating said second portion into constituent parts by capillary electrophoresis, and detecting said parts; and
- comparing the separated constituent parts of step (c) with the separated constituent parts of step (a).

5,567,283

**CAUSTIC CONCENTRATION REGULATOR FOR CHLORINE GENERATORS**

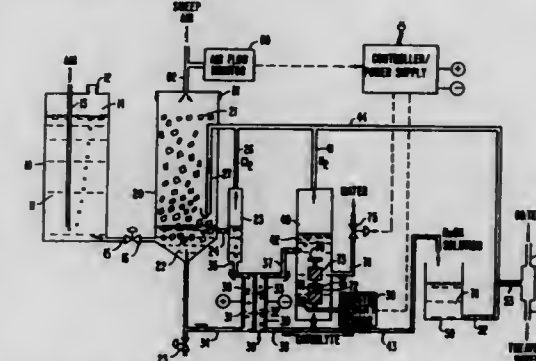
Scott Lynn, 37 Janin Pl., Pleasant Hill, Calif. 94523; Steven F. Sciamanna, 222 Rheem Blvd., Moraga, Calif. 94556, and Aldo F. Sciamanna, 3963 Oakmore Rd., Oakland, Calif. 94602

Filed Sep. 28, 1995, Ser. No. 535,853

Int. Cl.<sup>6</sup> C25B 9/00; 15/08; G05D 11/00; F16K 31/08

U.S. Cl. 204-228

4 Claims



3. A caustic tank controller which regulates the concentration of caustic in a caustic tank, the controller comprising:

- a rod vertically disposed within the caustic tank, the rod having a magnetically actuated switch therein;

5,567,281

**INHIBITION OF 141B DECOMPOSITION**

Richard M. Crooker, Lehigh; Maher Y. Elsheikh, Tredyffrin, both of Pa.; Anthony D. Kelton, Graves; Morris P. Walker, Marshall, both of Ky., and Danny W. Wright, Owatonna, Minn., assignors to Elf Atochem North America, Incorporated, Philadelphia, Pa.

Continuation of Ser. No. 119,905, Sep. 10, 1993, Pat. No. 5,531,867, which is a continuation of Ser. No. 983,919, Dec. 1, 1992, abandoned, which is a continuation-in-part of Ser. No. 869,225, Apr. 14, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 469,032

Int. Cl.<sup>6</sup> B01D 3/00

U.S. Cl. 203-6

6 Claims

1. A method for inhibiting the formation of by-products during the heating of 1,1-dichloro-1-fluoroethane, which method comprises heating 1,1-dichloro-1-fluoroethane in a distillation column made of a nickel alloy.

4. In a process for separating 1,1-dichloro-1-fluoroethane from a liquid mixture containing 1,1,1,2-tetrachloroethane in a distillation column, the improvement which comprises making said column out of a nickel alloy so as to inhibit the formation of by-products.



- (b) control means for regulating the flow of water into the caustic tank, the control means responding to said magnetically actuated switch;
- (c) a float having a magnet mounted therein and an axial hole, the float being mounted on the rod such that it is free to move along a defined length of the rod in response to buoyant forces;
- (d) stop-disks affixed to the rod at locations above and below the float at the ends of said defined length such that the float is constrained from further movement along the rod when the float encounters one of the stop-disks, wherein the float rises in response to increased caustic concentration and thereby actuates the magnetically actuated switch and causes water to flow into the caustic tank;
- wherein the caustic tank is coupled with a cathode compartment of a chlorine generating electrolytic cell such that caustic solution is recycled between the caustic tank and the cathode compartment.

4. The caustic tank controller of claim 3 further comprising means for automatically shutting down the cell if the caustic concentration in the cathode compartment exceeds a threshold value.

5,567,284

## ELECTROCHEMICAL ACTUATOR

Helmut Bauer; Foad Derisavi-Fard; Uwe Eckoldt; Ralf Gehrmann, all of Duisburg, and Heribert Kinkel, Straelen, all of Germany, assignors to Friwo Silberkraft Gesellschaft fuer Batterietechnik mbH, Duisburg, Germany

PCT No. PCT/EP94/02289, § 371 Date Apr. 7, 1995, § 102(e) Date Apr. 7, 1995, PCT Pub. No. WO95/08709, PCT Pub. Date Mar. 30, 1995

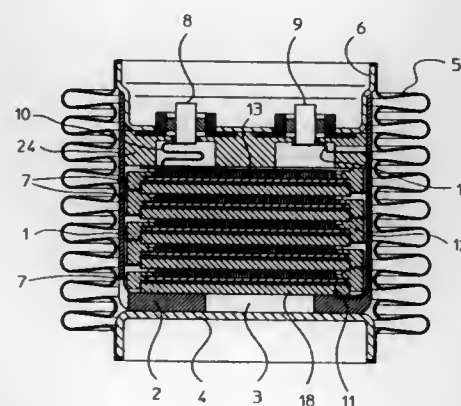
PCT Filed Jul. 7, 1994, Ser. No. 416,676

Claims priority, application Germany, Sep. 18, 1993, 43 31 763.4

Int. Cl.<sup>6</sup> C25B 9/00; H01M 8/18

U.S. Cl. 204—256

18 Claims



1. An electrochemical actuator with a sealed gas space and a plurality of cells each including a solid body electrode made of an electrochemically reversibly oxidizable material and a counter electrode, wherein a reversible electrochemical reaction initiated by a D.C. current causes a pressure increase or a pressure decrease in the gas space which can be transformed into motion, characterized in that each cell is defined by a stackable, frame-shaped spacer constructed of a material which is an electric isolator and has good heat conducting characteristics, the spacer receiving a rim of a metal cell cup (13) holding a matrix (15) soaked with an electrolyte, a solid body electrode (16), a separator (17) and a counter electrode (18), and wherein in a stack the counter electrode (18) of each cell (7) engages the cell cup (13) of the adjacent cell (7).

5,567,285  
FACILITY FOR REMOVING ELECTRO-DEPOSITED LAYERS FROM CATHODES

Francisco J. Sitges Menendez, Madrid; Fernando Sitges Menendez, Salinas; Francisco Alvarez Tamargo, Luanco; Francisco Tamargo Garcia, Castrillon; Jose M. Quiroga Alvarez, Castrillon; Ives Lefevre, Castrillon, and Carlos Gonzalez Gonzalez, Santa Cruz de Llanera, all of Spain, assignors to Asturiana De Zinc, S.A., Spain

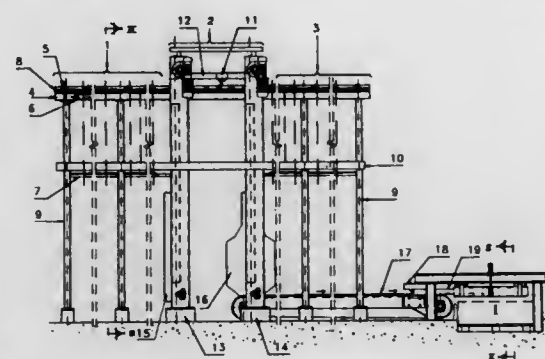
Filed May 31, 1995, Ser. No. 455,703

Claims priority, application Spain, May 31, 1994, 9401189

Int. Cl.<sup>6</sup> C25D 17/00

U.S. Cl. 204—227

20 Claims



1. A facility for removing electro-deposited layers from cathodes the facility, having a reception area for the reception of cathodes, a cathode treatment area, and a cathode storage area for cathodes from which the electro-deposited layers have been removed, the cathode treatment area having a cathode washing apparatus and an electro-deposited layer extraction apparatus, the extraction apparatus comprising:

a bracket;  
two sets of claws and two parallel rollers with each set of claws and each roller being coaxially mounted; and rotatable on two horizontal parallel bars;

the bars are connected to arms which are articulated at their lower end to the bracket, the arms are adapted to move between a maximum bar approximation position and separation position;

the bracket having a passageway between the horizontal parallel bars for receiving cathodes and is capable of vertical movement between a lower position at which it is positioned below the lower edge of a cathode received at the extraction apparatus, and an upper position at which the bracket contacts the cathode and the claws being located immediately above the upper edge of electro-deposited layer on the cathode;

the claws have a wedge shaped section with an internal surface, and the claws being adapted to rotate between a cathode approximation position at which the internal surface of the wedge shaped section is parallel to a cathode received in the bracket, and a separation position at which the internal surface rotates from the cathode, the internal surface of the wedge shaped section of the claws being near the cathode when the bracket is at an upper limiting position, which occurs when the arms tilt towards the maximum bar approximation position and the claws tilt towards the cathode approximation position.

5. The facility according to claim 1, within the washing chamber apparatus and the extraction bracket apparatus are mounted upon two consecutively positioned gantries in the facility.

5,567,286  
APPARATUS FOR REFINING A LOW CARBON STEEL MELT

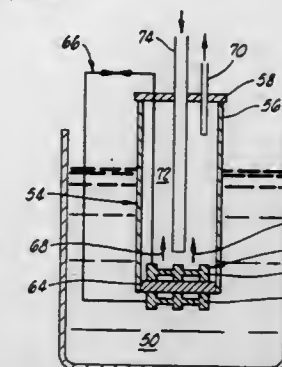
Uday B. Pal, Needham; Kuo-Chih Chou, Cambridge; Shi Yuan, Cambridge, and Zain Hasham, Cambridge, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 201,812, Feb. 25, 1994, Pat. No. 5,443,699, which is a continuation-in-part of Ser. No. 1,092, Jan. 6, 1993, Pat. No. 5,312,525. This application Apr. 20, 1995, Ser. No. 425,165

Int. Cl.<sup>6</sup> C25C 3/34

U.S. Cl. 204—246

1 Claim



1. An apparatus for electrochemically refining a low carbon steel melt comprising:

(1) a vessel for containing a low carbon steel melt wherein said low carbon steel melt includes an impurity and is characterized by a first impurity concentration; and

(2) a refining device including:

(2a) a refining gas inlet for introducing a refining gas characterized by a second impurity concentration lower than said first impurity concentration into said refining device;

(2b) a solid electrolyte ionic conductor including said impurity as an ionically conductive species;

(2c) a molybdenum-zirconia cermet electrode connected to said solid electrolyte and configured to produce a short circuit to allow for direct electronic transport between said refining gas and said melt; and

(2d) a gas outlet for exhausting impurity gas generated as said impurity is transported from said melt through said solid electrolyte ionic conductor driven by a difference between said first impurity concentration and said second impurity concentration and reduced to form said impurity gas to result in a refined low carbon steel melt characterized by a third impurity concentration less than said first impurity concentration.

5,567,287  
GAS RELEASING ELECTROCHEMICAL CELL FOR FLUID DISPENSING APPLICATIONS

Ashok V. Joshi; John H. Gordon, and Yousheng Shen, all of Salt Lake City, Utah, assignors to Ceramtec, Inc., Salt Lake, Utah

Division of Ser. No. 301,116, Sep. 6, 1994, Pat. No. 5,427,870, and a continuation-in-part of Ser. No. 58,438, May 7, 1993, Pat. No. 5,454,922. This application Jun. 27, 1995, Ser. No. 495,211

Int. Cl.<sup>6</sup> C25B 9/00

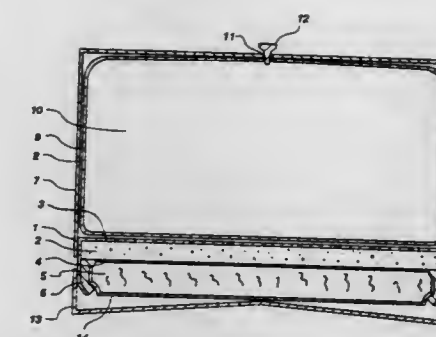
U.S. Cl. 204—265

8 Claims

1. A solid state, battery driven, fluid dispensing micropump comprising:

an electrolyte comprising of an ion transport material selected from the class of materials which transport A cations or A<sup>+</sup> cations;

a solid anode material of the general form A<sub>2</sub>O<sub>x</sub> or A<sub>2</sub>N<sub>y</sub>; wherein A is a cation with an oxidation state of 2y/x as A ions migrate across said ion conducting electrolyte, or as oxygen is



released from solid anode ions migrate across said solid ion conducting electrolyte;  
wherein A<sup>+</sup> is a cation of oxidation state 3β/α as A ions migrate across said ion conducting electrolyte;  
wherein O is an oxygen and N is nitrogen and the value for x is 1 to 3 and y is 1 to 4, α is 1 to 3 and β is 1 to 3;

a solid cathode material, said cathode material comprising a halogen ionizable to a minus one valence state or a compound consisting of carbon and halogen ionizable to a mixture of carbon and halogen with a valence of minus one state or a Group VIB substance ionizable to a minus two valence state, or where the migrating cations are reduced to elemental state at the cathode;

a fluid containing chamber having a fluid discharge outlet; and duct means providing gas communication between said anode compartment and said fluid containing chamber.

5,567,288  
CRYSTAL-ORIENTED THIN FILM MANUFACTURING APPARATUS

Masao Fukutomi; Shigeki Aoki; Kazunori Komori; Toshihisa Asano; Yoshiaki Tanaka, and Hiroshi Maeda, all of Ibaraki, Japan, assignors to Mituba Electric Mfg. Co., Ltd., Gunma, and National Research Institute for Metals, Tokyo, both of Japan

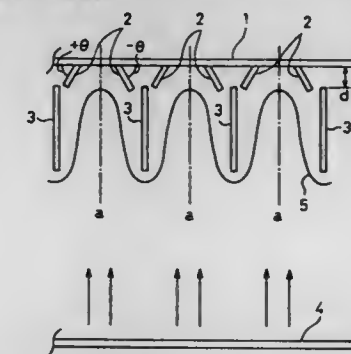
Filed Sep. 27, 1994, Ser. No. 313,339

Claims priority, application Japan, Sep. 27, 1993, 5-239512

Int. Cl.<sup>6</sup> C23C 14/34; 14/50

U.S. Cl. 204—298.06

3 Claims



1. A crystal-oriented film manufacturing apparatus, comprising a substrate electrode positioned in a horizontal plane, electrically insulated from a target disposed below said substrate electrode and having a plurality of substrate holders capable of causing a substrate to tilt by an arbitrary angle θ relative to the horizontal plane;

a plurality (n) of auxiliary electrodes arranged over said target and substantially vertically below the substrate electrode, and electrically insulated from the target;

a discharge space formed by adjacent auxiliary electrodes and the substrate electrode; and

2(n-1) substrate holders provided on the substrate electrode, pairs of the substrate holders provided for each discharge space at a position apart from a center line of an adjacent

auxiliary electrode pair by a distance  $\frac{1}{4}$  as short as the distance between the electrodes in said pair; wherein said apparatus is suitable for use in a process in which a substrate is attached to the substrate holders at an arbitrary inclination angle  $\theta$  relative to the horizontal plane with the lower end of the substrate disposed over the upper end of the closest auxiliary electrode; a negative voltage is applied both to the substrate electrode and to the auxiliary electrodes to cause a plasma boundary to form on a visionary outline drawn along surfaces of the substrate electrode and the auxiliary electrodes in the discharge space; and an oriented crystalline film is formed on the surface of said substrate.

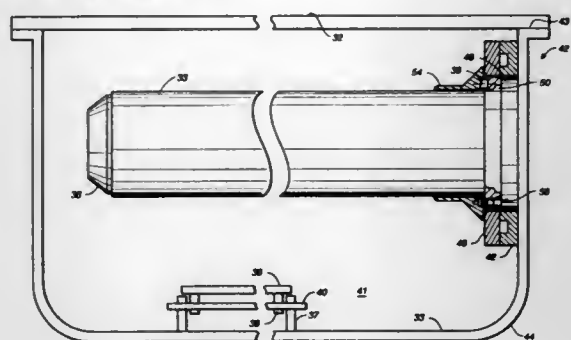
# **5,567,289** **ROTATING FLOATING MAGNETRON DARK-SPACE SHIELD AND CONE END**

Clifford L. Taylor, Nerstrand, and Daniel T. Crowley, Owatonna, both of Minn., assignors to Viratec Thin Films, Inc., Faribault, Minn.

Continuation-in-part of Ser. No. 174,533, Dec. 30, 1993. This application Aug. 4, 1994, Ser. No. 285,869  
Int. Cl.<sup>6</sup> C23C 14/35

U.S. Cl. 204—298.11

8 Claims



1. A magnetron cathode, comprising:  
a rotatable magnetron cathode having one supported end capable of being attached to a spindle and a free end;  
a shield attached to said magnetron cathode to rotate therewith at said free end, said shield facing away from a gas discharge and not overlapping a cylindrical wall of said magnetron cathode; and  
means for attaching said shield to said cathode without electrical conduction between said shield and said cathode.

**5,567,290**  
**SENSOR DEVICES**  
Pankaj M. Vadgama, Manchester; Ian M. Christie, Stockport; Yazid M. Benmakroha, Manchester, and Subrayal M. Reddy, Preston, all of United Kingdom, assignors to The Victoria University of Manchester, Manchester, England  
PCT No. PCT/GB93/01566, § 371 Date Mar. 10, 1995, § 102(e) Date Mar. 10, 1995, PCT Pub. No. WO94/02585, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 23, 1993, Ser. No. 374,740  
Claims priority, application United Kingdom, Jul. 28, 1992, 9215973

Int. Cl.<sup>6</sup> G01N 27/26

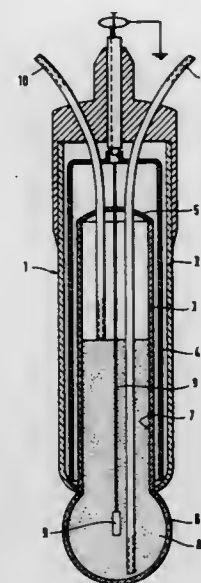
1. A sensor device comprising means for detecting components present in fluid samples and providing an output representative of the content of said component, comprising a detecting means and a membrane barrier between the detecting means and the sample to be analyzed, characterized in that the membrane barrier is composed of polyvinyl chloride (PVC) itself, in un-plasticized form and being selectively permeable to hydrogen peroxide, oxalate and oxalic acid and impermeable to paracetamol.

**5,567,291**  
**PH GLASS ELECTRODE**  
Werner Melzer, Liederbach, Germany, assignor to Hoechst Aktiengesellschaft, Germany  
Continuation of Ser. No. 190,599, Feb. 2, 1994, abandoned.  
This application Jun. 5, 1995, Ser. No. 465,569  
Claims priority, application Germany, Feb. 4, 1993, 43 03 186.2

Int. Cl.<sup>6</sup> G01N 27/36

U.S. Cl. 204—420

14 Claims



7. A pH glass electrode having a sealed glass tube sealed at an end with a pH-sensitive glass membrane, means defining an internal cavity within the tube, the cavity having a low point towards the end of the tube sealed with the pH-sensitive membrane, and, an internal reference solution in the internal cavity, and, an internal reference electrode extending into the solution, said pH glass electrode characterized by a feed tube and a drain tube extending into the cavity wherein the drain tube extends proximate to the low point of the cavity.

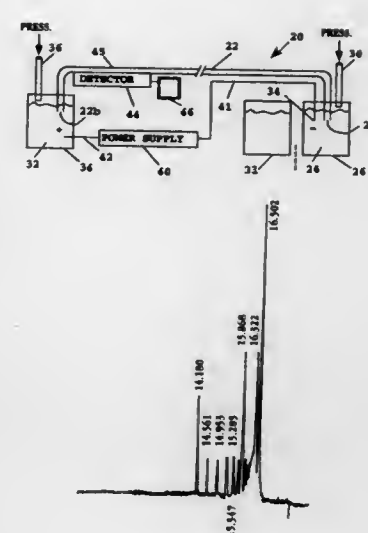
**5,567,292**  
**POLYMERS FOR SEPARATION OF BIOMOLECULES BY CAPILLARY ELECTROPHORESIS**  
Ramakrishna S. Madabhushi, Foster City; Steven M. Menchen, Fremont; J. William Efcavitch, San Mateo, and Paul D. Grossman, Burlingame, all of Calif., assignors to The Perkin-Elmer Corporation, Foster City, Calif.

Continuation-in-part of Ser. No. 170,078, Dec. 17, 1993, abandoned. This application Dec. 6, 1994, Ser. No. 350,852  
Int. Cl.<sup>6</sup> C07K 1/26; C25B 7/00; 15/00

U.S. Cl. 204—451

10 Claims

1. A method of suppressing electroosmotic flow and analyte-wall interactions in capillary electrophoresis, the method comprising providing a separation medium containing one or more uncharged water-soluble silica-adsorbing polymers having (i) water solubility in a temperature range between about 20° C. and about 50° C., (ii) a concentration in the separation medium in a range between about 0.001% and about 10% weight/volume, (iii) a molecular weight in the range between about  $5 \times 10^3$  and about  $1 \times 10^6$  daltons, (iv) an absence of charged groups in an aqueous medium having a pH in the range between about 6 and about 9; and  
the separation medium having a viscosity of less than about 1000 centipoise.



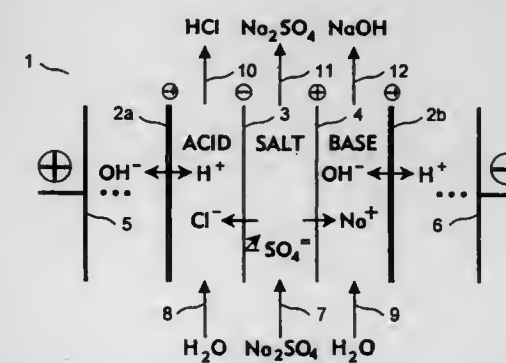
# **5,567,293** **ELECTROMEMBRANE PROCESSES FOR THE TREATMENT OF KRAFT MILL ELECTROSTATIC PRECIPITATOR CATCH**

Michael Paleologou, Pierrefonds; Richard M. Berry, Ile Perrot; Rokhsareh Thompson, Pointe Claire, and James T. Wearing, Vancouver, all of Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe-Claire, Canada  
Filed Dec. 22, 1994, Ser. No. 362,200

Int. Cl.<sup>6</sup> B01D 61/44

U.S. Cl. 204—523

30 Claims



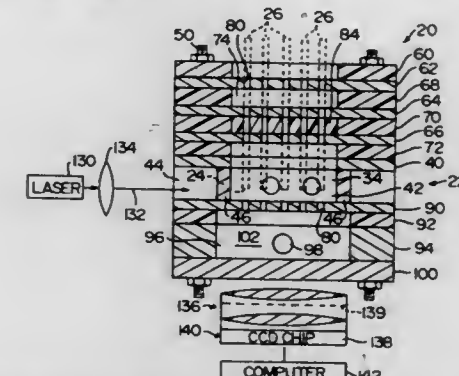
1. A single-stage electrodialysis process comprising:  
(a) providing a cell comprising an anode, a cathode and at least two compartments therebetween separated by a monovalent anion-selective membrane,  
(b) feeding an aqueous solution of a mixture of alkali metal salts of monovalent chloride anions and polyvalent anions into a first of said compartments to contact a first side of said monovalent anion-selective membrane, said solution being substantially free of polyvalent metal ions,  
(c) feeding a liquid comprising water into a second of said compartments to contact a second side of said monovalent anion-selective membrane,  
(d) passing a direct current through said cell between the anode and cathode to effect migration of monovalent chloride anions from said first compartment through said monovalent anion-selective membrane into said second compartment, and  
(e) recovering a solution of alkali metal salts of the polyvalent anions depleted in salts of the monovalent chloride anions from said first compartment.

**5,567,294**  
**MULTIPLE CAPILLARY BIOCHEMICAL ANALYZER WITH BARRIER MEMBER**  
Norman J. Dovichi, and Jian Z. Zhang, both of Edmonton, Canada, assignors to Board of Governors, University of Alberta, Alberta, Canada  
Filed Jan. 30, 1996, Ser. No. 593,877

Int. Cl.<sup>6</sup> G01N 27/26; 27/447

U.S. Cl. 204—603

13 Claims



1. An analyzer for analyzing an organic sample, said analyzer comprising:  
(a) a plurality of capillary tubes arranged side by side, each capillary tube having first and second ends, the second ends of the capillary tubes terminating adjacent each other and the first ends being connectable to a source of organic sample,  
(b) a flow chamber having an interior cavity, the second ends of the capillary tubes terminating inside the interior cavity,  
(c) means to force said organic sample through the capillary tubes from the first ends of the capillary tubes to the second ends of the capillary tubes,  
(d) means to provide sheath fluid into the interior cavity of said flow chamber to provide a flow of sheath fluid past the second ends of the capillary tubes and for entraining organic sample from said capillary tubes in individual sample streams from the second ends of the capillary tubes,  
(e) a barrier member spaced from the second ends of said capillary tubes, said barrier member including a plurality of openings therein, said openings being aligned with said second ends of said capillary tubes for the individual sample streams therefrom to pass through said openings, said barrier member having a first side facing said second ends of said capillary tubes, and a second side opposite said first side,  
(f) radiation means providing electromagnetic radiation having a wavelength that may excite said sample to emit radiation, said radiation means being positioned to illuminate said sample streams between said second ends of said capillary tubes and said first side of said barrier member,  
(g) and radiation detection means on said second side of said barrier means for detecting radiation which is emitted from said sample streams and which passes through said openings to said second side of said barrier member.

**5,567,295**  
**METHOD AND APPARATUS FOR MAKING STAGGERED BLADE EDGE CONNECTORS**  
Deepak N. Swamy, and Victor K. Pecone, both of Austin, Tex., assignors to Dell USA L.P., Austin, Tex.  
Filed Jan. 11, 1994, Ser. No. 180,175

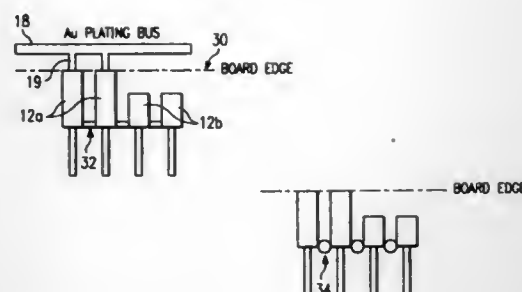
Int. Cl.<sup>6</sup> C25D 5/02

U.S. Cl. 205—125

11 Claims

1. A method for making an edge connector on a circuit board, comprising the steps of:  
creating a plurality of blades on an edge of the circuit board, each of said blades having a first end portion for connecting to components on the circuit board and a second end portion for connecting to a mating connector socket, wherein said second





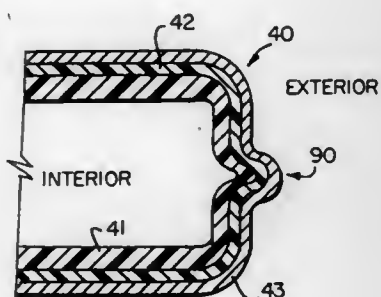
end portion of at least a first one of said blades is shorter than said second end portion of at least a second one of said blades;  
electrically connecting at least one of said blades to a plating cathode;  
electrically interconnecting said blades via a shorting bus wherein said shorting bus is physically connected to each of said blades at said second end portion;  
plating said blades with an electrically conductive substance after said steps of electrically connecting and placing; and  
removing portions of said shorting bus between said blades after said plating.

5,567,296

**PROCESS FOR PRODUCING VEHICULAR FUEL TANKS**  
Daniel Luch, 17161 Copper Hill Dr., Morgan Hill, Calif. 95037  
Division of Ser. No. 271,266, Jul. 6, 1994, which is a continuation of Ser. No. 5,556, Jan. 19, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 484,082  
Int. Cl.<sup>6</sup> C25D 5/54

U.S. Cl. 205—158

9 Claims



1. A process for the production of a vehicular fuel tank having reduced evaporative emissions of hydrocarbon fuel comprising the following steps:

co-extruding multiple polymeric compositions to form a multilayered polymeric melt parison, said multilayered polymeric melt parison having a directly electroplateable resin at an exterior surface,  
clamping said parison in a mold having an interior mold surface, injecting a pressurized gas to force and expand said polymeric melt parison against said interior mold surface to create a molded polymeric structure,  
removing said molded polymeric structure from said mold, immersing said molded polymeric structure in an electroplating bath containing Group VIII metal ions and,  
electrodepositing a first stratum of Group VIII-based metal or Group VIII-based metal alloy adherent onto said directly electroplateable resin, wherein a vehicular fuel tank having reduced evaporative emission of hydrocarbon fuel is produced.

5,567,297

**PROCESS FOR DEPOSITING BY ELECTROPOLYMERIZATION ON ORGANIC FILM ONTO AN ELECTRICALLY CONDUCTIVE SURFACE**  
Marc Mertens, Spa; Cedric Calberg, Liège; Lucien Martinot, Olne; Robert Jerome, Tilff, and Jean Schrijnemackers, Embourg, all of Belgium, assignors to Recherche et Développement du Groupe Cockerill Sambre en abrégé: "RD-CS", Ougrée, Belgium

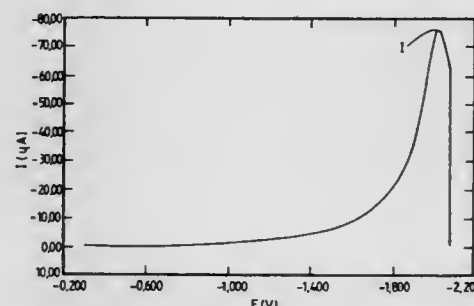
Filed Jan. 19, 1995, Ser. No. 374,431

Claims priority, application Belgium, Jan. 20, 1994, 09400067

Int. Cl.<sup>6</sup> C25B 3/00; C25D 11/00

U.S. Cl. 205—334

25 Claims



1. A process for depositing by electropolymerization an organic film onto an electrically conductive surface, wherein use is made of a mixture comprising:

(a) at least one monomer suited for forming a reconductive polymer on said surface,  
(b) at least one material which can be linked to said polymer,  
(c) a supporting electrolyte, and  
(d) a solvent,  
said mixture being subjected to electrolysis so as to create a cathodic reaction wherein said conductive surface to be coated is used as cathode at a potential situated in the range corresponding to electron transfer between the conductive surface and the monomer of a value equal to, near or more negative than the value corresponding to an inhibition peak of the cathodic reaction of the monomer, but less negative than a reaction of the solvent or of the supporting electrolyte, and said material to be linked to the polymer being a reactive substance which can chemically react with growing polymeric chains formed starting from the monomer.

5,567,298

**METHOD OF OPERATING CHLOR-ALKALI CELLS**  
Donald W. DuBois, Irwin; Bernard A. Maloney, Murrysville, and Stanley R. Pickens, Monroeville, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 637,104, Jan. 3, 1991, abandoned.

This application Feb. 25, 1992, Ser. No. 841,898

Int. Cl.<sup>6</sup> C25B 15/00; I/34

U.S. Cl. 205—350

24 Claims

1. In the method of producing chlorine and alkali metal hydroxide in an electrolytic chlor-alkali cell having an anolyte compartment containing an anode, a catholyte compartment containing a cathode, and a liquid-permeable diaphragm of a non-asbestos fibrous synthetic material resistant to cell operating conditions, said diaphragm separating the anolyte compartment from the catholyte compartment, wherein alkali metal chloride brine is fed to the anolyte compartment of the cell, and wherein the cell electrolyzes said alkali metal chloride at a less than desired current efficiency, wherein the improvement comprises increasing current efficiency of said cell while the cell is operating by the sequential steps of (a) adding clay mineral to the anolyte compartment, (b) lowering the pH of the anolyte to within the range of from about 0.9 to about 2.0, and (c) maintaining said lowered pH for from about 45 minutes to about 2 hours to increase the current efficiency of the cell.

5,567,299

**PROCESS FOR THE ELECTROCHEMICAL OXIDATION OF ARYLKETONES**

Ricardo E. Borjas, Corpus Christi, Tex.; Carina Araullo-McAdams, Wilmington, N.C.; Steven R. Alexander; George A. Blay, both of Corpus Christi, Tex., and Yaw-Hwa Liu, Sugarland, Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 437,595, May 9, 1995, Pat. No. 5,500,099. This application Dec. 21, 1995, Ser. No. 577,679

Int. Cl.<sup>6</sup> C25B 3/02

U.S. Cl. 205—449

22 Claims

1. A process for preparing arylglyoxals which comprises the steps of (a) electrochemically oxidizing an arylketone at a pH of less than about seven and at a temperature of from about -20° C. to about 120° C. in the presence of an electrolyte for a sufficient period of time to form an arylacetal, and (b) subjecting said acetal to hydrolysis for a sufficient period of time and under temperature and pressure conditions to form said arylglyoxal.

5,567,300

**ELECTROCHEMICAL METAL REMOVAL TECHNIQUE FOR PLANARIZATION OF SURFACES**

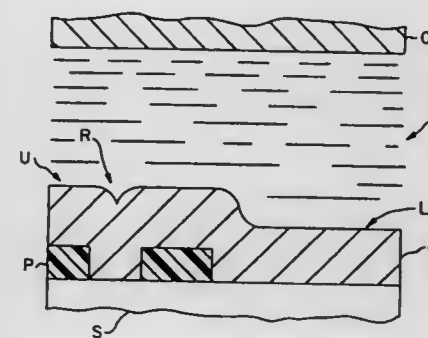
Madhav Datta, Yorktown Heights, and Terrence R. O'Toole, Webster, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Sep. 2, 1994, Ser. No. 300,623

Int. Cl.<sup>6</sup> C25F 3/14; 7/00

U.S. Cl. 205—652

22 Claims



11. A method of planarizing metal film on a substrate surface, the method including the steps of:

providing a cathode;  
providing an aqueous electrolyte disposed between the film and the cathode;  
adding an electrical resistance additive substance to the electrolyte;  
mixing the electrolyte and the additive substance to form a resistive electrolytic mixture;  
providing voltage means;  
spraying the resistive electrolytic mixture through localized impingement onto said metal film; and  
establishing a potential difference between the film and the cathode by the voltage means while performing relative lateral motion of the cathode parallel to the film so that the film is electrochemically planarized.

14. The method according to claim 11, wherein an inter-electrode distance between the film and the cathode is less than or equal to 3 millimeters.

5,567,301

**ANTIBODY COVALENTLY BOUND FILM IMMUNOBIOSENSOR**

Joseph R. Stetter, Naperville; Peter J. Hesketh, Chicago; Steven M. Gendel, Naperville, and G. Jordan MacLay, Maywood, all of Ill., assignors to Illinois Institute of Technology, Chicago, Ill., and United States of America, Washington, D.C.

Filed Mar. 1, 1995, Ser. No. 396,229

Int. Cl.<sup>6</sup> G01N 27/26

U.S. Cl. 205—777.5

25 Claims

25. A process for measuring antigen-antibody binding reactions comprising:

contacting a material comprising a chosen antigen with a biosensor comprising a substrate material, at least one covalently bound antibody corresponding to said chosen antigen immobilized on said substrate material, and impedance detection means for measuring an impedance of said biosensor; and  
measuring the impedance between two metal contact-electrodes of said biosensor.

5,567,302

**ELECTROCHEMICAL SYSTEM FOR RAPID DETECTION OF BIOCHEMICAL AGENTS THAT CATALYZE A REDOX POTENTIAL CHANGE**

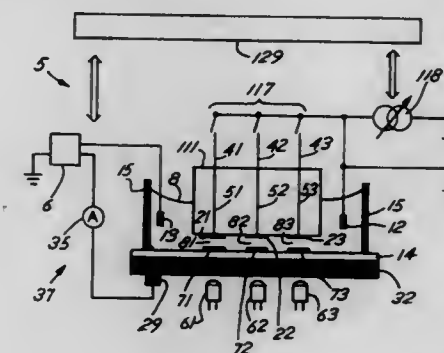
Herking Song, Fremont, and Dean G. Hafeman, Hillsborough, both of Calif., assignors to Molecular Devices Corporation, Sunnyvale, Calif.

Filed Jun. 7, 1995, Ser. No. 483,249

Int. Cl.<sup>6</sup> G01N 27/26

U.S. Cl. 205—777.5

20 Claims



1. A method for detecting biochemical agents that catalyze a redox potential change comprising the steps of:

(a) electrochemically contacting an electrolyte containing the biochemical agents with a first electrode and a second electrode;  
(b) measuring a change in the redox potential of the electrolyte through the first electrode;  
(c) delivering coulometric feedback to the electrolyte through the second electrode, in response to a measured change in the redox potential of the electrolyte, in an amount sufficient to maintain the electrolyte at a substantially constant redox potential; and  
(d) quantizing the amount of coulometric feedback necessary to maintain the electrolyte at the substantially constant redox potential.

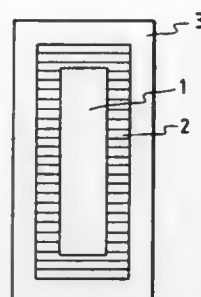
**5,567,303**  
**HYDROGEN STORING MEMBER AND PROCESS FOR**  
**STORING HYDROGEN INTO THE HYDROGEN**  
**STORING MEMBER**

Keisuke Yamamoto, Atsugi, and Toshiyuki Komatsu, Hiratsuka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 34,648, Mar. 22, 1993, Pat. No. 5,391,366, which is a continuation of Ser. No. 562,904, Aug. 6, 1990, abandoned. This application Nov. 22, 1994, Ser. No. 345,714 Claims priority, application Japan, Aug. 4, 1989, 1-203036 Int. Cl.<sup>6</sup> G25B 1/02

U.S. Cl. 205—637

3 Claims



1. A process for preparing a hydrogen storing member containing hydrogen, which comprises:

- charging aqueous solution containing hydrogen or its isotope into a temperature-controllable thermostat tank and disposing a hydrogen storing member connected to a cathode and anode in the aqueous solution, wherein the hydrogen storing member comprises, a thick first hydrogen storing material member generating  $\beta$  phase which is capable of storing hydrogen at a first temperature range and generating  $\beta$  phase which is capable of storing hydrogen at a second temperature range set at a lower temperature than the first temperature range, a thin film of a second hydrogen storing material provided on the thick first hydrogen storing material member generating  $\alpha$  phase which is capable of releasing hydrogen at the first temperature range and generating  $\beta$  phase which is capable of storing hydrogen at the second temperature range set at a lower temperature than the first temperature range, and a thin film of said first hydrogen storing material generating  $\beta$  phase which is capable of storing hydrogen at the first temperature range and generating  $\beta$  phase which is capable of storing hydrogen at the second temperature range set at a lower temperature than the first temperatures range;
- setting the thermostat tank at a temperature within the second temperature range and applying voltage to the cathode and the anode to carry out a first electrolysis; and
- setting the thermostat tank at a temperature within the first temperature range and applying voltage to the cathode and the anode to carry out a second electrolysis.

**5,567,304**  
**ELIMINATION OF ISLAND FORMATION AND**  
**CONTACT RESISTANCE PROBLEMS DURING**  
**ELECTROETCHING OF BLANKET OR PATTERNED**  
**THIN METALLIC LAYERS ON INSULATING**  
**SUBSTRATE**

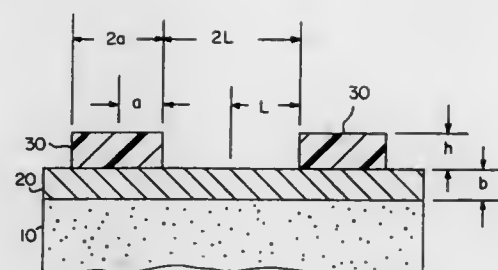
Madhav Datta, Yorktown Heights; Lubomyr T. Romankiw, Briarcliff Manor, and Ravindra V. Shenoy, Peekskill, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Jan. 3, 1995, Ser. No. 367,550  
 Int. Cl.<sup>6</sup> B23H 3/02; 7/18; 9/06

U.S. Cl. 205—666

22 Claims

1. A method of electrochemically micromachining a metal film



having a surface at least partially covered with an insulating mask having a plurality of openings, said method comprising the steps of:

calculating a numerical relationship among a plurality of values including a, h, and L wherein the insulating mask has a thickness h and at least one of said plurality of openings has a width 2L and is spaced a distance 2a apart from another one of said plurality of openings wherein the numerical relationship among a, h, and L is calculated and h is varied to prevent island formation during electrochemical micromachining of the metal film;

forming the insulating mask on the surface of the metal film according to the calculated numerical relationship; and electrochemically micromachining the metal film.

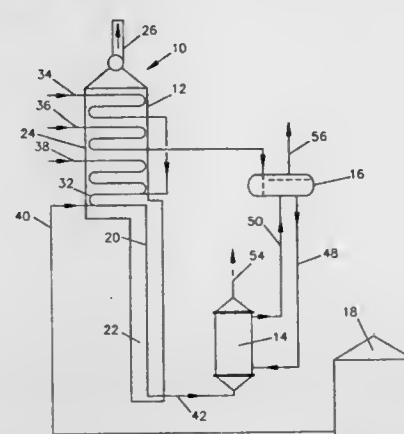
**5,567,305**  
**METHOD FOR RETARDING CORROSION AND COKE**  
**FORMATION AND DEPOSITION DURING PYROLYTIC**  
**HYDROCARBON PROCESSING**

Hong K. Jo, 249 E. Borromeo Ave., Placentia, Calif. 92760  
 Continuation-in-part of Ser. No. 103,291, Aug. 6, 1993, Pat. No. 5,358,626, This application Oct. 11, 1994, Ser. No. 321,115

Int. Cl.<sup>6</sup> C10G 9/00

U.S. Cl. 208—48 R

4 Claims

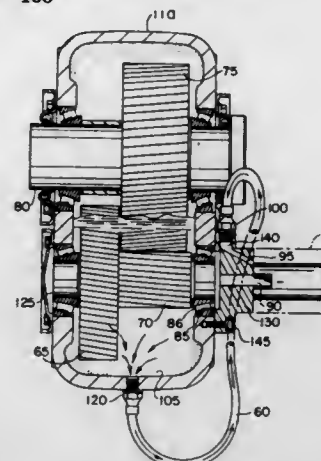


1. A method for inhibiting the formation and deposition of coke on the coil of a pyrolysis furnace having a radiation stage and convection stage during high temperature processing of hydrocarbon feed stock for the production of ethylene while minimizing corrosion of the coils which comprises: adding to the hydrocarbon feed stock in the coil at the end of the convection stage of the pyrolysis furnace a mixture of Group IA metal salt, a Group IIA metal salt, an aluminum compound and a silicon compound.

**5,567,306**  
**LUBRICANT FILTERING SYSTEM**  
 Gary DeWachter, Greenville, S.C., assignor to Reliance Electric Industrial Co., Greenville, S.C.  
 Continuation of Ser. No. 52,064, Apr. 22, 1993, abandoned.  
 This application Mar. 27, 1995, Ser. No. 410,407  
 Int. Cl.<sup>6</sup> B01D 35/02

U.S. Cl. 210—168

9 Claims



1. A speed reducer comprising:  
 a housing having a sump for containing a lubricant fluid, said housing including a sidewall having an opening therein;  
 at least one rotatable shaft mounted within said housing, said shaft having a free end defining an end face;  
 a bearing assembly mounted within the opening of said housing for supporting the free end of said shaft for rotation with respect to said housing, said bearing assembly including a first side facing axially toward an interior of said housing and being in direct fluid communication with said sump, and a second side facing exteriorly of said housing, wherein said bearing assembly is configured and arranged to pump fluid from said second side to said first side upon rotation thereof;  
 an adapter plate including opposed first and second mounting surfaces, wherein the first mounting surface of said adapter plate is mounted to the side wall of said housing to cover said opening, said adapter plate including an outlet passage therethrough including a first side on the first mounting surface and a second side on the second mounting surface, wherein the first side of said outlet passage is positioned adjacent the end face of said shaft, and wherein said adapter plate includes an inlet passage having a first side and a second side, wherein the second side of the said inlet passage is positioned on said second mounting surface;  
 lubricant directing means for directing lubricant between the first side of said inlet passage and said sump;  
 a lubricant filter including an inlet and an outlet; and  
 means for mounting said lubricant filter to the second mounting surface of said adapter plate such that the second side of said inlet passage communicates with the inlet of said filter and the second side of the outlet passage communicates with the outlet of said filter;  
 whereby rotation of said shaft causes said bearing assembly to pump lubricant through said filter.

**5,567,307**  
**SYSTEM AND A METHOD FOR USING A SMALL**  
**SUPPRESSOR COLUMN IN PERFORMING LIQUID**  
**CHROMATOGRAPHY**

Shreekant V. Karmarkar, New Berlin, Wis., assignor to Lachat Instruments, Milwaukee, Wis.

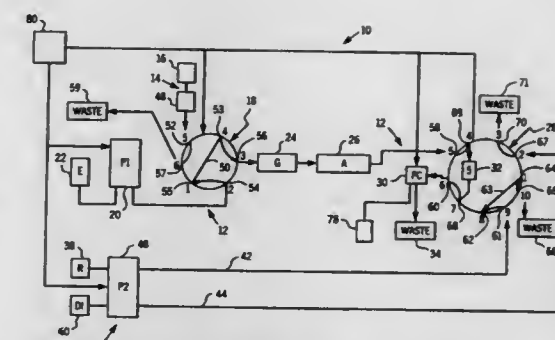
Filed Sep. 30, 1994, Ser. No. 316,641

Int. Cl.<sup>6</sup> B01D 15/08

U.S. Cl. 210—198.2

10 Claims

1. A system for consistently performing liquid chromatography of ionic species, comprising:



a transport assembly adapted to transport an eluant;  
 a sample portion injector including a valve connected to the transport assembly to selectively permit introduction of a plurality of sequential sample portions into the eluant, each sample portion containing at least one ionic species;  
 an analytical column connected to the transport assembly and disposed to receive the plurality of sequential sample portion and eluant therethrough, wherein the at least one ionic species is separated from the sample portion;  
 a suppressor column connected to the transport assembly downstream from the analytical column, wherein the suppressor column suppresses the electrical conductivity of the eluant;  
 a regeneration assembly cooperating with the suppressor column to supply regenerant through the suppressor column, the regeneration assembly including a regenerant reservoir configured to receive a portion of regenerant;  
 a deionized water delivery system to deliver deionized water to the suppressor column; and  
 a valve assembly which controls the flow of the regenerant, the deionized water, the eluant, and the at least one ionic species through the suppressor column, wherein the valve assembly is automatically actuable to selectively provide fluid communication between the regenerant reservoir and the suppressor column to direct a flow of the portion of regenerant through the suppressor column between the introduction of each sample into the eluant, further wherein the valve assembly is actuable to direct the deionized water through the regenerant reservoir to force the portion of regenerant out of the regenerant reservoir and into the suppressor column.

**5,567,308**  
**POINT-OF-USE WATER FILTRATION AND DISPENSING**  
**UNIT**

Timon J. Visser, Hamilton, Australia, assignor to Visshill-Tech (Patents) Pty. Limited, Wickham, Australia

PCT No. PCT/AU92/00488, § 371 Date Mar. 17, 1994, § 102(e) Date Mar. 17, 1994, PCT Pub. No. WO93/05861, PCT Pub. Date Apr. 1, 1993

PCT Filed Sep. 17, 1992, Ser. No. 211,028

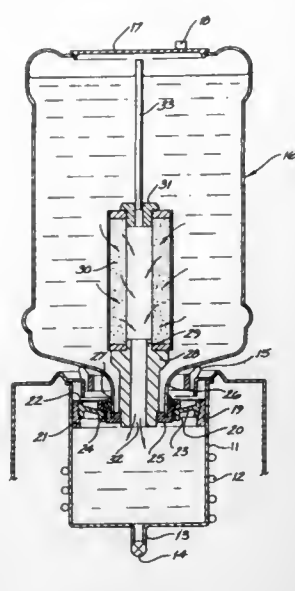
Claims priority, application Australia, Sep. 17, 1991, PK8405 Int. Cl.<sup>6</sup> B01D 35/30

U.S. Cl. 210—232

13 Claims

1. A point-of-use water filtration and dispensing unit, comprising an unfiltered water container removably supported above a filtered water reservoir, the container having an inlet for in situ addition of unfiltered water to the container and an outlet communicating with the reservoir, the filtered water reservoir communicating with a dispensing outlet having tap means, a seal removably sealed to the reservoir and adapted for sealing connection of the container to the reservoir, and a filter removably located in the container, the unfiltered water in the container being exposed to atmospheric pressure and held at a level above the reservoir by the tap means and the seal, the water flowing through said filter by gravity feed and entering the reservoir to replace filtered water which is dispensed from the reservoir, the seal comprising an outer sealing member which seals against an inner wall of the reservoir and an expansion member for urging the outer sealing member against the inner wall of the reservoir.





5,567,309

## SELF-FILTRATION CAP

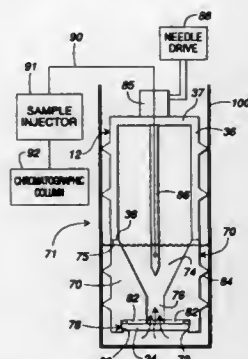
Robert J. Classon, Earleville, Md.; Karl N. Caldwell, Norcross, and Louis O. Leazenbee, Lawrenceville, both of Ga., assignors to Alcott Chromatography, Inc., Norcross, Ga.

Filed Feb. 14, 1994, Ser. No. 196,854

Int. Cl.<sup>6</sup> B01D 33/00

U.S. Cl. 210—233

17 Claims



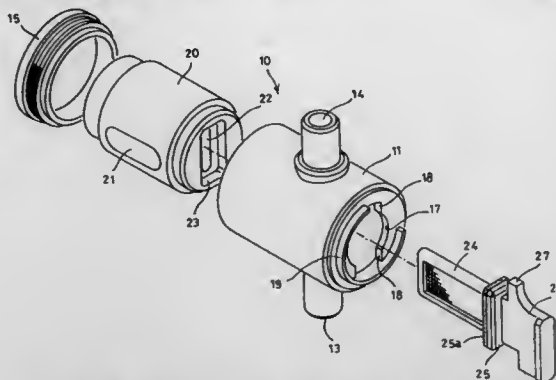
7. A sample removal and delivery system, comprising:

- a vial for containing a liquid sample;
- a housing having an upstream end and a downstream end opposite the upstream end for receiving a flow of the liquid sample from the vial, the housing shaped to be slidably received by said vial in liquid sealing engagement with an interior surface of said vial;
- an upstream end wall at the upstream end of said housing defining a filter mounting opening therethrough for receiving the liquid sample flow from the vial, so that the flow of the liquid sample flows from the vial, through the filter mounting opening in the upstream end wall, and toward the downstream end of the housing when the housing is slidably received by the vial;
- a filter having a downstream surface mounted to enclose said filter mounting opening with the downstream surface of the filter facing the downstream end of the housing;
- a downstream end wall enclosing the downstream end of the housing comprising a septum;
- a needle for receiving the flow of the liquid sample from the housing mounted in a needle housing shaped to engage said downstream end wall; and
- a needle drive mechanism operable to move said needle through said septum and to move said housing into said vial upon engagement of said needle housing with said downstream end wall, such that liquid is forced through said filter into said housing.

5,567,310  
STRAINER INCLUDING ROTATABLE CLOSURE MEMBER FOR FLUID SHUT OFF DURING FILTER DISPLACEMENT  
Yoshihiko Nakashima, Wakayama, Japan, assignor to Noritsu Koki Co., Ltd., Wakayama, Japan  
Filed Mar. 26, 1996, Ser. No. 621,940  
Claims priority, application Japan, Apr. 11, 1995, 7-085340  
Int. Cl.<sup>6</sup> B01D 27/08

U.S. Cl. 210—235

1 Claim



1. A strainer comprising a housing having a peripheral wall defining a bore and formed with a fluid inlet and outlet, and an end plate formed with a circular hole and a pair of cutouts formed along the edge of said circular hole, diametrically opposite to each other, a closure member rotatably mounted in said bore of said housing and formed with a passage through which said inlet and said outlet communicate with each other, and a filter mounting hole intersecting said passage and having an opening at one end of said closure member, a filter detachably inserted in said filter mounting hole, said filter having a flange which can pass through said cutouts, and a knob which protrudes outwardly through said circular hole of said housing when said filter is in said mounting hole, said knob having a protrusion spaced from said flange by a distance slightly larger than the thickness of said end plate of said housing, and a means for allowing the rotation of said closure member only within a range between a first position where said inlet and said outlet communicate with each other through said passage formed in said closure member and a second position where said inlet and said outlet are shut off from each other by said closure member, said flange of said filter being positioned so as to align with said cutouts when said closure member is in said second position.

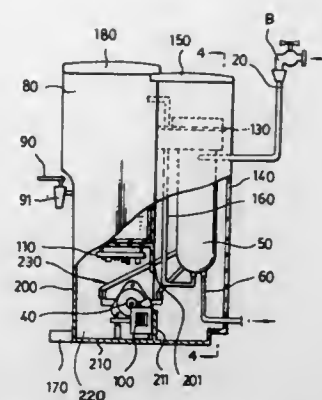
5,567,311  
WATER PURIFIER WITH ELECTRICAL COMPONENTS ISOLATED FROM LEAKED WATER  
Jae-Young Jang, Suwon-City, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon-City, Rep. of Korea  
Filed Nov. 9, 1995, Ser. No. 552,490

Claims priority, application Rep. of Korea, Nov. 14, 1994, 94-30238U  
Int. Cl.<sup>6</sup> B01D 35/30

U.S. Cl. 210—243

9 Claims

1. A water purifier comprising:  
a housing forming horizontally spaced first and second portions;  
a filtering mechanism including a plurality of filtering members disposed in said second portion of said housing, said filtering members interconnected by conduits for conducting water between the filtering members;  
a base plate disposed below said housing for forming a space extending across lower ends of said first and second portions, respectively, said space including first and second sections disposed in said first and second housing portions, respectively;  
an electric pump disposed in said first section of said space for pressurizing water passing through at least one of said filtering members;



5,567,313

## CONDENSATE FILTER HOUSING

Juan G. Almeida, 1980 Folkway Dr., Mississauga, Ontario, Canada

Filed Dec. 16, 1994, Ser. No. 356,975

Int. Cl.<sup>6</sup> B01D 24/46

U.S. Cl. 210—108

1 Claim

a pump-actuating mechanism disposed in said first section of said space and including a high voltage transformer and an electric circuit board operably connected to said pump; and  
a wall structure disposed between said first and second sections of said space for blocking water travel from said second section into contact with said pump, said transformer, and said circuit board.

5,567,312  
PRESSURE AND RECIRCULATING PUMP FOR CONCENTRATING A SOLUTION  
Denis Cote, Ham-Nord, Canada, assignor to Les Entreprises Denis Darveau, Ham-Nord, Canada

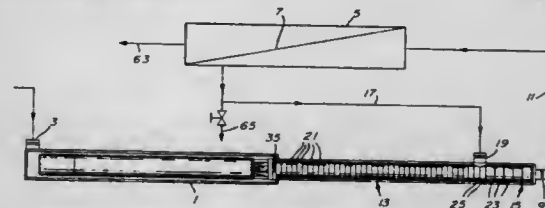
PCT No. PCT/CA93/00011, § 371 Date Nov. 15, 1994, § 102(e)  
Date Nov. 15, 1994, PCT Pub. No. WO/9314319, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 15, 1993, Ser. No. 256,527

Claims priority, application Canada, Jan. 15, 1992, 2059392  
Int. Cl.<sup>6</sup> B01D 6/12

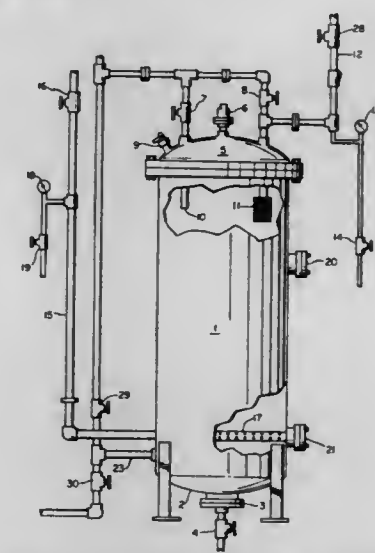
U.S. Cl. 210—321.66

7 Claims



1. An installation for the concentration, by reverse osmosis, of a solution containing one or more solutes and particles in suspension, comprising:

- a housing enclosing a semi-permeable membrane responsible for the concentration of said solution;
- a pump for introducing said solution under pressure in said housing and for ensuring recirculation of part of said solution so as to ensure at least a partial unclogging of said membrane and to reduce the concentration at the surface of the membrane to thereby produce a lowering of the osmotic pressure and bring about an increase of the permeation flow; said pump consisting of two successive axially aligned series of pumping stages, each said series of pumping stages having an inlet and an outlet;
- i) said inlet of said first series of pumping stages receiving a first volume of solution to be treated corresponding generally to the capacity of permeation of the membrane in said housing and to an evacuation;
- ii) said inlet of said second series of pumping stages being in axial fluid contiguity with the outlet of said first series of pumping stages whereby said first volume of solution is delivered to concentrate in said second series of pumping stages;
- iii) said second series of pumping stages delivering a second volume of liquid to concentrate greater than said volume;
- a first conduit connecting said outlet of said second series of pumping stages to said housing enclosing said membrane;



1. In an upright cylindrical condensate filter housing having a domed lower end and an open upper end, an unfiltered condensate inlet and a backwash water outlet, said housing containing a filter media for the removal of scale and impurities from said condensate, a removable domed top member sealingly engaging said open upper end of said housing, said top member including (1) a balanced pressure thermostatic air vent, (2) a backwash water inlet, (3) a filtered condensate outlet, and (4) a safety valve, and mounting means for said air vent, said backwash water inlet, said filtered condensate outlet and said safety valve secured to said top member, all of said elements and their mounting means contained within the domed portion of said top member.

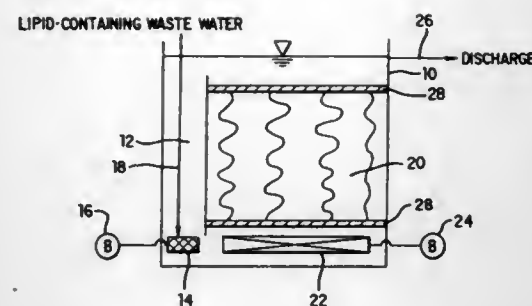
5,567,314  
APPARATUS FOR BIOLOGICALLY TREATING LIPID-CONTAINING WASTE WATER  
Kaoru Chigusa, and Yasuhiro Nakai, both of Tokyo, Japan, assignors to Nishihara Environmental Sanitation Res. Corp., Tokyo, Japan

Filed Sep. 30, 1994, Ser. No. 316,023  
Claims priority, application Japan, Oct. 1, 1993, 5-269898  
Int. Cl.<sup>6</sup> C02F 3/06;3/34

U.S. Cl. 210—150

9 Claims

1. An apparatus for biologically treating lipid-containing waste water comprising:  
a tank having a bottom and a top;  
an introducing means for introducing lipid-containing waste water into said tank;  
an aerating means for aerating said lipid-containing waste water;



an aerobic biological treatment means in said tank constituted by a carrier holding a fixed lipid assimilating yeast wherein said carrier is submerged in a mixture of air and waste water; a discharging means for discharging the waste water from said tank treated by said biological treatment means wherein said lipid-assimilating yeast is at least one selected from the group consisting of *Candida schatavii* N4 strain (FERM P-12768), *Candida fluvialis* N6 strain (FERM P-12770), *Candida visuwanathii* N8 strain (FERM 9-12772), *Candida pseudolambica* N9 strain (FERM P-12773) and *Candida pseudolambica* N9 strain (FERM P-12774).

5,567,315

**LIFTING-LOWERING TYPE AQUARIUM FILTER**  
Walter Weldenmann, Deizisau; Frank V. Luetzan, Bletigheim; Gerhard Frank, Esslingen; Michael Schmidt, Herrenberg; Ferdinand Mayer, Schwaebisch Gmuend, and Ulrich Herold, Oberboihingen, all of Germany, assignors to Eheim GmbH & Co. KG., Deizisau, Germany

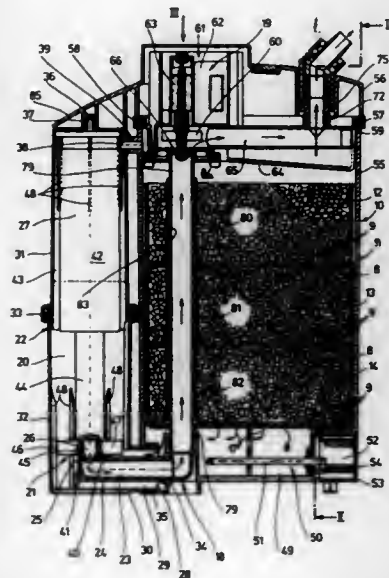
Filed Mar. 22, 1995, Ser. No. 408,912

Claims priority, application Germany, Mar. 26, 1994, 44 10 562.2

Int. Cl.<sup>6</sup> A01K 63/04

U.S. Cl. 210—123

73 Claims



1. A filter for aquarium, comprising a housing with at least one filter compartment for a filter material; a supply through which water is supplied from above into said filter compartment; a pump which aspirates water after passing through said filter compartment through a suction conduit and supplies the water back into an aquarium; at least one auxiliary chamber supplied with water and

having an outlet; a float-controlled valve device controlling said outlet of said auxiliary chamber and being in fluid communication with said suction conduit; an auxiliary housing in which said auxiliary chamber is provided, said auxiliary chamber being supplied with water which has been filtered after passing through said filter compartment, said valve device being provided with a float-controlled valve closing member; and a passage which is connected with said suction conduit and has a valve opening which is alternately closeable and openable by said valve closing member of said valve device.

5,567,316

# PROCESS FOR RECOVERING METALS FROM SOLUTION UTILIZING METALLOPROTEIN AFFINITY CHROMATOGRAPHY

Dennis R. Spears, and John B. Vincent, both of Tuscaloosa, Ala., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C. Division of Ser. No. 158,553, Nov. 29, 1993, Pat. No. 5,441,663. This application Jun. 5, 1995, Ser. No. 464,191 Int. Cl.<sup>6</sup> B01D 15/08

U.S. Cl. 210—635

3 Claims

1. A process for recovering metals from an aqueous metal-ion bearing solution, comprising the steps of:

- forming an affinity chromatography matrix by providing carboxypeptidase, a metalloprotein, bound to a carbohydrate-based support, an insoluble support material, to form an immobilized metalloprotein material;
- placing in contact with said affinity chromatography matrix a quantity of an aqueous metal-containing solution having a pH and ionic strength adjusted to cause selected metal ions within said aqueous metal-ion bearing solution to tightly bind to said immobilized metalloprotein material;
- placing in contact with said affinity chromatography matrix a quantity of an aqueous solution having a pH, ionic strength, and/or chelating agent to remove all metal ions within said aqueous metal-ion bearing solution except said selected metal ions tightly bound to said immobilized metalloprotein material; and
- placing in contact with said affinity chromatography matrix a quantity of an aqueous solution having a pH, ionic strength, and/or chelating agent to remove said selected metal ions tightly bound to said immobilized metalloprotein material.

5,567,317

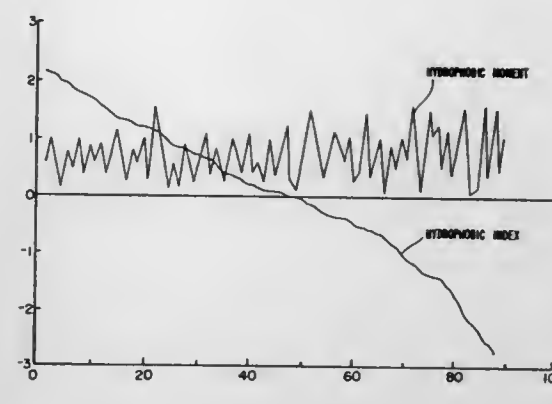
# METHOD TO IDENTIFY ANALYTE-BINDING LIGANDS

Lawrence M. Kauvar, San Francisco, Calif., assignor to Terrapin Technologies, Inc., South San Francisco, Calif. Division of Ser. No. 116,059, Sep. 2, 1993, Pat. No. 5,409,611, which is a division of Ser. No. 49,642, Apr. 9, 1993, Pat. No. 5,340,474, which is a continuation-in-part of Ser. No. 429,721, Oct. 31, 1989, Pat. No. 5,133,866, which is a continuation-in-part of Ser. No. 355,042, May 16, 1989, Pat. No. 4,963,263, which is a continuation of Ser. No. 172,626, Mar. 24, 1988, abandoned, and a continuation-in-part of Ser. No. 255,906, Oct. 11, 1988, Pat. No. 5,217,869. This application Mar. 9, 1995, Ser. No. 401,445 Int. Cl.<sup>6</sup> B01D 15/08

U.S. Cl. 210—635

32 Claims

1. A method to identify a paralog which has specific affinity for a first moiety in comparison to additional moieties present in the environment of the first moiety which method comprises: screening, for ability to selectively bind said first moiety a panel of individual candidate paralogs, wherein said candidate paralogs have systematically varied values of at least two parameters, each of which parameters determines the ability of the paralog to bind to other substances and/or wherein the combination of parameters determines the ability of the paralog to bind to other substances.



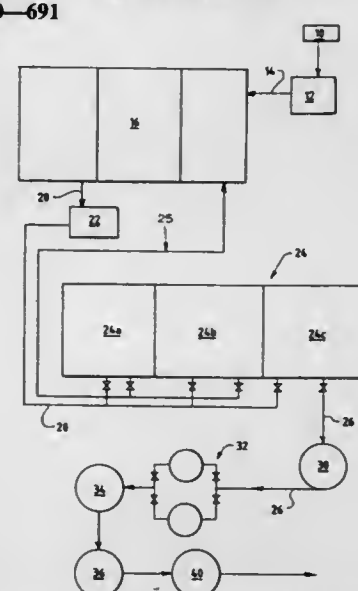
5,567,318

# METHOD OF REMOVING WATER-INSOLUBLE ORGANIC CONTAMINANTS FROM AN ACIDIC AQUEOUS STREAM

Gary W. Beall, McHenry, Ill., assignor to AMCOL International Corporation, Arlington Heights, Ill. Filed Aug. 31, 1995, Ser. No. 522,194 Int. Cl.<sup>6</sup> C02F 1/28

U.S. Cl. 210—691

23 Claims





measuring two values (Cd2in, Cd2out) of the characteristic (Cd) in the second treatment fluid (d2), respectively upstream and downstream of the exchanger; circulating through the exchanger, before the characteristic (Cd) of the second fluid (d2) has reached a stable value downstream of the exchanger, a third treatment fluid (d3) having the characteristic (Cd), a value (Cd3in) of the characteristic (Cd) in the third fluid (d3) upstream of the exchanger being different from the value of (Cd2in); measuring two values (Cd3in, Cd3out) of the characteristic (Cd) in the third fluid (d3) respectively upstream and downstream of the exchanger; and calculating, using the measured values of (Cd1in), (Cd1out), (Cd2in), (Cd2out), (Cd3in), and (Cd3out), at least one value of at least one significant parameter of the progress of the treatment (Ch, D, K, Kt/V).

15. A method according to claim 1, wherein, at the step of calculating at least a value of at least one significant parameter of the progress of the treatment (Ch, D, K, Kt/V), for the measured values Cd1in, Cd2in, Cd3in of the characteristic (Cd) in the first (d1), the second (d2) and the third (d3) treatment fluids, there are used corresponding reference values (Cd1in<sub>REF</sub>, Cd2in<sub>REF</sub>, Cd3in<sub>REF</sub>), which are entered before each treatment session in a control unit controlling the preparation of the treatment fluids.

5,567,321

## CENTRIFUGAL FILTER

Eduard Weber, Seon; René Rohr, Hunzenschwil, and Jürg Suter, Schafisheim, all of Switzerland, assignors to Ferrum AG, Rapperswil, Switzerland

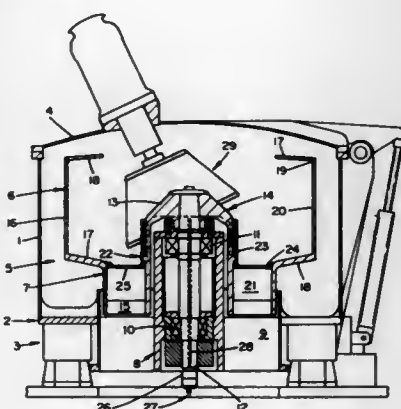
Filed Feb. 9, 1995, Ser. No. 386,071

Claims priority, application Switzerland, Mar. 14, 1994, 740/94

Int. Cl.<sup>6</sup> B04B 3/00; 3/02

U.S. Cl. 210—376

21 Claims



1. A centrifugal filter, comprising:
  - a) a collector chamber;
  - b) a machine body supporting said collector chamber;
  - c) a rotatable filter basket having a perforated barrel and a basket neck, said filter basket being disposed in the interior of the collector chamber;
  - d) a bearing housing having a bearing device comprising a rotatable drive shaft for the filter basket, said machine body having a portion supporting said bearing housing and having at least one opening;
  - e) a hub driven by said drive shaft and connected with a portion of said basket neck, wherein said portion of said basket neck has at least one basket neck bottom opening;
  - f) a filter element having a first edge connected with the filter basket; and
  - g) lifting means to which is connected a second edge of said filter element so as to move said second edge in a direction between a folded position of said filter element and a stretched position of said filter element.

5,567,322

## WATER COOLER FILTRATION DEVICE

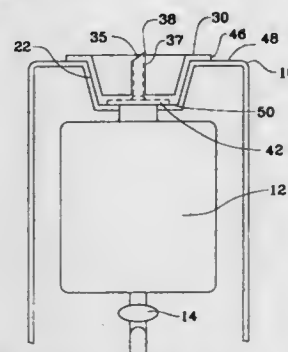
Christopher Rundle, 12598 SW. 60th Ct., Miami, Fla. 33156, and Michael Borell, 7787 SW. 86th St., Apt. 310, Miami, Fla. 33143

Filed Sep. 13, 1995, Ser. No. 527,628

Int. Cl.<sup>6</sup> B01D 35/04

U.S. Cl. 210—455

14 Claims



1. A filtration device for placement in a water cooler well comprising: a support structure having a base shaped to fit within a water cooler well formed by a substantially flat wall with a tapered side wall sealingly coupled to said base; a tube means centrally located in said support base having a first end sealingly coupled to said base and a second end projecting upwardly from said base forming an aperture therebetween, said second end having a chamfered leading edge with an opening to said aperture, said tube means piercing the cap of an inverted filled water bottle wherein water flows through said aperture of said tube means; a filter receiving cavity within said support structure positioned in fluid communication with said tube means aperture; and a filter means receivably secured within said cavity to said base, said filter means fluidly communicating with said tube means thereby providing for the filtration of water or air entering the water cooler through said aperture.

5,567,323

## INTAKE FILTER FOR A PAINT SPRAYER

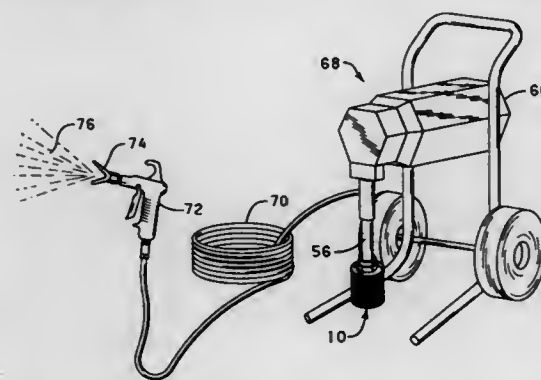
William E. Harrison, Jr., Norman, Okla., assignor to Harrison-Pipkin, L.L.C., Oklahoma City, Okla.

Filed Apr. 6, 1995, Ser. No. 418,039

Int. Cl.<sup>6</sup> B01D 27/06

U.S. Cl. 210—251

3 Claims



1. A filter for use in filtering paint in an airless paint spraying system comprising:
  - a base, comprising
    - an upper end, a lower end, and an outer peripheral surface, an opening in the upper end forming an inner peripheral surface,
  - wherein a substantial portion of the outer peripheral surface comprises an accordion wire mesh and means to hold the accordion wire mesh to the base,

wherein the inner peripheral surface comprises a support frame having means to permit a flow of paint therethrough, said means comprising a solid sheet of metal comprising a plurality of apertures, and

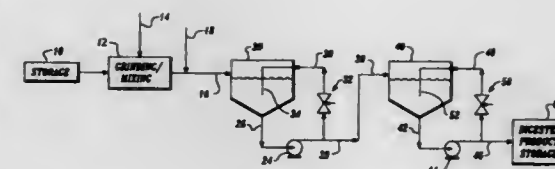
wherein the lower end has an outer surface which comprises an accordion wire mesh and means to hold the accordion wire mesh to the lower end; and

a top, comprising an upper surface, a lower surface and an outer periphery, wherein the top has means for disconnecting and reconnecting the top to the base,

wherein the top further comprises both a first connection means for connecting the top to the base, and a second connection means for connecting the filter to the airless paint spraying system,

wherein said disconnecting means of the top permits cleaning of both the inner peripheral surface and the outer peripheral surface of the base such that the filter is re-usable after said cleaning, and

wherein said filter is connected via the second connection means to the airless spraying system and then inserted in a paint container.



- (a) combining a waste containing chitinous material with sufficient water to make a pumpable mixture and to maintain the concentration of digestible waste constituents of the mixture at a level sufficient to allow the temperature of the mixture to be maintained at a thermophilic temperature during thermophilic digestion of the mixture under normal ambient conditions without addition of external heat;
- (b) charging the mixture to a thermophilic digester to commingle with medium in the digester;
- (c) aerating a medium in the digester at a rate sufficient to maintain the medium under at least marginally aerobic conditions;
- (d) subjecting the medium to thermophilic digestion in the digester by microorganisms, while aerating, to solubilize at least a portion of the chitin of the chitinous waste; and
- (e) continuously removing a volume of digested medium containing solubilized chitin from the digester, and continuously charging a substantially equal volume of pumpable mixture to the digester.

5,567,324

## METHOD OF BIODEGRADING HYDROPHOBIC ORGANIC COMPOUNDS

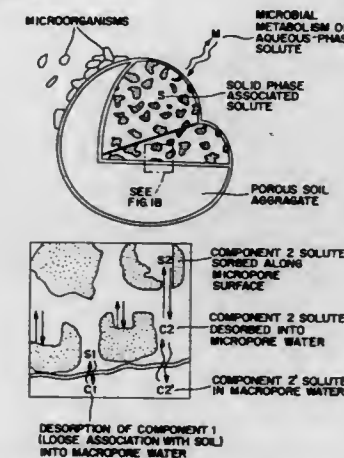
Randi K. Rothmel, Mt. Holly, and Ronald Unterman, Lawrenceville, both of N.J., assignors to Envirogen, Inc., Lawrenceville, N.J.

Filed Jun. 7, 1995, Ser. No. 476,699

Int. Cl.<sup>6</sup> C02F 3/34

U.S. Cl. 210—611

21 Claims



1. A method of degrading an HOC comprising:
  - (A) contacting at ambient temperature said HOC with a microorganism capable of metabolizing said HOC for a period of time sufficient to degrade some, but not all of said HOC;
  - (B) heating the HOC not degraded; and thereafter
  - (C) contacting the HOC not degraded with a microorganism capable of metabolizing said HOC.

5,567,325

## THERMOPHILIC DIGESTION OF CHITIN-CONTAINING WASTE

Phillip M. Townsley, and Peter J. Townsley, both of Unit No. 96, 2533 152nd Street, Surrey, British Columbia, Canada

Filed Sep. 7, 1995, Ser. No. 525,341

Int. Cl.<sup>6</sup> C02F 3/02

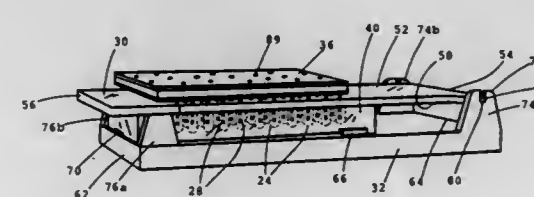
U.S. Cl. 210—612

20 Claims

1. A continuous process for thermophilic bacterial digestion of an aqueous waste including chitin-containing matter, the process comprising:

11. A method for magnetically separating a target substance from a test medium in a magnetic separation apparatus, the substance coupled to magnetically responsive particles, the apparatus comprising an array of nonmagnetic wells defining a separation chamber, nonmagnetic pins having a longitudinal axis and opposed upper and lower ends, a single substantially planar magnet pack for magnetizing the pins, the magnet pack capable of generating magnetic flux lines substantially collinear with said longitudinal axis, the method comprising the steps of:

- (a) introducing said test medium into said wells;
- (b) contacting a quantity of magnetically responsive particles comprising a receptor capable of binding specifically to said target substance in said test medium to produce target substance bearing particles;
- (c) positioning the lower end of said pins within said wells;
- (d) positioning said magnet pack above the upper end of said pins so that the plane of said magnet pack is substantially perpendicular to the longitudinal axis of said pins and
- (e) separating said target substance bearing particles from said test medium.



5,567,327

**AIR-ASSIST DISCHARGE OF FILTER PRESS CAKE**

Joel D. De Haan; Daniel De Haan; Gregory De Haan, all of Zeeland; David J. Spyker, Holland; David P. McLeod, Muskegon; Wesley G. Koops, and Leonid B. Gelfand, both of Holland, all of Mich., assignors to JWI, Inc., Holland, Mich.

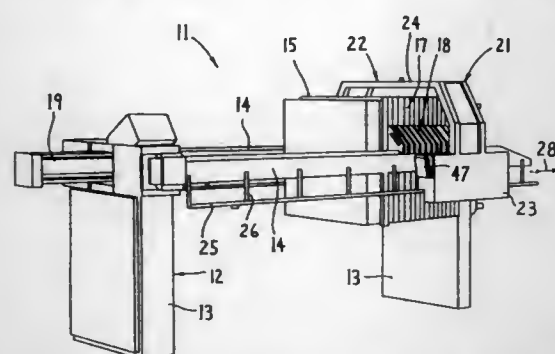
PCT No. PCT/US93/01887, § 371 Date Mar. 27, 1995, § 102(e) Date Mar. 27, 1995, PCT Pub. No. WO94/07584, PCT Pub. Date Apr. 14, 1994

Continuation-in-part of Ser. No. 952,236, Sep. 28, 1992, Pat. No. 5,328,617. This PCT application Feb. 18, 1993, Ser. No. 406,939

Int. Cl.<sup>6</sup> B01D 25/32

U.S. Cl. 210—768

15 Claims



1. In a filter press including a frame having a pair of horizontally elongate and generally parallel side rails which extend lengthwise of the press and are sidewardly spaced apart, a first head structure stationarily mounted adjacent one end of said rails, a second head structure mounted on said rails for movement toward and away from said first head structure for respective closing and opening of said press, a plurality of vertically-enlarged filter plates movably disposed in generally side-by-side relationship to define a stack extending lengthwise between said first and second head structures when said press is closed, each said filter plate mounting thereon a respective filter member which is independent of the filter members mounted on the other filter plates, said filter plates extending transversely between and being slidably supported on said side rails, each movable filter plate having parts which project outwardly from opposite side edges thereof, and a shift assembly for effecting shifting of individual said filter plates along the side rails toward the second head structure when said second head structure is in an open position, the improvement comprising:

discharge assist means for directing a pressurized stream of air against an exposed face of an endmost said plate of said stack to assist in dislodging filtrate adhered to said plate, said discharge assist means including an air nozzle assembly for directing a pressurized airstream at the exposed face of said plate, and a drive device for moving the nozzle generally parallel across the face to effect air-assisted discharge throughout the entirety of the face.

5,567,328

**MEDICAL CIRCUIT FORMING PROCESS**

Paul F. Engle; Thomas J. Lynch, both of Mechanicsburg, and Roger T. Banks, York, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Jun. 8, 1995, Ser. No. 482,244

Int. Cl.<sup>6</sup> B44C 1/22; C23F 1/00

U.S. Cl. 216—13

22 Claims

1. A process to manufacture disposable medical flat flexible printed circuits 10 comprising depositing conductive metal in the range of 1000 to 2500 Angstroms thick onto a flexible film having a thickness in the range of 0.1 to 10 mils., covering first portions of the metal with a resist material arranged in a pattern,



depositing metal circuit material onto second portions of the metal, overplating the metal circuit material with a corrosion resistant metal, removing the resist material and the first portions of the metal and laminating the circuit with a polymeric material.

5,567,329

**METHOD AND SYSTEM FOR FABRICATING A MULTILAYER LAMINATE FOR A PRINTED WIRING BOARD, AND A PRINTED WIRING BOARD FORMED THEREBY**

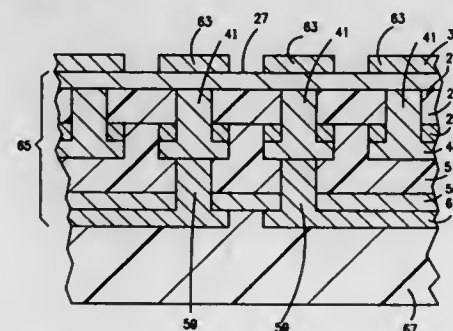
Paul B. Rose, and John L. Lamanna, both of Winter Park, Fla., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Jan. 27, 1995, Ser. No. 379,252

Int. Cl.<sup>6</sup> B44C 1/22

U.S. Cl. 216—18

29 Claims



1. A method of fabricating a multilayer laminate for a printed wiring board, comprising, in order, the steps of:

- developing, with photoimaging material, a photoimage of a plurality of blind via sites on a first side of a first sheet, the first sheet including a flexible dielectric material, the flexible material being clad on the first and a second side with first and second layers of conductive material, respectively;
- etching conductive material of the first layer of conductive material from the blind via sites;
- removing developed photoimaging material of the photoimage of the blind via sites;
- laser ablating the flexible material from the blind via sites;
- developing, with photoimaging material, a photoimage of a conductor and pad pattern on the first side of the first sheet;
- electroplating conductive material posts in the blind via sites, using the second layer of conductive material as an electrode;
- electroplating conductive material in the conductor and pad pattern on the first side of the first sheet;
- electroplating a protective material in the conductor and pad pattern over the conductive material electroplated in the conductor and pad pattern on the first side of the first sheet;
- removing developed photoimaging material of the photoimage of the conductor and pad pattern;
- etching the first side of the first sheet to remove the photoimage pattern and exposed conductive material of the first layer

- of conductive material beneath the photoimaged pattern, thereby forming a patterned first sheet;
- removing the protective material; and
- repeating steps of bonding a first side of a second sheet, the second sheet including a flexible material clad on a second side with a first layer of conductive material, to an etched first side of a preceding sheet, followed by steps a-k for each additional layer of conductive material desired, thereby forming the multilayer laminate.

- (8) depositing metal into the holes produced in (7) to provide vias to said planes and layers to yield an electrical interconnect structure.

5,567,331

**FLOATING HEAD SLIDER AND METHOD OF MANUFACTURING THE SAME**

Hiroshi Kajitani, Tokyo, Japan, assignor to Nec Corporation, Tokyo, Japan

Division of Ser. No. 292,035, Aug. 18, 1994, Pat. No.

5,555,145. This application Jun. 6, 1995, Ser. No. 466,931

Claims priority, application Japan, Aug. 20, 1993, 4-205946

Int. Cl.<sup>6</sup> G11B 5/127

U.S. Cl. 216—22

2 Claims

1. A method of manufacturing a floating head slider, comprising the steps of:

- forming a groove in a rail forming substrate;
- forming a read/write element on said rail forming substrate to have a front end portion formed on a side surface of said groove;
- forming a flattening film, having a first lead line extraction hole of said read/write element, on said rail forming substrate and said read/write element;
- stacking a slider base material substrate, having a second lead line extraction hole communicating with said first lead line extraction hole, on said flattening film;
- forming rails and a recess in said rail forming substrate by etching such that said rails and recess are perpendicular to a side surface of said groove on which the front end portion of said read/write element is formed;
- filling said first and second lead line extraction holes with a conductive material to form a connection signal line connected to said read/write element;
- cutting said rail forming substrate and said slider base material substrate along the side surface of said groove to expose the front end portion of said read/write element to obtain a slider; and
- polishing a rail forming surface of said rail forming substrate of said slider to form a front gap portion of said read/write element.

5,567,330

**ELECTRICAL INTERCONNECT STRUCTURES AND PROCESSES**

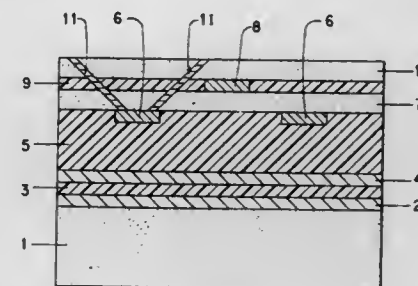
Robert G. Dorothy, Kennett Square, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 80,463, Jun. 21, 1993, abandoned, which is a continuation-in-part of Ser. No. 992,275, Dec. 15, 1992, abandoned. This application Oct. 17, 1994, Ser. No. 324,064

Int. Cl.<sup>6</sup> B44C 1/22; C03C 15/00

U.S. Cl. 216—18

17 Claims



1. A process for producing an electrical interconnect structure comprising:

- forming a substructure A by:
  - depositing onto a substrate, a first electrically conducting film which can serve as a power plane or ground plane;
  - depositing a layer of dielectric material onto the electrically conducting film; and
  - depositing a second electrically conducting film which can serve as a ground plane or power plane onto the layer of dielectric material; and
- forming a substructure B by:
  - depositing a high temperature superconducting film onto a first single crystal substrate chosen to provide epitaxial growth for said superconducting film and patterning the superconducting film to form a first patterned signal layer;
  - forming metal contact pads onto the first patterned signal layer;
- bonding the exposed patterned signal layer of substructure B to the exposed electrically conducting film of substructure A with a dielectric material having a thickness of at least 2 μm and a dielectric constant of less than about 5;
- reducing the thickness of the first single crystal substrate to a maximum thickness of about 25 μm;
- forming a substructure C by:
  - depositing a high temperature superconducting film onto a second single crystal substrate chosen to provide epitaxial growth for the superconducting film and patterning the superconducting film to form a second patterned signal layer;
  - forming metal contact pads onto the second patterned signal layer;
- bonding the exposed patterned signal layer of substructure C to the reduced first single crystal substrate of combined substructures A and B with a dielectric material a dielectric constant of less than about 5;
- producing holes through the top surface of the combined substructures A, B, and C to the ground plane, power plane, and signal layers; and

5,567,332

**MICRO-MACHINE MANUFACTURING PROCESS**

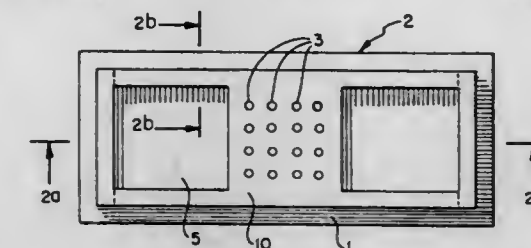
Jitesh Mehta, West Bloomington, Minn., assignor to FSI International, Chaska, Minn.

Filed Jun. 9, 1995, Ser. No. 488,879

Int. Cl.<sup>6</sup> H01L 21/027

U.S. Cl. 216—57

9 Claims



1. A manufacturing process for producing a three dimensional structure on a substrate, in which said structure has been built up of silicon on the substrate, with at least a portion of the structure overlying and supported by a layer of a silicon oxide on the substrate, the process comprising removing the silicon oxide layer in two steps, the first step comprising removing the bulk of the silicon oxide layer by a rapid liquid or gaseous etching process, leaving at least a portion of the silicon oxide layer directly underlying the structure in place so as to support the structure during a wash cycle, and the second silicon oxide removal step comprising introducing the substrate to a high flow rate gaseous environment



containing anhydrous HF, said flow rate being at least about 20 liters/min, to which substantially no water is provided until the silicon oxide directly underlying the structure has been removed.

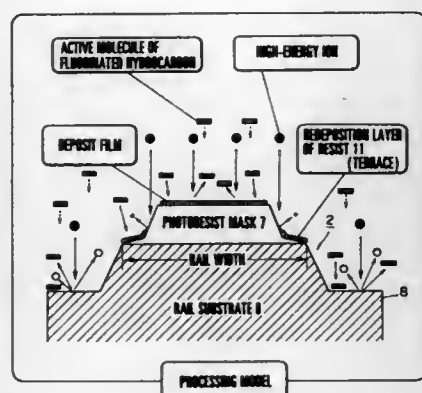
**5,567,333**  
**THIN FILM MAGNETIC HEAD, PROCESS FOR PRODUCTION THEREOF**

Yasuo Hira; Tamaki Toba, both of Yokohama; Hirokazu Iwayama, Kawasaki; Atsuko Ohkawa, Yokohama; Masayasu Fujisawa, Kanagawa-ken; Kazuo Nate, Machida; Hideki Sonobe, Odawara; Saburo Suzuki, Minamishigara; Eisei Togawa; Hiroshi Ishizaki, both of Odawara, and Yoshiaki Hagiwara, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 22, 1994, Ser. No. 263,915  
Claims priority, application Japan, Jun. 25, 1993, 5-154907; Dec. 10, 1993, 5-310110; Apr. 15, 1994, 6-077362  
Int. Cl.<sup>6</sup> B44C 1/22

U.S. Cl. 216—22

20 Claims



1. A process for producing a thin film magnetic head having non-linear rail(s), comprising the steps of:  
forming a mask composed of a high-molecular substance onto a surface of a substrate having a plurality of magnetic head elements thereon, which substrate is a material to be processed and on which surface said rail(s) are to be formed, thereby making a plurality of head blocks covered with the mask;  
mounting, on a holder, the substrate having said head blocks covered with the mask;  
rotating said holder having the mounted substrate; and  
ion milling the surface on which the rail(s) are to be formed while allowing said holder to have an inclination of 15° to 60° to an electrode for ion extraction.

**5,567,334**  
**METHOD FOR CREATING A DIGITAL MICROMIRROR DEVICE USING AN ALUMINUM HARD MASK**

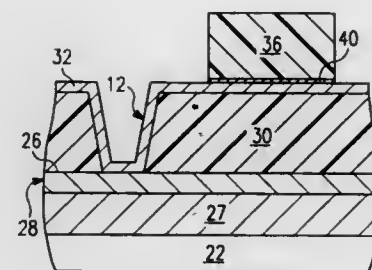
James C. Baker, Coppell; Henry Trombley, Princeton, and Scott H. Prengle, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 27, 1995, Ser. No. 396,024  
Int. Cl.<sup>6</sup> B44C 1/22; C23F 1/00

U.S. Cl. 216—24

29 Claims

1. A method of fabricating a device, comprising the steps of:  
a) forming electrical addressing circuitry on a substrate;  
b) depositing a spacer layer on said substrate and over said addressing circuitry;  
c) depositing a hinge layer on said spacer layer;  
d) depositing a beam layer on said hinge layer;  
e) defining a beam pattern of a first metal layer on said beam layer;



f) etching exposed said beam layer with said beam pattern of said first metal layer masking said beam layer to define a beam and hinge; and  
g) removing at least a portion of said spacer layer to free said beam from said spacer layer.

**5,567,335**  
**PROCESS AND APPARATUS FOR WELDING SHEET METAL EDGES**

Peter Baessler, Bellikon; Alan Marriott, Andelfingen; Urs Maurer, Schaffhausen, and Marcel Oberholzer, Kindhausen, all of Switzerland, assignors to Elpatronic AG, Zug, Switzerland

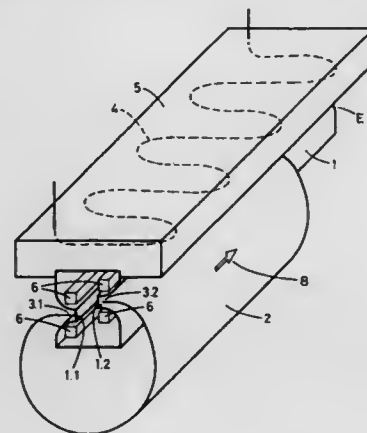
Filed Dec. 9, 1994, Ser. No. 352,546

Claims priority, application Switzerland, Dec. 15, 1993, 03 755/93; Mar. 21, 1994, 00 861/94

Int. Cl.<sup>6</sup> B23K 11/087; 13/02; 26/02

U.S. Cl. 219—61.2

12 Claims



1. Process for welding sheet metal edges, in particular for welding two edges of a rounded metal sheet to produce a container body, by positioning the edges to be welded in relation to one another by guide means comprising a Z-shaped rail having guide slots for engaging the edges to be welded and guiding the edges together at a welding station in which they are welded together, characterized in that the sheet metal edges to be welded are preheated prior to welding by preheating the sheet metal edges in region of the guide means.

**5,567,336**  
**LASER ABLATION FORWARD METAL DEPOSITION WITH ELECTROSTATIC ASSISTED BONDING**

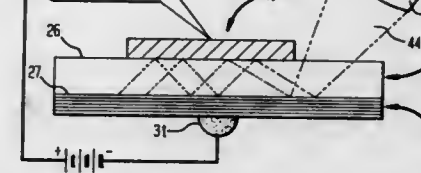
Abdelkrim Tatah, Arlington, Mass., assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 328,101, Oct. 24, 1994. This application Mar. 31, 1995, Ser. No. 414,930

Int. Cl.<sup>6</sup> B23K 26/00

U.S. Cl. 219—121.66

4 Claims



1. A method of bonding a metal line to a substrate having the metal line on a first surface thereof, and a second surface opposing the first surface, comprising the steps of:

(a) disposing said second surface adjacent a reflector such that said reflector directly opposes said metal line;  
(b) applying an electric field across said substrate; and  
(c) focusing a laser beam through said substrate onto said reflector such that said laser beam is repeatedly reflected between said reflector and said metal line;  
whereby said substrate absorbs energy from said laser beam as said laser beam is repeatedly reflected through said substrate, thereby heating said substrate.

**5,567,337**  
**ELECTRIC ENGINE BLOCK HEATER WITH FLANGED SCREW**

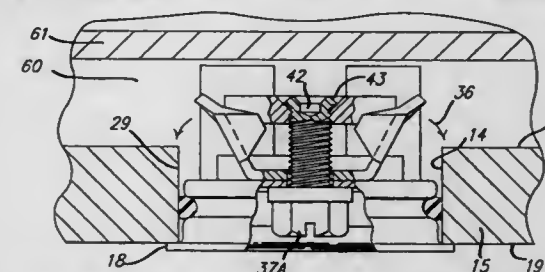
Gary C. Edwards; William Rose, and Ronald H. Schaefer, all of Winnipeg, Canada, assignors to Phillips & Temro Industries Ltd., Winnipeg, Canada

Filed May 26, 1994, Ser. No. 249,635

Int. Cl.<sup>6</sup> B60L 1/02

U.S. Cl. 219—205

12 Claims



1. A heater for attachment into an aperture in a wall of an engine block, the wall having an inner surface and an outer surface and closing a hollow interior of the engine block for receiving a cooling fluid of the engine block, the heater comprising a heater body having a front face for facing outwardly of the engine block, a rear face for facing inwardly of the engine block, and edge face means shaped to engage into the aperture, abutment means adjacent the front face for engaging the outer surface of the engine block, an opening passing through the heater body from the front face to the rear face, a heating element extending from the rear face for projecting into the cooling fluid within the hollow interior of the engine block, a screw having male screw threads thereon extending through the opening and having a head actuatable at the front face of the heater body, the screw being loosely received in the opening for free non-threaded rotation relative to the heater body, locating means having a female threaded bore and a ramp surface extending therefrom to define a countersink in the locating means, said bore in the locating means being threadably engaged

on the screw such that rotation of the screw causes the locating means to move toward the rear face for engagement with the inner surface of the engine block to clamp the wall between the abutment means and the locating means, the screw having a major longitudinal axis and a tubular terminal portion opposite the head of the screw, said terminal portion having an end face, an outer wall, and an inner wall, said inner wall defining an unobstructed bore, said tubular terminal portion being deformable from a first position to a second position, said first position being defined by the outer wall extending to said end face substantially parallel to the major longitudinal axis of the screw, said second position being defined by the outer wall being bent radially outwardly to form an annular flange lying on the ramp surface of the countersink in the locating means to prevent the locating means from being released from threaded engagement with the screw.

**5,567,338**  
**METHOD FOR CONTROLLING THE MICROWAVE FEED IN A MICROWAVE OVEN, AND MICROWAVE OVEN WITH SUCH CONTROL**

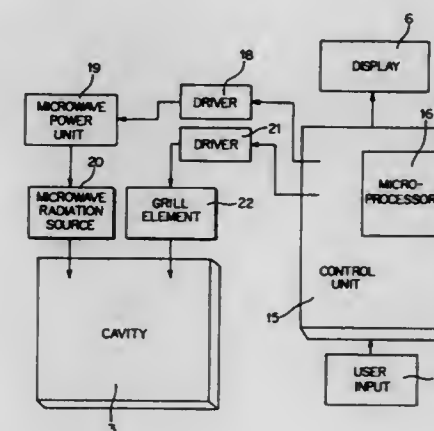
Mats G. Idebro, Linköping, and Tim P. Sundstrom, Norrköping, both of Sweden, assignors to Whirlpool Europe B.V., Veldhoven, Netherlands

Filed Jun. 28, 1995, Ser. No. 496,145

Claims priority, application Sweden, Jun. 29, 1994, 9402309  
Int. Cl.<sup>6</sup> H05B 6/74

U.S. Cl. 219—718

19 Claims



1. A method of controlling, in a microwave oven, the feeding of microwaves to the oven cavity, the oven comprising a microwave radiation source and a control unit for controlling the microwave feed, means being arranged in the cavity for bringing about a periodically-varying microwave exposure of the food or dish during heating, defining a variation period, and a desired power level below full power of the fed microwaves being produced by periodic activation of the microwave radiation source during a control cycle that is part of a sequence of control cycles, the method comprising:

selecting the duration (T) of each control cycle and the variation period of the microwave exposure to improve heating uniformity, wherein this selecting includes synchronizing the periodic activation and the variation period such that a point on the food or dish is located within every sector of a revolution during essentially the same amount of the total activation time of the microwave radiation source during a heating procedure.

5,567,339

## WAVE GUIDE SYSTEM OF A MICROWAVE OVEN

Phil D. Joo; Kyung S. Lim, and Kwan H. Lee, all of Kyungsangnam-do, Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

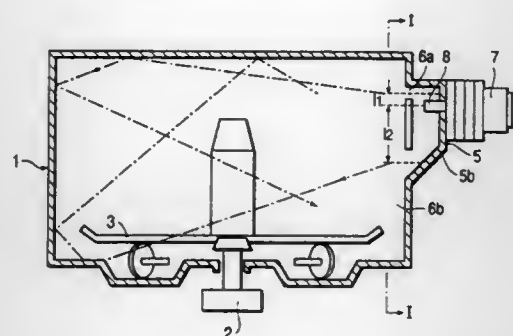
Filed May 21, 1993, Ser. No. 64,421

Claims priority, application Rep. of Korea, Aug. 25, 1992, 15981/1992; Mar. 8, 1993, 3427/1993

Int. Cl.<sup>6</sup> H05B 6/72

U.S. Cl. 219—748

16 Claims



1. A wave guide system of a microwave oven comprising: a cavity containing a food to be cooked and having a pair of microwave feed openings formed in one wall thereof;
- a magnetron having an antenna and positioned between said microwave feed openings in spaced apart relation to said wall having said microwave feed openings, to generate microwaves having a wavelength of  $\lambda_g$ ; and
- a waveguide provided to cover an external portion of said wall having said microwave feed openings, said external portion including said microwave feed openings, support thereon said magnetron and guide microwaves through said microwave feed openings into said cavity and having a short circuited surface which is spaced apart from said antenna by a distance of  $\lambda_g/4$  and parallel to said antenna.

5,567,340

## NITROGEN-FREE ANIONIC SOFTENERS

Ansgar Behler, Bottrop; Uwe Ploog, Haan; Guenther Uphues, Monheim; Bernd Wahle, Kaarst; Peter Waltenberger, Hollig, and Yvonne Jansen, Krefeld, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP93/03469, § 371 Date Jun. 16, 1995, § 102(e) Date Jun. 16, 1995, PCT Pub. No. WO94/13768, PCT Pub. Date Jun. 23, 1994

PCT Filed Dec. 9, 1993, Ser. No. 454,302

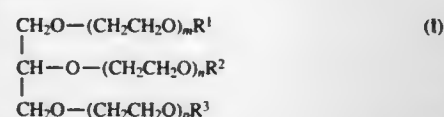
Claims priority, application Germany, Dec. 17, 1992, 42 42 689.8

Int. Cl.<sup>6</sup> D06M 13/148

U.S. Cl. 510—527

6 Claims

1. The process of softening textiles, yarns or fibers comprising contacting said textiles, yarns or fibers with a nitrogen-free anionic softener comprising sulfated fatty acid partial glycerides corresponding to formula (I):



in which

$\text{R}^1$ ,  $\text{R}^2$  and  $\text{R}^3$  independently of one another represent at least one aliphatic, linear or branched acyl radical containing 6 to 22 carbon atoms, at least one sulfate group and optionally a hydroxyl group, and m, n and p=0 or a number from 1 to 10.

5,567,341

## AMMONIUM ORGANO-PHOSPHORUS ACID SALTS

Bernard Tury, Manchester, United Kingdom, assignor to Imperial Chemical Industries PLC, United Kingdom

PCT No. PCT/GB93/01464, § 371 Date Apr. 18, 1995, § 102(e) Date Apr. 18, 1995, PCT Pub. No. WO94/03462, PCT Pub. Date Feb. 17, 1994

PCT Filed Jul. 13, 1993, Ser. No. 381,852

Claims priority, application United Kingdom, Aug. 7, 1992, 9216780

Int. Cl.<sup>6</sup> C10M 105/74; C07F 9/165

U.S. Cl. 508—436

10 Claims

1. An ammonium salt of an organo-oxyphosphorus acid, an organo-thiophosphorus acid or esters thereof with a polyesteramine of formula



wherein

- A is a divalent hydrocarbon radical;
  - Y is a hydrogen atom or an optionally substituted hydrocarbon group;
  - n is an integer from 1 to 100;
  - Z is a divalent bridging group; and
  - R is an amino group.
9. A lubricant composition comprising a lubricant and 0.01 to 10% by weight of an ammonium salt as claimed in claim 1.

5,567,342

## LUBRICATING OIL COMPOSITION FOR INTERNAL COMBUSTION ENGINES

Kiyoshi Inoue, and Masakuni Hirata, both of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Japan

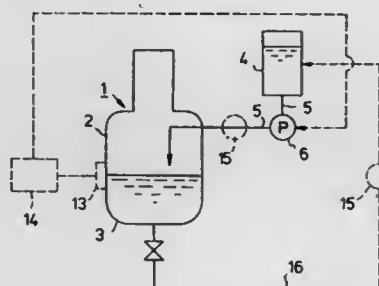
Filed Jun. 2, 1995, Ser. No. 458,438

Claims priority, application Japan, Jun. 6, 1994, 6-145727

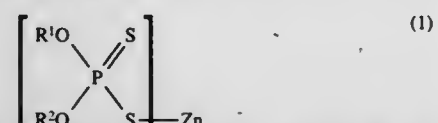
Int. Cl.<sup>6</sup> C10M 137/06; 133/56

U.S. Cl. 508—287

16 Claims



1. A lubricating oil composition for internal combustion engines characterized in that it comprises: a lubricating base oil, (A) a 0.1 to 0.7% by weight of at least one alkaline earth metal type cleansing agent in the form of sulfuric acid ash selected from alkaline earth metal sulfonate, alkaline earth metal phenate and alkaline earth salicylate, (B) a 0.01 to 0.10% by weight in terms of phosphorus atom concentration of zinc dialkylthiophosphate expressed by the following general formula (1)



where  $\text{R}^1$  and  $\text{R}^2$  are alkyl groups having 3 to 12 carbon atoms and may be same or different, (C) a 0.05 to 0.15% by weight in terms of nitrogen atom concentration of a succinic acid imide type ashless dispersant and (D) a 0.5 to 3.0% by weight of a phenol or amine type ashless antioxidant, or both, as essential components on the basis of the total amount of the composition, the total base number of the composition being between 2.0 and 6.0 mgKOH/g.

5,567,343

## NEW LEATHER OILING PREPARATIONS AND THEIR USE

Wolfgang Ritter, Hann; Hans-Dieter Sitz, Rommerskirchen; Rudolf Zauns-Huber, Duesseldorf, and Emil Ruschelsky, Leverkusen, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP93/01730, § 371 Date Feb. 17, 1995, § 102(e) Date Feb. 17, 1995, PCT Pub. No. WO94/01587, PCT Pub. Date Jan. 20, 1994

PCT Filed Jul. 5, 1993, Ser. No. 367,268

Claims priority, application Germany, Jul. 14, 1992, 42 23 111.6

Int. Cl.<sup>6</sup> C14C 9/00

U.S. Cl. 252—857

20 Claims

1. An aqueous dispersion of amphiphilic co-oligomers for oiling leather or skins, said dispersion comprising co-oligomers of
- (a) fatty crotonates, and
  - (b) radical-copolymerizable, hydrophilic, ethylenically unsaturated acids, anhydrides and mixtures thereof, wherein the weight ratio of (a):(b) is 30-90%:70-10%, based on the weight of (a)+(b), said dispersion having an active substance content in the range from about 30-70% by weight, based on the weight of said dispersion.

- (v) aminoalcohol compounds containing at least one reactive amino group and at least one reactive hydroxy group per molecule, and

- (vi) mixtures of (i) to (v);

provided that when said nucleophilic post-treating reactant includes one or more of (iii), (iv) or (v), the reaction between (A) and (B) is conducted in the presence of monoreactive nucleophilic chain-stopping or end-capping co-reactant (C) in an amount sufficient to ensure that the reaction product is gel-free.

5,567,345

## LOWER VISCOSITY TELOMER OIL

Phillip S. Landis, Alexandria, Va., assignor to International Lubricants, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 108,477, Aug. 18, 1993, Pat. No. 5,454,965. This application Jan. 30, 1995, Ser. No. 380,127

Int. Cl.<sup>6</sup> C10M 129/74; C07C 69/74

U.S. Cl. 508—486

15 Claims

1. A lower range viscosity telomer oil with an acid number of less than 20 and a viscosity range of from about 5000 sus to about 12,000 sus at 40° C., comprising no more than 4% polyunsaturated fatty acids and a plurality of aliphatic rings, wherein the telomer oil is made from about 5% to about 15% of a conjugated triglyceride oil, wherein the conjugated triglyceride oil has at least 50% of fatty acids having at least two conjugated double bonds, and from about 85% to about 95% of an unconjugated unsaturated triglyceride oil, wherein the unconjugated unsaturated triglyceride oil has from about 10% to about 75% of its fatty acids being polyunsaturated and having from about 16 to about 26 carbon atom chain length (unbranched).

5,567,344

## GEL-FREE DISPERSANT ADDITIVES USEFUL IN OLEAGINOUS COMPOSITIONS, DERIVED FROM FUNCTIONALIZED AND GRAFTED ALPHA-OLEFIN POLYMERS

Jacob Emert, Brooklyn, N.Y.; Robert D. Lundberg, Flemington, and David J. Lohse, Bridgewater, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 992,516, Dec. 17, 1992, abandoned.

This application Dec. 9, 1994, Ser. No. 352,967

Int. Cl.<sup>6</sup> C10M 145/22; 145/20

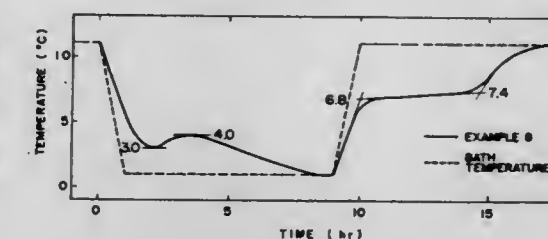
U.S. Cl. 508—452

20 Claims

1. A gel-free dispersant additive for oleaginous compositions comprising the reaction product of:
- (A) a functionalized and grafted  $\alpha$ -olefin polymer prepared by:
- (1) first functionalizing an oil soluble unsaturated  $\alpha$ -olefin polymer selected from the group consisting of  $\alpha$ -olefin homopolymers and  $\alpha$ -olefin interpolymers to obtain an intermediate product comprising functionalized  $\alpha$ -olefin polymer, said  $\alpha$ -olefin polymer having a number average molecular weight of from about 700 to about 10,000 and a polydispersity of from about 1 to about 5 prior to functionalizing; said  $\alpha$ -olefin polymer being selectively functionalized with carboxylic acid producing moieties at sites of olefinic unsaturation such that at least 65% of the polymer chains thereof which are functionalized are monofunctionalized, and
  - (2) then free radically grafting the intermediate product such that carboxylic acid producing moieties are randomly attached along the polymer chains of the functionalized  $\alpha$ -olefin polymer;

wherein said acid producing moieties introduced by functionalizing and by free radically grafting have 1 to 2 carboxylic acid producing groups per moiety such that the functionalized and grafted  $\alpha$ -olefin polymer contains an average of from about 0.5 to about 5 acid producing moieties per polymer chain; and

- (B) at least one nucleophilic post-treating reactant selected from the group consisting of:
- (i) amine compounds containing only a single reactive amino group per molecule,
  - (ii) alcohol compounds containing only a single hydroxy group per molecule,
  - (iii) polyamine compounds containing at least two reactive amino groups per molecule,
  - (iv) polyol compounds containing at least two reactive hydroxy groups per molecule,



1. A latent heat storage material composition having a melting point in the range of 5° to 10° C. and consisting essentially of 68 to 80 wt % of sodium sulfate decahydrate, 4 to 15 wt % of ammonium chloride and 4 to 15 wt % of sodium bromide.



5,567,347

## FIBER TREATMENT COMPOSITIONS CONTAINING ORGANOFUNCTIONAL SILOXANES AND METHODS FOR THE PREPARATION THEREOF

Jeffrey A. Kosal; Diane M. Kosal, both of Midland, and Anthony Revis, Freeland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.  
Division of Ser. No. 376,258, Jan. 23, 1995, Pat. No. 5,518,775, which is a division of Ser. No. 175,807, Dec. 30, 1993, Pat. No. 5,409,620. This application Jan. 29, 1996, Ser. No. 593,761  
Int. Cl.<sup>6</sup> D06M 11/77; D06C 15/00; B32B 27/36

U.S. Cl. 252—8.62 12 Claims

1. A treated substrate prepared by a method comprising the steps of:

(I) mixing:

(A) an allyl ester, vinyl ester, or an unsaturated acetate selected from the group consisting of isopropenyl acetate and 2-methyl-1-butenyl acetate,

(B) at least one organohydrogensiloxane,

(C) a metal catalyst, and

(D) an organosilicon compound having an average of at least one group per molecule selected from the group consisting of hydroxy groups, carboxyl groups, ester groups, amino groups, acetoxy groups, sulfo groups, alkoxy groups, acrylate groups, epoxy groups, fluoro groups, ether groups, olefinic hydrocarbon or halohydrocarbon radicals having from 2 to 20 carbon atoms, and mixtures thereof, and

(E) a dispersant selected from the group consisting of:

(i) surfactants; and

(ii) an acetonitrile solvent;

(II) applying the mixture from (I) to a substrate; and

(III) heating the substrate.

5,567,348

## DETERGENT COMPOSITION FOR PRECISION PARTS OR JIGS

Masanori Nozawa, Hannan, and Eiichi Kashiara, Wakayama, both of Japan, assignors to Kao Corporation, Tokyo, Japan  
Continuation of Ser. No. 50,669, Apr. 22, 1993, abandoned.  
This application Feb. 28, 1995, Ser. No. 395,654

Claims priority, application Japan, Apr. 30, 1992, 4-111560

Int. Cl.<sup>6</sup> C11D 1/72; 3/18; 3/44; C23G 5/032

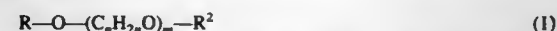
U.S. Cl. 510—175 7 Claims

1. A detergent composition for precision parts of jigs, which comprises:

(a) from 20 to 70% by weight of the composition of a hydrocarbon having 10–18 carbon atoms;

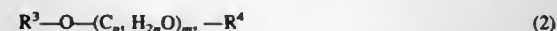
(b) from 10 to 70% by weight of the composition of a mixture of the following components (b) and (c);

(c) a glycol ether compound represented by the following formula (1):



wherein R<sup>1</sup> means an alkyl group having 1–3 carbon atoms, R<sup>2</sup> denotes a hydrogen atom or an alkyl group having 1–3 carbon atoms, n is 2 or 3 and m is 2 or 3, with the proviso that radicals C<sub>n</sub>H<sub>2n</sub>O may be different from each other;

(c) a glycol ether compound represented by the following formula (2):



wherein R<sup>3</sup> means an alkyl group having 4–8 carbon atoms, R<sup>4</sup> denotes a hydrogen atom or an alkyl group having 4–8 carbon atoms, n' is 2 or 3 and m' is 2 or 3, with the proviso that radicals C<sub>n</sub>H<sub>2n</sub>O may be different from each other; and

(d) from 3 to 30% by weight of a non-ionic surfactant selected from the group consisting of polyoxyethylene alkyl ethers, polyoxyethylene alkyl phenol ethers and polyoxyethylene sorbitan fatty acid esters, said alkyl having from 9 to 18 carbon atoms and said fatty acid having from 9 to 24 carbon atoms;

wherein components (a), (b) and (c) are present in amounts such that the ratio of the weight of component (a) to the sum of the weights of components (b) and (c), (a)/[(b)+(c)], is from 25/75 to 75/25, and the weight ratio of component (b) to component (c), (b)/(c), is from 5/9 to 30/13.

5,567,349

## PHOTO CROSS-LINKABLE LIQUID CRYSTALS

Stephen Kelly, Möhlin; Martin Schadt, Seltisberg, both of Switzerland, and Klaus Schmitt, Lörrach, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 1, 1995, Ser. No. 396,847

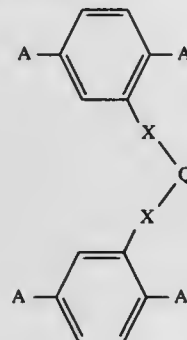
Claims priority, application Sweden, Mar. 30, 1994, 953/94

Int. Cl.<sup>6</sup> C09K 19/52; 19/20; C07C 69/76

U.S. Cl. 252—299.01

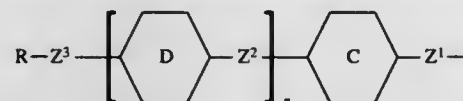
6 Claims

1. A compound of the formula



wherein

A is a cross-linkable mesogenic residue of the formula



wherein

rings C and D each independently are 1,4-phenylene, which is optionally substituted with halogen, methyl and/or cyano, pyridine-2,5-diyl, pyrimidine-2,5-diyl, trans-1,4-cyclohexylene or trans-1,3-dioxane-2,5-diyl;

Z<sup>1</sup> is —CH<sub>2</sub>CH<sub>2</sub>—, —CH<sub>2</sub>O—, —COO—, —OOC—, —(CH<sub>2</sub>)<sub>4</sub>— or (CH<sub>2</sub>)<sub>3</sub>O—;Z<sup>2</sup> is a single bond, —CH<sub>2</sub>CH<sub>2</sub>—, —CH<sub>2</sub>O—, —OCH<sub>2</sub>—, —COO—, —OOC—, —(CH<sub>2</sub>)<sub>4</sub>—, —O(CH<sub>2</sub>)<sub>3</sub>— or —(CH<sub>2</sub>)<sub>3</sub>O—;Z<sup>3</sup> is —(CH<sub>2</sub>)<sub>m</sub>—, —(CH<sub>2</sub>)<sub>m</sub>O—, —O(CH<sub>2</sub>)<sub>m</sub>—, —(CH<sub>2</sub>)<sub>m</sub>COO—, —OOC(CH<sub>2</sub>)<sub>m</sub>—, —(CH<sub>2</sub>)<sub>m</sub>OOC— or —COO(CH<sub>2</sub>)<sub>m</sub>—;

n is 0 or 1;

m is a whole number of 1 to 16;

R is acrylate, methacrylate, acryloyloxy, methacryloyloxy, vinyl-oxo or epoxy;

X is a single bond, —COO—, —CH<sub>2</sub>O—, —CONH—, or —C=N—; and

Q is n-alkylene, c-alkylene, 1,4-phenylene, 4,4'-biphenylene or 2,6-naphthylene.

5,567,350

## SILACYCLOHEXANE COMPOUND, A METHOD OF PREPARING IT AND A LIQUID CRYSTAL COMPOSITION CONTAINING IT

Takaaki Shimizu; Takeshi Kinsho; Tsutomu Ogihara; Tatsushi Kaneko; Ryuichi Saito, all of Niigata-ken, and Hideshi Kurihara, Kawasaki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1995, Ser. No. 383,368

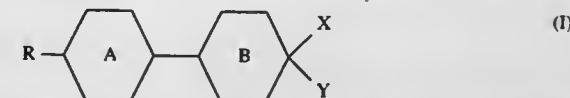
Claims priority, application Japan, Feb. 4, 1994, 6-033156

Int. Cl.<sup>6</sup> C09K 19/34; 19/30; C07F 7/08; G02F 1/13

U.S. Cl. 252—299.61

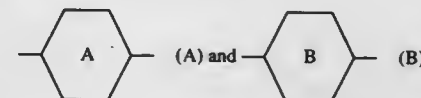
6 Claims

1. A silacyclohexane compound represented by the following general formula (I):



wherein R denotes a linear-chain alkyl group with a carbon number of 1–10, a mono- or di-fluoroalkyl group with a carbon number of 1–10, a branched-chain alkyl group with a carbon number of 3–8, an alkoxyalkyl group with a carbon number of 2–7, or an alkenyl group with a carbon number of 2–8;

at least one of



denotes a 1-sila-1,4-cyclohexylene or a 4-sila-1,4-cyclohexylene group whose silicon at position 1 or position 4 has a substitutional group of H, F, Cl or CH<sub>3</sub>, and the other denotes a 1,4-cyclohexylene group, a 1-sila-1,4-cyclohexylene or a 4-sila-1,4-cyclohexylene group whose silicon at position 1 or 4 has a substitutional group of H, F, Cl or CH<sub>3</sub>;

X denotes a substitutional group at an equatorial position, specifically CN, an alkyl group with a carbon number of 1–10 and with its end group replaced by a trifluoromethyl group, an alkoxy group with a carbon number of 1–10, an alkanoyloxy group with a carbon number of 2–10, an alkoxyalkyl group with a carbon number of 1–10, a linear-chain alkyl group with a carbon number of 1–10, or an alkoxyalkyl group with a carbon number of 2–7;

Y denotes a substitutional group at an axial position, specifically H or CN when Y is connected to a carbon atom in said (B) group or H, F, Cl or CH<sub>3</sub> when Y is connected to a silicon atom in said (B) group; and

the relationship between R and said (B) group as well as between said (A) group and the substitutional group X is trans.

5,567,351

## PHOSPHOR AND METHOD OF MAKING SAME

Ru-Yi Qi; Ronald E. Karam, both of Towanda; Vaddi B. Reddy, Sayre, and James R. Cox, Monroeton, all of Pa., assignors to OSRAM Sylvania Inc., Danvers, Mass.

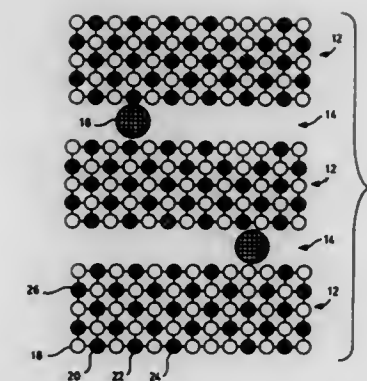
Continuation-in-part of Ser. No. 189,012, Jan. 28, 1994, abandoned, which is a continuation-in-part of Ser. No. 999,637, Dec. 31, 1992, abandoned. This application Apr. 20, 1995, Ser. No. 425,848

Int. Cl.<sup>6</sup> C09K 11/69; 11/59

U.S. Cl. 252—301.4 R

31 Claims

1. A phosphor having the general formula M<sup>a</sup>(Mg<sub>2</sub>M<sup>b</sup>M<sup>c</sup>)LiSi<sub>4</sub>O<sub>10</sub>F<sub>2</sub>, where M<sup>a</sup> is Na or Li; M<sup>b</sup> and M<sup>c</sup> are selected from Pb, Nb, Tb, Ti, Sn, Mn, Eu, or Ce; x is from about 0.0025 to about 0.2; and y is from 0 to about 0.2.



5,567,352

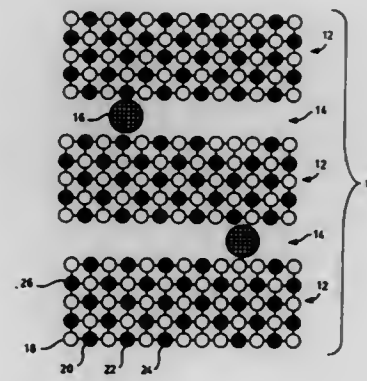
## PHOSPHOR AND METHOD OF MAKING SAME

Ru-Yi Qi, and Ronald E. Karam, both of Towanda, Pa., assignors to Osram Sylvania Inc., Danvers, Mass.  
Continuation-in-part of Ser. No. 189,012, Jan. 28, 1994, abandoned, which is a continuation-in-part of Ser. No. 999,637, Dec. 31, 1992, abandoned. This application Apr. 20, 1995, Ser. No. 425,535

Int. Cl.<sup>6</sup> C09K 11/54; 11/70; 11/57

U.S. Cl. 252—301.6 P

4 Claims



1. A phosphor having the general formula NaH(Zn<sub>1-x</sub>Mn<sub>x</sub>PO<sub>4</sub>)<sub>2</sub> where x is between about 0.02 to about 0.12.

5,567,353

## METHOD FOR DISPERSING CERAMIC MATERIAL IN AN AQUEOUS MEDIUM

Leonard E. Bogan, Jr., Hatfield, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 13, 1995, Ser. No. 421,091

Int. Cl.<sup>6</sup> B01J 13/00

U.S. Cl. 252—313.1

6 Claims

1. A method for dispersing one or more ceramic materials in an aqueous medium, comprising utilizing a polymeric dispersant consisting of, as polymerized units, from 5 percent to 95 percent by weight one or more hydroxy functional monomers and from 95 percent to 5 percent by weight one or more acid-containing monomers, wherein the one or more ceramic materials is selected from the group consisting of alumina, aluminum nitride, aluminum titanate, lead titanate, boron nitride, silicon, silicon carbide, sialon, zirconium nitride, zirconium carbide, zirconium boride, boron carbide, tungsten carbide, tungsten boride, tin oxide, ruthenium oxide, yttrium oxide, magnesium oxide, calcium oxide, and ferrites; wherein the polymeric dispersant is a random copolymer.

5,567,354

## INHIBITOR OF THE CORROSION OF A METAL MATERIAL SUCH AS STEEL

Christian Schwendemann, Metz; Jacques Keller, Florange; Jean-Luc Auger, Fameck, and Philippe Fatrez, Chieulles, all of France, assignors to Sollac (Societe Anonyme), Puteaux, France

Filed Nov. 22, 1994, Ser. No. 346,188

Claims priority, application France, Dec. 14, 1993, 93 15196  
Int. Cl.<sup>6</sup> C10M 173/02

U.S. Cl. 252—387

7 Claims

1. An inhibitor of the corrosion of a metal material consisting of an aqueous solution containing 0.01 to 0.3 mol/l of an alkali metal nitrite, 0.01 to 0.3 mol/l of an alkali metal phosphate and phosphoric acid in a proportion of a quantity sufficient to maintain the pH of said solution, measured at ambient temperature, between 6.9 and 7.2.



least one organic solvent wherein each organic solvent is soluble in water in an amount of at least 1 gram in 50 grams of water to miscible in water, a hydrophobic organic acid that is soluble in said organic solvent, aniline monomer and radical initiator.

5,567,355

## INTRINSICALLY CONDUCTIVE POLYMER IN THE FORM OF A DISPERSIBLE SOLID, ITS MANUFACTURE AND ITS USE

Bernhard Wessling; Harald Volk, both of Bargteheide, and Susanne Blättner, Hamburg, all of Germany, assignors to Zipperling Kessler & Co. (GmbH & Co.), Ahrensburg, Germany

Continuation of Ser. No. 350,738, May 3, 1989, abandoned.

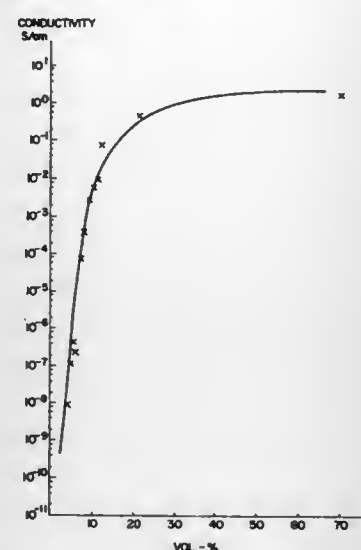
This application May 12, 1993, Ser. No. 59,740

Claims priority, application Germany, Sep. 4, 1987, 37 29 566.7

Int. Cl.<sup>6</sup> H01B 1/00; 1/12

U.S. Cl. 252—500

19 Claims



1. Intrinsically conductive polyaniline powder in the form of a dispersible solid of primary particles having a specific surface area according to BET of  $>15 \text{ m}^2/\text{g}$  and an average (weight) diameter of less than 500 nm.

5,567,356

## EMULSION-POLYMERIZATION PROCESS AND ELECTRICALLY-CONDUCTIVE POLYANILINE SALTS

Patrick J. Kinlen, Fenton, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 7, 1994, Ser. No. 335,143

Int. Cl.<sup>6</sup> H01B 1/00; 1/06; 1/12

U.S. Cl. 252—500

9 Claims

1. A process for producing a polyaniline salt comprising mixing in a composition, components consisting essentially of water, at

5,567,357

## CONDUCTIVE PAINT HAVING GOOD ADHESION TO MOLDING OF METALLIC OXIDE

Shinichi Wakita, Osaka, Japan, assignor to Tatsuta Electric Wire & Cable Co., Ltd., Osaka, Japan

PCT No. PCT/JP94/01401, § 371 Date Apr. 21, 1995, § 102(e) Date Apr. 21, 1995, PCT Pub. No. WO95/06092, PCT Pub. Date Mar. 2, 1995

PCT Filed Aug. 24, 1994, Ser. No. 424,427

Claims priority, application Japan, Aug. 25, 1993, 5-210568

Int. Cl.<sup>6</sup> H01B 1/16

U.S. Cl. 252—514

2 Claims

1. A conductive paint having a good adhesion to a molding of metallic oxide, said conductive paint comprising 100 parts by weight of silver-plated copper powder containing silver plating in the amount of not more than 30 wt %; 13.6–6.0 parts by weight of phenolic resin (solid content); 0.2–0.7 part by weight of one selected from saturated fatty acids, unsaturated fatty acids, metallic salts thereof, and coupling agents containing saturated fatty acids or unsaturated fatty acids; 1.0–4.0 parts by weight of triethanolamine; and 0.1–1.0 part by weight of dihydroxybenzene, said phenolic resin being a resol phenolic resin which satisfies the following relations:

(A)  $1/n=0.8-1.2$ (B)  $m/n=0.8-1.2$ (C)  $b/a=0.8-1.2$ (D)  $c/a=1.2-1.5$ 

wherein  $l$ ,  $m$ ,  $n$ ,  $a$ ,  $b$  and  $c$  are infrared ray transmittances of 2-mono substitution product, 2,4-di substitution product, 2,4,6-tri substitution product, methylol group, dimethylenether and phenol group, respectively.

5,567,358

## THICK FILM RESISTOR COMPOSITION

Fujio Makuta; Hiroshi Fukaya, and Katsuhiko Kawakubo, all of Tokyo, Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Continuation of Ser. No. 200,570, Feb. 22, 1994, abandoned, which is a continuation of Ser. No. 9,241, Jan. 26, 1993, abandoned. This application Aug. 28, 1995, Ser. No. 520,507

Int. Cl.<sup>6</sup> H01B 1/00; 1/08

U.S. Cl. 252—518

2 Claims

1. A thick film resistor composition consisting essentially of: at least one conductive material selected from the group consisting of  $\text{RuO}_2$ ,  $\text{Pb}_2\text{Ru}_2\text{O}_{6-7}$ , and  $\text{Bi}_2\text{Ru}_2\text{O}_7$ ; non-conductive glass comprising  $\text{PbO}$  and  $\text{SiO}_2$ ;  $\text{Ta}_2\text{O}_5$ , in a amount of up to 5 weight percent with respect to the total weight of conductive material and non-conductive glass; and an organic vehicle.

5,567,359

## ULTRA MILD SURFACTANT WITH GOOD LATHER

William A. Cassidy, Norwood; James R. Schwartz, and Richard D. Farris, both of West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 799,916, Nov. 26, 1991, abandoned, which is a continuation of Ser. No. 459,100, Dec. 29, 1989, abandoned. This application Jun. 2, 1995, Ser. No. 460,025

Int. Cl.<sup>6</sup> C11D 1/755; 1/004

U.S. Cl. 510—135

6 Claims

1. An ultra mild skin cleansing composition comprising:  
a) from 10% to 80% by weight of said composition of an ultra mild, good foaming surfactant consisting essentially of an alkyl glyceryl ether sulfonate surfactant having a hydrophobic group which contains an alkyl chain of 8 carbon atoms; and wherein said alkyl glyceryl ether sulfonate surfactant has a Relative Skin Barrier Destructive Value of from about 0.1 to about 0.9;  
b) from 10% to 40% by weight of said composition of a moisturizer;  
c) from 0.1% to 5% by weight of said composition of a polymeric skin feel aid; and  
d) from 5% to 25% by weight of said composition of soap.

5,567,360

## ELECTROCHEMICHROMIC MIRROR

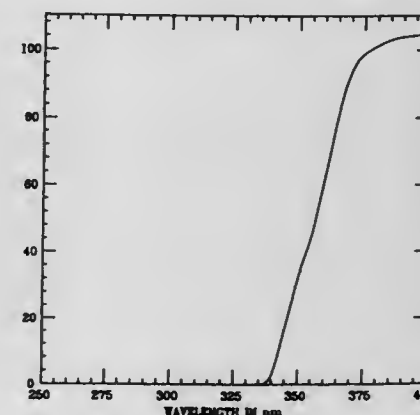
Desaraju V. Varaprasad, 327 Ridgeland Ct., Apt. 2, Holland, Mich. 49423; Niall R. Lynam, 248 Foxdown, Holland, Mich. 49424; Hamid R. Habibi, 2630 Knagspough, Holland, Mich. 49424, and Padma Desaraju, 327 Ridgeland Ct., Holland, Mich. 49423

Continuation of Ser. No. 289,939, Aug. 12, 1994, Pat. No. 5,472,643, which is a continuation of Ser. No. 878,176, May 4, 1992, Pat. No. 5,340,503, which is a division of Ser. No. 443,113, Nov. 29, 1989, Pat. No. 5,140,455. This application Dec. 4, 1995, Ser. No. 566,507

Int. Cl.<sup>6</sup> G02F 1/00

U.S. Cl. 252—583

14 Claims



1. An electrochemichromic rearview mirror for a vehicle, said mirror comprising:

spaced plates, each having an inwardly facing conductive surface;

an electrochemichromic solution between said spaced plates, said solution comprising:

a redox chemical pair in solution in said solvent which colors in the presence of an applied voltage and which bleaches to a colorless condition in the absence of an applied voltage; said solvent selected from the group consisting of: 3-hydroxypropionitrile (HPN), 3,3'-oxydipropionitrile (ODPN), 2-acetylbutyrolactone (ABL), 2-methylglutaronitrile (MGNT), and mixtures thereof.

5,567,361

## FRAGRANCE ENHANCER APPARATUS

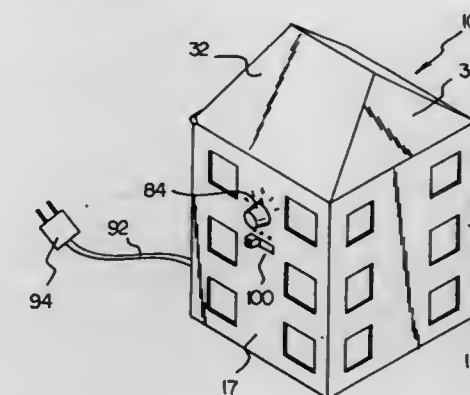
Edward C. Harper, 1429 Dewey Mims Rd., Dublin, Ga. 31027

Filed Jul. 14, 1995, Ser. No. 502,476

Int. Cl.<sup>6</sup> B01F 3/04

U.S. Cl. 261—26

1 Claim



1. A fragrance enhancer apparatus for maximizing the effectiveness of a wick air freshener by accumulating fragrance from the air freshener in an enclosed area and then expelling the fragrance with forced air comprising, in combination:

a container further comprising:

a box-shaped rigid body having a rectangular planar bottom wall with a rectangular planar front wall, a rectangular planar rear wall, and a pair of opposed rectangular planar side walls extended perpendicularly upwards from the bottom wall to define a hollow interior, a top edge, and a central opening for allowing access to the interior, each wall further having a plurality of rectangular-shaped vent holes disposed thereon;

a rigid peaked roof formed of a pair of trapezoidal-shaped side faces with a pair of opposed triangular-shaped end faces extended therebetween and with the roof hingably coupled to the top edge of the body and positionable over the central opening thereof;

a rigid perforated upstanding inner side wall coupled to the bottom wall and extended upwards therefrom to divide the interior into a first holding space and a second holding space; and

a rigid perforated floor disposed within the second holding space and extended between the inner side wall and rear wall;

an electrically energizable fan disposed within the first holding space for forcing air into the second holding space when electrically energized;

electrically energizable and user adjustable timer means disposed within the first holding space, extended through the face of the container, and coupled to the fan for allowing the fan to be electrically energized for a period of time;

power supply means for converting electrical energy from an external power source to a form compatible for use by the timer means;

power switch means coupled between the timer means and power supply means and extended through the front wall of the container for selectively energizing and de-energizing the timer means; and

a replaceable wick air freshener material disposed upon the floor of the container and with the material releasing a fragrance within the container that is first accumulated and then expelled by forced air from the fan.



5,567,362

# IDENTITY CARD AND A METHOD AND APPARATUS FOR PRODUCING IT

Herbert Grün, Vaterstetten, Germany, assignor to GAO Gesellschaft für Automation und Organisation mbH, Germany

Continuation of Ser. No. 992,725, Dec. 18, 1992, abandoned.

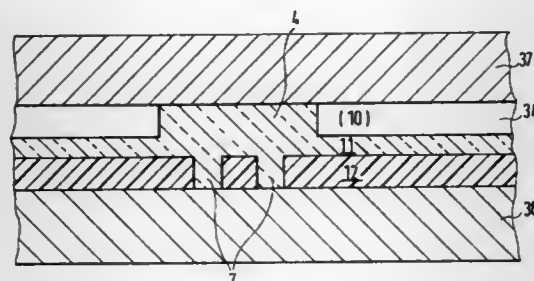
This application Aug. 10, 1994, Ser. No. 288,041

Claims priority, application Germany, Dec. 20, 1991, 41 42 408.5

Int. Cl.<sup>6</sup> B29C 45/16; B42D 15/10; G06K 19/18

U.S. Cl. 264—1.31

6 Claims



1. A method of injection molding a composite plastic identification card body comprising:

in succession, injecting a first plastic resin portion into an injection mold to delimit a first portion only of the card body, said first portion including a recess; permitting the first resin portion to solidify in the mold; then while the first resin portion is in the mold injecting into the mold at least a second plastic resin portion to delimit at least a portion of the remainder of the card body including filling said recess; then permitting the at least second resin portion to solidify in the mold; then removing the composite card body from the mold, wherein one of the plastic resin portions is incompatible with the other, and whereby one solidified resin portion may be separated from the other after the composite card body is removed from the mold to thereby leave a recess in the card body.

5,567,363

# MANUFACTURING METHOD OF A POLYMER GRIN LENS USING SULFONATION

Sang-Don Jung, and Seok-Ho Song, both of Daejeon, Rep. of Korea, assignors to Electronics & Telecommunications Research Inst., Daejeon, Rep. of Korea

Filed Nov. 30, 1994, Ser. No. 352,044

Claims priority, application Rep. of Korea, Oct. 14, 1994, 94-26392

Int. Cl.<sup>6</sup> B29D 11/00

U.S. Cl. 264—2.6

13 Claims

1. Manufacturing method for making a sphere shaped polymer GRIN lens comprising the steps of:

forming a sphere shaped cross-linked polymer by suspension polymerization, after an aromatic monomer capable of sulfonating and having hydrophobicity is mixed with a polymerization initiator and cross-linked to form said cross-linked polymer; swelling said cross-linked polymer by using a predetermined solvent; and sulfonating said swelled cross-linked polymer so as to have the highest refractive-index distribution at a center portion of said sphere and a gradually decreasing refractive-index distribution outwardly from said center of said sphere by using a sulfuric acid which is heated at a predetermined temperature.

5,567,364

# AMALGAMATION OF POLYMER MATERIALS

Thomas E. Philipps, Granville, Ohio, assignor to Isorea, Inc., Granville, Ohio

Filed Jun. 7, 1995, Ser. No. 475,564

Int. Cl.<sup>6</sup> B29C 45/00; 47/00

U.S. Cl. 264—140

17 Claims

1. A method of producing a formable material of dissimilar thermoplastic polymers comprising mixing fragments of said dissimilar thermoplastic polymers into a mixture, intermixing a small percentage by weight of particles of blown asphalt into a combination with said mixture, heating and working said combination into an amalgamation of said polymers, and further processing said amalgamation into products.

5,567,365

# METHOD OF PRODUCING REPOSITIONABLE INTRAOCULAR LENSES

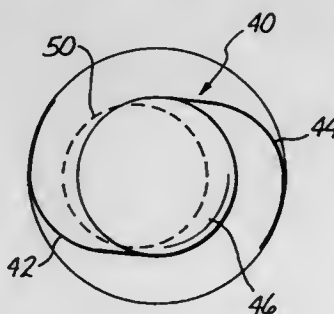
Joseph I. Weinschenk, III, Laguna Niguel; Jim Deacon, Capistrano Beach, and Glenn R. Sussman, Lake Forest, all of Calif., assignors to Allergan, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 77,810, Jun. 14, 1993. This application May 26, 1994, Ser. No. 249,402

Int. Cl.<sup>6</sup> B29D 11/00

U.S. Cl. 264—1.7

20 Claims



1. A method of producing an intraocular lens which comprises: providing a lens blank at least a portion of which comprises a polymeric material having a glass transition temperature in the range of about 40° C. to about 60° C.; and forming from said lens blank an intraocular lens including an optic and a fixation member so that at least a portion of said fixation member is made of said polymeric material, wherein said intraocular lens is formed so as to be repositionable after being placed in an eye by heating said at least a portion of said fixation member in the eye to a temperature above the glass transition temperature of said polymeric material to alter the configuration of said fixation member and move said optic.

5,567,366

# METHOD OF FINISHING A GREEN BODY

Kentaro Motegi; Yukio Ito; Yoshitaka Okamoto, and Kuniyoshi Komura, all of Aichi, Japan, assignors to Inax Corporation, Tokoname, Japan

Filed Jun. 29, 1994, Ser. No. 267,482

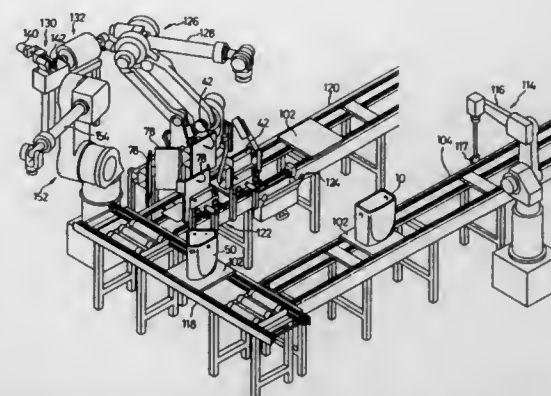
Claims priority, application Japan, Jul. 9, 1993, 5-170344

Int. Cl.<sup>6</sup> B28B 7/04; 11/00

U.S. Cl. 264—39

6 Claims

1. A method of finishing a ceramic green body in which a ceramic green body with a vessel shape is finished by steps preceding a drying step, said steps being carried out under automatic control and comprising: a distinguishing step wherein the shape of the green body is distinguished by a distinguishing device;



a holemaking step wherein a hole is made in the green body by a holemaking device in accordance with the distinguished shape; a water removing step wherein a water-removing suction device is operated in conformity with a movement pattern corresponding to the distinguished shape and water is removed from an inside of the green body; a correcting step wherein a mold having a shape conforming to that required of an outer surface of the green body is selected in correspondence with the distinguished shape and applied to the outer surface of the green body, and a movable pressure plate is inserted into the green body and presses a side surface of the green body from an inner side against the mold to correct a shape of the side surface of the green body; a suction-holding step wherein with the mold in position on the outer surface of the green body, a suction pad is pressed against an inner surface of the green body and the green body is suction-held; and an outer surface finishing step wherein the suction-held green body is lifted and brought into contact with an outer surface finishing device and finishing of the outer surface of the green body is carried out.

5,567,367

# ZERO CORRECTION METHOD FOR A PRESSURE DETECTING DEVICE OF AN INJECTION MOLDING MACHINE

Susumu Ito; Masao Kamiguchi, both of Yamanashi; Masato Yamamura, Hachioji; Noriaki Neko, Yamanashi; Tatsuhiro Uchiyama, Yamanashi; Yuichi Hosoya, Yamanashi; Nobuto Takeda, Yamanashi, and Kaoru Hiraga, Yamanashi, all of Japan, assignors to Fanuc Limited, Minamitsuru, Japan

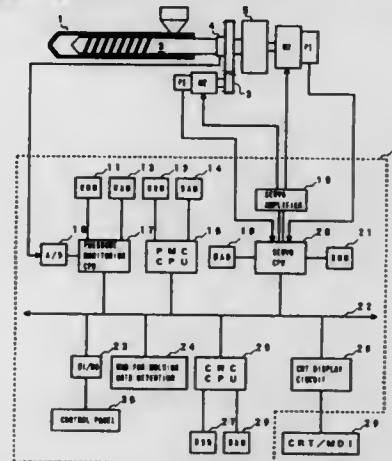
Filed Jan. 23, 1995, Ser. No. 377,273

Claims priority, application Japan, Jan. 21, 1994, 6-019829

Int. Cl.<sup>6</sup> B29C 45/77

U.S. Cl. 264—40.1

15 Claims



1. A zero correction method for a pressure detecting device of an injection molding machine, in which a pressure acting on a screw

is detected by a pressure sensor for detecting forward and reverse pressures acting on an injection force transmitting member, comprising the steps of:

applying a predetermined thrust in forward and reverse directions to the screw by a drive source; obtaining the average of the values of outputs of the pressure sensor detected when the thrust is applied in the forward and reverse directions, individually, said average being used as a correction value for zero correction; and performing the zero correction.

5,567,368

# EXTRUSION MOLDING METHOD AND EXTRUSION MOLDING APPARATUS

Yukimasa Ando, and Katsutomi Kishino, both of Obu, Japan, assignors to Tokai Kogyo Kabushiki Kaisha, Obu, Japan

PCT No. PCT/JP93/01906, § 371 Date Apr. 26, 1995, § 102(e) Date Apr. 26, 1995, PCT Pub. No. WO95/06557, PCT Pub. Date Mar. 9, 1995

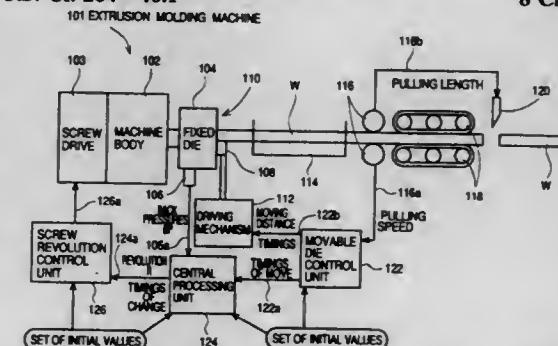
PCT Filed Dec. 27, 1993, Ser. No. 424,352

Claims priority, application Japan, Aug. 31, 1993, 5-216145

Int. Cl.<sup>6</sup> B29C 47/92

U.S. Cl. 264—40.1

8 Claims



1. In a method for extrusion molding of an article comprising extruding a molding material with an extrusion device through a die having a die opening of a configuration which is variable to change the cross-section of the article, the improvement comprising:

a) determining a desired value for a physical quantity for said molding material in the die for a particular die opening configuration; b) determining a speed of the extrusion device at which said desired value is obtained; c) determining a value for said physical quantity while changing the speed of the extrusion device at a predetermined rate of change so as to determine a time delay between changing of the speed and a resultant change in value for said physical quantity; and d) extruding molding material while changing the die opening configuration in accordance with a desired change in cross-section of the article and changing the speed to maintain said desired value, said changing the speed being done in advance of said changing the die opening configuration by an amount corresponding to said time delay.

5,567,369

# METHOD FOR DIE LIP TEMPERATURE ADJUSTMENT IN A THERMOPLASTIC EXTRUDER

Robert W. Beckwith, Cummaquid, Mass., assignor to Sencorp Systems, Inc., Hyannis, Mass.

Division of Ser. No. 45,477, Apr. 13, 1993, Pat. No. 5,462,423.

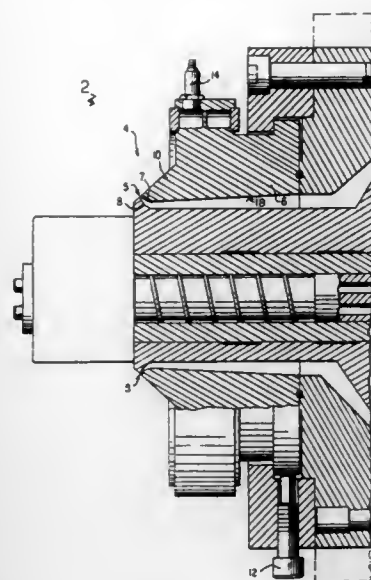
This application Jun. 5, 1995, Ser. No. 461,864

Int. Cl.<sup>6</sup> B29C 47/92

U.S. Cl. 264—40.1

10 Claims

1. A method for the control of wall thickness of an extruded thermoplastic material from an extruder, which method comprises:



- providing a thermoplastic extruder having an inlet for the introduction of thermoplastic material to be extruded and the extruder having an extrusion means comprising an inner die lip and an outer die lip having an inner lip surface, which inner and outer die lip form a concentric die gap therebetween for the extrusion of thermoplastic material therethrough of selected thickness, the die gap in a thermoplastic flow communication with an inlet of the extruder and providing in the outer die lip a generally radial oil flow inward passageway for the introduction of a heat transfer oil and providing in an outer die lip a generally radial oil outer flow passageway for the withdrawal of heat transfer oil and providing in the outer die lip a plurality of separate, generally uniformly spaced-apart sectors, each sector having a circulating oil passageway adjacent the die lip surface of the outer die lip which forms the die gap and each circulating passageway having an inlet connected to said inward passageway and an outlet connected to said outer passageway;
- introducing a thermoplastic material to be extruded into the inlet of the extruder;
- extruding the introduced thermoplastic material from the die gap with a defined wall thickness; and
- circulating a heat transfer oil from a common source at a selected heating or cooling temperature at an adjustable controlled flow rate for each sector through the circulating oil passageways of each sector to control the temperature at said inner lip surface of each sector, so as to adjust the viscosity of the thermoplastic material at each sector being extruded through the die gap and thereby to control the wall thickness of the extruded thermoplastic material.

5,567,370

# PROCESS FOR THE PRODUCTION OF TPE FOAM PROFILES FOR THE BUILDING AND AUTOMOTIVE INDUSTRIES

Otto Deseke, Lehrte; Joachim Meyke, Hannover, and Armin Pfeiffer, Celle, all of Germany, assignors to Hermann Bertsch Maschinenbau GmbH, Hanover, Germany

Filed Jan. 18, 1995, Ser. No. 374,109

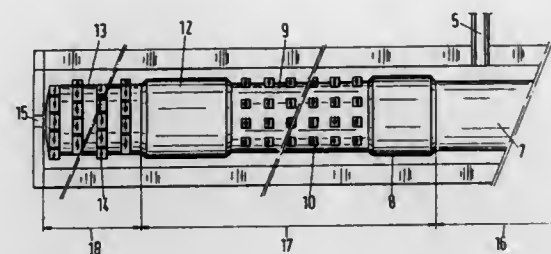
Claims priority, application Germany, Jan. 19, 1994, 44 01 432.5

Int. Cl. B29C 44/20

U.S. Cl. 264—53

5 Claims

1. A process for the production of foamed TPE profiles in an extruder using water as a blowing agent, the extruder including a conveying screw and being comprised of a conveying section, a two-stage shearing section comprised of spaced blisters and a homogenizing section between said blisters, and a further homogenizing section downstream of said two-stage shearing section, comprising the steps of:



enizing section downstream of said two-stage shearing section, comprising the steps of:

feeding TPE pellets into the conveying section of an extruder in which section the temperature is 180°-210° C. and the pressure is 100–200 bar thereby melting the pellets,

injecting water in an amount up to 5 percent by weight into the TPE melt prior to the two-stage shearing section,

exposing a mixture of melt and water in the two-stage shearing section to intensive shearing and homogenizing action thereby reducing the size of the water drops and finely distributing the water inside the melt,

exposing said mixture to an intensive mixing action in said further homogenizing section downstream of said two-stage shearing section, said further homogenizing section maintaining the desired mixture quality and temperature, and extruding the mixture through a profile die to the desired size and shape, and wherein

said two-stage shearing section comprises a first blister mounted on the conveying screw, a central toothed ring section, and a second blister downstream of said central section, and wherein the distance between the water injection and the first blister is between 1 and 4D, wherein D is the diameter of the conveying screw.

5,567,371

# BLOW MOLDING AND FLUORINATION PROCESS FOR THE PRODUCTION OF HOLLOW BODIES FROM THERMOPLASTIC MATERIALS AND PRODUCTS SO MADE

Ulrich Karsch, Niederkassel, Germany, assignor to Kautex Werke Reinold Hagen Aktiengesellschaft, Bonn, Germany

Filed Dec. 13, 1994, Ser. No. 354,997

Claims priority, application Germany, Dec. 16, 1993, 43 43 003.1

Int. Cl. B29C 49/18; 49/46

U.S. Cl. 264—83

20 Claims

1. A process for the production of a hollow body from a thermoplastic synthetic polymer by blow molding and fluorination, comprising expanding a preform within a blow molding mold using a gaseous pressure agent until a hollow body resulting from the expanded preform bears against the internal contour of the mold, and subjecting an internal wall surface of the resulting hollow body to a fluorination treatment to make the wall surface less permeable in relation to at least one substance, said treatment comprising a first treatment step in which the wall surface is treated with a gas mixture which contains fluorine and oxygen and thereafter a second treatment step in which the wall surface is treated with a gas mixture which contains fluorine but no oxygen.

5,567,372

# METHOD FOR PREPARING A NONWOVEN WEB CONTAINING ANTIMICROBIAL SILOXANE QUATERNARY AMMONIUM SALTS

Ronald S. Nohr, Roswell, and John G. MacDonald, Decatur, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 76,529, Jun. 11, 1993, abandoned. This application May 26, 1994, Ser. No. 249,788

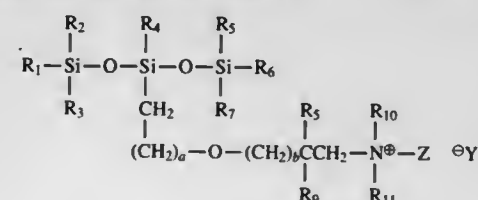
Int. Cl. D04H 3/00; D01D 5/04; D01F 1/10

U.S. Cl. 264—103 9 Claims

1. A method for preparing a nonwoven web having antimicrobial properties which comprises:

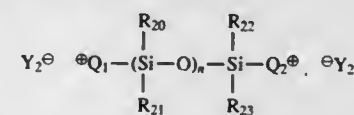
- melting a melt-extrudable thermoplastic composition;
- extruding the molten composition through multiple orifices to form streams of molten composition;
- cooling the streams of molten composition to form fibers; and
- randomly depositing said fibers on a moving foraminous surface to form a web; wherein

said melt-extrudable thermoplastic composition at least one thermoplastic polyolefin which contains only hydrogen and carbon atoms and at least one additive which is adapted to surface segregate upon extrusion of the molten composition to impart antimicrobial properties to the surface of said fibers of which said nonwoven web is comprised wherein said additive has either the general formula A,



wherein:

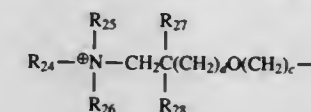
- each of  $R_1$ – $R_7$  is independently selected from the group consisting of monovalent  $C_1$ – $C_{20}$  alkyl, phenyl, and phenyl-substituted  $C_1$ – $C_{20}$  alkyl groups, in which each phenyl can be substituted or unsubstituted;
- each of  $R_8$  and  $R_9$  is a monovalent group independently selected from the group consisting of (a) hydrogen and (b) monovalent alkyl, cycloalkyl, aryl, and heterocyclic groups and combinations thereof having up to about 30 carbon atoms, except that both  $R_8$  and  $R_9$  cannot be hydrogen; or, when taken together in combination with the carbon atom to which they are attached,  $R_8$  and  $R_9$  represent a carbonyl group;
- each of  $R_{10}$  and  $R_{11}$  is a methyl group;
- $a$  represents an integer from 1 to about 20;
- $b$  represents an integer from 1 to about 20;
- $Z$  is a monovalent group having from about 8 to about 30 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, and heterocyclic groups, and combinations thereof, wherein  $Z$  is terminated by an alkyl moiety which includes at least about 8 carbon atoms in a single continuous chain;
- $Y_1$  is an anion which does not cause the thermal instability of the additive to be more than about 35 wt. % decomposition during melt extrusion; and
- said additive has a molecular weight of from about 600 to about 1,700; or the general formula B,



wherein:

- each of  $R_{20}$ – $R_{23}$  is independently selected from the group consisting of monovalent  $C_1$ – $C_{20}$  alkyl, phenyl, and phenyl-substituted  $C_1$ – $C_{20}$  alkyl groups, in which each phenyl can be substituted or unsubstituted;

- $n$  represents an integer of from 1 to about 19;
- each of  $Q_1$  and  $Q_2$  represents an independently selected quaternary ammonium group having the general formula,



in which:

- $R_{24}$  is a monovalent alkyl group having from about 8 to about 30 carbon atoms, at least about 8 carbon atom of which make up a single continuous chain;
- $R_{25}$  and  $R_{26}$  are methyl groups;
- each of  $R_{27}$  and  $R_{28}$  is a monovalent group independently selected from the group consisting of (i) hydrogen and (ii) monovalent alkyl, cycloalkyl, aryl, and heterocyclic groups and combinations thereof having up to about 30 carbon atoms, except that both  $R_{27}$  and  $R_{28}$  cannot be hydrogen; or, when taken together in combination with the carbon atom to which they are attached,  $R_{27}$  and  $R_{28}$  represent a carbonyl group;
- $c$  represents an integer of from 2 to about 20; and
- $d$  represents an integer of from 2 to about 20;
- $Y_2$  represents an anion which does not cause the thermal instability of the additive to be more than about 35 wt. % decomposition during melt extrusion; and
- said additive has a polydispersity of up to about 3.0 and a weight-average molecular weight of from about 800 to about 2,000;

wherein said additive is present in said melt-extrudable thermoplastic composition in an amount sufficient to impart antimicrobial activity to the surfaces of said fibers of which said nonwoven web is comprised.

5,567,373

# METHOD AND APPARATUS FOR MANUFACTURING A LIQUID CONTAINER HAVING PLURAL POROUS MEMBERS

Osamu Sato, Kawasaki; Hiroshi Sugitani; Tsuyoshi Orikasa, both of Tokyo; Toshihiko Ujita, Yamato; Masahiko Higuma, Togane; Yasuo Kotaki, Tokyo, and Jun Hinami, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

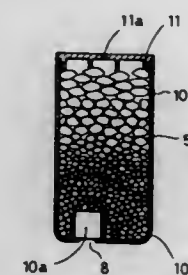
Filed Jan. 27, 1995, Ser. No. 379,756

Claims priority, application Japan, Jan. 31, 1994, 6-009876

Int. Cl. B29C 43/14; B41J 2/175

U.S. Cl. 264—112

30 Claims



1. A method of manufacturing a liquid container having an enclosed space within an inner wall of the liquid container, the enclosed space filled with a plurality of porous members including a plurality of inner porous members and a plurality of outer porous members, said method comprising the steps of:

- packing the porous members into the enclosed space so that the inner porous members contact and press against other inner porous members and/or outer porous members, and the outer porous members contact and press against the inner porous members and the inner wall of the liquid container; and
- compressing the porous members.



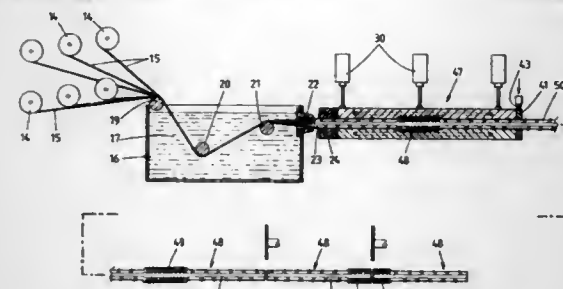
# 5,567,374 POLYMERIC MOLDINGS REINFORCED WITH TOWS OF FIBERS

Edward P. Thichener, West Lakes Shore, and Peter J. Hastwell, North Adelaide, both of Australia, assignors to Applied Research of Australia, Pty. Ltd., Australia  
Continuation-in-part of Ser. No. 81,362, Jun. 30, 1993, abandoned. This application Nov. 17, 1994, Ser. No. 341,431  
Claims priority, application Australia, Nov. 1, 1991, PK9225; Oct. 30, 1992, 28899/92

Int. Cl.<sup>6</sup> B29C 70/52

U.S. Cl. 264—137

12 Claims



1. A method of forming a plurality of elongate molded products of settable resin reinforced with fibers, comprising the following steps:

- (a) drawing a bundle of tows of fibers through a bath of fluid settable resin mix and between cavities of die portions of an open die;
- (b) applying pressure to close the die portions to conform the shape of said tows and said resin entrained and wetted thereby to the shapes of surfaces which define said cavities, retaining pressure on said tows and applying heat to said die portions to accelerate curing of said resin therebetween;
- (c) opening said die portions and partially withdrawing a molded product lengthwise therefrom, thereby drawing a further bundle of tows wetted with said resin between said die cavities, the further bundle of tows being a trailing extension of said molded product;
- (d) repeating said steps (b) and (c) to form successive molded products; and
- (e) separating said molded products externally of the die.

# 5,567,375 METHOD FOR CASTING A THERMOPLASTIC AUTOMOTIVE AIR BAG COVER SKIN WITH A LESSER STRENGTH THERMOPLASTIC TEAR SEAM STRIP INSERT

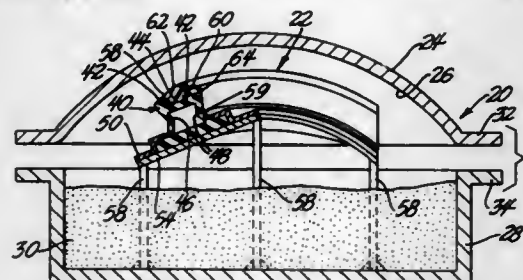
Scott M. Filion, Newmarket; John D. Gray, Union, and William M. Humphrey, Dover, all of N.H., assignors to Davidson Textron Inc., Dover, N.H.

Filed Jun. 5, 1995, Ser. No. 465,306

Int. Cl.<sup>6</sup> B29C 41/18; 47/00

U.S. Cl. 264—251

7 Claims



1. A method of making a thermoplastic air bag cover skin with a lesser strength thermoplastic air bag deployment tear seam insert comprising the steps of: forming a filled thermoplastic tear seam strip having an inner side with a protruding rib and having an outer side with oppositely angled surfaces that intersect to form a

pointed ridge, conforming said tear seam strip with the use of said rib to a prescribed tear seam configuration to form a tear seam strip insert, holding said tear seam strip insert with said rib, pressing said pointed ridge of said tear seam strip insert with a limited force against a prescribed location on a heated air bag cover skin defining mold surface to prevent air entrapment between said heated mold surface and said tear seam strip insert and to eventually melt both said pointed ridge and all of said rib and conform a narrow portion on said outer side of said tear seam strip insert intersected by a remaining portion of said angled surfaces to a prescribed area of said heated mold surface, and casting thermoplastic powder against said heated mold surface and said remaining portion of said angled surfaces of said tear seam strip insert to form a thermoplastic air bag cover skin that joins with said remaining portion of said angled surfaces of said tear seam strip insert and smoothly blends with said narrow portion of said tear seam strip insert at said mold surface and also smoothly blends at an inner side of said skin with said inner side of said tear seam strip insert.

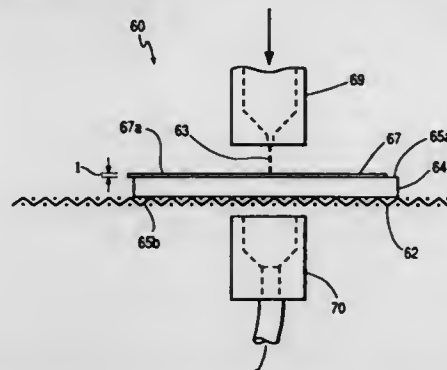
# 5,567,376 METHOD OF FORMING TEXTILE-LIKE APERTURED PLASTIC FILMS

Mordechai Turi, Princeton Junction; Edmund Z. DeRossett, Mercerville, and Ching-Yun M. Yang, Princeton Junction, all of N.J., assignors to Chicopee, New Brunswick, N.J.  
Continuation of Ser. No. 4,379, Jan. 14, 1993, abandoned, which is a continuation of Ser. No. 744,744, Aug. 14, 1991, abandoned. This application Apr. 5, 1995, Ser. No. 417,404

Int. Cl.<sup>6</sup> B29C 59/00

U.S. Cl. 264—455

14 Claims



1. A method for forming an apertured film comprising a stretchable thermoplastic polymeric material having a plurality of micro-holes therein, said micro-holes being defined by a network of fibrils formed from said thermoplastic polymeric material, said method comprising:

- (a) providing a starting film comprising said stretchable thermoplastic polymeric material and having an upper surface and a lower surface;
- (b) providing a backing member comprising localized support regions for supporting said starting film, recessed zones into which the film may be deformed by the application thereto of fluid forces; and means for allowing said applied fluid to be transported away from said backing member;
- (c) supporting said starting film on said backing member with portions of the lower surface of said film being in contact with the support regions of said backing member and with the upper surface of said film facing away from said backing member;
- (d) providing a manifold adjacent to the starting film on said backing member, said manifold having a plurality of holes therein having areas ranging from about  $7.07 \times 10^{-6}$  square inches to about  $78.5 \times 10^{-6}$  square inches;
- (e) directing a fluid through said manifold holes in the form of columnar streams against the upper surface of said starting film in a zone of contact and at a pressure sufficient to urge the unsupported portions of said starting film between said

supported portions downwardly at least partially into said recessed zones and to cause the formation of said micro-holes and fibrils;  
f) moving said film from said contact zone; and  
g) removing said now-apertured film from said backing member.

# 5,567,377 METHOD OF MANUFACTURING A MULTILAYER BOTTLE

Akira Nishigami; Tetsuzo Nakamura, both of Ibaraki, and Masato Honda, Buzen, all of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Division of Ser. No. 30,385, May 5, 1993, Pat. No. 5,435,452.

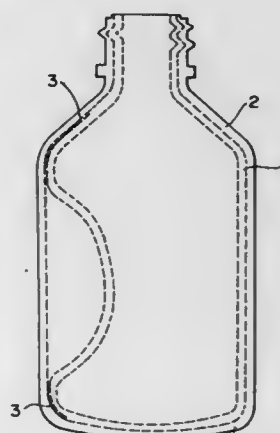
This application May 23, 1995, Ser. No. 447,620

Claims priority, application Japan, Aug. 5, 1991, 3-195566; May 11, 1992, 4-117756

Int. Cl.<sup>6</sup> B29C 49/22

U.S. Cl. 264—515

10 Claims



1. A method of forming a multilayer bottle having an outer layer and a deformable inner layer, the method comprising:

- extruding a multilayer parison comprising an outer layer, a deformable inner layer formed inside the outer layer, and at least one strip of adhesive material interposed between the inner and outer layers, at least a portion of the inner layer being adhered to the outer layer by the at least one strip of adhesive material;
- clamping the multilayer parison in a blow mold comprising at least two mold sections, the clamping action cutting the parison to form a parison bottom end and a parison top end;
- inserting a core bar into the top end of the parison;
- blowing a gas into the parison through the core bar to perform a blow molding operation and form the multilayer bottle; and
- releasing the multilayer bottle from the blow mold, the inner layer being separable from the outer layer, during discharge of contents of the multilayer bottle, at portions other than the portion of the inner layer adhered to the outer layer by the adhesive material.

# 5,567,378 MOLTEN METAL HOLDING FURNACE AND METHOD OF HOLDING MOLTEN METAL WITHIN THE SAME

Shunji Mochizuki, Nishinomiya; Hiromi Takagi; Masahiko Hoshino, both of Nagoya, and Sumi Yoshikawa, Aichi-ken, all of Japan, assignors to Nippondenso Co., Ltd., Aichi-pref, Japan

Filed Feb. 10, 1995, Ser. No. 388,047

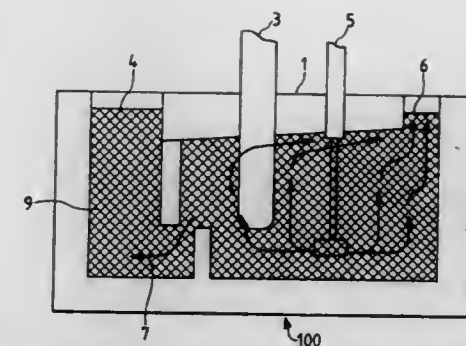
Claims priority, application Japan, Jun. 24, 1994, 6-142999

Int. Cl.<sup>6</sup> C21B 13/00

U.S. Cl. 266—44

2 Claims

2. A method for removing oxide in molten metal held within a furnace, the furnace including a reservoir chamber having an upper



wall including an inclined wall surface leading to an inlet port, the inlet port communicating with the reservoir chamber, the method comprising:

- setting a level of molten metal in the reservoir chamber to a given level so that the inclined wall surface contacts a surface of the molten metal; and
- generating inert gas in the molten metal such that oxide in the molten metal rises to the surface of the molten metal and moves along the inclined wall surface so as to be collected at the inlet port.

# 5,567,379 METHOD OF PRODUCING MOLTEN PIG IRON OR MOLTEN STEEL PRE-PRODUCTS AND A PLANT THEREFOR

Leopold W. Kepplinger, Leonding; Panajiotis Matzawrakos; Johannes Schenk, both of Linz, and Dieter Siuka, Neuhofen, all of Austria, assignors to Voest-Alpine Industrieanlagenbau GmbH, Linz, Austria; Pohang Iron & Steel Co., Ltd., and Research Institute of Industrial Science & Technology, Incorporated Foundation, both of Pohang, Rep. of Korea

Division of Ser. No. 66,505, May 20, 1993, Pat. No. 5,445,668.

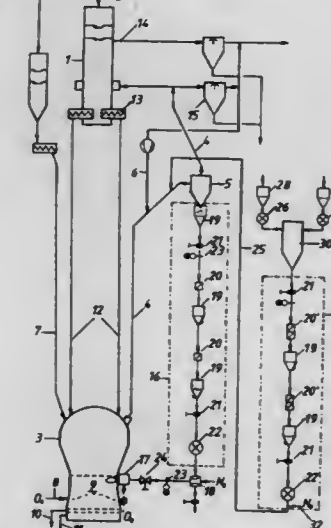
This application May 25, 1995, Ser. No. 449,761

Claims priority, application Austria, May 21, 1992, 1054/92

Int. Cl.<sup>6</sup> C21B 7/00

U.S. Cl. 266—143

12 Claims



1. A plant for producing molten pig iron or molten steel pre-products from lumpy, iron-ore-containing charging substances of the type including  
a reduction shaft furnace for said lumpy, iron-ore-containing charging substances, and  
a melter gasifier for receiving the reduction product formed in said reduction shaft furnace, the improvement comprising  
a first charging means for at least one of iron ore and ore dust, a second charging means for solid carbon carriers, at least one dust burner provided at said melter gasifier,

means for flow-connecting said first charging means for said at least one of iron ore and ore dust and said second charging means for said solid carbon carriers with said at least one dust burner.

5,567,380

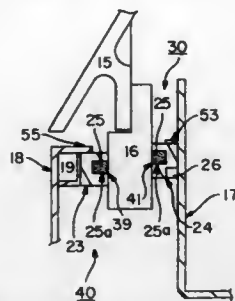
**ROTARY RETORT HEAT TREATING FURNACE SEALS**  
Donald P. Hoover, P.O. Box 13957, Savannah, Ga. 31416

Filed Sep. 30, 1994, Ser. No. 316,421

Int. Cl.<sup>6</sup> C21B 11/06

U.S. Cl. 266—173

15 Claims



1. A seal ring assembly for sealing a discharge end of a rotary retort heat treating furnace comprising an outer furnace shell, a retort chamber, a rear plug, a cone casting, and a support ring, wherein the cone casting is positioned at the discharge end of the retort chamber and the cone casting and the support ring are fixedly attached to rotate together with the retort chamber, said assembly comprising:

- metal annular member;
- fixing means attached to said metal annular member for fixedly attaching said metal annular member at the discharge end of the rotary retort furnace;
- static biasing means forming a wear surface, wherein said wear surface is disposed between said metal annular member and the support ring, and in sealing engagement therebetween; and
- wherein said metal annular member is aluminum-bronze and further comprises lubricating means.

5,567,381

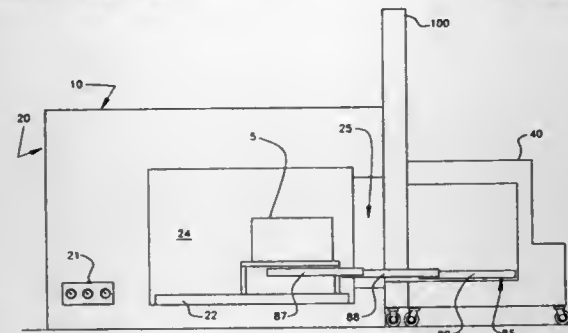
**HYBRID HEAT TREATING FURNACE**  
Matthew D. Carter, Portland, Oreg., assignor to Abar Ipsen Industries, Inc., Bensalem, Pa.

Filed Mar. 20, 1995, Ser. No. 407,407

Int. Cl.<sup>6</sup> C21D 1/74

U.S. Cl. 266—250

16 Claims



1. Apparatus for heat treating a workpiece comprising: a vacuum furnace for heating a metallic workpiece to a first elevated temperature, said vacuum furnace including a heating chamber and an opening for inserting a workpiece into or removing a workpiece from said heating chamber; sealing means connected to said vacuum furnace for closing the vacuum furnace opening and preventing the introduction of

air into the heating chamber while the workpiece is being heated in said vacuum furnace; and an oven removably connected to said sealing means comprising: an oven chamber for holding the workpiece, said oven chamber having an opening at one end thereof for inserting a workpiece into or removing a workpiece from said oven chamber; oven closing means for closing the opening of said oven chamber and for preventing the introduction of air into the oven chamber while said oven is disconnected from said vacuum furnace; and heating means for maintaining the workpiece in said oven chamber above a second elevated temperature when said oven is disconnected from said furnace.

5,567,382

**DISPERSION STRENGTHENED COPPER**  
Evgeny P. Danelia, Moscow, Russian Federation, assignor to OTD Products L.L.C., Denver, Colo.

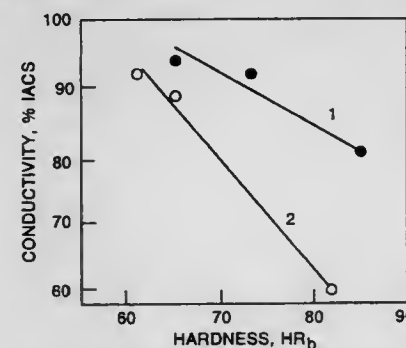
Division of Ser. No. 107,529, Aug. 17, 1993. This application

Jun. 5, 1995, Ser. No. 464,603

Int. Cl.<sup>6</sup> B22F 1/00

U.S. Cl. 419—19

10 Claims



1. A method for producing a dispersion strengthened material, comprising the steps of:  
(a) forming an alloy comprising aluminum, titanium and hafnium, the balance being copper;  
(b) forming said alloy into particle;  
(c) oxidizing said particles to form an oxide skin on the surface of said particles;  
(d) internally oxidizing said particles to form a copper matrix comprising oxides of aluminum, titanium and hafnium, said internally oxidizing step being controlled such that a portion of said aluminum, titanium and hafnium is unoxidized to improve the resistance to hydrogen embrittlement of the dispersion strengthened material; and  
(e) forming said copper matrix using a drawing coefficient of at least about 12 to form a dispersion strengthened material.

5,567,383

**HEAT RESISTING ALLOYS**  
Toshiharu Noda, Tajimi; Katsuaki Sato, and Tsutomu Saka, both of Wako, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Aichi-Prefecture, and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of Japan

Filed Jun. 6, 1995, Ser. No. 471,153

Claims priority, application Japan, Jun. 15, 1994, 6-133050

Int. Cl.<sup>6</sup> C22C 30/00

U.S. Cl. 420—584.1

16 Claims

1. A heat resisting alloy consisting essentially by weight percentage of 0.01 to 0.10% of C, not more than 2.0 % of Si, not more than 2.0% of Mn, 14 to 20% of Cr, 0.3 to 1.5% of Nb, 1.5 to 3.5% of Ti, 0.5 to 1.5% of Al, 35 to 45% of Ni, 0.001 to 0.0196% of B, at least one element selected from 0.001 to 0.03% of Ca and 0.001 to 0.03% of Mg, and the balance being Fe and inevitable impuri-

ties, wherein the total atomic percentage of Al, Ti and Nb is in a range of 4.5 to 6.0% an atomic percentage ratio of Ti/Al is in a range of 1.0 to 2.0, and M-value calculated using the following equation does not exceed 0.925;

$$M = 0.717 \text{ Ni (atomic fraction)} + 0.858 \text{ Fe (atomic fraction)} + 1.142 \text{ Cr (atomic fraction)} + 1.90 \text{ Al (atomic fraction)} + 2.271 \text{ Ti (atomic fraction)} + 2.117 \text{ Nb (atomic fraction)} + 1.001 \text{ Mn (atomic fraction)} + 1.90 \text{ Si (atomic fraction)}$$

5,567,384

Patent Not Issued For This Number

5,567,385

**STERILANT COMPOSITION**  
Charles R. Miller, Houston, and Haskell B. Berry, Jr., Channelview, both of Tex., assignors to Premier Medical Technology, Inc., Houston, Tex.

Continuation of Ser. No. 174,297, Dec. 23, 1993, abandoned.

This application Jul. 24, 1995, Ser. No. 505,920

Int. Cl.<sup>6</sup> A01N 25/14; A61L 2/16; C02F 1/68; C11D 7/20

U.S. Cl. 422—28

13 Claims

7. A method of sterilizing pathogen-containing hospital medical waste material during size reduction in a shredding apparatus, comprising mixing shredded hospital medical waste material with a sterilant composition for rendering pathogens in the waste material non-infectious, said sterilant composition comprising calcium oxide and calcium carbonate mixed in a ratio of 20:80 to 60:40, by weight, reacting said sterilant composition with said pathogen-containing material and water at a pH of about 10–12.5 and a temperature of 5°–35° C., rendering said pathogens non-infectious and producing a non-infectious product.

5,567,386

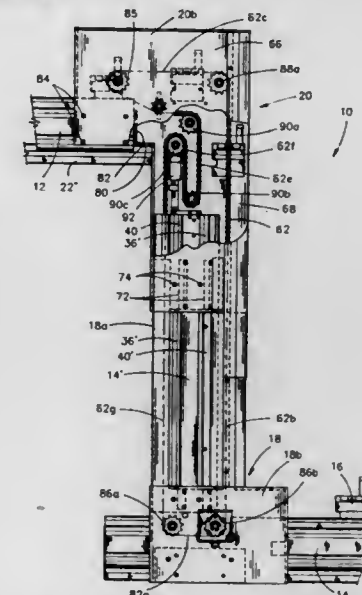
**ELEVATOR AND SPECIMAN CARRIER FOR AUTOMATED CONVEYOR SYSTEM**  
Rodney S. Markin, Omaha, Nebr., assignor to Board of Regents—Univ. of NE, Lincoln, Nebr.

Filed Apr. 7, 1995, Ser. No. 418,942

Int. Cl.<sup>6</sup> G01N 35/04

U.S. Cl. 422—65

4 Claims



1. An elevator for moving a specimen carrier between vertically spaced apart conveyor tracks, comprising:

an elevator having an upper housing removably connected to an upstream end of an upper conveyor track and having a lower housing removably connected to a downstream end of a lower conveyor track;

each said conveyor track having a moving support surface for transporting a specimen carrier downstream, and a pair of arms projecting upwardly on opposing sides the support surface for guiding a specimen carrier;

said elevator including means for lifting a specimen carrier vertically off of the downstream end of the lower track and placing a lifted specimen carrier on the upstream end of the upper track;

said means for lifting and placing a specimen carrier including: a pair of opposing, spaced apart, coaxial lift members operably mounted to move in a continuous loop between the lower track downstream end and upper track upstream end; and each specimen carrier including oppositely disposed wings cooperable with the lift members to selectively receive opposing free ends of the lift members;

a pair of continuous loop chains engaged around a plurality of pairs of spaced apart, coaxial sprockets;

a drive motor operably connected to a pair of drive sprockets engaged with said pair of chains to selectively drive the same; said pair of lift members including one lift member attached to one of said pair of chains, and the opposing lift member attached to the second of said pair of chains;

a first sprocket pair rotatably mounted in the lower housing on opposing sides of the lower conveyor track;

said pair of chains forming a chain loop with a first leg extending between the first sprocket pair and a second sprocket pair;

a stop plate mounted over the support surface of the lower conveyor track and located to stop a specimen carrier on the lower track transport surface with the specimen carrier's wings aligned vertically with the first leg of the chain loop to receive the lift members;

a second sprocket pair rotatably mounted in the upper housing directly above the first sprocket pair, such that the first leg of the chain loop is generally vertical;

a third sprocket pair rotatably mounted in the upper housing on opposing sides of the upper conveyor track, and spaced horizontally from the second sprocket pair;

said chain loop having a second leg extending from the second sprocket pair to the third sprocket pair;

said third sprocket pair located to place a specimen carrier carried on the chain loop on the transport surface of the upper track.

5,567,387

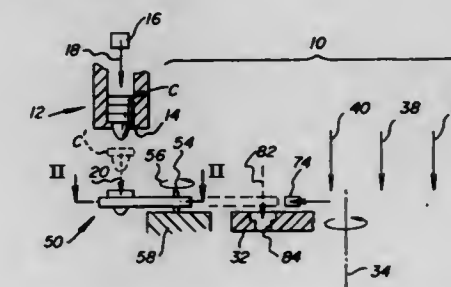
**CUVETTE CONVEYOR AND SENSOR**  
Richard J. Versluys, Spencerport, and J. Daniel Riall, Pittsford, both of N.Y., assignors to Johnson & Johnson Clinical Diagnostics, Inc., Rochester, N.Y.

Filed Nov. 7, 1994, Ser. No. 335,429

Int. Cl.<sup>6</sup> G01N 21/13

U.S. Cl. 422—67

6 Claims



1. In a chemical analyzer comprising a conveyor for conveying a selected reaction cuvette from a cuvette dispensing station of the analyzer to a processing station, said conveyor including means for holding a cuvette in, and releasing a cuvette from, said conveyor,



the improvement wherein said analyzer further includes a sensor for sensing whether the number of cuvettes dispensed onto said conveyor is more than just one, by sensing the presence or absence of a cuvette projecting above the top of said selected cuvette.

5,567,388

# APPARATUS FOR MEASURING TOTAL ORGANIC CARBON

Youzo Morita, Kameoka, and Keiji Inoue, Suita, both of Japan, assignors to Shimadzu Corporation, Japan

Continuation of Ser. No. 915,578, Jul. 20, 1992, abandoned.

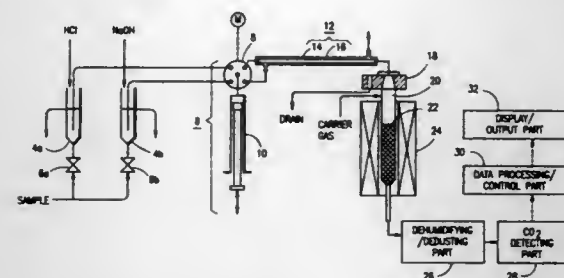
This application Sep. 8, 1995, Ser. No. 525,070

Claims priority, application Japan, Jul. 29, 1991, 3-212942

Int. Cl.<sup>6</sup> G01N 31/12

U.S. Cl. 422—80

7 Claims



1. A total organic carbon measuring apparatus, comprising:
  - a source of sample solution;
  - a first sample preparing part for acidifying said sample solution to prepare an acidified sample solution to not more than pH 4, said first sample preparing part in fluid connection with said source of sample solution;
  - a second sample preparing part for alkalifying said sample solution to prepare an alkalified sample solution of at least pH 9, said second sample preparing part in fluid connection with said source of sample solution;
  - an inorganic carbon removing part including a first chamber in fluid communication with said first sample preparing part for containing said acidified sample solution and a second chamber in fluid communication with said second sample preparing part for containing said alkalified sample solution, said inorganic carbon removing part further including a carbonic acid gas permeable material film separating said first chamber and said second chamber to allow inorganic carbon contained in said acidified sample solution to move toward said alkalified sample solution and through said carbonic acid gas permeable material film while preventing loss of purgeable organic carbon components from the acidified sample solution since the acidified sample solution and alkalified sample solution on opposite sides of the carbonic acid gas permeable material film have the same concentration of purgeable organic carbon components; and
  - a detecting part connected to said inorganic carbon removing part for receiving said acidified sample solution from which inorganic carbon has been removed by said inorganic carbon removing part for detecting total carbon contained in said acidified sample solution.

## 5,567,389 METHOD FOR CONTROLLED DISPENSING OF EXTENDED-RELEASE CHEMICAL FORMULATION IN TABLET FORM

Philip J. Birbara, Windsor Locks; Harold T. Couch, Canton; Joseph E. Genovese, East Granby, and Donald W. Rethke, Granby, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 7, 1995, Ser. No. 499,234

Int. Cl.<sup>6</sup> A61L 2/16

U.S. Cl. 422—28

7 Claims

1. A method for controlled dispensing of a water soluble, extended-release chemical formulation into a liquid stream whereby said chemical formulation controls and prevents microbial growth and/or controls and prevents precipitation of solids in and transfer of odorous gases from urine, wherein said method comprises:

securing an extended-release chemical formulation, in tablet form, within a permeable casing; and mounting said permeable casing, containing said tableted chemical formulation, in a liquid flow path leading to urine collection hardware or in said urine collection hardware, whereby, as liquid contacts said tableted chemical formulation secured within, said casing, said tableted formulation slowly dissolves into said liquid thereby controlling and preventing microbial growth and/or controlling and preventing precipitation of solids in and transfer of odorous gases from urine, wherein said chemical formulation comprises:

a biocide; and/or an organic acid or an acid salt; and up to about 10% by weight of an extended-release binder, wherein said biocide is an acid oxidizing compound selected from the group including monopersulfate compounds, copper sulfate, silver nitrate, and mixtures thereof, wherein said organic acid is selected from the group including citric, oxalic, and maleic acids, and mixtures thereof, wherein said acid salt is selected from the group including potassium bisulfate, sodium bisulfate, cupric chloride, silver nitrate, and mixtures thereof;

wherein said binder is comprised of: at least one polyol having an average molecular weight ranging from about 600 to about 20,000 grams/mole; and, up to about 5% weight, based on the total weight of said binder, of polyethylene oxide; and wherein, when said chemical formulation comprises an organic acid and an extended-release binder, said formulation is prepared by either a method comprising:

preparing a mixture made up of said organic acid and said binder; heating said prepared mixture to a temperature of from about 45° C. to about 70° C.; cooling said heated mixture to ambient temperature; and pressing said cooled mixture into at least one tablet, or by a method comprising: heating said organic acid, alone or in combination with said binder, to a temperature sufficient to melt said acid to form a melt; optionally, adding said binder to said melt; pouring said melt into at least one mold; and cooling said melt, contained into said mold(s), to form at least one tablet.

5,567,390

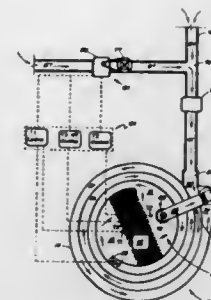
## COUNTERFLOW CATALYTIC DEVICE WITH INTERACTIVE DILUTION CONTROL

James M. Cleary, P.O. Box 541, Falmouth, Mass. 02540  
Continuation-in-part of Ser. No. 11,290, Jan. 29, 1993, Pat. No. 5,326,537. This application Jul. 5, 1994, Ser. No. 270,755  
Int. Cl.<sup>6</sup> B01J 8/04; F01N 3/10

U.S. Cl. 422—111

13 Claims

1. A catalytic oxidizer having an interactive dilution control system for continuous treatment of air hydrocarbon vapor mixture comprising:



- a) shell means for enclosing a central volume of generally circular cross-section having a longitudinal axis and a wall of generally cylindrical configuration, including an inlet header and an exhaust header;
- b) a combined catalyst chamber and spiral heat exchanger integrally connected and coaxially positioned within the shell means, also of cylindrical configuration, for providing a continuous transverse flow path from the inlet header to the exhaust header having a longitudinal and transverse dimension for two dimensional flow of vapor comprising:
  - i) a spiral heat exchanger for providing counter-flow heating of vapor comprising a pair of spaced spiral plates forming there between a first spiral flow passage having an external end and an internal end defining a transverse inlet spiral flow path and a second spiral flow passage having an internal end and an external end defining a transverse exhaust spiral flow path; and
  - ii) a catalyst chamber centrally positioned along the longitudinal axis of the shell means having permeable partition means for dividing the catalyst chamber into three zones comprising an inlet zone comprising an inlet plenum having an inlet aperture, a central core zone for containing a catalyst means, and an exhaust zone comprising an exhaust plenum having an exhaust aperture; wherein the inlet spiral flow of the heat exchanger is connected to the inlet plenum defining a first heat exchange region, and the transverse exhaust spiral flow path is connected to the exhaust plenum and is positioned adjacent to the inlet spiral flow path defining a second heat exchange region and said inlet aperture and exhaust aperture are positioned on opposite sides of the catalyst chamber for providing transverse two dimensional flow of vapor previously heated in the spiral heat exchanger with flameless combustion of the vapor introduced therein; and
- c) vapor inlet supply line connected to the inlet header for introducing a hydrocarbon vapor stream to said inlet header;
- d) dilution supply line including a dilution valve, said dilution supply line connected to the vapor inlet supply line for introducing dilution air to the vapor stream;
- e) means for heating said stream of air hydrocarbon mixture to operating temperature comprising a heater positioned at the inlet aperture of the inlet plenum;
- f) interactive dilution control means for automatically maintaining a concentration of inlet vapor at a selected optimum operating level comprising:
  - i) microprocessor control means comprising a microprocessor control sub-system including three programmable T1, T2, T3 controllers connected to sensing means disposed in each zone for sensing the temperature in each zone of the catalyst chamber, each zone operationally connected to dilution control means;
  - ii) by-pass control means connecting the exhaust plenum with an exhaust stack for controlling the heat recovery in said spiral heat exchanger; and

iii) dilution control means connected to the vapor inlet supply line and dilution supply line for adjusting the proportion of dilution air admitted to vapor stream; wherein said dilution control means in combination with said microprocessor control sub-system and said by-pass control means automatically adjusts inlet dilution of air hydrocarbon vapor mixtures for optimum operational efficiency with manual adjustment of heat recovery of the spiral heat exchanger and controlled by-pass of exhaust air hydrocarbon vapor, including automatic shutoff.

5,567,391

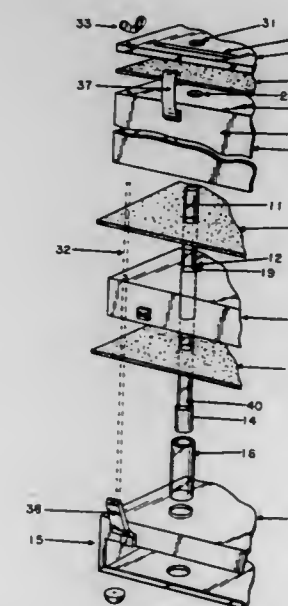
## APPARATUS FOR MULTIPLE SIMULTANEOUS SYNTHESIS

Sheila H. H. DeWitt, Dexter, Mich.; John S. Kiely, San Diego, Calif.; Michael R. Pavia, Newton, Mass.; Mel C. Schroeder, Dexter, and Charles J. Stankovic, Saline, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.  
Continuation of Ser. No. 430,696, Apr. 28, 1995, which is a continuation of Ser. No. 217,347, Mar. 24, 1994, abandoned, which is a division of Ser. No. 12,557, Feb. 2, 1993, Pat. No. 5,324,483, which is a continuation-in-part of Ser. No. 958,383, Oct. 8, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 464,161

Int. Cl.<sup>6</sup> B01J 19/00; 8/00; C12M 1/00; C07K 17/00

U.S. Cl. 422—131

11 Claims



1. An apparatus for multiple, simultaneous synthesis of compounds comprising:
  - a plurality of reaction tubes, each reaction tube having an upper end and a lower end, said lower ends each having a filter device;
  - a reservoir member having means for receiving the filter devices on the lower ends of said plurality of reaction tubes;
  - a holder member removably located adjacent to the reservoir member having a plurality of apertures for supporting said plurality of reaction tubes, and

a manifold member having a central cavity for enclosing the upper ends of said plurality of reaction tubes, said manifold member having a top wall member, said top wall member having a plurality of apertures which are coaxial with the plurality of apertures in said holder member, wherein access is possible independently to each of said reaction tubes through said top wall member.

**5,567,392**  
**DEVICE FOR THE PURIFICATION OF CONTAMINATED EXHAUST AIR THROUGH HETEROGENEOUS CATALYSIS**

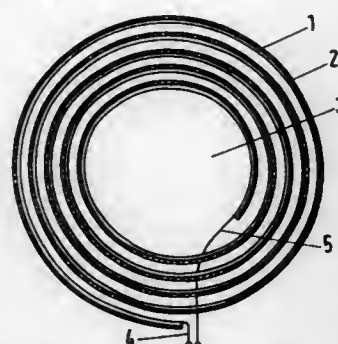
Oliver Becker, Losheim; Sabine Kolz, Grossrosseln, and Herbert Hager, Nalbach, all of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Germany  
Filed Jun. 28, 1994, Ser. No. 267,778

Claims priority, application Germany, Jun. 28, 1993, 43 21 831.8; Jun. 22, 1994, 44 23 329.9

Int. Cl.<sup>6</sup> F01N 3/10

U.S. Cl. 422—174

11 Claims



1. A device for the purification of an exhaust gas containing at least one contaminant removable through heterogeneous catalysis and flowing through a chamber having an inlet and an outlet, comprising:

- at least one disk structure positionable within a chamber and defining a central cavity aligned with an inlet of the chamber, said disk structure including:
  - a non-metallic, gas-permeable and flexible carrier element comprising a band of glass fiber yarn, said yarn comprising individual fibers coated with a layer of pulverized zeolitic material defining a molecular sieve and having a catalytic material, selected to act adsorptively upon the at least one contaminant, dispersed therein; and
  - an electrically heatable metallic woven band disposed on said carrier element, said metallic woven band and said carrier element being wound spirally end-over-end, whereby exhaust gas flowing into said central cavity from the chamber inlet passes through said bands and said at least one contaminant is removed therefrom.

**5,567,393**  
**AGGREGATE FOR PRODUCING FRESH AIR STREAM**  
Claudius Muschelkautz, Lauf; Claude Bieger, Duttlenheim, and Jochen Goehre, Karlsruhe, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany  
Filed Nov. 16, 1994, Ser. No. 340,222

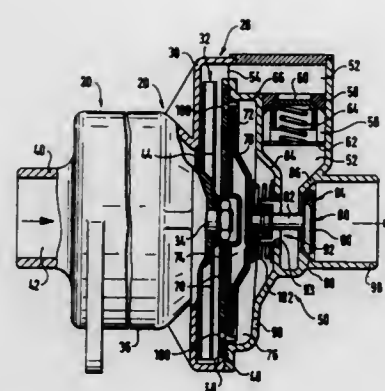
Claims priority, application Germany, Jan. 26, 1994, 44 02 137.2

Int. Cl.<sup>6</sup> F01N 3/22; F16K 31/12

U.S. Cl. 422—168

10 Claims

1. An apparatus for producing a fresh air stream, comprising a blower having an impeller and connectable at a pressure side with an exhaust gas conduit of an internal combustion engine of a motor vehicle; a fresh air supply element communicable with the exhaust gas conduit; a check valve provided between said blower



and an opening of said fresh air supply element into the exhaust gas conduit; a cut-off valve arranged in said fresh air supply element between said check valve and its opening into the exhaust gas conduit and having a closing member loaded with a spring force toward a closing position; an actuating member for said closing member; a bypass branching from said fresh air supply element so that when said blower operates a pressure builds and is supplied through said bypass branching to said actuating member for said closing member to act opposite to said spring force; an electric drive motor which has a shaft supporting said impeller; a cup-shaped blower chamber which accommodates said impeller and has walls connected with a housing part of said motor; and a roof-shaped cover part which closes said blower chamber and is provided with said check valve, said cut-off valve and a control chamber.

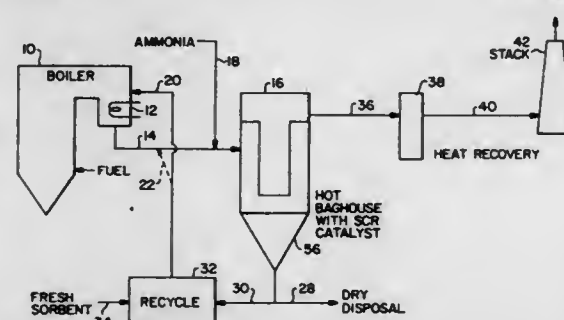
**5,567,394**  
**SO<sub>x</sub>, NO<sub>x</sub>, AND PARTICULATE REMOVAL SYSTEM**  
Paul Chu, Canton; William Downs, Alliance, both of Ohio; John B. Doyle, Littleton, Colo., and Peter V. Smith, North Canton, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 404,153, Sep. 7, 1989, abandoned, which is a continuation-in-part of Ser. No. 224,419, Jul. 25, 1988, Pat. No. 4,871,522. This application Oct. 2, 1990, Ser. No. 593,546

Int. Cl.<sup>6</sup> B01D 46/02

U.S. Cl. 422—177

4 Claims



1. An apparatus for controlling emissions of a fossil fuel fired boiler which produces flue gases containing SO<sub>x</sub>, NO<sub>x</sub>, and particulates, comprising:

- a flue gas duct constructed so as to carry flue gases from a boiler to a stack for discharge;
- a high-temperature pulse jet fabric filter house connected along the flue gas duct between the boiler and the stack, said filter house constructed so as to remove particulate from the flue gas passing along the flue gas duct, said fabric filter house having a plurality of fabric filter bags contained therein with each of said fabric filter bags having a bag retainer situated therein;
- a selective catalytic reduction catalyst positioned inside the bag retainer of each of said fabric filter bags in said filter house;

means for recovering heat connected along the flue gas duct downstream of said fabric filter house, said heat recovering means constructed so as to be heated by the flue gases in the flue gas duct;

means for injecting an ammoniacal compound into the flue gas duct upstream of said filter house; and

means for injecting sorbent into the flue gas duct upstream of the filter house whereby the sorbent reacts with SO<sub>x</sub> from the flue gas, the particulates are removed in said fabric filter house, thus protecting the selective catalytic reduction catalyst from fly ash erosion and SO<sub>x</sub> poisoning.

**5,567,395**  
**CATALYST CARRIER FOR A CATALYTIC CONVERTER FOR PURIFYING AN EXHAUST GAS IN AN INTERNAL COMBUSTION ENGINE**

Shinichi Okabe, Nishio; Tohru Yoshinaga, Okazaki; Kiyohiko Watanabe, Okazaki, and Yasuyuki Kawabe, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Japan

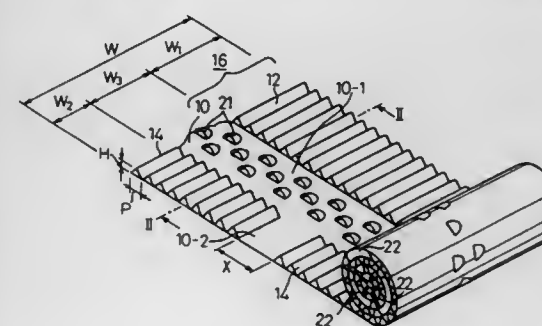
Filed Apr. 20, 1995, Ser. No. 425,720

Claims priority, application Japan, Apr. 21, 1994, 6-083470

Int. Cl.<sup>6</sup> B01D 53/34

U.S. Cl. 422—180

6 Claims



1. A catalyst carrier comprising:

an assembly of flat and corrugated sheets, wherein a first corrugated sheet is disposed along an end portion of the flat sheet, along the entire length of the flat sheet, while on an other end portion of the flat sheet, a plurality of spaced second corrugated sheets are arranged along the flat sheet, so that the flat sheet has spaced sections with no corrugated sheet along the length of said flat sheet;

a mid-section of the flat sheet with no corrugated sheet being defined between the first corrugated sheet and the plurality of spaced second corrugated sheets, the mid-section extending along the entire length of the flat sheet, the mid-section being formed with a plurality of louvers distributed along the entire length of the mid-section;

the flat-corrugated sheet assembly being rolled to form a catalyst carrier of a cylindrical shape having axially spaced inlet and outlet ends;

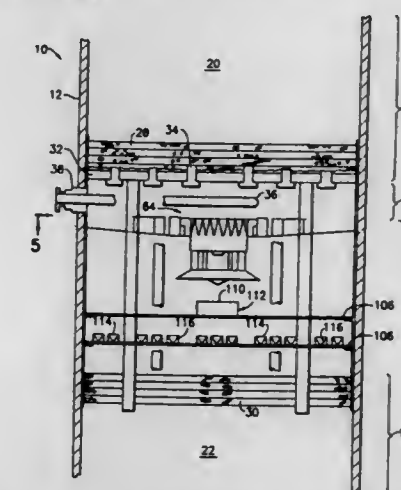
in the catalyst carrier, the mid-section of the flat sheet with no corrugated sheet and with louvers defining a turbulence generating section;

in the catalyst carrier, said spaced sections with no corrugated sheet defining low flow-resistance sections located upstream from the turbulence generating section.

**5,567,396**  
**FLUIDS MIXING AND DISTRIBUTING APPARATUS**  
George K. Perry, and John C. Strickland, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.  
Continuation-in-part of Ser. No. 61,605, May 13, 1993, Pat. No. 5,403,560. This application Nov. 4, 1994, Ser. No. 334,670

Int. Cl.<sup>6</sup> B01J 8/04

10 Claims



1. In an interzone mixing assembly for mixing and intimately contacting vapor and liquid in a downflow reactor vessel defined by a cylindrical wall wherein the assembly comprises:

- (i) an inwardly sloping collector tray peripherally sealed to the cylindrical wall of said reactor vessel and having a central opening concentric with the vertical axis of said reactor vessel;
- (ii) a mixer downcomer having an elongated hollow member having a serrated upper edge forming a plurality of tapered prongs defining a plurality of tapered slots, extending vertically through the central opening in said collector tray wherein the bottom of the tapered prongs are substantially even with the upper surface of said collector tray and wherein the wall of said mixer downcomer is sealed to the periphery of the central opening in said collector tray;
- (iii) a cover plate attached to the upper end of said mixer downcomer;
- (iv) a hollow, elongated mixer cap mounted on the upper surface of the collector tray, said mixer cap being closed at the top, having a slotted lower edge forming a plurality of rectangular prongs defining a plurality of rectangular slots, the inner wall of said mixer cap and the outer wall of said mixer downcomer forming an annular space, and the rectangular slots in said mixer cap being radially aligned with the tapered prongs of said mixer downcomer; and
- (v) attachment means for attaching the mixer downcomer to the mixer cap; said mixer downcomer, cover plate and mixer cap defining a mixing means;

the improvement in combination therewith comprising:

a flow deflector means in said mixing means to direct flow of liquid through said mixing means toward the vertical axis of said reactor vessel.

**5,567,397**  
**DEVICE FOR MANUFACTURING SYNTHETIC GAS**  
Jean-Hervé Le Gal, Paris; Michel Maute, Les Clayes Sous Bois, and Pierre Boucot, Ternay, all of France, assignors to Institut Français du Pétrole, Reuil Malmaison, France  
Filed Sep. 24, 1993, Ser. No. 125,699

Claims priority, application France, Sep. 25, 1992, 92 11568

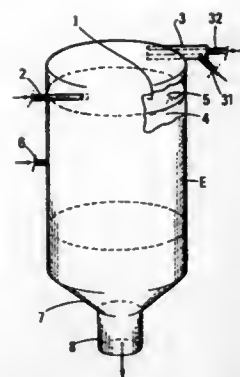
Int. Cl.<sup>6</sup> B01J 8/02

U.S. Cl. 422—192

9 Claims

1. A device for manufacturing synthetic gas, comprising within a single housing:





- a non catalytic combustion chamber, at least one fuel injection element injecting fuel into said chamber and at least one oxidizer injection element for introducing oxidizer into said chamber so as to achieve a partial combustion within said chamber;
- a catalytic element comprising at least one catalytic bed located next to said combustion chamber, with a surface of the bed being in direct contact with at least a part of the gases passing from the combustion chamber to the catalytic bed; and
- at least one other injection element for injecting complementary oxidizer directly into said at least one catalytic bed; the surface of contact between the combustion chamber and said catalytic element is such that:

$$\frac{V}{S} < \frac{d}{4}$$

wherein V is the overall volume of the combustion chamber expressed in cubic meters; S is the surface of the combustion chamber in contact with the catalytic element, expressed in square meters, and d is a greatest dimension of the chamber expressed in meters so that the contact surface is maximized with respect to the volume of the combustion chamber to allow reduction of the formation of soot in said combustion chamber.

#### 5,567,398 ENDOTHERMIC REACTION APPARATUS AND METHOD

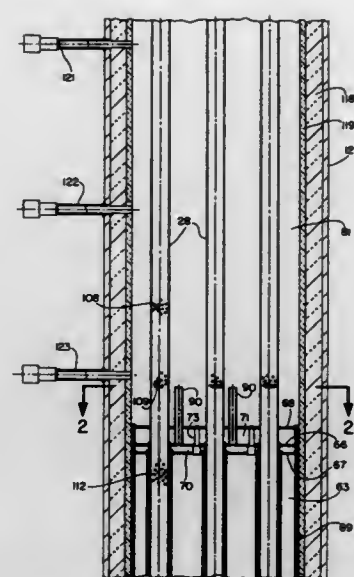
Robert C. Ruhl, Cleveland Heights, and Ralph A. Felice, Macedonia, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 888,776, May 26, 1992, abandoned, and Ser. No. 889,035, May 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 810,251, Dec. 19, 1991, abandoned, and Ser. No. 810,237, Dec. 19, 1991, abandoned, which is a continuation-in-part of Ser. No. 504,375, Apr. 3, 1990, abandoned, said Ser. No. 810,251 is a continuation-in-part of Ser. No. 504,375, Apr. 3, 1990. This application Jun. 16, 1993, Ser. No. 78,748  
Int. Cl.<sup>6</sup> B01J 8/06

U.S. Cl. 422—197

29 Claims

1. An endothermic reaction apparatus for effecting an endothermic reaction, comprising
- a vessel, said vessel including an inlet port for an endothermic reactant to be subjected to an endothermic reaction to convert the reactant to an endothermic product, an outlet port for the endothermic product, and an exothermic reaction chamber,
- a plurality of reaction tubes providing respective flow passages between said inlet and outlet ports, said reaction tubes extending through said exothermic reaction chamber in laterally spaced apart relationship, and
- first and second supplies for separately supplying first and second exothermic reaction fluids to said exothermic reaction chamber for exothermically reacting within said exothermic reaction chamber and for providing flow of exothermic reac-



tion products in a direction going from an upstream end to a downstream end of said exothermic reaction chamber, said first supply having first fluid outlet means for introducing said first fluid into said exothermic reaction chamber at said upstream end thereof for flow around and along said reaction tubes, and said second supply including second fluid outlet means for introducing said second fluid into said exothermic reaction chamber at or downstream of said first fluid outlet means and at a plurality of discrete locations interposed among but laterally offset from said reaction tubes, whereby said second fluid exiting from said second fluid outlet means combines with said first fluid for generation of high temperature flames around said reaction tubes downstream of said second fluid outlet means and high temperature exothermic reaction products for flow around and along said reaction tubes, for heating said reaction tubes to support an endothermic conversion of the endothermic reactant to the endothermic product as it flows through said reaction tubes, and wherein said first fluid outlet means includes a flow distribution member extending transversely of said reaction tubes at said upstream end of said exothermic reaction chamber and having a plurality of openings through which said first fluid flows into the upstream end of said exothermic reaction chamber, and wherein each said reaction tube passes through the distribution member and is surrounded by a plurality of said openings that are closer to said reaction tube than the latter is to its nearest neighbor reaction tube.

5,567,399  
APPARATUS FOR PRODUCING A SINGLE CRYSTAL  
Wilfried Von Ammon; Erich Dornberger, both of Burghausen; Herber Weidner, Haiming, and Alfred Pardubitzki, Burghausen, all of Germany, assignors to Wacker Siltronic Gesellschaft für Halbleitermaterialien AG, Burghausen, Germany

Filed Jan. 26, 1996, Ser. No. 592,072

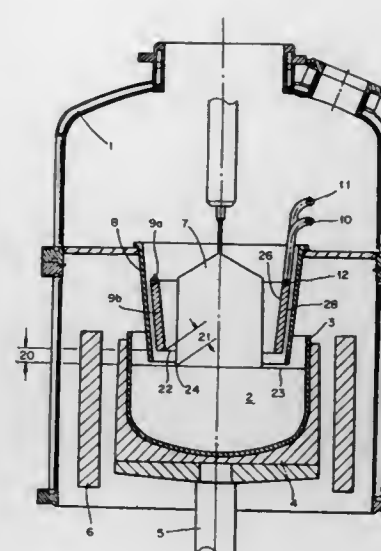
Claims priority, application Germany, Feb. 2, 1995, 19503357.4

Int. Cl.<sup>6</sup> B01D 9/00

U.S. Cl. 722—245.1

7 Claims

1. An apparatus for producing a single crystal of semiconductor material in accordance with the Czochralski method, comprising at least one heat shield which shields a growing single crystal, and
- a cooling means which cools the growing single crystal, wherein the cooling means is constructed in two parts, with a first upper part comprising a duct system through which a liquid coolant flows, and with a second lower part comprising a cooling body having high thermal conductivity.



#### 5,567,400 PROCESS FOR APPLYING A LOW SOILING FIBER FINISH

Elbert H. Mudge, and Thomas D. Brabson, both of Charlotte, N.C., assignors to Henkel Corporation, Plymouth Meeting, Pa.

Division of Ser. No. 249,590, May 26, 1994, Pat. No. 5,491,004. This application Sep. 26, 1995, Ser. No. 534,150  
Int. Cl.<sup>6</sup> B05D 3/02

U.S. Cl. 252—8.62

7 Claims

1. A method for applying a low soil secondary finish to synthetic fibers comprising treating spun fibers with a coating effective quantity of a composition comprising a dry waxy component solid at room temperature selected from at least one compound from the group consisting of

- A) a block copolymer of ethylene oxide and propylene oxide;
- B) the reaction product of a C<sub>8-30</sub> saturated fatty amine or a phenol with from 2 to 250 moles of ethylene oxide, and
- C) a C<sub>8-22</sub> fatty acid ester.

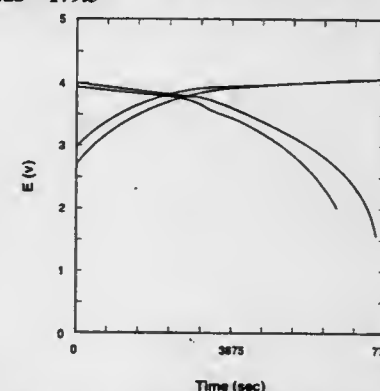
5,567,401  
METHOD OF PRODUCING STABLE METAL OXIDES AND CHALCOGENIDES AND POWER SOURCE  
Narayan Doddapaneni, 10516 Royal Birkdale, N.E., and David Ingersoll, 5824 Mimosa PL, N.E., both of Albuquerque, N.M. 87111

Filed Mar. 14, 1995, Ser. No. 404,037

Int. Cl.<sup>6</sup> C01D 15/00; H01B 1/06; H01M 4/58

U.S. Cl. 423—179.5

18 Claims



1. A method of producing chemically and electrochemically stable oxides or other chalcogenides for use as cathodes for power source applications, the method comprising the steps of:

- a) mixing a lithium salt, a metal salt, a pore former, and a solvent;
- b) removing the solvent;
- c) drying the mixture;
- d) performing a stepwise heating of the mixture; and
- e) cooling the mixture in a dry atmosphere.

#### 5,567,402 METHOD OF CLEANING GASES CONTAINING ORGANIC POLLUTANTS

Jean-François Vicard, 17 Rue de la Charité, Lyon, France, and Gilles Vicard, 45 bis Montée Saint-Laurent, Lyon, France  
PCT No. PCT/FR92/00408, § 371 Date Oct. 26, 1993, § 102(e)  
Date Oct. 26, 1993, PCT Pub. No. WO92/19364, PCT Pub. Date Nov. 12, 1992

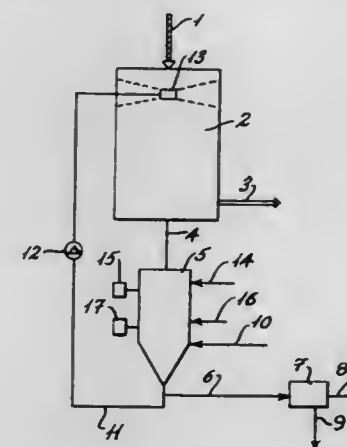
PCT Filed May 6, 1992, Ser. No. 137,202

Claims priority, application France, May 7, 1991, 91.05853

Int. Cl.<sup>6</sup> B01J 8/00; C01B 11/24

U.S. Cl. 423—245.2

28 Claims



1. A method of removing organics contained in combustion gases comprising the steps of:

- providing combustion gases containing organics;
- introducing finely divided solids selected from the group consisting of powders of activated carbon, titanium oxide, alumina, iron oxide and silica into said combustion gases;
- providing a scrubber and a scrubbing liquid;
- introducing said combustion gases and said scrubbing liquid into said scrubber, said finely divided solids remaining substantially in suspension in said scrubbing liquid during movement of said scrubbing liquid;
- wet scrubbing said combustion gases with said scrubbing liquid to remove said organics;
- introducing a reagent selected from the group consisting of hydrogen peroxide and ozone directly into said scrubbing liquid, said reagent reacting, in combination with said finely divided solids, with said organics removed from said gases, to oxidize the removed organics;
- reusing directly in said wet scrubbing a major portion of said scrubbing liquid having said finely divided solids suspended therein; and
- bleeding a small portion of said scrubbing liquid to an effluent treatment plant.

5,567,403

**PARTICLES OF RARE EARTH PHOSPHATE AND METHOD FOR THE PREPARATION THEREOF**  
Yuji Kimura, and Shigeru Sakai, both of Fukui-ken, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan  
Filed May 30, 1995, Ser. No. 453,400  
Claims priority, application Japan, May 30, 1994, 6-139442  
Int. Cl.<sup>6</sup> C01F 17/00

U.S. Cl. 423—263

4 Claims



1. A method for the preparation of a rare earth phosphate powder which comprises the steps of:

- (a) adding a first aqueous solution of a salt of a rare earth element or an aqueous solution of salts of rare earth elements in combination into a second aqueous solution of phosphoric acid in which the amount of phosphoric acid is at least 150% by moles of the theoretical amount, based on the amount of the rare earth element in the first aqueous solution, said first aqueous solution being added to the second aqueous solution gradually over a time period ranging from 3 seconds to 5 minutes to form an aqueous slurry of particles of a rare earth phosphate or composite rare earth phosphate in an aqueous medium; and
- (b) separating the particles in the aqueous slurry from the aqueous medium.

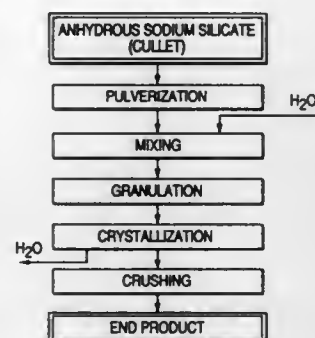
5,567,404

**PROCESS FOR PREPARATION OF LAYERED SODIUM SILICATE FROM ANHYDROUS SODIUM SILICATE**  
Jung-Min Lee; Jeong-Kwon Suh; Soon-Yong Jeong, all of Taejeon; Chun-Hee Park, Seoul, and Jeong-Hwan Park, Taejeon, all of Rep. of Korea, assignors to Korea Research Institute of Chemical Technology, Taejeon, Rep. of Korea  
Filed Sep. 1, 1994, Ser. No. 299,432  
Claims priority, application Rep. of Korea, May 31, 1994, 94-12365

Int. Cl.<sup>6</sup> C01B 33/32

U.S. Cl. 423—332

10 Claims



9. A layered sodium silicate having a  $\delta$  crystalline structure, said layered sodium silicate having a calcium ion binding capacity greater than 87.0 mg  $\text{Ca}^{2+}/\text{g}$  and a magnesium ion binding capacity greater than 73.0 mg  $\text{Mg}^{2+}/\text{g}$  at 25° C.

5,567,405

**METHOD FOR PRODUCING CHLORINE DIOXIDE USING CHEMICALLY IMPREGNATED ZEOLITE**  
Fred Klatte, San Francisco, Calif.; James Aamodt, Wilsonville, Oreg., and David Biswell, Kings Bang, Calif., assignors to Klatte Inc., Petaluma, Calif.  
Continuation-in-part of Ser. No. 382,601, Feb. 2, 1995, which is a continuation-in-part of Ser. No. 150,438, Nov. 10, 1993, Pat. No. 5,464,598, which is a continuation-in-part of Ser. No. 975,680, Nov. 13, 1992, Pat. No. 5,278,112. This application May 19, 1995, Ser. No. 445,025  
Int. Cl.<sup>6</sup> C01B 11/02

U.S. Cl. 423—477

15 Claims

1. A method for producing chlorine dioxide, including the steps of:
- (a) moving a fluid containing oxygen through a first bed of impregnated zeolite crystals, which are impregnated with at least sodium chlorite; and
- (b) moving the fluid through a second bed of impregnated zeolite crystals, which are impregnated with at least one of the following impregnating agents: phosphoric acid, acetic acid, and citric acid, thereby producing the chlorine dioxide as a result of chemical reaction of the fluid and said sodium chlorite and said at least one of the impregnating agents.

5,567,406

**MANUFACTURING CLEAR POTASSIUM SULFITE**  
Robert L. Zeller, III, 425 Hawthorne Pl., Youngstown, N.Y. 14174, and David L. Johnson, 51 Saber La., Williamsville, N.Y. 14221

Filed May 11, 1995, Ser. No. 439,243

Int. Cl.<sup>6</sup> C01B 17/42

U.S. Cl. 423—519.2

6 Claims

1. A method of making an aqueous solution of potassium sulfite having an APHA number less than 40 from a potassium hydroxide feedstock that contains more than 0.1 ppm iron (based on a 45 wt % KOH solution) comprising:
- (A) reacting said potassium hydroxide with sulfur dioxide in an aqueous solution to produce an aqueous solution of potassium sulfite; and
- (B) adding about 0.02 to about 0.8 wt % hypophosphorous acid to said aqueous solution of potassium sulfite.

5,567,407

**LI-EXCHANGED LOW SILICA EMT-CONTAINING METALLOSILICATES**  
Charles G. Coe, 1381 Walnut La., Macungie, Pa. 18062; Thomas R. Gaffney, 1211 Clearview Cir., Allentown, Pa. 18103; Hong-Xin Li, 403 Barn Swallow La., Allentown, Pa. 18104; Yanliang Xiong, Terbank 0117F Celestijnenlaan 70, B-3001 Heverlee, Belgium; Johan A. Martens, 25 Borheidestr, B-3040 Huldenberg, Belgium, and Pierre A. Jacobs, 104 Strijlandstr, B-1755 Gooik, Belgium

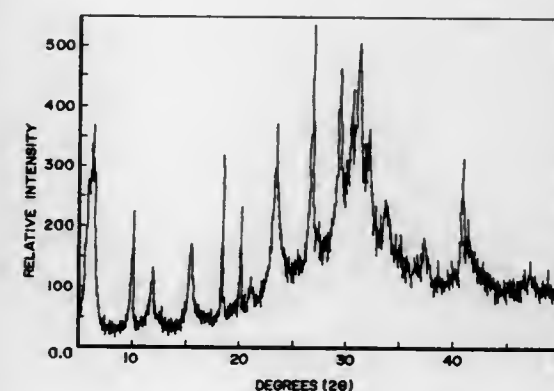
Filed May 12, 1994, Ser. No. 241,880

Int. Cl.<sup>6</sup> C01B 39/20

U.S. Cl. 423—700

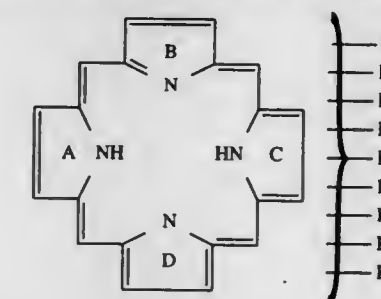
17 Claims

1. A crystalline metallosilicate composition comprising an EMT

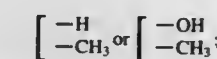


structure with a Si/X ratio of less than 1.4 and a lithium cation exchange of more than 80%, wherein X is selected from the group consisting of aluminum, boron and gallium.

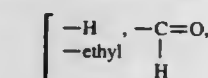
lesion within said mammal and applying light of sufficient wavelength and intensity to produce fluorescence in said arthritic lesion, wherein said tetrapyrrole compound is selected from the group consisting of tetrapyrrole carboxylic acids having at least one carboxyl group represented by the following general formula, and corresponding dihydrotetrapyrrole or tetrahydrotetrapyrrole carboxylic acids, and monoamides, diamides and polyamides of said tetrapyrrole carboxylic acids with amino-monocarboxylic acids or dicarboxylic acids, and their pharmacologically acceptable salts:



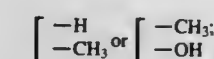
wherein,  
R<sub>1</sub> is methyl



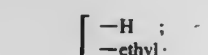
R<sub>2</sub> is H, vinyl, ethyl, —CH(OH)CH<sub>3</sub>, acetyl,



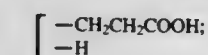
—CH<sub>2</sub>CH<sub>2</sub>COOH or =CHCHO;  
R<sub>3</sub> is methyl,



R<sub>4</sub> is H, vinyl, ethyl, —CH(OH)CH<sub>3</sub>, —CH<sub>2</sub>CH<sub>2</sub>COOH, =CHCHO or



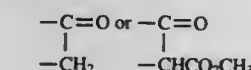
R<sub>5</sub> is methyl;  
R<sub>6</sub> is H, —CH<sub>2</sub>CH<sub>2</sub>COOH, —CH<sub>2</sub>CH<sub>2</sub>COOR or —COOH;  
R<sub>7</sub> is —CH<sub>2</sub>CH<sub>2</sub>COOH, —CH<sub>2</sub>CH<sub>2</sub>COOR or



R<sub>8</sub> is methyl or



R<sub>9</sub> is H, —COOH, —CH<sub>2</sub>COOH or methyl; provided that when R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>7</sub> and R<sub>8</sub> represent two substituents or are divalent and attached to the same carbon, the respective pyrrole ring to which attached is a dihydropyrrole;  
R is lower alkyl or benzyl;  
R<sub>6</sub> and R<sub>9</sub>, taken together are



U.S. Cl. 424—9.363

9 Claims

1. A method for the diagnosis of arthritis of mammals, which comprises administering to a mammal an effective amount of a fluorescent tetrapyrrole compound that accumulates in an arthritic

group, with the proviso that at least one of R<sub>1</sub> to R<sub>9</sub> is a free carboxyl group.

5,567,409

**METHOD AND MEDICAL AGENT FOR DIAGNOSIS OF ARTHRITIS**

Katsuo Aizawa, Yokohama, and Yukari Kuroiwa, Urawa, both of Japan, assignors to Nippon Petrochemicals Company, Ltd., Tokyo, Japan

Division of Ser. No. 229,940, Apr. 19, 1994, Pat. No. 5,430,051.

This application Dec. 12, 1994, Ser. No. 353,882

Claims priority, application Japan, Apr. 22, 1993, 5-120977

Int. Cl.<sup>6</sup> A61K 49/00; 31/40

U.S. Cl. 424—9.363

9 Claims

1. A method for the diagnosis of arthritis of mammals, which comprises administering to a mammal an effective amount of a fluorescent tetrapyrrole compound that accumulates in an arthritic

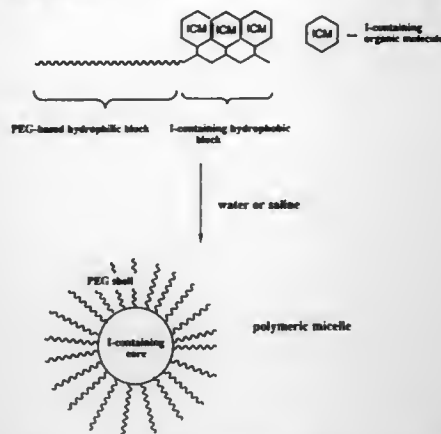


# 5,567,410 COMPOSITIONS AND METHODS FOR RADIOGRAPHIC IMAGING

Vladimir P. Torchilin, Charlestown; Vladimir S. Trubetskoy, Milton; Gerald L. Wolf, Winchester, and G. Scott Gazelle, Hingham, all of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Filed Jun. 24, 1994, Ser. No. 265,421

Int. Cl.<sup>6</sup> A61K 49/04; C07C 63/10; 23/65; 25/02  
U.S. Cl. 424—9.4 20 Claims



1. A compound capable of reversibly forming micelles in an aqueous solution, said compound comprising a hydrophilic polymer linked to a hydrophobic polymer, and said hydrophobic polymer comprising a backbone incorporating radiopaque molecules via covalent bonds, wherein said micelles dissociate in vivo into said compound over a 24 hour period.

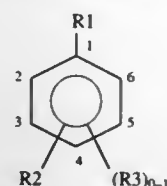
# 5,567,411 DENDRITIC AMPLIFIER MOLECULES HAVING MULTIPLE TERMINAL ACTIVE GROUPS STEMMING FROM A BENZYL CORE GROUP

John F. W. Keana; Vladimir Martin, both of Eugene, Oreg., and William H. Ralston, St. Charles, Mo., assignors to State of Oregon Acting by and Through the State Board of Higher Education on Behalf of the University of Oregon, Eugene, Oreg.

Continuation-in-part of Ser. No. 133,652, Oct. 6, 1993, Pat. No. 5,412,148, which is a division of Ser. No. 887,542, May 22, 1992, Pat. No. 5,252,317, which is a division of Ser. No. 403,595, Sep. 5, 1989, Pat. No. 5,135,737, which is a continuation-in-part of Ser. No. 928,943, Nov. 10, 1986, Pat. No. 4,863,717. This application Sep. 29, 1994, Ser. No. 316,787 Int. Cl.<sup>6</sup> C07F 11/00; A61K 49/00; 49/02; C12N 9/96; C07D 209/48; 207/38; C07C 69/80

U.S. Cl. 424—9.1 30 Claims

1. A compound having the structure:

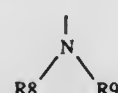


wherein:

(a) R1 is selected from a group consisting of:  
R2,  
R3, and  
groups having the structure —(R4)<sub>0-1</sub>—(R5)<sub>0-1</sub>—(R6)(—R7)<sub>0-1</sub> wherein R4 is selected from a group consisting of C(O)—NH, C(S)—NH, C(O), O, NH—C(O), NH—C(S), NH—C(S)—NH, NH—C(O)—NH, C(O)—O, and O—C(O); R5 is selected from a group consisting of aryls,

aryl-(C<sub>1</sub>—C<sub>20</sub> alkyls), (C<sub>1</sub>—C<sub>20</sub> alkyl)-aryl, cycloalkyls, C<sub>1</sub>—C<sub>20</sub> alkyls and combinations thereof; R6 is selected from a group consisting of H, C<sub>1</sub>—C<sub>6</sub> alkyls, C(O)—OH, C(O)—O—(C<sub>1</sub>—C<sub>6</sub> alkyls), C(O)—O—X<sup>+</sup>, NH<sub>2</sub>, NO<sub>2</sub>, NCS, NCO, OH, SH, B(OH)<sub>2</sub>, and R4, wherein X is a monovalent metal cation; and R7 is a targeting group; and

(b) R2 and R3, which are the same or different, each has the structure



wherein R8 and R9, which are the same or different, are a hydrogen or a group having the structure —R10—(R11)—(R12)<sub>0-1</sub>—(R13)<sub>n</sub>, and at least one of said R8 and R9 groups has the —R10—(R11)—(R12)<sub>0-1</sub>—(R13)<sub>n</sub> structure, wherein R10 is at least one structure selected from a group consisting of linkers and branch groups, the linkers and branch groups, when more than one is present in R10, being covalently bonded together in a series manner to form R10; R11 is selected from a group consisting of —NH—C(O)—, —C(O)—NH—, —C(O)—, —NH—C(S)—, —C(S)—NH—, —NH—C(O)—NH—, —NH—C(S)—NH—, —NH—C(O)—O—, —O—C(O)—NH—, —C(O)—O—, and —O—C(O)—; R12 is an aryl, C<sub>1</sub>—C<sub>12</sub> alkyl, (C<sub>1</sub>—C<sub>12</sub> alkyl)-aryl, cycloalkyl, aryl-(C<sub>1</sub>—C<sub>12</sub> alkyl), or a combination thereof; and R13 is an active group wherein n is 1 or 2.

# 5,567,412 CONTRAST AGENTS CONSISTING OF GALACTOSE PARTICLES AND AN AMPHILIC CARBOXYLIC ACID

Jo Klaveness, Oslo; Pål Rongved, Hellvik, and Lars Stubberud, Södertälje, all of Norway, assignors to Nycomed Imaging AS, Oslo, Norway

PCT No. PCT/EP93/00026, § 371 Date Sep. 29, 1994, § 102(e) Date Sep. 29, 1994, PCT Pub. No. WO93/13802, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 8, 1993, Ser. No. 256,150

Claims priority, application United Kingdom, Jan. 9, 1992, 9200387  
U.S. Cl. 424—9.35 12 Claims

1. A contrast agent comprising microbubble-generating carbohydrate microparticles in admixture with an amphiphilic C<sub>22-50</sub> organic acid.

# 5,567,413 FLEXIBLE AMPHIPHILIC MICROBUBBLES FOR ULTRASOUND

Jo Klaveness; Hanno Priebe, both of Oslo; Pål Rongved, Nesoddtangen, all of Norway, and Lars Stubberud, Södertälje, Sweden, assignors to Nycomed Imaging AS, Oslo, Norway

Division of Ser. No. 119,217, Oct. 29, 1993, Pat. No. 5,536,490. This application Jun. 6, 1995, Ser. No. 466,615

Claims priority, application United Kingdom, Mar. 28, 1991, 9106673

The portion of the term of this patent subsequent to Oct. 29, 2013, has been disclaimed.

Int. Cl.<sup>6</sup> A61B 8/13 46 Claims

3. Vesicles comprising flexible amphiphilic phospholipid material capable of formation of gas-containing vesicles, said vesicles containing biocompatible gas comprising a fluorinated low molecular weight hydrocarbon.

# 5,567,414 STABLE MICROBUBBLES SUSPENSIONS INJECTABLE INTO LIVING ORGANISMS

Michel Schneider, Troinex, Switzerland; Daniel Bichon, Montpellier, France; Philippe Bussat, Collonges S/Saleve, France; Jerome Puginier, Le Chable-Beaumont, France, and Eva Hybl, Wiesbaden, Germany, assignors to Bracco International B.V., Netherlands

Division of Ser. No. 315,347, Sep. 30, 1994, Pat. No. 5,531,980, which is a division of Ser. No. 128,540, Sep. 29, 1993, Pat. No. 5,380,519, which is a division of Ser. No. 775,989, Nov. 20, 1991, Pat. No. 5,271,928. This application Jun. 1, 1995, Ser. No. 457,581

Claims priority, application European Pat. Off., Apr. 2, 1990, 90810262

Int. Cl.<sup>6</sup> A61K 49/00

U.S. Cl. 424—9.52 12 Claims

1. A method of imaging organs in a living body, said method comprising administering to said body a composition consisting of a suspension of air or gas microbubbles in a physiologically acceptable aqueous carrier phase the suspension comprising one or more dissolved or dispersed surfactants, at least one of which is a film forming surfactant present in the composition at least partially in lamellar or laminar form; and subjecting said body to ultrasonic echography.

# 5,567,415 ULTRASOUND CONTRAST AGENTS AND METHODS FOR THEIR MANUFACTURE AND USE

Thomas R. Porter, Omaha, Nebr., assignor to The Board of Regents of the University of Nebraska, Lincoln, Nebr.

Continuation-in-part of Ser. No. 113,415, Aug. 27, 1993, abandoned, which is a continuation-in-part of Ser. No. 57,298, May 14, 1993, abandoned, which is a continuation-in-part of Ser. No. 60,751, May 12, 1993. This application Jun. 1, 1994, Ser. No. 252,286

Int. Cl.<sup>6</sup> A61K 49/00

U.S. Cl. 424—9.52 8 Claims

1. A pharmaceutically acceptable ultrasound contrast agent which relies on microbubbles for echogenicity, comprising: microbubbles with an internal atmosphere enhanced with an amount of perfluoropropane gas which is effective for visually detecting myocardial contrast, said microbubbles formed from a solution of dextrose and albumin wherein said dextrose comprises about 3.75% by weight of said solution.

# 5,567,416 SLOW-VOLATILIZING TERPENOID COMPOSITION

Shoichi Sato, Machida; Toshi Tabuchi, Yamato; Shigeo Urushida, Kodaira, and Sakae Shimizu, Chigasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 29, 1993, Ser. No. 158,399

Claims priority, application Japan, Nov. 30, 1992, 4-345425

Int. Cl.<sup>6</sup> A61L 9/04

U.S. Cl. 424—76.4 10 Claims

1. A slow-volatilizing composition comprising at least one terpenoid, an antioxidant, an oil-absorbing polymeric network containing 0.001–2 wt. % cross-linking monomers on which said terpenoid and said antioxidant are adsorbed, wherein said polymeric network absorbs said terpenoid in an amount equal to 10 times the weight of said polymeric network and wherein said polymeric network absorbs chloroform, carbon tetrachloride, trichloroethane and trichloroethylene in an amount of 20 times the weight of said polymeric network, and a non-combustible organic compound which is adsorbed on said oil-absorbing polymeric network, wherein said composition contains 5–30 parts by weight of said antioxidant to 100 parts by weight of said terpenoid and

said composition contains 10–100 parts by weight of said non-combustible organic compound to 100 parts by weight of said terpenoid.

# 5,567,417 METHOD FOR INHIBITING ANGIOGENESIS USING HEPARINASE

Ramnath Sasisekharan, Arlington; Marsha A. Moses, Brookline; Matthew A. Nugent, Bedford; Charles L. Cooney, Brookline, and Robert S. Langer, Newton, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, and Children's Medical Center Corporation, Boston, both of Mass.

Continuation of Ser. No. 153,873, Nov. 17, 1993, abandoned. This application May 1, 1995, Ser. No. 431,476

Int. Cl.<sup>6</sup> A61K 38/51

U.S. Cl. 424—94.5 14 Claims

1. A composition inhibiting angiogenesis comprising an effective amount of a heparinase selected from the group consisting of heparinase I and heparinase III from *Flavobacterium heparinum* in a pharmaceutically acceptable carrier for topical administration to inhibit angiogenesis at a selected site in a non-heparinized patient in need of treatment thereof, wherein the carrier delivers to a site where angiogenesis is to be inhibited between approximately one and four µg heparinase or a concentration of between 10 and 100 nM heparinase.

# 5,567,418 PROCESS FOR STABILIZING 4-(1,1-DIMETHYLETHYL)-4'-METHOXYDIBENZOYL-METHANE AGAINST UV RADIATION

Serge Forestier, Claye-Souilly, and Andre Deflandre, Orry-la-Ville, both of France, assignors to L'Oreal, Paris, France

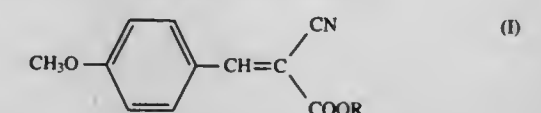
Division of Ser. No. 39,047, Apr. 7, 1993. This application Jun. 5, 1995, Ser. No. 464,552

Claims priority, application France, Aug. 7, 1991, 91 10061; WIPO, Aug. 5, 1992, PCT/FR92/00774

Int. Cl.<sup>6</sup> A61K 7/42; C07C 255/02

U.S. Cl. 424—59 12 Claims

1. Process for stabilizing 4-(1,1-dimethylethyl)-4'-methoxydibenzoylmethane against UV radiation, comprising adding at least 0.5% by weight of a (4-methoxybenzylidene)cyanoacetate of formula:



in which

R represents a linear or branched alkyl radical having 6 to 12 carbon atoms;  
to a cosmetic screening composition comprising, in a cosmetically acceptable carrier, from 0.5 to 5% by weight of 4-(1,1-dimethylethyl)-4'-methoxydibenzoylmethane, the mole ratio of the compound of formula (I) to 4-(1,1-dimethylethyl)-4'-methoxydibenzoylmethane being equal to or greater than 0.8.

5,567,419

**STABILIZED COSMETIC COMPOSITIONS CONTAINING MONOACYL PHOSPHATIDE AND A SAPONIN**

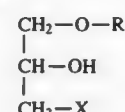
Satoshi Togiya; Satomi Yamada, and Mitsuo Kondo, all of Kanagawa, Japan, assignors to Kanebo Ltd., Tokyo, Japan  
Continuation-in-part of Ser. No. 454,157, Dec. 21, 1989, abandoned. This application Dec. 14, 1990, Ser. No. 627,694  
Claims priority, application Japan, Dec. 22, 1988, 63-321940; Sep. 26, 1989, 1-249983

Int. Cl.<sup>6</sup> A61K 7/06; 7/48; 35/78; 47/24

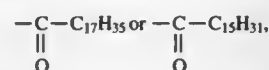
U.S. Cl. 424—74

6 Claims

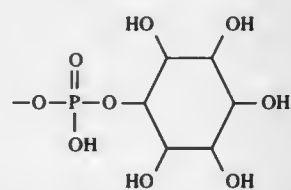
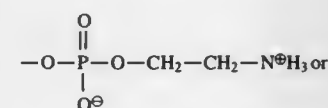
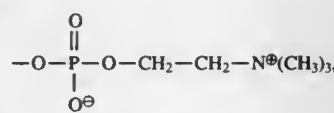
1. A cosmetic composition which comprises a solution of water; from 0.0001 to 1.0 weight % of a higher fatty acid; and from 0.01 to 10 weight % of a monoacyl phosphatide represented by the following general formula



wherein R represents



and X represents



and from 0.01 to 10 weight % of a saponin compound selected from the group consisting of a saponin composed of a sterol and a saccharide moiety, a saponin composed of a triterpene moiety and a saccharide moiety, and mixtures thereof, the moieties being bound by glycosidic linkage.

5,567,420

**LOTION WHICH IS TEMPORARILY COLORED UPON APPLICATION**

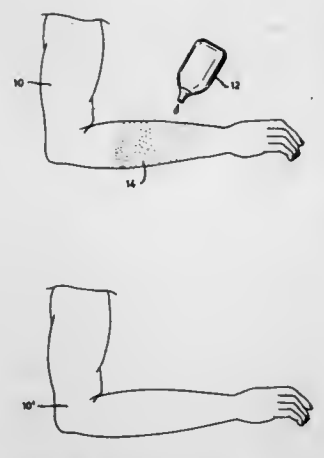
John McEleney, 14 Abbott St., Newton, Mass. 02164; Wende Reenstra, 34 Claremont Pk #3, Boston, Mass. 02118, and Curtis A. Vock, 28-A Federal St. #12, Salem, Mass. 01970  
Filed Nov. 16, 1994, Ser. No. 340,540

Int. Cl.<sup>6</sup> A61K 7/44

U.S. Cl. 424—60

39 Claims

1. A sunscreen for application to human skin, comprising a formulation selected from the group consisting of lotions, mousses, gels, medications, cremes, moisturizers, lotions, ointments, waxed based sticks, aerosols, alcohol sticks, oil-in-water creams, oil-in-water lotions, water-in-oil lotions, oil-in-water resistant creams and lotions, oils, hand and body lotions, oil-in-water emollient creams, moisturizing lotions, after sun emollient sticks, facial spray mist, skin mousse, moisturizing gel, and mixtures thereof;



a sunscreen agent and a physiologically compatible pH indicator, the formulation, sunscreen agent and the pH indicator forming a sunscreen composition which has substantially no visible color within a pH range of the human skin, and a visible color outside the pH range.

5,567,421

**OXIDATION DYE COMPOSITION FOR KERATINOUS FIBRES COMPRISING A PARA-AMINOPHENOL, A META-AMINOPHENOL AND A PARA-PHENYLENEDIAMINE AND/OR A BIS(PHENYLALKYLENEDIAMINE)**

Jean Cotteret, Verneuil-sur-Seine; Marie P. Audoussot, Levallois-Perret; Alain LaGrange, Coupvray, and Jean J. Vandenbosche, Sevrin, all of France, assignors to L'Oreal, Paris, France

Filed Jul. 13, 1994, Ser. No. 273,748

Claims priority, application France, Jul. 13, 1993, 93 08615  
Int. Cl.<sup>6</sup> A61K 7/13

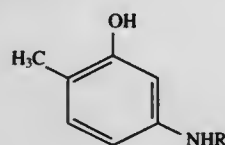
U.S. Cl. 424—70.1

20 Claims

1. A composition for dyeing keratinous fibers comprising in a medium suitable for dyeing said keratinous fibers,

(a) at least one oxidation dye precursor selected from the group consisting of 3-methyl-para-aminophenol, 2-methyl-para-aminophenol, 2-hydroxymethyl-para-aminophenol and an acid addition salt thereof;

(b) at least one coupling agent selected from the group consisting of a 2-methyl-5-aminophenol of formula (I) and an acid addition salt thereof



(I)

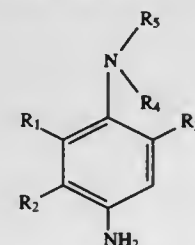
wherein

R represents methyl, ethyl, β-hydroxyethyl or γ-hydroxypropyl; and

(c) at least one oxidation dye precursor selected from the group consisting of

(i) a para-phenylenediamine of formula (II)

(II)



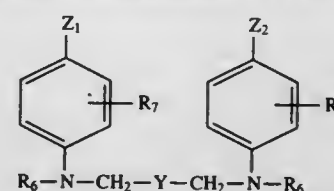
wherein

R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub>, each independently, represent hydrogen, halogen, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, a carboxyl radical, a sulpho radical or C<sub>1</sub>-C<sub>4</sub> hydroxyalkyl,

R<sub>4</sub> and R<sub>5</sub>, each independently, represent hydrogen, alkyl, hydroxyalkyl, alkoxyalkyl, carbamylalkyl, mesylaminoalkyl, acetylaminoalkyl, ureidoalkyl, carbalkoxyaminoalkyl, sulphoalkyl, piperidinoalkyl, morpholinoalkyl, the alkyl groups being in each occurrence C<sub>1</sub>-C<sub>4</sub> alkyl groups or phenyl optionally para-substituted with an amino group,

or R<sub>4</sub> and R<sub>5</sub> together with the nitrogen atom to which R<sub>4</sub> and R<sub>5</sub> are attached form a piperidino or morpholino heterocycle, with the proviso that R<sub>1</sub> or R<sub>3</sub> represent a hydrogen when R<sub>4</sub> and R<sub>5</sub> do not represent hydrogen;

(ii) a bis(phenylalkylenediamine) of formula (III)



(III)

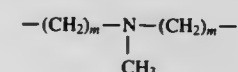
wherein

Z<sub>1</sub> and Z<sub>2</sub>, each independently, represent hydroxyl or NHR<sub>9</sub>, wherein R<sub>9</sub> represents hydrogen or lower C<sub>1</sub>-C<sub>4</sub> alkyl;

R<sub>7</sub> and R<sub>8</sub>, each independently, represent hydrogen, halogen or C<sub>1</sub>-C<sub>4</sub> alkyl;

R<sub>6</sub> represents hydrogen, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> hydroxyalkyl or amino C<sub>1</sub>-C<sub>4</sub> alkyl;

Y represents a member selected from the group consisting of —(CH<sub>2</sub>)<sub>n</sub>—, —(CH<sub>2</sub>)<sub>m</sub>—O—(CH<sub>2</sub>)<sub>m</sub>—, —(CH<sub>2</sub>)<sub>m</sub>—CHOH—(CH<sub>2</sub>)<sub>m</sub>— and



wherein n is an integer ranging from 0 to 8 and m is an integer ranging from 0 to 4; and  
an acid addition salt of (i) or (ii).

5,567,422

**AZLACTONE ACTIVATED POLYALKYLENE OXIDES CONJUGATED TO BIOLOGICALLY ACTIVE NUCLEOPHILES**

Richard B. Greenwald, Somerset, N.J., assignor to Enzon, Inc., Piscataway, N.J.

Division of Ser. No. 12,447, Feb. 2, 1993, Pat. No. 5,321,095.

This application Mar. 30, 1994, Ser. No. 220,307

Int. Cl.<sup>6</sup> A61K 31/77

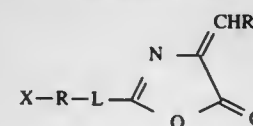
U.S. Cl. 424—78.3

11 Claims

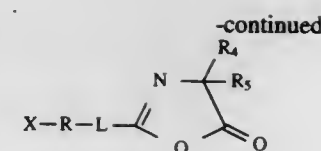
1. A polyalkylene oxide conjugate comprising:

a nucleophile having biological activity; and

at least one water-soluble polyalkylene oxide covalently bonded thereto by a hydrolytically stable linkage formed by reacting said nucleophile with an azlactone-activated polyalkylene oxide comprising a structure represented by:



or



wherein:

R represents the non-terminal portion of a water-soluble polyalkylene oxide having a number average molecular weight between about 600 and about 100,000 daltons;

L is selected from the group consisting of —O— and —CH<sub>2</sub>—;

R<sub>1</sub> is a moiety selected from the group consisting of hydrogen, alkyl and cycloalkyl moieties; carbocyclic and heterocyclic aromatic rings and α,β-unsaturated alkyl moieties;

R<sub>4</sub> and R<sub>5</sub> are moieties independently selected from the group consisting of hydrogen, alkyl, aryl and alkylaryl moieties; and

X is a terminal moiety of said polyalkylene oxide selected from the group consisting of alkoxy moieties containing up to four carbon atoms.

5,567,423

**ANIMAL GROWTH PROMOTANT**

Thomas K. S. Ying, Rowville, Australia, assignor to Enzacor Properties, Ltd., St. Helier, Channel Islands

Continuation of Ser. No. 833,587, Feb. 12, 1992, abandoned, which is a continuation of Ser. No. 328,075, Feb. 23, 1989, abandoned. This application Apr. 19, 1994, Ser. No. 230,007

Claims priority, application Australia, Aug. 28, 1986, PH7714/86

Int. Cl.<sup>6</sup> A61K 38/54

U.S. Cl. 424—94.3

29 Claims

1. An animal growth promotant comprising microgranules having a core consisting of one or more digestive enzymes immobilized by entrapment within a gel matrix wherein said gel matrix restricts the accessibility of denaturing agents to the enzyme(s), said enzyme selected from:

- (i) protein digesting enzymes;
- (ii) carbohydrate digesting enzymes;
- (iii) fat digesting enzymes; and
- (iv) fibre digesting enzymes

the core being encapsulated within a water soluble film, said water soluble film forming a barrier to, and being insoluble in, organic solvents, and coated with an enteric coating comprising an alkali soluble, acid insoluble polymer, or a high molecular weight polymer whose structure is substituted with or contains windows of fatty acid or other material capable of being solubilized by intestinal juices, whereby said enzymes essentially are not degraded by contact with fluids in the stomach or rumen, and whereby the growth of an animal to which said growth promotant is administered is promoted.

5,567,424

**FIBER, ANTIOXIDANT, HERBAL AND ENZYME SUPPLEMENTED BEVERAGE COMPOSITION FOR HUMAN CONSUMPTION**

Carl W. Hastings, Glencoe, Mo., assignor to Reliv International, Inc., Chesterfield, Mo.

Filed Jun. 10, 1994, Ser. No. 258,421

Int. Cl.<sup>6</sup> A61K 35/78; 31/685; 31/715

U.S. Cl. 424—195.1

11 Claims

1. An aqueous beverage composition adapted for oral administration of both soluble and insoluble fiber, antioxidants, herbs and enzymes to the human body, comprising per serving:

from about 3.0 to 5.0 g gum arabic, 1.0 to 3.0 g soy fiber, 4.0 to 6.0 g corn bran, 0.5 to 1.5 g oat fiber, 0.25 to 1.0 g pea fiber, 0.5 to 1.5 g apple fiber, 0.1 to 0.5 g citrus fiber, 0.1 to 0.5 g carrageenan, 0.1 to 0.5 g guar gum and 0.1 to 0.5 g xanthan gum;



from about 5 to 15 mg each of garlic, cayenne, licorice root, kelp, oriental ginseng, siberian ginseng, aloe vera powder, chicory root, dandelion root, chamomile powder, alfalfa powder, ginger root, passion flower, capsicum fruit powder, fenugreek, hibiscus, rhubarb root, irish moss, pearl barley, celery seed and sarsaparilla;  
from about 200 to 1000 mg Vitamin C, 150 to 300 IU Vitamin E and 2500 to 10,000 IU Vitamin A activity in the form of Beta Carotene; and  
from about 5 to 10 mg each of pepsin, papain and bromelain.

**5,567,425**  
**COMPOSITIONS WHICH INHIBIT APOPTOSIS, METHODS OF PURIFYING THE COMPOSITIONS AND USES THEREOF**  
Ian C. Bathurst, Kensington; John D. Bradley, Oakland; L. David Tomel, Richmond, and Philip J. Barr, Berkeley, all of Calif., assignors to LXR Biotechnology Inc., Richmond, Calif.

Division of Ser. No. 320,155, Oct. 7, 1994, which is a continuation-in-part of Ser. No. 158,980, Nov. 30, 1993, abandoned. This application May 30, 1995, Ser. No. 453,530  
Int. Cl.<sup>6</sup> A61K 35/78; C12N 5/00

**U.S. Cl. 424—195.1** **5 Claims**  
1. A method of preventing apoptosis in cells during the culture or maintenance of mammalian organs, tissues and cells comprising treating the cells with a composition comprising a tissue culture media and an effective amount of at least one phytochemical apoptosis inhibitor.

**5,567,426**  
**COSMETIC COMPOSITION IN THE FORM OF A GELLED TRIPLE WATER/SILICONE OIL/WATER EMULSION**  
Jean F. Nadaud, Paris, and Laurence Sebillotte, Creteil, both of France, assignors to L'Oreal, Paris, France  
PCT No. PCT/FR93/00658, § 371 Date Jan. 6, 1995, § 102(e) Date Jan. 6, 1995, PCT Pub. No. WO94/01073, PCT Pub. Date Jan. 20, 1994  
PCT Filed Jun. 30, 1993, Ser. No. 367,244  
Claims priority, application France, Jul. 9, 1992, 92 08532  
Int. Cl.<sup>6</sup> A61K 7/06

**U.S. Cl. 424—401** **20 Claims**  
1. Gelled triple water/silicone oil/water emulsion, characterized in that it comprises:  
(A) a gelled, continuous, external aqueous phase which comprises at least one fatty-chain gelling agent of the C<sub>3</sub>-C<sub>6</sub> monoethylenic carboxylic acid or anhydride/fatty-chain acrylic ester copolymer type;  
(B) a silicone-containing fatty phase comprising at least one silicone oil and a silicone-containing emulsifier, forming the primary W/O emulsion with an aqueous phase.

**5,567,427**  
**EMULSIFIED, LOW PH COSMETIC COMPOSITIONS HAVING IMPROVED STABILITY**  
Marcelline C. Papadakis, Berwyn, Ill., assignor to Helene Curtis, Inc., Chicago, Ill.  
Filed Mar. 17, 1995, Ser. No. 406,106  
Int. Cl.<sup>6</sup> A61K 7/42

**U.S. Cl. 424—401** **11 Claims**  
1. An emulsified cosmetic composition comprising:  
(a) about 2% to about 20% by weight of an organic acid selected from the group consisting of glycolic acid and salicylic acid;  
(b) about 10% to about 50% by weight of an oil phase;  
(c) about 5% to about 20% by weight of an emulsifier or emulsifier blend;

(d) about 0.5% to about 2% by weight of linoleamidopropyl PG-dimonium chloride phosphate; and  
(e) water,  
wherein the composition has a pH of about 3.7 to about 4.5 and a pH drift of about 0.15 pH unit or less.  
10. A method of improving the stability of an emulsified cosmetic composition comprising  
(a) about 2% to about 20% by weight of an organic acid selected from the group consisting of glycolic acid and salicylic acid;  
(b) about 10% to about 50% by weight of an oil phase;  
(c) about 5% to about 20% by weight of an emulsifier or emulsifier blend;  
(d) water, and having a pH of about 3.7 to about 4.5,  
said method comprising the step of incorporating about 0.5% to about 2% by weight of linoleamidopropyl PG-dimonium chloride phosphate into the composition such that the composition has a pH drift of about 0.15 pH unit or less.

**5,567,428**  
**TOPICAL PERSONAL CARE COMPOSITION CONTAINING POLYSILOXANE-GRAFTED ADHESIVE POLYMER AND DRYING AID**  
Kendrick J. Hughes, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio  
Continuation of Ser. No. 405,415, Mar. 15, 1995, abandoned, which is a continuation of Ser. No. 113,570, Aug. 27, 1993, abandoned. This application Dec. 4, 1995, Ser. No. 566,599  
Int. Cl.<sup>6</sup> A61K 6/00; 7/00; 31/74

**U.S. Cl. 424—401** **23 Claims**  
1. A topical personal care composition, said composition comprising:  
(a) a polysiloxane-grafted adhesive polymer;  
(b) a volatile, water insoluble solvent for said polysiloxane-grafted polymer;  
(c) a nonvolatile drying aid for said polysiloxane grafted polymer which is soluble in said solvent (b) at 45° C. and is water insoluble at 25° C., and is selected from the group consisting of silicone fluids and waxes having from 1 to about 100 siloxy units, silanes, and silicone resins, and mixtures thereof;  
wherein the weight ratio of said polysiloxane-grafted adhesive polymer to said drying aid is about 100:1 or less.

**5,567,429**  
**PEST CONTROLLING COMPOSITION**  
Satoshi Senbo, Takarazuka, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan  
Filed Dec. 21, 1994, Ser. No. 360,637  
Claims priority, application Japan, Dec. 21, 1993, 5-322151  
Int. Cl.<sup>6</sup> A01N 43/50

**U.S. Cl. 424—405** **14 Claims**  
1. A pest controlling composition containing as active ingredients at least one insect growth regulator and at least one N-aryldiazole compounds selected from the group consisting of 4-(2-bromo-1,1,2,2-tetrafluoroethyl)-1-(3-chloro-5-trifluoromethylpyridine-2-yl)-2-methylimidazole, 5-amino-3-cyano-1-(2,6-dichloro-4-trifluoromethylphenyl)-4-trifluoromethylsulfonpyrazole and 5-amino-3-cyano-1-(2,6-dichloro-4-trifluoromethylphenyl)-4-trifluoromethylthiopyrazole.

**5,567,430**  
**INSECTICIDAL DELIVERY COMPOSITIONS AND METHOD FOR CONTROLLING A POPULATION OF INSECTS IN AN AQUATIC ENVIRONMENT**  
Richard Levy, Fort Myers, Fla., assignor to Stockhausen GmbH, Krefeld, Germany  
Continuation of Ser. No. 76,683, Jun. 15, 1993, abandoned, which is a continuation of Ser. No. 783,224, Oct. 28, 1991, abandoned, which is a division of Ser. No. 560,286, Jul. 30, 1990, abandoned, which is a continuation of Ser. No. 211,895, Jun. 27, 1988, abandoned, which is a division of Ser. No. 32,532, Apr. 1, 1987, Pat. No. 4,818,534. This application Nov. 4, 1994, Ser. No. 334,424

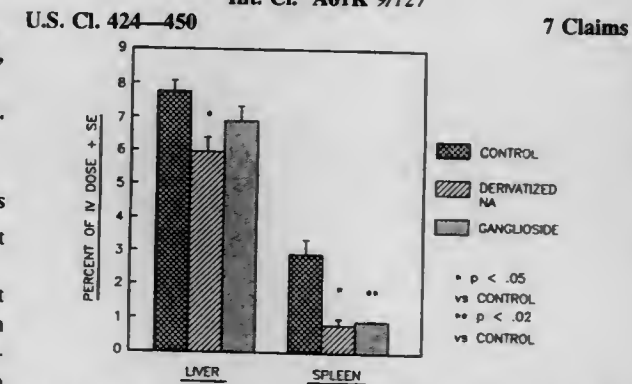
**Int. Cl.<sup>6</sup> A01N 25/34; A61K 9/14**  
**U.S. Cl. 424—409** **20 Claims**  
1. A method for controlling a population of aquatic environment insects, comprising the steps of:  
(a) preparing an insecticidal delivery composition comprising at least one superabsorbent solid organic polymer selected from the group consisting of hydrophilic acrylamide and hydrophilic acrylate polymers and mixtures thereof which absorb over 100 times their weight in water and said composition being free of insecticidal agents other than said superabsorbent polymer;  
(b) choosing an environment area needing aquatic environment insect control treatment; and  
(c) applying said insecticidal delivery composition in an amount effective to control the population of aquatic environment insects, to said aquatic environment area needing aquatic environment insect control treatment.

**5,567,431**  
**POLYLACTIC ACID-BASED IMPLANT SUSCEPTIBLE OF BIORESORPTION CONTAINING AND ANTIBIOTIC**  
Michel Vert, Mont-Saint-Aignan; Jacques Mauduit, Bacqueville En Caux, both of France, and Niels Bukh, Hellerup, Denmark, assignors to Centre National de la Recherche Scientifique (CNRS), Paris, France  
PCT No. PCT/FR92/00231, § 371 Date Dec. 8, 1993, § 102(e) Date Dec. 8, 1993, PCT Pub. No. WO92/16193, PCT Pub. Date Oct. 1, 1992

PCT Filed Mar. 13, 1992, Ser. No. 117,185  
Claims priority, application France, Mar. 14, 1991, 91 03110  
Int. Cl.<sup>6</sup> A61F 2/02; A61K 9/14; 9/50; 47/32  
**U.S. Cl. 424—426** **21 Claims**

1. A bioresorbable pharmaceutical composition comprising poly(lactic acid), said composition being implantable so as to implement a local internal antibiotherapy for those in need thereof, said composition comprising an antibiologically effective amount of at least one water-soluble antibiotic in the form of particles of controlled size less than 100  $\mu$ m dispersed homogeneously in a poly(lactic acid) matrix, said composition being provided in the form of (i) either a ground powder obtained by grinding a homogeneous dispersion of said antibiotic in an amorphous poly(lactic acid) matrix having a mean molecular mass ranging from 10,000 to 300,000 or (ii) a thin film whose poly(lactic acid) matrix is made of a mixture of (1) an amorphous poly(lactic acid) having a mean molecular mass greater than 20,000 and (2) an amorphous poly(lactic acid) having a mean molecular mass less than 5,000.

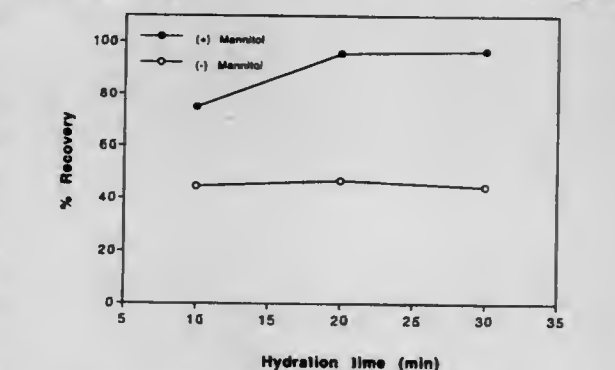
**5,567,432**  
**MASKING OF LIPOSOMES FROM RES RECOGNITION**  
John R. Lau, 585 King Beach Dr., Howard, Ohio 43028, and W. Blair Gebro, 533 Beechwood St., Wooster, Ohio 44691  
Continuation of Ser. No. 8,779, Jan. 15, 1993, abandoned, which is a continuation-in-part of Ser. No. 739,485, Aug. 2, 1991, abandoned. This application May 9, 1995, Ser. No. 437,309  
**Int. Cl.<sup>6</sup> A61K 9/127**



1. A composition of matter for internal administration in the therapeutic or diagnostic treatment of a warm-blooded animal comprising:  
a first component which comprises liposomes;  
a second component which is a synthetic neuraminic acid molecule attached to the liposome wall, said synthetic neuraminic acid selected from the group consisting of neuraminic acid with a methoxy group on carbon 2, neuraminic acid with an N-acetyl group attached to the nitrogen on carbon 5, neuraminic acid with N-acetyl groups attached to the nitrogen on carbon 5 and to the oxygen on carbon 9, neuraminic acid with an N-acetyl group attached to the nitrogen on carbon 5 and a lactyl group attached to the oxygen on carbon 9, or neuraminic acid with an N-acetyl group attached to the nitrogen on carbon 5 and an N-glycolyl group attached to the oxygen on carbon 9, that prevent phagocytosis of the liposome by the body's reticuloendothelial system and which cannot be cleaved by the body's endogenous enzymes; and,  
a third component, which is a target-specific molecule attached to the liposome wall to deliver liposomes to specific sites in the body.

**5,567,433**  
**LIPOSOME PREPARATION AND MATERIAL ENCAPSULATION METHOD**  
David Collins, Thousand Oaks, Calif., assignor to Amgen Inc., Thousand Oaks, Calif.

Division of Ser. No. 148,099, Nov. 5, 1993, abandoned. This application Jan. 30, 1995, Ser. No. 381,613  
Int. Cl.<sup>6</sup> A61K 9/127; B01J 13/02  
**U.S. Cl. 424—450** **6 Claims**



1. A method of preparing liposomes and encapsulating a biologically active agent therein, consisting essentially of the steps of:

- a) preparing a dispersion of unilamellar vesicles by bath sonication of a lipid in the presence of an aqueous solvent and in the absence of an organic solvent or detergent;
- b) subjecting said unilamellar vesicles to one or more freeze-thaw cycles to form a suspension of multilamellar vesicles;
- c) combining said multilamellar vesicle suspension with a bulking agent, wherein said bulking agent is different from the biologically active agent and wherein said lipid:bulking agent weight to weight ratio is 0.1:1 to 2:1;
- d) freeze-drying said mixture of multilamellar vesicles and bulking agent to form a lipid powder;
- e) hydrating said lipid powder in said biologically active agent, to be entrapped and microfluidizing said hydrated lipid, whereby said biologically active is encapsulated in reconstituted liposomes wherein said reconstituted liposomes are a mixture of liposomes comprising unilamellar and oligolamellar vesicles; and
- g) separating unencapsulated biologically active agent from said liposomes.

5,567,434

#### PREPARATION OF LIPOSOOME AND LIPID COMPLEX COMPOSITIONS

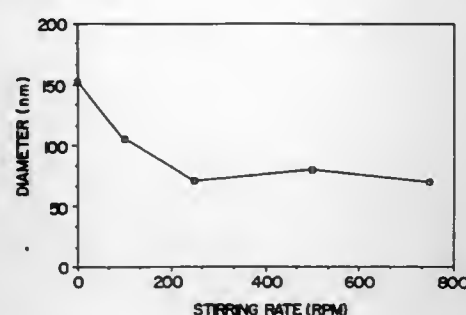
Francis C. Szoka, Jr., San Francisco, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Division of Ser. No. 179,291, Jan. 10, 1994, which is a continuation-in-part of Ser. No. 741,937, Aug. 8, 1991, Pat. No. 5,277,914, which is a continuation-in-part of Ser. No. 605,155, Oct. 29, 1990, Pat. No. 5,077,057, which is a continuation of Ser. No. 334,055, Apr. 5, 1989, abandoned, which is a continuation-in-part of Ser. No. 332,609, Mar. 31, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 480,227

Int. Cl.<sup>6</sup> A61K 9/127; 51/12; B01J 13/02

U.S. Cl. 424—450

4 Claims



1. A product of the process for preparing a lipid suspension of particle size less than about 10,000 nm in diameter encapsulating a therapeutically, pharmaceutically or diagnostically useful compound, which process comprises:

- dissolving said useful compound and an encapsulating amount of a suitable lipid in a sufficient amount of a solvent mixture comprising a non-halogenated hydrocarbon aprotic solvent to provide a compound/lipid solution; and
- extruding said compound/lipid solution through a suitably-sized aperture into an aqueous solution to form a lipid-compound suspension of particle size less than about 10,000 nm in diameter.

#### 5,567,435 PHOTOPOLYMERIZABLE BIODEGRADABLE HYDROGELS AS TISSUE CONTACTING MATERIALS AND CONTROLLED-RELEASE CARRIERS

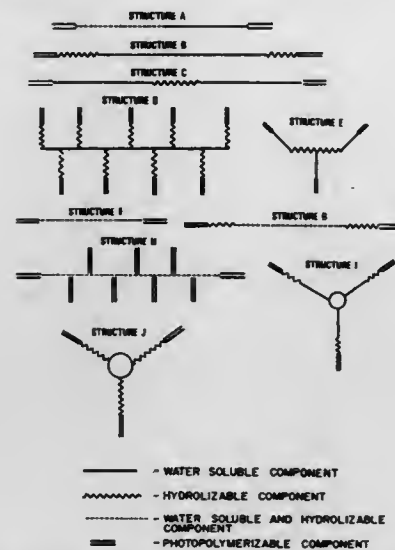
Jeffrey A. Hubbell, Austin, Tex.; Chandrashekhar P. Pathak, Waltham; Amarpreet S. Sawhney, Newton, both of Mass.; Neil P. Desai, Los Angeles, Calif., and Jennifer L. Hill-West, Austin, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Division of Ser. No. 379,848, Jan. 27, 1995, which is a division of Ser. No. 22,687, Mar. 1, 1993, Pat. No. 5,410,016, which is a continuation-in-part of Ser. No. 843,485, Feb. 28, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 468,364

Int. Cl.<sup>6</sup> A61K 9/58; C08G 63/08; 67/00

U.S. Cl. 424—426

38 Claims



1. A method for making a polymeric composition capable of controlled release of a biologically active substance entrapped therein, the method comprising:

- mixing a biologically active substance with a solution of biodegradable, polymerizable macromer having a solubility of at least about 1 g/100 ml in aqueous solution, the macromer comprising at least one water soluble region, at least one degradable region which is hydrolyzable under in vivo conditions, and free radical polymerizable end groups having the capacity to form additional covalent bonds resulting in macromer interlinking, wherein the polymerizable end groups are separated from each other by at least one degradable region, in the presence of a free radical initiator, and polymerizing the macromer to entrap the biologically active substance within the resulting polymer.

5,567,436

#### PROCESS FOR LIQUID CATNIP AROMAS

Steven D. Udelle, 26414 Barranquilla Ave., Punta Gorda, Fla. 33983

Continuation-in-part of Ser. No. 217,931, Mar. 25, 1994, abandoned. This application Feb. 28, 1995, Ser. No. 396,455

Int. Cl.<sup>6</sup> A61K 35/78

U.S. Cl. 424—439

10 Claims

1. A method or process for extracting aromatic oil and flavor from certain selected herbaceous plants by absorption to a liquid comprising:

- (a) 1 ounce of fresh or high grade dried Nepeta cataria particles, (b) 192 ounces, or 6 quarts of potable, unheated tap water, (c) store said Nepeta cataria particles, and said potable unheated tap water mixture in a sealed container, (d) filter said Nepeta cataria particle pulp from extract solution prior to filling finger pump spray applicator bottle used for misting animal devices,

- (e) filling said finger pump spray applicator bottle with a sealed containment of the aroma laden liquid.

5,567,437

#### EFFERVESCENT PHARMACEUTICAL COMPOSITION CONTAINING IBUPROFEN AND ITS METHOD OF PREPARATION

Nicole Bru-Magniez, Paris; Jean-Francois Cordoliani, Layrac; Gérard Thauvin, Agen, and Jehan-Yves Drouin, Verrieres Le Buisson, all of France, assignors to Laboratoires UPSA, Agen, France

Continuation of Ser. No. 14,530, Feb. 8, 1993, Pat. No. 5,480,652. This application Jun. 6, 1995, Ser. No. 471,155  
Claims priority, application France, Dec. 9, 1992, 92 14851  
Int. Cl.<sup>6</sup> A61K 9/46

U.S. Cl. 424—466

14 Claims

1. A pharmaceutical composition in the form of effervescent powders or tablets comprising:

- a) a pharmaceutically effective amount of ibuprofen or pharmaceutically acceptable salt thereof;
- b) a pharmaceutically acceptable effervescent system comprising an alkaline carbonate and an organic acid; and
- c) a pharmaceutically acceptable oxidant in an amount sufficient to stabilize the ibuprofen, said pharmaceutically acceptable oxidant being selected from the group consisting of alpha-tocopherol, gamma-tocopherol, delta-tocopherol, L-ascorbic acid, L-ascorbic acid sodium salt, L-ascorbic acid calcium salt, palmityl-DL-ascorbic acid, propyl gallate, octyl gallate, dodecyl gallate, butylhydroxyanisole gallate, butylhydroxy-toluene gallate and mixtures thereof.

5,567,438

#### SHELLAC DISPERSIONS AND COATINGS, AND METHOD OF FORMING AQUEOUS-BASED SHELLAC DISPERSIONS AND COATINGS

Richard B. Cook, Chelmsford, Mass., assignor to Opta Food Ingredients, Inc., Bedford, Mass.

Continuation of Ser. No. 92,386, Jul. 14, 1993, abandoned.  
This application Oct. 12, 1995, Ser. No. 541,227  
Int. Cl.<sup>6</sup> A61K 9/28

U.S. Cl. 424—474

9 Claims

1. A shellac colloidal dispersion suitable for use in foods or medicaments, comprising:

- a) an aqueous medium that does not contain alcohol;
- b) a plurality of shellac microparticles stably dispersed in the aqueous medium, said microparticles being derived from shellac which is first solubilized in a basic aqueous medium that does not contain alcohol and then precipitated to form the shellac microparticles; and
- c) a plasticizer, present in the aqueous medium in an amount sufficient to cause at least a substantial portion of the shellac microparticles of the dispersion to fuse upon application of the dispersion onto a substrate and subsequent volatilization of the aqueous medium.

5,567,439

#### DELIVERY OF CONTROLLED-RELEASE SYSTEMS(S)

Garry L. Myers; Gerald E. Battist, both of Reston, and Richard C. Fuisz, Great Falls, all of Va., assignors to Fuisz Technologies Ltd., Chantilly, Va.

Continuation-in-part of Ser. No. 259,496, Jun. 14, 1994, and Ser. No. 259,258, Jun. 14, 1994. This application Nov. 4, 1994, Ser. No. 334,729

Int. Cl.<sup>6</sup> A61K 9/20; 9/22

U.S. Cl. 424—486

11 Claims

1. A method of preparing quick dissolve comestible units having a controlled-release system comprising:

5,567,440

#### METHODS FOR MODIFYING CELL CONTACT WITH A SURFACE

Jeffrey A. Hubbell; Donald Elbert; Jennifer L. Hill-West; Paul D. Drumbeller, all of Austin; Sanghamitra Chowdhury, Round Rock, all of Tex., and Amarpreet Sawhney, Newtown, Mass., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Division of Ser. No. 132,507, Oct. 5, 1993, Pat. No. 5,462,990, which is a continuation-in-part of Ser. No. 740,703, Aug. 5, 1991, Pat. No. 5,380,536, which is a division of Ser. No. 598,880, Oct. 15, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 471,390

Int. Cl.<sup>6</sup> A61K 9/14

U.S. Cl. 424—484

25 Claims

1. A method for modifying cell contact with a surface, comprising applying to the surface a biocompatible polymeric material which is selected from the group consisting of copolymers having the formulas (A)x(B)y; (A)x(B)y(A)z; (B)x(A)y(B)z; and a brush copolymer (A)x(B)y having bristles of poly(A);

wherein (A)x, (A)y and (A)z are biocompatible synthetic polymers and mixtures of polymers that form a region which is polyanionic at a pH of between 6.5 and 8.5 and does not bind tissue; and

wherein (B)y, (B)x, and (B)z are biocompatible, water-soluble synthetic polymers or mixture of polymers that form a region which is polycationic at a pH of between 6.5 and 8.5 and binds to tissue; and

wherein x is an integer of greater than or equal to 5, y is an integer of greater than or equal to 3, and z is an integer of greater than or equal to 0;

wherein the polymer has a molecular weight of at least 300 g/mole.

5,567,441

#### DILTIAZEM CONTROLLED RELEASE FORMULATION

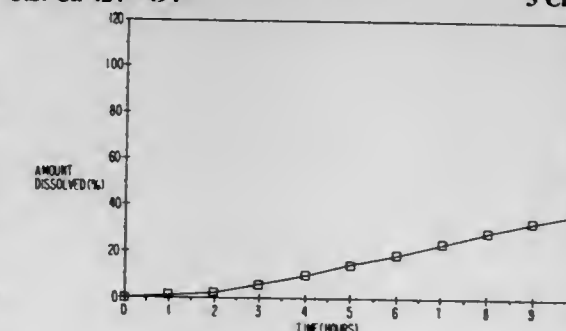
Chih-Ming Chen, Cooper City, Fla., assignor to Andrx Pharmaceuticals Inc., Ft. Lauderdale, Fla.

Filed Mar. 24, 1995, Ser. No. 409,449

Int. Cl.<sup>6</sup> A61K 9/58; 9/60; 9/62

U.S. Cl. 424—494

5 Claims





1. A once-a-day controlled release diltiazem formulation which comprises:

- from 20 to 50% by weight of enteric polymer membrane coated pellets comprising a polymer membrane coated core which comprises a biologically inert core which is coated with a first layer which consists essentially of diltiazem and a polymer binder; and a second layer which comprises a membrane comprising polymer enteric coating material selected from the group consisting of shellac, methacrylic acid copolymers and cellulose acetate phthalate; and
- from 50% to 80% by weight of delayed pulse polymer membrane coated pellets comprising a polymer membrane coated core which comprises a biologically inert core which is coated with a first layer which consists essentially of diltiazem and a polymer binder and a second layer which comprises a polymer membrane which will maintain its integrity in the varying pH conditions of the gastrointestinal tract but is permeable to diltiazem; and
- a unit dose containment system.

5,567,442

Patent Not Issued For This Number

5,567,443

#### METHOD OF TREATING INFLAMMATORY DISEASES

Nobuhito Kashiwagi; Syojiro Asakura; Tatsuo Ide, all of Takasaki; Masato Sakurai, Naganohara-machi; Masakazu Adachi, Takasaki; Katsumi Tomiyoshi, Fuji-mura, and Tsuneo Hirano, Maebashi, all of Japan, assignors to Japan Immunoresearch Laboratories Co., Ltd., Gunma, and Sekisui Chemical Co., Ltd., Osaka, both of Japan

Filed Jun. 20, 1994, Ser. No. 262,519

Claims priority, application Japan, Aug. 4, 1993, 5-193481

Int. Cl.<sup>6</sup> B29C 49/00

U.S. Cl. 424—529

6 Claims

1. A method of treating inflammatory diseases which comprises contacting peripheral blood of a patient suffering from an inflammatory disease with a carrier whose affinity for inflammation-associated cells is higher than that for lymphocytes so as to remove said cells from the blood, and returning the thus treated blood to the patient.

5,567,444

#### POTENTIATED AQUEOUS OZONE CLEANING AND SANITIZING COMPOSITION FOR REMOVAL OF A CONTAMINATING SOIL FROM A SURFACE

Robert D. Hei, Oakdale; Guange-jong J. Wei, Mendota Heights; Bruce R. Cords, Eagan, and Keith D. Lokkesmoe, Savage, all of Minn., assignors to Ecolab Inc., St. Paul, Minn. Continuation-in-part of Ser. No. 114,193, Aug. 20, 1993, Pat. No. 5,484,549. This application Sep. 22, 1995, Ser. No. 532,485

Int. Cl.<sup>6</sup> A61L 9/00; A01N 37/00; 39/00; C11D 7/54

U.S. Cl. 424—616

27 Claims

- A method of cleaning and sanitizing solid surfaces comprising:
  - contacting a soil or film residue on a solid surface with an ozonized cleaning aqueous composition having a pH of at least about 8 and comprising an effective concentration of an active ozone composition sufficient to produce an oxidation-reduction potential of at least about +550 mV with respect to an Ag/AgCl reference electrode;
  - treating the contacted solid surface with an aqueous sanitizing composition comprising an effective amount of a hydrogen peroxide, C<sub>1</sub>-C<sub>10</sub> peroxyaliphatic carboxylic acid or a mixture thereof sufficient to reduce the oxidation-reduction potential below about +400 mV.

5,567,445

#### GAUGE BAND RANDOMIZER

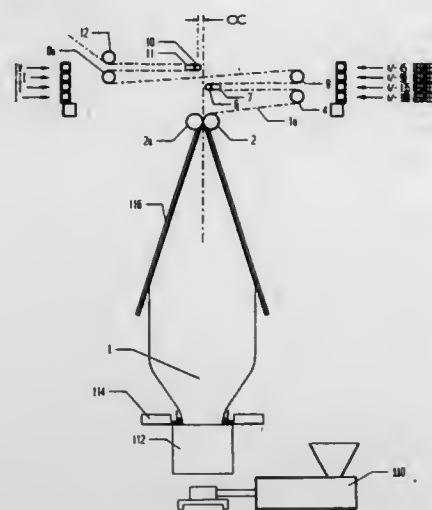
Robert E. Cree, 127 Bartle Ave., Newark, N.Y. 14513, and Ricardo Rodriguez, 1919 Royal Credit Blvd., Mississauga, Ontario, Canada

Continuation of Ser. No. 831,499, Feb. 5, 1992, Pat. No. 5,360,328. This application Jul. 28, 1994, Ser. No. 282,425

Int. Cl.<sup>6</sup> B29C 53/10

U.S. Cl. 425—72.1

24 Claims



- An oscillating hauloff device for a blown film line wherein an assembly of idler rolls rotatably shift their relationship to one another and to a turning bar over time in a predetermined manner to enable flattened film trained there-over to have gauge variations distributed back and forth across the width of the flattened film, that improvement wherein; said hauloff device comprises a plurality of ring members sized to surround the path of film to be produced by the blown film line, said ring members being stacked to rest upon each other, each said ring member being relatively rotatable with respect to its adjacent ring member, at least one selected ring member carrying a said idler roll and at least one other selected ring member carrying a said turning bar, each said idler roll and each said turning bar being of a length fitting within its respective ring member and located so that the plurality of stacked ring members substantially encloses said idler roll and turning bar, and a drive mechanism engaged with the exterior of said ring members for producing said relative rotation between said idler roll and said turning bar.

5,567,446

#### SLIP SUPPLY SYSTEM

Takeo Enomoto; Toshiya Abe; Hironobu Murakami, and Shini-chi Hiraki, all of Kitakyushu, Japan, assignors to Toto Ltd., Fukuoka-ken, Japan

Filed Jun. 1, 1995, Ser. No. 456,865

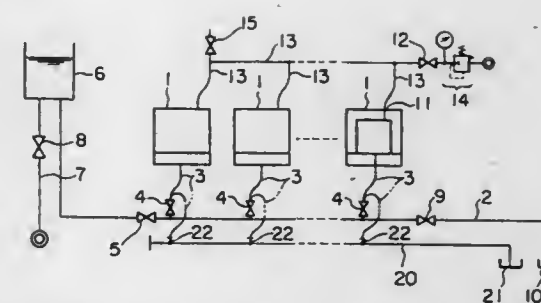
Claims priority, application Japan, Jun. 3, 1994, 6-122780

Int. Cl.<sup>6</sup> B28B 1/26

U.S. Cl. 425—84

2 Claims

- A slip supply system which comprises:
  - means for supplying slip;
  - a slip supply pipe for supplying slip from said slip supply means;
  - one or more casting molds;
  - branch pipes for supplying the slip from said slip supply pipe to said casting molds, said branch pipes branching off from said slip supply pipe and being detachably connected at their ends to said casting molds; and



a slip discharge pipe provided with one or more communicating ports to which the ends of said branch pipes are detachably connected, said branch pipes being removed from said casting molds and connected to said communicating ports before supplying slip to said casting molds and being connected to said casting molds after displacement of slip within said pipes.

5,567,447

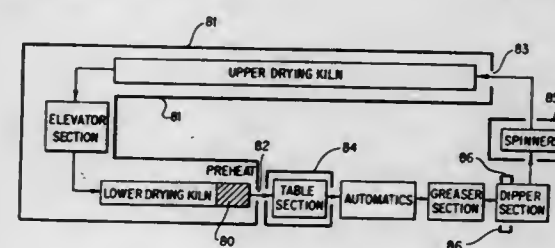
#### APPARATUS FOR THE MANUFACTURE OF PHARMACEUTICAL CELLOLULOSE CAPSULES

Ralph R. Grosswald, Fairfield, Iowa; Jeffery B. Anderson, Springfield, and Clair S. Andrew, Provo, both of Utah, assignors to GS Technologies, Inc., Fairfield, Iowa Division of Ser. No. 377,669, Jan. 24, 1995, which is a continuation of Ser. No. 893,091, May 29, 1992, abandoned, which is a continuation-in-part of Ser. No. 708,023, May 31, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 463,053

Int. Cl.<sup>6</sup> B29C 41/14; 41/40; 41/42; 41/46

U.S. Cl. 425—143

36 Claims



- An apparatus for manufacturing pharmaceutical cellulose capsules, the capsules suitable for filling by capsule filling machines, each capsule consisting of a capsule body and a capsule cap formed from an aqueous solution of a thermogelling cellulose ether composition, comprising:

a plurality of pinbars, each pinbar having a bar with a plurality of pins mounted to the bar; greaser means for greasing the pins; dipper means for dipping hot pins into the solution to cause solution to gelatinize on the surface of the pins; dryer means for drying gelatinized solution on the surface of the pins of a drying group of pinbars, as a group, to form capsule bodies and capsule caps; differential heater means for differentially heating the pins of the drying group; automatics means for removing the capsule parts from the pins; and transport means for moving the pinbars in a closed loop path through the greaser means, the dipper means, the dryer means, the differential heater means, and the automatics means; wherein the differential heater means is positioned to receive the drying group of pinbars as a group, and includes means for differentially heating the pins of the drying group of pinbars in accordance with the expected differential heat loss from the pins as the pins move from the differential heater means through the automatics means and through the greaser means to the dipper means.

5,567,448

#### ROLL FOR PROCESSING UNIFORMLY FLAT PRODUCTS

James D. Frankland, New Castle, Pa., assignor to New Castle Industries, Inc., New Castle, Pa.

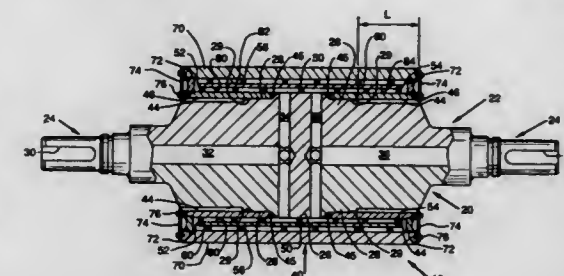
Continuation of Ser. No. 207,836, Mar. 8, 1994, abandoned.

This application Sep. 18, 1995, Ser. No. 529,378

Int. Cl.<sup>6</sup> B29C 43/24; 43/46; 43/52

U.S. Cl. 425—363

4 Claims



- A roll comprising:
  - an axially extending core member having a central portion and two end portions;
  - duct means in said core for receiving a fluid medium therein;
  - an inner shell member having a central portion and two distal end portions, said inner shell member surrounding said core member and being substantially coextensive therewith, said central portion of said inner shell member being attached to said central portion of said core member such that said distal end portions of said inner shell member are unsupported and are permitted to deflect in relation to the adjacent end portions of said core member;
  - a first spacer means attached to said inner shell member;
  - a middle shell member surrounding said inner shell member and being substantially coextensive therewith, said middle shell member being received on said first spacer means and cooperating therewith to form a first spiral passageway between said inner shell member and said middle shell member, said first spiral passageway communicating with said duct means in said core member;
  - a second spacer means attached to said middle shell member; and
  - an outer shell member having a central portion and two distal ends, said outer shell member surrounding said middle shell member and being substantially coextensive therewith, said outer shell member being received on said second spacer means and cooperating therewith to form a second spiral passageway between said middle shell member and said outer shell member, said second spiral passageway communicating with said first spiral passageway.

5,567,449

#### AUTOMOBILE WINDSHIELD MOLDING AND THE METHOD OF PRODUCING THE SAME

Yukihiko Yada, Nagoya, Japan, assignor to Tokai Kogyo Kabushiki Kaisha, Ohbu, Japan

Division of Ser. No. 291,088, Aug. 18, 1994, Pat. No. 5,474,729, which is a division of Ser. No. 192,623, Feb. 7, 1994, Pat. No. 5,374,096, which is a continuation of Ser. No. 781,371, Oct. 23, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 475,618

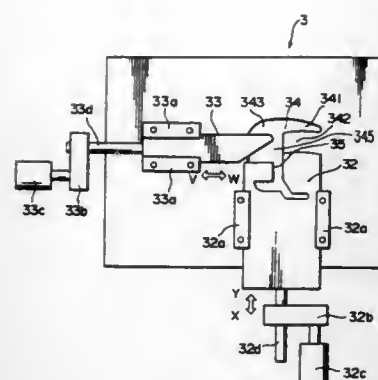
Claims priority, application Japan, Oct. 23, 1990, 2-283344

Int. Cl.<sup>6</sup> B29C 47/12

U.S. Cl. 425—381

12 Claims

- An apparatus for producing an automobile windshield molding for decorating along a periphery of a windshield located in an opening of a vehicle body panel, said automobile windshield molding having an exterior wing extending, when installed, along said periphery of the windshield, a cross-sectional profile of which continuously varies in a longitudinal direction from a second



molding section to a first molding section and which has a waterdrain channel in and along the second molding section, said apparatus comprising:

- dies for forming an outer surface and an inner surface of the exterior wing and an inner surface of the water drain channel by extrusion;
- means for gradually changing a position of said dies in a direction perpendicular to an extruding direction when moving from the forming of said second molding section to the first molding section; and
- means for moving the die for forming the waterdrain channel with distance from the other dies so as to reduce a size of the waterdrain channel from the second molding section to the first molding section.

5,567,450

## GUM BASE MANUFACTURING METHOD

Edward J. Zuromski, Bridgewater; James H. Campbell, Edison; George E. Yurish, Metuchen, and Dinah Diaz, Colonia, all of N.J., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Filed Jun. 7, 1995, Ser. No. 486,682

Int. Cl.<sup>6</sup> A23G 3/30

U.S. Cl. 426—5

17 Claims

1. A process for manufacturing gum base, comprising:
  - a. forming a pre-blend in liquid form in a primary mixer by using
    - (i) one or more liquefiable gum base ingredients selected from the group consisting of a wax with a melting point below about 115° C., an elastomer plasticizer having a softening point less than about 115° C., a monoglyceride, a diglyceride, a triglyceride, an acetylated monoglyceride and lecithin; and
    - (ii) one or more dry powder ingredients selected from the group consisting of magnesium carbonate, calcium carbonate, magnesium silicate, aluminum silicate, a calcium phosphate, clay and talc;
 wherein the pre-blend has a viscosity in its liquid form less than about 2x10<sup>6</sup> cps;
  - b. transferring a portion of the pre-blend to each of at least two secondary mixers;
  - c. introducing an elastomer to the secondary mixers, where the ratio of pre-blend to elastomer ranges from about 1:1 to about 10:1; and
  - d. blending the pre-blend and elastomer to form a finished gum base in each of the secondary mixers.

5,567,451

## ALGINATE OR PECTATE GEL DEFICIENT IN GELLING IONS FOR USE IN BINDING METAL IONS

Jean-Charles Rinn, Cognac, and Bertrand Robillard, Epernay, both of France, assignors to Champagne Moët & Chandon, Epernay, France

Continuation of Ser. No. 940,856, Oct. 23, 1992, Pat. No. 5,385,741. This application Jan. 4, 1995, Ser. No. 368,446  
Claims priority, application France, Feb. 25, 1991, 91 02220  
Int. Cl.<sup>6</sup> C12G 1/06; C02F 1/42; C12N 11/10

U.S. Cl. 426—13

60 Claims

1. A method of preparation of a solid gel selected from the group consisting of an alginate and a pectate gel, said gel being partially deficient in calcium ions, comprising the successive steps of:
  - (a) preparing a solution of a solubilized form of said gel selected from the group consisting of alginic acid, pectic acid, water-soluble salts of alginic acid, and water-soluble salts of pectic acid,
  - (b) preparing a solution of a calcium salt capable of gelling said solution of said solubilized form of said gel,
  - (c) contacting said solution of said solubilized form of said gel with said calcium salt solution under conditions capable of gelling said solubilized form of said gel as a calcium alginate or pectate gel, wherein said calcium alginate or pectate gel has a calcium ion content corresponding substantially to saturation of the binding sites of the alginate or pectate gel,
  - (d) reducing by ion exchange of calcium ions with protons the content of said calcium ions in the alginate or pectate gel by contacting said gel with an aqueous solution of acid having a pH between 1 and 3.5 during a period of time sufficient to lower the content of said calcium ions in said gel to between about 0.01 mg/g and about 1.5 mg/g of moist alginate or pectate gel, so that said gel is deficient in calcium ions, has ionic binding sites resulting from the absences of said calcium ion and has an affinity for ions capable of binding to said gel at binding sites not occupied by calcium ions, and
  - (e) recovering said calcium alginate or pectate gel partially deficient in cation ions, whereby said gel has an affinity for ions capable of binding to said gel at said binding sites not occupied by calcium ions.

5,567,452

## MINERAL SUPPLEMENT INCLUDING NON-SEPARATING GRANULES, AND MANUFACTURING PROCESS

Herbert Rebhan, New Richmond, Wis., assignor to Domain, Inc., New Richmond, Wis.

Filed Apr. 14, 1995, Ser. No. 422,349

Int. Cl.<sup>6</sup> A23K 1/00; 1/175

U.S. Cl. 426—72

16 Claims

1. A mineral supplement with vitamins for ruminant animals, comprising:
  - vitamin component granules containing one or more vitamins selected from the group consisting of Vitamin A, Vitamin D and Vitamin E, the majority of the granules being sized to pass a no. 3½ U.S. Standard Sieve but not a no. 16 U.S. Standard Sieve, the granules having an irregular shape such that the size and shape of the granules substantially prevents them from separating from the mineral supplement, and
  - a mineral mix of finely divided particles that are visibly smaller than the majority of the vitamin granules, the mineral mix containing from about 3 to about 67 weight percent of at least one of the minerals selected from the group consisting of calcium, magnesium and phosphorus,
 wherein the vitamin granules are about 3 to about 10 weight percent of the mineral supplement and the mineral mix is about 90 to about 97 weight percent of the mineral supplement.

5,567,453

## PROCESS OF COATING FOODS WITH A SYSTEM FOR FLUID RETENTION AND PRODUCT THEREOF

Ernesto J. Reutimann, New Milford; Dharam V. Vadehra, New Milford, and Elaine R. Wedral, Sherman, all of Conn., assignors to Nestec S.A., Vevey, Switzerland  
Continuation of Ser. No. 906,753, Jun. 30, 1992, Pat. No. 5,403,600. This application Mar. 27, 1995, Ser. No. 410,772  
Int. Cl.<sup>6</sup> A23B 4/10; A23L 1/31

U.S. Cl. 426—89

16 Claims

1. A process for treating meat and preparing a food product comprising:
  - preparing an ingredient mixture consisting essentially of egg albumen, milk protein, an ungelatinized starch and water and at least one ingredient selected from the group consisting of a gelatinized starch, an edible oil and salt wherein, by weight, the egg albumen is in an amount of at least



- f) moving heated conditioned grain from an airlock inlet to an airlock outlet exit by motion of said rotating baffles,  
g) compressing mechanically the heated conditioned grain to a pressure sufficient in combination with an internal pressure of heated kernels to cause heated kernels to burst,  
h) further compressing burst kernels into flaked grain, and  
j) cooling the flaked grain.

5,567,458

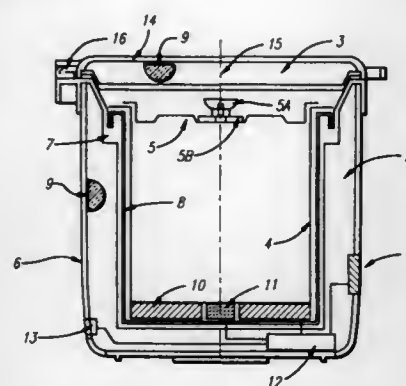
# METHOD AND APPARATUS FOR AUTOMATIC ADIABATIC COOKING

James M. Wu, 23506 Community St., West Hills, Calif. 91304

Filed Feb. 2, 1995, Ser. No. 382,610

Int. Cl.<sup>6</sup> A23L 1/01; A47J 27/00; 37/00; H05B 1/02

U.S. Cl. 426—233 22 Claims



1. An energy conserving cooking apparatus comprising:  
an inner cooking pot having an open top and a cover for closing said open top;  
an insulated outer container having an open top and a cover for closing said open top, said insulated outer container including a housing having an outer wall, an inner wall, and an inner receptacle contained within said inner wall for receiving said inner cooking pot;  
a heater disposed in said outer container for heating said inner cooking pot;  
a temperature sensor disposed in said outer container for sensing the temperature of said inner cooking pot; and  
means for controlling the heating of the ingredients in a first cooking mode in which water and ingredients to be cooked are actively heated for a specific time and for discontinuing heating of the ingredients in a second cooking mode in which the ingredients to be cooked are adiabatically cooked by retaining heat generated in said first cooking mode and without additional heat being provided from said heater.

5,567,459

# METHOD OF COOKING CORN DOUGH TORTILLAS USING INFRARED RADIATION

Jesús Gonzalez-Hernandez, Col. Industrial; José De La Luz Martínez, Puebla; Feliciano Sánchez-Sinencio, Col. Tecamachalco; Fernando Martínez-Bustos, Orizaba; Juan De Dios Figueroa C., Valle Hermoso, and Maximiano Ruiz-Torres, Morelia, all of Mexico, assignors to Centro de Investigación y de Estudios Avanzados del I.P.N., Mexico City, Mexico

Filed Oct. 11, 1994, Ser. No. 322,022

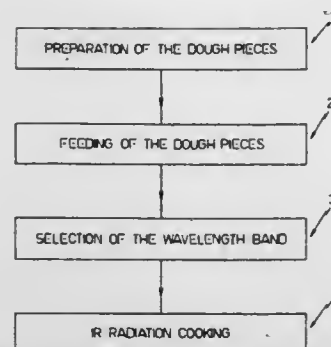
Claims priority, application Mexico, Oct. 12, 1993, 936338

Int. Cl.<sup>6</sup> A21D 6/00

U.S. Cl. 426—237 5 Claims

1. A method for cooking corn dough tortillas using infrared radiation comprising the steps of:

- a) preparing a corn dough to be cooked, with a moisture content in the range of 40 to 52% by weight;



- b) cutting and shaping the dough with said moisture content in order to obtain pieces of uncooked corn tortillas of predetermined size and thickness;  
c) generating infrared radiation waves within a wavelength range of from 1.5 to 4 micrometers to be irradiated within a cooking space for the uncooked corn tortilla; and  
d) passing the pieces of uncooked corn tortillas through said cooking space at a predetermined speed in order to produce the desired degree of cooking of said pieces of uncooked corn tortillas.

5,567,460

# METHOD OF PREPARING FULLY COOKED BACON DERIVED FROM PORK BELLIES

Brent J. Afman, Munster, Ind., assignor to OSI Industries, Inc., Aurora, Ill.

Filed May 4, 1995, Ser. No. 437,445

Int. Cl.<sup>6</sup> A23L 1/314; 1/318

U.S. Cl. 426—264 16 Claims

1. A method of curing and processing pork bellies to produce fully cooked sliced bacon using a single heating step and omitting any smokehouse treatment, consisting essentially of the steps of:  
providing pork bellies having a preselected weight;  
infusing the pork bellies with a seasoned liquid pickle solution;  
chilling rapidly the pork bellies sufficient to render the seasoned pickle solution a semi-solid;  
slicing the chilled pork bellies into a plurality of individual slices,  
heating rapidly the chilled slices with a heat source to a finished weight no more than 40% of the preselected weight; and  
continuing heating with said heat source until the slices are fully cooked.

5,567,461

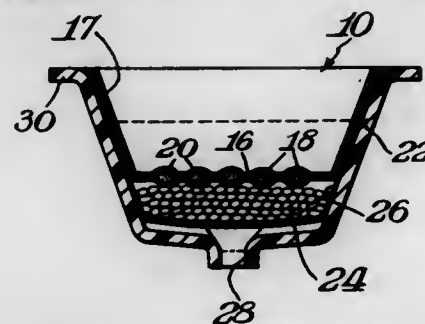
# METHOD OF TREATING FLUIDS WITH A FILTER

Robert Lehrer, Wilmington, Del., assignor to Robert Lehrer Associates, Inc., Wilmington, Del.

Filed May 9, 1994, Ser. No. 239,581

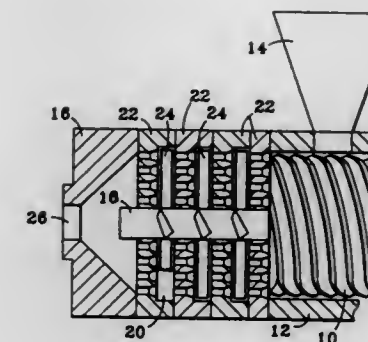
Int. Cl.<sup>6</sup> A23D 9/00; A23L 1/015; B01D 39/00

U.S. Cl. 426—417 14 Claims



1. A process for incorporating an additive in a fluid for enhancing the fluid comprising the steps of providing a fluid treating

member in the form of upstream and downstream layers of material joined together to form a laminate having a fluid contacting surface with a plurality of spaced pockets between the layers of the material in the fluid contacting surface and with the layers of material being fluid permeable at the pockets and with the upstream layer being liquid impermeable except at the pockets, mounting the treating member in a fluid applying station, the permeability and impermeability characteristics of the upstream layer whereby the permeability portions are self-permeable without requiring any piercing and alterations of the upstream layer to create fluid permeability, the upstream layer having its permeability and impermeability characteristics prior to mounting the treating member in the fluid applications station with the characteristics remaining unchanged both before and after the treating member is mounted in the fluid applying station, the permeability and impermeability characteristics requiring the fluid to pass through the laminate by being confined to flowing through the pockets and with dissolvable additive material in the pockets dissolving in response to the fluid passing through the members, mounting the treating member in the path of fluid flow at a location spaced upstream from the collection area of the path of flow, directing the fluid against the upstream layer of the fluid contacting surface, flowing a portion of the fluid laterally at the liquid impermeable portion of the upstream layer, flowing the fluid through the pockets of the treating member, dissolving the additive material by the action of the fluid contacting the additive material in the pockets, and incorporating the dissolved material in the fluid which passes out of the pockets and through the treating member and then flows to the collection area.



placing a biopolymeric material to be extruded in a cooker extruder having a screw, and at least one spatula pump, said spatula pump comprising a plate with a matrix of holes and at least one spatula element, said spatula element being passable over said plate with a matrix of holes; extruding the biopolymeric material through the cooker-extruder; and passing said spatula element over said plate with a matrix of holes to cause a pressure increase and thus a liquefaction of fluid vapor generated from said biopolymeric material in front of said passing spatula element and to cause a decrease in pressure behind said passing spatula element, thereby allowing an evaporation of the fluid contained in the biopolymeric material.

5,567,462

# PECTO CELLULOSIC PRODUCT FROM WHOLE CITRUS PEEL AND OTHER MATERIALS

Robert M. Ehrlich, North Hollywood, Calif., assignor to Sanofi bio-Industries, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 832,131, Feb. 6, 1992, abandoned. This application Apr. 22, 1994, Ser. No. 231,626

Int. Cl.<sup>6</sup> A23L 1/6; 1/0524; 1/308; 1/025

U.S. Cl. 426—425 11 Claims

1. A method for preparing pecto-cellulosic compositions from a pectin-containing plant raw material without a step of alcohol precipitation, said method comprising:  
combining comminuted raw material with an acidified aqueous solution comprising a food acid and incubating the comminuted raw material in the acidified aqueous solution at less than about 50° C. for about 8 to about 24 hours, thereby producing a mixture comprising a solid phase containing cellulosic components and a liquid phase containing solubilized pectin;  
pureeing the mixture, while the mixture is in the acidified aqueous solution, thereby producing particles less than about 200  $\mu$ m;  
partially neutralizing the pH of the mixture; and  
drying the mixture, thereby producing pecto-cellulosic solids.

5,567,463

# COOKER-EXTRUDER APPARATUS AND PROCESS FOR COOKING-EXTRUSION OF BIOPOLYMERS

Heinz Schaaf, Bad Camberg, Germany, assignor to Schaaf Technologie GmbH, Bad Camberg, Germany

PCT No. PCT/EP94/02402, § 371 Date Mar. 29, 1995, § 102(e) Date Mar. 29, 1995, PCT Pub. No. WO95/03714, PCT Pub. Date Feb. 9, 1995

PCT Filed Jul. 20, 1994, Ser. No. 407,004

Claims priority, application Germany, Jul. 29, 1993, 43 25 514.0

Int. Cl.<sup>6</sup> A23L 1/00; A23P 1/00

U.S. Cl. 426—523 19 Claims

14. A process for cooking extrusion of biopolymers comprising:

5,567,464

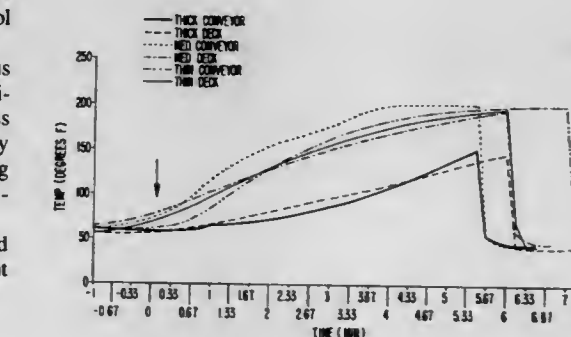
# PROCESS OF MAKING MOZZARELLA CHEESE

Richard L. Barz, Littleton, and Carolyn P. Cremer, Denver, both of Colo., assignors to Leprino Foods Company, Denver, Colo.

Filed Feb. 16, 1995, Ser. No. 389,932

Int. Cl.<sup>6</sup> A23C 19/14

U.S. Cl. 426—582 17 Claims



1. In a process of manufacturing a mozzarella variety of cheese or a mozzarella-like cheese comprising the following steps:  
a) pasteurizing cow's milk;  
b) acidifying the milk to convert it to a cheese milk;  
c) coagulating the cheese milk to obtain a coagulum comprised of curd and whey;  
d) cutting the coagulum and draining the whey therefrom, thereby leaving a cheese curd;  
e) heating, kneading, and stretching the cheese curd until it is a homogeneous, fibrous mass of heated, unripened cheese;  
f) forming the heated cheese into a shape;  
g) cooling the shaped cheese in cold brine; and  
h) removing the cooled cheese from the brine;  
the improvement wherein, between said steps (e) and (f), a GRAS cheese emulsifier is mixed into the heated cheese in an amount of about 0.01 to 2 percent, based on the weight of the cheese.

5,567,465

**DEHYDRATED PARTICULATE FOOD PRODUCT AND PREPARATION THEREOF**

Werner Bauer, Lutry, and Gerard Masson, Cully, both of Switzerland, assignors to Nestec S.A., Vevey, Switzerland  
PCT No. PCT/CH94/00175, § 371 Date Jul. 6, 1995, § 102(e) Date Jul. 6, 1995, PCT Pub. No. WO95/07029, PCT Pub. Date Mar. 16, 1995

PCT Filed Sep. 6, 1994, Ser. No. 416,876

Claims priority, application European Pat. Off., Sep. 10, 1993, 93114552

Int. Cl.<sup>6</sup> A23D 7/04

U.S. Cl. 426—613

17 Claims

1. A process for preparing a dehydrated particulate food product comprising:

- preparing an aqueous mixture by mixing albumen and a food acid;
- combining and mixing the aqueous mixture with fat in amounts sufficient to obtain an emulsion containing albumen and fat in a ratio of between 0.14:1 and 1.5:1 and having a pH below 5; homogenizing the emulsion; and
- dehydrating the homogenized emulsion to obtain a dehydrated particulate food product.

5,567,466

**ANIMAL FOOD COMPOSITIONS AND PREPARATION THEREOF**

Nathalie Dupont-Delboven, Beauvillé, Belgium, assignor to Nestec S.A., Vevey, Switzerland

Filed Dec. 30, 1994, Ser. No. 367,469

Claims priority, application European Pat. Off., Jan. 24, 1994, 94100959

Int. Cl.<sup>6</sup> A23K 1/10; A23L 1/31

U.S. Cl. 426—641

15 Claims

1. A process for preparing an animal food composition comprising:

- preparing a mixture of ingredients comprising, by weight, from 55% to 85% meat and meat by-product and from 10% to 25% farinaceous cereal to obtain a paste mixture;
- emulsifying the paste mixture at a temperature no higher than 15° C. to obtain an emulsified paste;
- pumping the emulsified paste to a frame system for containing and shaping the emulsified paste to obtain a framed, contained paste;
- heating the framed, contained paste to coagulate the paste to obtain a coagulated shaped paste;
- cutting the coagulated shaped paste into pieces suitable for being cut into chunks;
- cooling the pieces to a temperature of between 10° C. and 40° C. for hardening the pieces to obtain hardened pieces; and
- cutting the hardened pieces to obtain chunks.

5,567,467

**SOFT CANDY AND PROCESS FOR PRODUCING THE SAME**

Tsutomu Kondou, and Akifumi Yuki, both of Kanagawa, Japan, assignors to Nikken Chemicals Company, Limited, Tokyo, Japan

Filed Apr. 4, 1995, Ser. No. 416,002

Claims priority, application Japan, Apr. 8, 1994, 6-070674

Int. Cl.<sup>6</sup> A23G 3/00

U.S. Cl. 426—659

13 Claims

1. A soft candy which comprises erythritol, a sugar or a sugar alcohol other than erythritol, a fat and an emulsifier, wherein the weight ratio of erythritol to the sugar or the sugar alcohol other than erythritol ranges from 7:3 to 3:7, wherein the content of the fat ranges from 5 to 20% by weight, and wherein the content of the emulsifier ranges from 0.1 to 5% by weight.

5,567,468

**METHOD AND APPARATUS FOR APPLYING POWDER COATINGS TO SURFACES**

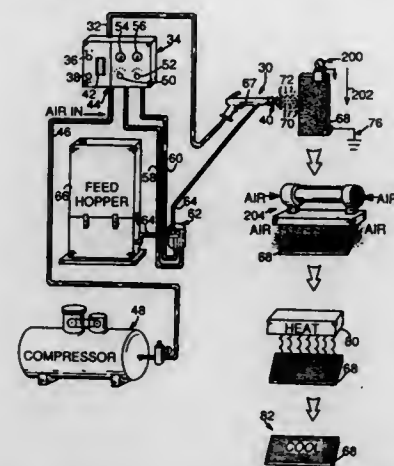
John M. Lucas, Cadyville, N.Y., assignor to Schonbek Worldwide Lighting Inc., Plattsburgh, N.Y.

Filed Oct. 11, 1994, Ser. No. 322,008

Int. Cl.<sup>6</sup> B05D 1/22; 1/04

U.S. Cl. 427—9

12 Claims



1. A method for powder coating a surface of an object comprising the steps of:

- applying a stream of electrostatic charged powder coat particles to the surface of the object;
- providing an ionized gas flow of opposite charge relative to the charge on the powder coat particles to the surface of the object so that the gas flow neutralizes and transports at least some of the particles from the surface, leaving a substantially-uniform layer of powder coat particles; and
- curing the powder coat particles to form a finished powder coat surface.

5,567,469

**PROCESS FOR PRODUCING CHALCOPYRITE TYPE COMPOUND THIN FILM**

Takahiro Wada, Katano; Mikihiro Nishitani, Nara, and Takayuki Negami, Katano, all of Japan, assignors to Matsuhita Electric Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 138,213, Oct. 20, 1993, abandoned.

This application Jun. 1, 1995, Ser. No. 458,015

Claims priority, application Japan, Oct. 30, 1992, 4-292460

Int. Cl.<sup>6</sup> B05D 1/36

U.S. Cl. 427—74

13 Claims



1. A process for producing a Cu-In-Group VI chalcopyrite film, which comprises: treating a film containing (1) copper metal, (2) indium metal, and (3) an indium compound selected from the group consisting of oxides, sulfides and selenides, with heat under a reducing atmosphere containing at least one of a Group VIb element or under an atmosphere containing a reducing compound of at least one of a Group VIb element, wherein an atomic ratio In/Cu of indium metal to copper metal in said film prior to heating is In/Cu ≤ 1, thereby converting said film into a Cu-In-Group VI chalcopyrite compound.

5,567,470

**HEAT-SENSITIVE TRANSFER SHEET CONTAINING BLUE DYESTUFF**

Hitoshi Koshida; Isamu Gboda, both of Hyogo-ken; Tsukasa Ohshima, and Keisuke Takuma, both of Fukuoka-ken, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

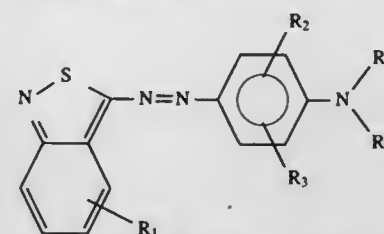
Continuation of Ser. No. 274,870, Jul. 14, 1994, abandoned, which is a division of Ser. No. 921,805, Jul. 31, 1992, Pat. No. 5,358,536. This application Aug. 18, 1995, Ser. No. 516,893  
Claims priority, application Japan, Jul. 31, 1991, 3-191544; Jul. 31, 1991, 3-191552

Int. Cl.<sup>6</sup> B41M 5/26; 3/12

U.S. Cl. 427—151

8 Claims

1. A heat-sensitive transfer sheet comprising a substrate and an ink coated thereon, wherein the ink contains a blue dyestuff represented by the formula (2)



wherein R<sub>1</sub> is a hydrogen atom, halogen atom or nitro group and each of R<sub>2</sub> and R<sub>3</sub> is independently a hydrogen atom, halogen atom, methyl group, ethyl group, methoxy group, methylcarbonylamino group, ethylcarbonylamino group, propylcarbonylamino group or methylsulfonylamino group, R<sub>4</sub> is an alkyl group having 1 to 8 carbon atoms, optionally substituted by a hydroxy group or a cyano group, an aralkyl group or an alkyl carboxyethyl group, and R<sub>5</sub> is an alkoxy carbonyl ethyl group.

5,567,471

**COHERENT, FLEXIBLE, COATED-BORE HOLLOW-FIBER WAVEGUIDE, AND METHOD OF MAKING SAME**

James A. Harrington, Martinsville; Todd C. Abel, Lakewood, and Jeffrey Hirsch, Princeton, all of N.J., assignors to Rutgers, The State University of New Jersey, Piscataway, N.J.  
Division of Ser. No. 181,852, Jan. 13, 1994, Pat. No. 5,448,664.  
This application Aug. 8, 1995, Ser. No. 512,672

Int. Cl.<sup>6</sup> B05D 5/06

U.S. Cl. 427—163.2

17 Claims

1. A method of fabricating a hollow waveguide having a bore with a smooth surface, a reflective layer deposited upon the surface of the bore, and a dielectric film formed upon the exposed surface of the reflective layer, for transmitting mid-infrared electromagnetic radiation, comprising the steps of:

- (a) propelling a reflective solution through the bore by creating a pressure differential between the proximal end and the distal end of the bore, such that the reflective solution contacts the surface of the bore, and a film of essentially opaque reflective material is deposited on the surface of the bore; and
- (b) propelling a dielectric solution through the bore by creating a pressure differential between the proximal and distal end of the bore, thereby causing the dielectric solution to contact the exposed surface of the film of reflective material, thereby forming a film of dielectric material of controllable thickness at the exposed surface of the film of reflective material.

5,567,472

**METHOD AND APPARATUS FOR FORMING A PULSED STREAM OF PARTICLES FOR APPLICATION TO A FIBROUS WEB**

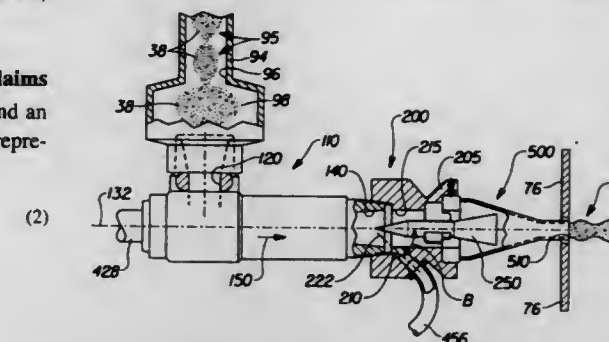
Robert H. Siegfried; James M. Fleming; Michael J. Stallford, all of Cincinnati, and John P. Janson, Cleves, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 332,022, Oct. 31, 1994. This application May 15, 1995, Ser. No. 440,805

Int. Cl.<sup>6</sup> B05D 1/02; 1/12; B05B 1/08; 7/14

U.S. Cl. 427—180

12 Claims



1. A method for forming a pulsed stream of discrete particles for application to a fibrous web, the method comprising the steps of: providing a stream of particles having a predetermined mass flow rate; providing a pulsed particle accelerating airflow in a downstream direction from a first location to a second location; providing a particle decelerating airflow; impacting the stream of particles with the pulsed particle accelerating airflow at the first location to accelerate the particles in the downstream direction to provide a pulsed stream of discrete particles; impacting the pulsed stream of discrete particles with the particle decelerating airflow at the second location downstream of the first location; and directing the pulsed stream of discrete particles to the fibrous web downstream of the first and second positions.

5,567,473

**PHOTOGRAPHIC PAPER WITH LOW OXYGEN PERMEABILITY**

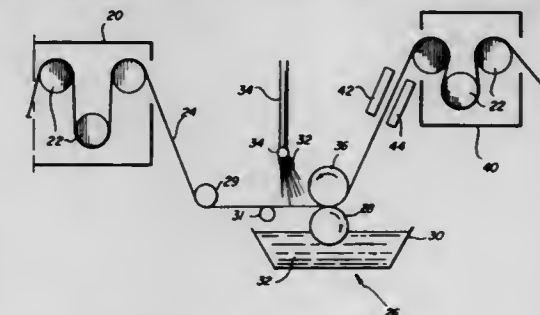
David J. Lacz, Honeoye Falls; Todd R. Skochdopole, Rochester; Larry D. Hagemeyer, Rochester; Anita M. Fees, Rochester; Brian Thomas, Pittsford, and Gary J. McSweeney, Hilton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 39,340, Apr. 16, 1993, Pat. No. 5,391,473, which is a continuation-in-part of Ser. No. 756,262, Aug. 19, 1991, abandoned. This application Jan. 24, 1995, Ser. No. 378,039

Int. Cl.<sup>6</sup> B05D 1/02

U.S. Cl. 427—211

13 Claims



1. A method of forming an oxygen barrier paper comprising





moving said conveyer belts from said first location to a second location in a first direction;  
directing gas streams upwardly against said lower surface of said sheet and against and through said conveyer belts as said belts move in said first direction from said first location to said second location to dry said sheet and to press and hold said sheet upwardly against said lower sides of said conveyer belts;  
moving said sheet from said first location to said second location in said first direction as said sheet is held against said lower sides of said conveyer belts by said gas streams;  
ejecting said dried sheet from said second location;  
wherein said step of coating said sheet further includes the steps of:  
providing a container holding said coating liquid,  
rotating a first roller through said coating liquid in said container,  
collecting said coating liquid onto said first roller,  
rotating a second roller to receive said coating liquid from said first roller,  
rotating a third roller,  
passing said sheet between said second and third rollers to said first location, and  
transferring said coating liquid from said second roller to a lower surface of said sheet as said sheet passes between said second and third rollers.

5,567,482

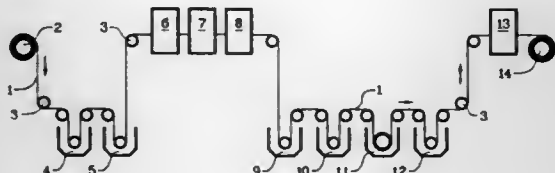
## METHOD OF PROTECTING STEEL STRIP

Ersan Ilgar; Edward J. Patula, both of Monroeville, Pa., and James R. Roney, Canton, Mich., assignors to USX Corporation, Pittsburgh, Pa., and Rouge Steel Company, Dearborn, Mich.

Filed Dec. 20, 1995, Ser. No. 575,816  
Int. Cl.<sup>6</sup> C08J 7/04

U.S. Cl. 427—510

19 Claims



1. Method of protecting steel strip in a high speed electrogalvanizing process from generation of zinc edge nodules comprising providing a steel strip, applying as an edge band to said steel strip, while it is moving at a rate of at least 100 feet per minute, a liquid ultraviolet-curable coating, and curing said coating with ultraviolet radiation.

5,567,483

## PROCESS FOR PLASMA ENHANCED ANNEAL OF TITANIUM NITRIDE

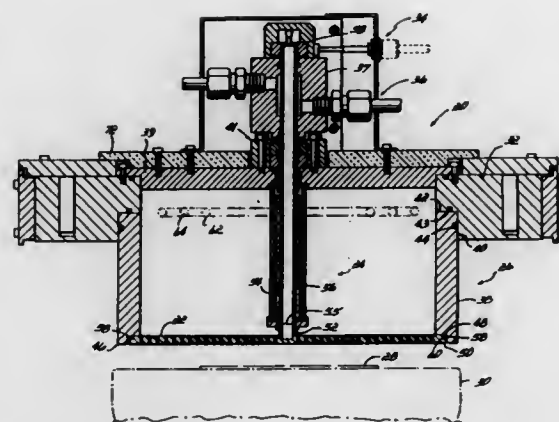
Robert F. Foster, Phoenix; Joseph T. Hillman, Scottsdale, and Rikhit Arora, Mesa, all of Ariz., assignors to Sony Corporation, Tokyo, Japan, and Materials Research Corporation, Park Ridge, N.J.

Filed Jun. 5, 1995, Ser. No. 461,665  
Int. Cl.<sup>6</sup> H05H 1/00

U.S. Cl. 427—535

9 Claims

1. A method of annealing a titanium nitride film on a substrate comprising contacting a titanium nitride film on a substrate with a plasma formed from a gas selected from the group consisting of ammonia and nitrogen at a temperature less than about 500° C.



5,567,484

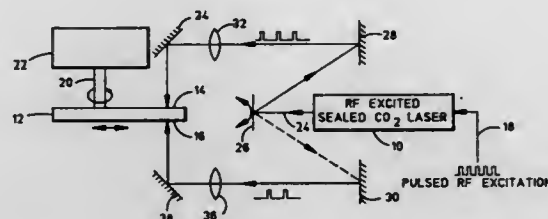
## PROCESS FOR TEXTURING BRITTLE NONMETALLIC SURFACES

Peter M. Baumgart, San Jose; Wing P. Leung, Arcadia; Hung V. Nguyen; Thao A. Nguyen, both of San Jose; Andrew C. Tam, Saratoga, and Anthony Wu, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 149,851, Nov. 10, 1993, abandoned. This application May 31, 1995, Ser. No. 455,861  
Int. Cl.<sup>6</sup> B05D 3/00

U.S. Cl. 427—555

40 Claims



1. A method for texturing a surface comprising the steps of:  
providing an element which is composed essentially of a glass material which has a thermal shock threshold fluence level above which said glass material is fractured, the element having a surface;

concentrating pulses of laser energy selectively on a plurality of spaced-apart locations over a treatment area of said surface to alter the topography of said surface in a target area at each said spaced-apart location, each pulse of laser energy having a fluence  $f_p$  at said each spaced-apart location wherein the fluence  $f_p$  is less than said thermal shock threshold fluence level for said glass material;

each pulse of laser energy having laser energy  $E_p$ , a duration  $t_p$ , and a focussed spot having a maximum spot diametral dimension  $D_p$ , wherein  $E_p$ ,  $t_p$ , and  $D_p$  are selected to limit said fluence  $f_p$  to a value below said thermal shock threshold fluence level, whereby a bump is formed in said each target area, said each bump having a maximum bump diametral dimension  $D_b$  and rising to a maximum height  $h_b$  above said surface; and

said duration  $t_p$  being in the interval  $10^{-9}$  to  $10^{-1}$  seconds, said maximum spot diametral dimension  $D_p > D_b$  being in the interval 1 to 500 micrometers and said pulse of laser energy having a wavelength  $\lambda_p$  such that the optical penetration of said pulse of laser energy in said surface is in the interval  $10^{-8}$  to  $10^{-3}$  meters.

5,567,485

## MOLDING COMPOSITE COMPOSITION AND METHOD FOR MOLDING THE SAME

Takashi Tomita, Hiroshima; Masakatsu Ohsugi, Hiroshima-ken, and Daisaburo Adachi, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima-ken, Japan

Continuation of Ser. No. 63,099, Apr. 15, 1993, abandoned.

This application Jul. 1, 1994, Ser. No. 266,899

Claims priority, application Japan, Apr. 17, 1992, 4-098193

Int. Cl.<sup>6</sup> C08L 67/00; 67/04; 77/00; 77/12

U.S. Cl. 428—1

6 Claims

1. A thermoplastic composite composition, comprising:  
a thermoplastic matrix resin,  
a liquid crystal resin which has a liquid crystal transition temperature higher than a minimum molding temperature of said matrix resin and which is capable of being melt-extruded into a fiber in the matrix resin; and  
a compatible agent for providing an improved bonding power with an interfacing surface between the matrix resin and the liquid crystal resin, said compatible agent having a compounding ratio sufficient to prevent the liquid crystal resin fiber or fibers formed by extruding said thermoplastic composite composition from having an aspect ratio of less than 3;  
wherein the thermoplastic matrix resin is selected from the group consisting of ABS resin, polystyrene resin, polyphenyleneoxide resin, polycarbonate resin and polyolefin resin, with the provisos that:  
(i) where the thermoplastic matrix resin is an ABS resin, polystyrene resin, or polyphenyleneoxide resin, the compatible agent is a matrix resin modified by a compound having an epoxy group and/or an acid anhydride,  
(ii) where the matrix resin is a polycarbonate resin, the compatible agent is a matrix resin modified by an acid anhydride; and  
(iii) where the matrix resin is a polyolefin resin, the compatible agent is a matrix resin modified by a compound having an epoxy group.

portion of the elastic member connected to the strip of material near the first end of the strip of material and the second portion of the elastic member connected to the ribbon support member such that the first portion of the elastic member extends along the strip of material;

post means disposed on the ribbon support member near the second end thereof for maintaining the first portion of the elastic member extending along the strip of material in the unstretched condition; and

retaining post means disposed on the ribbon support member for releasably maintaining the second portion of the elastic member extending along the support member in a stretched condition, the first and second post means cooperating such that upon disengagement of the first portion of the elastic member from the post means and disengagement of the second portion of the elastic member from the retaining post means the second portion of the elastic member moves towards an unstretched condition whereby the first portion of the elastic member extending along the strip of material moves towards a stretched condition and the first and second portion of the elastic members cooperate to form the strip of material into a decorative ribbon supported on the ribbon support member.

5,567,487

## MOVING ART FORM AND METHOD OF PRODUCING SAME

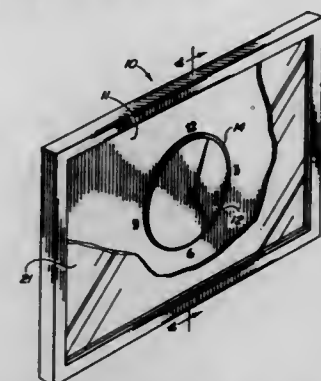
Richard M. Head, 12000 N. 90th St., Apt. 3048, Scottsdale, Ariz. 85260

Filed Mar. 1, 1995, Ser. No. 396,709

Int. Cl.<sup>6</sup> B43L 9/00

U.S. Cl. 428—14

20 Claims



1. A new art form comprising a backing sheet having a first precisely generated planar pattern imposed thereupon; a first transparent sheet having a second precisely generated planar pattern imposed thereupon, said second planar pattern being discernibly different from said first planar pattern, said first transparent sheet being disposed in fixed planar relationship to said backing sheet and rotatable relative thereto to create a dynamic optical effect therewith.

5,567,486

## RIBBON ASSEMBLY

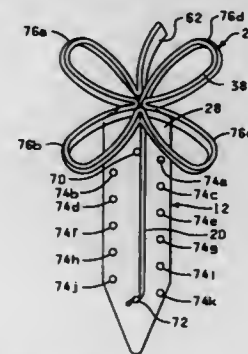
Donald E. Weder, Highland, Ill., assignor to The Family Trust U/T/A, and Southpac Trust International, Inc., both of Oklahoma City, Okla.

Continuation-in-part of Ser. No. 384,496, Feb. 5, 1995, Pat. No. 5,470,620, which is a continuation of Ser. No. 286,853, Aug. 5, 1994, Pat. No. 5,411,774, which is a continuation of Ser. No. 101,210, Aug. 3, 1993, Pat. No. 5,387,446. This application Jun. 7, 1995, Ser. No. 484,423

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—4

17 Claims



1. A ribbon assembly, comprising:

a ribbon support member having a first and a second end;  
a strip of material having a first end, a second end, an upper surface and a lower surface, the second end of the strip of material connected to the support member;

an elastic member having a first portion, a second portion, a stretched condition and an unstretched condition, the first

5,567,488

## MULTILAYER BARRIER FILM FOR TRANSDERMAL DRUG DELIVERY SYSTEM AND OSTOMY APPLICATIONS

Scott I. Allen, Newark; Michael Ferguson, Granville, and Harvey Tung, Newark, all of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 121,474, Sep. 16, 1993, abandoned. This application Mar. 23, 1994, Ser. No. 216,903

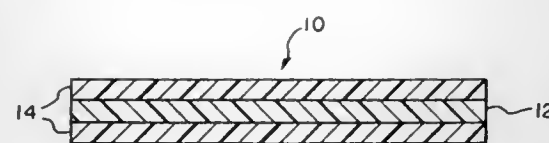
Int. Cl.<sup>6</sup> B32B 27/32

U.S. Cl. 428—34.1

15 Claims

1. An oxygen and moisture impermeable multilayer barrier film having a heat seal strength of at least about 1.0 lb/inch width of said film, said film comprising a barrier layer and at least one heat





sealable skin layer, said skin layer comprising a thermoplastic polymer having a 2% secant modulus of less than about 15,000 psi in both the machine and transverse directions; said barrier film exhibiting a noise of less than about 85 dB when subjected to flexing through a 65° angle at 0.45 Hz.

**5,567,489**  
**MULTILAYER HALOGEN-FREE BARRIER FILM FOR OSTOMY AND TRANSDERMAL DRUG DELIVERY APPLICATIONS**

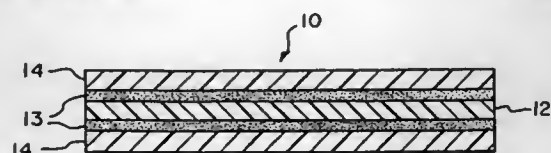
Scott I. Allen, Newark; Michael Ferguson, Granville, and Harvey Tung, Newark, all of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 121,634, Sep. 16, 1993, abandoned. This application Mar. 23, 1994, Ser. No. 216,905

Int. Cl.<sup>6</sup> B32B 27/08

U.S. Cl. 428—34.1

26 Claims



1. An oxygen and moisture impermeable multilayer barrier film comprising a halogen-free polymeric barrier layer and at least one heat sealable skin layer, said skin layer comprising a thermoplastic polymer having a 2% secant modulus of less than about 15,000 psi in both the machine and transverse directions, said barrier film exhibiting a noise of less than about 85 dB when subjected to flexing through a 65° angle at 0.45 Hz and having a heat seal strength of at least about 1.0 lb/inch width of said film.

**5,567,490**  
**WHITE THERMAL CONTROL SURFACES**

Harold A. Papazian, Littleton; Donald F. Shepard, Evergreen; Edward A. Pierson, Littleton, all of Colo., and Michael J. Gordon, Buellton, Calif., assignors to Martin Marietta Corporation, Denver, Colo.

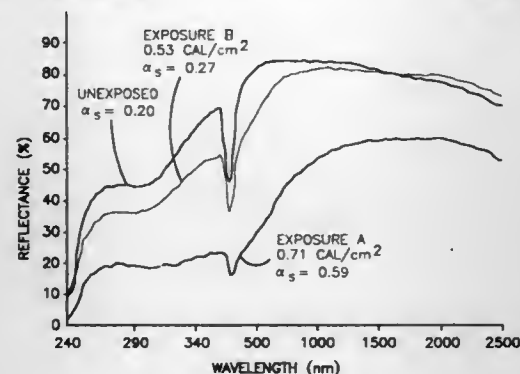
Division of Ser. No. 48,774, Apr. 16, 1993, Pat. No. 5,476,696.

This application Jun. 2, 1995, Ser. No. 459,124

Int. Cl.<sup>6</sup> B32B 18/00; C23C 4/10

U.S. Cl. 428—34.4

10 Claims



1. A method of preparing a white thermal control surface which is resistant to darkening due to exposure to X-rays and ultraviolet radiation comprising the steps of:

(a) providing a substrate; and

(b) plasma spray-applying onto said substrate particles of zirconium orthosilicate, said zirconium orthosilicate being doped with a dopant which is a metal oxide of a +3 valent metal.

**5,567,491**  
**HYDROCARBON VAPOR-IMPERVIOUS CONTAINERS AND PROCESS FOR PRODUCING THEM**

Annibale Vezzoli, Como; Aldemaro Ciaperoni, Milan, and Piero Furlan, Treviso, all of Italy, assignors to Montedipe S.r.l., Milan, Italy

Continuation of Ser. No. 144,630, Nov. 2, 1993, abandoned, which is a continuation of Ser. No. 914,222, Jul. 17, 1992, abandoned, which is a continuation of Ser. No. 483,650, Feb. 23, 1990, abandoned. This application Jan. 31, 1995, Ser. No. 380,920

Claims priority, application Italy, Feb. 23, 1989, 19546A/89

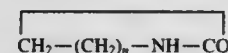
Int. Cl.<sup>6</sup> B32B 27/00; 31/00

U.S. Cl. 428—35.7

13 Claims

1. A coated container, which is impervious to hydrocarbon vapors and in particular to fuel vapors, comprising an outer shell formed from a single layer of polyethylene plastic material, a single thin layer consisting of an in situ polymerized poly-omega-lactam from caprolactam monomers coated on a surface of said single polyethylene plastic layer and adhered thereto, said thin layer covering the plastic layer and being in contact with the hydrocarbon vapor, said thin layer further being formed without substantially altering the mechanical-dynamic properties including impact strength of said polyethylene layer, and wherein said thin layer is between zero and 5 mm in thickness;

wherein the poly-omega-lactam is prepared by polymerization of an omega-lactam having the formula:



(I)

wherein n is an integer ranging from 1 to 10; and wherein the poly-omega-lactam layer contains amounts not greater than 15% by weight with respect to the polymer, of a polyoxyalkylene polyol having a molecular weight greater than 400, of a polyoxypropylene/polyoxyethylene polyol copolymer having a molecular weight ranging from 1,000 to 20,000, or of a polyoxyalkylene amine having a functionality lower than 3.

**5,567,492**

Patent Not Issued For This Number

**5,567,493**  
**DIE FOR EXTRUSION OF MULTI-HOLE TUBE AND MULTI-HOLE TUBE MADE WITH THE DIE**

Toshihiro Imai, Nagoya; Tokuo Shirai, Aichi-ken; Ken Yamamoto, Obu, and Shingoro Fukuoka, Tokyo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, and Furukawa Electric Co., Ltd., Tokyo, both of Japan

Filed Nov. 2, 1993, Ser. No. 143,907

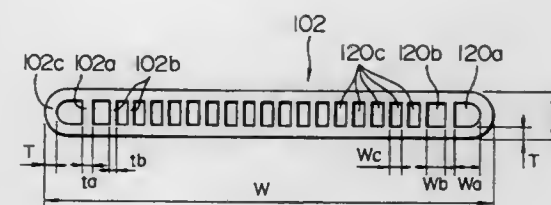
Claims priority, application Japan, Nov. 5, 1992, 4-296167

Int. Cl.<sup>6</sup> F28D 1/04

U.S. Cl. 428—36.9

8 Claims

1. A flat multi-hole tube having a cross section which is formed by two side portions confronting each other, two connection portions respectively connecting the two side portions to each other at opposite ends thereof, and at least four partition walls respectively interconnecting the two side portions to define therein spaces serving as a plurality of fluid paths, wherein thicknesses of adjacent partition walls and path widths of said fluid paths are varied in a direction of width of the multi-hole tube and are set to satisfy at least one of following conditions:



(a) when said thicknesses of said partition walls are represented from respective ends thereof in the width direction toward inside by  $t_a, t_b, t_c, t_d, \dots$ , said thicknesses are in a relation of  $t_a > t_b$ ; and

(b) when said path widths of said fluid paths are represented from respective ends thereof in the width direction toward inside by  $w_a, w_b, w_c, w_d, w_e, \dots$ , said path widths are in a relation of  $w_a > w_b$ .

**5,567,494**  
**ROLLS FOR ELECTROSTATIC CHARGE**

Kentaro Ageishi, Ebina; Ryuji Watanabe, Suzuka, and Tsutomu Sugimoto, Ebina, all of Japan, assignors to Fujitsu Xerox Co., Ltd., Tokyo, Japan

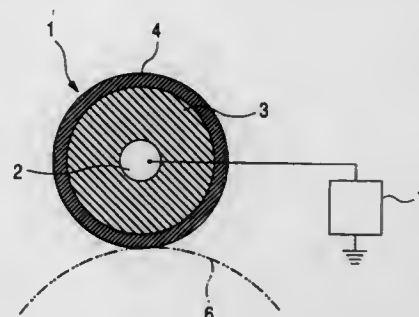
Filed Jul. 5, 1994, Ser. No. 270,250

Claims priority, application Japan, Jul. 6, 1992, 5-166917

Int. Cl.<sup>6</sup> B25F 5/02; B32B 27/32; 27/40

U.S. Cl. 428—36.9

4 Claims



1. A roll for electrostatic charging, comprising a core member having laminated thereon, in sequence, a conductive elastomer layer and a surface layer, said surface layer being a single layer that includes a binder resin and a conductive material, said surface layer having an inner surface layer region and an outermost surface layer region, said outermost surface layer region having an electrical resistance of  $10^{13}$  to  $10^{16} \Omega/\text{cm}^2$ , said electrical resistance of said outermost surface layer region being higher than an electrical resistance of said inner surface layer region.

**5,567,495**  
**INFECTION RESISTANT MEDICAL DEVICES**

Shanta Modak, River Edge, N.J., and Lester Sampath, Nyack, N.Y., assignors to The Trustees of Columbia University In The City of New York, New York, N.Y.

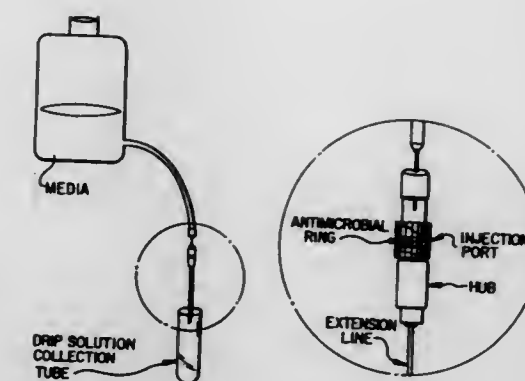
Continuation-in-part of Ser. No. 103,087, Aug. 6, 1993, abandoned. This application Jul. 11, 1994, Ser. No. 273,329

Int. Cl.<sup>6</sup> B29D 22/00

U.S. Cl. 428—36.9

5 Claims

1. An injection port comprising an antiinfective insert selected from the group consisting of an antiinfective disc and an antiinfective ring, wherein the antiinfective disc or antiinfective ring is comprised of a polymer which has been impregnated, at its surface, with an antiinfective agent.



**5,567,496**  
**MARTIAL ARTS BOARD**

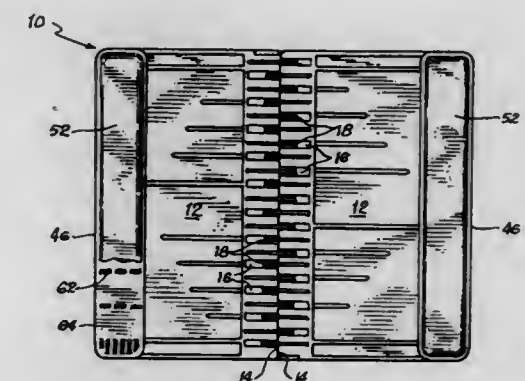
Oswald C. Svehaug, 125 N. Glover, Chula Vista, Calif. 91910

Filed Jan. 31, 1995, Ser. No. 384,317

Int. Cl.<sup>6</sup> B32B 3/06

U.S. Cl. 428—60

11 Claims



1. An improved martial arts board comprising:

(a) two planar board halves each having a mating edge and defining mating interengagement means along said edge such that said board halves are releasibly mutable along said respective mating edges to define a generally planar full board when assembled with a front surface defining an elongated breakaway zone there across at the juncture between said two halves whereby said halves separate upon being impacted by a blow of at least a threshold magnitude;

(b) said interengagement means being of interfitting mortise and tenon construction mutable by sliding said two planar board halves together in the plane defined by said full board in edge-to-edge abutted relation such that separation can be effected by reversal of the mating movement, or a hinging action caused by a sharp frontal blow to said breakaway zone; said board halves are identical such that each has both mortises and tenons reversed from, and thereby slidably interfitting with, those of the other of said coupling sets being a detent set which defines a dimple interface between the respective mortise and tenon wherein a concave dimple and a convex dimple longitudinally align with one another when sliding said two halves together, and noticeably snap into overlaid, seated relation when said board halves reach a fully mated position, such that each said detent set defines a positive detent; and

(c) at least one snaplock detent which is forced to release when said halves separate, and to positively engage said board halves when forced back together after being used and to produce a sharp noticeable snap to signal complete closure of the two board halves as they are completely mated.

5,567,497

**SKID-RESISTANT FLOOR COVERING AND METHOD OF MAKING SAME**

Stephen A. Zegler, Cobutta, Ga.; Paul L. Weinle, Concord, N.C., and Lorence M. Moot, Cobutta, Ga., assignors to Collins & Aikman Products Co., Charlotte, N.C.

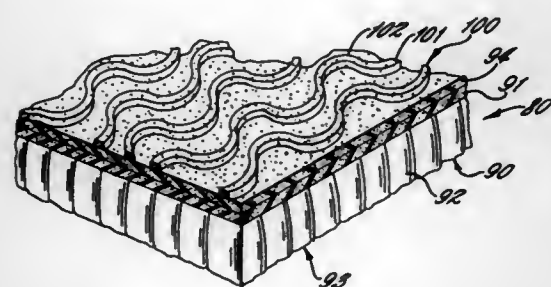
Continuation of Ser. No. 911,285, Jul. 9, 1992, abandoned.

This application Apr. 21, 1994, Ser. No. 230,623

Int. Cl.<sup>6</sup> B32B 3/02

U.S. Cl. 428—95

6 Claims



1. A skid-resistant carpet suitable for use on smooth or carpeted floors comprising:

- a carpet face layer including a fabric backing layer, tufted yarns secured through and to said fabric backing layer to provide a tufted pile face surface, and a thermoplastic secondary backing layer; and
- a thermoplastic contact layer fusibly compatible with and fused to said thermoplastic secondary backing layer having a plurality of narrow herringbone or serpentine raised bands, the thermoplastic of said contact layer being fusibly compatible with said secondary backing layer, and said bands being sufficiently elastic to impart skid-resistance to the carpet.

5,567,498

**TEXTURED BALLISTIC ARTICLE**

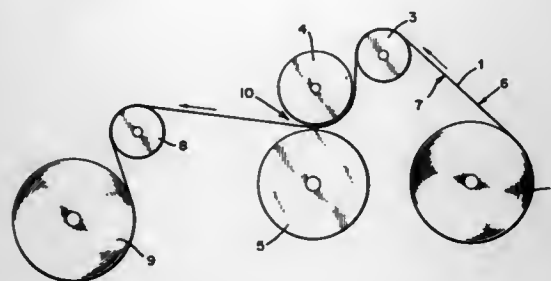
Kevin S. McCarter, Steven A. Young, and Pamela K. Laws, all of Richmond, Va., assignors to AlliedSignal Inc., Morristown, N.J.

Filed Sep. 24, 1993, Ser. No. 126,838

Int. Cl.<sup>6</sup> B32B 5/12

U.S. Cl. 428—113

20 Claims



1. A composite comprising an element which includes at least two adjacent fiber network layers, each of the fiber network layers comprising a network of high strength fibers having a tenacity of at least about 7 g/d, a tensile modulus of at least about 100 g/d and an energy-to-break of at least about 8 J/g, in a matrix material, wherein the element has a first plane profile and a second plane profile, at least one of the first and second plane profiles has on its surface a textured pattern, and the matrix material is distributed substantially uniformly based on weight over the textured plane profile.

5,567,499

**RESIN TRANSFER MOLDING IN COMBINATION WITH HONEYCOMB CORE**

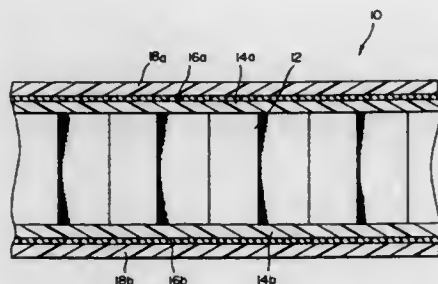
Thomas R. Cundiff, Puyallup, and Bradley A. Frye, Auburn, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 3, 1995, Ser. No. 368,062

Int. Cl.<sup>6</sup> B32B 3/12

U.S. Cl. 428—116

2 Claims



1. A strong and lightweight layered product made in a mold and having a honeycomb core having all empty cells, said product comprised of:

- a central honeycomb core having all empty cells;
- a first layer of a cured adhesive film above said central honeycomb core, and a second layer of a cured adhesive film below said central honeycomb core, said first and second layers of cured adhesive film having been cured inside said mold; and
- a first layer of a cured prepreg material above said first layer of cured adhesive film, and a second layer of a cured prepreg material below said second layer of cured adhesive film, said first and second layers of prepreg material having been cured inside said mold; and
- a first layer of a cured dry fiber preform impregnated with a resin transfer molding (RTM) resin system above said first layer of cured prepreg material, and a second layer of a cured prepreg material impregnated with a resin transfer molding (RTM) resin system below said second layer of cured prepreg material, said first and second layers of prepreg material impregnated with a resin transfer molding (RTM) resin system having been cured inside said mold, wherein said first and second prepreg materials prevent infiltration of the resin transfer molding resin into the honeycomb core.

5,567,500

**COMPOSITE HONEYCOMB CORE STRUCTURE COMPRISING CELL WALLS CONSTRUCTED OF AT LEAST THREE UNIDIRECTIONAL FIBER LAYERS OR AT LEAST TWO UNIDIRECTIONAL FIBER LAYERS AND A RANDOM FIBER LAYER**

Andrew C. Marshall, Walnut Creek, and Michael L. Fellman, Benicia, both of Calif., assignors to Specialty Cellular Products Company, Dublin, Calif.

Continuation of Ser. No. 312,480, Sep. 26, 1994, which is a continuation of Ser. No. 250,644, May 27, 1994, abandoned, which is a division of Ser. No. 988,674, Dec. 10, 1992, abandoned, which is a continuation of Ser. No. 741,126, Aug. 7, 1991, abandoned. This application Oct. 13, 1995, Ser. No. 543,225

Int. Cl.<sup>6</sup> B32B 3/12; 3/10

U.S. Cl. 428—116

7 Claims

- a first layer of material containing a plurality of structural fibers arranged to lie substantially unidirectionally within said layer;
- a second layer material positioned adjacent said first layer, said second layer containing a plurality of structural fibers in either random or unidirectional configuration;

5,567,502

**MAGNETIC RECORDING MEDIUM HAVING A MAGNETIC LAYER CONTAINING ABRASIVE PARTICLES**

Hiroyuki Miyabara; Shigeharu Watase, both of Saku; Yoshio Kawakami, Nagano-ken, and Kiyoto Fukushima, Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan

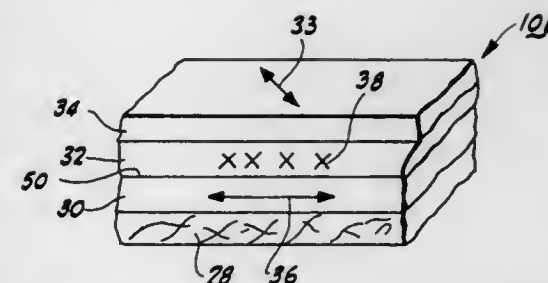
Filed Mar. 16, 1995, Ser. No. 405,192

Claims priority, application Japan, Mar. 31, 1994, 6-083655

Int. Cl.<sup>6</sup> G11B 05/708

U.S. Cl. 428—141

18 Claims



c. a third layer of material adjacent said first layer, said third layer of material containing a plurality of structural fibers arranged to lie substantially unidirectionally within said third layer; and

d. an impregnating material for forming a matrix connecting said first and second layers binding said fibers within said first and second layers, said first, second, and third layers being formed into a honeycomb core, said first, second, and third fiber-containing layers of material forming the cell walls of said honeycomb core.



1. A magnetic recording medium comprising a nonmagnetic support having thereon a paint film layer including a magnetic layer, wherein the paint film layer has a lamination structure consisting of two or more layers, a top surface layer of the layers constituting the paint film layer is the magnetic layer, the top surface magnetic layer contains abrasive particles having a Mohs hardness of not less than 6 in an amount of 3 to 16 parts by weight based on 100 parts by weight of a ferromagnetic powder and has a thickness of not more than 0.5 μm, a ratio of a mean particle diameter of the abrasive particles to the thickness of the top surface magnetic layer is in the range of 1.08 to 1.8, and a content of the abrasive particles each having a size larger than the thickness of the top surface magnetic layer in the particle size distribution of the abrasive particles is in the range of 50 to 90% by weight, and the nonmagnetic support comprises a biaxially oriented polyethylene terephthalate film containing as inert particles at least inert particles having such basicity as capable of adsorbing a basic indicator bromothymol blue with a blue color, and said magnetic recording medium is a tape.

5,567,501

**THERMALLY APERTURED NONWOVEN PRODUCT**

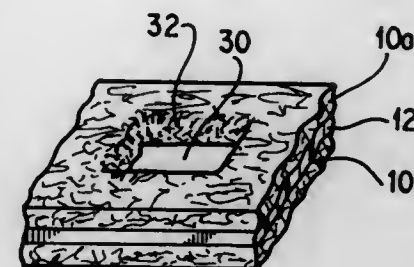
Ramesh Srinivasan, Billerica; W. Andrew Coslett, Medfield; Leonardo B. L. Guerrero, Franklin, and Donald V. McCoombs, Medway, all of Mass., assignors to International Paper Company, Purchase, N.Y.

Filed Jun. 15, 1994, Ser. No. 260,126

Int. Cl.<sup>6</sup> B32B 3/10; 23/08; 27/32; 31/20

U.S. Cl. 428—137

16 Claims



1. An apertured nonwoven product made by a thermal aperturing process which comprises:

- combining a layer of nonwoven fibers having a first melting temperature and a layer of polymeric film having a second melting temperature lower than said first melting temperature and a property of shrinking under application of heat, and
- applying heat and pressure to the combination of said nonwoven fibers and said polymeric film through calendaring points of a calendar roll, such that said polymeric film becomes bonded to said nonwoven fibers and simultaneously shrinks and takes back said nonwoven fibers away from the calendaring points, thereby generating apertures through said layer of nonwoven fibers and said layer of polymeric film.

5,567,503

**POLISHING PAD WITH ABRASIVE PARTICLES IN A NON-POROUS BINDER**

John S. Sexton, Bobcat, West Street, Odiham, and Derek N. Wright, No. 5 Eagle Close, Heathlake, Crowthorne, Berkshire, both of England

Continuation of Ser. No. 33,561, Mar. 16, 1993, abandoned.

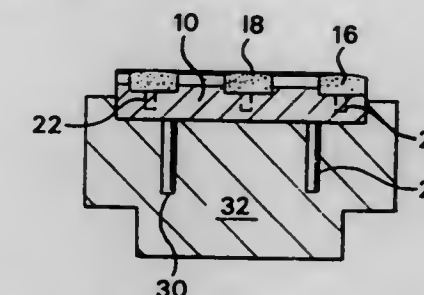
This application Sep. 19, 1994, Ser. No. 308,399

Claims priority, application United Kingdom, Mar. 16, 1992, 9205664; Oct. 12, 1992, 9221397

Int. Cl.<sup>6</sup> B24D 7/00

U.S. Cl. 428—143

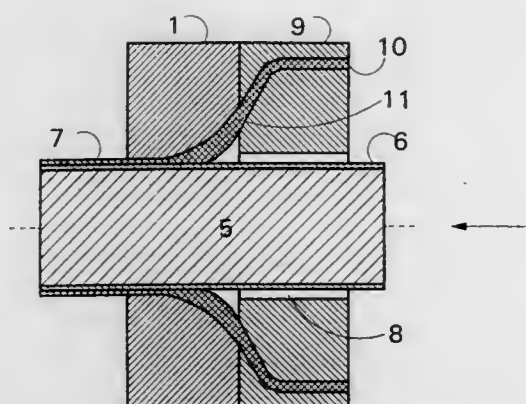
10 Claims



1. A polishing pad comprising a carrier having major surfaces on opposite sides thereof, said major surfaces having longitudinal edges, and at least one of said major surfaces having an abrasive layer structure secured thereto, said abrasive layer structure comprising a plurality of elongate strips arranged to extend generally transversely to the longitudinal edges of said at least one major surface in spaced relationship to each other so as to form regions of empty space.



interspaces therebetween, depending pin members being formed on a surface of each of said elongate strips facing said at least one major surface and being clampingly engaged in complementary apertures formed in said at least one major surface so as to constitute a unitary structure with said carrier; a base member of said polishing pad having a surface mounting said unitary structure comprising said abrasive layer structure and said carrier, said carrier having a plurality of elongate pin members extending into complementary holes formed in a surface of said base member facing a surface of said carrier opposite the surface of said carrier mounting said plurality of elongate strips, whereby said unitary structure of said abrasive layer of strips and barrier are conjointly detachable from said base member and replaceable by another said unitary structure.



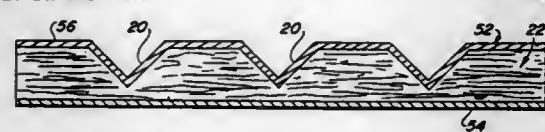
#### 5,567,504 GLASS FIBER DUCT BOARD WITH COATED GROOVES AND THE METHOD OF MAKING THE SAME

Eric G. Schakel, Sedalia; Robert R. Coleman, Westminster; Kent R. Matthews, Littleton, all of Colo., and Lowell K. Morton, Greenville, S.C., assignors to Schuller International, Inc., Denver, Colo.

Filed May 31, 1994, Ser. No. 250,982  
Int. Cl.<sup>6</sup> B32B 3/28; 3/30

U.S. Cl. 428—167

11 Claims



7. A glass fiber duct board comprising: a sheet of glass fiber duct board having a planar interior major surface, lateral edges and end edges; continuous, spaced-apart grooves cut into the interior major surface of the duct board and extending between the end edges of the duct board to facilitate the folding of the duct board along the grooves to form a duct; and the interior major surface, including surfaces of the grooves, being coated with a polymeric coating to encapsulate glass fibers and dust within the interior major surface of the duct board.

#### 5,567,505 MEANS AND METHOD OF APPLYING A PLASTIC FINISHING LAYER TO THE SURFACE OF A COMPOSITE ARTICLE; COATED COMPOSITE ARTICLE

Claude Debennau, Waterloo, and Serge Dupont, Vilvoorde, both of Belgium, assignors to Solvay (Société Anonyme), Brussels, Belgium

Filed Aug. 14, 1995, Ser. No. 515,065  
Claims priority, application Belgium, Aug. 16, 1994, 09400741; Dec. 27, 1994, 09401176

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—188

10 Claims

1. An installation for the manufacture and coating of a composite article, the composite article comprising an extruded solid body comprised of a plastic material, and at least one bundle of reinforcing fibers, the bundle being affixed to a surface of the body to reinforce the body, the body being coated by a finishing layer of plastic C, said installation comprising:  
means for manufacturing the composite article;  
an overextrusion device receiving the composite article from said means, for applying the finishing layer to the surface of the body; and  
a ring associated with said overextrusion device and exerting a completely uniformly distributed pressure on the finishing layer, said ring having an entry with an entry diameter, an exit with an exit diameter smaller than the entry diameter, and an internal passage connecting the entry with the exit, the inter-

nal passage having a diameter that progressively decreases from the entry to the exit.

#### 5,567,506 THERMAL TRANSFER RECORDING MEDIUM

Jun Sogabe, Osaka, Japan, assignor to Fujicopian Co., Ltd., Osaka, Japan

Filed Apr. 28, 1994, Ser. No. 234,533  
Claims priority, application Japan, Apr. 30, 1993, 5-104652  
Int. Cl.<sup>6</sup> B41M 5/40

U.S. Cl. 428—212

5 Claims

1. A thermal transfer recording medium comprising a foundation, a heat-meltable release layer provided on the foundation, and a heat-meltable colored ink layer provided on the release layer, the heat-meltable release layer comprising particles comprising a wax and having an average particle size of 1 to 6  $\mu\text{m}$ , the wax having a melting or softening point of 50° to 130° C. and a melt viscosity of not more than 1,000 cps at a temperature that is 30° C. higher than the melting or softening point of the wax, the coating amount of the particles being from 0.3 to 2.5  $\text{g}/\text{m}^2$ , the average particle size and the coating amount of the particles satisfying the relationship represented by formula (1):

$$0.28R \leq M \leq 0.83R \quad (1)$$

wherein R is the average particle size of the particles in terms of  $\mu\text{m}$ , and M is the coating amount of the particles in terms of  $\text{g}/\text{m}^2$ , said relationship resulting in clearances between the particles through which the heat-meltable ink layer reaches to adhere to the foundation.

#### 5,567,507 INK-RECEPTIVE SHEET

Armin J. Paff, Alan G. Miller, and Donald J. Williams, all of Austin, Tex., assignors to Minnesota Mining And Manufacturing Company, St. Paul, Minn.

Filed Feb. 28, 1995, Ser. No. 396,000  
Int. Cl.<sup>6</sup> B41M 5/00

U.S. Cl. 428—213

14 Claims

1. An ink-receptive sheet comprising a substrate bearing on at least one major surface an ink-receptive coating comprising at least two layers, an upper layer and a base layer, said upper layer being thinner than said base layer, wherein said upper layer comprises a high viscosity binder selected from the group consisting of methylcellulose, hydroxypropyl methylcellulose, and blends thereof, said binder having a viscosity of at least about 250 cps, wherein said upper layer also comprises at least one organic acid salt of polyethyleneimine.

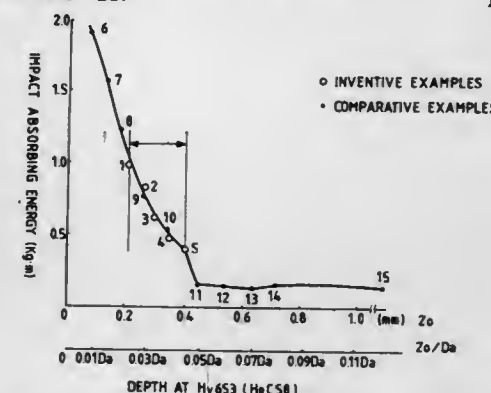
#### 5,567,508 ROLLING BEARING WITH SURFACE HARDENED LAYER

Yasuo Murakami, Kanagawa, Japan, assignor to NSK Ltd., Tokyo, Japan

Filed Aug. 14, 1995, Ser. No. 515,042  
Claims priority, application Japan, Aug. 12, 1994, 6-190574  
Int. Cl.<sup>6</sup> F16C 33/62

U.S. Cl. 428—217

1 Claim



1. In a rolling bearing with components comprising an inner race, an outer race and a plurality of rolling elements, one of the components being carburized or carbonitrided to form a hardened layer on a surface thereof,

the improvement wherein the hardened layer has a depth to a point  $Z_0$  which is 0.025 to 0.045 times an average diameter of the rolling elements and a depth ratio ( $Z_0/Y_0$ ) of the point  $Z_0$  to a point  $Y_0$  is equal to or less than 0.8, the point  $Z_0$  being a depth where hardness is  $H_R C 58$ , the point  $Y_0$  being a depth where hardness is  $H_R C 52.4$ .

#### 5,567,509 COMPOSITE MATERIAL LATTICE ELEMENTS

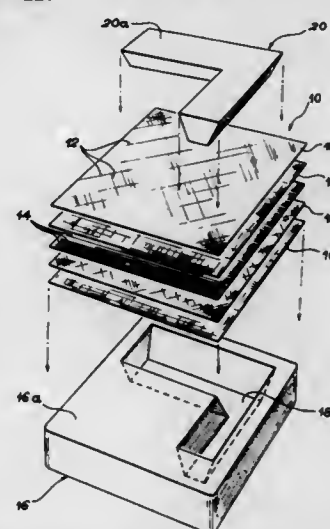
André Gautier, Rognes, France, assignor to Eurocopter France, France

Division of Ser. No. 161,318, Dec. 2, 1993, Pat. No. 5,431,870.  
This application Apr. 13, 1995, Ser. No. 421,070

Claims priority, application France, Dec. 17, 1992, 92 15235  
Int. Cl.<sup>6</sup> B32B 3/20

U.S. Cl. 428—227

3 Claims



1. A unitary composite material lattice, comprising a plurality of hollow bars interconnected by a plurality of hollow connecting joints to form a plurality of meshes between the hollow bars, wherein each of the hollow bars include end connecting portions of given cross-section, and the hollow connecting joints each have a cross-section which conforms to the cross-section of said hollow

bars, the end connecting portions of the hollow bars penetrating into said hollow connecting joints to form the meshes between said hollow bars;

the hollow bars and the hollow connecting joints are separately formed from fibers embedded in a thermoset resin matrix and interconnected by said thermoset resin matrix; and at least one of the meshes is sealed by a skin formed from fibers embedded in said thermoset resin matrix, said skin having edges connected by said thermoset resin matrix to the hollow bars and hollow connecting joints forming said at least one of the meshes.

#### 5,567,510 DISPERSIBLE COMPOSITIONS AND ARTICLES AND METHOD OF DISPOSAL FOR SUCH COMPOSITIONS AND ARTICLES

Gregg A. Patnode, Woodbury; John E. Bruno, Franconia Township, Chisago County; Denise R. Rutherford, Oakdale; Walter B. Sandison, St. Louis Park, all of Minn., and Dietmar Schlei, Hudson Township, St. Croix County, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 367,026, Dec. 30, 1994, Pat. No. 5,472,518. This application May 30, 1995, Ser. No. 452,795  
Int. Cl.<sup>6</sup> D04H 1/58

U.S. Cl. 428—288

2 Claims

1. An article comprising an aqueous-alkali dispersible microfiber, said microfiber comprising at least one hydrolytically degradable polymer and a water soluble polymer.

#### 5,567,511 NON-SHRINKABLE AND SHRINKABLE FOAMED POLYESTER FILM FOR THE LABELING OF PET CONTAINERS

Wayne K. Shih, Kingsport, Tenn., and Robert J. Turney, Hertfordshire, England, assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed Mar. 12, 1996, Ser. No. 615,003  
Int. Cl.<sup>6</sup> B32B 3/26; C08L 67/00

U.S. Cl. 428—314.8

7 Claims

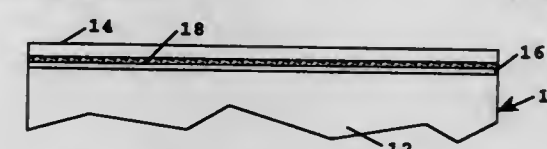
1. A label for containers comprising a foamed polyester film having a density of less than 1  $\text{g}/\text{cm}^3$  wherein said foamed polyester film may be blown away in air and then floated away in water during a recycle process for containers.

#### 5,567,512 THIN CARBON OVERCOAT AND METHOD OF ITS MAKING

Ga-Lane Chen, Fremont, and Hoa Do, Union City, both of Calif., assignors to HMT Technology Corporation, Fremont, Calif.

Filed Oct. 8, 1993, Ser. No. 134,216  
Int. Cl.<sup>6</sup> G11B 5/66; B32B 5/16; 9/00; C23C 14/00  
U.S. Cl. 428—332

5 Claims



1. In a thin-film medium having a substrate and a magnetic thin-film layer, a carbon overcoat which is formed on said layer by sputtering from a graphite target under an atmosphere consisting essentially of 60–80 atomic percent argon and 20–40 atomic percent nitrogen, said overcoat characterized by an erosion rate, as measured by rate of erosion of the overcoat by an  $\text{Al}_2\text{O}_3$  particle

tape placed in contact with the medium, that is several times less than that of a carbon overcoat having the same thickness, but formed by sputtering under a pure argon atmosphere.

# 5,567,513 INK-JET RECORDING PAPER, AND INK-JET RECORDING METHOD

Tatsuo Takeuchi; Yoshihiro Kuroyama, and Teruhisa Shimada, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan, and Nippon Paper Industries Co., Inc., Tokyo, Japan

Filed Jul. 12, 1994, Ser. No. 274,024

Claims priority, application Japan, Jul. 13, 1993, 5-195270; Jul. 13, 1993, 5-195271

Int. Cl.<sup>6</sup> B41M 5/00

U.S. Cl. 428—331

2 Claims

1. An ink-jet recording paper sheet for ink-jet recording with on-demand heads having a multi-nozzle, comprising a recording layer formed on one face of a base paper sheet said recording layer comprising a pigment and a binder, the pigment containing synthetic silica having a BET specific surface area ranging from 250 to 500 m<sup>2</sup>/g at a content of not less than 80% by weight of the pigment, the binder containing casein and styrene-butadiene rubber, the weight ratio of the pigment to the binder ranging from 1.8 to 2.4, the recording layer having coating solids in an amount ranging from 15 to 25 g/m<sup>2</sup>, and surface roughness by ten-point-height of the recording layer ranging from 0.5 to 5 μm.

# 5,567,514 PACKAGING CODING SYSTEM AND METHOD FOR EMPLOYING SAME

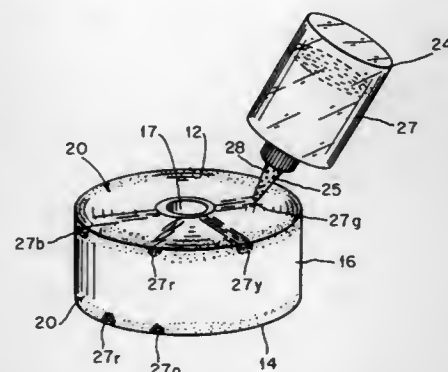
Peter N. Gold, 465 N. Wood Rd., Rockville Centre, N.Y. 11570

Filed Aug. 28, 1995, Ser. No. 520,271

Int. Cl.<sup>6</sup> B32B 7/12; G01B 3/10

U.S. Cl. 428—350

12 Claims



1. A packaging coding system, comprising:

at least one roll of moisture-activated adhesive tape with a top side and an underside and two lateral edges, and including a layer of moisture-activated adhesive applied to the underside of the tape, said tape having oil absorbed into both lateral edges to provide flexibility, waterproofing, and a vapor barrier to prevent activation of said adhesive when said tape is rolled up and inked; and

at least one colored ink applied to at least one edge of said tape so that it bleeds onto said top side of said tape in a predetermined discrete position which serves to code said tape.

# 5,567,515 SURFACE PROTECTIVE FILMS Hitoshi Koga; Masao Kameyama; Kazuo Iwata, and Masahiro Gonda, all of Yamaguchi, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan Filed Dec. 28, 1994, Ser. No. 365,540 Claims priority, application Japan, Dec. 28, 1993, 5-336419 Int. Cl.<sup>6</sup> B32B 7/12; 27/08

U.S. Cl. 428—355

17 Claims

1. A surface protective film comprising:

(1) a base layer consisting of one or more sublayers; and  
(2) an adhesive layer disposed on an underside of said base layer, comprising an α-olefin copolymer of at least two α-olefins selected from among α-olefins having 3–12 carbon atoms, and having a crystallinity of up to 10%; wherein said adhesive layer develops an initial tack of at least 20 g/25 mm when said surface protective film is attached to the surface of a stainless steel plate at 23° C., and exhibits an adhesive strength of no more than 1,000 g/25mm after a period of time of heating under pressure.

# 5,567,516 TEXTILE SILICA SLIVER, ITS MANUFACTURE AND USE

Hans-Dieter Achtsnit, Am Sonnenberg 17, D-63820 Elsenfeld-Eichelsbach, Germany

PCT No. PCT/DE93/00862, § 371 Date May 10, 1995, § 102(e) Date May 10, 1995, PCT Pub. No. WO94/12441, PCT Pub. Date Jun. 9, 1994

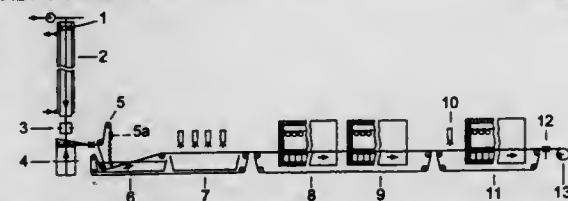
PCT Filed Sep. 15, 1993, Ser. No. 433,435

Claims priority, application Germany, Dec. 1, 1992, 42 40 354.5

Int. Cl.<sup>6</sup> D02G 3/00

U.S. Cl. 428—357

11 Claims



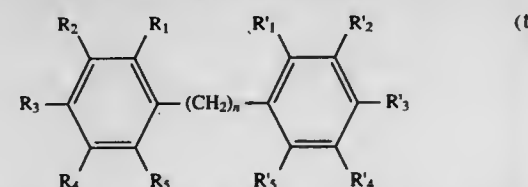
1. A textile silica sliver consisting of silica staple fibers 50–1000 mm long, the single fibers having a breaking tenacity of 20–50 cN/tex and the textile silica sliver having, at a linear density of 50–2000 tex according to type, a maximum drawing force of 2 to 20N.

# 5,567,517 FLAME-RETARDANT FIBER AND NONWOVEN FABRIC Yuji Nakajima, and Masahiko Taniguchi, both of Moriyama, Japan, assignors to Chisso Corporation, Osaka, Japan Filed Jun. 28, 1995, Ser. No. 496,226 Claims priority, application Japan, Jul. 8, 1994, 6-180633 Int. Cl.<sup>6</sup> D02G 3/00

U.S. Cl. 428—364

3 Claims

1. A flame-retardant fiber comprising a mixtures of a thermoplastic resin and 5 to 15% by weight of the fiber of a flame retardant having the following general formula (1):



where R1 to R5 and R'1 to R'5 are independently Br or Cl with the Br/Cl ratio lying in the range of 100% to 40%, and n is an integer of

2 to 16, and 2 to 8% by weight of the fiber of antimony oxide as a flame retardant promoter, obtained by mixing said resin, flame retardant and flame retardant promoter, to form a mixture, and then forming said mixture into a fiber.

# 5,567,518 CERAMIC COMPOSITE, PARTICULARLY FOR USE AT TEMPERATURES ABOVE 1400 DEGREES CELSIUS Lars Pejryd; Robert Lundberg, both of Trollhattan, Sweden, and Edwin Butler, Little Shrewley, Great Britain, assignors to Volvo Aero Corporation, Trollhattan, Sweden, and Rolls Royce PLC, Bristol, England PCT No. PCT/SE92/00297, § 371 Date Apr. 13, 1995, § 102(e) Date Apr. 23, 1995, PCT Pub. No. WO93/22258, PCT Pub. Date Nov. 11, 1993

PCT Filed May 7, 1992, Ser. No. 331,630

Int. Cl.<sup>6</sup> B32B 18/00

U.S. Cl. 428—378

5 Claims

1. A ceramic composite material comprising matrix material, reinforcing fibers and an intermediate interface material, wherein said matrix material and reinforcing fibers consists of the same or different ceramic oxides having a melting point above 1600° C.; said interface material being applied as a coating on said fibers and consisting of at least one ceramic oxide not exhibiting solid solubility, eutecticum below the temperature of manufacture or use or reactivity with any of said matrix or reinforcing materials; said matrix and reinforcing materials being substantially pure, and wherein the combination fiber/interface material/matrix material, respectively, is selected from the group consisting of:

Al <sub>2</sub> O <sub>3</sub> /Al <sub>2</sub> TiO <sub>3</sub> /Al <sub>2</sub> O <sub>3</sub> ,	YAG/Al <sub>2</sub> TiO <sub>3</sub> /Al <sub>2</sub> O <sub>3</sub> ,
Al <sub>2</sub> O <sub>3</sub> /YAG/Al <sub>2</sub> O <sub>3</sub> ,	Al <sub>2</sub> O <sub>3</sub> /SnO <sub>2</sub> /Al <sub>2</sub> O <sub>3</sub> ,
YAG/SnO <sub>2</sub> /Al <sub>2</sub> O <sub>3</sub> ,	Al <sub>2</sub> O <sub>3</sub> /mullite/Al <sub>2</sub> O <sub>3</sub> ,

# 5,567,519 COMPOSITION FOR USE IN DRY PRODUCTS Clement P. Stoney, III, Bel Air; James W. Stendera, Baltimore, both of Md., and Keith Bridger, Washington, D.C., assignors to Martin Marietta Magnesia Specialties, Inc., Raleigh, N.C. Filed Aug. 6, 1993, Ser. No. 102,937 Int. Cl.<sup>6</sup> B32B 5/16

U.S. Cl. 428—402

8 Claims

1. A compactible refractory product comprising: first refractory aggregate particles substantially coated with 0.05 to 1.5% by weight, of a lubricating organic compound comprising a polar head and a hydrocarbon chain of at least 12 carbon atoms admixed with an uncoated coarser second refractory aggregate, said refractory product being free-flowing and at least 50% of the coated first refractory aggregate particles being able to pass through a 100 mesh screen.

# 5,567,520 COMMUNUTED STYRENE ACRYLONITRILE (SAN) FOR USE AS AN ANTI-SLIP OR ABRASIVE GRIT, TEXTURIZER, AND FILLER, AND METHOD OF MAKING THE SAME

Edwin F. Neckermann, Kalamazoo, Mich., assignor to American Fillers & Abrasives, Corp. of Michigan/Co., Inc., Bangor, Mich.

Division of Ser. No. 916,171, Jul. 17, 1992, Pat. No. 5,367,024. This application Nov. 22, 1994, Ser. No. 343,722

Int. Cl.<sup>6</sup> B32B 5/16

U.S. Cl. 428—402

8 Claims

1. A liquid coating material for producing an anti-slip texturized coating, said coating material comprising

a mixture of epoxy resin, amine hardener, and comminuted styrene acrylonitrile co-polymer grit, said grit having a particle size sufficiently large to produce a texturized anti-slip coating.

# 5,567,521 POWDER COATING Kiyoshi Nishida; Tsutomu Sugiyama; Katsuro Funato, and Kenzi Hattori, all of Shizuoka, Japan, assignors to Tomoe-gawa Paper Co., Ltd., Tokyo, Japan Continuation-in-part of Ser. No. 426,609, Apr. 21, 1995, Pat. No. 5,498,479. This application Jan. 29, 1996, Ser. No. 593,274 Claims priority, application Japan, Apr. 22, 1994, 6-107949; Apr. 6, 1995, 7-106994

Int. Cl.<sup>6</sup> B32B 5/16

U.S. Cl. 428—403

7 Claims

1. A powder coating, comprising:  
a particulate material made of at least a binder resin and a hardener, said particulate material having a particle distribution satisfying the following requirements:  
(a) a volume 50% diameter is from 7 μm to 20 μm;  
(b) the proportion by volume of particles having a particle diameter of not less than 30 μm in the particulate material is not more than 20%; and  
(c) the proportion by population of particles having a particle diameter of not more than 5 μm in the particulate material is not more than 65%, and  
an external additive attached to a surface of the particulate material, such that the external additive provides a percent coverage X of from 30% to 200%; wherein the percent coverage X is defined as:

$$X = \frac{dt}{da} \cdot \frac{\rho_t}{\rho_a} \cdot W[\%]$$

wherein dt represents a population 50% diameter of the particulate material; da represents an average primary particle diameter of the external additive; ρ<sub>t</sub> represents a true specific gravity of the particulate material; ρ<sub>a</sub> represents a true specific gravity of the external additive; and W represents a percent proportion by weight of the external additive to the sum of the weight of the particulate material and the external additive.

# 5,567,522 DIAMOND CUTTING TOOL AND METHOD OF MANUFACTURING THE SAME

Keiichi Tanabe; Akihiko Ikegaya; Toshiya Takahashi, and Naoki Fujimori, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

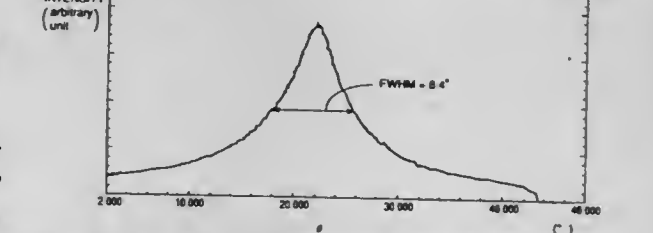
Continuation-in-part of Ser. No. 28,324, Mar. 9, 1993, abandoned. This application Oct. 5, 1994, Ser. No. 318,188

Claims priority, application Japan, Mar. 10, 1992, 4-51823

Int. Cl.<sup>6</sup> B24D 3/00

U.S. Cl. 428—408

9 Claims



1. A diamond cutting tool, comprising a tool substrate, a cutting edge member consisting essentially of a vapor-deposited polycrystalline diamond material including a plurality of crystal grains, and an intermediate layer forming a brazed bond between said cutting edge member and said tool substrate, wherein said intermediate



layer consists essentially of at least one material selected from the group consisting of metals included in groups IVa, IVb, Va, Vb, VIa, VIb, VIIa and VIIb of the periodic table and compounds thereof, wherein a principal diamond crystal plane forming a rake face of said cutting edge member is defined by respective (111) planes of said crystal grains, and wherein said respective (111) planes are non-uniformly oriented and have a fluctuation in orientation represented by an FWHM value of a rocking curve with respect to said (111) planes as determined by X-ray diffractometry of said rake face being in a range from about 2° to about 20°.

5,567,523

# MAGNETIC RECORDING MEDIUM COMPRISING A CARBON SUBSTRATE, A SILICON OR ALUMINUM NITRIDE SUB LAYER, AND A BARIUM HEXAFERRITE MAGNETIC LAYER

Stephen S. Rosenblum, Palo Alto; Jinshan Li, Newark, and Hidetaka Hayashi, Saratoga, all of Calif., assignors to Kobe Steel Research Laboratories, USA, Applied Electronics Center, Palo Alto, Calif.

Filed Oct. 19, 1994, Ser. No. 325,069  
Int. Cl.<sup>6</sup> G11B 5/66

U.S. Cl. 428—408

8 Claims

1. A magnetic recording medium, comprising: a carbon substrate;
- a magnetic recording layer of the formula  $\text{BaFe}_{12}\text{O}_{19}$  or  $\text{Ba}(\text{M}^1\text{M}^2)\text{Fe}_{12-2x}\text{O}_{19}$ , wherein  $0 < x < 4$ , and either:
  - (i)  $\text{M}^1$  and  $\text{M}^2$  are the same and are selected from the group consisting of Al, Ga and Cr, or
  - (ii)  $\text{M}^1$  is selected from the group consisting of Co, Zn, Cu, Ni and combinations thereof, and  $\text{M}^2$  is selected from the group consisting of Ti, Ir, Ge, Sn, Zr, V, Nb, Ta, Mo, Si and combinations thereof; and
- a first interlayer therebetween selected from the group consisting of silicon and aluminum nitride.

5,567,524

# MAGNETIC RECORDING MEDIUM HAVING A COBALT THIN FILM MAGNETIC LAYER, CARBON PROTECTIVE LAYER, AND FLUOROLUBRICANT LAYER

Toshio Ishida; Masaki Satake; Hideomi Watanabe; Tadashi Yasunaga, and Tsutomu Okita, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 27, 1995, Ser. No. 379,931

Claims priority, application Japan, Jan. 31, 1994, 6-009378

Int. Cl.<sup>6</sup> G11B 5/72

U.S. Cl. 428—408

8 Claims

1. A magnetic recording medium having a ferromagnetic metal thin film formed over at least one surface of a non-magnetic support, wherein the ferromagnetic metal thin film is formed from columnar grains of a material consisting essentially of cobalt which have a diameter less than 36 nm, and a carbon protective film is formed on said ferromagnetic metal thin film, said magnetic recording medium further comprising a lubricant layer consisting essentially of at least one of fluoroalkyl carboxylic acid esters containing an unsaturated bond-containing hydrocarbon chain, which are represented by one of the following formulae (1) to (3):



where Rf:  $(\text{CF}_3)_a\text{CF}_2(\text{CF}_2)_b$

a: 1 to 3 a+b: 1 to 17

$\text{R}^1$  is an alkyl group having from 2 to 18 carbon atoms, or a hydrocarbon group having from 2 to 18 carbon atoms and containing at least one double or triple bond;

$\text{R}^2$  is an alkyl group having from 4 to 22 carbon atoms, or a hydrocarbon group having from 4 to 22 carbon atoms and containing at least one double or triple bond;

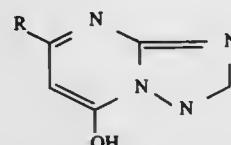
at least either one of  $\text{R}^1$  and  $\text{R}^2$  contains at least one double or triple bond;

$\text{R}^3$  is an alkyl group having from 3 to 21 carbon atoms, and  $\text{R}^4$

is a hydrocarbon group having from 4 to 18 carbon atoms and containing at least one double or triple bond; and

$\text{R}^5$  and  $\text{R}^6$  are each an alkyl group having from 2 to 18 carbon atoms, or a hydrocarbon group having from 2 to 18 carbon atoms and containing at least one double or triple bond, at least either one of  $\text{R}^5$  and  $\text{R}^6$  containing at least one double or triple bond, and  $\text{R}^5$  and  $\text{R}^6$  having from 20 to 44 carbon atoms in total;

and wherein the lubricant layer further contains a rust preventive which is a tetrazinedene cyclic compound represented by the following formula:



where R is a hydrocarbon group selected from the group consisting of an alkyl group, an alkoxy group, and an alkylamide group.

5,567,525

# BRAZING OF DIAMOND FILM TO TUNGSTEN CARBIDE

Rakesh R. Kapoor, Shrewsbury; Bela G. Nagy, Acton, and Louis K. Bigelow, Boylston, all of Mass., assignors to Saint-Gobain/Norton Industrial Ceramics Corporation, Worcester, Mass.

Division of Ser. No. 283,311, Jul. 29, 1994. This application  
Jun. 1, 1995, Ser. No. 458,002

Int. Cl.<sup>6</sup> B24D 11/00

U.S. Cl. 428—408

10 Claims

1. A diamond film substantially covered with a layer of a braze comprising vanadium.

5,567,526

# CEMENTED TUNGSTEN CARBIDE SUBSTRATES HAVING ADHERENT DIAMOND FILMS COATED THEREON

Michael G. Peters, and Robert H. Cummings, both of Santa Clara, Calif., assignors to National Center for Manufacturing Sciences, Ann Arbor, Mich.

Continuation of Ser. No. 35,359, Mar. 22, 1993, abandoned, which is a division of Ser. No. 693,234, Apr. 26, 1991, Pat. No. 5,236,740. This application Oct. 11, 1995, Ser. No. 542,200

Int. Cl.<sup>6</sup> B32B 15/04

U.S. Cl. 428—408

1 Claim

1. A tool comprising an unpolished cemented tungsten carbide substrate containing between about 3-6% cobalt, coated with a substantially continuous film consisting essentially of diamond, said substantially continuous film having a polycrystalline structure and a thickness greater than 10 microns, said tool characterized by a failure mechanism whereby said diamond film wears rather than delaminates.

5,567,527

# COPOLYMERS CONTAINING 1,3-DIOXOLANE-2-ONE-4-YL GROUPS AND COATINGS MADE THEREFROM

Dean C. Webster, Kingsport; Chih-Herng J. Su, deceased, late of Kingsport, and Charles H. Foster, Kingsport, all of Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

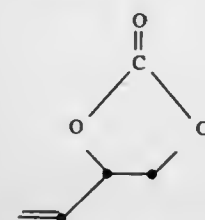
Filed Feb. 21, 1995, Ser. No. 395,392

Int. Cl.<sup>6</sup> C09D 137/00; 175/12; C08L 75/12; 37/00

U.S. Cl. 428—412

42 Claims

1. A method for forming a polyurethane coating on a substrate which comprises:
  - (i) applying to said substrate a coating composition which comprises
    - (a) a curable copolymer prepared by the free radical polymerization of from about 1 to 50 weight percent, based on the total weight of monomers, of a monomer compound of formula (I)



and one or more monoethylenically unsaturated monomers of a structure other than formula (I), and

(b) an amino-functional crosslinking agent having at least two amine groups

(ii) forming at least a substantially cross-linked polyurethane coating.

5,567,528

# POLYMER CONCRETE COATING FOR PIPE, TUBULAR SHAPES, OTHER METAL MEMBERS AND METAL STRUCTURES

Thomas J. Toerner, The Woodlands, and Bang T. Tran, Sugarland, both of Tex., assignors to Power Lone Star, Inc., Houston, Tex.

Continuation of Ser. No. 39,521, Mar. 29, 1993, Pat. No.

5,464,886, which is a continuation of Ser. No. 600,543, Oct.

19, 1990, abandoned. This application Jun. 6, 1995, Ser. No.

470,266

Int. Cl.<sup>6</sup> B32B 27/38

U.S. Cl. 428—414

8 Claims

1. A protective coating for metal members prepared by a process comprising the steps of:

heating a combination of a filler material and an organic resin, wherein the organic resin comprises about 60-75% by weight of a bisphenol A based epoxy and between about 25-40% by weight of a polyglycol diepoxide;

mixing the combination of the organic resin and the filler material, wherein the ratio by weight of said filler material to said organic resin is between about 1:1 and 7:3 with an amine, selected from a group consisting of aminoethylpiperazine and tetraethylenepentamine, to create a polymer concrete;

spraying the polymer concrete on a metal member; and protecting the sprayed polymer concrete from contact with other surfaces until it has polymerized.

5,567,529

# MULTILAYERED GLASS LAMINATE HAVING ENHANCED RESISTANCE TO PENETRATION BY HIGH VELOCITY PROJECTILES

Charles A. Smith, Vienna, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

PCT No. PCT/US91/08751, § 371 Date Nov. 15, 1994, § 102(e)  
Date Nov. 15, 1994, PCT Pub. No. WO93/10973, PCT Pub.

Date Jun. 10, 1993

PCT Filed Nov. 27, 1991, Ser. No. 244,191

Int. Cl.<sup>6</sup> B32B 17/10; 27/08

U.S. Cl. 428—425.6

3 Claims

1. A multilayered glass laminate having enhanced resistance to spalling and penetration by high velocity projectiles consisting of from three to seven plies of glass, each ply having a thickness from 3.175 to 635 mm, with layers of plasticized polyvinyl butyral resin therebetween, said laminate having permanently bonded to an outer layer of one of said plies of glass a thin composite consisting of an adhesive, energy absorbing layer and a dimensionally stable, chemical resistant polyester film, said composite having a thickness not greater than about 2 mm: said polyester film having a thickness of from about 0.762 to 0.381 mm and said adhesive layer having a thickness from about 0.381 to 1.524 mm.

5,567,530

# METHOD OF TREATMENT OF A PANE FOR THE BONDING OF A PERIPHERAL PROFILE

Frederic Drujon, Machemont; Gerard Dande, Villenave d'Ornon, and Cecile Gosse, Compeigne, all of France, assignors to Saint Gobain Vitrage International, Courbevoie, France

Filed Dec. 17, 1993, Ser. No. 168,193

Claims priority, application France, Dec. 18, 1992, 92 15292

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—429

38 Claims

36. A monolithic or laminated pane provided with a molded-on profile, comprising:
  - said pane;
  - said profile; and
  - a treating substance, between and in contact with, both said pane and said profile;
 wherein said treating substance comprises at least one silane and a composition capable of forming a film having free OH groups, and the composition comprises a polyol component and an isocyanate component, the polyol component being taken in excess relative to the isocyanate component.

5,567,531

# POLYMERS HAVING DECREASED SURFACE ENERGY

Eric S. Gardiner, Westtown, and John T. Geoghegan, Portcharter, both of N.Y., assignors to Arizona Chemical Company, Panama City, Fla.

Division of Ser. No. 126,382, Sep. 23, 1993, Pat. No. 5,473,002.  
This application Aug. 28, 1995, Ser. No. 519,990

Int. Cl.<sup>6</sup> B32B 27/00

U.S. Cl. 428—447

5 Claims

1. A release liner comprising a low surface energy polymeric film, either free standing or extrusion laminated, prepared from an intimate mix comprising:

from about 99.5% to about 95.0% of a polyolefin; and from about 0.5% to about 5.0% of an agent having the structure  $\text{R}^1-\text{A}-\text{Si}(\text{R}^2\text{R}^3)-\text{O}-[\text{Si}(\text{R}^4\text{R}^5)-\text{O}]_n-\text{Si}(\text{R}^6\text{R}^7)-\text{A}-\text{R}^8$  wherein  $\text{R}^1$  and  $\text{R}^8$  are selected from the group consisting of alkyl, aryl, and alkaryl derivatives of an aliphatic or aliphatic/aromatic alcohol or mono-acid with a molecular weight of between about 250 to about 600 daltons, A is selected from the group consisting of  $-\text{O}-$ ,  $-\text{NH}-\text{C}(\text{O})-$ ,  $\text{NH}(\text{CH}_2)_3-$  and  $-\text{C}(\text{O})-\text{NH}-(\text{CH}_2)_3-\text{O}-$ ,  $\text{R}^2$ ,  $\text{R}^3$ ,  $\text{R}^6$  and  $\text{R}^7$  are

selected from the group consisting of  $\text{CH}_3$ ,  $\text{C}_2\text{H}_5$ ,  $\text{C}_3\text{H}_7$ , and  $\text{C}_4\text{H}_9$ ,  $\text{R}^4$  and  $\text{R}^5$  are selected from the group consisting of  $\text{CH}_3$ ,  $\text{C}_2\text{H}_5$ ,  $\text{C}_3\text{H}_7$ , and  $(\text{CH}_2)_i-\text{CF}_{2+j-1}$ , wherein  $i$  is from 0 to 3 and  $j$  is from 1 to 3, and  $n$  is from 7 to 70.

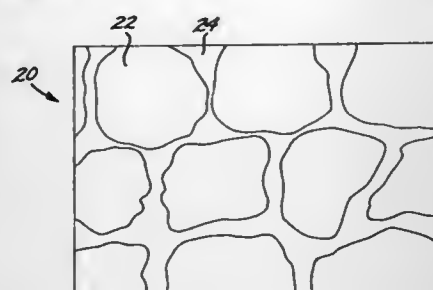
# 5,567,532 AMORPHOUS METAL/DIAMOND COMPOSITE MATERIAL

Atakan Peker, William L. Johnson, both of Pasadena, Calif.; Robert Schafer, Worthington, Ohio, and David M. Scruggs, Oceanside, Calif., assignors to Amorphous Alloys Corp., Laguna Niguel, Calif.

Filed Aug. 1, 1994, Ser. No. 284,153  
Int. Cl.<sup>6</sup> C22C 9/00

U.S. Cl. 428—457

13 Claims



1. A diamond-containing metal-matrix composite material prepared by the process comprising the steps of:  
providing at least one piece of diamond;  
providing a metal having a capability of retaining an amorphous state when cooled from its melt at a critical cooling rate of no more than about 500° C. per second;  
melting the metal and dispersing at least one piece of diamond throughout the melt to form a mixture; and  
solidifying the mixture at a cooling rate.

# 5,567,533 ANTIFOG FILM LAMINATES

Gloria G. Toney, Greer; Robert A. Young, Fountain Inn, and David V. Babb, Duncan, all of S.C., assignors to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed May 11, 1993, Ser. No. 60,394  
Int. Cl.<sup>6</sup> B32B 27/08; 27/06

U.S. Cl. 428—475.5

13 Claims



1. A laminate suitable for lidstock applications comprising:  
(a) a first substrate including:  
(i) a first layer comprising a blend of a polyolefin and an antifogging agent; and  
(ii) a bonding layer comprising polyolefin and having a corona-treated surface;  
(b) a second substrate bonded to the corona-treated surface of the bonding layer of the first substrate and comprising a polyester or nylon; and  
(c) an adhesive disposed between the first and second substrates; wherein the bond between the bonding layer of the first substrate, and the second substrate, has a bond strength of 2.8 lb/inch.

# 5,567,534 FOIL FOR A PRINTED CIRCUIT

Masami Yano, Kyoto, and Masato Takami, Uji, both of Japan, assignors to Fukuda Metal Foil and Powder Co., Ltd., Kyoto, Japan

Filed Apr. 7, 1995, Ser. No. 417,873

Claims priority, application Japan, Apr. 15, 1994, 6-077158  
Int. Cl.<sup>6</sup> B32B 15/20

U.S. Cl. 428—607 4 Claims  
1. A foil for printed circuits having excellent resin dust resistance comprising:  
a base layer composed of copper and having at least one shiny side surface,  
a first layer of a zinc alloy composed of zinc with nickel and/or cobalt, formed on said shiny side surface of said base layer,  
a second layer of mixture or compound of benzotriazole and phosphorus compound formed on said first layer, and said zinc alloy is composed of 0.5 to 15% by weight of nickel and/or cobalt, and the remainder of zinc.

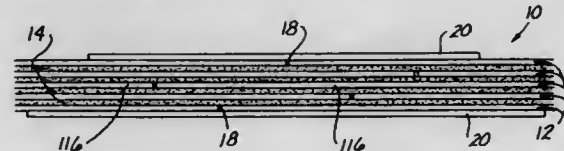
# 5,567,535 FIBER/METAL LAMINATE SPLICE

Richard G. Pettit, La Habra, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Continuation-in-part of Ser. No. 977,895, Nov. 18, 1992, abandoned. This application May 4, 1994, Ser. No. 238,143  
Int. Cl.<sup>6</sup> B23B 7/10

U.S. Cl. 428—608

11 Claims



1. A fiber/metal laminate structure comprising at least two metal plies and at least one fiber layer, said at least two metal plies each comprising at least two substantially crystalline metal sheets having sheet metal breaks therebetween, said structure further including at least one integral splice region therein for extending a dimension of the structure, a splice axis oriented in a direction generally transverse to the extension direction, said sheet metal breaks lying within said at least one integral splice region, the sheet metal breaks in each metal ply being staggered in the extension direction with respect to the sheet metal breaks in the remaining metal plies, said at least one fiber layer being continuous through said at least one integral splice region, wherein  $d_1$  is an overlap parameter defining the shortest linear distance along the extension direction of said structure between a first sheet metal break in one metal ply and a second sheet metal break in the adjacent metal ply, said overlap parameter  $d_1$  being about 10 to 150 times the thickness of said metal sheet.

# 5,567,536 INORGANIC CERAMIC PAPER, ITS METHOD OF MANUFACTURING AND ARTICLES PRODUCED THEREFROM

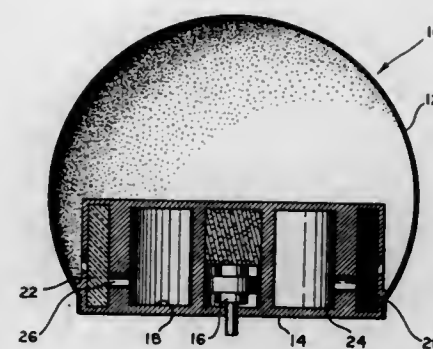
Timothy S. Lintz, Grand Island, and Ralph W. Paddock, Newfane, both of N.Y., assignors to Unifrax Corporation, Niagara Falls, N.Y.

Division of Ser. No. 156,378, Nov. 22, 1993, Pat. No. 5,419,975. This application Mar. 1, 1995, Ser. No. 397,765  
Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—688

8 Claims

1. A filter for use in an inflator unit of an automotive airbag comprising an inorganic ceramic paper including inorganic ceramic fibers and an inorganic binder of fibers consisting essentially of 100% silica, said inorganic ceramic paper being porous and free of all organic materials and having a tensile strength of at



least about 500 grams per inch wherein said fibers consisting essentially of 100% silica have an average length of about 1 to about 3 inches.

# 5,567,537 MAGNETIC CORE ELEMENT FOR ANTENNA, THIN-FILM ANTENNA, AND CARD EQUIPPED WITH THIN-FILM ANTENNA

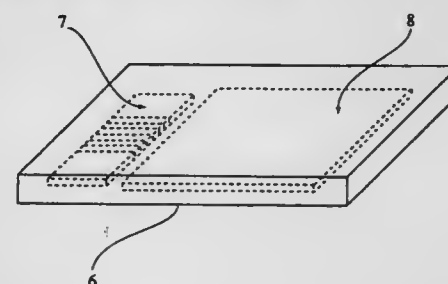
Yoshihito Yoshizawa, Fukaya, and Shunsuke Arakawa, Saitama-ken, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Apr. 11, 1995, Ser. No. 419,690

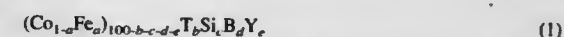
Claims priority, application Japan, Apr. 11, 1994, 6-072229  
Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—692

13 Claims



1. A magnetic core element in the form of an amorphous alloy strip of a thickness of 25  $\mu\text{m}$  or less having a chemical composition representation by:



where T is at least one element selected from the group consisting of Mn, Ni, Ti, Zr, Hf, Cr, Mo, Nb, W, Ta, Cu, Ru, Rh, Pd, Os, Ir, Pt, Re and Sn; Y is at least one element selected from the group consisting of C, Ge, Ga, P and Al; a is a numerical value satisfying  $0 \leq a \leq 0.1$ ; and b, c, d and e are atomic percentages each satisfying  $0 \leq b \leq 15$ ,  $0 \leq c \leq 20$ ,  $5 \leq d \leq 25$ ,  $0 \leq e \leq 20$  and  $15 \leq c+d \leq 30$ , said magnetic core element being provided with an induced magnetic anisotropy in the width direction or in the thickness direction of said magnetic core.

# 5,567,538 METAL-AIR CELL HAVING THIN-WALLED ANODE AND CATHODE CANS

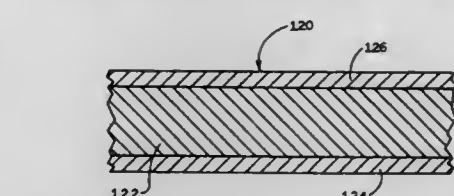
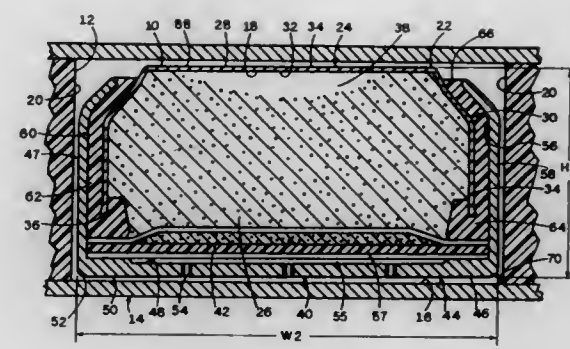
John E. Oltman, Mount Horeb; Robert B. Dopp, Madison, both of Wis., and John D. Burns, Durham, United Kingdom, assignors to Rayovac Corporation, Madison, Wis.

Filed May 5, 1995, Ser. No. 435,179  
Int. Cl.<sup>6</sup> H01M 12/06; 2/04

U.S. Cl. 429—27

89 Claims

1. A metal-air electrochemical cell, comprising:



(a) an anode, including an anode can, and a cavity in said anode can, and anode material in said cavity, including electrochemically reactive anode material;  
(b) a cathode, including a cathode can, and a cathode assembly in said cathode can; and  
(c) a seal between said anode can and said cathode can, said anode and said cathode being joined together, with said seal therebetween and, in combination, defining outer walls of said electrochemical cell, said outer walls defining an outer surface of said electrochemical cell, an interior of said electrochemical cell being disposed inwardly of said outer walls,  
said anode can comprising a structure having a first outer layer comprising an outer surface of said structure and corresponding, in part, with the outer surface of said electrochemical cell, a second inner layer disposed toward the interior of said electrochemical cell and comprising an inner surface of said structure, and a third layer disposed between said first and second layers, said third layer comprising about 77 percent by weight to about 91 percent by weight of said anode can and comprising stainless steel, said first and second layers, in combination, comprising about 9 percent by weight to about 23 percent by weight of said anode can, said first layer comprising nickel and said second layer comprising copper,  
said cathode can comprising a three-layer structure having a fourth core layer of cold rolled steel, plated on opposing surfaces with fifth and sixth layers of nickel, said fifth and sixth layers being diffusion bonded to said fourth layer, the three-layer structure having been annealed after diffusion bonding, and temper rolled after annealing, such that the three-layer structure is both work hardened, and tempered to about Temper 3.5.

# 5,567,539 NON-AQUEOUS SECONDARY CELL

Osamu Takahashi, and Mitsutoshi Tanaka, both of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

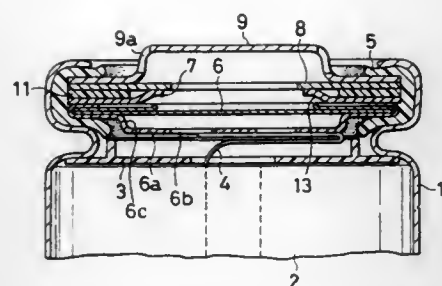
Filed May 19, 1995, Ser. No. 445,416

Claims priority, application Japan, May 23, 1994, 6-108287; Sep. 29, 1994, 6-235244

Int. Cl.<sup>6</sup> H01M 2/12

1. An enclosed non-aqueous secondary cell in which a group of electrodes comprising positive and negative electrodes allowing absorption and release of a light metal and separators are accommodated in a closed-end cell-armoring can together with a non-aqueous electrolyte and an opening of the armoring can is closed by an insulating gasket positioned around the inner periphery of





the opening of the can and a closing lid fitted in and supported by the gasket and simultaneously serving as a positive or negative terminal, wherein:

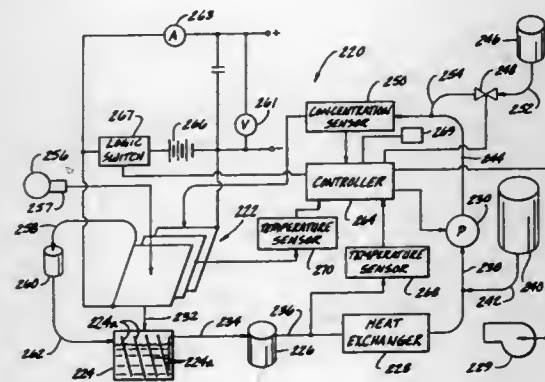
the closing lid comprises an explosion-proof valve capable of deforming towards the direction opposite to the group of electrodes in response to an increase in the internal pressure of the cell, a terminal cap provided with vent holes and arranged at the side of the explosion-proof valve opposed to the group of electrodes and a switch which is not reversible and which is positioned between the explosion-proof valve and the terminal cap and serves to shut-off the electrical connection between the terminal cap and the positive or negative electrode when the temperature of the cell is raised or the internal pressure of the cell is increased.

**5,567,540**  
**ELECTROCHEMICAL POWER GENERATING SYSTEM**  
Gordon R. Stone, O'Fallon, Ill.; Richard L. McGee, Chesterfield, Mo., and Douglas J. Amick, Ann Arbor, Mich., assignors to Voltek, Inc., Belleville, Ill.

Continuation of Ser. No. 81,662, Jun. 23, 1993, Pat. No. 5,439,758, which is a continuation-in-part of Ser. No. 955,583, Oct. 2, 1992, Pat. No. 5,415,949. This application Jun. 5, 1995, Ser. No. 464,382  
Int. Cl.<sup>6</sup> H01M 8/06; 8/24

U.S. Cl. 429—63

2 Claims



1. A method of controlling an electrochemical power generating system during start-up of the system, the system comprising at least one metal-air cell, an electrolyte reservoir, and electrolyte transport means including a pump for pumping electrolyte from the reservoir and moving it through the cell, the method comprising the steps of:

- turning the pump on for a first duration  $t_1$  and turning the pump off for a second duration  $t_2$ ;
- sensing the temperature of electrolyte in the cell;
- repeating steps (a) and (b) until the sensed temperature of the electrolyte in the cell is at least  $T_1$ , and then sensing the temperature of electrolyte in the electrolyte transport means.

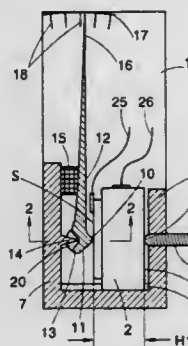
**5,567,541**  
**METHOD AND APPARATUS FOR MEASURING THE STATE OF CHARGE IN A BATTERY BASED ON VOLUME OF BATTERY COMPONENTS**  
S. Zia Rouhani, Idaho Falls, Id., assignor to Lockheed Idaho Technologies Company, Idaho Falls, Id.

Filed Mar. 21, 1995, Ser. No. 407,570

Int. Cl.<sup>6</sup> H01M 10/48

U.S. Cl. 429—93

16 Claims



1. Apparatus for determining the charge of a battery that generates electricity through a chemical reaction which takes place within the battery and changes the volume of reactive masses in the battery, wherein the battery includes an exterior casing, and wherein the changes in the volume of reactive masses in the battery cause a change in a physical parameter of the exterior case of the battery, comprising means for receiving the battery and for measuring a physical parameter of the exterior case of the battery that changes as the volume of the reactive masses in the battery changes, and means for relating the measured value of the parameter to the value of the parameter when the battery is fully charged and the value of the parameter when the battery is functionally discharged to thereby indicate the charge of the battery.

**5,567,542**  
**HOLDER OF RECHARGEABLE BATTERY CELLS AND RETAINER THEREOF FOR USE IN AN ELECTRIC VEHICLE**

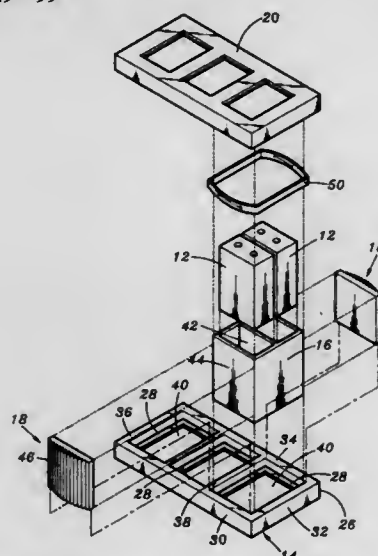
Do-In Bae, Kyungsangnam-Do, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea  
Filed Dec. 21, 1994, Ser. No. 360,638

Claims priority, application Rep. of Korea, Dec. 21, 1993, 93-28906; Dec. 21, 1993, 93-28907

Int. Cl.<sup>6</sup> H01M 2/10

U.S. Cl. 429—99

19 Claims



1. A holder for a plurality of battery cells, each battery cell having a plurality of electrodes and an electrolyte in a sealed

housing and having positive and negative terminals, said holder being adapted to transfer heat produced by operation of the battery cells to external surroundings, said holder comprising:

- a lower frame having a vertical rim and horizontal flanges extending inwardly from the bottom of the rim to define a receptacle;
- a plurality of casings each for individually receiving an entirety of the housing of at least one of the plurality of battery cells, a bottom portion of each of the casings being received in the receptacle of the lower frame;
- at least a pair of heat sink members attached to each of the casings, each of the heat sink members having a plurality of fins formed thereon; and
- an upper frame having a vertical rim and horizontal flanges extending inwardly from the top of the rim to contain and hold a top portion of each of the casings.

an elongated cathode positioned adjacent and in spaced-apart relation to the anode, the cathode including a second reagent and being connectable to the second terminal of the circuit; a separator positioned between the anode and the cathode which provides electrical insulation between the anode and the cathode yet permits an electrochemical reaction to occur involving the transfer of ions between the anode and cathode, the transfer of ions allowing electrical current to flow from the cathode through the circuit to the anode of the battery; wherein the anode, the separator, and the cathode form an elongated electrode stack; and wherein a plurality of elongated electrode stacks are connected together in a honeycomb structure.

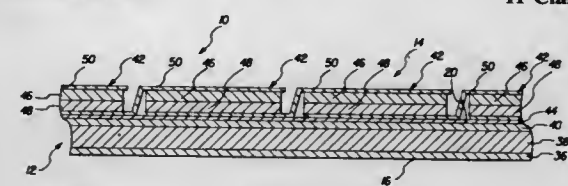
**5,567,543**  
**FILMSTRIP AND FLEXIBLE BATTERY UNIT**  
Douglas W. Constable, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 11, 1995, Ser. No. 439,331

Int. Cl.<sup>6</sup> H01M 6/12

U.S. Cl. 429—127

11 Claims



1. A film and battery unit comprising:
  - a filmstrip having a photosensitive side with successive imaging areas at which respective exposures are to be made and a non-photosensitive side; and
  - a thin, flat, flexible battery extending at least substantially along the non-photosensitive side of said filmstrip for providing electrical energy relating to making the exposures, whereby said filmstrip and said flexible battery can be coiled into a roll.

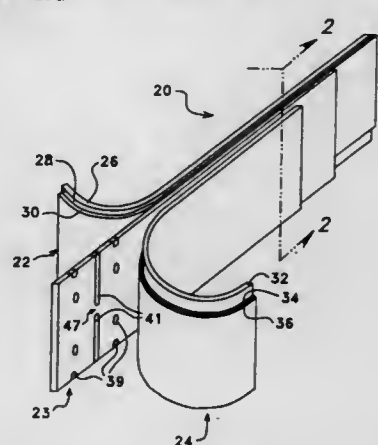
**5,567,544**  
**BATTERY**  
Philip C. Lyman, Boulder, Colo., assignor to Boundless Corp., Boulder, Colo.

Filed May 26, 1995, Ser. No. 452,423

Int. Cl.<sup>6</sup> H01M 6/46; 6/00

U.S. Cl. 429—152

30 Claims



1. A battery for supplying power to an electrical circuit having a first terminal and a second terminal, comprising:
  - an elongated anode including a first reagent, the anode being connectable to the first terminal of the circuit;

1. A battery housing device comprising:
  - a battery housing chamber having an opening and which houses a battery having an electrode;
  - a cover for closing the opening in the chamber, the cover comprising
    - an electrically conductive plate for electrically contacting one of the positive electrode and the negative electrode of a battery housed in the chamber, and
    - a spring plate secured to the cover and supporting the electrically conductive plate to be movable along a straight line path extending through the positive electrode and the negative electrode of the battery, to compensate for movement of the battery inside the chamber.

**5,567,546**  
**ION CONDUCTOR FOR ELECTROCHEMICAL CELLS**  
Martha Maly-Schreiber, and Josef Michel, both of Ulm, Germany, assignors to Daimler-Benz AG, Germany  
Filed Jun. 9, 1995, Ser. No. 489,292  
Claims priority, application Germany, Jun. 9, 1994, 44 20 095.1

Int. Cl.<sup>6</sup> H01M 6/04

U.S. Cl. 429—207

16 Claims

1. An ion conductor for an electrochemical cell comprising:
  - at least one constituent selected from the group consisting of alkali metal salts and mixtures thereof;

a polymer which is chemically stable with respect to constituents of the ion conductor and has at least one phosphazene base unit; and  
at least one inorganic constituent positioned at the phosphorus atom of the phosphazene base unit.

5,567,547

**SOLID, GLYME-CONTAINING CATHODE MATERIALS**  
Milton N. Golovin, 145 Manton Dr., San Jose, Calif. 95123;  
Dale R. Shackle, 17135 Oak Leaf Dr., Morgan Hill, Calif. 95037, and Russel D. Moulton, 6316 Felder Dr., San Jose, Calif. 95123

Division of Ser. No. 918,508, Jul. 22, 1992, abandoned. This application May 1, 1995, Ser. No. 432,909

Int. Cl.<sup>6</sup> H01M 4/62

U.S. Cl. 429—217

7 Claims

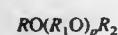
1. A cathodic paste which comprises:
  - (a) from about 35 to 65 weight percent of a compatible cathodic material;
  - (b) from about 1 to 20 weight percent an electroconductive agent;
  - (c) from about 0 to 20 weight percent of polyethylene oxide having a number average molecular weight of at least 100,000;
  - (d) from about 10 to 50 weight percent of solvent comprising a 10:1 to 1:10 mixture of:
    - (i) an organic aliphatic carbonate represented by the formulae:



and



where each  $R_{13}$  and  $R_{14}$  are independently selected from the group consisting of alkyl of from 1 to 4 carbon atoms,  $R_{15}$  is an alkylene group of from 2 to 4 carbon atoms,  $n$  is an integer of from 1 to 2, and  $q$  is an integer from 1 to 4; and  
(ii) a glyme of Formula I:



where  $R$  and  $R_2$  are  $—CH_3$ ,  $R_1$  is  $—(CH_2CH_2)—$ , and  $p$  is an integer of from 2 to 6; and

- (e) from at least about 5 weight percent to about 30 weight percent of a solid matrix forming monomer or partial polymer thereof wherein all weight percents are based on the total weight of the cathode paste.

5,567,548

**LITHIUM ION BATTERY WITH LITHIUM VANADIUM PENTOXIDE POSITIVE ELECTRODE**

Charles R. Walk, Herndon, and Nehemiah Margalit, Burke, both of Va., assignors to Tracor Applied Sciences, Inc., Rockville, Md.

Continuation-in-part of Ser. No. 420,294, Apr. 11, 1995, Pat. No. 5,496,663, and a continuation-in-part of Ser. No. 292,427, Aug. 19, 1994, abandoned. This application Feb. 12, 1996, Ser. No. 600,206

Int. Cl.<sup>6</sup> H01M 4/02; 4/36

U.S. Cl. 429—218

14 Claims

1. A lithium ion battery comprising:
  - a lithium free negative electrode, a non-aqueous solvent and a positive electrode including delta  $LiV_2O_5$  admixed with a conductive material, said negative electrode being substantially free of lithium ions when substantially one mole of lithium ions per mole of  $V_2O_5$  is in said positive electrode.

5,567,549

**NICKEL METAL HYDRIDE BATTERY CONTAINING A MODIFIED DISORDERED MULTIPHASE NICKEL ALUMINUM BASED POSITIVE ELECTRODE**

Stanford R. Ovshinsky, Bloomfield Hills, and Rosa T. Young, Troy, both of Mich., assignors to Ovonic Battery Company, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 27,973, Mar. 8, 1993, Pat. No. 5,348,822, which is a continuation-in-part of Ser. No. 975,031, Nov. 12, 1992, Pat. No. 5,344,728. This application Sep. 19, 1994, Ser. No. 308,764

Int. Cl.<sup>6</sup> H01M 4/32; 4/28

U.S. Cl. 429—223

17 Claims

1. A disorder positive electrode for use in an alkaline rechargeable electrochemical cell comprising:

- a bulk modified nickel aluminum hydroxide material that comprises:
  - a stable multiphased  $\alpha$ -phase material where at least one phase of said stable multiphased material comprises a structure chosen from the group consisting of amorphous, microcrystalline, and polycrystalline.

5,567,550

**METHOD OF MAKING A MASK FOR MAKING INTEGRATED CIRCUITS**

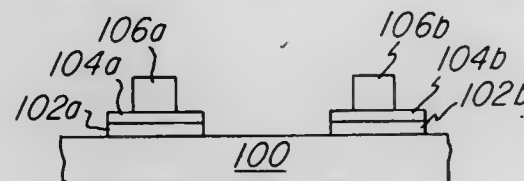
Michael C. Smayling, Missouri City, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 25, 1993, Ser. No. 37,050

Int. Cl.<sup>6</sup> G03F 9/00

U.S. Cl. 430—5

23 Claims



1. A method of forming a mask comprising the steps of:
  - providing a substrate which is substantially transparent to a selected radiation;
  - forming a transmission layer over said substrate;
  - forming an intervening layer over said transmission layer;
  - forming an opaque layer over said intervening layer;
  - forming a plurality of opaque regions by patterning and etching said opaque layer, said step further exposing an exposed portion of said intervening layer, said opaque regions substantially opaque to said selected radiation; and
  - forming a plurality of transmissive regions and forming a plurality of transparent regions by patterning and etching said exposed portion of said intervening layer and underlying transmission layer, said transmissive regions for transmitting a portion of said selected radiation and said transparent regions being substantially transparent to said selected radiation.

5,567,551

**METHOD FOR PREPARATION OF MASK FOR ION BEAM LITHOGRAPHY**

Joseph Yahalom, Haifa, Israel, and Martin Peckerar, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

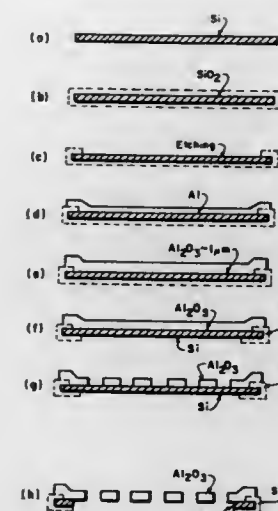
Filed Apr. 4, 1994, Ser. No. 222,791

Int. Cl.<sup>6</sup> G03F 9/00

U.S. Cl. 430—5

21 Claims

1. A method for obtaining a mask for ion beam lithography comprising the steps of:
  - coating a front side, sidewalls, and a backside of a substrate with an insulating layer;



- opening, on the front side of the substrate, a window in the insulating layer to expose a front substrate surface;
- depositing an oxide membrane on the front substrate surface;
- opening a portion of the insulating material on the backside of the substrate to form an exposed backside of the substrate;
- forming a photoresist layer on said oxide membrane;
- patterning said photoresist layer;
- ion beam etching said oxide membrane through said patterned photoresist layer to completely remove selected portions of said oxide membrane, thereby forming a stenciled pattern in said oxide membrane;
- removing said patterned photoresist layer from said stenciled oxide membrane;
- removing, from the backside of the substrate, the exposed backside of the substrate to expose a backside of said stenciled pattern in said oxide membrane, thus leaving a stenciled oxide membrane, corresponding to said stenciled oxide pattern, held within a frame formed by remaining portions of said substrate, said stenciled oxide membrane being capable of being supported entirely by said frame.

5,567,552

**METHOD FOR FABRICATING A PHASE SHIFT MASK**  
Young Mok Ham, Seoul, Rep. of Korea, assignor to Hyundai Electronics Industries, Kyungki-do, Rep. of Korea

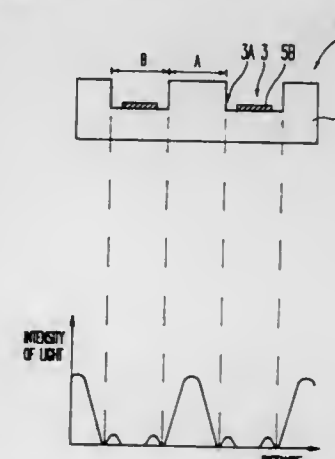
Filed Mar. 9, 1995, Ser. No. 401,223

Claims priority, application Rep. of Korea, Mar. 11, 1994, 94-4785

Int. Cl.<sup>6</sup> G03F 9/00

U.S. Cl. 430—5

4 Claims



1. A method for fabricating a phase shift mask, comprising:

- separating a light transparent portion and a light shielding portion on a quartz substrate;
- forming an etching groove having side walls in said light shielding portion; and
- forming a chrome region on a bottom surface of said etching groove in a location such that openings are formed between said chrome region and said side walls.

5,567,553

**METHOD TO SUPPRESS SUBTHRESHOLD LEAKAGE DUE TO SHARP ISOLATION CORNERS IN SUBMICRON FET STRUCTURES**

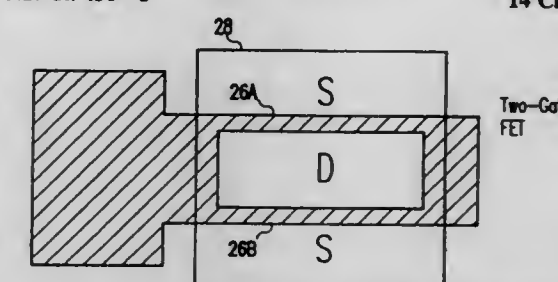
Louis L. Hsu, Chang-Ming Hsieh, both of Fishkill, and Lyndon R. Logan, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 274,055, Jul. 12, 1994. This application May 18, 1995, Ser. No. 447,571

Int. Cl.<sup>6</sup> G03F 9/00

U.S. Cl. 430—5

14 Claims



1. A method of fabricating a mask used in manufacturing an FET device isolated by shallow trench isolation having a channel width between first and second shallow trenches at first and second shallow trench edges, in which a gate extends across said channel width between said first and second shallow trenches, said gate having both a first length at said shallow trench edges and a second length less than said first length between said shallow trench edges, said method comprising the steps of:
  - forming two opaque stripes on a transparent substrate, said opaque stripes being positioned so that their shadows will overlie said shallow trench edges;
  - depositing a transparent film over the transparent substrate having the opaque stripes deposited thereon;
  - forming phase shift patterns in the transparent film, said phase shift pattern extending over portions of said opaque stripes and a region of said transparent substrate; and
  - using the phase shift patterns as a mask to trim exposed portions of said opaque stripes on the transparent substrate.

5,567,554

**MASK FOR PRODUCING RADOMES TO HIGH PRECISION**

David G. Jensen, Auburn, and Daniel R. Tichenor, Kent, both of Wash., assignors to The Boeing Company, Seattle, Wash. Division of Ser. No. 315,993, Sep. 30, 1994, which is a division of Ser. No. 978,322, Nov. 18, 1992, Pat. No. 5,395,718. This application Jun. 5, 1995, Ser. No. 461,923

Int. Cl.<sup>6</sup> G03F 9/00

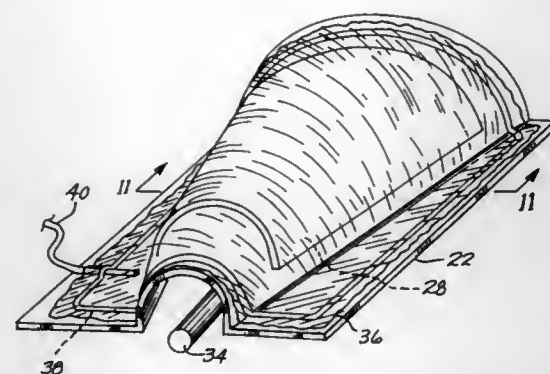
U.S. Cl. 430—5

16 Claims

1. A mask made in accordance with the process comprising the steps of:

- (a) forming, from a material transparent to electromagnetic radiation within a range of frequencies, a substrate having a complexly curved surface;
- (b) applying to the substrate a layer of material that is opaque to the radiation;
- (c) using essentially parallel electromagnetic radiation to define on the surface temporary areas and permanent areas of the layer; and





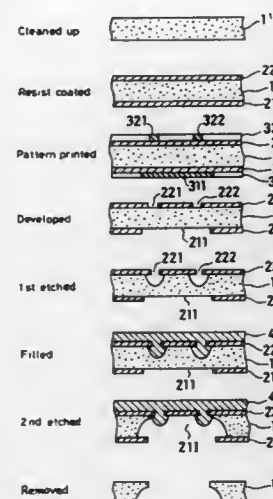
(d) removing the temporary areas of the layer while leaving the permanent areas on the surface to define a pattern.

**5,567,555**  
**METHOD FOR MANUFACTURING SHADOW MASK**  
**AND SHADOW MASK MANUFACTURED BY SAID**  
**METHOD**

Osamu Nakamura, and Takeshi Ikegami, both of Tokyo, Japan, assignors to Dai Nippon Printing Co., Ltd., Tokyo, Japan

Division of Ser. No. 908,194, Jul. 1, 1992, Pat. No. 5,348,825.  
 This application Mar. 29, 1994, Ser. No. 221,058  
 Claims priority, application Japan, Jul. 2, 1991, 3-161578;  
 Jul. 19, 1991, 3-179108

U.S. Cl. 430—29 Int. Cl.<sup>6</sup> G03C 5/00 4 Claims



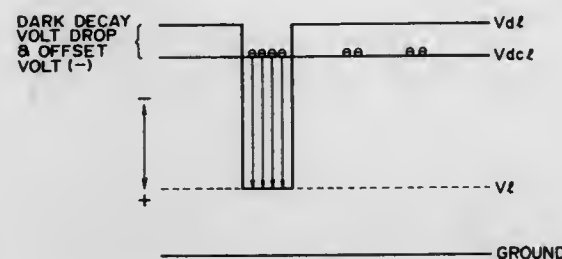
1. A method for manufacturing a shadow mask, whereby a through-hole is formed on a steel plate of 20–80 μm in thickness and is dimensionally larger than the thickness of the plate, characterized in that resist layers are coated on front and rear sides of the steel plate, an opening of relatively large size matching the shape of the through-hole to be formed is patterned on the resist layer of the coated front side, and an opening of relatively small size which has two openings on at least one cross-section matching edge shape of the through-hole to be formed is patterned on the resist layer on the coated rear side, etching is performed to a partial depth of the steel plate from the rear side through the opening of the rear side resist layer, a packing material with anti-etching property is filled into the etched hole, etching is performed on the steel plate from the front side through the front side resist layer to form a hole communicating with the etched hole as formed on the rear side, and the packing material and resist layers are then removed to thus form the through-hole.

**5,567,556**  
**ELECTROPHOTOGRAPHIC PROCESS AND APPARATUS**  
**SIMULTANEOUSLY EFFECTING IMAGE EXPOSURE**  
**AND DEVELOPING STEPS TO OPPOSITES SIDES OF**  
**PHOTOSENSITIVE MEMBER**

Hideyuki Yano, Junji Araya, and Osamu Iwasaki, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 10, 1994, Ser. No. 258,495  
 Claims priority, application Japan, Jun. 11, 1993, 5-140685  
 Int. Cl.<sup>6</sup> G03G 15/00

U.S. Cl. 430—55 20 Claims



1. An electrophotographic process in which an image exposing step and a developing step are carried out at the same position on opposite sides of a photosensitive member, comprising:  
 preparing an electrophotographic photosensitive member having a conductive base layer transmitting light and a photosensitive layer thereon;  
 exposing the conductive base side of the photosensitive member to light information;  
 rubbing an opposite side of said photosensitive member with a developer supplied with a developing bias voltage of the same polarity as the polarity of the developer in a region including an upstream side and a downstream side of an image exposure region of said photosensitive member;  
 wherein an absolute value of a sum of a triboelectric charge potential provided on a surface of said photosensitive member by rubbing between the developer and the photosensitive member and a surface potential of the photosensitive member provided by application of the developing bias upstream of the image exposure region, is larger than an absolute value of the developing bias of the image exposure region.

**5,567,557**  
**ELECTROPHOTOGRAPHIC PHOTORECEPTOR**

Nobuyoshi Mori, Nagano, Japan, assignor to Fujitsu Electric Co., Kawasaki, Japan

Filed Feb. 23, 1995, Ser. No. 393,411  
 Claims priority, application Japan, Feb. 23, 1994, 6-024634  
 Int. Cl.<sup>6</sup> G03G 5/147

U.S. Cl. 430—58 9 Claims

1. A negative-charge electrophotographic photoreceptor comprising:  
 a conductive substrate;  
 an intermediate layer on said conductive substrate;  
 a photosensitive bilayer of an organic material on said intermediate layer;  
 said photosensitive bilayer includes a charge generation layer and a charge transport layer;  
 said charge generation layer being deposited on said intermediate layer;  
 said charge transport layer being deposited on said charge generation layer;  
 said charge transport layer being an outermost layer of said photosensitive bilayer; and  
 said charge transport layer contains an ester phosphite antioxidant and a hindered phenol antioxidant.

**5,567,558**  
**IMAGING MEMBER WITH HYDROXYGALLIUM**  
**PHTHALOCYANINE TYPE A,B,C OR D**

Cheng-Kuo Hsiao; Ah-Mee Hor, both of Mississauga; Sandra J. Gardner, Willowdale; Roger E. Gaynor, Oakville, and Jacques Poitras, L'Assomption, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 30, 1995, Ser. No. 413,554  
 Int. Cl.<sup>6</sup> G03G 5/047;5/06

U.S. Cl. 430—58 8 Claims

1. A layered photoconductive imaging member comprised of a supporting substrate, a photogenerating layer, and a charge transport layer; and wherein the photogenerating layer consists essentially of hydroxygallium phthalocyanine Type A, B, C, or Type D, and which hydroxygallium phthalocyanine is obtained by contacting Type V hydroxygallium phthalocyanine with an aliphatic alcohol for about 10 or more.

**5,567,559**  
**ELECTROPHOTOGRAPHIC PHOTORECEPTORS**  
**CONTAINING TITANYL PHTHALOCYANINE**  
**PROCESSED THROUGH AMMONIATED COMPLEX,**  
**AND METHOD FOR PRODUCTION THEREOF**

Chen-Jen Yang, Hsinchuang; Tsong-Shin Jean, Hsinchu; Lung-Tarn Wu, Ping Tung Hsien; Ching-Liang Yang, Hsinchu, and Kuei-Fei Teng, Kaohsiung, all of Taiwan, assignors to Sinar Corp., Hsinchu, and Industrial Technology Research Institute, Hsinchu Hsien, both of Taiwan

Filed Apr. 11, 1995, Ser. No. 420,180  
 Int. Cl.<sup>6</sup> G03G 5/06

U.S. Cl. 430—58 26 Claims

1. A method to improve the charge generation efficiency of titanyl phthalocyanine comprising the step of subjecting said titanyl phthalocyanine to an ammonia-induced complexation-mediated crystal transformation so as to obtain an ammonia-modified titanyl phthalocyanine.

**5,567,560**  
**TRIPHENYLAMINE DERIVATIVE**  
**CHARGE-TRANSPORTING MATERIAL CONTAINING**  
**ELECTROPHOTOGRAPHIC PHOTORECEPTOR**

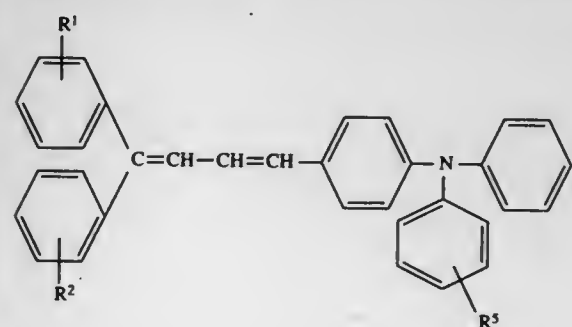
Toshimitsu Hagiwara; Hiroshi Sugiyama; Yoshimasa Matsushima, and Tohru Kobayashi, all of Kanagawa, Japan, assignors to Takasago International Corporation, Tokyo, Japan

Division of Ser. No. 333,295, Nov. 1, 1994. This application May 18, 1995, Ser. No. 443,661

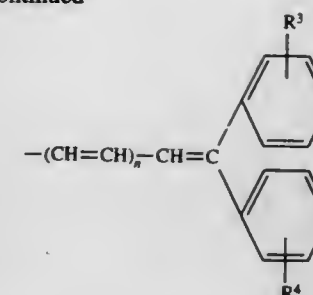
Claims priority, application Japan, Nov. 2, 1993, 5-295965  
 Int. Cl.<sup>6</sup> G03G 5/047

U.S. Cl. 430—59 9 Claims

1. An electrophotographic photoreceptor containing a charge generating material and a charge-transporting layer comprising a triphenylamine derivative represented by the following general formula (1):



—continued



wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, and R<sup>5</sup> may be the same or different and each represents a hydrogen atom, a lower alkyl group, an alkoxy group, a halogen atom, or an aryl group which may have a substituent and n represents 0 or 1.

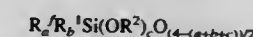
**5,567,561**  
**COATING AGENTS FOR ELECTROPHOTOGRAPHY**  
**AND ELECTROPHOTOGRAPHY CARRIERS PREPARED**  
**BY USING THEM**

Yuji Yoshikawa, Annaka, and Mitsuhiro Takarada, Takasaki, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 2, 1994, Ser. No. 300,011  
 Claims priority, application Japan, Sep. 2, 1993, 5-242102  
 Int. Cl.<sup>6</sup> G03G 9/113

U.S. Cl. 430—106.6 21 Claims

1. A carrier particle composition comprising carrier particles covered with a covering agent, wherein said carrier particles have a particle size of 10–1,000 μm and are particles of magnetic metals, particles of magnetic metal oxides, particles of Carborundum, glass beads or particles of silicon dioxide, and said covering agent contains one or more organopolysiloxane(s) of formula I:



wherein

R<sup>1</sup> is C<sub>n</sub>F<sub>2n+1</sub>Q;

P is 1–12;

Q is a bivalent organic group with 2–12 carbon atoms;

R<sup>1</sup> is alkyl with 1–12 carbon atoms or phenyl;

R<sup>2</sup> is H or alkyl with 1–6 carbon atoms; and

a, b and c are numbers satisfying the following conditions:

0 < a ≤ 1, 0 ≤ b < 2, 0 ≤ c ≤ 3, and 0 < a + b + c < 4,

wherein said covering agent is applied to said carrier particles as a composition comprising an organic solvent and one or more organopolysiloxanes of formula I.

**5,567,562**  
**COATED CARRIER PARTICLES AND PROCESSES**  
**THEREOF**

John A. Creatura, Ontario; Catherine A. McKnight, Penfield; Michael J. Duggan, Webster; Thomas C. Dombroski, Rochester; Bernard A. Kelly, Ontario, all of N.Y.; Hadi K. Mahabadi, Toronto, and Michael F. Cunningham, Georgetown, both of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 17, 1995, Ser. No. 373,715  
 Int. Cl.<sup>6</sup> G03G 9/10;9/113

U.S. Cl. 430—108 12 Claims

1. A carrier composition consisting essentially of a core with coatings consisting essentially of a first polymer pair, or a first polymer, and a second polymer pair and wherein the first and second polymer pair each contain an insulating polymer and a conductive polymer, and wherein said conductive polymer con-

tains therein a conductive component and wherein said carrier possesses a conductivity of from about  $10^{-6}$  to about  $10^{-14}$  (ohm-cm)<sup>-1</sup>.

**5,567,563**  
**TONER BINDER COMPOSITION AND TONER COMPOSITION**

Tohru Minami, Kyoto, Japan, assignor to Sanyo Chemical Industries, Ltd., Kyoto, Japan

Filed Jun. 7, 1995, Ser. No. 482,543  
Int. Cl.<sup>6</sup> G03G 9/097

U.S. Cl. 430—110 24 Claims

1. A toner binder composition for electrophotography, which comprises a binder resin (A) and an organic material, (B) dispersed therein with an average particle size of not more than 5  $\mu$ m at room temperature; said material (B) becoming compatible with (A) at a temperature between 80°–150° C. and having a melting point of at most 120° C., a melt viscosity of at most 10,000 cps. at 120° C. and a molecular weight satisfying the inequality:

$$4.0 \leq \Delta Sp + 1.2 \log M_B \leq 7.0 \quad (I)$$

wherein  $\log M_B$  represents logarithm of the molecular weight or the weight-average molecular weight of (B), and  $\Delta Sp$  represents the absolute value of the difference of Sp value of (A) and Sp value of (B).

**5,567,564**  
**LIQUID DEVELOPMENT COMPOSITION HAVING A COLORANT COMPRISING A STABLE DISPERSION OF MAGNETIC PARTICLES IN AN AQUEOUS MEDIUM**  
Ronald F. Ziolo, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 910,808, Jul. 9, 1992, Pat. No. 5,322,756, and Ser. No. 910,805, Jul. 9, 1992, Pat. No. 5,358,659, and Ser. No. 910,803, Jul. 9, 1992, Pat. No. 5,362,417. This application Jan. 7, 1994, Ser. No. 178,540  
Int. Cl.<sup>6</sup> G03G 9/00

U.S. Cl. 430—115 11 Claims

1. A liquid development composition comprising:  
a hydrocarbon liquid vehicle;  
a charge-control agent; and  
a colorant;

wherein the colorant comprises a stable dispersion of magnetic particles in an aqueous medium, said dispersion containing a fluidized matrix of an ion exchange resin.

**5,567,565**  
**METHOD FOR TRANSFERRING A TONER IMAGE**  
James R. Larson, Fairport; Santokh S. Badesha, Pittsford; Anthony M. Wallace, and Donald S. Sypula, both of Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.  
Filed Jul. 15, 1994, Ser. No. 275,481  
Int. Cl.<sup>6</sup> G03G 13/16

U.S. Cl. 430—126 23 Claims

1. An intermediate transfer member for transferring a toner image from an electrostatic imaging member to an image receiving substrate, said intermediate transfer member being in the form of a roller, belt or sheet configured for operating in an electrostatic printing system having an electrostatic imaging member, and said intermediate transfer member comprising a fluorocarbon elastomer containing less than 60 mole % vulnerable sites in the fluorocarbon chain and said fluorocarbon elastomer being conformable.

**5,567,566**  
**LATEX PROCESSES**  
Hadi K. Mahabadi, Etobicoke; Grazyna E. Kmiecik-Lawrynowicz, Burlington, and T. Hwee Ng, Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.  
Filed Feb. 22, 1996, Ser. No. 605,423  
Int. Cl.<sup>6</sup> G03G 9/087

U.S. Cl. 430—137 11 Claims

1. A process for the preparation of toner particles comprising:  
(i) preparing a pigment dispersion, which dispersion is comprised of a pigment, an ionic surfactant, and optionally a charge control agent;  
(ii) paring latex or emulsion blend comprised of resin, a counterionic surfactant with a charge polarity of opposite sign to that of said ionic surfactant and a nonionic surfactant by (a) conducting a pre-reaction emulsification which comprises emulsification of the polymerization reagents of monomer, polar comonomer, water, surfactant, chain transfer agent, and initiator, and wherein said emulsification is accomplished at a low temperature of from about 3° to about 35° C.; and (b) accomplishing an emulsion polymerization which comprises heating the emulsified mixture of (a) in a reactor at from about 25° to about 125° C. and retaining the contents of the reactor at said temperature of from about 25° to about 125° C. for an effective time period, from about 1 to about 10 hours, and preferably 7 hours, followed by cooling;  
(iii) shearing said pigment dispersion with said latex or emulsion blend thereby causing a flocculation or heterocoagulation of the formed particles of pigment, resin, and optional charge control agent;  
(iv) stirring the resulting formed particles of resin, pigment and optional charge control agent of (iii) to form substantially stable toner size aggregates with a narrow particle size distribution;  
(v) subsequently adding further surfactant in the range amount of from about 0.1 to about 10 parts or percent by weight of water present in said latex or in said emulsion to control, prevent, or minimize further growth or enlargement of the particles in the coalescence step (vi); and  
(vi) heating from about 5° to about 60° C. above about the resin glass transition temperature, T<sub>g</sub>, which resin T<sub>g</sub> is from between about 45° C. to about 90° C., thereby coalescing the statically bound aggregated particles to form said toner particles comprised of resin, pigment and optional charge control agent.

**5,567,567**  
**METHOD FOR PRODUCING ENCAPSULATED TONER FOR HEAT-AND-PRESSURE FIXING AND ENCAPSULATED TONER OBTAINED THEREBY**  
Koji Akiyama, Wakayama; Takashi Yamaguchi, Arida; Koji Kameyama, and Koji Shimokusa, both of Wakayama-ken, all of Japan, assignors to Kao Corporation, Tokyo, Japan  
Filed Nov. 2, 1994, Ser. No. 334,026  
Claims priority, application Japan, Nov. 5, 1993, 5-301126  
Int. Cl.<sup>6</sup> G03G 9/093

U.S. Cl. 430—138 18 Claims

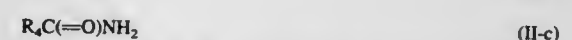
1. A method for producing an encapsulated toner for heat-and-pressure fixing comprising a heat-fusible core material containing at least a thermoplastic resin, and a shell formed thereon so as to cover the surface of the core material, said shell having additives dispersed therein the method comprising the steps of:  
(a) dispersing in a shell-forming resin an additive selected from the group consisting of conductive materials, charge control agents, wax components, color pigments, particulate magnetic materials, and mixtures thereof to give a shell-forming resin containing the additive;  
(b) dissolving the shell-forming resin containing the additive in a mixture comprising a core material-constituting monomer;  
(c) dispersing the mixture obtained in step (b) in an aqueous dispersant, and localizing the shell-forming resin containing

the additive on the surface of droplets of the core material-constituting monomer to give a polymerizable composition; and  
(d) polymerizing the polymerizable composition obtained in step c) by in situ polymerization to form said encapsulated toner in which the additive is dispersed in said shell.

**5,567,568**  
**PHOTOSENSITIVE COMPOSITION AND PHOTOSENSITIVE LITHOGRAPHIC PRINTING PLATE**  
Akira Nishioka, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
Filed Dec. 14, 1994, Ser. No. 357,305  
Claims priority, application Japan, Dec. 14, 1993, 5-313589  
Int. Cl.<sup>6</sup> G03F 7/11; 7/021; 7/031

U.S. Cl. 430—162 9 Claims

1. A photosensitive composition comprising, in admixture:  
(A) an ethylenically unsaturated addition-polymerizable compound,  
(B) an aqueous alkali-soluble or swelling polymer which is capable of forming a film,  
(C) a photopolymerization initiator,  
(D) a negative-working diazo resin, and  
(E) a component which is soluble in a photosensitive solution, but floats on a surface of a photosensitive layer and is capable of forming an oxygen-intercepting layer during coating and drying,  
wherein the component (E) comprises a compound represented by the following formula (I) and a compound represented by the following formula (II-a), (II-b) or (II-c):



wherein R<sup>1</sup> represents an alkyl group having from 15 to 25 carbon atoms;

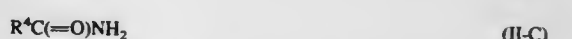
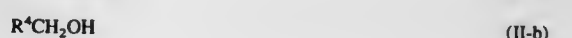
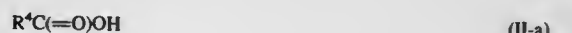
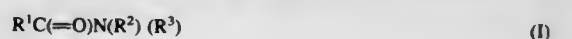
R<sup>2</sup> represents —H, —CH<sub>3</sub>, —C<sub>2</sub>H<sub>5</sub> or —C<sub>3</sub>H<sub>7</sub>;

R<sup>3</sup> represents —CH<sub>3</sub>, —C<sub>2</sub>H<sub>5</sub> or —C<sub>3</sub>H<sub>7</sub>;

and R<sup>4</sup> represents an alkyl group having from 15 to 25 carbon atoms.

2. A presensitized plate comprising  
(1) a support coated with a photosensitive composition comprising  
(A) an ethylenically unsaturated addition-polymerizable compound,  
(B) an aqueous alkali-soluble or swelling polymer which is capable of forming a film,  
(C) a photopolymerization initiator,  
(D) a negative-working diazo resin, and  
(E) a component which is soluble in a photosensitive solution, but floats on a surface of a photosensitive layer and is capable of forming an oxygen-intercepting layer during coating and drying,

wherein the component (E) comprises a compound represented by the following formula (I) and a compound represented by the following formula (II-a), (II-b) or (II-c):



wherein R<sup>1</sup> represents an alkyl group having from 15 to 25 carbon atoms;

R<sup>2</sup> represents —H, —CH<sub>3</sub>, —C<sub>2</sub>H<sub>5</sub> or —C<sub>3</sub>H<sub>7</sub>;

R<sup>3</sup> represents —CH<sub>3</sub>, —C<sub>2</sub>H<sub>5</sub> or —C<sub>3</sub>H<sub>7</sub>;

and R<sup>4</sup> represents an alkyl group having from 15 to 25 carbon atoms, and

(2) a matting layer provided thereon, wherein the surface of the matting layer has a micro pattern comprising (i) a portion which is coated with a composition comprising a copolymer containing at least one monomer unit having a sulfonic acid group and (ii) a portion which is uncoated with the composition.

**5,567,569**  
**PROCESS FOR PRODUCING A POSITIVE PATTERN UTILIZING NAPHTHO QUINONE DIAZIDE COMPOUND HAVING NON-METALLIC ATOM DIRECTLY BONDED TO THE NAPHTHALENE RING**

Ari Aviram, Croton-on-Hudson; William R. Brunsvoild, Poughkeepsie, both of N.Y.; Daniel Bucca, Alexandria, Va.; Willard E. Conley, Jr., Cornwall, and David E. Seeger, Congers, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 314,975, Sep. 29, 1994. This application Mar. 15, 1996, Ser. No. 616,598

Int. Cl.<sup>6</sup> G03F 7/30

U.S. Cl. 430—296 19 Claims

1. A method for forming a pattern of a photoresist which comprises:

a) providing on a substrate a layer of a positive photoresist composition comprising a positive acting organic polymer; and a naphthoquinone-diazo photoactive compound wherein said naphthoquinone diazo compound contains a non-metallic atom directly bonded to the naphthalene ring of said compound, and wherein said non-metallic atom is selected from the group consisting of iodine, germanium, arsenic, antimony and mixtures thereof;  
b) imagewise exposing said layer to x-ray or electron beam radiation in a pattern to thereby cause a change in the solubility of said photoresist; and  
c) developing said photoresist to thereby form said pattern.

**5,567,570**  
**GAMMA RAY TECHNIQUES APPLICABLE TO SEMICONDUCTOR LITHOGRAPHY**  
Michael D. Rostoker, San Jose; Nicholas F. Pasch, Pacifica, and Joe Zelayeta, Saratoga, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Division of Ser. No. 56,340, Apr. 30, 1993. This application Jun. 5, 1995, Ser. No. 464,449

Int. Cl.<sup>6</sup> G03F 7/20

U.S. Cl. 430—311 7 Claims

1. A method of performing lithography in a semiconductor wafer, comprising:

a) providing a source emitting gamma-radiation emissions downstream towards a surface of a semiconductor wafer;  
b) applying a layer of gamma-radiation-sensitive resist material to the surface of the semiconductor wafer, said gamma-radiation-sensitive resist material comprising:  
i) a first material responsive to the gamma-radiation for emitting secondary emissions; and  
ii) a second material responsive to said secondary emissions; and  
c) causing said gamma-radiation emissions to form a pattern in the layer of resist material.



5,567,571

**SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL**

Toshihiro Nishikawa, Minami-Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
Continuation of Ser. No. 297,940, Aug. 31, 1994, abandoned, which is a continuation of Ser. No. 74,560, Jun. 11, 1993, abandoned. This application Sep. 14, 1995, Ser. No. 527,915  
Claims priority, application Japan, Jun. 12, 1992, 4-177693  
Int. Cl.<sup>6</sup> G03C 1/46

U.S. Cl. 430—506

16 Claims

1. A silver halide color photographic light-sensitive material comprising at least two silver halide emulsion layer groups having different color sensitivities on a support, wherein each of said at least two silver halide emulsion layer groups contains at least two silver halide emulsion layers sensitive to essentially the same spectral range and having different sensitivities, a highest-speed layer of said at least two silver halide emulsion layers in each of said silver halide emulsion layer groups contains a silver halide emulsion in which selenium, sulfur and gold-sensitized tabular silver halide grains with an aspect ratio of 3 or more occupy 50% or more of a total projected area, and a lowest-speed layer of said at least two silver halide emulsion layers in each of said silver halide emulsion layer groups contains a silver halide emulsion containing selenium, sulfur and gold-sensitized regular crystal cubic grains, and said cubic grains have a silver iodide content of 3 mol % or less.

5,567,572

**SUPPORT SHEET FOR PHOTOGRAPHIC PRINTING SHEET**

Takaharu Miura, Chiba; Masataka Itoh, Yokohama, and Chieko Tanaka, Ichikawa, all of Japan, assignors to New Oji Paper Co., Ltd., Tokyo, Japan  
Continuation of Ser. No. 30,554, Mar. 12, 1993, abandoned, which is a division of Ser. No. 810,076, Dec. 19, 1991, abandoned. This application Sep. 26, 1994, Ser. No. 312,188  
Claims priority, application Japan, Dec. 21, 1990, 2-404784; Jan. 7, 1991, 3-000172; Apr. 19, 1991, 3-088709  
Int. Cl.<sup>6</sup> G03C 1/815

U.S. Cl. 430—510

6 Claims

1. A support sheet for a photographic printing sheet comprising: a substrate sheet comprising (1) a base paper layer comprising a cellulosic pulp material and (2) one pigment layer or two pigment layers located on a front surface alone (hereinafter referred to as front pigment layer) or both front and back surfaces (hereinafter referred to as back pigment layer) of the base paper layer; a front coating layer located on a front side of the substrate sheet, said front coating layer comprising a mixture of an electron beam irradiation-curing product of at least one electron beam-curable unsaturated organic compound and a white pigment; and a back coating layer located on a back side of the substrate sheet, said back coating layer comprising a film-forming synthetic resinous material, said front pigment layer alone or both said front and back pigment layers of the substrate sheet containing a binder and 1 to 50 g/cm<sup>2</sup> of an anti-fogging agent selected from the group consisting of magnesium hydroxide, magnesium carbonate, magnesium oxide, and magnesium sulfate.

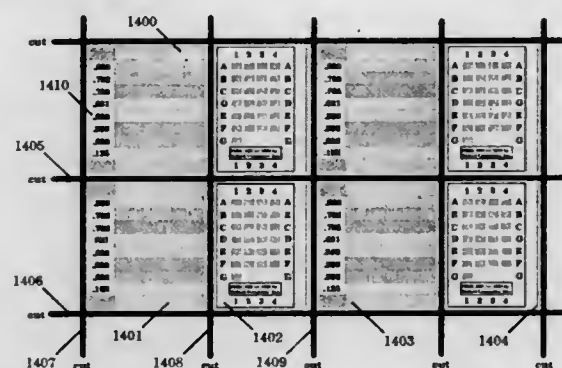
5,567,573

**OPTICAL DEVICE BEARING A PATTERN FOR REPRESENTING AT LEAST ONE IMAGE THAT IS CAPABLE OF HAVING MICROSCOPIC DETAIL**

Steven G. Morton, 39 Old Good Hill Rd., Oxford, Conn. 06478  
Division of Ser. No. 23,630, Feb. 26, 1993, Pat. No. 5,426,010.  
This application Apr. 3, 1995, Ser. No. 416,446  
Int. Cl.<sup>6</sup> G03C 5/00

U.S. Cl. 430—321

22 Claims



1. An optical device comprised of a substrate that bears upon a surface thereof at least one multi-layered pattern forming a life-size image of a cytology specimen, said image having sufficient detail to show details of a cell nucleus, wherein said image is comprised of a plurality of picture elements, and wherein specified ones of said picture elements are comprised of from one thin film layer to a plurality of superimposed thin film layers.

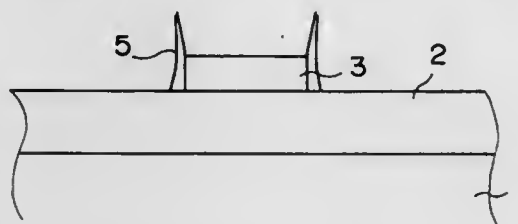
5,567,574

**REMOVING AGENT COMPOSITION FOR PHOTORESIST AND METHOD OF REMOVING**

Ryuji Hasemi, Keiichi Iwata, Mayumi Hada, and Hidetoshi Ikeda, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan  
Filed Dec. 8, 1995, Ser. No. 569,673  
Claims priority, application Japan, Jan. 10, 1995, 7-002077; Mar. 28, 1995, 7-069746  
Int. Cl.<sup>6</sup> G03F 7/30; C11D 3/43

U.S. Cl. 430—331

10 Claims



1. A removing agent composition for a photoresist which comprises  
(1) 5 to 50% by weight of an alkanolamine, an alkoxyalkylamine or an alkoxyalkanolamine represented by the general formula  $R^1R^2-NC_mH_{2m}OR^3$  wherein  $R^1$  and  $R^2$  are each a hydrogen atom, an alkyl group having 1 to 4 carbon atoms or a hydroxyethyl group;  $R^3$  is a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, a hydroxyethyl group, a methoxyethyl group or an ethoxyethyl group; and  $m$  is an integer of 2 to 4;  
(2) 1 to 30% by weight of a glycol monoalkyl ether represented by the general formula  $R^4-(C_2H_4O)_q-R^4$  wherein  $R^4$  is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms;  $p$  is an integer of 2 to 3; and  $q$  is an integer of 1 to 3;  
(3) 0.5 to 15% by weight of a sugar or a sugaralcohol, and water as the balance.

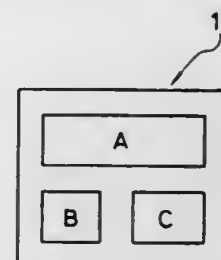
5,567,575

**METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES**

Masahide Hiram, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan  
Continuation of Ser. No. 186,533, Jan. 26, 1994, abandoned.  
This application May 18, 1995, Ser. No. 443,563  
Claims priority, application Japan, Jan. 26, 1993, 5-029833  
Int. Cl.<sup>6</sup> G03F 7/20; 7/22

U.S. Cl. 430—394

5 Claims



1. A method for manufacturing a semiconductor device having a CCD linear sensor defined thereon, said method comprising:  
(a) providing a photosensitive semiconductor substrate on which a CCD linear sensor is to be defined, the CCD linear sensor including a first pattern portion including at least one non-repeating image unit and a continuous linearly adjacent second pattern portion, the second pattern portion including  $n$  number of repeating image units, wherein  $n$  is an integer;  
(b) providing a reticle for imparting the first and second pattern portions on the substrate, the reticle including a first pattern imparting section and a repeatable unit imparting section;  
(c) positioning the substrate in an exposure apparatus;  
(d) positioning the reticle in the exposure apparatus adjacent the substrate so that the first pattern imparting section is disposed over a desired location on the substrate;  
(e) exposing the first pattern imparting section to define the first pattern portion on the substrate;  
(f) moving the reticle and substrate relative to each other and to the exposure apparatus, so that the repeatable unit imparting section is positioned to define a first image unit of the second pattern portion linearly adjacent the first pattern portion;  
(g) exposing the repeatable unit imparting section to define a second image unit on the substrate;  
(h) moving the reticle and substrate relative to each other and to the exposure apparatus so that the repeatable unit imparting section is positioned to define another second image unit linearly adjacent the previously defined second image unit;  
(i) exposing the repeatable unit imparting section to define a next linearly adjacent second image unit on the substrate; and  
(j) thereafter, successively repeating steps (h) and (i)  $n-2$  times until formation of the second pattern portion is complete.

5,567,576

**PHOTOGRAPHIC SUPPORT**

Fumiyuki Suzuki, Toshimitsu Okutu, and Masaaki Otoshi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
Filed May 23, 1995, Ser. No. 447,693  
Claims priority, application Japan, May 26, 1994, 6-113007  
Int. Cl.<sup>6</sup> G03C 1/76

U.S. Cl. 430—533

4 Claims

1. A photographic support comprising a uniaxially or biaxially stretched polyester film comprising (1) a main layer containing a polyester and (2) one or two surface layers, wherein at least one of said surface layers comprises a noncrystalline polyester selected from the group consisting of copolymers of polyethylene terephthalate and polyethylene naphthalate having a copolymerization mol ratio of from 15:85 to 75:25, copolymers of polyethylene naphthalate and polycyclohexanedimethylene terephthalate having a copolymerization mol ratio of from 15:85 to 90:10, and copoly-

mers of polyethylene terephthalate and polycyclohexanedimethylene terephthalate having a copolymerization mol ratio of from 10:90 to 95:5.

5,567,577

**PHOTOGRAPHIC ELEMENTS CONTAINING RELEASE COMPOUNDS**

Thomas R. Welter, Webster; David A. Dickinson, Brockport, and Keith T. Chen, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
Continuation of Ser. No. 250,148, May 27, 1994, abandoned.  
This application Oct. 5, 1995, Ser. No. 539,381  
Int. Cl.<sup>6</sup> G03C 7/305; 1/295; 1/34; 1/42

U.S. Cl. 430—544

12 Claims

1. A silver halide color reversal, black and white, or color negative photographic element comprising a support having located thereon at least one silver halide emulsion layer, the element containing a release compound that provides a non-imagewise distribution of a photographically active moiety other than a developing agent, wherein:  
(a) the release compound comprises a blocking group from which the photographically active moiety is released, a ballasting group other than a coupler moiety, and an aqueous solubilizing group, both the ballasting group and the aqueous solubilizing group being attached to the blocking group and not directly to the photographically active moiety;  
(b) the blocking group comprises an aromatic ring system which is unsubstituted or substituted with one or more electron withdrawing groups and, optionally, a timing group or series of timing groups;  
(c) the aqueous solubilizing group is attached, either directly or indirectly, to a timing group, or is attached indirectly through at least one carbon atom to the aromatic ring system; and  
(d) the active functionality of the photographically active moiety is a heteroatom which is blocked by direct attachment to the timing group or aromatic ring of the aromatic ring system.

5,567,578

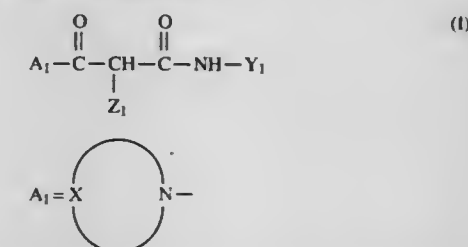
**SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL**

Toshiyuki Makuta; Nobuo Seto, and Yasuhiro Yoshioka, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
Filed Nov. 22, 1994, Ser. No. 345,745  
Claims priority, application Japan, Nov. 24, 1993, 5-315782  
Int. Cl.<sup>6</sup> G03C 7/36; 7/392

U.S. Cl. 430—551

15 Claims

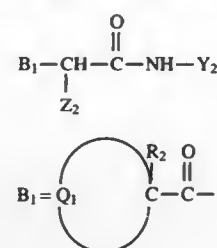
1. A silver halide color photographic material having at least one or more light-sensitive silver halide emulsion layers on a support, wherein at least one of said light-sensitive layers contains at least one yellow coupler of the following formulae (I), (II) and (III), at least one compound of the following formula (IV) and at least one compound of the following formula (V):



wherein

X represents an organic residue necessary for forming a nitrogen-containing hetero ring together with the nitrogen atom in the formula;  
 $\text{Y}_1$  represents an aromatic group or a heterocyclic group;  
 $\text{Z}_1$  represents a group splitting off from the coupler of the formula by coupling reaction with an oxidation product of an

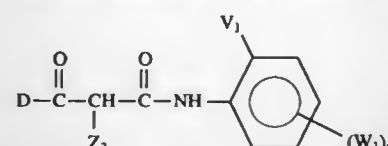
aromatic primary amine developing agent,



wherein

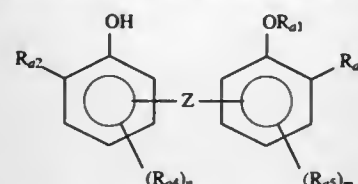
R<sub>2</sub> represents a monovalent group except a hydrogen atom;  
Q<sub>1</sub> represents a non-metallic atomic group necessary for forming, together with the carbon atom in the formula, a 3-membered to 5-membered hydrocarbon ring or a 3-membered to 6-membered hetero ring having therein at least one hetero atom selected from N, O, S and P; provided that R<sub>2</sub> may be bonded to Q<sub>1</sub> to form a bi-cyclic ring or a higher poly-cyclic ring;

Z<sub>2</sub> represents a hydrogen atom, or a group splitting off from the coupler of the formula by coupling reaction with an oxidation product of an aromatic primary amine developing agent;  
Y<sub>2</sub> has the same meaning as Y<sub>1</sub> in formula (I),



wherein

D represents a tertiary alkyl group;  
V<sub>1</sub> represents a fluorine atom, an alkoxy group, an aryloxy group, a dialkylamino group, an alkylthio group, an arylthio group, or an alkyl group;  
Z<sub>3</sub> has the same meaning as Z<sub>1</sub> in formula (I);  
W<sub>1</sub> represents a group substitutable on the benzene ring in the formula;  
t represents an integer of from 0 to 4, and when t is 2 or more, then the plural W<sub>1</sub>'s may be the same or different,



wherein

R<sub>1</sub> represents a hydrogen atom, an aliphatic group, an aromatic carbonyl group, a saturated aliphatic carbonyl group, or a sulfonyl group;

R<sub>2</sub> and R<sub>3</sub> may be the same or different and each represents a hydrogen atom, an aliphatic group, an aliphatic-oxy group, an acylamino group, an aliphatic-oxycarbonyl group, or a carbamoyl group;

R<sub>4</sub> and R<sub>5</sub> may be the same or different and each represents an aliphatic group or an acylamino group;

Z represents a chemical bond or a divalent linking group;  
n and m each represent 0, 1 or 2, and when n or m is 2, then the plural R<sub>4</sub>'s or R<sub>5</sub>'s may be the same or different,



wherein

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub> and R<sub>8</sub> may be the same or different and each represents a hydrogen atom, an aliphatic

(II)

group, an acyl group, an acylamino group, an aliphatic-oxycarbonyl group, an aryloxy carbonyl group, a halogen atom, a sulfonyl group, a carbamoyl group, a sulfamoyl group, or -X<sub>b</sub>-R<sub>b9</sub>;

A represents a non-metallic atomic group necessary for forming a spiro ring or a bicyclic ring;

X<sub>b</sub> represents -O-, -S- or -N(R<sub>b10</sub>)-;

R<sub>b9</sub> and R<sub>b10</sub> may be the same or different and each represents an aliphatic group; ortho-positioned two groups of R<sub>b1</sub> to R<sub>b8</sub> may be bonded to each other to form a 5-membered to 8-membered ring;

R<sub>b9</sub> and R<sub>b10</sub> may be bonded each other to form a 5-membered to 7-membered ring;

provided that at least one of R<sub>b1</sub> to R<sub>b4</sub> and at least one of R<sub>b5</sub> to R<sub>b8</sub> are the same or different -X<sub>b</sub>-R<sub>b9</sub>.

5,567,579

#### PHOTOGRAPHIC PRODUCT COMPRISING A BLEND OF EMULSIONS WITH DIFFERENT SENSITIVITIES

Luc R. Gourlaouen, Givry; Gerard A. D. Friour, Chalon-sur-Saone; Didier J. Martin, and Philippe Strauel, both of Givry, all of France, assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 213,320, Mar. 15, 1994, abandoned.

This application Apr. 28, 1995, Ser. No. 431,393

Claims priority, application France, Apr. 2, 1993, 93 04146  
Int. Cl.<sup>6</sup> G03C 1/005; 1/494

U.S. Cl. 430-567

23 Claims

1. A reversal photographic product comprising at least one light sensitive silver halide emulsion layer consisting of a blend of monodisperse silver halide emulsions comprising at least one each of a fast silver halide emulsion and one slow silver halide emulsion, and optionally comprising a medium silver halide emulsion characterized in that

- 1) at least one of the emulsions making up the blend is a pure bromide emulsion and at least one of the emulsions making up the blend is a bromiodide emulsion,
- 2) the proportion of fast emulsion grains in the blend wherein said at least one slow emulsion is a pure bromide emulsion is less than 40% and
- 3) the proportion of slow emulsion grains in the blend is greater than 20% based on the total grain number in said blend.

5,567,580

#### RADIOGRAPHIC ELEMENTS FOR MEDICAL DIAGNOSTIC IMAGING EXHIBITING IMPROVED SPEED-GRANULARITY CHARACTERISTICS

David E. Fenton; Lucius S. Fox, both of Fairport, and Donald L. Black, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 329,591, Oct. 26, 1994, Pat. No. 5,476,760. This application Sep. 29, 1995, Ser. No. 536,898

Int. Cl.<sup>6</sup> G03C 1/035

U.S. Cl. 430-567

7 Claims

1. A radiographic element for diagnostic imaging comprised of a transparent support and first and second silver halide emulsion layer units coated on opposite sides of the support, each emulsion layer unit being comprised of a silver iodohalide emulsion containing less than 5 mole percent iodide, based on silver, and tabular grains accounting for at least 50 percent of total grain projected area including tabular grains having {111} major faces, containing a maximum surface iodide concentration along their edges, and a lower iodide concentration within their corners than elsewhere along their edges.

5,567,581

#### METHOD AND KIT FOR ENZYMATICALLY DETERMINING THE PH OF A SPECIMEN

Cheng-I Lin, Cupertino, and Yuh-Geng Tsay, Los Altos Hills, both of Calif., assignors to Diagnostic Reagents, Inc., Sunnyvale, Calif.

Filed Mar. 6, 1995, Ser. No. 398,693

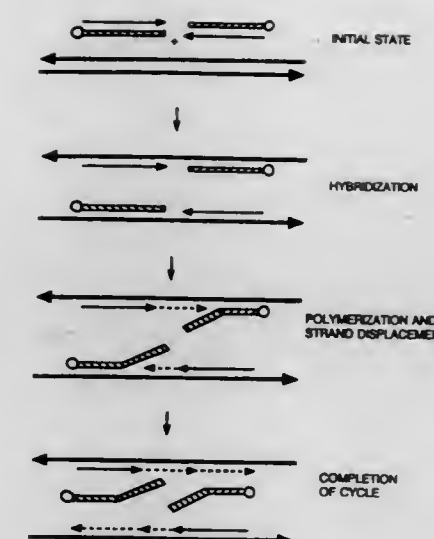
Int. Cl.<sup>6</sup> C12Q 1/62; 1/58; 1/54; 1/26

U.S. Cl. 435-4

20 Claims

1. A method of enzymatically detecting adulteration of a biological fluid specimen having a pH, comprising

- (a) mixing in a buffered solution (i) a sample of said biological fluid specimen with (ii) an enzyme having an activity and (iii) a one or more substrates for said enzyme, said buffered solution having a pH effective to provide a direct proportional relationship between said activity of said enzyme and the pH of said biological fluid specimen, wherein each of said sample, said enzyme, said substrate and said buffered solution is present in an amount effective to provide said direct proportional relationship between said activity of said enzyme and the pH of said biological fluid specimen,
- (b) determining said activity of said enzyme,
- (c) correlating said activity of said enzyme to the pH of said biological fluid specimen, wherein a pH of less than 5 or greater than 8 is a positive indication of adulteration of said biological fluid specimen.



amplifying the target nucleic acid to obtain an amplification product using a polymerase, a first primer with or without a segment noncontiguous to a first priming sequence, and a second primer with or without a segment noncontiguous to a second priming sequence in the presence of an oligonucleotide which is incapable of acting as a primer for said polymerase, wherein said oligonucleotide has at least 5 consecutive nucleotides fully complementary to at least 5 consecutive nucleotides of said first primer; and detecting the presence of the target nucleic acid by monitoring the amplification thereof.

5,567,582

#### VARIANTS OF CYTOMEGALOVIRUS GB

Jane Grundy, and Vincent Emery, both of London, England, assignors to Royal Free Hospital School of Medicine, London, England

Continuation of Ser. No. 946,472, Nov. 10, 1992, abandoned.

This application Feb. 17, 1994, Ser. No. 197,811

Claims priority, application United Kingdom, Apr. 11, 1990, 9008223

Int. Cl.<sup>6</sup> C12Q 1/70; C12P 19/34; C07H 21/04

U.S. Cl. 435-5

2 Claims

2. A process for detecting cytomegalovirus (CMV) DNA having the sequence of SEQ ID NO:1, or a fragment of said DNA, which DNA or fragment includes at least one sequence variation in relation to the sequence of SEQ ID NO:1, with the proviso that the variation is not that found in the Towne strain of CMV, and that a CMV genome having said sequence variation would be capable of reproduction in a host system which supports reproduction of wild type CMV,

which process comprises:

conducting a polymerase chain reaction on a sample suspected of containing said CMV DNA or fragment wherein the primers used in the polymerase chain reaction are:

Primer 1 5'-GAGGACAACGAAATCCTGTTGGGCA (SEQ ID NO:3)

Primer 2 5'-GTCCGACGGTGGAGATACTGCTGAGG (SEQ ID NO:4), and

detecting an amplification product of said polymerase chain reaction thereby detecting said cytomegalovirus DNA.

5,567,583

#### METHODS FOR REDUCING NON-SPECIFIC PRIMING IN DNA DETECTION

Chang-Ning J. Wang, Chelmsford, and Kai-Yuan Wu, Lowell, both of Mass., assignors to Biotronics Corporation, Lowell, Mass.

Continuation-in-part of Ser. No. 808,463, Dec. 16, 1991, Pat. No. 5,348,853. This application May 26, 1994, Ser. No. 250,849

Int. Cl.<sup>6</sup> C12Q 1/68; C12P 19/34

U.S. Cl. 435-6

16 Claims

1. A method for detecting a target nucleic acid, which method comprises the steps of:

5,567,584

#### METHODS OF USING BIOLOGICALLY ACTIVE DIMERIZED POLYPEPTIDE FUSIONS TO DETECT PDGF

Andrzej Z. Sledziewski; Lillian A. Bell, and Wayne R. Kindsvogel, all of Seattle, Wash., assignors to Zymogenetics, Inc., Seattle, Wash.

Continuation of Ser. No. 634,510, Dec. 27, 1990, abandoned, which is a continuation-in-part of Ser. No. 347,291, May 2, 1989, Pat. No. 5,155,027, which is a continuation-in-part of Ser. No. 146,877, Jan. 22, 1988, abandoned. This application Jan. 11, 1994, Ser. No. 180,195

Claims priority, application European Pat. Off., Jan. 18, 1989, 89100787

Int. Cl.<sup>6</sup> C12Q 1/68; C12N 15/62

U.S. Cl. 435-6

5 Claims

1. A method for determining the presence of platelet-derived growth factor (PDGF) or isoforms thereof in a biological sample, comprising:

incubating a multimeric polypeptide comprising two polypeptide fusions, each of said polypeptide fusions comprising a ligand binding domain and a dimerizing domain, wherein said ligand binding domain corresponds to a ligand binding domain of a PDGF receptor, wherein the receptor is a homodimer composed of subunits, each of which has a single extracellular ligand binding domain, a single transmembrane domain and a single cytoplasmic domain, and wherein said dimerizing domain is a polypeptide chain having affinity for a second polypeptide chain such that the two chains associate under physiological conditions to form a dimer, with a biological sample suspected of comprising PDGF or an isoform thereof under physiological conditions to allow the formation of receptor/ligand complexes; and

detecting the presence of the receptor/ligand complexes as an indication of the presence of human PDGF or an isoform thereof.



5,567,585

# METHOD AND KIT FOR SILVER STAINING, DEVELOPING AN IMAGE AND VISUALIZING BIOLOGICAL MATERIALS

Gustavo Caetano-Anolles, Knoxville, Tenn.; Brant J. Bassam, The University of Queensland, Australia, and Peter M. Gresshoff, Knoxville, Tenn., assignors to The University of Tennessee Research Corporation, Knoxville, Tenn.

Continuation-in-part of Ser. No. 139,459, Oct. 20, 1993, which is a continuation-in-part of Ser. No. 676,869, Mar. 28, 1991, abandoned. This application Jun. 9, 1994, Ser. No. 258,553 Int. Cl.<sup>6</sup> C12Q 1/68; G01N 27/26

U.S. Cl. 435—6 26 Claims

1. An improved method of visualizing an image of a profile characteristic of nucleic acid fragments of various lengths on an electrophoresed gel with more accurate image development and improved sensitivity of detection of the nucleic acids fixed on the washed gel without oxidation or reduction pre-treatment of the gel which method comprises

- staining the washed gel having the nucleic acids fixed thereon with a solution of silver comprising silver nitrate at a concentration of about 3 mM to about 20 mM and formaldehyde at a concentration of about 0.001% to about 0.010%;
- developing the image of the profile of nucleic acids fixed on the gel with a developing solution which comprises sodium carbonate at a concentration of about 10 g/l to about 50 g/l, formaldehyde at a concentration of about 0.01 to about 0.2%, and sodium thiosulfate pentahydrate at a concentration of about 4 μM to about 130 μM, and
- stopping the development by lowering the pH of the image.

5,567,586

# METHODS OF IDENTIFYING SOLID TUMORS WITH CHROMOSOME ABNORMALITIES IN THE ALL-1 REGION

Carlo M. Croce, Philadelphia, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Filed May 18, 1995, Ser. No. 446,926

Int. Cl.<sup>6</sup> C12P 1/68; C12P 19/34; C07H 21/02; 21/04

U.S. Cl. 435—6 23 Claims

1. A method of determining whether a solid tumor has an ALL-1 gene rearrangement comprising the steps of: obtaining a sample of a solid tumor; contacting a probe or primer which comprises from at least 20 nucleotides to the full length of ALL-1 cDNA or genomic sequence with nucleic acid from a cell in said sample; and detecting the presence of an ALL-1 gene rearrangement in a cell in said sample.

5,567,587

# METHOD FOR DETECTING THE PRESENCE AND AMOUNT OF PROKARYOTIC ORGANISMS USING SPECIFIC RRNA SUBSEQUENCES AS PROBES

David E. Kohne, La Jolla, Calif., assignor to Gen-Probe Incorporated, San Diego, Calif.

Division of Ser. No. 199,486, Feb. 22, 1994, which is a continuation of Ser. No. 179,922, Jan. 11, 1994, abandoned, which is a continuation of Ser. No. 857,081, Mar. 19, 1992, Pat. No. 5,288,611, which is a continuation of Ser. No. 584,432, Sep. 12, 1990, abandoned, which is a continuation of Ser. No. 464,717, Jan. 12, 1990, abandoned, which is a continuation of Ser. No. 353,208, May 17, 1989, abandoned, which is a continuation of Ser. No. 655,365, Sep. 4, 1984, abandoned, which is a continuation-in-part of Ser. No. 456,729, Jan. 10, 1983, abandoned. This application Jun. 2, 1995, Ser. No. 460,735

Int. Cl.<sup>6</sup> C12Q 1/68

U.S. Cl. 435—6 26 Claims

1. A method for specifically detecting the presence or amount of prokaryotic organisms in a sample, comprising the steps of:

(a) contacting a sample which may contain rRNA from prokaryotic organisms with a probe which hybridizes with only a subsequence of a rRNA subunit that is specific to prokaryotic organisms under hybridization conditions;

(b) incubating the probe and the sample under said hybridization conditions, such that the probe and the sample under said hybridization conditions, such that the probe hybridizes with the prokaryotic specific rRNA subsequence but not with non-prokaryotic specific sequences which will prevent specific detection of said prokaryotes; and

(c) assaying for hybridization of the probe with the prokaryotic specific rRNA subsequence in order to detect the presence or amount of prokaryotic organisms in the sample.

5,567,588

# SYSTEMATIC EVOLUTION OF LIGANDS BY EXPONENTIAL ENRICHMENT: SOLUTION SELEX

Larry Gold, and Steven Ringquist, both of Boulder, Colo., assignors to University Research Corporation, Boulder, Colo.

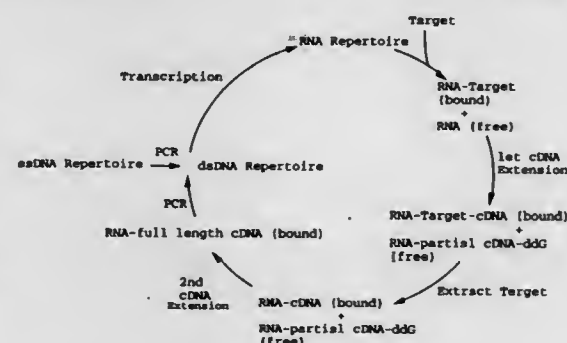
Continuation of Ser. No. 143,564, Oct. 25, 1993, and a continuation-in-part of Ser. No. 714,131, Jun. 10, 1991, Pat. No. 5,475,096, and Ser. No. 931,473, Aug. 17, 1992, Pat. No. 5,270,163, and Ser. No. 536,428, Jun. 11, 1990, abandoned.

This application Jun. 5, 1995, Ser. No. 461,069

Int. Cl.<sup>6</sup> C12P 19/34; C12Q 1/68

U.S. Cl. 435—6

10 Claims



1. A method for identifying nucleic acid ligands from a candidate mixture of nucleic acids, said nucleic acid ligands being a ligand of a given target molecule comprising:

- contacting said candidate mixture with the target molecule, wherein nucleic acids having increased affinity to the target molecule form nucleic acid-target complexes;
- partitioning the increased affinity nucleic acids from the remainder of the candidate mixture, said partitioning step resulting in two differentiable nucleic acid pools said nucleic acids in each pool having different relative affinities to said target molecule; and
- amplifying the increased affinity nucleic acids to yield a ligand-enriched mixture of nucleic acids, whereby nucleic acid ligands of the target molecule may be identified.

5,567,589

Patent Not Issued For This Number

5,567,590

# METHODS OF DIAGNOSING STEROID-RESISTANT INFLAMMATION DUE TO TYPE I OR TYPE II NUCLEAR GLUCOCORTICOID RECEPTOR BINDING ABNORMALITIES

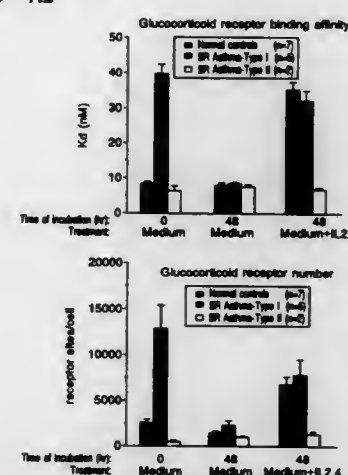
Donald Y. M. Leung, Englewood; Stanley J. Szeffer, Aurora, and Joseph D. Spahn, Denver, all of Colo., assignors to National Jewish Center for Immunology and Respiratory, Denver, Colo.

Filed Jan. 6, 1994, Ser. No. 178,220

Int. Cl.<sup>6</sup> C07K 14/72; G01N 33/53; 33/567

U.S. Cl. 435—7.2

6 Claims



1. A method for identifying animals having steroid-resistant inflammation due to a Type II nuclear glucocorticoid receptor binding abnormality, comprising:

- determining the nuclear glucocorticoid receptor number and nuclear glucocorticoid receptor binding affinity in nuclear glucocorticoid receptor-producing cells recovered from said animals; and
- identifying those animals having an abnormally low number of nuclear glucocorticoid receptors and normal nuclear glucocorticoid receptor binding affinity.

5,567,591

# AMPLIFIED ASSAY FOR ANALYTE

Stephen J. Lovell, Towson, and Jeffrey H. Bruton, Randallstown, both of Md., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 719,488, Jun. 24, 1991, abandoned.

This application Aug. 12, 1994, Ser. No. 289,833

Int. Cl.<sup>6</sup> G01N 33/538

U.S. Cl. 435—7.5

33 Claims

1. An indirect sandwich assay process for determining analyte, comprising:

- forming in the assay a complex of (i) solid phase bound first specific binding partner for the analyte; (ii) analyte; (iii) a primary particle having attached to the exterior thereof directly or through linking groups multiple first specific binding partners and a plurality of molecules specific for a second specific binding partner attached to a tracer particle as in (iv) wherein each molecule specifically binds to each second specific binding partner attached to the tracer particle; and (iv) the tracer particle comprising a secondary detectably labeled particle having attached to the exterior thereof a second specific binding partner for the plurality of molecules of (iii), wherein said complex is formed by contacting the solid phase bound first specific binding partner of (i) with the analyte of (ii), the primary particle of (iii) and the tracer particle of (iv), either by contacting:
- (1) a complex of the solid phase bound first specific binding partner of (i) and the analyte of (ii) with the primary particle of (iii) and subsequently contacting the complex resulting therefrom with the tracer particle of (iv), or

- (2) a complex of the analyte of (ii) and the primary particle of (iii) with the solid phase bound first specific binding partner of (i) and contacting the complex resulting therefrom with the tracer particle of (iv), or
- (3) a complex of the analyte of (ii), the primary particle of (iii) and the tracer particle of (iv) with the solid phase bound first specific binding partner of (i) and
- (b) determining analyte by determining bound or unbound tracer.

5,567,592

# SCREENING METHOD FOR THE IDENTIFICATION OF BIOENHANCERS THROUGH THE INHIBITION OF P-GLYCOPROTEIN TRANSPORT IN THE GUT OF A MAMMAL

Leslie Benet, Belvedere, and Chi Y. Wu, San Francisco, both of Calif., assignors to Regents of the University of California, Oakland, Calif.

Filed Feb. 2, 1994, Ser. No. 190,288

Int. Cl.<sup>6</sup> G01N 33/567; 33/53; C12Q 1/00

U.S. Cl. 435—7.21

7 Claims

1. A method of identifying a compound useful for increasing bioavailability of a drug in a mammal, which comprises:

- screening candidate compounds by assaying for inhibition of transport by P glycoprotein by said candidate compounds in the gut of said mammal, and
- selecting from said candidate compounds a compound that inhibits said transport in said gut, said selected compound being useful for increasing bioavailability of said drug in said mammal.

5,567,593

# CYTODIAGNOSTIC METHOD USING ALSTONINE AS A SELECTIVE MARKER, AND DIAGNOSTIC KIT CONTAINING MARKER

Mirko Beljanski, 46 Boulevard De Port Royal, 75005 Paris, France

PCT No. PCT/FR93/00762, § 371 Date Feb. 22, 1994, § 102(e) Date Feb. 22, 1994, PCT Pub. No. WO93/02829, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 26, 1993, Ser. No. 196,165

Claims priority, application France, Jul. 28, 1992, 92 09283

Int. Cl.<sup>6</sup> G01N 33/574; 33/48; A01N 25/34

U.S. Cl. 435—7.23

21 Claims

1. A method for the detection of tumor cells or of chromosomal aberrations in a tissue sample, comprising treating the tissue sample with a composition comprising alstonine or an isomer thereof, irradiating the treated tissue sample with light having a wavelength effective to induce a fluorescent emission having a wavelength of about 446 nm from alstonine absorbed into tumor cells or cells having a chromosomal aberration; and detecting any fluorescence from the tissue sample.

5,567,594

# METHODS AND COMPOSITIONS FOR THE DETECTION AND TREATMENT OF DISEASES ASSOCIATED WITH ANTIGENS OF MICROORGANISMS

Emanuel Calenoff, Chicago, Ill., assignor to Enteron, L.P., Oak Brook, Ill.

Continuation-in-part of Ser. No. 693,232, Apr. 26, 1991, abandoned. This application Dec. 20, 1993, Ser. No. 170,017

Int. Cl.<sup>6</sup> G01N 33/53; 33/554; 33/569

U.S. Cl. 435—7.32

15 Claims

1. A method of detecting in an individual a condition associated with a microorganism, said microorganism selected from the group consisting of a bacterium, a virus, and a mycoplasma, said method comprising:

- obtaining a library of purified and isolated antigens from a single species of microorganism wherein said library is specific for the condition;
- measuring an antigen/antibody reaction between (i) immunoglobulin E in a biological sample from the individual, wherein immunoglobulin E is the antibody, and (ii) the isolated antigens of a library of purified antigens specific for the microorganism, and
- determining whether the condition is present, wherein the presence of said antigen/antibody reaction for said antigens indicates the presence of said condition in the individual.

5,567,595

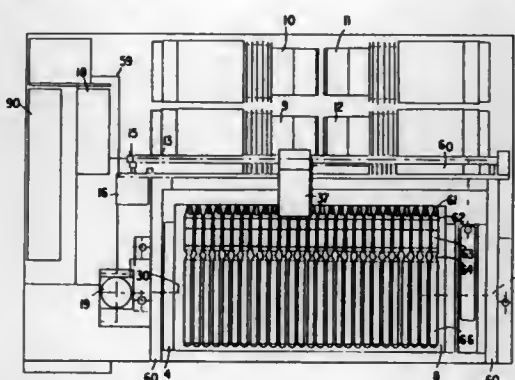
## ANALYTICAL APPARATUS AND METHOD FOR AUTOMATED BLOT ASSAY

Lim J. Kok, Singapore, Singapore, assignor to Genelabs Diagnostics PTE Ltd., Singapore  
Continuation of Ser. No. 284,281, Aug. 2, 1994, abandoned, which is a continuation of Ser. No. 926,018, Aug. 7, 1992, abandoned, which is a continuation of Ser. No. 448,114, Dec. 13, 1989, abandoned. This application Mar. 9, 1995, Ser. No. 401,662

Int. Cl. G01N 33/543;35/00

U.S. Cl. 435—7.92

15 Claims



1. An automated assay apparatus comprising:
  - a tray having a reaction zone for receiving a solution and retainer means for retaining at least one reactant strip means in said reaction zone, said reactant strip means comprising at least one reactant for an assay immobilized on a support;
  - a rocking and draining means for rocking the tray in order to disperse the solution over said strip means and for further tilting the tray in order to drain said solution from said reaction zone;
  - a means for dispensing at least one solution to said reaction zone said tray; and
  - a control means for activating (i) said means for rocking said tray and draining said zone, and (ii) said means for dispensing, according to a predetermined schedule.

5,567,596

## RAPID ASSAY OF ACTIVATORS AND INHIBITORS OF CLOTTING

Scott L. Diamond, Snyder, and Jung-He Wu, Amherst, both of N.Y., assignors to Research Foundation of State University of New York, Amherst, N.Y.

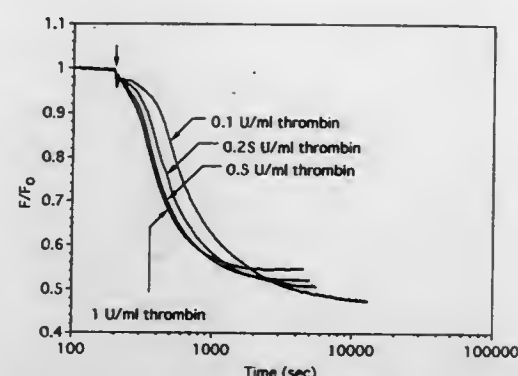
Filed Dec. 29, 1994, Ser. No. 365,780

Int. Cl. C12Q 1/56

U.S. Cl. 435—13

26 Claims

1. A method for measuring in a sample a body fluid component's activity in an enzyme-catalyzed polymerization reaction of a protein substrate, wherein the component is the enzyme that catalyzes the polymerization of said substrate, said method comprising the sequential steps of:



- (a) measuring a basal level of fluorescence emission of a reaction mixture comprising a reaction buffer and a known amount of the substrate which has been labeled with fluorescent molecules, wherein the substrate
  - (i) is selected from the group consisting of fibrinogen and procollagen,
  - (ii) is soluble in the reaction mixture, and
  - (iii) is a template on which molecular assemblies occur;
- (b) contacting the sample with the reaction mixture;
- (c) incubating the reaction mixture for a sufficient time for the polymerization reaction to occur in solution;
- (d) exposing the reaction mixture to an excitation wavelength specific for the fluorescent molecules; and
- (e) detecting the fluorescence emission from the polymerization reaction wherein reduced fluorescence emission, relative to the basal level of fluorescence emission, is indicative of the polymerization of the fluorescent-labeled substrate and proportional to the enzyme's activity in the sample.

12. A method for measuring in a sample a body fluid component's activity in an enzyme-catalyzed degradation reaction of a protein substrate, wherein the component is the enzyme that catalyzes the degradation of said substrate, said method comprising the sequential steps of:

- (a) measuring a basal level of fluorescence emission of a reaction mixture comprising a reaction buffer and a known amount of the substrate which has been labeled with fluorescent molecules, wherein the substrate
  - (i) is selected from the group consisting of fibrinogen, fibrin, and collagen,
  - (ii) is soluble in the reaction mixture, and
  - (iii) is a template on which molecular assemblies occur;
- (b) contacting the sample with the reaction mixture;
- (c) incubating the reaction mixture for a sufficient time for the degradation reaction to occur in solution;
- (d) exposing the reaction mixture to an excitation wavelength specific for the fluorescent molecules; and
- (e) detecting the fluorescence emission from the degradation reaction wherein increased fluorescence emission, relative to the basal level of fluorescence emission, is indicative of the degradation of the fluorescent-labeled substrate and proportional to the enzyme's activity in the sample.

5,567,597

## HYDROLYTIC ENZYME INHIBITORS/INACTIVATORS AND METHODS FOR USING SAME

Edward A. Dennis, LaJolla, Calif., and William N. Washburn, Titusville, N.J., assignors to The Regents of the University of California, Oakland, Calif.

Division of Ser. No. 162,578, Dec. 2, 1993, Pat. No. 5,427,919, which is a division of Ser. No. 713,116, Jun. 10, 1991, Pat. No. 5,308,766, which is a continuation of Ser. No. 399,799, Aug. 29, 1989, abandoned. This application Feb. 14, 1995, Ser. No. 388,377

Int. Cl. C12Q 1/34;1/00; C12N 9/96; C07F 9/02

U.S. Cl. 435—18

2 Claims

1. A method for preparing a therapeutically useful composition which comprises compounding a pharmaceutically acceptable form

5,567,599

## METHOD FOR PRODUCING TRANSFORMED CHRYSANTHEMUM PLANTS

Christine S. Lemieux, Oakland, Calif., assignor to Florigene Europe B.V., Rijnsburg, Netherlands

Continuation of Ser. No. 570,575, Aug. 21, 1990, abandoned.

This application Jan. 26, 1994, Ser. No. 251,392

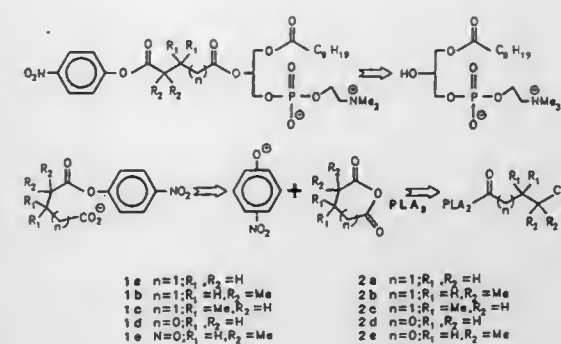
Int. Cl. C12N 15/00;15/82

U.S. Cl. 435—172.3

61 Claims

1. A method for producing a chrysanthemum plant comprising an exogenous DNA fragment, which chrysanthemum plant is capable of expressing a gene within the exogenous DNA fragment, comprising the steps of:

- (a) isolating an explant from source material from a chrysanthemum plant, wherein said source material is selected from the group consisting of leaf, stem, peduncle, petiole, meristem, and shoot apex;
- (b) inoculating the explant from source material from the chrysanthemum plant with a culture of Agrobacterium, which Agrobacterium comprises an exogenous DNA fragment comprising a gene under the control of a promoter capable of promoting the transcription of the gene within the exogenous fragment, to obtain an inoculated explant;
- (c) incubating the inoculated explant of step (b) on an incubation medium;
- (d) culturing the incubated explant of step (c) on a regeneration medium to obtain regenerated shoots of the chrysanthemum plant; and
- (e) culturing the regenerated shoots of step (d) on a rooting medium to obtain a chrysanthemum plant comprising the exogenous DNA fragment, in which the chrysanthemum plant is capable of expressing the gene within the exogenous DNA fragment.



of a compound of the formula:



with a pharmaceutically acceptable carrier, wherein

R is oxygen or imino,

each X independently is oxygen, sulfur or imino,

A is a moiety recognized by phospholipase A<sub>2</sub> enzyme wherein said enzyme hydrolyses the bond linking AX with C(O)Y,

B is a physiologically acceptable leaving group,

Y is an alkylene or alkenylene optionally substituted with one or more lower alkyl groups.

5,567,598

## MICROBIAL MONITORING DEVICE

David T. Stitt, Freeland, Md.; Gregory J. Burrell, Red Lion, Pa.; Kwok-Yu Hu, Ellicott City, Md.; James F. Monthey, Baltimore, Md., and Robert Sapitowicz, Abingdon, Md., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 687,359, Apr. 18, 1991, abandoned.

This application Mar. 3, 1993, Ser. No. 25,899

Int. Cl. C12Q 1/18

U.S. Cl. 435—29

34 Claims

1. A method for detecting the presence of respiring microorganisms in a fluid comprising:

- (i) contacting said fluid with a sensor composition which comprises a fluorescent compound that exhibits a reduction in fluorescent intensity, when irradiated with light containing wavelengths which cause said compound to fluoresce, upon exposure to oxygen, wherein the presence of the sensor composition is non-destructive to the microorganism;
- (ii) irradiating said sensor composition with light containing wavelengths which cause said fluorescent compound to fluoresce;
- (iii) measuring or visually observing the fluorescent light intensity from said fluorescent compound while irradiating said sensor compound with said light;
- (iv) comparing said measurement to that of a control not containing a respiring microorganism, wherein said control is selected from the group consisting of: a reagent control not in contact with respiring microorganisms and a calculated threshold, wherein a change in fluorescent intensity relative to the fluorescent intensity of the control is indicative of the presence of respiring microorganisms; and
- (v) in the event that no such increase is measured or observed, repeat steps (ii), (iii), and (iv) as needed, to detect the presence of respiring microorganisms in said fluid.

5,567,600

## SYNTHETIC INSECTICIDAL CRYSTAL PROTEIN GENE

Michael J. Adang, Athens, Ga.; Thomas A. Rocheleau, Madison, Wis.; Donald J. Merlo, Carmel, Ind., and Elizabeth E. Murray, Madison, Wis., assignors to Mycogen Plant Sciences, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 57,191, May 3, 1993, Pat. No. 5,380,831, which is a continuation of Ser. No. 827,844, Jan. 28, 1992, abandoned, which is a continuation of Ser. No. 242,482, Sep. 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 848,733, Apr. 4, 1986, abandoned, which is a continuation-in-part of Ser. No. 535,354, Sep. 24, 1983, abandoned. This application Jan. 6, 1995, Ser. No. 369,835

Int. Cl. C12N 15/32

U.S. Cl. 536—23.71

24 Claims

1. A method of designing a synthetic *Bacillus thuringiensis* gene to be more highly expressed in plants, comprising the steps of:

- (a) analyzing the coding sequence of a gene derived from a *Bacillus thuringiensis* which encodes a pesticidal protein toxin;
  - (b) modifying a portion of said coding sequence to yield a modified sequence which contains a greater number of codons preferred by the intended plant host than did said coding sequence prior to modification, said modification comprising reducing the number codons having CG in codon positions II and III in a region between plant polyadenylation signals in said coding sequence;
  - (c) inserting said modified sequence into the genome of a plant cell; and
  - (d) maintaining said plant cell under conditions suitable to allow replication of said plant cell to produce additional plant cells having said modified sequence in the genome of said additional plant cells, wherein said synthetic *Bacillus thuringiensis* gene is expressed to produce a pesticidal protein toxin.
13. A method of designing a synthesis *Bacillus thuringiensis* gene to be more highly expressed in plants, comprising the steps of:



- (a) analyzing the coding sequence of a gene derived from a *Bacillus thuringiensis* which encodes a pesticidal protein toxin;
- (b) modifying a portion of said coding sequence to yield a modified sequence which contains a greater number of codons preferred by the intended plant host than did said coding sequence prior to modification, and wherein said modification results in fewer occurrences of the sequence AATGAA in said modified sequence than in said coding sequence;
- (c) inserting said modified sequence into the genome of a plant cell; and
- (d) maintaining said plant cell under conditions suitable to allow replication of said plant cell to produce additional plant cells having said modified sequence in the genome of said additional plant cells, wherein said synthesis *Bacillus thuringiensis* gene is expressed to produce a pesticidal protein toxin.

5,567,601

#### SUBTILISIN MUTANTS LACKING A PRIMARY CALCIUM BINDING SITE

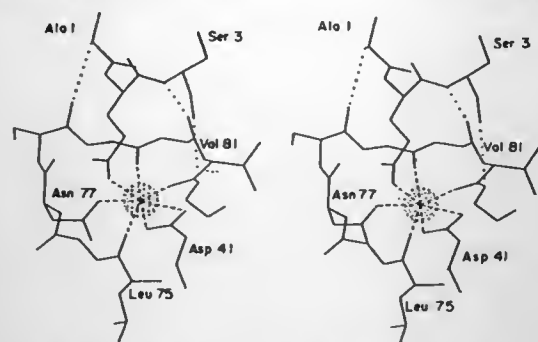
Philip N. Bryan; Patrick A. Alexander, both of Silver Spring, and Susan L. Strausberg, Rockville, all of Md., assignors to University of Maryland, College Park, Md.

Continuation-in-part of Ser. No. 69,863, Jun. 1, 1993, Pat. No. 5,470,733. This application Sep. 20, 1994, Ser. No. 309,069

Int. Cl.<sup>6</sup> C12N 9/56; 15/11; 15/57; 15/75

U.S. Cl. 435—222

14 Claims



1. An enzymatically active subtilisin protein which has been mutated to eliminate the ability of said subtilisin protein to bind calcium at a high affinity calcium binding sites wherein the mutated subtilisin protein comprises (1) a deletion of amino acids corresponding to amino acid positions 75–83 of the mature subtilisin BPN<sup>®</sup>, and, (2) one or more additional, stabilizing, mutations comprising amino acid deletions, substitutions, and/or additions in at least one region selected from the following regions and amino acid positions numbered according to the corresponding regions and amino acid sequence positions of the mature subtilisin BPN<sup>®</sup>: the N-terminal amino acid positions 1–8, the  $\omega$ -loop amino acid positions 36–45, the  $\alpha$ -helix amino acid positions 70–74, the helix turn amino acid positions 84–89, and the  $\beta$ -ribbon amino acid positions 202–219.

5,567,602

#### RECOMBINANT PRODUCTION OF CHYMASE

James M. Clark, San Mateo; Kevin R. Shoemaker, and Robert L. Warne, both of San Francisco, all of Calif., assignors to Arris Pharmaceutical Corporation, South San Francisco, Calif.

Filed Aug. 12, 1992, Ser. No. 929,198

Int. Cl.<sup>6</sup> C12N 15/57; 15/62; 15/09; 15/10

U.S. Cl. 435—226

6 Claims

1. A method for producing a chymase comprising the following steps in the stated order:

- (a) culturing a host cell which contains a recombinant DNA molecule comprising a first nucleotide sequence encoding a

fusion protein, which fusion protein comprises at least a portion of a non-chymase protein joined via a peptide bond to a chymase having an amino acid sequence selected from the group consisting of SEQ ID NO:2, SEQ ID NO:4, and SEQ ID NO:6; and a second nucleotide sequence comprising a promoter, which promoter controls expression of the first nucleotide sequence, whereby the fusion protein is expressed by the cultured cell;

- (b) recovering the fusion protein expressed by the cultured cell;
- (c) refolding the fusion protein;

- (d) cleaving the portion of the non-chymase protein from the chymase; and

- (e) recovering the chymase;

whereby the recovered chymase is proteolytically active, in which the refolding step comprises the following steps in the stated order:

- (i) incubating the protein in a reducing buffer; and
- (ii) incubating the protein in an oxidizing buffer.

5,567,603

#### HIV-3 RETROVIRUS AND ITS USE

Robert De Leys, Grimbergen; Bart Vanderborgh, Geel; Eric Saman, Niklaas, and Hugo Van Heuverswyn, Laarne, all of Belgium, assignors to Innogenetics N.V., Belgium

Division of Ser. No. 460,913, Mar. 23, 1990, Pat. No.

5,304,466. This application Apr. 15, 1994, Ser. No. 228,519

Claims priority, application European Pat. Off., Jun. 9, 1988, 88109200

Int. Cl.<sup>6</sup> C12N 7/00; C12Q 1/70; 1/68; C07H 21/04

U.S. Cl. 435—235.1

15 Claims

1. HIV-3 retrovirus or variants of this virus having the essential morphological and immunological properties of any of the retroviruses deposited at the European Collection of Animal Cell Cultures (ECACC) under No. V88060301, said essential morphological and immunological properties are as follows:

- the virus exhibits a tropism for T4 lymphocytes;
- the virus is cytotoxic for the lymphocytes that it infects;
- the virus has a diameter of approximately 120 nm;
- the virus possesses a magnesium dependent reverse transcriptase activity;
- the virus can be cultivated in T4 receptor-bearing immortalized cell lines;

lysates of the virus contain a p25 protein which is immunologically distinct from the p19 protein of HTLV-I and the p24 proteins of HIV-1 and HIV-2 as determined by Western blot analysis, respectively;

lysates of the virus contain a gp120 protein which is immunologically distinct from the gp110 protein of HTLV-I, the gp120 of HIV-1 and the gp120 of HIV-2 as determined by western blot analysis;

the lysate of the virus contains in addition a gp41 glycoprotein with a molecular weight of 40,000–45,000;

the genomic RNA of HIV-3 hybridizes neither with the sequences of HIV-1 nor with the sequences of HIV-2 under stringent hybridization conditions; and

lysates of the virus contain a p12 protein which is immunologically distinct from the p12 proteins of HIV-1 and HIV-2 as determined by Western blot analysis.

5,567,604

#### ANTI-VIRAL GUANOSINE-RICH OLIGONUCLEOTIDES

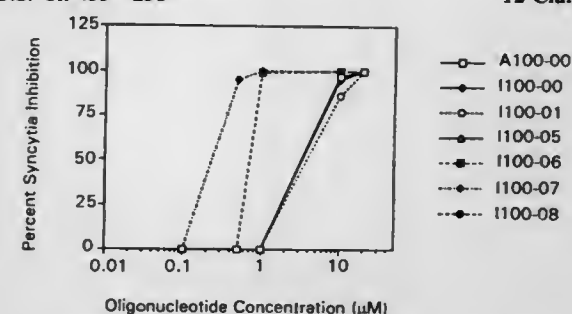
Robert F. Rando; Susan Fennwald; Joseph G. Zengdel, all of The Woodlands, and Joshua O. Ojwang, Spring, all of Tex., assignors to Aronex Pharmaceuticals, Inc., The Woodlands, Tex.

Continuation-in-part of Ser. No. 53,027, Apr. 23, 1993, abandoned. This application Oct. 28, 1993, Ser. No. 145,704

Int. Cl.<sup>6</sup> C12N 7/06

U.S. Cl. 435—238

12 Claims



1. A method of inhibiting the production of a human immunodeficiency virus in cultured cells comprising contacting said virus with an oligonucleotide selected from the group consisting of SEQ ID NOS: 2–27, 29 and 31–39.

5,567,605

#### ASSAY FOR D-ALLOSE USING A NAD COFACTOR COUPLED D-ALLOSE DEHYDROGENASE

Edward J. St. Martin, Libertyville, Ill., assignor to UOP, Des Plaines, Ill.

Filed Nov. 21, 1994, Ser. No. 342,502

Int. Cl.<sup>6</sup> C12Q 1/32; 1/26; G01N 33/00; 33/48

U.S. Cl. 435—26

6 Claims

1. A method of determining the amount of only D-allose present in an aqueous medium, said aqueous medium optionally containing at least one other D-aldoheose, comprising selectively oxidizing said D-allose with a D-allose-specific dehydrogenase elaborated by a strain of *Exophiala pisciphila* in the presence of nicotinamide adenine dinucleotide at a pH between about 8.5 and about 9.5 and at a temperature from about 25° to about 75° C., measuring the formation of the reduced form of nicotinamide adenine dinucleotide (NADH<sub>2</sub>), and relating the rate of NADH<sub>2</sub> formation to D-allose concentration using a standard curve of NADH<sub>2</sub> formation rate versus D-allose concentration.

5,567,606

#### ANTIFOAMING AGENT FOR FERMENTATION, L-AMINO ACID-PRODUCING MEDIUM AND PRODUCTION PROCESS OF L-AMINO ACIDS

Masaharu Hayashi; Yuichi Hioki; Masafumi Shonaka, and Tadashi Moriyama, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 36,281, Mar. 24, 1993, abandoned.

This application Feb. 28, 1995, Ser. No. 395,656

Claims priority, application Japan, Apr. 10, 1992, 4-090723; May 12, 1992, 4-118898; Aug. 7, 1992, 4-211698

Int. Cl.<sup>6</sup> C12P 13/04; C09K 3/00; C07C 51/43

U.S. Cl. 435—106

7 Claims

1. A method of reducing the tendency of an aqueous fermentation medium to foam, comprising:

- adding to the aqueous fermentation medium a defoaming agent which is the reaction product obtained by reacting at least one alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide, butylene oxide or mixtures thereof with a mixture of (1) at least one vegetable oil or animal oil and (2) a trihydric or higher polyhydric alcohol, said reaction product having a fatty acid content as low as the beef tallow

component of the composition: beef tallow/pentaerythritol/ethylene oxide/propylene oxide in a mole ratio of 1:0.5:10:45 to as high as the coconut oil content of the composition: coconut oil/glycerol/ethylene oxide in a mole ratio of 1:1:20.

5,567,607

#### METHOD OF PRODUCING TRANSGENIC ANIMALS

Xi Zhao, and Tal-kin Wong, both of Saratoga, Calif., assignors to Incell, Santa Clara, Calif.

Continuation of Ser. No. 291,136, Aug. 16, 1994, abandoned, which is a continuation of Ser. No. 59,180, May 6, 1993, abandoned, which is a continuation of Ser. No. 475,726, Feb. 6, 1990, abandoned, which is a continuation-in-part of Ser. No. 215,670, Jul. 6, 1988, abandoned, which is a continuation-in-part of Ser. No. 142,320, Dec. 30, 1987, Pat. No. 4,849,355, which is a continuation of Ser. No. 689,657, Jan. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 315,944, Oct. 28, 1981, abandoned. This application Apr. 19, 1995, Ser. No. 424,221

Int. Cl.<sup>6</sup> C12N 15/85; 5/16; 13/00

U.S. Cl. 435—172.1

13 Claims

1. A method for transferring DNA into fertilized eggs of a non-human mammal, comprising: subjecting a mixture of said DNA and said fertilized eggs to pulses of an electric field for a time sufficient to effect transfer of said DNA to said fertilized eggs.

5,567,608

#### BIOCATALYSTS IMMOBILIZED IN A STORAGE STABLE COPOLYMER GEL

Toshiaki Doi; Hiroyasu Bamba, and Kouzou Murao, all of Kanagawa, Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jan. 9, 1995, Ser. No. 370,254

Claims priority, application Japan, Jan. 11, 1994, 6-012279

Int. Cl.<sup>6</sup> C12N 11/04; 11/08

U.S. Cl. 435—182

6 Claims

1. An immobilized biocatalyst consisting essentially of polymer gel entrapping a biocatalyst wherein the polymer gel is a copolymer of an N,N-dialkylacrylamide monomer selected from the group consisting of N,N-dimethylacrylamide and N,N-diethylacrylamide in an amount of from about 70 to about 99.8% by weight with a cationic acrylamide monomer selected from the group consisting of N,N-dimethylaminopropylacrylamide, N,N-dimethylaminopropylmethacrylamide, N,N-diethylaminopropylacrylamide, N,N-diethylaminopropylmethacrylamide, and quaternary compounds thereof in an amount of from about 0.1 to about 10% by weight and a water-soluble cross-linking monomer selected from the group consisting of N,N'-methylenebisacrylamide, N,N'-methylenebisacrylamide, N,N'-(1,2-dihydroxyethylene) bisacrylamide, 1,3-diacrylamide methyl-2-imidazolidone and diacrylamide methylethylene urea in an amount of from about 0.1 to about 20% by weight.

5,567,609

#### USE OF ISOLATED DOMAINS OF TYPE IV COLLAGEN TO MODIFY CELL AND TISSUE INTERACTIONS

Michael P. Sarras, Jr., Kansas City, and Billy G. Hudson, Lenexa, both of Kans., assignors to University of Kansas Medical Center, Kansas City, Kans.

Filed Jun. 30, 1994, Ser. No. 268,969

Int. Cl.<sup>6</sup> C12N 5/00; C07K 1/00

U.S. Cl. 435—240.2

3 Claims

1. A method for inhibiting in vitro basal lamina membrane formation in animal cell or tissue development, comprising:

contacting the animal cell or tissue with at least one isolated domain of type IV collagen, wherein said isolated domain is selected from the group consisting of 7S or NC1 domains of type IV collagen.

5,567,610

# METHOD OF PRODUCING HUMAN MONOCLONAL ANTIBODIES AND KIT THEREFOR

Carl Borrebaeck; Lena Danielsson, and Susanna Möller, all of Lund, Sweden, assignors to Biolnvent International AB, Lund, Sweden

Continuation of Ser. No. 888,480, May 22, 1992, abandoned, which is a continuation of Ser. No. 326,664, Mar. 3, 1989, abandoned. This application Oct. 17, 1994, Ser. No. 323,593 Claims priority, application Sweden, Sep. 4, 1986, 8603711; Feb. 11, 1987, 8603711

Int. Cl.<sup>6</sup> C12N 5/00; 15/00

U.S. Cl. 435—240.2

11 Claims

1. In an improved method for in vitro immunization of lymphocytes for use in production of human monoclonal antibodies, the improvement comprising:

exposing human peripheral blood lymphocytes to a lysomotropic agent selected from the group consisting of L-leucine-O-methyl ester, L-glutamic acid dimethyl ester and L-leucyl-L-leucine-O-methyl ester to produce treated human lymphocytes; and

exposing said treated human lymphocytes to an antigen to activate lymphocytes wherein said treated, activated lymphocytes produce antibody which specifically binds said antigen.

5,567,611

# MULTIFUNCTIONAL M-CSF PROTEINS AND GENES ENCODING THEREFOR

Peter Ralph, Orinda; George Martin, Berkeley; Michael Piatak, Pleasanton, and James W. Larrick, Woodside, all of Calif., assignors to Cetus Oncology Corporation, Emeryville, Calif.

Continuation of Ser. No. 995,338, Dec. 21, 1992, abandoned, which is a continuation of Ser. No. 340,228, Apr. 19, 1989, abandoned. This application Dec. 12, 1994, Ser. No. 354,456

Int. Cl.<sup>6</sup> C12N 15/00; 15/24; 15/20; 15/27

U.S. Cl. 435—240.2

23 Claims

1. An isolated DNA encoding a multifunctional fusion protein having an M-CSF component and second bioactive component, wherein said DNA comprises a portion encoding an M-CSF protein capable of stimulating formation of primarily macrophage colonies in the in vitro colony-stimulating assay, which portion is in frame with a portion encoding a second bioactive protein selected from the group consisting of IL-1, IL-2, IFN- $\gamma$ , and G-CSF, said M-CSF protein having amino acids 1 to 522 of SEQ ID NO: 2 or amino acids 1 to 224 of SEQ ID NO: 4 or being a biologically active fragment thereof, said fragment thereof having M-CSF activity and an N-terminus that begins with an amino acid residue at a position that is a member of the group consisting of positions 1, 2, 3 and 4 of SEQ ID NOS: 2 and 4, and having C-terminus that ends with an amino acid residue at a position that is a member of the group consisting of positions 150, 158, 190, 221 and 224 of SEQ ID NOS: 2 and 4, and 522 of SEQ ID NO: 2; said second bioactive protein having the provisions: when the second bioactive protein is IL-1, said IL-1 protein comprises amino acid residues 127 through 271 of human IL-1 $\alpha$  or amino acid residues 1 through 147 of human IL-1 $\beta$  as shown in SEQ ID NO: 8; when said second bioactive protein is IL-2, said IL-2 protein comprises amino acid residues 12 through 127 of SEQ ID NOS: 5 or 6, said fusion protein being capable of stimulating the proliferation of T-lymphocytes; when said second bioactive protein is IFN- $\gamma$ , said IFN- $\gamma$  protein comprises amino acid residues 6 through 127 of human IFN- $\gamma$  as shown in SEQ ID NO: 9, said fusion protein having IFN- $\gamma$  activity; and when said second bioactive protein is G-CSF,

said G-CSF protein comprises amino acid residues 1 through 163 of recombinant G-CSF as shown in SEQ ID NO: 7, said fusion protein capable of stimulating the production of primarily neutrophil colonies of neutrophil-macrophage colonies in a colony forming assay using bone marrow progenitor cells of a species in which stimulation is to be effected.

5,567,612

# GENITOURINARY CELL-MATRIX STRUCTURE FOR IMPLANTATION INTO A HUMAN AND A METHOD OF MAKING

Joseph P. Vacanti, Winchester, and Michael R. Freeman, Boston, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, and Children's Medical Center Corporation, Boston, both of Mass.

Continuation of Ser. No. 781,898, Oct. 24, 1991, abandoned, which is a continuation-in-part of Ser. No. 679,177, Mar. 26, 1991, abandoned, which is a continuation of Ser. No. 401,648, Aug. 30, 1989, abandoned, which is a continuation of Ser. No. 123,579, Nov. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 933,018, Nov. 20, 1986, abandoned. This application Jul. 27, 1993, Ser. No. 98,569

Int. Cl.<sup>6</sup> C12N 5/00; A01N 1/02; 63/00; A61F 2/02; 2/04; 13/00; 2/00; A61K 9/14

U.S. Cl. 435—240.23

11 Claims

1. A genitourinary cell-matrix structure for implantation into a human comprising:

a biocompatible, biodegradable polymeric matrix comprising a plurality of fibers in a nutrient environment; and parenchymal cells of human genitourinary origin attached to and within the matrix in vitro,

wherein the matrix provides a scaffold for cell attachment and has a surface area sufficient to provide free exchange of nutrients and waste by diffusion for attached cells to survive in vitro prior to implantation and in the absence of vascularization, and wherein the matrix is formed in a shape for reconstruction of a genitourinary structure.

5,567,613

Patent Not Issued For This Number

5,567,614

# ENZYMATIC PROCESSES FOR RESOLUTION OF ENANTIOMERIC MIXTURES OF COMPOUNDS USEFUL AS INTERMEDIATES IN THE PREPARATION OF TAXANES

Ramesh N. Patel, Bridgewater; Laszlo J. Szarka, East Brunswick, and Richard Partyka, Neshanic, all of N.J., assignors to E.R. Squibb & Sons, Inc., Princeton, N.J.

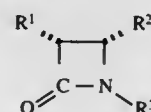
Division of Ser. No. 822,015, Jan. 15, 1992, abandoned. This application May 23, 1994, Ser. No. 247,789

Int. Cl.<sup>6</sup> C12P 17/02; 17/10

U.S. Cl. 435—280

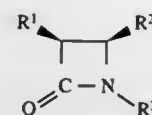
31 Claims

1. A method for the resolution of a mixture I comprising the enantiomers Ia and Ib, where R<sup>1</sup> is in the cis position relative to R<sup>2</sup> in both Ia and Ib:

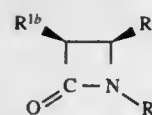
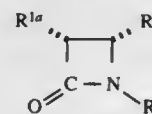


(Ia)

-continued



to form a mixture II comprising the compounds IIa and IIb, where R<sup>1a</sup> and R<sup>1b</sup> are in the cis position relative to R<sup>2</sup> in both IIa and IIb:



where

R<sup>1</sup> is —O—C(O)—alkyl or —O—C(O)—alkenyl;

one of R<sup>1a</sup> or R<sup>1b</sup> is the same as R<sup>1</sup> and the other of R<sup>1a</sup> or R<sup>1b</sup> is hydroxyl;

R<sup>2</sup> is aryl; and

R<sup>3</sup> is hydrogen, aryl, —C(O)—O-alkyl, or —C(O)—aryl;

wherein said alkyl and alkenyl groups contain 1 to 15 carbons in the normal chain and said aryl groups contain 6 to 12 carbons in the ring portion;

comprising the steps of (a) contacting said mixture I with a carboxylic ester hydrolase enzyme or a microorganism having a carboxylic ester hydrolase enzyme, wherein said enzyme catalyzes the stereoselective hydrolysis of said mixture I to provide said mixture II, (b) effecting said hydrolysis, and (c) recovering one or both of said compounds IIa and IIb.

5,567,615

# AFFINITY SEPARATION METHOD

Peter J. Degen, Huntington, N.Y.; Tony Alex, Kendall Park, N.J., and Richard F. Salinaro, Hastings on Hudson, N.Y., assignors to Pall Corporation, East Hills, N.Y.

Continuation of Ser. No. 172,475, Dec. 23, 1993, abandoned.

This application Feb. 28, 1995, Ser. No. 396,343

Int. Cl.<sup>6</sup> C12P 1/00; C07K 1/22; A61K 39/395; C02F 1/28

U.S. Cl. 435—280

34 Claims

1. A method of affinity separation for isolating a target compound from a fluid comprising:

(a) introducing

(1) a fluid containing a target compound to be isolated, and (2) affinity particles capable of adsorbing the target compound into a dynamic filtration apparatus comprising

motive means, a porous filtration medium having an upstream side and a downstream side, an inlet in fluid communication with the upstream side of said filtration medium, and a filtrate outlet in fluid communication with the downstream side of said filtration medium, wherein said fluid is capable of passing through said filtration medium and said affinity particles are incapable of passing through said filtration medium,

(b) closing said filtrate outlet of said dynamic filtration apparatus and preventing the passage of said fluid through said filtration medium,

(c) mixing said affinity particles and said fluid in said dynamic filtration apparatus by operating said motive means of said dynamic filtration apparatus and adsorbing said target compound onto said affinity particles, wherein operating said motive means moves said fluid relative to said filtration medium and creates a shear at the fluid-filtration medium interface which is nearly independent of any cross-flow fluid velocity,

(d) opening said filtrate outlet of said dynamic filtration apparatus and passing said fluid through said filtration medium of said dynamic filtration apparatus,

(e) washing said affinity particles, and  
(f) eluting said target compound from said affinity particles.

5,567,616

# APPARATUS FOR SUPPORTING AND DRIVING A ROTATING CYLINDER

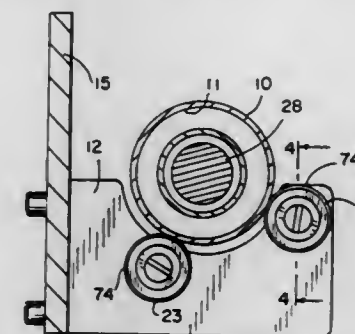
John J. Dill, II, Kalamazoo, Mich., assignor to Dill Instruments, Kalamazoo, Mich.

Filed Mar. 7, 1994, Ser. No. 206,776

Int. Cl.<sup>6</sup> C12M 1/10; 1/42

U.S. Cl. 435—283.1

22 Claims



1. An apparatus for processing material by axially rotating a hollow cylinder, wherein the material is introduced into the hollow cylinder, the apparatus comprising:

a. a cylinder having an outer peripheral wall, an inner peripheral wall and an axis at an inclined angle, the cylinder further including an upper inlet end and a lower discharge end;

b. a support plate having a lower end plate extending therefrom, the lower end plate positioned substantially perpendicular to the cylinder axis, and having an axial through hole larger than the cylinder the through hole adapted for coaxially receiving the lower discharge end of the cylinder;

c. a support member attached to the support plate, the support member disposed for supporting the cylinder while permitting axial rotation of the cylinder;

d. a collection cup attached to the lower end plate, the collection cup comprising an outer cylindrical sleeve having an open end and an opposite closed end, the open end adapted to be mounted over the through hole of the lower end plate; and

e. the collection cup including an inner sleeve coaxial with the outer sleeve and having one end extending through the closed end of the cup to form an extension and an opposite open end in communication with the cylinder.

5,567,617

# APPARATUS FOR HEATING A FLUID-CARRYING COMPARTMENT OF REACTION CUVETTE

Craig A. Caprio; Michael R. Van der Gaag, both of Rochester, N.Y.; Charles C. Hinckley, Santa Rosa, Calif., and John B. Chemelli, Webster, N.Y., assignors to Johnson & Johnson Clinical Diagnostics, Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 178,206, Jan. 6, 1994, abandoned. This application Jan. 5, 1995, Ser. No. 369,057

Int. Cl.<sup>6</sup> C12M 1/40; 1/38

U.S. Cl. 435—287.2

15 Claims

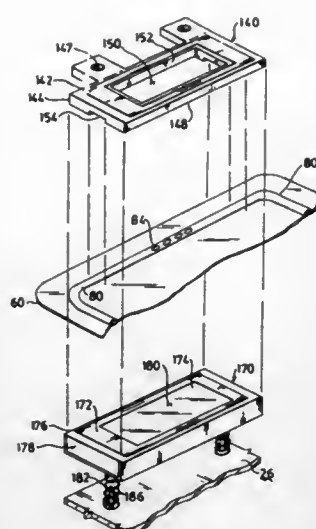
1. An assembly for heating a fluid-carrying portion of a reaction cuvette comprising:

a first heating element comprising a source of heat and a heat-delivering surface;

a support for supporting a reaction cuvette having at least one compliant fluid-carrying compartment;

and means for moving said heat-delivering surface into and out of intimate contact with a portion of said supported cuvette, wherein said heat-delivering surface further comprises





- a) means defining a fixed passage within said heat-delivering surface permanently sized to receive said at least one compliant fluid-carrying compartment for allowing flow therethrough while said first heating element is engaged with said cuvette, and
- b) means for viewing said fluid-carrying compartment while said first heating element is engaged with said cuvette, said passage extending to said viewing means from opposite sides of said heat-delivering surface.

5,567,618

## KARL FISCHER REAGENT

Eugen Scholz, Garbsen, Germany, assignor to Riedel-De Haen Aktiengesellschaft, Germany

Filed May 18, 1995, Ser. No. 445,210

Claims priority, application Germany, Jun. 18, 1994, 44 21 453.7

Int. Cl.<sup>6</sup> G01N 33/18

U.S. Cl. 436—42

18 Claims

1. Karl Fischer reagent for the determination of water, comprising a base, sulfur dioxide, iodine or iodide, and tetrahydrofurfuryl alcohol (THFA) as an alcohol component.

5,567,619

## PROCESS AND APPARATUS FOR TESTING FOR SUBSTANCES IN LIQUIDS

Marcia J. Stone, Wellesley, Mass., assignor to HybriVet Systems, Inc., Natick, Mass.

Continuation-in-part of Ser. No. 105,842, Aug. 13, 1993, Pat.

No. 5,416,028. This application May 15, 1995, Ser. No. 441,312

Int. Cl.<sup>6</sup> G01N 33/20

U.S. Cl. 436—77

25 Claims

1. A method for detecting lead in a liquid sample comprising: mixing the liquid sample with a first reagent that causes the lead to precipitate; filtering the precipitate from the liquid sample; releasing the lead from the precipitate by contacting the precipitate with an organic solvent and an oxidizing agent; and testing the precipitate for lead by contacting the precipitate with a second reagent that forms a colorimetric reaction when exposed to lead.



5,567,620

## NON-DENATURING POTENCY ASSAY FOR SOMATOTROPIN

Jen P. Chang, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 357,073, Dec. 15, 1994, abandoned, which is a continuation of Ser. No. 9,034, Jan. 26, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 468,015

Int. Cl.<sup>6</sup> G01N 30/06

U.S. Cl. 436—87

35 Claims

1. A method for determining the potency of a bovine somatotropin sample, comprising:

providing a bovine somatotropin sample dissolved in a first aqueous buffer solution having a pH above 8.5 and less than 12 and which is non-denaturing to the bovine somatotropin sample, said aqueous buffer solution being effective for dissolving both biologically-active bovine somatotropin and biologically-inactive bovine somatotropin non-covalent aggregates having a molecular weight above about 500,000 daltons;

measuring the level of biologically-active bovine somatotropin in the bovine somatotropin sample by size exclusion HPLC employing as a mobile phase a second aqueous buffer solution which is non-denaturing to the bovine somatotropin sample; said size exclusion HPLC also employing a stationary phase which is stable against degradation at the pH of said mobile phase; and

determining the potency of the bovine somatotropin sample based upon the measured level of biologically active bovine somatotropin in the sample.

5,567,621

## METHOD OF AND APPARATUS FOR ANALYZING NITROGEN COMPOUND AND PHOSPHORUS COMPOUND CONTAINED IN WATER

Shu Tahara, Shiga, and Yauzo Morita, Kyoto, both of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Jul. 11, 1994, Ser. No. 272,747

Claims priority, application Japan, Jul. 14, 1993, 5-197964; Jul. 14, 1993, 5-197965; Nov. 30, 1993, 5-330042; Apr. 30, 1994, 6-114236; May 16, 1994, 6-126769

Int. Cl.<sup>6</sup> G01N 21/78

U.S. Cl. 436—103

15 Claims

1. An analytical method of analyzing a nitrogen compound and a phosphorus compound being contained in water, comprising the following steps (A) to (C):

5,567,623

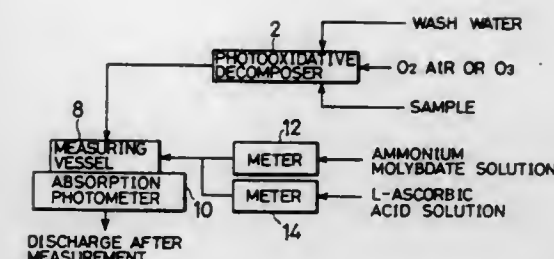
## METHOD AND SYSTEM FOR SAMPLING AND DETERMINING THE PRESENCE OF COMPOUNDS

David P. Rounbehler, Bedford; David H. Fine, Sudbury; Eugene K. Achter, Lexington, all of Mass.; Stephen J. MacDonald, Salem, N.H., and Daniel B. Dennison, Kennesaw, Ga., assignors to The Coca-Cola Company, Atlanta, Ga. Division of Ser. No. 20,804, Feb. 22, 1993, Pat. No. 5,470,754, which is a continuation-in-part of Ser. No. 890,863, Jun. 1, 1992, Pat. No. 5,352,611, and a continuation-in-part of Ser. No. 890,864, Jun. 1, 1992. This application Apr. 4, 1995, Ser. No. 416,574

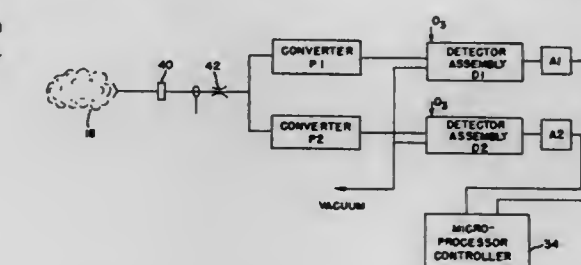
Int. Cl.<sup>6</sup> G01N 21/76

U.S. Cl. 436—158

16 Claims



- (A) an oxidation step of irradiating sample water with ultraviolet radiation while heating said sample water to 50° to 100° C.;
- (B) a step of measuring nitric acid ions being contained in oxidized said sample water by absorptiometry; and
- (C) a step of adding molybdenum blue selectively reacting with phosphoric acid ions to oxidized said sample water and measuring the as-colored solution by absorptiometry.



5,567,622

## SENSOR FOR DETECTION OF NITROGEN DIOXIDE AND NITROGEN TETROXIDE

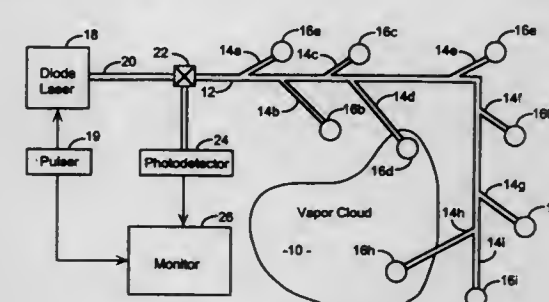
Bernardo Jadaszliwer, Santa Monica, and Charles M. Klimcak, Hawthorne, both of Calif., assignors to The Aerospace Corporation, El Segundo, Calif.

Filed Jul. 5, 1995, Ser. No. 490,443

Int. Cl.<sup>6</sup> G01N 21/78

U.S. Cl. 436—106

2 Claims



1. A sensor for optical absorption and reflection of an interrogating optical pulse, said sensor comprising: an optical fiber having a fiber optic end, an interrogating optical pulse communicated through said optical fiber,

a phosphomolybdic acid (PMA) reagent disposed at said fiber optic end for reacting to the presence of nitrogen dioxide, said PMA reagent being saturated with a hydrazine fuel for reaction when exposed to nitrogen dioxide, wherein said reaction changes the optical absorption and reflection of said optical pulse causing amplitudinal changes of said optical pulse when reflected at said fiber optic end back through said optical fiber, and a medium integrally formed with said fiber optic end and for containing said PMA reagent.

1. A method of detecting selected compounds in a sample by chemiluminescent gas phase reaction with a reactant comprising the steps of:

collecting the sample;

dividing the sample into first and second portions;

heating the first portion of the sample to a first predetermined temperature in a first pyrolyzer having first conversion properties with respect to the selected compounds;

heating the second portion of the sample to a second predetermined temperature in a second pyrolyzer having second conversion properties with respect to the selected compounds which are different from the first conversion properties of the first pyrolyzer;

mixing the heated first portion of the sample with the reactant to cause a chemical reaction therewith in order to generate radiation by chemiluminescence having characteristic wavelengths related to substances in said first portion;

mixing the heated second portion of the sample with the reactant to cause a chemical reaction therewith in order to generate radiation by chemiluminescence having characteristic wavelengths related to substances in said second portion;

selectively detecting radiation emitted by chemiluminescence from a selected compound in the first portion of the sample;

selectively detecting radiation emitted by chemiluminescence from conversion of the selected component in the second portion of the sample and at least the same compound in the first portion of the sample in the second portion of the sample;

generating first electrical signals from the radiation selectively detected from the first portion of the sample and second electrical signals from the radiation selectively detected from the second portion of the sample; and

comparing the first electrical signals with the second electrical signals in order to determine the presence or absence of selected compounds in the sample;

wherein said heating, mixing, detecting, and generating steps are performed at substantially the same times for said first portion as for said second portion and wherein the step of comparing includes the steps of comparing the first electrical signals and the second electrical signals so as to cancel signals related to said portions of background components.

**5,567,624**  
**CARBAZINE DYES AND DERIVATIVES FOR PH MEASUREMENT**

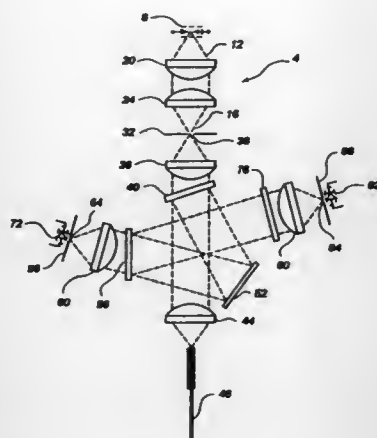
Roger E. Smith, Bountiful, Utah, assignor to Utah Medical Products, Inc., Midvale, Utah

Filed Apr. 27, 1995, Ser. No. 429,622

Int. Cl.<sup>6</sup> G01N 31/22; 21/64; C07D 219/00

U.S. Cl. 436—163

83 Claims

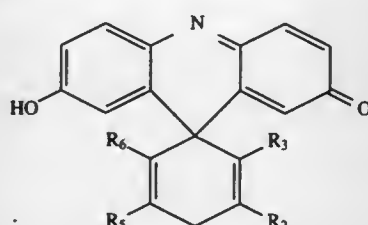


61. A method of determining pH of a solution comprising the steps of:

- (a) providing a composition comprising a fluorescent carbazine dye covalently bonded to a solid support, said dye-support composition represented by the formula:

D-B-M

wherein M is any solid support containing or derivatized to contain a functional group reactive with hydrazine such that reaction with hydrazine forms a hydrazine-derivatized solid support; D is any fluorescent carbazine dye represented by the formula



wherein R<sub>2</sub>, R<sub>3</sub>, R<sub>5</sub>, and R<sub>6</sub> are each selected from the group consisting of H and alkyl, and wherein said fluorescent carbazine dye is reactive with the hydrazine-derivatized solid support at the 1-carbon of the spiro ring; and B is a covalent linkage formed by reaction between the hydrazine-derivatized solid support and the 1-carbon of the spiro ring, and is selected from the group consisting of —NHNH—, —N—NH—, and —N=N—;

- (b) placing said composition in the solution for which pH is to be determined;  
 (c) contacting said composition in the solution with light of a selected wavelength for exciting emission of fluorescent light by said carbazine dye;  
 (d) measuring intensities of said fluorescent light at a first selected wavelength and at a substantially different second selected wavelength;  
 (e) calculating a ratio of said measurements of intensity at said first selected wavelength and said second selected wavelength; and  
 (f) correlating said ratio with a predetermined relationship of ratios to pH.

**5,567,625**  
**APPARATUS AND METHOD FOR REAL-TIME SPECTRAL DECONVOLUTION OF CHEMICAL MIXTURES**

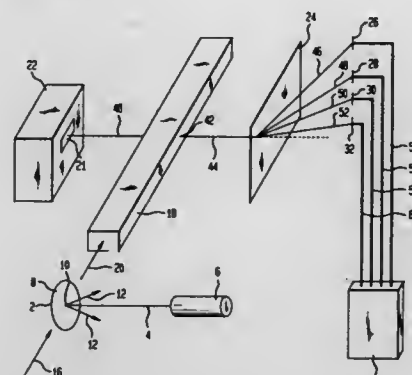
Jerome M. Kurtzberg, Yorktown Heights, and John S. Lew, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 19, 1994, Ser. No. 326,101

Int. Cl.<sup>6</sup> G01N 21/25

U.S. Cl. 436—164

28 Claims



13. A method for determining the concentrations X<sub>j</sub> of N component chemical constituents, wherein j=1 to N, in a chemical combination using predetermined relative constituent spectral intensities A<sub>ij</sub> of said N component chemical constituents, wherein i=1 to M, wherein M>N, comprising the steps of:

- providing relative spectral intensities C<sub>i</sub> of said chemical combination at wavelengths λ<sub>i</sub>;  
 determining said relative concentrations X<sub>j</sub> from equation

$$X = (A^T A)^{-1} A^T C$$

wherein A is a matrix of said relative spectral intensities A<sub>ij</sub>, wherein A<sup>T</sup> is the transpose of A, and wherein (A<sup>T</sup>A)<sup>-1</sup> is the inverse matrix of A<sup>T</sup>A, and X is a vector of said relative concentrations X<sub>j</sub>, and C is a vector of said relative spectral intensities C<sub>i</sub>.

**5,567,626**  
**METHOD OF DETECTING BIOLOGICAL MATERIALS USING A POLYINYLIDENE FLUORIDE MEMBRANE**

Richard F. Salinaro, Hastings on Hudson, N.Y., assignor to Pall Corporation, East Hills, N.Y.

Filed Apr. 11, 1995, Ser. No. 420,218

Int. Cl.<sup>6</sup> G01N 21/77

U.S. Cl. 436—178

18 Claims

1. A method of detecting a biological material whereby a biological material is adhered to a membrane which is then contacted with a reagent capable of binding to said biological material and capable of being detected, such that the detection of said reagent bound to said biological material represents a biological material detection signal evidencing the presence of said biological material, and the detection of said reagent directly bound to said membrane represents background noise, wherein the improvement comprises utilizing a polyvinylidene fluoride membrane which has

been subjected to a temperature of at least about 80° C. but less than the temperature at which the membrane softens and deforms for a time sufficient to substantially reduce said detecting reagent from directly adhering to said membrane, so as to result in a decrease in the background noise and an increase in a biological material detection signal-to-noise ratio.

**5,567,627**  
**METHOD AND COMPOSITION FOR THE SIMULTANEOUS AND DISCRETE ANALYSIS OF MULTIPLE ANALYTES**

Brian C. Lehnen, San Carlos, Calif., assignor to Trans-Med Biotech, Incorporated, S. South Francisco, Calif.

Continuation of Ser. No. 731,039, Jul. 16, 1991, abandoned.

This application Nov. 5, 1993, Ser. No. 149,129

The portion of the term of this patent subsequent to Sep. 23, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> G01N 33/543; 33/546

U.S. Cl. 436—518

5 Claims

1. A method for simultaneously detecting multiple analytes of interest in a sample, said method comprising:

- (a) combining said sample with a composition comprising a population of particulate supports that are detectable by flow cytometry techniques, wherein  
 A. each particulate support consists essentially of an unlabeled particle to which is bound exactly one of a set of at least two unlabeled specific reagents, each of said specific reagents is capable of binding specifically to one of the multiple analytes of interest;  
 B. the population comprises discrete subpopulations of supports, each of which consists of those supports comprising the same specific reagent, wherein the combined number of supports in any two or more subpopulations is unique as compared to the number of supports in any other combination of subpopulations or as to a single subpopulation;  
 C. each subpopulation constitutes a predetermined, known proportion of the population of particulate supports, and  
 D. the particles of the population are substantially physically indistinguishable from each other, the particulate supports being of approximately the same mean diameter, whereby in the presence of one or more analytes a discrete population of specific binding pairs is formed on the supports of each subpopulation for each analyte of interest in the sample;  
 (b) contacting said specific binding pairs with a labeled agent, said labeled agent comprising a number of specific binding moieties each attached to a fluorochrome which emits a detectable fluorescence upon exposure to excitation energy, wherein each of the binding moieties is specific for one of the multiple analytes and the same fluorochrome is attached to each of the binding moieties;

- (c) removing any unbound labeled agent and detecting fluorescence intensity of each particulate support of a preselected number of said population of particulate supports using flow cytometry techniques;  
 (d) obtaining a histogram plot of said preselected number of particulate supports detected as a function of the logarithm of said fluorescence intensity detected, said histogram plot contains one or more peaks, wherein each peak has an area which indicates the proportion of each subpopulation of particulate supports of said preselected number associated with said peak, and wherein each peak has a position for each analyte detected which may be the same as or different from the peak position of any other analyte detected and wherein absence of one or more analytes results in a peak having a position at essentially background fluorescence; and  
 (e) identifying analytes present in said sample by the relative proportion of each peak as a function of the relative proportion of said preselected supports.

**5,567,628**  
**SURFACE-ENHANCED RAMAN SPECTROSCOPY IMMUNOASSAY METHOD, COMPOSITION AND KIT**  
 Peter J. Tarcha, Lake Villa; Thomas E. Rohr, Gurnee; James J. Markese, Downers Grove, all of Ill., and Therese Cotton, Ames, Iowa, assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 944,138, Sep. 11, 1992, Pat. No. 5,376,556, which is a continuation-in-part of Ser. No. 790,106, Nov. 7, 1991, Pat. No. 5,266,498, which is a continuation of Ser. No. 428,230, Oct. 27, 1989, abandoned. This application Jun. 30, 1994, Ser. No. 268,471

Int. Cl.<sup>6</sup> G01N 33/553

7 Claims

1. A method for determining the presence or amount of an analyte in a test sample by monitoring an analyte-mediated ligand binding event in a test mixture, said method comprising:

- reacting the test sample with a conjugate of labeled specific binding member comprising a Raman-active label attached to a specific binding member specific for the analyte, under conditions permitting specific binding of the binding member to the analyte, if present, to give a first complex in the test mixture;  
 adding an enhancer to the first complex in the test mixture; sequentially or simultaneously allowing the first complex to come into contact with a particulate having a surface capable of inducing a surface-enhanced Raman light scattering and having attached thereto a specific binding member specific for the analyte bound to the particulate through the specific binding member on a surface of the particulate to form a second complex, the particulate being characterized as having a surface capable of inducing a surface-enhanced Raman light scattering;  
 illuminating the second complex with a radiation sufficient to cause the Raman-active labels in the complex to produce a detectable Raman spectrum; and  
 then monitoring differences in the surface-enhanced Raman scattering spectra; the differences being dependent upon the amount of the analyte present in the test mixture.

**5,567,629**  
**METHOD OF MAKING TRANSISTOR WITH OXYGEN IMPLANTED REGION**

Masahiko Kubo, Chiba-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

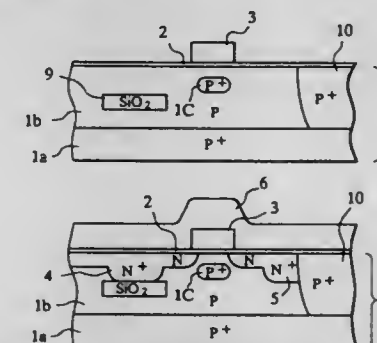
Division of Ser. No. 298,668, Aug. 31, 1994, Pat. No. 5,463,241. This application Jun. 22, 1995, Ser. No. 493,533

Claims priority, application Japan, Sep. 1, 1993, 5-217602; Aug. 25, 1994, 6-200473

Int. Cl.<sup>6</sup> H01L 21/8234

U.S. Cl. 437—24

1 Claim



1. A method of manufacturing a semiconductor device having an insulated gate, first and second main electrodes, and a channel region between the first and second main electrodes, comprising the steps of:

- (1) epitaxially growing a second semiconductor region on a high-impurity-concentration first semiconductor region, the



- impurity concentration of the second semiconductor region being lower than that of the first semiconductor region;
- (2) implanting ions into the second semiconductor region, to locally form an insulation layer only under an area where the second main electrode is to be formed;
  - (3) forming a highly conductive region extending from the top surface of the second semiconductor region down to the first semiconductor region;
  - (4) forming a gate insulation film on the surface of the second semiconductor region;
  - (5) implanting ions into the second semiconductor region, to form a high-impurity-concentration third semiconductor region under an area where said channel region is to be formed; and
  - (6) forming a gate electrode on the gate insulation film, and forming fourth and fifth semiconductor regions serving as first and second main electrode regions along the surface of the second semiconductor region.

5,567,630

# METHOD OF FORMING AN INK JET RECORDING DEVICE, AND HEAD USING SAME

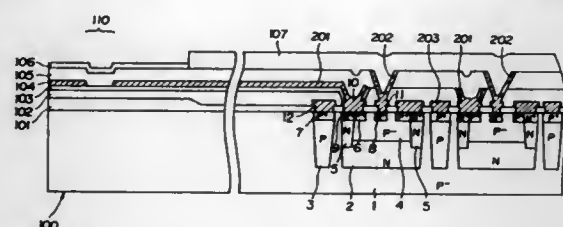
Shigeyuki Matsumoto, Atsugi; Asao Saito, Yokohama; Yashiro Naruse, Kiyokawa-mura, and Kei Fujita, Kokubunji, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan Division of Ser. No. 652,432, Feb. 7, 1991, Pat. No. 5,264,874. This application Apr. 20, 1993, Ser. No. 58,433

Claims priority, application Japan, Feb. 9, 1990, 2-28265; Apr. 11, 1990, 2-95402; Apr. 11, 1990, 2-95403

Int. Cl.<sup>6</sup> H01L 21/265; 21/70; 21/77

U.S. Cl. 437—31

14 Claims



1. A method for preparing a device for an ink jet recording head which ejects ink using thermal energy generated by applying an electrical current of at least 200 mA and not more than 300 mA to a rectifier element to drive an electrothermal converting element, said method comprising the steps of:

- preparing a semiconductor body of a first conductivity type; forming the rectifier element on said semiconductor body; and forming the electrothermal converting element electrically connected to said rectifier element on said semiconductor body, wherein said rectifier element forming step comprises the steps of:
- forming a first semiconductor region of a second conductivity type on said semiconductor body;
  - forming a second semiconductor region of the first conductivity type within said first semiconductor region;
  - forming a third semiconductor region of the second conductivity type within said second semiconductor region; and
  - forming an electrode for short-circuiting said first semiconductor region and said second semiconductor region;
- wherein a junction area between said second semiconductor region and said third semiconductor region is within a range from  $5 \times 10^{-6} \text{ cm}^2$  to  $5 \times 10^{-4} \text{ cm}^2$ .

# METHOD OF FORMING GATE SPACER TO CONTROL THE BASE WIDTH OF A LATERAL BIPOLAR JUNCTION TRANSISTOR USING SOI TECHNOLOGY

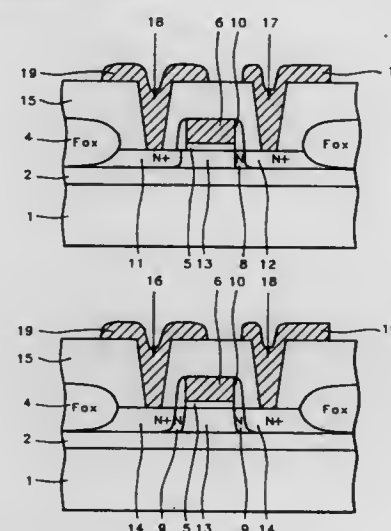
Ching-Hsiang Hsu, Hsin Chu; Shyh-Chyi Wong, Taichang; Mong-Song Liang, Hsin Chu, and Steve S. Chung, Hsin Chu, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Hsin Chu, Taiwan

Filed Nov. 13, 1995, Ser. No. 557,654

Int. Cl.<sup>6</sup> H01L 21/265

U.S. Cl. 437—32

18 Claims



1. A method for fabricating a lateral bipolar junction transistor, in a layer of silicon on insulator, on a semiconductor substrate, comprising the steps of: providing said semiconductor substrate; providing said silicon on insulator layer on said semiconductor substrate; growing field oxide regions on specific areas of said silicon on insulator layer; growing a first insulator layer on surface of said silicon on insulator layer, not covered by said field oxide regions; depositing a polysilicon layer on said first insulator layer and on said field oxide regions; ion implanting a first conductivity imparting dopant into said polysilicon layer; patterning said polysilicon layer to form polysilicon gate structure; photoresist masking to expose specific region of said silicon on insulator layer; ion implanting a second conductivity imparting dopant into said specific region of said silicon on insulator layer, not covered by said photoresist masking, not covered by said field oxide regions, and not covered by said polysilicon gate structure, to form lightly doped collector region of said lateral bipolar transistor; removal of said photoresist masking; deposition of a second insulator layer, on said silicon on insulator layer, on said polysilicon gate structure, and on said field oxide region; anisotropic etching of said second insulator layer to form insulator sidewall spacer on sides of said polysilicon gate structure; ion implanting a third conductivity imparting dopant into said silicon on insulator layer, not covered by said field oxide region, not covered by said polysilicon gate structure, and not covered by said insulator sidewall spacer to form heavily doped emitter and heavily doped collector regions of said lateral bipolar junction transistor; deposition of a third insulator layer, on silicon on insulator layer, on said polysilicon gate structure, and on said field oxide regions; opening contact holes in said third insulator layer, to said silicon on insulator layer;

deposition of a metal on said third insulator layer, and on said silicon on insulator layer, exposed in said contact hole; and forming metal contact structures to said specific said silicon on insulator region, exposed in said contact hole.

5,567,632

# METHOD FOR FABRICATING SOLID STATE IMAGE SENSOR DEVICE HAVING BURIED TYPE PHOTODIODE

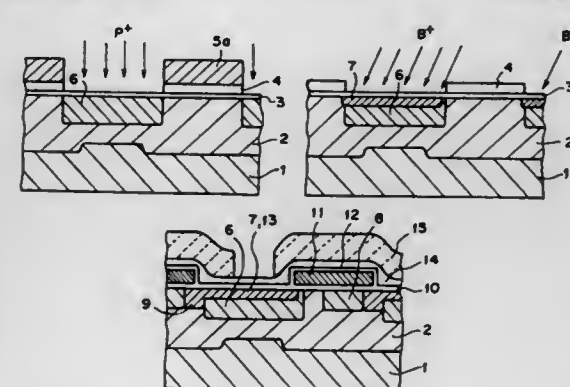
Yasutaka Nakashiba, and Satoshi Uchiya, both of c/o NEC Corporation, 7-1, Shiba 5-chome, Minato-ku, Tokyo, Japan Division of Ser. No. 992,102, Dec. 17, 1992, abandoned. This application Oct. 18, 1993, Ser. No. 137,219

Claims priority, application Japan, Dec. 20, 1991, 3-338658

Int. Cl.<sup>6</sup> H01L 21/265; 31/18; 21/70; 27/00

U.S. Cl. 437—35

13 Claims



1. A method for fabricating a solid state image sensor device, said method comprising the steps of: forming a mask above a first conductivity type semiconductor layer using a lithographic technique; forming, in said first conductivity type semiconductor layer, a second conductivity type semiconductor region serving as a photoelectric conversion section by ion implantation using said mask; and forming, in a surface area of said second conductivity type semiconductor region, a first conductivity type semiconductor region using said mask and selected angles of incidence during ion implantation so that said first conductivity type semiconductor region is self-aligned with respect to said second conductivity type semiconductor region.

5,567,633

# METHOD FOR PRODUCING A THIN FILM TRANSISTOR HAVING IMPROVED CARRIER MOBILITY CHARACTERISTICS AND LEAKAGE CURRENT CHARACTERISTICS

Dharam P. Gosain; Jonathan Westwater, and Setsuo Usui, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 29, 1995, Ser. No. 412,946

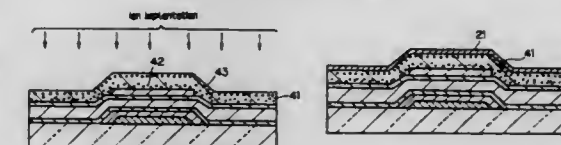
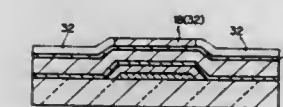
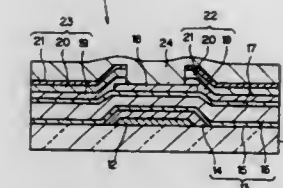
Claims priority, application Japan, Mar. 31, 1994, 6-087799

Int. Cl.<sup>6</sup> H01L 21/786

U.S. Cl. 437—40

4 Claims

1. A method of producing a thin film transistor, comprising the steps of: providing a substrate having insulating properties and providing a gate on a surface of the substrate; forming an insulating film, including at least a gate insulating film, over the substrate and gate, and then forming a polycrystalline silicon film on an upper surface of said insulating film; depositing a silicon oxide film on said polycrystalline silicon film, and then patterning said silicon oxide film to form a silicon oxide film pattern on said polycrystalline silicon film directly above said gate;



successively forming a hydrogen-containing amorphous silicon film, a conductive silicon film, and a metal film on said polycrystalline silicon film so as to cover said silicon oxide film pattern; introducing hydrogen from said amorphous silicon film into said polycrystalline silicon film, and also activating conductive impurities in said conductive silicon film by heat treatment; and patterning said metal film, said conductive silicon film, and said amorphous silicon film to form source/drain regions.

5,567,634

# METHOD OF FABRICATING SELF-ALIGNED CONTACT TRENCH DMOS TRANSISTORS

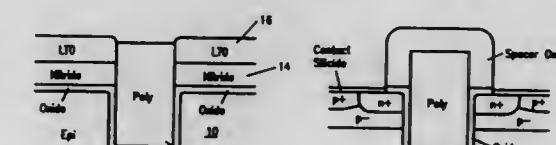
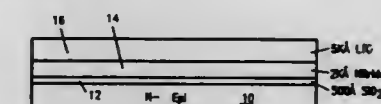
Francois Hébert; Sze-Hon Kwan, both of Sunnyvale, and Izak Bencuya, San Jose, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 1, 1995, Ser. No. 431,765

Int. Cl.<sup>6</sup> H01L 21/265

U.S. Cl. 437—41

1 Claim



1. A method of fabricating a trench DMOS transistor structure having a source and a body and a contact to the source and body of the transistor structure that is self-aligned to a trench formed to isolate the transistor structure, the method comprising: forming a silicon dioxide layer on an underlying layer of N-type epitaxial silicon; forming a nitride layer on the silicon dioxide layer, the nitride layer having an upper surface; forming a low temperature oxide (LTO) layer on the nitride layer to define an LTO/nitride/silicon dioxide (ONO) sandwich; defining a trench mask on the LTO layer to expose regions of the LTO layer; etching the ONO sandwich to expose regions of the N-type epitaxial layer underlying the exposed regions of the LTO layer; etching the exposed regions of the N-type epitaxial layer to define trenches therein; forming silicon dioxide on exposed surfaces of the trenches; depositing a polysilicon layer to fill the trenches;

etching the polysilicon layer to define polysilicon gate regions within the trenches, each polysilicon gate region having an upper surface that is higher than the upper surface of said nitride layer;  
removing the LTO layer;  
removing the nitride layer;  
implanting P-dopant to form a region of P-type conductivity between the trenches;  
defining an N+ source mask and using the N+ source mask to implant N-dopant to define N+ source regions adjacent to the trenches;  
oxidizing the polysilicon gate regions to form oxide pads on the upper surface of the polysilicon gate regions and oxide spacers on exposed sidewalls of the polysilicon gate regions such that the oxide spacers extend over the N+ source regions;  
implanting P-dopant to form P+ body ohmic contact regions between the N+ source regions; and  
forming a conductive layer over the oxide pads and the oxide spacers for contact with the P+ body ohmic contact regions.

5,567,635

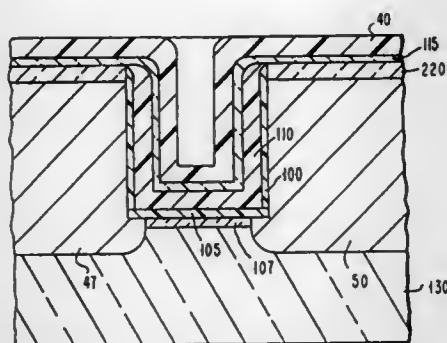
#### METHOD OF MAKING A THREE DIMENSIONAL TRENCH EEPROM CELL STRUCTURE

Alexandre Acovic, Yorktown Heights, N.Y.; Ching-Hsiang Hsu, Hsin Chu, Taiwan, and Being S. Wu, Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 855,956, Mar. 23, 1992, Pat. No. 5,315,142. This application May 17, 1994, Ser. No. 245,724  
Int. Cl.<sup>6</sup> H01L 21/8247

U.S. Cl. 437—43

11 Claims



1. A method of making a semiconductor device, comprising:  
etching a trench in a semiconductor substrate, said trench etching forming first and second trench sidewalls and a channel region, said channel region separating said first trench sidewall from said second trench sidewall;  
partially filling said trench with isolation material to form first and second isolation sidewalls in said trench, said channel region separating said first isolation sidewall from said second isolation sidewall;  
doping said first and second trench sidewalls with a first type of dopant;  
forming a first dielectric layer over said first and second trench sidewalls;  
forming a second dielectric layer over said channel region; and  
forming a floating gate covering said second dielectric layer and at least partially covering said first dielectric layer, said floating gate having an interface side and a patterned side, said interface side contacting said first and second dielectric layers, said patterned side having at least two generally planar surfaces for increasing capacitance between said floating gate and said control gate.

#### 5,567,636 PROCESS FOR FORMING A NONVOLATILE RANDOM ACCESS MEMORY ARRAY

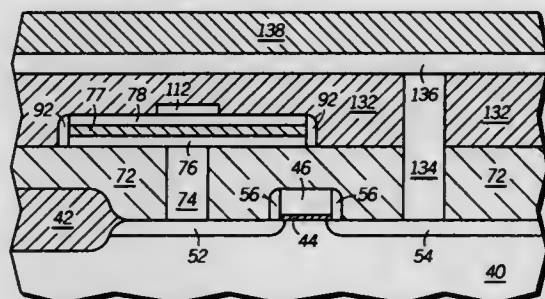
Robert E. Jones, Jr., Austin, Tex., assignor to Motorola Inc., Schaumburg, Ill.

Filed Feb. 27, 1995, Ser. No. 395,132

Int. Cl.<sup>6</sup> H01L 21/8242

U.S. Cl. 437—43

19 Claims



1. A process for forming a nonvolatile random access memory array having memory cells comprising the steps of:  
forming a control transistor and a memory transistor, wherein each of the control and memory transistors includes a source/drain region;  
forming an insulating layer over the control and memory transistors;  
forming openings in the insulating layer over the source/drain regions of the control and memory transistors;  
forming a first capacitor electrode over the source/drain region of the memory transistor; and  
forming a conductive member that overlies the source/drain region of the memory transistor and is electrically connected to the source/drain region of the control transistor.

5,567,637

#### METHOD OF FABRICATING A MICRO-TRENCH FLOATING GATE ELECTRODE FOR FLASH MEMORY CELL

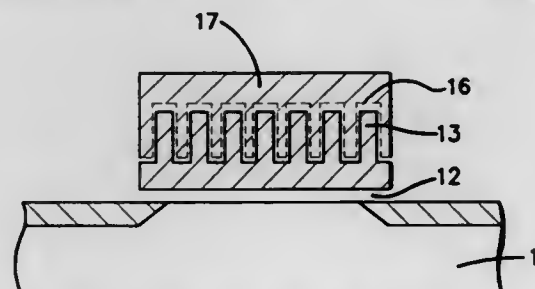
Toshiyuki Hirota, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 280,933, Jul. 27, 1994. This application Jul. 5, 1995, Ser. No. 498,409

Claims priority, application Japan, Jul. 27, 1993, 5-184557  
Int. Cl.<sup>6</sup> H01L 21/265

U.S. Cl. 437—43

14 Claims



1. A method of fabricating control and floating gate electrodes involved in a flash memory cell comprising the steps of:  
forming a bottom semiconductor film serving as a floating gate electrode;  
forming a phase splitting glass film on said bottom semiconductor film;  
subjecting said phase splitting glass film to a heat treatment to allow said phase splitting glass film to be split into at least two different glass films which have different components;  
subjecting said phase splitting glass film to an etching in which one of said glass films has a higher etching rate than an etching rate of another of said glass films so that said one glass film having the higher etching rate only is removed,

while said another glass film remains thereby a mask pattern comprising the remaining glass film is formed;  
subjecting said bottom semiconductor film to a dry etching using said mask pattern to form trench grooves defined by trench pillars in said bottom semiconductor film;  
forming a dielectric film on surfaces of said trench grooves and trench pillars; and  
forming a top semiconductor film serving as a control gate electrode on said dielectric film.

5,567,638

#### METHOD FOR SUPPRESSING BORON PENETRATION IN PMOS WITH NITRIDIZED POLYSILICON GATE

Yung-Hao Lin, Feng-Yuan; Chao-Sung Lai, Han; Chung-Len Lee, and Tan-Fu Lei, both of Hsinchu, all of Taiwan, assignors to National Scientific Council, Taipei, Taiwan

Filed Jun. 14, 1995, Ser. No. 490,401

Int. Cl.<sup>6</sup> H01L 21/265

U.S. Cl. 437—46

14 Claims



1. A method of suppressing boron penetration in a PMOS with a nitridized polysilicon gate comprising the steps of:  
1) growing a layer of gate oxide on a substrate;  
2) forming at least one first polysilicon layer on said gate oxide layer;  
3) nitriding said at least one first polysilicon layer;  
4) removing a layer of nitridized silicon which is generated by said nitriding step 3) on said at least one first polysilicon layer;  
5) forming a second polysilicon layer on said at least one first polysilicon layer; and  
6) implanting B-containing ions into said first and second polysilicon layers for constructing a PMOS structure wherein said nitriding step suppresses a boron ion from penetration into said substrate.

5,567,639

#### METHOD OF FORMING A STACK CAPACITOR OF FIN STRUCTURE FOR DRAM CELL

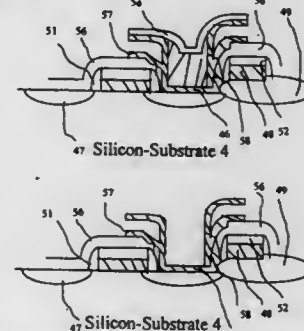
Su-Jaw Chang, Hsin-Chu, Taiwan, assignor to Utron Technology Inc., Hsin-Chu, Taiwan

Filed Jan. 4, 1996, Ser. No. 582,707

Int. Cl.<sup>6</sup> H01L 21/70; 27/00

U.S. Cl. 437—52

10 Claims



1. A method of fabricating a stacked fin structure storage capacitor for a DRAM cell, comprising the steps of:

growing a field oxide layer on a semiconductor substrate so that the substrate is divided into active regions and field oxide regions;  
growing a gate oxide,  
sequentially depositing a first polysilicon layer and cap oxide layer over said substrate, and patterning said first polysilicon layer to form a gate of an MOSFET;  
forming a spacer by depositing a second oxide layer over said gate and etching back said second oxide layer;  
depositing a second polysilicon layer over said substrate including said spacer to contact a node contact diffusion region of said MOSFET;  
sequentially depositing a silicon nitride and a sacrificial oxide (sac) layer on said second polysilicon layer, patterning and etching said sac oxide layer and said silicon nitride layer to form a capacitor area overhanging said node contact diffusion region, said patterned silicon nitride layer which is undercut beneath edges of said patterned sac oxide layer and exposing portions of said second polysilicon layer;  
oxidizing said exposed portions of said second polysilicon layer selectively by using said patterned silicon nitride as a mask;  
removing portions of said patterned silicon nitride layer to expose unoxidized portions of said second polysilicon layer and forming an enlarged undercut beneath each edge of said patterned sac oxide layer;  
depositing a third polysilicon layer on sidewalls of said patterned silicon nitride layer, said second polysilicon layer and said enlarged undercut to form a bottom electrode of said capacitor, said third polysilicon layer contacting said unoxidized portions of said second polysilicon layer;  
etching back said third polysilicon layer to form a fin-shape bottom capacitor electrode;  
removing said patterned sac oxide and said patterned silicon nitride by etching;  
forming a capacitor dielectric over said fin-shape bottom capacitor electrode; and  
depositing and patterning a fourth polysilicon layer to form a top electrode of said capacitor.

5,567,640

#### METHOD FOR FABRICATING T-SHAPED CAPACITORS IN DRAM CELLS

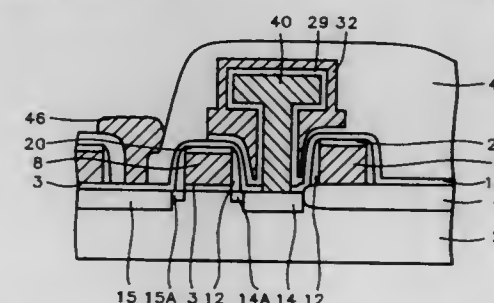
Horng-Huei Tseng, Hsinchu, Taiwan, assignor to Vanguard International Semiconductor Corporation, Hsin-Chu, Taiwan

Filed Jan. 11, 1996, Ser. No. 583,789

Int. Cl.<sup>6</sup> H01L 21/70; 27/00

U.S. Cl. 437—52

20 Claims



11. A method of manufacturing a T-shaped capacitor over a node in a substrate, comprising the steps of:  
forming a first insulation layer over a substrate surface;  
forming a resist layer over said first insulation layer, said resist layer having a first opening over said node;  
etching said first insulation layer through said first opening forming a node contact hole defined by said first opening in said first insulation layer, said node contact hole extending partially through said first insulation layer, said node contact hole having a depth less than a thickness of said first insulation layer;



laterally etching said resist layer with an oxygen plasma thereby widening said first opening in said resist layer to form a second opening over said node, said second opening being concentric with said not contact hole and having a larger area than said node contact hole;

anisotropically etching said first insulation layer using said etched resist layer as a mask and extending said node contact hole through said first insulation layer to expose said node, and etching said first insulation layer through said second opening thereby forming a storage electrode hole into said first insulation layer, said storage electrode hole being defined by sidewalls of said first insulation layer;

removing said resist layer;

forming a first polysilicon layer completely filling said extended node contact hole and said storage electrode hole and covering a top surface of said first insulation layer;

etching back said first polysilicon layer on the top surface of said first insulation layer thereby exposing said first insulation layer;

selectively etching said first insulation layer thereby forming a T-shaped storage electrode from remaining portions of said first polysilicon layer; and

forming a dielectric layer and a top electrode over said storage electrode thereby completing said T-shaped capacitor.

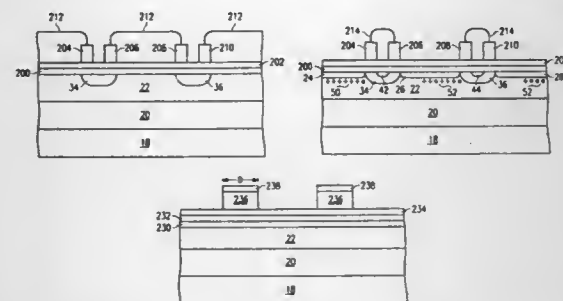
5,567,641

# **METHOD OF MAKING A BIPOLAR GATE CHARGE COUPLED DEVICE WITH CLOCKED VIRTUAL PHASE**

Jaroslav Hyncek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.  
Division of Ser. No. 401,321, Mar. 9, 1995, Pat. No. 5,502,318, which is a continuation of Ser. No. 196,045, Feb. 14, 1994, abandoned. This application May 5, 1995, Ser. No. 437,121  
Int. Cl.<sup>6</sup> H01L 21/70

U.S. Cl. 437—53

4 Claims



1. A method for fabricating a bipolar gate charge coupled device comprising:

forming a semiconductor layer of a first conductivity type;

forming a buried channel of a second conductivity type in the semiconductor layer;

forming semiconductor regions over the buried channel;

laterally oxidizing the semiconductor regions to a desired width;

etching off the semiconductor regions to leave cap oxide regions;

forming bipolar gates in the buried channel at locations defined by the cap oxide regions; and

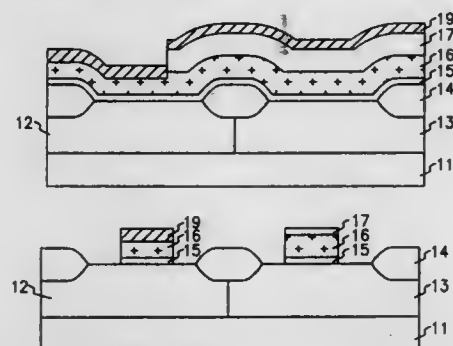
forming virtual gates in the buried channel adjacent the bipolar gates at locations defined by the cap oxide regions.

# **5,567,642 METHOD OF FABRICATING GATE ELECTRODE OF CMOS DEVICE**

Hyeon S. Kim, and Choong H. Lee, both of Kyoungkido, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyoungkido, Rep. of Korea  
Filed Nov. 6, 1995, Ser. No. 554,337  
Claims priority, application France, Nov. 8, 1994, 94 29185  
Int. Cl.<sup>6</sup> H01L 21/70

U.S. Cl. 437—57

8 Claims



1. A method of fabricating a gate electrode of a CMOS device, comprising the steps of:

sequentially forming a gate insulating layer, a first conductive layer and a protective layer on a semiconductor substrate;

selectively etching a portion of said protective layer in which a PMOS transistor is formed;

forming a second conductive layer on a resulting surface of said substrate;

removing said second conductive layer formed on said protective layer, and partially etching said protective layer to a first thickness; and

patterning said second conductive layer, said protective layer, said first conductive layer and said gate insulating layer to form a gate electrode.

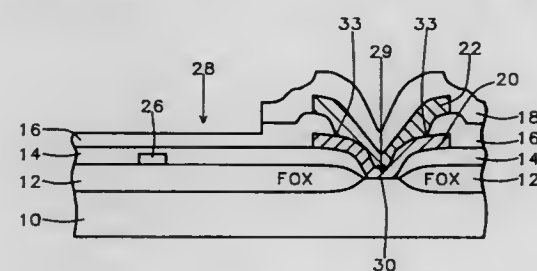
5,567,643

# **METHOD OF FORMING CONTAMINATION GUARD RING FOR SEMICONDUCTOR INTEGRATED CIRCUIT APPLICATIONS**

Jin-Yuan Lee, Hsin-Chu; John C. S. Wei, Taipei, and Ying-Chen Chao, Hsin-Chu, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Hsinchu, Taiwan  
Filed May 31, 1994, Ser. No. 251,039  
Int. Cl.<sup>6</sup> H01L 21/70; 27/00

U.S. Cl. 437—60

18 Claims



1. A method of fabricating a guard ring about a fusible link on a semiconductor substrate comprising:

forming a first insulating layer over portions of the substrate with first split annular openings that expose a substrate surface;

forming a fuse link on the first insulating layer;

forming a second insulating layer over the fuse link and the first insulating layer;

forming a second split annular opening in the second insulating layer over said first split annular openings;

forming a first metal layer in said first and second openings in contact with the substrate surface;

forming a third insulating layer overlying the first metal layer and the second insulating layer;

forming an third annular opening in said third insulating layer that surrounds the fusible link and exposes the first metal layer;

forming a second annular metal layer in said third opening in contact with the first metal layer; and

forming a fourth insulating layer overlying the third insulating layer and forming a window opening over the fuse link.

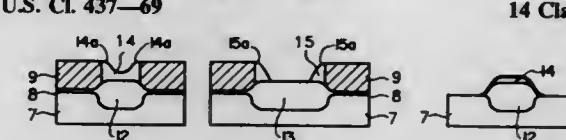
5,567,645

# **DEVICE ISOLATION METHOD IN INTEGRATED CIRCUITS**

Sung-tae Ahn, Kwacheon, and Tai-su Park, Seoul, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea  
Filed Apr. 22, 1994, Ser. No. 231,705  
Claims priority, application Rep. of Korea, Apr. 24, 1993, 93-6925  
Int. Cl.<sup>6</sup> H01L 21/76

U.S. Cl. 437—69

14 Claims



1. A device isolation method for integrated circuits comprising steps of:

forming sequentially a pad oxide film and a nitride film on a semiconductor substrate;

defining an isolation region for electrically isolating an active region by patterning said nitride film;

forming a first field oxide film by a thermal oxidation of said semiconductor substrate in said isolation region;

depositing a material to cover said patterned nitride film and said first field oxide film, said material being an oxide material or spin on glass;

forming a second film on said first field oxide film by removing a portion of said deposited material which extends farther in a direction normal to a principal surface of said semiconductor substrate than said nitride film so that said deposited material remains self-aligned only on said first field oxide film in said isolation region; and

sequentially removing said nitride film and said pad oxide film in said active region.

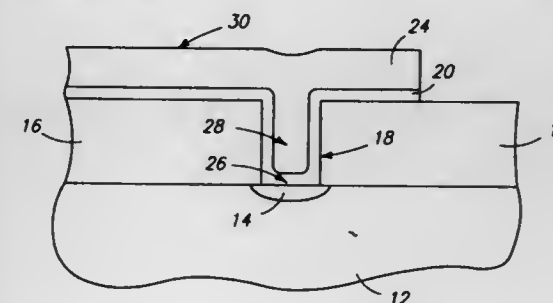
5,567,644

# **METHOD OF MAKING A RESISTOR**

J. Brett Rolison, and Monte Manning, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.  
Filed Sep. 14, 1995, Ser. No. 528,124  
Int. Cl.<sup>6</sup> H01L 21/8244

U.S. Cl. 437—60

22 Claims



1. A semiconductor processing method of forming a resistor construction from semiconductive material comprising the following steps:

providing a node to which electrical connection to a resistor is to be made;

providing an electrically insulative layer outwardly of the node;

providing a first opening in the electrically insulative layer over the node, the first opening having an opening width;

providing a first layer of semiconductive material over the electrically insulative layer and within the first opening over the node to a thickness which is less than one half the first opening width to less than completely fill the first opening with semiconductive material and thereby define a remaining opening, the first layer within the first opening being provided with a first conductivity enhancing dopant concentration falling within a range from 0 to a first value;

providing a second layer of semiconductive material to within the remaining opening and inside of the first layer to completely fill the remaining opening with semiconductive material and define an elongated resistor within the first opening, the second layer within the remaining opening being provided with a second conductivity dopant concentration which is greater than the first concentration; and

providing an outer layer of electrically conductive material outwardly of the insulative layer and patterning the outer layer into a conductive line, the elongated resistor extending between the node and the conductive line.

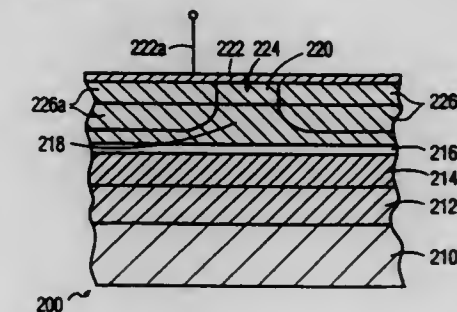
5,567,646

# **METHOD OF MAKING A STRIPE-GEOMETRY II/VI SEMICONDUCTOR GAIN-GUIDED INJECTION LASER STRUCTURE USING ION IMPLANTATION**

Kevin W. Haberern, Hopewell Junction, N.Y., assignor to Philips Electronics North America Corporation, New York, N.Y.  
Continuation-in-part of Ser. No. 310,194, Sep. 21, 1994, which is a continuation-in-part of Ser. No. 159,755, Nov. 30, 1993, Pat. No. 5,363,395, which is a continuation-in-part of Ser. No. 997,988, Dec. 28, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 471,293  
Int. Cl.<sup>6</sup> H01L 21/20

U.S. Cl. 437—129

11 Claims



1. A method of making a stripe-geometry semiconductor laser structure of the type having a substrate of III/V semiconductor material, and, disposed successively above said substrate, a first cladding layer of II/VI semiconductor material, a first guiding layer of II/VI material, an active layer of II/VI material, a second guiding layer of II/VI material, a second cladding layer of II/VI material, and a contact layer, said method comprising the steps of:

forming a stripe-shaped mask against ion implantation on a surface of said second cladding layer;

ion implanting a dopant suitable for increasing the resistivity of ILVI semiconductor material into said second cladding layer and said second guiding layer, using said stripe-shaped mask, to define implanted blocking layer portions of higher resistivity in said second cladding layer and said second guiding layer on both sides of said stripe-shaped mask and a stripe-shaped lateral confinement region of lower resistivity in said second cladding layer and said second guiding layer beneath said stripe-shaped mask; and providing said contact layer on said second cladding layer at least above said stripe-shaped lateral confinement region.

**5,567,647**  
**METHOD FOR FABRICATING A GATE ELECTRODE**  
**STRUCTURE OF COMPOUND SEMICONDUCTOR**  
**DEVICE**

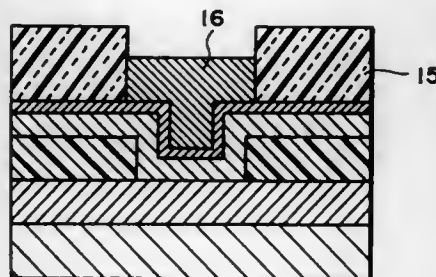
Kiyoshi Takahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 6, 1994, Ser. No. 354,067

Claims priority, application Japan, Dec. 7, 1993, 5-306203  
Int. Cl.<sup>6</sup> H01L 21/28

U.S. Cl. 437—177

11 Claims



1. A method for fabricating an electrode of a semiconductor device, the method comprising the steps of:  
forming one of a refractory metal layer and a refractory metal compound layer over a compound semiconductor substrate in a sputtering system;  
forming a nitride layer on a surface of one of said refractory metal layer and said refractory metal compound layer by a reactive sputtering process using a nitrogen containing gas introduced into said sputtering system, wherein said nitride layer comprises a nitride of one of said refractory metal and refractory metal compound;  
selectively forming a metal film on said nitride layer by plating using said nitride layer as an electrode; and  
removing one of said refractory metal layer and said refractory metal compound layer, and said nitride layer by etching using said metal film as a mask.

**5,567,648**  
**PROCESS FOR PROVIDING INTERCONNECT BUMPS**  
**ON A BONDING PAD BY APPLICATION OF A SHEET OF**  
**CONDUCTIVE DISCS**

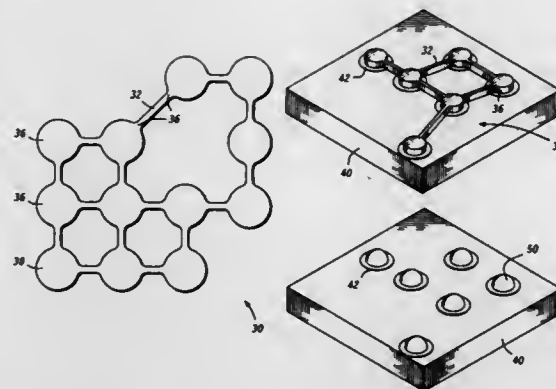
Debabrata Gupta, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 297,065, Aug. 29, 1994, abandoned.  
This application Nov. 3, 1995, Ser. No. 552,430

Int. Cl.<sup>6</sup> H01L 21/283; 21/48  
U.S. Cl. 437—183

19 Claims

1. A method for forming conductive material on bond pads on a substrate comprising the steps of:  
providing a plurality of conductive discs and a connecting member with a backsheet, wherein each of said plurality of conductive discs is connected to at least another of said plurality of conductive discs by said connecting member;  
placing said plurality of conductive discs over said bond pads on said substrate; and



heating said plurality of conductive discs and said connecting member, wherein said backsheet is removed prior to heating, so that said plurality of conductive discs and said connecting member combine to form isolated hemispherical interconnect bumps on said bond pads.

**5,567,649**  
**METHOD OF FORMING A CONDUCTIVE DIFFUSION**  
**BARRIER**

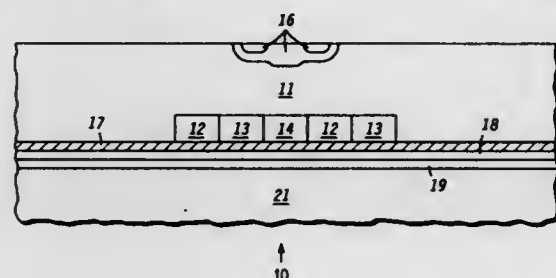
Israel A. Lesk, Phoenix; Francine Y. Robb, Tempe; Lewis E. Terry, Phoenix, and Frank Secco d'Aragona, Scottsdale, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Continuation of Ser. No. 282,144, Jul. 28, 1994, abandoned, which is a division of Ser. No. 929,232, Aug. 14, 1992, Pat. No. 5,369,304. This application Aug. 24, 1995, Ser. No. 519,159

Int. Cl.<sup>6</sup> H01L 21/28; 21/30

U.S. Cl. 437—190

5 Claims



1. A method of forming a conductive diffusion barrier comprising the steps of:  
providing an active semiconductor wafer having a plurality of adjoining, alternately doped areas on a surface of the wafer;  
covering the plurality of adjoining, alternately doped areas with a continuous titanium nitride conductor layer, wherein the titanium nitride conductor layer is in contact with each of the plurality of adjoining, alternately doped areas and the titanium nitride conductor layer provides a suitable surface for wafer bonding; and

bonding a semiconductor handle wafer to the active semiconductor wafer by placing the titanium nitride conductor layer in contact with the handle wafer, wherein the titanium nitride conductor layer forms a diffusion barrier that prevents dopants within a first doped area of the plurality of adjoining, alternately doped areas from diffusing laterally through the titanium nitride conductor layer and into a second doped area of the plurality of adjoining, alternately doped areas.

**5,567,650**  
**METHOD OF FORMING TAPERED PLUG-FILLED VIA**  
**IN ELECTRICAL INTERCONNECTION**

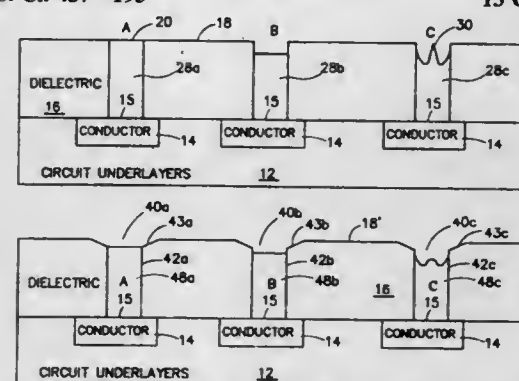
John B. Straight, Crystal; Daniel W. Youngner, Maple Grove, and James C. Anderson, Columbia Heights, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 15, 1994, Ser. No. 356,421

Int. Cl.<sup>6</sup> H01L 21/28

U.S. Cl. 437—195

13 Claims



1. A process for forming an electrical interconnection system on a semiconductor, comprising the steps of:  
providing a semiconductor substrate having an interconnection site;  
forming a first insulating layer on said semiconductor substrate, said first insulating layer having an upper surface;  
selectively etching a via in said first insulating layer at said interconnection site;  
forming a first layer comprising a refractory metal on said insulating layer and in said via to contact said interconnection site;  
partially removing said refractory metal layer until a surface of said refractory metal within said via is below said upper surface;  
performing an etching process which removes a portion of said first insulating layer, simultaneously allowing for smoothing of said refractory metal surface, and whereby a tapered shape is formed at an intersection of said via and said upper surface; and  
forming a second layer of metal over said insulating layer, said second layer of metal extending into said via and contacting said refractory metal with said tapered shape providing improved step coverage of said second metal at said via.

**5,567,651**  
**SELF-ALIGNED COBALT SILICIDE ON MOS**  
**INTEGRATED CIRCUITS**

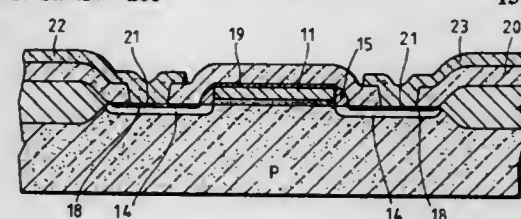
Antonio C. Berti, and Stephen P. Baranowski, both of Marlborough, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 372,852, Jan. 13, 1995, abandoned, which is a continuation of Ser. No. 240,603, May 10, 1994, abandoned, which is a continuation of Ser. No. 844,233, Mar. 2, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 487,573

Int. Cl.<sup>6</sup> H01L 21/441

U.S. Cl. 437—200

15 Claims



1. A method of making a semiconductor device, comprising the steps of:

a) applying a gate layer at a face of a silicon body;  
b) forming sidewall spacers composed of oxide at edges of said gate layer the sidewall spacers having a narrow width compared to a width of said gate layer;  
c) applying a first layer comprising cobalt to exposed areas of said face, said first layer extending from said exposed areas across said narrow width of said sidewall spacers and access said gate layer;  
d) applying a second layer including titanium nitride or titanium tungsten over said first layer;  
e) heating said body at a temperature of 420° C. to 550° C. to cause formation of cobalt monosilicide on said gate layer; and heating said body to a temperature in excess of said first temperature range to convert the cobalt monosilicide into cobalt disilicide.

**5,567,652**  
**METHOD FOR MANUFACTURING SEMICONDUCTOR**  
**DEVICE COMPRISING COBALT SILICIDE FILM**

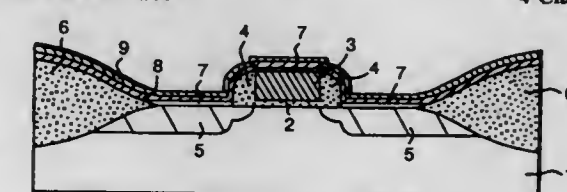
Naoharu Nishio, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 25, 1995, Ser. No. 533,160

Claims priority, application Japan, Oct. 14, 1994, 6-249219  
Int. Cl.<sup>6</sup> H01L 21/283

U.S. Cl. 437—200

4 Claims



1. A method for manufacturing a semiconductor device comprising a cobalt silicide film, said method comprising supplying a silicon single crystal substrate, thermally oxidizing said substrate to form a silicon oxide layer followed by a step of depositing a high melting point metal in which the generated free energy of its oxide is lower than that of said silicon oxide, and then depositing Co, followed by heat treatment to form CoSi<sub>2</sub>, wherein the silicon oxide layer is formed with a thickness which is sufficient to prevent a reaction of said Co with said formed silicon oxide layer during said heat treatment.

**5,567,653**  
**PROCESS FOR ALIGNING ETCH MASKS ON AN**  
**INTEGRATED CIRCUIT SURFACE USING**  
**ELECTROMAGNETIC ENERGY**

Claude L. Bertin, South Burlington; John E. Cronin, Milton, both of Vt., and David J. Perlman, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 14, 1994, Ser. No. 306,042

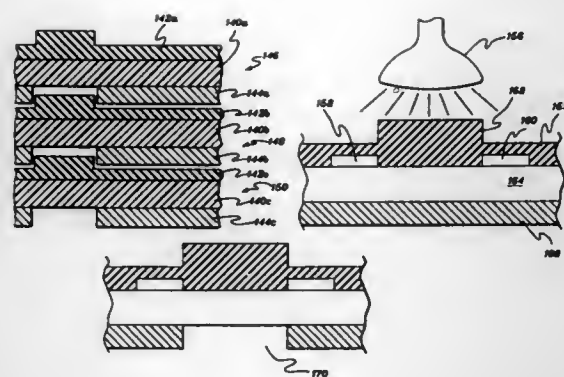
Int. Cl.<sup>6</sup> H01L 21/027; 21/31

U.S. Cl. 437—173

11 Claims

1. A method for aligning a pattern formed on a first surface of an integrated circuit chip with a complementary pattern formed on a second surface of said integrated circuit chip, said first surface having devices therebelow, said method comprising the steps of:  
etching the pattern into said first surface according to a first mask aligned to said devices, said pattern having regions of different heights relative to said first surface;  
irradiating said first surface with penetrating electromagnetic energy, the penetrating electromagnetic energy being affected by said pattern or said devices. Upon passage through said chip;  
aligning a second mask adjacent said second surface to said pattern including sensing said affected penetrating electromagnetic energy emanating from said second surface and





aligning said second mask according to the sensed affected penetrating electromagnetic energy; and etching a complementary pattern into said second surface according to said second mask, said complementary pattern having regions of different heights relative to said second surface.

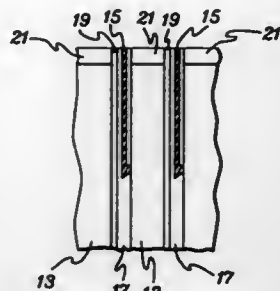
5,567,654

#### METHOD AND WORKPIECE FOR CONNECTING A THIN LAYER TO A MONOLITHIC ELECTRONIC MODULE'S SURFACE AND ASSOCIATED MODULE PACKAGING

Kenneth E. Beilstein, Jr., Essex Junction; Claude L. Bertin, South Burlington; John E. Cronin, Milton; Wayne J. Howell, Williston; James M. Leas, South Burlington, all of Vt., and David J. Perlman, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.  
Filed Sep. 28, 1994, Ser. No. 313,976  
Int. Cl.<sup>6</sup> H01L 21/60

U.S. Cl. 437—209

56 Claims



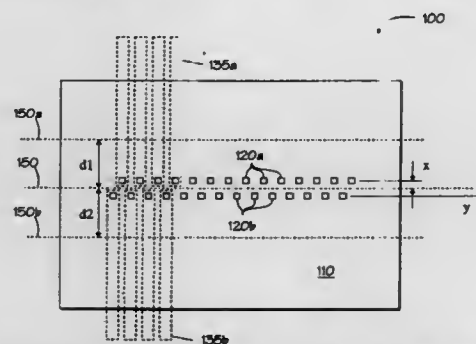
1. A method for establishing a thin-film layer on a semiconductor structure having a planar surface, said thin-film layer comprising a metallization layer, said semiconductor structure comprising a plurality of stacked integrated circuit (IC) chips having a plurality of edge surfaces that at least partially define said planar surface of said semiconductor structure, said method comprising the steps of:

- forming the metallization layer in association with a temporary support separate from the semiconductor structure;
- electrically coupling the metallization layer to the planar surface of the semiconductor structure such that said metallization layer physically bonds to said planar surface and said temporary support is coupled to said semiconductor structure, wherein said metallization layer electrically connects to said semiconductor structure; and
- decoupling the temporary support from said semiconductor structure, said metallization layer remaining electrically coupled and physically bonded to said planar surface of the semiconductor structure.

5,567,655  
METHOD FOR FORMING INTERIOR BOND PADS HAVING ZIG-ZAG LINEAR ARRANGEMENT  
Michael D. Rostoker, San Jose; Nicholas F. Pasch, Pacifica, and Joe Zelayeta, Saratoga, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.  
Continuation of Ser. No. 58,347, May 5, 1993, abandoned.  
This application Jun. 5, 1995, Ser. No. 469,086  
Int. Cl.<sup>6</sup> H01L 21/60

U.S. Cl. 437—209

12 Claims



1. Method of interconnecting densely packed bond pads on a semiconductor die with leadframe fingers, comprising: providing a semiconductor die having a planar surface; defining on the planar surface a thermal centroid axis passing substantially over a thermal centroid of the semiconductor die, the die having a width perpendicular to the axis; defining on the planar surface a first limit line parallel to and on a first side of the thermal centroid axis and near the thermal centroid axis at a first distance; defining on the planar surface a second limit line parallel to and on a second side of the thermal centroid axis and near the thermal centroid axis at a second distance; the first and second distances are each less than 30% of the width of the die; disposing a first plurality of bond pads in a first row adjacent to the first limit line and between the first limit line and the thermal centroid axis; disposing a second plurality of bond pads in a second row adjacent to the second limit line and between the second limit line and the thermal centroid axis; connecting a first set of leadframe fingers to the first plurality of bond pads with solder bump connections; and connecting a second set of leadframe fingers to the second plurality of bond pads with solder bump connections, wherein the first set of leadframe fingers are longitudinally offset from the second set of leadframe fingers.

5,567,656

#### PROCESS FOR PACKAGING SEMICONDUCTOR DEVICE

Dong-Suck Chun, Chungcheongbuk-do, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Cheongju, Rep. of Korea

Filed Dec. 20, 1994, Ser. No. 359,762

Claims priority, application Rep. of Korea, Dec. 27, 1993, 93-29910

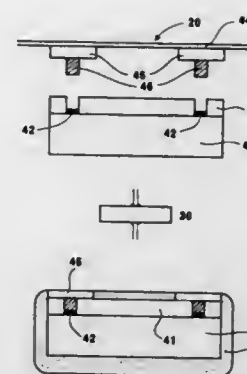
Int. Cl.<sup>6</sup> H01L 21/60

U.S. Cl. 437—211

9 Claims

1. A process for packaging a semiconductor device, comprising the steps of:

- forming an insulating layer on a wafer after a wafer fabrication process, wherein the wafer comprises a plurality of chips having bonding pads formed thereon, and removing portions of the insulating layer on portions of the chips where the bonding pads are positioned;
- cutting the wafer into a plurality of chips;
- forming a plurality of leads on a lead tape, wherein each of the leads comprises a pad type lead surface adjacent to the



lead tape and a bump on a surface facing away from the lead tape, wherein the leads corresponding to the bonding pads of the chips;

- making connections respectively between the bonding pads of one of the chips and the leads on the lead tape by attaching the bumps of the leads to the corresponding bonding pads of the chip; and
- molding the chip with resin.

5,567,657

#### FABRICATION AND STRUCTURES OF TWO-SIDED MOLDED CIRCUIT MODULES WITH FLEXIBLE INTERCONNECT LAYERS

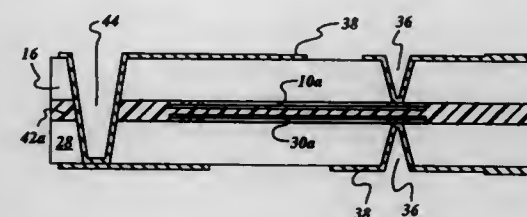
Robert J. Wojnarowski, Ballston Lake, and Thomas B. Gorczyca, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 4, 1995, Ser. No. 567,386

Int. Cl.<sup>6</sup> H01L 21/60

U.S. Cl. 437—214

8 Claims

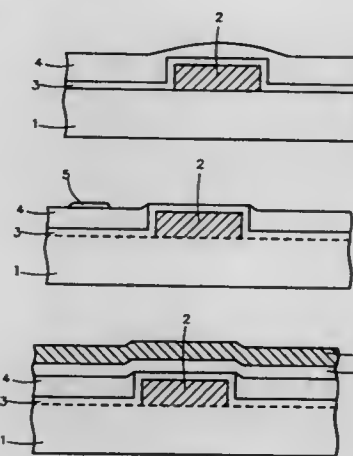


1. A method for fabricating a two-sided molded circuit module with flexible interconnect layers, the method comprising the steps of:

- providing first and second flexible interconnect structures, each flexible interconnect structure comprising a flexible interconnect layer having a chip surface and a chip with chip pads attached to the chip surface;
- providing molding material between the chip surfaces of the flexible interconnect layers and thereby surrounding respective chips with the molding material;
- solidifying the molding material;
- forming vias in the flexible interconnect layers, at least some of the vias extending to selected chip pads;
- applying a pattern of electrical conductors extending over the flexible interconnect layers and into the vias to couple selected ones of the chip pads.

5,567,658  
METHOD FOR MINIMIZING PEELING AT THE SURFACE OF SPIN-ON GLASSES  
Chin-Kun Wang, Shan-Chung, and Cheng-Cheng Chang, Chu-Dong, both of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chu, Taiwan  
Filed Sep. 1, 1994, Ser. No. 299,269  
Int. Cl.<sup>6</sup> H05H 1/00; H01L 21/4757; 21/469  
U.S. Cl. 437—228

28 Claims



1. A method for treating the surface of a layer of a spin-on glass comprising: subjecting said layer to an etchback treatment in a gaseous atmosphere containing compounds of carbon and fluorine; and exposing the surface of said etched back spin-on glass layer to an RF glow discharge between two electrodes in gas.

5,567,659

#### METHOD OF ETCHING PATTERNS IN III-V MATERIAL WITH ACCURATE DEPTH CONTROL

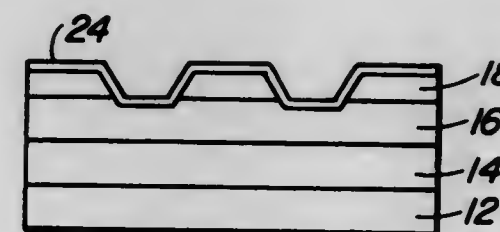
Grzegorz Pakulski, Woodlawn; Cornelis Blaauw, Kanata; Agnes Margittai, Ottawa, and Ronald Moore, Stittsville, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 25, 1995, Ser. No. 450,839

Int. Cl.<sup>6</sup> H01L 21/302

U.S. Cl. 437—228

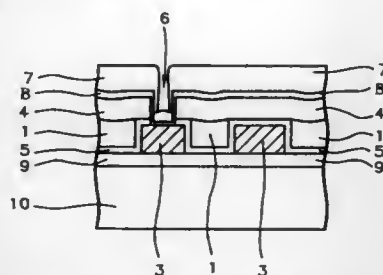
14 Claims



1. A method of etching a pattern in InGaAsP comprising:

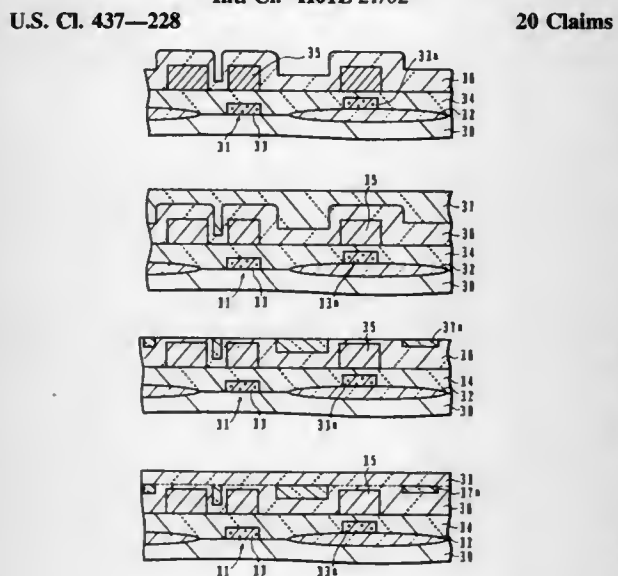
- forming a masking layer of InP on said InGaAsP;
- creating said pattern on said masking layer;
- selectively removing said masking layer to expose said InGaAsP;
- forming a native oxide on said exposed InGaAsP by UV-ozone oxidation; and
- removing said native oxide.

**5,567,660**  
**SPIN-ON-GLASS PLANARIZATION BY A NEW STAGNANT COATING METHOD**  
 Shih-Shiung Chen, and Kern-Shen Chou, both of Hsin-Chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company Ltd, Hsin-Chu, Taiwan  
 Filed Sep. 13, 1995, Ser. No. 527,707  
 Int. Cl.<sup>6</sup> H01L 21/473  
 U.S. Cl. 437—231 22 Claims



1. A method for an improved planar spin-on-glass layer on a semiconductor body comprising:  
 providing a semiconductor body having devices formed within an on its surface and with at least one patterned conductive layer thereover; and patterned conductive layer comprised of closely spaced members having spaces there between;  
 depositing a spin-on-glass (SOG) layer at least filling said spaces between said spaced members; said SOG layer not having voids, by:  
 (a) dispensing a solution containing a solute for forming said SOG layer on said body while said body is stationary;  
 (b) dispensing said solution on to said body while applying first spin cycle to said body; said first cycle having a speed in the range of about 50 to 350 rpm;  
 (c) applying a second spin cycle to said body; said second spin cycle having a speed greater than 3600 rpm; and  
 (d) baking said body.

**5,567,661**  
**FORMATION OF PLANARIZED INSULATING FILM BY PLASMA-ENHANCED CVD OF ORGANIC SILICON COMPOUND**  
 Hidetoshi Nishio; Takako Furuse; Yumiko Hamada, and Hiroyuki Uesugi, all of Kawasaki, Japan, assignors to Fujitsu Limited, Japan  
 Filed Jun. 3, 1994, Ser. No. 253,778  
 Claims priority, application Japan, Aug. 26, 1993, 5-211200  
 Int. Cl.<sup>6</sup> H01L 21/02 20 Claims



1. A method of manufacturing a semiconductor device having an insulating film comprising the steps of:  
 preparing a semiconductor substrate having one of convexities and concavities which create a step height on a surface thereof; and  
 generating plasma by using organic silicon having tri- or more silazane bonding and oxidant and depositing a planarized insulating film on said semiconductor substrate by plasma chemical vapor deposition at a substrate temperature of about 100° C. or lower in order to significantly reduce the step height.

**5,567,662**  
**METHOD OF MAKING METALLIC CARBIDE POWDERS**  
 Stephen D. Dunmead, Midland, and David D. Mossner, Coleman, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.  
 Filed Feb. 15, 1994, Ser. No. 196,928  
 Int. Cl.<sup>6</sup> C04B 35/56 17 Claims

1. A method of making metallic carbide powders, comprising heating a non-static solid reactant mixture of a metal oxide and a source of carbon to a first elevated temperature which is sufficient to cause at least partial carburization of the mixture, the heating being performed in a non-reducing atmosphere having a total pressure of at least one atmosphere for a sufficient time to form at least a partially-carburized mixture containing metallic carbide powder, the source of carbon employed at a level which results in a total carbon content equaling at most about 99 weight percent of the stoichiometric amount needed to produce pure metallic carbide from all of the metal oxide in the reactant mixture plus the amount needed to react with the oxygen in the reactant mixture to form carbon monoxide;  
 admixing a sufficient level of a source of carbon to the partially-carburized mixture to form an adjusted mixture having a total carbon content equaling the stoichiometric amount needed to make pure metallic carbide plus the amount needed to react with the oxygen in the partially-carburized mixture to form carbon monoxide; and  
 carburizing the adjusted mixture in a hydrogen-containing atmosphere at a second elevated temperature which is sufficient to cause carburization of the adjusted mixture to form the metallic carbide having a particle size of less than 0.2 micrometers.

**5,567,663**  
**CORDIERITE HONEYCOMB CERAMICS AND METHOD PRODUCING THE SAME**  
 Wataru Kotani, Kasugai; Yoshiro Ono, and Kazuhiko Kumazawa, both of Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan  
 Filed Mar. 2, 1995, Ser. No. 397,760  
 Claims priority, application Japan, Mar. 7, 1994, 6-035725  
 Int. Cl.<sup>6</sup> C04B 35/195 8 Claims

1. A cordierite ceramic honeycomb comprising a cordierite phase as a main ingredient, said cordierite phase comprising 42–56 wt % SiO<sub>2</sub>, 30–45 wt % Al<sub>2</sub>O<sub>3</sub>, 12–16 wt % MgO and an amount of Fe<sub>2</sub>O<sub>3</sub> from a talc raw material, said cordierite ceramic honeycomb satisfying the following equation:

$$\{Fe_2O_3 \text{ wt \%} / (MgO \text{ wt \%} + Fe_2O_3 \text{ wt \%})\} \times 100 = 2-10;$$

wherein a thermal expansion coefficient of said honeycomb is less than  $0.5 \times 10^{-6}/^\circ\text{C}$ . within a temperature range of 40°–800° C. in a direction parallel to a flow passage of said honeycomb.

**5,567,664**  
**SUPPORTED ZEO-TYPE MEMBRANE**  
 Sami A. I. Barri, South Ascot; Graham J. Bratton, Sidcup, and Timothy D. Naylor, Egham, all of England, assignors to British Petroleum Company, p.l.c., London, Great Britain  
 Division of Ser. No. 9,425, Jan. 27, 1993, Pat. No. 5,362,522, which is a continuation of Ser. No. 776,951, Oct. 15, 1991, abandoned. This application Aug. 4, 1994, Ser. No. 285,897  
 Claims priority, application United Kingdom, Oct. 19, 1990, 9022836  
 Int. Cl.<sup>6</sup> B01J 20/16; 35/04 19 Claims

1. A membrane which comprises a film of a crystalline material which is a molecular sieve with a crystal structure made up of a tetrahedra joined together through oxygen atoms to produce an extended network with channels of molecular dimensions, said film being carried by a porous support in which the crystalline material of the film is essentially continuous over the pores of the support, extends into the support and the crystalline material is crystallized directly from and bonds directly to the support wherein any pin-holes initially present in the film of crystalline material have been blocked by a post-treatment.

**5,567,665**  
**SHAPE-SHIFTED MAGNESIUM ALKOXIDE COMPONENT FOR POLYMERIZING OLEFINS**  
 Burkhard E. Wagner, Highland Park, N.J.; Daniel P. Zilker, Jr., Charleston, W. Va., and Robert J. Jorgensen, Belle Mead, N.J., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.  
 Continuation of Ser. No. 221,684, Mar. 31, 1994, abandoned.  
 This application May 23, 1995, Ser. No. 447,921  
 Int. Cl.<sup>6</sup> C08F 4/656 7 Claims

1. A process for preparing a catalyst component comprising:  
 (1) contacting dihydrocarbyloxide magnesium with carbon dioxide in the presence of a slurrying agent to form a magnesium hydrocarbyl carbonate;  
 (2) adding a filler an average particle size of no greater than 1 μm either before or after the dihydrocarbyloxide magnesium is contacted with carbon dioxide;  
 (3) spray drying the slurry of step (2) to evaporate the slurrying agent and to produce solid particles of magnesium hydrocarbyl carbonate incorporating the filler; and  
 (4) heating the solid particles to remove carbon dioxide to produce a hydrocarbyloxide magnesium catalyst component having an average particle size from about 5 μm to 200 μm.

**5,567,666**  
**SELECTIVATED ZEOLITE CATALYST TREATED WITH A DEALUMINIZING AGENT**  
 Jeffrey S. Beck, Princeton, and David L. Stern, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.  
 Filed May 15, 1995, Ser. No. 441,518  
 Int. Cl.<sup>6</sup> B01J 29/06 16 Claims

1. A method for preparing a selectivated catalyst composition, said method comprising the steps of:  
 (a) combining an intermediate pore size zeolite with an organo-silicon compound;  
 (b) calcining the organosilicon-containing material in an oxygen-containing atmosphere under conditions effective to remove organic material therefrom and deposit a siliceous material on said catalyst;  
 (c) contacting the catalyst comprising a zeolite and siliceous material from step (b) with an aqueous solution comprising at least one dealuminizing agent;  
 (d) washing the aqueous solution treated catalyst from step (c) with water;

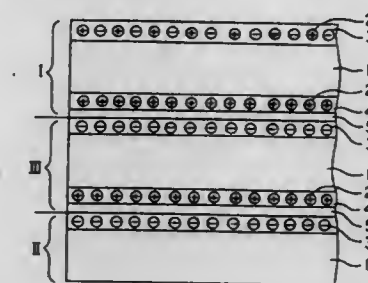
(e) drying the washed catalyst from step (d); and  
 (e) calcining the dried catalyst from step (d) under conditions sufficient to remove any residue of said dealuminizing agent; the catalyst from step (e) having a greater para selectivity and para xylene yield than a catalyst not treated with said dealuminizing agent.

**5,567,667**  
**OXIDATION CATALYSTS**  
 Michael A. Morris, Sunnyside; Martin Fowles, Danby, and William C. Mackrodt, Nr Altrincham, all of United Kingdom, assignors to Imperial Chemical Industries PLC, London, United Kingdom  
 PCT No. PCT/GB93/00356, § 371 Date Oct. 21, 1994, § 102(e) Date Oct. 21, 1994, PCT Pub. No. WO93/16799, PCT Pub. Date Sep. 2, 1993  
 PCT Filed Feb. 19, 1993, Ser. No. 290,831  
 Claims priority, application United Kingdom, Feb. 21, 1992, 9203709  
 Int. Cl.<sup>6</sup> B01J 23/10 3 Claims

1. A zirconia free catalyst composition consisting essentially of an intimate mixture of a total of 5–50% of praseodymium atoms and 50–95% of non-variable valency Group IIIa element atoms, said percentages being based upon the total number of praseodymium and non-variable valency Group IIIa element atoms, and less than 5%, based on the total number of Group IIIa element atoms, of variable valency Group IIIa element atoms other than praseodymium.

**5,567,668**  
**PRESSURE- AND HEAT-SENSITIVE MULTILAYER COPYING PAPER**  
 Kunio Oda; Nobuhiko Kitada; Akihiro Tanaka; Kazuho Fujiiwara, and Shinichi Matsumoto, all of Takatsuki, Japan, assignors to Naigai Carbon Ink Co., Ltd., Takatsuki, Japan  
 PCT No. PCT/JP94/00247, § 371 Date Dec. 21, 1994, § 102(e) Date Dec. 21, 1994, PCT Pub. No. WO94/19198, PCT Pub. Date Sep. 1, 1994  
 PCT Filed Feb. 18, 1994, Ser. No. 338,506  
 Claims priority, application Japan, Feb. 24, 1993, 5-035238  
 Int. Cl.<sup>6</sup> B41M 5/34 26 Claims

1. A pressure- and heat-sensitive multilayer copying paper, comprising:  
 an upper paper member composed of: a substrate sheet having a front surface and a back surface; a layer provided on the front surface of the substrate sheet comprising a colorless electron donative color-forming organic compound and an acidic organic compound which develops said organic compound when heat is applied to said layer for melting it; a layer provided on the back surface of the substrate sheet comprising a colorless electron donative color-forming organic compound, pressure-sensitive microcapsules encapsulating the colorless electron donative color-forming organic compound and a thermomelttable material; and an overcoated protective





layer placed over the layer provided on the back surface of the substrate sheet, said protective layer including a UV curable resin; and

a lower paper member having a surface flatness of not less than 80 sec composed of: a substrate sheet having a front surface and a back surface; a layer provided on the front surface of the substrate sheet comprising at least one acidic organic compound which forms color when it reacts with the colorless electron donative color-forming organic compound.

5,567,669

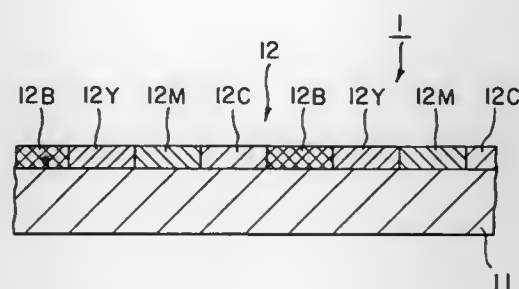
## THERMAL TRANSFER SHEET

Nobuyuki Harada, and Hiroshi Eguchi, both of Tokyo-to, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan  
Filed Mar. 14, 1995, Ser. No. 404,818

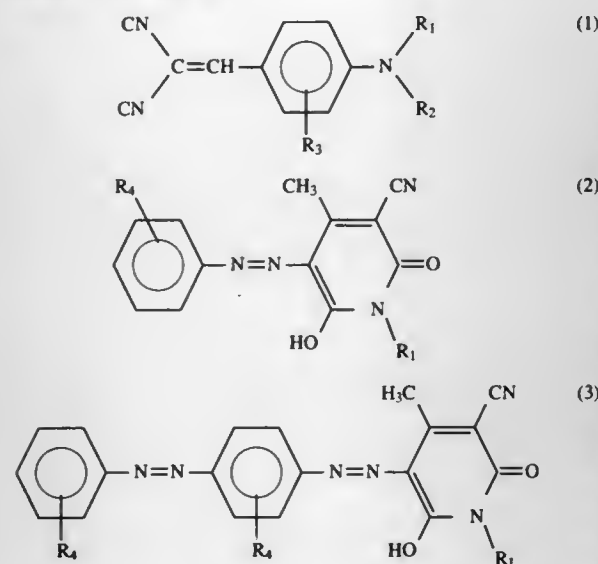
Claims priority, application Japan, Mar. 17, 1994, 6-072742  
Int. Cl.<sup>6</sup> B41M 5/035; 5/38

U.S. Cl. 503—227

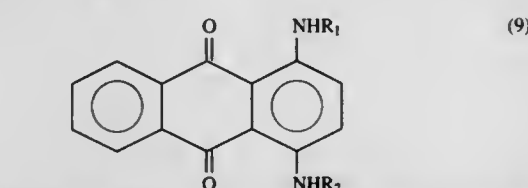
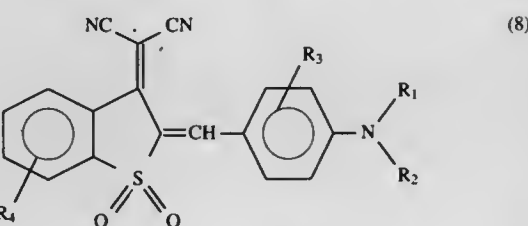
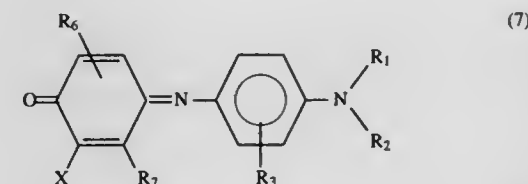
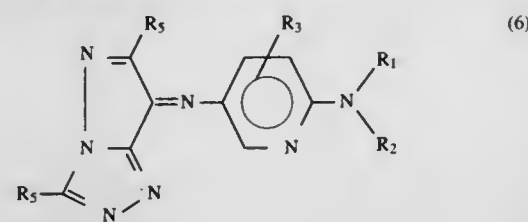
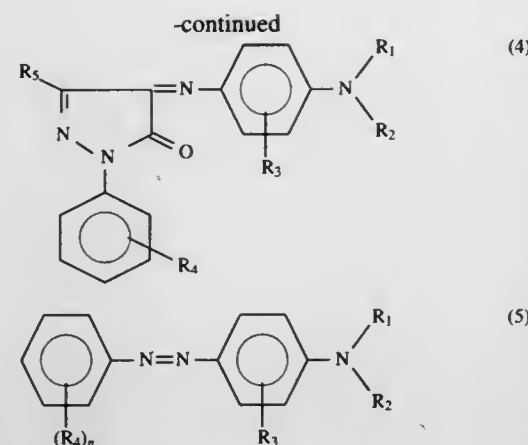
5 Claims



1. A thermal transfer sheet for a black image, comprising a substrate sheet and, provided on one side of said substrate sheet, a black dye layer containing a plurality of dyes, said dyes contained in said black dye layer being at least one yellow dye selected from those represented by the following general formulae (1), (2), and (3), at least one magenta dye selected from those represented by the following general formulae (4), (5), and (6), and at least one cyan dye selected from those represented by the following general formulae (7), (8), and (9):



wherein  $R_1$  and  $R_2$  represent a substituted or unsubstituted alkyl group, a substituted or unsubstituted allyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted aralkyl group, or a substituted or unsubstituted alkoxyalkyl group,  $R_3$  represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted alkylcarbonylamino group, a substituted or unsubstituted alkylsulfonylamino group, a substituted or unsubstituted alkylaminocarbonyl group, a cyano group, a nitro group, a halogen atom, or a hydrogen atom,  $R_4$  represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aralkyloxycarbonyl group, a substituted or unsubstituted alkoxy carbonyl group, a substituted or unsubstituted alkylaminocarbonyl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted alkylaminosulfonyl group, a substituted or unsubstituted cycloalkyl group, a cyano group, a nitro group, a hydrogen atom or a halogen atom,  $R_5$  represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted



5,567,671

## SUBSTITUTED 1-H-3-PHENYL-5-CYCLOALKYLPYRROLIDINE-2,4-DIONES, THEIR PREPARATION AND THEIR USE

Reiner Fischer, Monheim; Thomas Bretschneider, Siegburg; Bernd-Wieland Krüger, Bergisch Gladbach; Hans-Joachim Santel, Leverkusen; Markus Dollinger, Leichlingen; Andreas Turberg, Erkrath, and Ulrike Wachendorf-Neumann, Monheim, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 22, 1994, Ser. No. 200,139

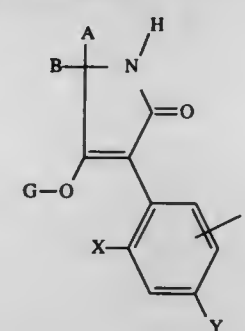
Claims priority, application Germany, Mar. 1, 1993, 43 06 257.1

Int. Cl.<sup>6</sup> A01N 43/36; C07D 207/22

U.S. Cl. 504—283

20 Claims

1. A 1-H-3[P]-phenyl-5-cycloalkylpyrrolidine-2,4-dione[s] of the formula [(I)]



I in which

A represents optionally substituted cycloalkyl and B represents optionally substituted alkyl, X represents alkyl, halogen or alkoxy, Y represents hydrogen, alkyl, halogen, alkoxy or halogenoalkyl, Z represents alkyl, halogen or alkoxy, n represents a number 0, 1, 2 or 3, G represents hydrogen (a) or the groups

5,567,670

## HERBICIDES FOR CITRUS OIL PALM RUBBER AND OTHER PLANTATION CROPS

Kofi S. Amuti, Wilmington; Wonyoo Hong, Hockessin, both of Del., and Joseph E. Semple, San Diego, Calif., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

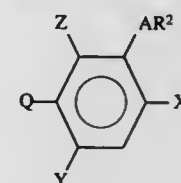
Division of Ser. No. 256,339, Jul. 13, 1994, which is a continuation-in-part of Ser. No. 821,118, Jan. 15, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 468,399

Int. Cl.<sup>6</sup> C07D 251/30; 251/46; A01N 43/66

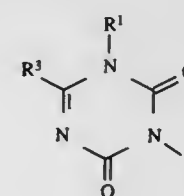
U.S. Cl. 504—230

17 Claims

1. A method for controlling the growth of undesired vegetation in plantation crops which comprises applying to the locus of the crop an herbicidally effective amount of a compound of Formula I



wherein



A is O or S;

$R^1$  is  $C_1-C_4$  alkyl optionally substituted with one or more halogen,  $OR^5$ ,  $SR^6$  or  $CN$ ;  $C_3-C_6$  alkenyl or  $C_3-C_6$  alkynyl, each optionally substituted with 1-3 halogen atoms; formyl; or  $C_2-C_6$  alkanoyl;

$R^2$  is H, allyl, propargyl,  $CH(CH_3)C\equiv CH$ , benzyl,  $CHR^7CO_2R^8$  or may be taken together with Z;

$R^3$  is  $C_1-C_4$  alkyl,  $C_1-C_4$  haloalkyl or  $N(CH_3)_2$ ;

$R^5$  and  $R^6$  are independently H or  $C_1-C_3$  alkyl;

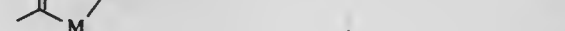
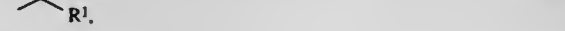
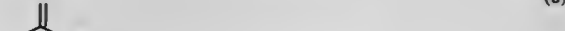
$R^7$  and  $R^8$  are independently  $C_1-C_2$  alkyl;

X is Cl or Br;

Y is F or Cl;

Z is H or may be taken together with  $R^2$  as  $-CH_2CHR^9$  such that the linking A atom is attached to the methine carbon;

$R^9$  is  $C_1-C_3$  alkyl,  $C_1-C_3$  haloalkyl, cyclopropyl, vinyl,  $C_2$  alkynyl,  $CN$ ,  $C(O)R^{10}$ ,  $CO_2R^{10}$ ,  $CONR^{10}R^{11}$ ,  $CR^{12}R^{13}C(O)R^{10}$ ,  $CR^{12}R^{13}CO_2R^{10}$ ,  $CR^{12}R^{13}CONR^{10}R^{11}$ ,  $CHR^{12}OH$ ,  $CHR^{12}C(O)R^{10}$  or  $CHR^{12}OC(O)NR^{10}R^{11}$ ; and  $R^{10}$ ,  $R^{11}$ ,  $R^{12}$  and  $R^{13}$  are independently H or  $C_1-C_3$  alkyl.



L and M represent oxygen and/or sulphur,

$R^1$  represents in each case optionally halogen-substituted alkyl, alkenyl, alkoxyalkyl, alkylthioalkyl, polyalkoxyalkyl or cycloalkyl, wherein said cycloalkyl group is optionally interrupted by hetero atoms, or represents optionally substituted phenyl, optionally substituted phenylalkyl, substituted heteraryl, substituted phenoxyalkyl or substituted heteroalkoxyalkyl,

$R^2$  represents in each case optionally halogen-substituted alkyl, alkenyl, alkoxyalkyl, polyalkoxyalkyl or in each case optionally substituted cycloalkyl, phenyl or benzyl,

$R^4$  and  $R^5$  independently of one another represent in each case optionally halogen-substituted alkyl, alkoxy, cycloalkyloxy, alkylamino, dialkylamino, alkylthio, alkenylthio or

cycloalkylthio and in each case optionally substituted phenyl, phenoxy, benzyloxy or phenylthio,  $R^6$  and  $R^7$  independently of one another represent hydrogen, in each case optionally halogen-substituted alkyl, alkenyl, alkoxy or alkoxyalkyl, optionally substituted phenyl, optionally substituted benzyl, or together with the N-atom to which they are bound represent a cycle which is optionally interrupted by oxygen or sulphur.

5,567,672

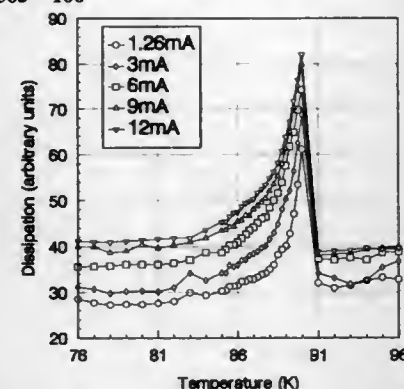
# METHOD AND APPARATUS FOR DAMPING MECHANICAL VIBRATION WITH A HIGH TC SUPERCONDUCTOR

Alexander N. Terentiev, and John P. Harrison, both of Kingston, Canada, assignors to Queen's University at Kingston, Kingston, Canada

Filed Oct. 11, 1994, Ser. No. 320,638  
Int. Cl.<sup>6</sup> H02K 5/24; 7/09

U.S. Cl. 505—166

16 Claims



1. A method for damping vibrations in a structure comprising the steps of:

incorporating a high  $T_c$  superconducting element into said structure; sensing said vibrations and controlling temperature in said superconducting element in a temperature range corresponding to an energy dissipation peak which is below a transition temperature to a superconducting state, in response to said sensing step.

5,567,673

# PROCESS OF FORMING MULTILAYERED TL-CONTAINING SUPERCONDUCTING COMPOSITES

Dean W. Face, Wilmington, Del., and Kirsten E. Myers, Philadelphia, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 323,560, Oct. 17, 1994, abandoned. This application Mar. 29, 1995, Ser. No. 412,424  
Int. Cl.<sup>6</sup> H01L 39/24

U.S. Cl. 505—329

5 Claims



1. A vapor phase process for preparing an improved multilayer composite article comprising, in order: 1) a substrate, 2) a first superconducting layer, 3) at least one intermediate layer, each said at least one intermediate layer independently being selected from the group consisting of an insulating layer and a normal conductive layer, and 4) a second superconducting layer, wherein all of said layers at least partially overlap, wherein said first superconducting layer, said intermediate layer, and said second superconducting layer each independently comprise a thallium-containing oxide,

said vapor phase process being by vapor phase deposition of successive layers by providing a first source of relatively volatile thallium-containing oxides, providing a second source of involatile oxides, depositing said involatile oxides from said second source onto a substrate while concurrently depositing a sufficient amount of thallium-containing oxides from said first source onto said substrate to provide a crystalline thin film of predetermined stoichiometry, wherein, the improvement in the process comprises heating each of the deposited superconducting films to a temperature greater than 700° C. but less than the decomposition temperature of the film in the presence of  $O_2$  or  $N_2O$  at a pressure of from about  $1.33 \times 10^{-4}$  Pa to about  $10.1 \times 10^{-5}$  Pa in the presence of a thallium vapor pressure sufficient to avoid evaporation of thallium from said superconducting films.

5,567,674

# PROCESS OF FORMING OXIDE SUPERCONDUCTOR POSSESSING LOCALLY DIFFERENT CRYSTAL ORIENTATIONS

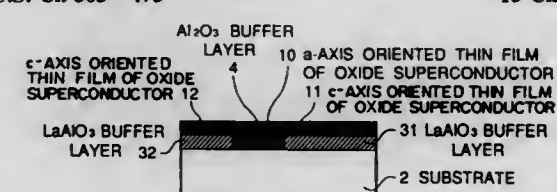
Hiroshi Inada, and Michitomo Iiyama, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan  
Division of Ser. No. 201,080, Feb. 24, 1994, Pat. No. 5,464,812, which is a continuation of Ser. No. 845,420, Mar. 4, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 472,642

Claims priority, application Japan, Mar. 4, 1991, 3-62602; Mar. 4, 1991, 3-62603

Int. Cl.<sup>6</sup> H01L 39/24; C23C 14/34

U.S. Cl. 505—475

15 Claims



1. A process for preparing a film of oxide superconductor having a first portion and a second portion, each of the portions possessing a different crystal orientation, the process comprising: depositing a first buffer layer on a substrate, removing a portion of the first buffer layer to expose a surface of the substrate, depositing a second buffer layer on the exposed surface of the substrate, and depositing a film of oxide superconductor on a remaining portion of the first buffer layer and on the second buffer layer, such that a first portion of the film of oxide superconductor on the first buffer layer has a first crystal orientation, and a second portion of the film of oxide superconductor on the second buffer layer has a second crystal orientation, one of the crystal orientations being a c-axis crystal orientation.

5,567,675

# APPLICATION OF N,N-DIALKYLAMIDES TO CONTROL THE FORMATION OF EMULSIONS OR SLUDGE DURING DRILLING OR WORKOVER OF PRODUCING OIL WELLS

Julian Romocki, Calgary, Canada, assignor to Buckman Laboratories of Canada, Ltd., Quebec, Canada, and Buckman Laboratories Int., Inc., Memphis, Tenn.

Filed Feb. 16, 1994, Ser. No. 195,675

Int. Cl.<sup>6</sup> C09K 7/00

U.S. Cl. 507—131

11 Claims

1. A composition useful for prevention of the formation of crude oil/water emulsions or for breaking such emulsions encountered

5,567,678

# ANTI-OBESITY PROTEINS

Richard D. DiMarchi, Carmel; David B. Flora, Greenfield; William F. Heath, Jr., Fishers; James A. Hoffmann, Greenwood; James E. Shields, Noblesville, and David L. Smiley, Greenfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 31, 1995, Ser. No. 381,041

Int. Cl.<sup>6</sup> C07K 14/00; A61K 38/00

U.S. Cl. 530—324

8 Claims

1. A protein of the formula: SEQ ID NO: 1 or a pharmaceutically acceptable salt thereof.

5,567,676

# GLYCOPEPTIDE ANTIBIOTICS

Enrico Selva, Via Di Vittorio; Grazia Beretta, Via Belgirate; Angelo Borghi, Via Pierluigi Da Palestrina, and Maurizio Denaro, Viale Bligny, all of Italy, assignors to Gruppo Lepetit S.p.A., Gerenzano, Italy

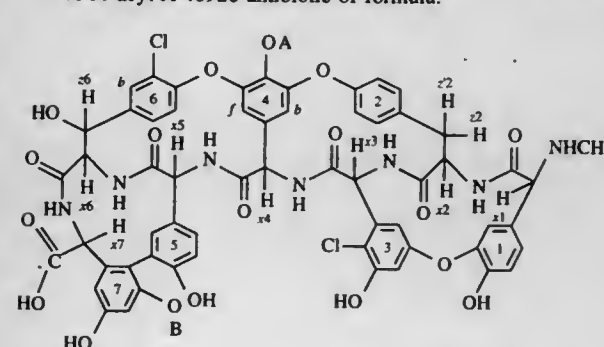
Continuation of Ser. No. 317,430, Oct. 4, 1994, abandoned, which is a continuation of Ser. No. 347,980, Apr. 14, 1989, abandoned. This application Jun. 1, 1995, Ser. No. 457,365  
Claims priority, application United Kingdom, Oct. 10, 1986, 8624400; Nov. 4, 1986, 8626324

Int. Cl.<sup>6</sup> A61K 38/14; 38/12; C07K 9/00

U.S. Cl. 514—8

10 Claims

1. A de-acyl A 40926 antibiotic of formula:



wherein:

A represents a 2-amino-2-deoxy-beta-D-glucopyranosiduronic acid group and  
B represents hydrogen, alpha-D-mannopyranosyl or 6-acetyl-alpha-D-mannopyranosyl, or the addition salt thereof.

5,567,677

# PROTEIN FORMULATION COMPRISING GROWTH HORMONE

Staffan Castensson, Knivsta; Ebba Florin-Robertsson, Stockholm; Elvy Hokby, Enskede, and Sirkka Thomé, Stockholm, all of Sweden, assignors to Pharmacia AB, Sweden  
PCT No. PCT/SE93/00281, § 371 Date Dec. 20, 1993, § 102(e) Date Dec. 20, 1993, PCT Pub. No. WO93/19776, PCT Pub. Date Oct. 14, 1993

PCT Filed Apr. 1, 1993, Ser. No. 162,017

Claims priority, application Sweden, Apr. 3, 1992, 9201073  
Int. Cl.<sup>6</sup> A61K 38/27

U.S. Cl. 514—12

28 Claims

1. A stabilized injectable growth hormone formulation being stable for at least 12 months, consisting of a solution of human growth hormone (hGH) as the growth hormone in said formulation and citrate in an amount of 2–50 mM as buffer substance at a pH of about 5.0 to 7.0 to thereby stabilize said growth hormone in said formulation.

5,567,680

# PGLA AND XPF PEPTIDES AND USES THEREFOR

Michael A. Zasloff, Rockville, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 731,304, Jul. 16, 1991, abandoned, which is a continuation of Ser. No. 81,793, Aug. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 76,734, Jul. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 21,493, Mar. 4, 1987, Pat. No. 4,810,777. This application Feb. 14, 1992, Ser. No. 834,992

Int. Cl.<sup>6</sup> A61K 38/17

U.S. Cl. 514—13

10 Claims

1. A process for inhibiting, preventing, or destroying the growth of a bacterium or fungus in a host, comprising: administering to a host at least one member selected from the group consisting of XPF peptide and PGLa peptide, said at least one member being administered in an amount effective to inhibit, prevent, or destroy the growth of a bacterium or fungus in a host.



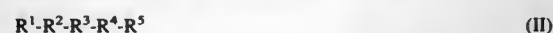
5,567,682

**METHOD OF TREATING ALZHEIMER'S DISEASE**  
 Candace B. Pert, Potomac, Md., assignor to Advanced Peptides and Biotechnology Sciences, Sewickely, Pa.  
 Continuation of Ser. No. 44,903, Apr. 6, 1993, abandoned, which is a continuation of Ser. No. 831,088, Feb. 7, 1992, abandoned, which is a continuation of Ser. No. 551,048, Jul. 11, 1990, abandoned, which is a continuation of Ser. No. 285,074, Dec. 16, 1988, abandoned. This application Nov. 29, 1994, Ser. No. 346,334  
 Int. Cl.<sup>6</sup> A61K 38/07;38/08

U.S. Cl. 514—15 8 Claims  
 1. A method of treating the symptoms of Alzheimer's disease by reducing or halting a loss of neurons, comprising intranasally administering to a person suffering from Alzheimer's dementia a therapeutically effective amount of a peptide of the formula:



where  $R^a$  represents an amino terminal residue Ala- or D-Ala- and  $R^b$  represents a carboxyl terminal residue -Thr or Thr amide and/or an additional Cys-residue at one or both of the amino and carboxyl terminals, or a peptide of the formula:

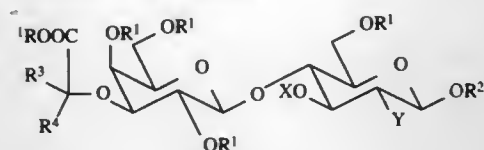


where  $R^1$  is an amino terminal residue Thr-, Ser-, Asn-, Leu-, Ile-, Arg- or Glu-;  $R^2$  is Thr, Ser or Asp;  $R^3$  is Thr, Ser, Asn, Arg, Gln, Lys or Trp;  $R^4$  is Tyr; and  $R^5$  is a carboxyl terminal amino group with a corresponding D-amino acid as the amino terminal residue, and/or a corresponding amide derivative at the carboxyl terminal residue and/or additionally a Cys-residue at one or both of the amino and carboxyl terminals, or a physiologically acceptable salt thereof.

5,567,683

**SUBSTITUTED LACTOSE AND LACTOSAMINE DERIVATIVES AS CELL ADHESION**  
 Mina A. Nashed, Alexandria, Egypt; Falguni Dasgupta, Alameda; Saeed A. Abbas, Vallejo; John H. Musser, San Carlos, all of Calif., and Darwin S. Asa, Galesburg, Mich., assignors to Glycomed Incorporated, Alameda, Calif.  
 Continuation of Ser. No. 800,557, Nov. 27, 1991, Pat. No. 5,326,752. This application Jul. 1, 1994, Ser. No. 270,874  
 Int. Cl.<sup>6</sup> A61K 31/70;31/715;37/00;37/10  
 U.S. Cl. 514—25 22 Claims

1. A compound of the formula



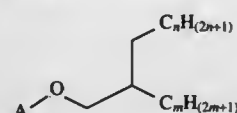
wherein each  $R^1$  is independently H or lower alkyl (1-4C);  $R^2$  is H, lower alkyl(1-4C), alkylaryl or at least one additional saccharide residue;  $R^3$  and  $R^4$  are each independently H, alkyl(1-6C), aryl or  $R^3$  and  $R^4$ , taken together, form a five- or six-membered ring optionally containing a heteroatom selected from the group consisting of O, S, and NR<sup>1</sup>; wherein said five- or six-membered ring may further be substituted by one or more substituents selected from the group consisting of (CHOR<sup>1</sup>)<sub>m</sub>H, wherein m is 1-4, OR<sup>1</sup>, OOCR<sup>1</sup>, NR<sup>2</sup>, NHCOR<sup>1</sup>, and SR<sup>1</sup>; Y is H, OR<sup>1</sup>, OOCR<sup>1</sup>, NR<sup>2</sup>, NHCOR<sup>1</sup> or SR<sup>1</sup>; and X is —CHR<sup>5</sup>(CHOR<sup>1</sup>)<sub>2</sub>CHR<sup>6</sup>OR<sup>1</sup> wherein  $R^5$  and  $R^6$  result in a five- or six-membered ring optionally containing a heteroatom selected from the group consisting of O, S, and NR<sup>1</sup>; said five- or six-membered ring optionally substituted with one or more substituents selected from the group consisting of  $R^1$ , CH<sub>2</sub>OR<sup>1</sup>, OR<sup>1</sup>, OOCR<sup>1</sup>, NR<sup>2</sup>, NHCOR<sup>1</sup>, SR<sup>1</sup> and F;

with the proviso that if Y represents NR<sup>2</sup>, or NHCOR<sup>1</sup>, then  $R^3$  and  $R^4$ , taken together, cannot provide a hexose substituent.

5,567,684

**SYNTHETIC GANGLIOSIDE DERIVATIVES**  
 Stephan Ladisch, Chevy Chase, Md., and Akira Hasegawa, Gifu, Japan, assignors to The Regents of The University of California, Oakland, Calif.  
 Filed Sep. 14, 1994, Ser. No. 305,832  
 Int. Cl.<sup>6</sup> A61K 31/70; C08B 37/00; C07H 3/06  
 U.S. Cl. 514—25 12 Claims

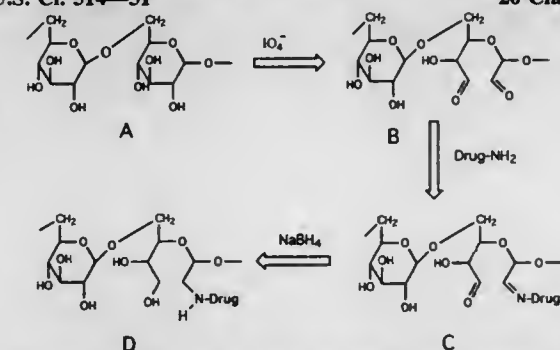
1. A compound having the formula



wherein A is a carbohydrate moiety which corresponds to the carbohydrate moiety of a naturally occurring ganglioside, n is 5 to 20 and m is 5 to 20.

5,567,685

**WATER-SOLUBLE POLYENE CONJUGATE**  
 Galina Linden, Rishon LeZion; Abraham J. Domb, Efrat; Itzhack Polacheck, and Shimon Benita, both of Jerusalem, all of Israel, assignors to Yissum Research Development Company of the Hebrew University of Jerusalem, Jerusalem, Israel  
 Filed Aug. 16, 1994, Ser. No. 291,292  
 Int. Cl.<sup>6</sup> A61K 31/70; C07H 1/06; C07G 11/00; C08B 37/02  
 U.S. Cl. 514—31 20 Claims



5. A method for producing a substantially stable water-soluble polysaccharide conjugate of a polyene antibiotic comprising:  
 (a) activating said polysaccharide to a dialdehyde by periodate oxidation;  
 (b) purifying said dialdehyde from interfering anions and by-products;  
 (c) coupling said antibiotic to said purified dialdehyde by Schiff base formation to form said conjugate; and  
 (d) purifying said conjugate.

5,567,686

**METHOD FOR PROTECTION AGAINST GENOTOXIC MUTAGENESIS**  
 David J. Grdina, Naperville, Ill., assignor to Arch Development Corporation, Chicago, Ill.  
 Continuation-in-part of Ser. No. 851,210, Mar. 13, 1992. This application Sep. 13, 1993, Ser. No. 121,946  
 Int. Cl.<sup>6</sup> A61K 31/66  
 U.S. Cl. 514—43 11 Claims

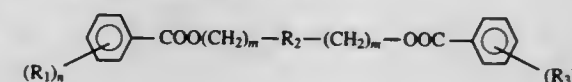
1. A method for reducing mammal cell mutations induced by irradiation, comprising the steps of:

5,567,689

**METHODS FOR INCREASING URIDINE LEVELS WITH L-NUCLEOSIDES**  
 Jean-Pierre Sommadossi, and Mahmoud H. el Kouni, both of Birmingham, Ala., assignors to The UAB Research Foundation, Birmingham, Ala.  
 Filed Aug. 13, 1993, Ser. No. 106,225  
 Int. Cl.<sup>6</sup> A61K 31/70;31/55; C07D 241/04; A01N 43/62  
 U.S. Cl. 514—50 12 Claims

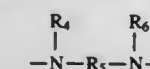
1. A method of increasing intracellular and plasma uridine levels in a subject by coadministering or sequentially administering to the subject:

- one or more compounds selected from the group consisting of uridine phosphorylase inhibitors, uridine, cytidine, prodrugs of uridine, prodrugs of cytidine; and
- an effective amount of a uridine secretion inhibiting compound represented by the following formula or a pharmaceutically acceptable salt thereof

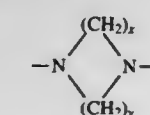


where:

$R_1$  and  $R_2$  are lower alkoxy groups having from 1 to 3 carbon atoms, and may be the same or different, n is an integer from 1 to 3, m is 2 or 3,  $R_2$  is



where  $R_4$  and  $R_6$  are methyl, ethyl or propyl, and may be the same or different, and  $R_5$  is methyl, ethyl, propyl or butyl; or where  $R_2$  is

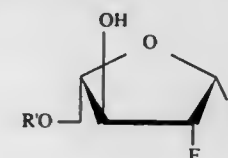


where x is an integer from 2 to 4 and y is 2 or 3, and the sum of x and y is from 5 to 7.

5,567,688

**L-NUCLEOSIDES FOR THE TREATMENT OF HEPATITIS B-VIRUS**  
 Chung K. Chu, Athens, Ga.; Yung-Chi Cheng, Woodbridge, Conn.; Balakrishna S. Pai, New Haven, Conn., and Gang-Oing Yao, Guilford, Conn., assignors to Univ. of GA Research Foundation, Athens, Ga., and Yale University, New Haven, Conn.  
 Continuation of Ser. No. 189,070, Jan. 28, 1994. This application Jun. 6, 1995, Ser. No. 467,010  
 Int. Cl.<sup>6</sup> A61K 31/70  
 U.S. Cl. 514—46 32 Claims

1. A method for the treatment of a human infected with HBV comprising administering to said human an HBV treatment amount of an L-nucleoside of the formula:

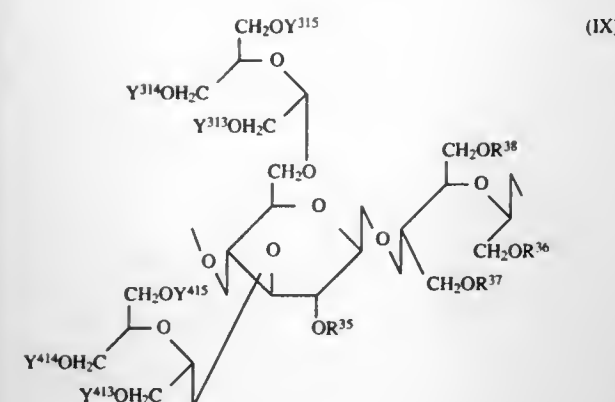


wherein R is selected from the group consisting of 5-methyluracil, adenine and cytosine, and  $R'$  is hydrogen, acyl, alkyl or a mono-phosphate, diphosphate or triphosphate ester.

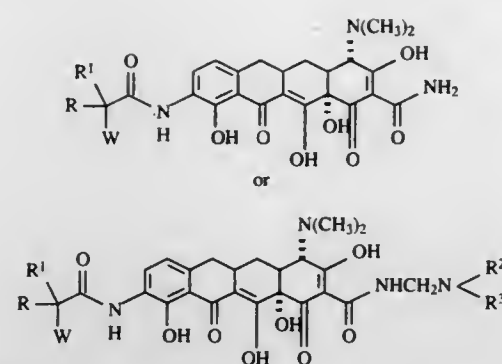
**CARBOXYMETHYLMANNOGLUCANS AND DERIVATIVES THEREOF**

Kazuhiro Inoue, Funabashi; Teruomi Ito, Matsudo; Takayuki Kawaguchi, Toshima-ku; Katsutoshi Aono, Nara; Satoshi Okuno, Misato, and Toshiro Yano, Kashiwa, all of Japan, assignors to Drug Delivery System Institute, Ltd., Japan  
 Continuation of Ser. No. 136,039, Oct. 14, 1993, abandoned, which is a division of Ser. No. 934,501, Oct. 21, 1992, abandoned. This application Mar. 2, 1995, Ser. No. 397,560  
 Claims priority, application Japan, Feb. 21, 1991, 3-27544; Dec. 27, 1991, 3-360395  
 Int. Cl.<sup>6</sup> A61K 31/725;31/72;31/715;47/36  
 U.S. Cl. 514—54 5 Claims

1. A carboxymethyl ring-opened mannoglucan or derivative thereof comprising units represented by the formula (XI) or salt thereof:



(IX)



wherein:

R is selected from the group consisting of hydrogen; straight or branched (C<sub>1</sub>-C<sub>8</sub>)alkyl group selected from the group consisting of methyl, ethyl, propyl, isopropyl, butyl, isobutyl, pentyl, hexyl, heptyl and octyl; α-mercapto(C<sub>1</sub>-C<sub>4</sub>)alkyl group selected from the group consisting of mercaptomethyl, α-mercaptoethyl, α-mercapto-1-methylethyl, α-mercapto-1-propylethyl, α-mercapto-1-butylethyl, α-mercapto-1-pentylethyl, α-mercapto-1-hexylethyl, α-mercapto-1-octylethyl; carboxyl(C<sub>1</sub>-C<sub>4</sub>)alkyl group; (C<sub>6</sub>-C<sub>10</sub>)aryl group selected from the group consisting of phenyl, α-naphthyl and β-naphthyl; substituted(C<sub>6</sub>-C<sub>10</sub>)aryl group wherein the substitution is selected from the group consisting of hydroxy, halogen, (C<sub>1</sub>-C<sub>4</sub>)alkoxy, trihalo (C<sub>1</sub>-C<sub>3</sub>)alkyl, nitro, amino, cyano, (C<sub>1</sub>-C<sub>4</sub>)alkoxycarbonyl, (C<sub>1</sub>-C<sub>3</sub>)alkylamino and carboxy; (C<sub>7</sub>-C<sub>9</sub>)aralkyl group selected from the group consisting of benzyl, 1-phenylethyl, 2-phenylethyl and phenylpropyl; and substituted (C<sub>7</sub>-C<sub>9</sub>)aralkyl group wherein the substitution is selected from the group consisting of halo, (C<sub>1</sub>-C<sub>4</sub>)alkyl, nitro, hydroxy, amino, mono- or di-substituted (C<sub>1</sub>-C<sub>4</sub>)alkylamino, (C<sub>1</sub>-C<sub>4</sub>)alkoxy, (C<sub>1</sub>-C<sub>4</sub>)alkylsulfonylethyl, cyano and carboxy;

R<sup>1</sup> is selected from the group consisting of hydrogen and (C<sub>1</sub>-C<sub>6</sub>)alkyl selected from the group consisting of methyl, ethyl, propyl, isopropyl, butyl, isobutyl, pentyl and hexyl; when R does not equal R<sup>1</sup> the stereochemistry of the asymmetric carbon (i.e. the carbon bearing the W substituent) may be either the racemate (DL) or either of the individual enantiomers (L or D);

W is selected from amino; hydroxylamino; (C<sub>1</sub>-C<sub>12</sub>) straight or branched alkyl monosubstituted amino group wherein the substitution is selected from the group consisting of methyl, ethyl, n-propyl, 1-methylethyl, n-butyl, 1-methylpropyl, 2-methylpropyl, 1,1-dimethylethyl, n-pentyl, 2-methylbutyl, 1,1-dimethylpropyl, 2,2-dimethylpropyl, 3-methylbutyl, n-hexyl, 1-methylpentyl, 1,1-dimethylbutyl, 2,2-dimethylbutyl, 3-methylpentyl, 1,2-dimethylbutyl, 1,3-dimethylbutyl, 1-methyl-1-ethylpropyl, heptyl, octyl, nonyl, decyl, undecyl and dodecyl; diastereomers and enantiomers of said branched alkyl monosubstituted amino group; (C<sub>3</sub>-C<sub>8</sub>)cycloalkyl monosubstituted amino group wherein the substitution is selected from the group consisting of cyclopropyl, trans-1,2-dimethylcyclopropyl, cis-1,2-dimethylcyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, cyclooctyl, bicyclo[2.2.1]hept-2-yl, and bicyclo[2.2.2]oct-2-yl; diastereomers and enantiomers of said (C<sub>3</sub>-C<sub>8</sub>) cycloalkyl monosubstituted amino group; ((C<sub>4</sub>-C<sub>10</sub>)cycloalkyl)alkyl monosubstituted amino group wherein the substitution is selected from the group consisting of (cyclopropyl)methyl, (cyclobutyl)methyl, (cyclopentyl)methyl, (trans-2-methylcyclopropyl) methyl, and (cis-2-methylcyclobutyl)methyl; (C<sub>3</sub>-C<sub>10</sub>)alkenyl monosubstituted amino group wherein the substitution is selected from the group consisting of allyl, 3-butenyl, cis 2-butenyl, trans 2-butenyl, 2-pentenyl, 4-octenyl, 2,3-dimethyl-2-butenyl, 3-methyl-2-butenyl 2-cyclopentenyl and 2-cyclohexenyl; (C<sub>6</sub>-C<sub>10</sub>)aryl monosubstituted amino group wherein the sub-

wherein

R<sup>35</sup>, R<sup>36</sup>, R<sup>37</sup>, R<sup>38</sup>, Y<sup>313</sup>, Y<sup>314</sup>, Y<sup>315</sup>, Y<sup>413</sup>, Y<sup>414</sup> and Y<sup>415</sup>, which may be the same or different, each represents a hydrogen atom, CH<sub>2</sub>COOH or CH<sub>2</sub>CONR<sup>1</sup>R<sup>2</sup>, wherein the NR<sup>1</sup>R<sup>2</sup> represents a residue formed by removing one hydrogen atom from an amino group of daunorubicin or mitomycin C, or CH<sub>2</sub>COO-½[Pt(NH<sub>3</sub>)<sub>2</sub>], wherein Pt represents divalent platinum;

wherein the degree of substitution is defined as the number of CH<sub>2</sub>COOH and CH<sub>2</sub>CONR<sup>1</sup>R<sup>2</sup> groups in the molecule per saccharide residue and is in the range of 0.4 to 1.0.

5,567,691

Patent Not Issued For This Number

5,567,692

# 9-[(SUBSTITUTED GLYCYL) AMIDO]-6-DEMETHYL-6-DEOXYTETRACYCLINES

Phaik-Eng Sum, Pomona; Ving J. Lee, Monsey, both of N.Y., and Raymond T. Testa, Cedar Grove, N.J., assignors to American Cyanamid Company, Madison, N.J.

Division of Ser. No. 299,769, Sep. 1, 1994, Pat. No. 5,495,030, which is a division of Ser. No. 928,590, Aug. 13, 1992, Pat. No. 5,442,059. This application May 18, 1995, Ser. No. 443,612

Int. Cl.<sup>6</sup> A61K 31/65

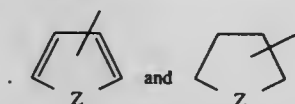
U.S. Cl. 514-152

2 Claims

1. A method for the prevention, treatment or control of bacterial infections in warm-blooded animals which comprises administering to said animal a pharmacologically effective amount of a compound of the formula:

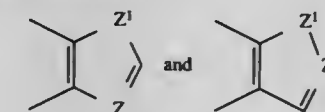
stitution is selected from the group consisting of phenyl and naphthyl; (C<sub>7</sub>-C<sub>10</sub>)aralkylamino group wherein the aralkyl is selected from the group consisting of benzyl, 2-phenylethyl, 1-phenylethyl, 2-(naphthyl) methyl, 1-(naphthyl) methyl and phenylpropyl; substituted (C<sub>6</sub>-C<sub>10</sub>)aryl monosubstituted amino group wherein the substitution is selected from the group consisting of (C<sub>1</sub>-C<sub>3</sub>)acyl, (C<sub>1</sub>-C<sub>3</sub>)acylamino, (C<sub>1</sub>-C<sub>4</sub>)alkyl, mono or disubstituted (C<sub>1</sub>-C<sub>8</sub>)alkylamino, (C<sub>1</sub>-C<sub>4</sub>)alkoxy, (C<sub>1</sub>-C<sub>4</sub>)alkoxycarbonyl, (C<sub>1</sub>-C<sub>4</sub>)alkylsulfonylethyl, amino, carboxy, cyano, halogen, hydroxy, nitro and trihalo (C<sub>1</sub>-C<sub>3</sub>)alkyl; straight or branched symmetrical disubstituted (C<sub>2</sub>-C<sub>4</sub>)alkylamino group wherein the substitution is selected from the group consisting of dimethyl, diethyl, diisopropyl, di-n-propyl, di-n-butyl and diisobutyl; symmetrical disubstituted (C<sub>3</sub>-C<sub>4</sub>)cycloalkylamino group wherein the substitution is selected from the group consisting of dicyclopropyl, dicyclobutyl, dicyclopentyl, dicyclohexyl and dicycloheptyl; straight or branched unsymmetrical disubstituted (C<sub>3</sub>-C<sub>4</sub>)alkyl-amino group wherein the total number of carbons in the substitution is not more than 14; unsymmetrical disubstituted (C<sub>4</sub>-C<sub>4</sub>)cycloalkylamino group wherein the total number of carbons in the substitution is not more than 14; (C<sub>2</sub>-C<sub>8</sub>)azacycloalkyl; substituted (C<sub>2</sub>-C<sub>8</sub>)azacycloalkyl group wherein the substitution is selected from the group consisting of aziridinyl, azetidyl, pyrrolidinyl, piperidinyl, 4-methylpiperidinyl, 2-methylpyrrolidinyl, cis-3,4-dimethylpyrrolidinyl, trans-3,4-dimethylpyrrolidinyl, 2-azabicyclo[2.1.1]hex-2-yl, 5-azabicyclo[2.1.1]hex-5-yl, 2-azabicyclo[2.2.1]hept-2-yl, 7-azabicyclo[2.2.1]hept-7-yl, and 2-azabicyclo[2.2.2]oct-2-yl; diastereomers and enantiomers of said (C<sub>2</sub>-C<sub>8</sub>)azacycloalkyl and substituted (C<sub>2</sub>-C<sub>8</sub>)azacycloalkyl groups; 1-azaoxacycloalkyl group selected from the group consisting of morpholinyl and 1-azaoxacycloheptane; substituted 1-azaoxacycloalkyl group wherein the substitution is selected from the group consisting of 2-(C<sub>1</sub>-C<sub>3</sub>)alkylmorpholinyl, 3-(C<sub>1</sub>-C<sub>3</sub>)alkylisoxazolidinyl, tetrahydrooxazinyl and 3,4-dihydrooxazinyl; [1,n]-diazacycloalkyl or substituted [1,n]-diazacycloalkyl group selected from the group consisting of piperazinyl, 2-(C<sub>1</sub>-C<sub>3</sub>)alkylpiperazinyl, 4-(C<sub>1</sub>-C<sub>3</sub>)alkylpiperazinyl, 2,4-dimethylpiperazinyl, 4-(C<sub>1</sub>-C<sub>3</sub>)alkoxy-piperazinyl, 4-(C<sub>6</sub>-C<sub>10</sub>)aryloxy-piperazinyl, 4-hydroxypiperazinyl, 2,5-diazabicyclo[2.2.1]hept-2-yl, 2,5-diaza-5-methylbicyclo[2.2.1]hept-2-yl, 2,3-diaza-3-methylbicyclo[2.2.2]oct-2-yl and 2,5-diaza-5,7-dimethylbicyclo[2.2.2]oct-2-yl; diastereomers and enantiomers of said [1,n]-diazacycloalkyl and substituted [1,n]-diazacycloalkyl groups; 1-azathiacycloalkyl or substituted 1-azathiacycloalkyl group selected from the group consisting of thiomorpholinyl, 2-(C<sub>1</sub>-C<sub>3</sub>)alkylthiomorpholinyl and 3-(C<sub>1</sub>-C<sub>3</sub>) cycloalkylthiomorpholinyl; N-azoyl or substituted N-azoyl group selected from the group consisting of 1-imidazolyl, 2-(C<sub>1</sub>-C<sub>3</sub>)alkyl-1-imidazolyl, 3-(C<sub>1</sub>-C<sub>3</sub>)alkyl-1-imidazolyl, -1-pyrrolyl, 2-(C<sub>1</sub>-C<sub>3</sub>)alkyl-1-pyrrolyl, 3-(C<sub>1</sub>-C<sub>3</sub>)alkyl-1-pyrrolyl, 1-pyrazolyl, 3-(C<sub>1</sub>-C<sub>3</sub>)alkyl-1-pyrazolyl, indolyl, 1-(1,2,3-triazolyl), 4-(C<sub>1</sub>-C<sub>3</sub>)alkyl-1-(1,2,3-triazolyl), 5-(C<sub>1</sub>-C<sub>3</sub>)alkyl-1-(1,2,3-triazolyl), 4-(1,2,4-triazolyl, 1-tetrazolyl, 2-tetrazolyl and benzimidazolyl; (heterocycle)amino group selected from the group consisting of 2- or 3-furanyl-amino, 2- or 3-thienyl-amino, 2-, 3- or 4-pyridyl-amino, 2- or 5-pyridazinyl-amino, 2-pyrazinyl-amino, 2-(imidazolyl)amino, (benzimidazolyl)amino, and (benzothiazolyl)amino; substituted (heterocycle)- amino group wherein (heterocycle)amino is as defined above with substitution selected from straight or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl; (heterocycle)methylamino group selected from the group consisting of 2- or 3-furylmethyl- amino, 2- or 3-thienylmethyl- amino, 2-, 3- or 4-pyridylmethyl-amino, 2- or 5-pyridazinylmethyl-amino, 2-pyrazinylmethyl-amino, 2-(imidazolyl)methyl-amino, (benzimidazolyl)methyl-amino, and (benzothiazolyl)methyl-amino; substituted (heterocycle)methylamino group wherein (heterocycle) methylamino is as defined above with substitution selected from straight or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl; carboxy(C<sub>2</sub>-C<sub>4</sub>)alkylamino group selected from the group consisting of aminoacetic acid, α-aminopropionic acid, β-aminopropionic acid, α-butyric acid, and β-aminobutyric acid; enantiomers of said carboxy (C<sub>2</sub>-C<sub>4</sub>)alkylamino group; (C<sub>1</sub>-C<sub>4</sub>)alkoxycarbonylamino group wherein alkoxycarbonyl is selected from the group consisting of methoxycarbonyl, ethoxycarbonyl, allyloxycarbonyl, propoxycarbonyl, isopropoxycarbonyl, 1,1-dimethylethoxycarbonyl, n-butoxycarbonyl, and 2-methylpropoxycarbonyl; (C<sub>1</sub>-C<sub>4</sub>)alkoxyamino group wherein alkoxy is selected from the group consisting of methoxy, ethoxy, n-propoxy, 1-methyl- ethoxy, n-butoxy, 2-methylpropoxy, and 1,1-dimethyl ethoxy; (C<sub>3</sub>-C<sub>8</sub>)cycloalkoxyamino group wherein cycloalkoxy is selected from the group consisting of cyclopropoxy, trans-1,2-dimethylcyclopropoxy, cis-1,2-dimethylcyclopropoxy, cyclobutoxy, cyclopentoxy, cyclohexoxy, cycloheptoxy, cyclooctoxy, bicyclo[2.2.1]hept-2-yloxy, and bicyclo[2.2.2]oct-2-yloxy; diastereomers and enantiomers of said (C<sub>3</sub>-C<sub>8</sub>)cycloalkoxyamino group; (C<sub>6</sub>-C<sub>10</sub>)aryloxyamino group selected from the group consisting of phenoxyamino, 1-naphthylamino and 2-naphthylamino; and (C<sub>7</sub>-C<sub>11</sub>)aryloxyamino group wherein arylalkoxy is selected from the group consisting of benzyloxy, 2-phenylethoxy, 1-phenylethoxy, 2-(naphthyl)methoxy, 1-(naphthyl) methoxy and phenylpropoxy;

R<sup>2</sup> is selected from the group consisting of hydrogen; straight or branched (C<sub>1</sub>-C<sub>3</sub>)alkyl group selected from the group consisting of methyl, ethyl, n-propyl and 1-methylethyl; (C<sub>6</sub>-C<sub>10</sub>)aryl group selected from the group consisting of phenyl, α-naphthyl and β-naphthyl; (C<sub>7</sub>-C<sub>9</sub>)aralkyl group; a heterocycle group selected from a five membered aromatic or saturated ring with one N, O, S or Se heteroatom optionally having a benzo or pyrido ring fused thereto selected from the group consisting of



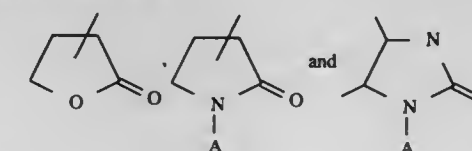
Z = N, O, S or Se

a five membered aromatic ring with two N, O, S or Se heteroatoms optionally having a benzo or pyrido ring fused thereto selected from the group consisting of



Z or Z' = N, O, S or Se

a five membered saturated ring with one or two N, O, S or Se heteroatoms and an adjacent appended O heteroatom selected from the group consisting of



wherein A is selected from the group consisting of hydrogen; straight or branched (C<sub>1</sub>-C<sub>4</sub>)alkyl; C<sub>6</sub>-aryl; substituted C<sub>6</sub>-aryl wherein the substitution is selected from the group consisting of halo, (C<sub>1</sub>-C<sub>4</sub>)alkoxy, trihalo (C<sub>1</sub>-C<sub>3</sub>)alkyl, nitro, amino, cyano, (C<sub>1</sub>-C<sub>4</sub>)alkoxycarbonyl, (C<sub>1</sub>-C<sub>3</sub>)alkylamino or carboxy; and (C<sub>7</sub>-C<sub>9</sub>)aralkyl group selected from the group consisting of benzyl, 1-phenylethyl, 2-phenylethyl or phenylpropyl; a six membered aromatic ring with one to three N heteroatoms; a six membered



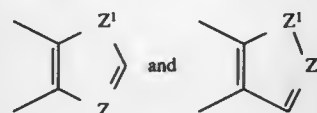
saturated ring with one or two N, O, S or Se heteroatoms and an adjacent appended O heteroatom; and  $-(CH_2)_nCOOR^4$  where  $n=0-4$  and  $R^4$  is selected from the group consisting of hydrogen; straight or branched  $(C_1-C_3)$ alkyl group selected from the group consisting of methyl, ethyl, n-propyl and 1-methylethyl; and  $(C_6-C_{10})$ aryl group selected from the group consisting of phenyl,  $\alpha$ -naphthyl, and  $\beta$ -naphthyl;

$R^3$  is selected from the group consisting of hydrogen; straight or branched  $(C_1-C_3)$ alkyl group selected from the group consisting of methyl, ethyl, n-propyl and 1-methylethyl;  $(C_6-C_{10})$ aryl group selected from the group consisting of phenyl,  $\alpha$ -naphthyl and  $\beta$ -naphthyl;  $(C_7-C_9)$ aralkyl group; a heterocycle group selected from a five membered aromatic or saturated ring with one N, O, S or Se heteroatom optionally having a benzo or pyrido ring fused thereto selected from the group consisting of



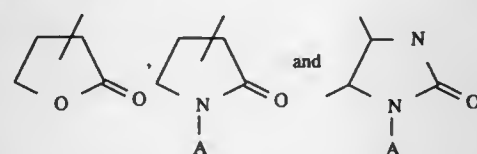
Z = N, O, S or Se

a five membered aromatic ring with two N, O, S or Se heteroatoms optionally having a benzo or pyrido ring fused thereto selected from the group consisting of



Z or Z' = N, O, S or Se

a five membered saturated ring with one or two N, O, S or Se heteroatoms and an adjacent appended O heteroatom selected from the group consisting of



wherein A is selected from the group consisting of hydrogen; straight or branched  $(C_1-C_4)$ alkyl;  $C_6$ -aryl; substituted  $C_6$ -aryl wherein the substitution is selected from the group consisting of halo,  $(C_1-C_4)$ alkoxy, trihalo $(C_1-C_3)$ alkyl, nitro, amino, cyano,  $(C_1-C_4)$ -alkoxycarbonyl,  $(C_1-C_3)$ alkylamino and carboxy; and  $(C_7-C_9)$ -aralkyl group selected from the group consisting of benzyl, 1-phenylethyl, 2-phenylethyl or phenylpropyl; a six membered aromatic ring with one to three N heteroatoms; a six membered saturated ring with one or two N, O, S or Se heteroatoms and an adjacent appended O heteroatom; and  $-(CH_2)_nCOOR^4$  where  $n=0-4$  and  $R^4$  is selected from the group consisting of hydrogen; straight or branched  $(C_1-C_3)$ alkyl selected from the group consisting of methyl, ethyl, n-propyl and 1-methylethyl; and  $(C_6-C_{10})$ aryl selected from the group consisting of phenyl,  $\alpha$ -naphthyl and  $\beta$ -naphthyl; with the proviso that  $R^2$  and  $R^3$  cannot both be hydrogen; or  $R^2$  and  $R^3$  taken together are  $-(CH_2)_2B(CH_2)_2-$ , wherein B is selected from the group consisting of  $(CH_2)_n$  where  $n=0-1$ ,  $-NH$ , straight or branched  $-N(C_1-C_3)alkyl$ ,  $-N(C_1-C_4)alkoxy$ , oxygen, sulfur and substituted congeners selected from the group consisting of (L or D)proline, ethyl(L or D)proline, morpholine, pyrrolidine or piperidine; and the pharmacologically acceptable organic and inorganic salts or metal complexes.

5,567,693

# METHOD FOR INHIBITING ANGIOGENESIS, PROLIFERATION OF ENDOTHELIAL OR TUMOR CELLS AND TUMOR GROWTH

Joseph M. Backer, Tenafly, N.J.; Peter Bohlen, Cortland Manor, and Phaik-Eng Sum, Pomona, both of N.Y., assignors to American Cyanamid Company, Madison, N.J.

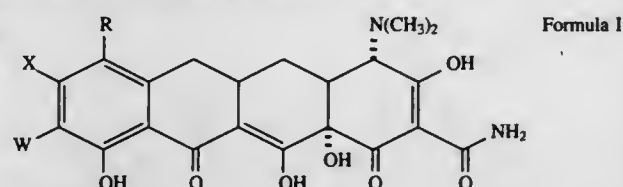
Filed Dec. 13, 1994, Ser. No. 354,688

Int. Cl.<sup>6</sup> A61K 31/65; 47/00; 9/26

U.S. Cl. 514—154

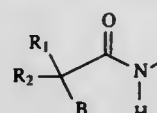
6 Claims

1. A method for inhibiting angiogenesis and endothelial cell proliferation which comprises administering an effective inhibitory amount of a compound of formula I:



wherein:

R is hydrogen or a di $(C_1-C_4)$ alkylamino;  
X is halogen selected from bromine, chlorine, fluorine and iodine;  
W is hydrogen or a moiety of the formula I:



wherein:

$R_1$  and  $R_2$  are hydrogen or  $(C_1-C_3)$ alkyl;  
B is  $(R_3)_2N-$ ,  $R_3NH-$  or  $(C_2-C_5)$ azacycloalkane wherein  $R_3$  is  $(C_1-C_7)$ alkyl, or  $(C_3-C_5)$ cycloalkylmethyl; or a pharmaceutically acceptable salt thereof;  
alone or in combination with a therapeutic agent used in the treatment of an angiogenic disorder;  
to a warm blooded animal having a disorder characterized by the undesired proliferation of endothelial cells.

5,567,694

# 17-ARYL AND 17-HETEROCYCLYL-5BETA, 14BETA-ANDROSTANE DERIVATIVES ACTIVE ON THE CARDIOVASCULAR SYSTEM, PROCESSES FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Nicoletta Almirante; Luigi Bernardi, both of Milan; Alberto Cerri, Gessate; Piero Melloni, Bresso; Gloria Padoani, Locate Triulzi, and Luisa Quadri, Cernusco, all of Italy, assignors to SIGMA-TAU Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

Filed Sep. 29, 1993, Ser. No. 128,114

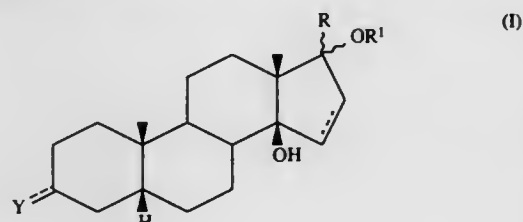
Claims priority, application Germany, Sep. 29, 1992, 42 32 638.9

Int. Cl.<sup>6</sup> A61K 31/56; 31/58; C07D 207/00; C07J 1/00

U.S. Cl. 514—169

8 Claims

1. 17-Aryl and 17-heterocyclyl-5 $\beta$ ,14 $\beta$ -androstane compounds of formula (I):



wherein:

the symbol  $---$  means that the substituents in position 17 have an  $\alpha$  or  $\beta$  configuration;

the symbol  $---$  represents a single or a double bond;

Y is oxygen or guanidinoimino, when  $---$  in position 3 is a double bond;

Y is hydroxy,  $OR^2$  or  $SR^2$ , when  $---$  in position 3 is a single bond and has an  $\alpha$  or  $\beta$  configuration;

R is an aryl ring, unsubstituted or substituted by one or more halogen, hydroxy, hydroxymethyl, alkoxy, oxo, amino, alkylamino, dialkylamino, cyano, nitro, sulfonamido, C1-C6 lower alkyl group or  $COR^3$ ;

$R^1$  is hydrogen; methyl; ethyl or n-propyl substituted by OH or  $NR^4R^5$ ;

$R^2$  is hydrogen; methyl; C2-C6 alkyl or C3-C6 alkenyl or C2-C6 acyl, unsubstituted or substituted by a quaternary ammonium group or one or more  $OR^6$ ,  $NR^7R^8$ , CHO, C(NH)NH<sub>2</sub>, guanidinoimino or by  $NR^7R^8$  and hydroxy;

$R^3$  is hydrogen, hydroxy, C1-C4 alkoxy or C1-C4 alkyl;

$R^4$ ,  $R^5$  are independently hydrogen; methyl, C2-C6 alkyl unsubstituted or substituted by  $NR^9R^{10}$ , or  $R^4$  and  $R^5$  taken together with the nitrogen atom form an unsubstituted or substituted saturated or unsaturated five- or six-membered ring optionally containing another heteroatom selected from the group consisting of oxygen, sulfur and nitrogen;

$R^6$  is hydrogen; methyl; C2-C4 alkyl, unsubstituted or substituted by one or more  $NR^9R^{10}$  or by  $NR^9R^{10}$  and hydroxy;

$R^7$ ,  $R^8$  are independently hydrogen; methyl; C2-C6 alkyl or C3-C6 alkenyl unsubstituted or substituted by one or more  $NR^9R^{10}$ , or  $NR^9R^{10}$  and hydroxy, or  $R^7$  and  $R^8$  taken together with the nitrogen atom they are linked to, form an unsubstituted or substituted saturated or unsaturated five- or six-membered ring optionally containing another heteroatom selected from the group consisting of oxygen, sulfur and nitrogen, or  $R^7$  is hydrogen and  $R^8$  is C(NH)NH<sub>2</sub>;

$R^9$ ,  $R^{10}$  are independently hydrogen, C1-C6 alkyl, or  $R^9$  and  $R^{10}$  taken together with the nitrogen atom they are linked to, form a saturated or unsaturated five- or six-membered ring.

5,567,695

# METHODS FOR PREVENTING AND TREATING OSTEOPOROSIS WITH LOW DOSE NON-MASCULINIZING ANDROGENIC COMPOUNDS

Fernand Labrie, Quebec, Canada, assignor to Endorecherche, Inc., Quebec, Canada

Division of Ser. No. 282,964, Jul. 29, 1994, which is a division of Ser. No. 15,083, Feb. 8, 1993, Pat. No. 5,362,720, which is a continuation of Ser. No. 724,532, Jun. 28, 1991, abandoned.

This application Jun. 7, 1995, Ser. No. 483,761

Int. Cl.<sup>6</sup> A61K 31/165; 31/12

U.S. Cl. 514—169

29 Claims

1. A method for preventing osteoporosis comprising administering to a warm-blooded animal in need of such treatment, including a human, at least one androgenic steroid having a  $K_i$  value of less than about  $2 \times 10^{-8} M$  for the androgen receptor and an androgen receptor-mediated inhibitory effect on the growth of human breast cancer ZR-75-1 cells which reaches half-maximal value at a concentration below 3.0 nanomoles per liter and no visible masculinizing activity wherein every such androgenic steroid is administered at a dosage sufficiently low to maintain a cumulative androgenic steroid serum concentration below 50 nanomoles per liter.

5,567,696

# TREATMENT OF SYSTEMIC LUPUS ERYTHEMATOSUS WITH DEHYDROEPIANDROSTERONE

James L. McGuire; Ronald F. Van Vollenhoven, and Edgar G. Engleman, all of Stanford, Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation of Ser. No. 958,911, Oct. 9, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 485,353

Int. Cl.<sup>6</sup> A61K 31/56

U.S. Cl. 514—170

6 Claims

1. In a method of treating systemic lupus erythematosus (SLE) in a patient receiving a glucocorticoid, the improvement comprising

administering to the patient, in addition to said corticosteroid, a dose of dehydroepiandrosterone (DHEA) or a derivative thereof in an amount effective to significantly reduce the amount of glucocorticoid required by the patient to provide effective relief from symptoms of SLE.

5,567,697

# 17-(4-PYRIDAZINYL)-5 $\beta$ , 14 $\beta$ -ANDROSTANE DERIVATIVES ACTIVE ON THE CARDIOVASCULAR SYSTEM, PROCESSES FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Luisa Quadri, Cernusco; Luigi Bernardi; Giuseppe Bianchi, both of Milan; Patrizia Ferrari, Varese; Piero Melloni, Bresso, and Loredana Valentino, Buccinasco, all of Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

Division of Ser. No. 106,893, Aug. 16, 1993. This application Jun. 2, 1995, Ser. No. 458,822

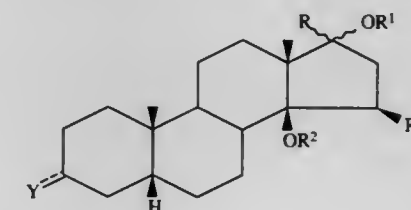
Claims priority, application Germany, Aug. 20, 1992, 42 27 616.0

Int. Cl.<sup>6</sup> A61K 31/58; C07J 71/00

U.S. Cl. 514—176

7 Claims

1. A 17-(4-pyridazinyl)-5 $\beta$ ,14 $\beta$ -androstane derivative of formula (I):



wherein:

the symbol  $---$  means that the substituents in position 17 can have an  $\alpha$  or  $\beta$  configuration;

the symbol  $---$  represents a single or double bond;

Y is oxygen or guanidinoimino, when  $---$  in position 3 is a double bond;

Y is hydroxyl,  $OR^4$  or  $SR^4$ , when  $---$  in position 3 is a single bond and can have an  $\alpha$  or  $\beta$  configuration;

R is an unsubstituted or substituted 4-pyridazinyl group;

$R^1$  is hydrogen; methyl; ethyl or n-propyl substituted by OH or  $NR^5R^6$ ;

$R^2$  is hydrogen or together to  $R^3$  is a bond of an oxirane ring;

$R^3$  is hydrogen or together to  $R^2$  is a bond of an oxirane ring;

$R^4$  is hydrogen; methyl; C2-C6 alkyl or C3-C6 alkenyl or C2-C6 acyl, these alkyl, alkenyl and acyl groups being unsubstituted or substituted by a quaternary ammonium group or one or more  $OR^7$ ,  $NR^8R^9$ , formyl, amidino, guanidinoimino or by  $NR^8R^9$  and hydroxy;

$R^5$ ,  $R^6$  are independently hydrogen; methyl; C2-C6 alkyl unsubstituted or substituted by one  $NR^{10}R^{11}$ , or  $NR^{10}R^{11}$  and hydroxy, or  $R^5$  and  $R^6$  taken together with the nitrogen atom form an unsubstituted or substituted saturated or unsaturated

penta- or hexa-monoheterocyclic ring, optionally containing another heteroatom chosen from oxygen or sulfur or nitrogen; R<sup>7</sup> is hydrogen, methyl or C<sub>2</sub>-C<sub>4</sub> alkyl, this alkyl being unsubstituted or substituted by one or more NR<sup>10</sup>R<sup>11</sup> or by NR<sup>10</sup>R<sup>11</sup> and hydroxy;

R<sup>8</sup>, R<sup>9</sup> are independently hydrogen; methyl; C<sub>2</sub>-C<sub>6</sub> alkyl or C<sub>3</sub>-C<sub>6</sub> alkenyl, these alkyl and alkenyl groups being unsubstituted or substituted by one or more NR<sup>10</sup>R<sup>11</sup>, or NR<sup>10</sup>R<sup>11</sup> and hydroxy, or R<sup>8</sup> and R<sup>9</sup> taken together with the nitrogen atom form an unsubstituted or substituted saturated or unsaturated penta- or hexa-monoheterocyclic ring, optionally containing another heteroatom chosen from oxygen or sulfur or nitrogen, or R<sup>8</sup> is hydrogen and R<sup>9</sup> is amidino;

R<sup>10</sup>, R<sup>11</sup> are independently hydrogen, C<sub>1</sub>-C<sub>6</sub> alkyl, or R<sup>10</sup> and R<sup>11</sup>, taken together with the nitrogen atom form a saturated or unsaturated penta- or hexa-monoheterocyclic ring, including all of the possible stereoisomers, in particular Z and E isomers, optical isomers and their mixtures and the metabolites and the metabolic precursors of the compounds of formula (I).

5,567,698

#### PYRIDINIUM THIOMETHYL SUBSTITUTED CHEPHOLOSPORIN DERIVATIVES

Choung U. Kim, San Carlos; Peter F. Misco, Jr., Durham; John A. Wichtowski, Deep River; Yasutsugu Ueda, Clinton; Thomas W. Hudyma, Durham; John D. Matiskella, Wallingford; Stanley V. D'Andrea; Shelley E. Hoeft, both of Middletown; Raymond F. Miller, Killingworth, all of Conn.; Muzammil M. Mansuri, Lexington, Mass., and Joanne J. Bronson, Madison, Conn., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

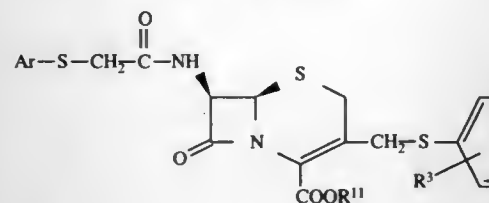
Continuation-in-part of Ser. No. 388,940, Feb. 15, 1995, abandoned. This application May 30, 1995, Ser. No. 454,058

Int. Cl.<sup>6</sup> A61K 31/43; C07D 501/60

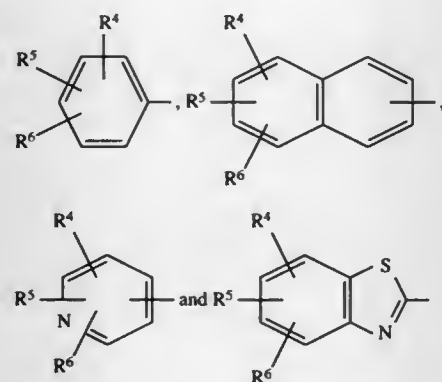
U.S. Cl. 514-210

16 Claims

1. A compound having the formula

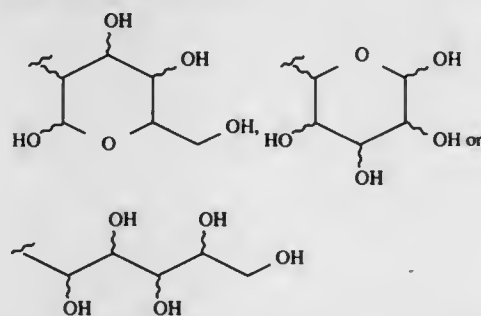


wherein Ar is an aryl group selected from the group consisting of



in which R<sup>4</sup>, R<sup>5</sup>, and R<sup>6</sup> are each independently hydrogen, halogen, trihalomethyl, nitro, C<sub>1</sub>-C<sub>6</sub> alkyl, -(CH<sub>2</sub>)<sub>n</sub>OR<sup>7</sup> or -(CH<sub>2</sub>)<sub>n</sub>SR<sup>7</sup>; n is an integer of from 1 to 6; R<sup>7</sup> is hydrogen or C<sub>1</sub>-C<sub>6</sub> alkyl; R<sup>1</sup> is selected from the group consisting of

-CR<sup>8</sup>R<sup>9</sup>R<sup>10</sup>, -(CH<sub>2</sub>)<sub>n</sub>CONR<sup>8</sup>R<sup>9</sup> and -(CH<sub>2</sub>)<sub>n</sub>COR<sup>8</sup> in which R<sup>8</sup>, R<sup>9</sup> and R<sup>10</sup> are each independently hydrogen, substituted or unsubstituted C<sub>1</sub>-C<sub>15</sub> alkyl, C<sub>7</sub>-C<sub>15</sub> alkenyl or C<sub>2</sub>-C<sub>15</sub> alkynyl, substituted or unsubstituted phenyl, phenyl(C<sub>1</sub>-C<sub>6</sub>)alkyl, naphthyl or naphthyl(C<sub>1</sub>-C<sub>6</sub>)alkyl or a sugar moiety of the formula



in which said alkyl, alkenyl or alkynyl group, or the alkyl portion of said phenyl(C<sub>1</sub>-C<sub>6</sub>)alkyl or naphthyl(C<sub>1</sub>-C<sub>6</sub>)alkyl group can be substituted by one or more hydroxy groups and said phenyl or naphthyl group, or the phenyl or naphthyl portion of said phenyl(C<sub>1</sub>-C<sub>6</sub>)alkyl or naphthyl(C<sub>1</sub>-C<sub>6</sub>)alkyl group can be substituted by one or more hydroxy, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, halo or halo(C<sub>1</sub>-C<sub>6</sub>)alkyl groups; n is as defined above; R<sup>2</sup> and R<sup>3</sup> are each independently hydrogen, C<sub>1</sub>-C<sub>6</sub> alkyl, or amino(C<sub>1</sub>-C<sub>6</sub>)alkylcarbonylamino; and R<sup>11</sup> is hydrogen, an anionic charge or a carboxyl-protecting group, provided that when R<sup>11</sup> is hydrogen or a protecting group, there is also present a counter ion; or a pharmaceutically acceptable salt or prodrug thereof.

5,567,699

#### THIADIAZINONE DERIVATIVES

Rikizo Furuya; Hiromi Okushima, and Yuji Abe, all of Kanagawa, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Apr. 17, 1995, Ser. No. 422,916

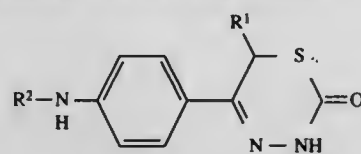
Claims priority, application Japan, Apr. 26, 1994, 6-088509

Int. Cl.<sup>6</sup> C07D 285/16; A61K 31/54

U.S. Cl. 514-222.5

7 Claims

1. A thiadiazinone compound of the formula



wherein R<sup>1</sup> represents hydrogen or C<sub>1</sub>-C<sub>3</sub> alkyl, R<sup>2</sup> represents a 6-membered aromatic heterocyclic ring having 1-3 nitrogen atoms selected from the group consisting of pyridyl, pyridazinyl, pyrimidinyl, pyrazinyl and s-triazinyl which rings are unsubstituted or are substituted by one or more substituents selected from the group consisting of C<sub>1</sub>-C<sub>3</sub> alkyl, cyano, hydroxy, C<sub>1</sub>-C<sub>3</sub> alkoxy, amino, C<sub>1</sub>-C<sub>3</sub> alkylamino, C<sub>2</sub>-C<sub>3</sub> dialkylamino, C<sub>2</sub>-C<sub>3</sub> alkylamino, C<sub>2</sub>-C<sub>3</sub> acylamino, carboxyl, C<sub>2</sub>-C<sub>3</sub> alkoxy-carbonyl and carbamoyl; or a pharmaceutically acceptable salt thereof.

5,567,700

#### THERAPEUTIC HETEROCYCLES WHICH ANTAGONIZE NEUROKININ RECEPTORS

Scott C. Miller, Wilmington, Del., assignor to Zeneca Limited, London, United Kingdom

Filed Aug. 15, 1994, Ser. No. 290,642

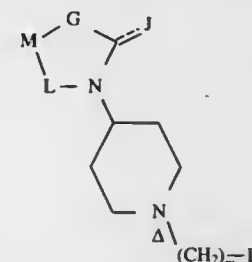
Claims priority, application United Kingdom, Aug. 17, 1993, 9317104

Int. Cl.<sup>6</sup> C07D 413/14; 279/06; A61K 31/54; 31/495

U.S. Cl. 514-226.8

10 Claims

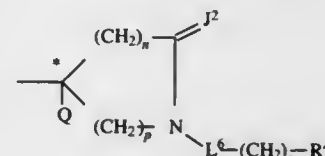
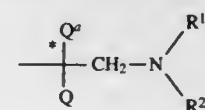
1. A compound of formula I:



wherein

m is 2 or 3;

D is a residue of formula Ia or formula Ib:



wherein

Q is phenyl which may bear one or two substituents independently selected from halo, trifluoromethyl, hydroxy, (1-3C)alkoxy, (1-3C)alkyl and methylenedioxy; or Q is thienyl, imidazolyl, benzothienyl or naphthyl any of which may bear a halo substituent; or Q is biphenyl; or Q is carbon-linked indolyl which may bear a benzyl substituent at the 1-position;

Q<sup>+</sup> is hydrogen, (1-4C)alkyl, or a radical of formula -(CH<sub>2</sub>)<sub>q</sub>-NR<sub>2</sub>R<sub>6</sub> in which q is 2 or 3 and R<sup>3</sup> and R<sup>6</sup> are independently (1-4C)alkyl or NR<sub>2</sub>R<sub>6</sub> is piperidino or 4-benzylpiperidino; R<sup>1</sup> is hydrogen, methyl or (2-6C)n-alkyl which may bear a terminal amino radical;

R<sup>2</sup> is -C(=O)R<sup>3</sup>, -C(=O)OR<sup>3</sup> or -C(=I)NHR<sup>3</sup> in which J<sup>1</sup> is oxygen or sulfur and R<sup>3</sup> is hydrogen, (1-6C)alkyl, phenyl(1-3C)alkyl (in which the phenyl may bear one or more halo, hydroxy, (1-4C)alkoxy or (1-4C)alkyl substituents), pyridyl (1-3C)alkyl, naphthyl(1-3C)alkyl, pyridylthio (1-3C)alkyl, styryl, 1-methylimidazol-2-ylthio (1-3C)alkyl, aryl (which may bear one or more halo, hydroxy, (1-4C)alkoxy or (1-4C)alkyl substituents), heteroaryl (which may bear one or more halo, hydroxy, (1-4C)alkoxy or (1-4C)alkyl substituents), or (when R<sup>2</sup> is -COR<sup>3</sup>) (α-hydroxybenzyl);

n is 0, 1, 2 or 3;

p is 1 or 2, and when p is 2, n is 1 and J<sup>2</sup> is two hydrogens;J<sup>2</sup> is oxygen or two hydrogens;L<sup>6</sup> is carbonyl or methylene;

r is 0, 1, 2, or 3;

R<sup>4</sup> is phenyl which may bear one or more halo, trifluoromethyl, (1-4C)alkyl, hydroxy or (1-4C)alkoxy substituents (and particularly one or more chloro or fluoro substituents); naphthyl which may bear one or more halo, trifluoromethyl, (1-4C)alkyl or hydroxy substituents; pyridyl; thienyl; indolyl; quinolinyl; benzothienyl or imidazolyl; or when L<sup>6</sup> is carbonyl, the group -(CH<sub>2</sub>)<sub>p</sub>-R<sup>4</sup> may represent aryl, heteroaryl or a benzyl group bearing an α-substituent selected from

hydroxy, (1-4C)alkoxy and (1-4)alkyl, and further wherein the aryl, heteroaryl or phenyl portion of the benzyl group may bear one or more substituents selected independently from halo, trifluoromethyl, (1-4C)alkyl, hydroxy and (1-4C)alkyl, hydroxy and (1-4C)alkoxy (and particularly one or more chloro or fluoro substituents);

the values of G, J, M and L are selected from

(a) G is a single bond; J is oxo or thio; M is oxy, thio or NR<sup>12</sup>; and L is L<sup>1</sup>;

(b) G is a single bond; J is NR<sup>8</sup>; M is NR<sup>7</sup>; and L is L<sup>1</sup>;

(c) G is a double bond; J is OR<sup>7</sup>, SR<sup>7</sup> or NR<sup>9</sup>R<sup>10</sup>; M is nitrogen; and L is L<sup>1</sup>;

(d) G is methylene which may bear one or two methyl substituents; J is oxo, thio or NR<sup>11</sup>; M is oxy, thio, sulfinyl, sulfonyl or NR<sup>7</sup>; and L is L<sup>2</sup>;

(e) G is a single bond; J is oxo, thio or NR<sup>11</sup>; M is nitrogen; and L is L<sup>3</sup>;

(f) G is methine, which may bear a (1-3C)alkyl substituent; J is oxo, thio or NR<sup>11</sup>; M is nitrogen; and L is L<sup>4</sup>; and

(g) G is cis-vinylene, which may bear one or two methyl substituents; J is oxo, thio, or NR<sup>11</sup>; M is nitrogen; and L is L<sup>5</sup>;

wherein

R<sup>7</sup> is hydrogen or (1-3C)alkyl;

R<sup>8</sup> is hydrogen, (1-3C)alkyl, cyano, (1-3C)alkylsulfonyl or nitro;

(la) R<sup>9</sup> and R<sup>10</sup> are independently hydrogen or (1-3C)alkyl or the radical NR<sup>9</sup>R<sup>10</sup> is pyrrolidino, piperidino, morpholino, thiomorpholino (or its S-oxide) or piperazino (which may bear a (1-3C)alkyl substituent at the 4-position);

R<sup>11</sup> is hydrogen or (1-3C)alkyl;

(lb) R<sup>12</sup> is hydrogen, (1-3C)alkyl, R<sup>a</sup>OC(=O)CH<sub>2</sub>- or R<sup>b</sup>R<sup>c</sup>-NC(=O)CH<sub>2</sub>-;

R<sup>a</sup> is hydrogen or (1-3C)alkyl;

R<sup>b</sup> and R<sup>c</sup> are independently hydrogen, (1-3C)alkyl, phenyl or benzyl;

L<sup>1</sup> is trimethylene which radical L<sup>1</sup> itself may bear one or two methyl substituents;

L<sup>2</sup> is ethylene which radical L<sup>2</sup> itself may bear one or two methyl substituents;

L<sup>3</sup> is prop-2-en-1-yliden-3-yl, which radical L<sup>3</sup> itself may bear one or two methyl substituents;

L<sup>4</sup> is cis-vinylene, which radical L<sup>4</sup> itself may bear one or two methyl substituents; and

L<sup>5</sup> is methine, which radical L<sup>5</sup> itself may bear a (1-3C)alkyl substituent;

or the N-oxide of said compound of formula I at the piperidino nitrogen indicated by Δ;

or a pharmaceutically acceptable salt of said compound of formula I or said N-oxide;

or a quaternary ammonium salt of said compound of formula I in which the piperidino nitrogen indicated by Δ is a quadricovalent ammonium nitrogen wherein the fourth radical on the nitrogen is (1-4C)alkyl or benzyl and the associated counterion is a pharmaceutically acceptable anion.

5,567,701

#### ALKYLPOLYGLYCOSIDE AND PYRIMIDINE DERIVATIVE BASED COMPOSITION FOR INDUCING AND STIMULATING HAIR GROWTH AND/OR REDUCING HAIR LOSS

Jean F. Grollier, Paris, France, assignor to L'Oréal, Paris, France

Continuation of Ser. No. 815,872, Jan. 3, 1992, abandoned,

which is a continuation of Ser. No. 397,253, Aug. 23, 1989,

abandoned. This application Mar. 18, 1994, Ser. No. 214,668

Claims priority, application Luxembourg, Aug. 25, 1988, 87323

Int. Cl.<sup>6</sup> A61K 31/505; 7/06; 31/70

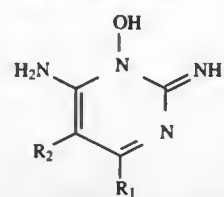
U.S. Cl. 514-256

16 Claims

1. An improved composition for inducing and stimulating hair growth and/or reducing hair loss, comprising in a physiologically



acceptable medium an effective concentration of one active pyrimidine compound having the formula

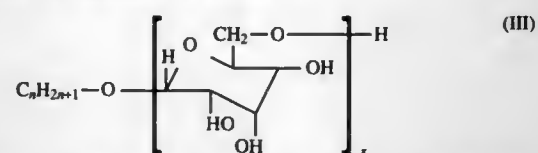


or a physiologically acceptable acid addition salt thereof, wherein:  $R_1$  represents a group having the formula



in which  $R_3$  and  $R_4$  are selected from the group consisting of hydrogen, lower alkyl, alkenyl, alkylaryl and cycloalkyl in which the alkyl portion is a  $C_1$ - $C_4$  alkyl radical, or  $R_3$  and  $R_4$  with the nitrogen to which they are each bound form a heterocyclic group, which is unsubstituted or is substituted on the carbon atoms with one to three lower alkyl, hydroxy, or alkoxy groups, and which is selected from the group consisting of aziridinyl, azetidyl, pyrrolidinyl, piperidinyl, hexahydroazepinyl, heptamethylenimino, octamethyleneimino, morpholino and 4-(lower alkyl)piperazinyl;

$R_2$  is selected from the group consisting of hydrogen,  $C_1$ - $C_4$  alkyl, alkenyl, alkoxyalkyl, cycloalkyl, aryl, alkylaryl, arylalkyl, alkylarylalkyl, alkoxyarylalkyl and haloarylalkyl, the alkyl portion of which is a lower alkyl radical; wherein the improvement is due to the addition of an effective concentration of one alkylpolyglycoside selected from the group consisting of compounds of formula (III):



in which  $n$  is an integer between 8 and 15 and  $x$  is an integer between 1 and 10, so that the penetration of the pyrimidine compound of formula (I) into the corneal layer is encouraged and the efficiency of the said composition is substantially increased.

5,567,702

#### COMBINATION OF PYRIMIDINE DERIVATIVES AND RETINOLIDS, AS SEPARATE COMPONENTS, FOR INDUCING AND STIMULATING HAIR GROWTH AND REDUCING ITS LOSS

Jean F. Grollier, Paris, France, assignor to L'Oreal, Paris, France

Continuation of Ser. No. 220,582, Mar. 31, 1994, abandoned, which is a continuation of Ser. No. 614,676, Nov. 13, 1990, abandoned, which is a continuation of Ser. No. 208,136, Jun. 17, 1988, abandoned. This application Jun. 5, 1995, Ser. No. 461,843

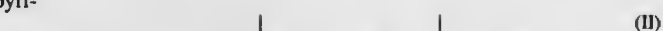
Claims priority, application Luxembourg, Aug. 12, 1987, 86.969

Int. Cl. A61K 31/505;7/06

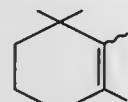
U.S. Cl. 514-256

26 Claims

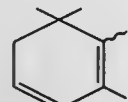
1. A method for inducing and stimulating hair growth and for decreasing hair loss or for improving the appearance of the hair, comprising applying first and second components to the scalp, successively or intermittently, each component being in lotion, thickened lotion or gel form, wherein the first component (A) comprises a physiologically acceptable medium and 0.001 to 2% by weight relative to the weight of component (A) of at least one retinoid selected from the group consisting of compounds of formula:



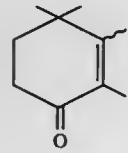
wherein  
A is a substituent selected from groups of formulae:



(IIIa)

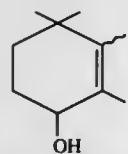


(IIIb)



(IV)

and



(V)

and wherein R is selected such that:  
when A is a group of formula (IIIb), (IV) or (V), R is COOH;  
when A is a group of formula (IIIa), R is selected from the group consisting of CHO,  $CH_2OR_5$  in which  $R_5$  is hydrogen or  $C_1$ - $C_4$  lower alkyl,



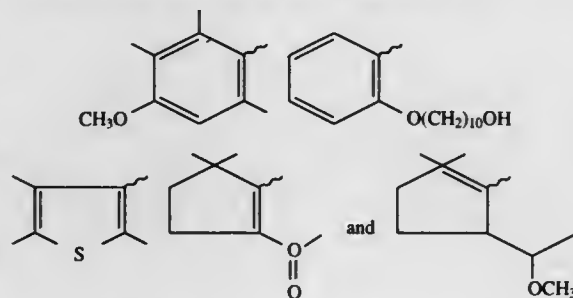
in which  $R_6$  denotes  $C_1$ - $C_{16}$  linear or branched alkyl,  $CH_2SR_7$  in which  $R_7$  is hydrogen or methyl and

in which X is selected from the group consisting of

(i) OH,

(ii)  $OR_8$  in which  $R_8$  denotes a  $C_1$ - $C_4$  alkyl radical, an unsubstituted  $C_1$ - $C_4$  arylalkyl radical, a  $C_1$ - $C_4$  arylalkyl radical substituted on the aryl group, an unsubstituted  $C_1$ - $C_4$  arylcarboxyalkyl radical, a  $C_1$ - $C_4$  arylcarboxyalkyl radical substituted on the aryl group, or a  $C_1$ - $C_4$  hydroxyalkyl or  $C_1$ - $C_4$  amidoalkyl group;

(b) retinoids selected from the group consisting of compounds of formula (II) in which R is COOH,  $CONHC_2H_5$  or  $COOC_2H_5$  and A is selected from the group consisting of



(c) retinoids selected from the group consisting of compounds of the formulae:

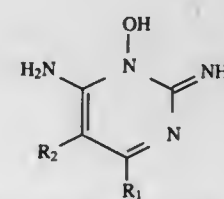


(IX)



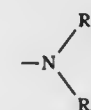
(X)

and the second component (B) comprises a physiologically acceptable medium and 0.1 to 3% by weight relative to the weight of component (B) of at least one pyrimidine derivative having the formula:



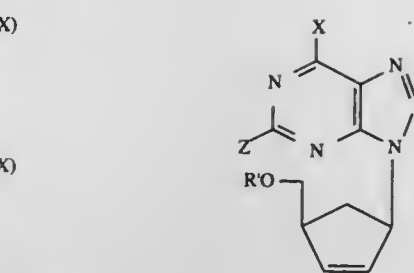
(I)

or an acid addition salt thereof, wherein  $R_1$  represents a group having the formula



(II)

wherein each of  $R_3$  and  $R_4$  is a member selected from the group consisting of hydrogen, lower alkyl, alkenyl, alkylaryl and cycloalkyl, the alkyl part of which is a lower alkyl radical, or  $R_3$  and  $R_4$  with the nitrogen to which each is bound, form a heterocyclic group, which is unsubstituted or is substituted on the carbon atoms with one to three lower alkyl, hydroxy, or alkoxy groups, and which is selected from the group consisting of aziridinyl, azetidyl, pyrrolidinyl, piperidino, hexahydroazepinyl, heptamethylenimino, octa-methylenimino, morpholine and 4-(lower alkyl)piperazinyl, and wherein  $R_2$  is a member selected from the group consisting of hydrogen, lower alkyl, alkenyl, alkoxyalkyl, cycloalkyl, aryl, alkylaryl, arylalkyl, alkylarylalkyl, alkoxyarylalkyl and haloarylalkyl, the alkyl part of which is a lower alkyl radical.



wherein Z is  $NH_2$ ,  $R'$  is H,  $(C_1-C_{16})$ alkanoyl or  $O=P(OH)_2$ ; Y is CH, and X is selected from the group consisting of OR, H, or  $N(R)_2$ , wherein each R is H or  $(C_1-C_4)$ alkyl, and the pharmaceutically acceptable salts thereof, wherein said amount is effective to inhibit the course of HIV infection.

5,567,704

#### R-ENANTIOMERICALLY PURE HYDROXYLATED XANTHINE COMPOUNDS TO TREAT BALDNESS

James A. Bianco, Seattle; Paul Woodson, Bothell; David Porubek, Edmonds, and Jack Singer, Seattle, all of Wash., assignors to Cell Therapeutics, Inc., Seattle, Wash.

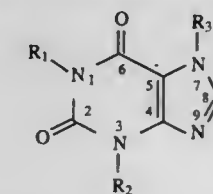
Division of Ser. No. 343,810, Nov. 22, 1994, which is a division of Ser. No. 307,554, Sep. 16, 1994, which is a continuation of Ser. No. 13,977, Feb. 4, 1993, abandoned, which is a continuation-in-part of Ser. No. 926,665, Aug. 7, 1992, abandoned, which is a continuation-in-part of Ser. No. 846,354, Mar. 4, 1992, abandoned. This application Jun. 1, 1995, Ser. No. 457,683

Int. Cl. A61K 31/52

U.S. Cl. 514-263

4 Claims

1. A method for treating baldness, hair loss or alopecia caused by cytoreductive therapies, comprising administering an effective amount of a compound wherein the compound has a formula:



wherein:

$R_1$  is a substantially pure resolved R enantiomer  $\omega$ -1, secondary alcohol-substituted alkyl ( $C_{5-8}$ ) group; and  
 $R_2$  and  $R_3$  are independently hydrogen atom or an alkyl ( $C_{1-12}$ ) or alkoxy ( $C_{1-12}$ ), or a pharmaceutical composition thereof.

5,567,703

#### METHOD FOR TREATING HIV INFECTIONS WITH DIDEOXYCARBOCYCLIC NUCLEOSIDES

Robert Vince, St. Paul, Minn., and Mei Hua, Beijing, China, assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Division of Ser. No. 290,185, Aug. 15, 1994, which is a continuation-in-part of Ser. No. 495,341, Mar. 19, 1990, abandoned, which is a division of Ser. No. 278,652, Dec. 5, 1988, Pat. No. 4,931,559, which is a continuation-in-part of Ser. No. 146,252, Jan. 20, 1988, Pat. No. 4,916,224. This application May 15, 1995, Ser. No. 441,072

Int. Cl. A61K 31/52

U.S. Cl. 514-261

22 Claims

1. A therapeutic method comprising administering to a human infected with HIV, an amount of a compound of the formula:

5,567,705

#### MICROBICIDES

Ludwig Mittermeier, Freiburg, Germany, and Wilhelm Ruess, Pfeffingen, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 392,562, Feb. 23, 1995, abandoned, which is a division of Ser. No. 991,674, Dec. 16, 1992, Pat. No. 5,403,844. This application Jul. 26, 1995, Ser. No. 506,946

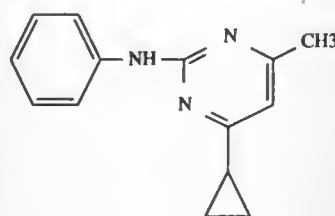
Int. Cl. A01N 43/54;43/64

U.S. Cl. 514-275

6 Claims

1. A synergistic, fungicidal, two-component composition, having an effective amount of an ergosterin-biosynthesis inhibitor of the triazole series as component I and a 2-anilinopyrimidine derivative as component II, wherein component I is 1-[2-[2-chloro-4-(4-chlorophenoxy)-phenyl]-4-methyl-1,3-dioxolan-2-ylmethyl]-1H-1,2,4-triazole or a salt or metal complex thereof, and component II

is 4-cyclopropyl-6-methyl-N-phenyl-2-pyrimidinamine of the formula



or a salt or metal complex thereof, wherein the synergistic weight ratio of component I to component II is in the range of 10:1 to 1:10, together with a carrier.

5,567,706

## METHOD FOR TREATING IMPOTENCE

Haralambos Gavras, 8 Stevens Rd., Marblehead, Mass. 01945

Continuation of Ser. No. 15,592, Feb. 10, 1993, abandoned.

This application Aug. 2, 1994, Ser. No. 284,744

Int. Cl.<sup>6</sup> A61K 31/44; 31/49; 31/50

U.S. Cl. 514—280

5 Claims

1. A method of treating impotency in a male patient comprising administering orally to said male patient an effective amount for treating impotency of a selective post-synaptic peripheral  $\alpha_1$ -adrenoceptor antagonist having antihypertensive characteristics, and yohimbine, having central and peripheral  $\alpha_2$ -adrenoceptor inhibitor activity and a parasympathetic agonist effect.

5,567,707

## ACRONYCINE ANALOGUES

Michel Koch, La Celle Saint Cloud; Francois Tillequin, Paris, both of France; Alexios-Leandros Skaltsounis, Athens, Greece; Yves Rolland, Vanves, France; Alain Pierre, Marly-le-Roi, France, and Ghanem Atassi, Saint-Cloud, France, assigns to Adir et Compagnie, Courbevoie, France

Filed Feb. 16, 1995, Ser. No. 389,798

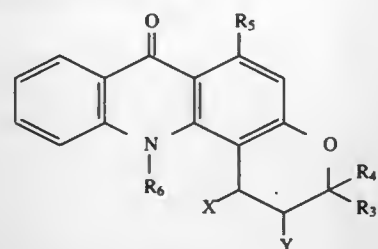
Claims priority, application France, Feb. 17, 1994, 94 01806

Int. Cl.<sup>6</sup> C07D 491/04

U.S. Cl. 514—280

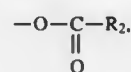
5 Claims

1. A compound of formula (I):

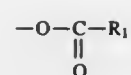


wherein:

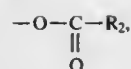
X represents —O—R<sub>1</sub> and Y represents



or X represents



and Y represents



R<sub>1</sub> and R<sub>2</sub>, which are the same or different, each represents, independently of the other, phenyl or a hydrocarbon radical having 1 to 6 carbon atoms inclusive in straight or branched chain and being optionally monosubstituted by a group selected from hydroxy, halogen, nitro, amino, alkoxy, and acyl,

R<sub>1</sub> is selected from hydrogen and R<sub>1</sub>,

A is selected from a valency bond and a divalent hydrocarbon group optionally having one or more unsaturations and having 1 to 6 carbon atoms inclusive in straight or branched chain, and which is optionally monosubstituted by a group selected from hydroxy, halogen, nitro, amino, alkoxy, and acyl,

R<sub>3</sub>, R<sub>4</sub> and R<sub>6</sub>, which are the same or different, are each selected, independently of the others, from hydrogen and alkyl,

but R<sub>3</sub> and R<sub>4</sub> possibly being only straight-chain alkyl,

R<sub>5</sub> is selected from hydrogen, hydroxy, and alkoxy, the terms "alkyl", "alkoxy" and "acyl" unless otherwise restricted being understood to designate groups having 1 to 6 carbon atoms inclusive in straight or branched chain or benzoyl, and which are optionally monosubstituted by a group selected from hydroxy, halogen, nitro, amino, alkoxy, and acyl,

its possible enantiomers, diastereoisomers, N-oxides or, where appropriate, its pharmaceutically-acceptable addition salts with an acid.

5,567,708

METHODS OF TREATING ANDROGENIC ALOPECIA WITH FINASTERIDE [17 $\beta$ -N-MONO-SUBSTITUTED-CARBAMOYL-4-AZA-5 $\alpha$ -ANDROST-1-EN-ONES]

Gary H. Rasmussen, Watchung, and Glenn F. Reynolds, Westfield, both of N.J., assigns to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 94,815, Jul. 20, 1993, which is a continuation of Ser. No. 16,476, Feb. 10, 1993, abandoned, which is a continuation of Ser. No. 927,256, Aug. 7, 1992, abandoned, which is a continuation of Ser. No. 698,374, May 5, 1991, abandoned, which is a continuation of Ser. No. 545,676, Jun. 28, 1990, abandoned, which is a continuation of Ser. No. 370,142, Jun. 21, 1989, abandoned, which is a continuation of Ser. No. 198,708, May 19, 1988, abandoned, which is a continuation of Ser. No. 34,806, Apr. 3, 1987, abandoned, which is a continuation-in-part of Ser. No. 800,623, Nov. 21, 1985, Pat. No. 4,760,071, which is a continuation of Ser. No. 584,062, Feb. 27, 1984, abandoned. This application May 31, 1995, Ser. No. 455,464

Int. Cl.<sup>6</sup> A61K 31/44; C07D 221/18

U.S. Cl. 514—284

6 Claims

1. A method of treating androgenic alopecia which comprises topically administering to a human in need of such treatment a therapeutically effective amount of 17 $\beta$ -(N-tert-butylcarbamoyle)-4-aza-5 $\alpha$ -androst-1-en-3-one.

5,567,709

## CARBAMATES OF RAPAMYCIN

Jerauld S. Skotnicki, Allentown, N.J.; Yvette L. Palmer, Newtown, Pa.; Wenling Kao, Paoli, Pa., and Magid A. Abou-Gharbia, Glen Mills, Pa., assigns to American Home Products Corporation, Madison, N.J.

Division of Ser. No. 259,701, Jun. 14, 1994, Pat. No.

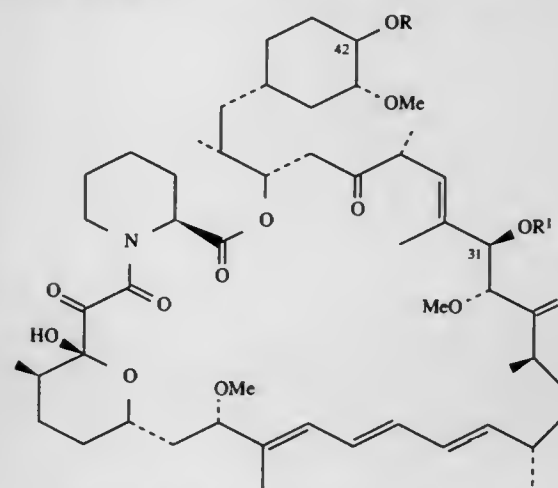
5,434,260, which is a continuation of Ser. No. 160,984, Dec. 1, 1993, abandoned, which is a division of Ser. No. 54,655, Apr. 23, 1993, Pat. No. 5,302,584, which is a continuation-in-part of Ser. No. 960,597, Oct. 13, 1992, abandoned. This application Feb. 27, 1995, Ser. No. 395,013

Int. Cl.<sup>6</sup> A61K 31/395; C07D 498/16

U.S. Cl. 514—291

1 Claim

1. A pharmaceutical composition which comprises a compound of the structure





5,567,710

## POLYCYCLIC FUSED RING MODULATORS OF ACETYLCHOLINE RECEPTORS

Jeffrey P. Whitten; Ian A. McDonald, and Jean-Michel Vernier, all of San Diego, Calif., assignors to Sibia Neurosciences, Inc., La Jolla, Calif.

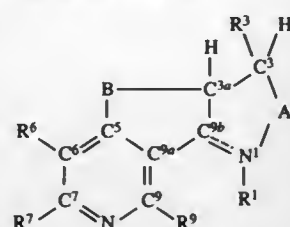
Filed Oct. 13, 1994, Ser. No. 322,757

Int. Cl.<sup>6</sup> A61K 31/44; C07D 471/04; 491/147

U.S. Cl. 514—292

17 Claims

1. A compound having the structure:



wherein:

- A is a 1 or 2 atom bridging species which forms part of a 5- or 6-membered ring including N<sup>1</sup>, C<sup>9a</sup>, C<sup>3a</sup> and C<sup>3</sup>; and B is a 1, 2 or 3 carbon alkylene or oxyalkylene bridging species which forms part of a 5-, 6- or 7-membered ring including C<sup>5</sup>, C<sup>9a</sup>, C<sup>9b</sup> and C<sup>3a</sup>; and R<sup>1</sup> is selected from hydrogen, lower alkyl, aryl, substituted aryl, alkylaryl, or substituted alkylaryl, or R<sup>1</sup> is absent when there is a double bond between N<sup>1</sup> and C<sup>9a</sup>; and R<sup>3</sup> is selected from hydrogen or a lower alkyl moiety; and R<sup>6</sup> and R<sup>7</sup> are independently selected from hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl, arylalkyl, substituted arylalkyl, aroyl, substituted aroyl, heteroaryl, substituted heteroaryl, acyl, halogen, trifluoromethyl, trialkylsilyl, triarylsilyl, cyano, nitro, —S(O)—R<sup>1</sup>, S(O)<sub>2</sub>R<sup>1</sup>, —S(O)<sub>2</sub>—NHR<sup>1</sup>, —C(O)—NHR<sup>1</sup>, or —NH—C(O)—R<sup>1</sup>, wherein each R<sup>1</sup> is lower alkyl or aryl; —OR<sup>1</sup>, —NR<sup>1</sup>, or —SR<sup>1</sup>, wherein each R<sup>1</sup> is independently selected from hydrogen, lower alkyl, aryl, substituted aryl, alkylaryl or substituted alkylaryl; and R<sup>9</sup> is selected from hydrogen or lower alkyl; with the proviso that, when A is —CH<sub>2</sub>—, B is —CH<sub>2</sub>CH<sub>2</sub>—, and each of R<sup>3</sup>, R<sup>6</sup>, R<sup>7</sup> and R<sup>9</sup> are —H, then R<sup>1</sup> is not —H, —CH<sub>3</sub> or —CH<sub>2</sub>CH<sub>3</sub>.

5,567,711

## INDOLE-3-CARBONYL AND INDOLE-3-SULFONYL DERIVATIVES AS PLATELET ACTIVATING FACTOR ANTAGONISTS

George S. Sheppard, Wilmette; Steven K. Davidsen; James B. Summers, both of Libertyville, and George M. Carrera, Jr., Des Plaines, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

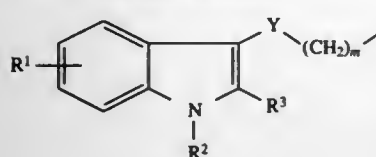
Filed Apr. 19, 1995, Ser. No. 424,911

Int. Cl.<sup>6</sup> C07D 471/04; A61K 31/445

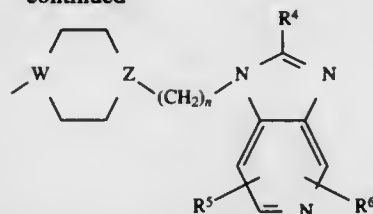
U.S. Cl. 514—303

7 Claims

1. A compound of formula



-continued



or a pharmaceutically acceptable salt thereof wherein

R<sup>1</sup> is one or more groups independently selected from the group

- consisting of (a) hydrogen, (b) halogen, (c) hydroxy, (d) cyano, (e) alkyl of one to six carbon atoms, (f) alkenyl of two to six carbon atoms, (g) alkynyl of two to six carbon atoms, (h) alkoxy of one to six carbon atoms, (i) alkanoyl of one to seven carbon atoms, (j) —COOR<sup>7</sup>, wherein R<sup>7</sup> is hydrogen, alkyl of one to ten carbon atoms, or phenylalkyl wherein the alkyl portion is of one to four carbon atoms, (k) unsubstituted phenyl, (l) phenyl, substituted with alkyl of one to six carbon atoms, alkoxy of one to six carbon atoms, halogen, —NR<sup>8</sup>R<sup>9</sup>, where R<sup>8</sup> and R<sup>9</sup> are independently selected from hydrogen and alkyl of one to six carbon atoms, or R<sup>8</sup> and R<sup>9</sup> together with the nitrogen atom to which they are attached form a pyrrolidinyl, piperidinyl, piperazinyl, or morpholinyl ring, —COOR<sup>7</sup>, —C(O)NR<sup>8</sup>R<sup>9</sup>, or —SO<sub>2</sub>NR<sup>8</sup>R<sup>9</sup>, (m) —C(O)NR<sup>8</sup>R<sup>9</sup>, (n) —OC(O)NR<sup>8</sup>R<sup>9</sup>, (o) —NHC(O)NR<sup>8</sup>R<sup>9</sup>, (p) 2- or 3-furyl, (q) 2- or 3-thienyl, (r) 2-, 4-, or 5-thiazolyl, (s) 2-, 3-, or 4-pyridyl, (t) 2-, or 4-pyrimidyl, (u) phenylalkyl in which the alkyl portion is of one to six carbon atoms, (v) phenylalkyl, in which the alkyl portion is of one to six carbon atoms and the phenyl moiety is substituted with halogen, alkyl of from one to six carbon atoms, or alkoxy of from one to six carbon atoms, (w) unsubstituted benzoyl, (x) benzoyl substituted with halogen, alkyl of from one to six carbon atoms, or alkoxy of from one to six carbon atoms, (y) unsubstituted phenoxy, (z) phenoxy substituted with halogen, alkyl of from one to six carbon atoms, or alkoxy of from one to six carbon atoms, (aa) unsubstituted phenylalkyloxy, in which the alkyl portion is of one to six carbon atoms, (bb) phenylalkyloxy in which the alkyl portion is of one to six carbon atoms and the phenyl moiety is substituted with halogen, alkyl of from one to six carbon atoms, or alkoxy of from one to six carbon atoms, (cc) unsubstituted phenylalkanoyl, in which the alkanoyl portion is of one to seven carbon atoms, and

- (dd) phenylalkanoyl, in which the alkanoyl portion is of one to seven carbon atoms and the phenyl moiety is substituted with; halogen, alkyl of from one to six carbon atoms, or alkoxy of from one to six carbon atoms;

R<sup>2</sup> is selected from the group consisting of

- (a) hydrogen, (b) alkyl of one to six carbon atoms; (c) —(CH<sub>2</sub>)<sub>p</sub>COOR<sup>7</sup>, where p is 0, 1, 2, 3, or 4, (d) —(CH<sub>2</sub>)<sub>p</sub>NR<sup>8</sup>R<sup>9</sup>, where q is 2, 3, or 4, (e) —(CH<sub>2</sub>)<sub>p</sub>COR<sup>7</sup>, (f) —(CH<sub>2</sub>)<sub>p</sub>OR<sup>7</sup>, (g) —(CH<sub>2</sub>)<sub>p</sub>SO<sub>2</sub>R<sup>7</sup>, (h) —(CH<sub>2</sub>)<sub>p</sub>SO<sub>2</sub>NR<sup>8</sup>R<sup>9</sup>, where R<sup>7</sup>, R<sup>8</sup> and R<sup>9</sup> are as defined above, (i) —(CH<sub>2</sub>)<sub>p</sub>CONR<sup>10</sup>R<sup>11</sup>, where R<sup>10</sup> and R<sup>11</sup> are independently selected from the group consisting of hydrogen, alkyl of one to six carbon atoms, —(CH<sub>2</sub>)<sub>r</sub>COOR<sup>7</sup>, where r is 1, 2, 3, or 4, —(CH<sub>2</sub>)<sub>r</sub>NR<sup>8</sup>R<sup>9</sup>, —(CH<sub>2</sub>)<sub>r</sub>OH, —(CH<sub>2</sub>)<sub>r</sub>SO<sub>2</sub>R<sup>7</sup>, and —(CH<sub>2</sub>)<sub>r</sub>SO<sub>2</sub>NR<sup>8</sup>R<sup>9</sup>, or R<sup>10</sup> and R<sup>11</sup> taken together define a pyrrolidine, morpholine, or thiomorpholine ring,

- (j) —(CH<sub>2</sub>)<sub>p</sub>CN, (k) —(CH<sub>2</sub>)<sub>p</sub>-1H-tetrazol-5-yl, (l) —CONHNH<sub>2</sub>, (m) unsubstituted phenylalkyl wherein the alkyl portion is of one to four carbon atoms, and (n) phenylalkyl wherein the alkyl portion is of one to four carbon atoms and the phenyl moiety is substituted with halogen, alkyl of from one to six carbon atoms, or alkoxy of from one to six carbon atoms;

R<sup>3</sup> is selected from the group consisting of hydrogen and alkyl of one to six carbon atoms;

Y is selected from the group consisting of

- >C=O, and >S(O)<sub>t</sub>, wherein t is 1 or 2;

W is N;

Z is CH

R<sup>4</sup> is selected from the group consisting of

- (a) alkyl of one to six carbon atoms, (b) alkenyl of two to six carbon atoms, (c) alkynyl of two to six carbon atoms, (d) alkoxy of one to six carbon atoms, (e) alkylthio of one to six carbon atoms, (f) alkoxyalkyl in which the alkoxy and alkyl portions are independently of one to six carbon atoms, (g) alkylthioalkyl in which the alkyl portions each independently of one to six carbon atoms, (h) haloalkyl of one to six carbon atoms, (i) unsubstituted phenylalkyl wherein the alkyl portion is of one to six carbon atoms, (j) phenylalkyl wherein the alkyl portion is of one to six carbon atoms and the phenyl moiety is substituted with alkyl of one to six carbon atoms, haloalkyl of one to six carbon atoms, alkoxy of one to six carbon atoms, hydroxy, or halogen, (k) cycloalkyl of three to eight carbon atoms, (l) unsubstituted thiophenyl, and (m) thiophenyl substituted with alkyl of one to six carbon atoms, haloalkyl of one to six carbon atoms, alkoxy of one to six carbon atoms, hydroxy, or halogen;

R<sup>5</sup> and R<sup>6</sup> are independently selected from the group consisting of hydrogen,

alkyl of one to six carbon atoms, halogen, haloalkyl, and alkoxy of one to six carbon atoms; m is 0 or 1; and n is 0, 1, or 2.

5,567,712

## NAPHTHYL COMPOUNDS, INTERMEDIATES, COMPOSITIONS AND METHODS

Alan D. Palkowitz, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

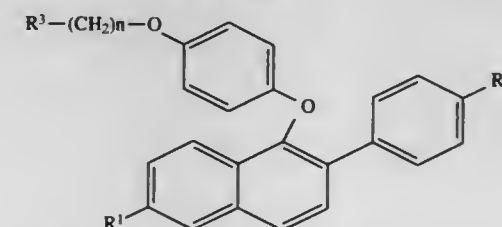
Division of Ser. No. 395,950, Feb. 28, 1995. This application Jun. 6, 1995, Ser. No. 469,971

Int. Cl.<sup>6</sup> A61K 31/445; 31/40; 31/135

U.S. Cl. 514—231.2

1 Claim

1. A method for inhibiting endometriosis comprising administering to a woman in need of such treatment an effective amount of a compound of compound of formula I



wherein

- R<sup>1</sup> is —H, —OH, —O(C<sub>1</sub>—C<sub>4</sub> alkyl), —OCOC<sub>6</sub>H<sub>5</sub>, —OCO(C<sub>1</sub>—C<sub>6</sub> alkyl), or —OSO<sub>2</sub>(C<sub>2</sub>—C<sub>6</sub> alkyl); R<sup>2</sup> is —H, —OH, —O(C<sub>1</sub>—C<sub>4</sub> alkyl), —OCOC<sub>6</sub>H<sub>5</sub>, —OCO(C<sub>1</sub>—C<sub>6</sub> alkyl), —OSO<sub>2</sub>(C<sub>2</sub>—C<sub>6</sub> alkyl), or halo; R<sup>3</sup> is 1-piperidinyl, 1-pyrrolidinyl, methyl-1-pyrrolidinyl, dimethyl-1-pyrrolidinyl, 4-morpholino, dimethylamino, diethylamino, diisopropylamino, or 1-hexamethyleneimino; and n is 2 or 3; or a pharmaceutically acceptable salt thereof.

5,567,713

## HYPOGLYCEMIC AGENTS

George J. Cullinan, Trafalgar, and Terence T. Yen, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 82,218, Jun. 24, 1993, abandoned. This application Jan. 9, 1995, Ser. No. 370,062

Int. Cl.<sup>6</sup> A61K 31/445; 31/40

U.S. Cl. 514—324

4 Claims

1. A method of reducing blood glucose concentration in mammals which comprises administering to a mammal in need of treatment [6-hydroxy-2-(4-hydroxyphenyl)benzo[b]thien-3-yl][4-[2-(1-piperidinyl)ethoxy]phenyl]methanone and pharmaceutically acceptable salts and solvates thereof.

5,567,714

# METHODS OF TREATING OBESITY BY INHIBITING PHYSIOLOGICAL CONDITIONS ASSOCIATED WITH AN EXCESS OF NEUROPEPTIDE Y

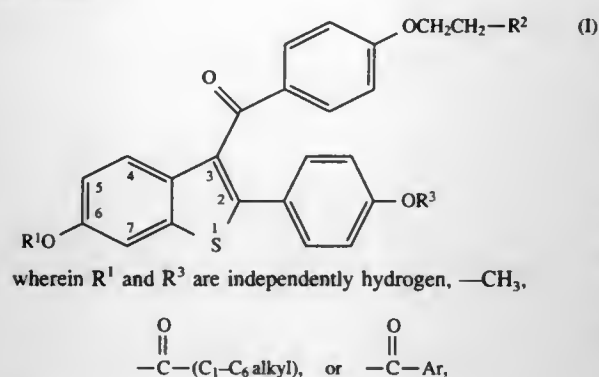
Robert F. Bruns, Jr., Carmel; Donald R. Gehlert, Indianapolis, both of Ind.; J. Jeffrey Howbert, Bellevue, Wash., and William H. W. Lunn, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 326,675, Oct. 20, 1994. This application Aug. 21, 1995, Ser. No. 517,049  
Int. Cl.<sup>6</sup> A61K 31/445;31/40

U.S. Cl. 514—324

4 Claims

1. A method of inhibiting a physiological disorder associated with an excess of neuropeptide Y, comprising administering to a human in need thereof an effective amount of a compound having the formula



5,567,715

# METHODS OF TREATING DEPRESSION BY INHIBITING PHYSIOLOGICAL CONDITIONS ASSOCIATED WITH AN EXCESS OF NEUROPEPTIDE Y

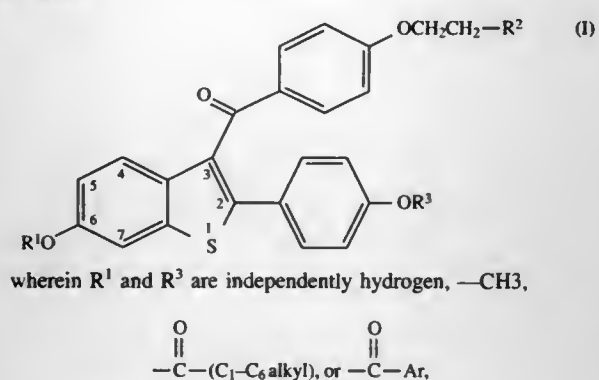
Robert F. Bruns, Jr., Carmel; Donald R. Gehlert, Indianapolis, both of Ind.; J. Jeffrey Howbert, Bellevue, Wash., and William H. W. Lunn, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 326,675, Oct. 20, 1994. This application Aug. 21, 1995, Ser. No. 517,315  
Int. Cl.<sup>6</sup> A61K 31/445;31/40

U.S. Cl. 514—324

4 Claims

1. A method of inhibiting a physiological disorder associated with an excess of neuropeptide Y, comprising administering to a human in need thereof an effective amount of a compound having the formula



R<sup>2</sup> is selected from the group consisting of pyrrolidine, hexamethyleneimino, and piperidino; or a pharmaceutically acceptable salt of solvate thereof, wherein the condition associated with an excess of neuropeptide Y is depression.

5,567,716

# TRANS AND CIS TRAUMATIC ACID SALTS HAVING CICATRIZANT ACTIVITY ASSOCIATED TO BACTERIOSTATIC, ANTIVIRAL, ANTIBIOTIC OR ANTIFUNGAL ACTIVITY

Francesco Della Valle; Silvana Lorenzi, both of Padova, and Gabriele Marcolongo, Carrara San Giorgio, all of Italy, assignors to Lifegroup S.p.A., Rome, Italy

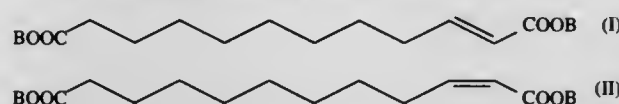
Filed Nov. 19, 1993, Ser. No. 155,153

Claims priority, application Italy, Nov. 23, 1992, MI92A2674  
Int. Cl.<sup>6</sup> A61K 31/195;31/20

U.S. Cl. 514—332

10 Claims

1. A trans and cis traumatic acid salt of formula (I) and (II)



5,567,717

# HETEROCYCLE SUBSTITUTED PHENOXYALKYLHETEROCYCLES AND THEIR USE AS ANTIVIRAL AGENTS

David J. Aldous, Glenmore; Thomas R. Bailey, Phoenixville; Guy D. Diana, and Theodore J. Nitz, both of Pottstown, all of Pa., assignors to Sterling Winthrop, Inc., New York, N.Y.

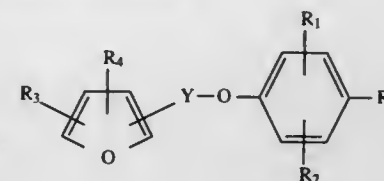
Division of Ser. No. 242,528, May 13, 1994, Pat. No.

5,514,679. This application Jun. 5, 1995, Ser. No. 461,285  
Int. Cl.<sup>6</sup> A61K 31/34; C07D 405/12;413/12;407/12;409/12;417/12

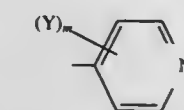
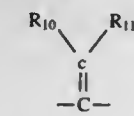
U.S. Cl. 514—336

7 Claims

1. A compound of formula:



or R<sub>1</sub> and R<sub>2</sub> can be taken together to form a carbonyl group; or



5,567,719

# THIA DIAZOLES AND THEIR USE AS ANTIPICORNAVIRAL AGENTS

David J. Aldous, Glenmore; Thomas R. Bailey, Phoenixville; Guy D. Diana, and Theodore J. Nitz, both of Pottstown, all of Pa., assignors to Sterling Winthrop, Inc., New York, N.Y.

Division of Ser. No. 242,529, May 13, 1994, Pat. No.

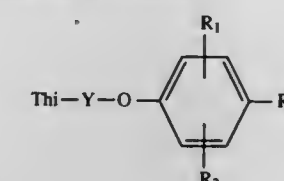
5,453,433. This application Jun. 7, 1995, Ser. No. 477,040

Int. Cl.<sup>6</sup> A61K 31/44; C07D 417/12

U.S. Cl. 514—342

5 Claims

1. A compound of formula:





alkyl, alkoxy, nitro, carboxy, alkoxycarbonyl, dialkylaminoalkyl, alkylaminoalkyl, aminoalkyl, difluoromethyl, trifluoromethyl, or cyano;

R<sub>3</sub> is a pyridyl, or a substituted pyridyl wherein the substitution is with alkyl, alkoxyalkyl, cycloalkyl, haloalkyl, hydroxyalkyl, alkoxy, hydroxy, furyl, thienyl, or fluoroalkyl or a pharmaceutically acceptable salt thereof.

5,567,720

# PHARMACEUTICALLY ACTIVE AGENTS THAT IMPEDE AMYLOID FORMATION IN VIVO

Paul Averbach, Montreal, Canada, assignor to DMS Pharmaceutical Inc., Quebec, Canada

Division of Ser. No. 493,276, Jun. 14, 1990, Pat. No. 5,231,170, which is a continuation-in-part of Ser. No. 315,796, Feb. 27, 1989, Pat. No. 4,919,915, which is a continuation of Ser. No. 21,242, Mar. 3, 1987, Pat. No. 4,816,416, which is a continuation-in-part of Ser. No. 901,007, Aug. 27, 1986, abandoned. This application Jun. 27, 1994, Ser. No. 265,931

Int. Cl.<sup>6</sup> A61K 31/515;31/44;31/35;31/34

U.S. Cl. 514—345

7 Claims

1. A method of treating cerebral amyloidosis, comprising the step of administering to a subject, in whom amyloid formation is anticipated, a pharmaceutically effective amount of a compound that inhibits formation of amyloid fibrils when administered, at an in-tissue concentration of about 10<sup>-5</sup> M or less, to a test animal that has received an intracerebral injection of dense microspheres.

5,567,721

# DI(AROMATIC) COMPOUNDS AND THEIR USE IN HUMAN AND VETERINARY MEDICINE AND IN COSMETICS

Jean-Michel Bernardon, Nice, and William R. Pilgrim, Valbonne, both of France, assignors to Centre International de Recherches Dermatologiques, Valbonne, France

Division of Ser. No. 167,145, Dec. 16, 1993, Pat. No. 5,439,925, which is a division of Ser. No. 859,522, Aug. 4, 1992, Pat. No. 5,387,594. This application Apr. 28, 1995, Ser. No. 430,622

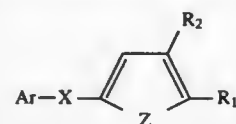
Claims priority, application Luxembourg, Oct. 12, 1990, 87 821

Int. Cl.<sup>6</sup> A61K 31/44;31/17;31/195;31/245

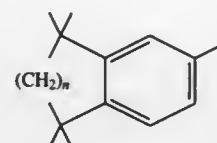
U.S. Cl. 514—353

21 Claims

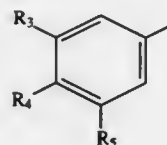
1. A di(aromatic) compound having the formula:



wherein  
Ar represents:



wherein  
n=1 or 2 or



wherein

R<sub>3</sub> represents α-branched alkyl having from 3–12 carbon atoms, α,α'-branched alkyl having from 4–12 carbon atoms, cycloalkyl having 3–12 carbon atoms, or mono- or polycyclic cycloalkyl having 5–12 carbon atoms in which the carbon having the free valence is trisubstituted,

R<sub>4</sub> represents OH, alkoxy having 1–6 carbon atoms, α-branched alkyl having from 3–12 carbon atoms, α,α'-branched alkyl having 4–12 carbon atoms, cycloalkyl having 3–12 carbon atoms, mono- or polycyclic cycloalkyl having 5–12 carbon atoms in which the carbon having the free valence is trisubstituted, monohydroxyalkyl, polyhydroxyalkyl, fluorine, chlorine, SH, SR<sub>6</sub>, SO<sub>2</sub>R<sub>6</sub>, alkenyl having 2–6 carbon atoms or alkenyloxy having 2 to 6 carbon atoms,

R<sub>5</sub> represents hydrogen,

R<sub>6</sub> represents lower alkyl,

R<sub>1</sub> represents —COR<sub>7</sub>,

R<sub>7</sub> represents hydrogen, OH, —OR<sub>10</sub>, —N(r'r'), lower alkyl, monohydroxyalkyl, polyhydroxyalkyl or a sugar residue,

R<sub>10</sub> represents alkyl having 1–12 carbon atoms or alkenyl having 2–12 carbon atoms,

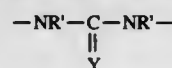
r' and r'' each independently, represent hydrogen, lower alkyl, aryl, aralkyl, an amino acid residue, a sugar residue, an amino sugar residue or a heterocycle, or r' and r'' taken together from a heterocycle,

R<sub>2</sub> represents hydrogen, OH, lower alkyl alkoxy having 1–6 carbon atoms, fluorine, chlorine, CF<sub>3</sub>, COR<sub>7</sub>, CH<sub>2</sub>OH or CH<sub>2</sub>OR<sub>6</sub> wherein R<sub>6</sub> has the above meaning,

Z represents an oxygen atom, a sulfur atom, —CH=CR<sub>11</sub>—, —N=CH— or —N=CR<sub>6</sub>— wherein R<sub>6</sub> has the above meaning,

R<sub>11</sub> represents hydrogen, OH, lower alkyl, alkoxy having 1–6 carbon atoms, fluorine, chlorine or CF<sub>3</sub>,

X represents a divalent radical which can be read from left to right or vice versa and has the formula:



R' represents hydrogen or —CH<sub>3</sub> and Y represents an oxygen atom, and the salts of compounds of formula (I) when R<sub>1</sub> represents a carboxylic acid function, and the optical isomers of the said compounds of formula (I).

5,567,722

# CYANOGUANIDINES AS K-CHANNEL BLOCKERS

Stephen J. Humphrey, Kalamazoo; Kaushik D. Meisneri, Kalamazoo; James H. Ludens, Kalamazoo, and Jackson B. Hester, Jr., Galesburg, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

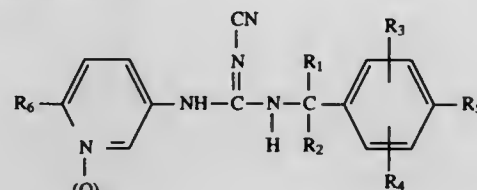
Continuation-in-part of Ser. No. 929,795, Aug. 13, 1992, abandoned. This application Feb. 6, 1995, Ser. No. 384,562

Int. Cl.<sup>6</sup> C07D 213/75; A61K 31/44

U.S. Cl. 514—353

8 Claims

1. A compound of Formula I or its pharmaceutically acceptable acid addition salts



wherein  
R<sub>1</sub> is hydrogen or methyl;

R<sub>2</sub> is C<sub>1</sub>–C<sub>6</sub> alkyl, C<sub>2</sub>–C<sub>6</sub> alkenyl, C<sub>2</sub>–C<sub>6</sub> alkynyl, C<sub>3</sub>–C<sub>5</sub> cycloalkyl, C<sub>3</sub>–C<sub>5</sub> cycloalkenyl, hydroxy methyl, methoxy-C<sub>1</sub>–C<sub>5</sub> alkyl, or R<sub>1</sub> and R<sub>2</sub> are combined to form a C<sub>3</sub>–C<sub>6</sub> carbocyclic ring;

5,567,725

# SUBSTITUTED CYCLOHEXANOL ESTERS, THEIR USE FOR TREATING DISEASES, AND PHARMACEUTICAL PREPARATIONS

Horst Hemmerle, Lorsch; Gerrit Schubert, Kelkheim; Peter Below, Frankfurt; Andreas Herling, Bad Camberg, and Hans-Jörg Burger, Frankfurt, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 14, 1995, Ser. No. 388,511

Claims priority, application Germany, Feb. 16, 1994, 44 04 848.3

Int. Cl.<sup>6</sup> A61K 31/505;31/415; C07D 401/12;401/08;235/12

U.S. Cl. 514—381

11 Claims

5,567,723

# MITICIDAL HYDRAZINE COMPOUNDS AND THEIR INTERMEDIATES

Mark A. Dekeyser, Waterloo; Derek J. McPhee, Guelph, both of Canada, and Paul T. McDonald, Middlebury, Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn., and Uniroyal Chemical Ltd./Ltee, Elmira, Canada

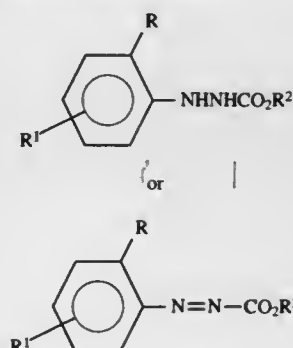
Filed Jul. 5, 1995, Ser. No. 498,102

Int. Cl.<sup>6</sup> C07D 213/02; A01N 43/40;33/26; C07C 243/24

U.S. Cl. 514—357

20 Claims

1. A compound having the formula:



wherein R is C<sub>1</sub>–C<sub>6</sub> alkoxy or C<sub>1</sub>–C<sub>6</sub> alkyl; R<sup>1</sup> is fluorenyl, thienyl, pyridyl or thiazolyl, unsubstituted or substituted by one or more substituents selected from C<sub>1</sub>–C<sub>4</sub> alkoxy, C<sub>1</sub>–C<sub>4</sub> alkyl, C<sub>1</sub>–C<sub>4</sub> alkylthio, halogen, C<sub>1</sub>–C<sub>4</sub> haloalkyl and nitro; and R<sup>2</sup> is C<sub>1</sub>–C<sub>6</sub> alkyl, C<sub>3</sub>–C<sub>6</sub> cycloalkyl, C<sub>1</sub>–C<sub>6</sub> haloalkyl, C<sub>2</sub>–C<sub>6</sub> alkenyl, or C<sub>2</sub>–C<sub>6</sub> alkoxyalkyl.

5,567,724

# ALKALINE AND ACID PHOSPHATASE INHIBITORS IN TREATMENT OF NEUROLOGICAL DISORDERS

Judith A. Kelleher, Irvine, and David D. Eveleth, Mission Viejo, both of Calif., assignors to Cortex Pharmaceuticals, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 71,281, Jun. 1, 1993, abandoned. This application Jun. 1, 1994, Ser. No. 252,109

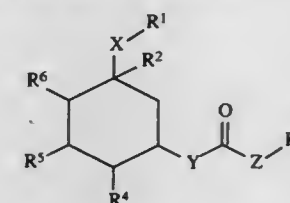
Int. Cl.<sup>6</sup> A61K 31/38

U.S. Cl. 514—368

19 Claims

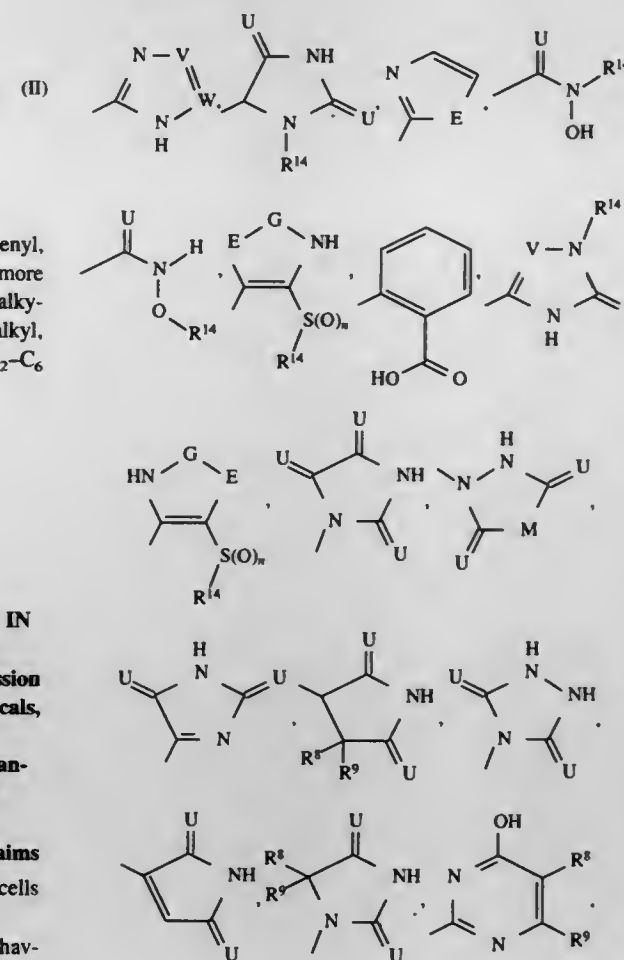
1. A method of inhibiting β-amyloid toxicity in brain cells exposed to β-amyloid peptide, comprising:  
administering to said cells an arylimidothiazole derivative having nucleotide alkaline phosphatase inhibitory activity in an amount effective to reduce cell degeneration.

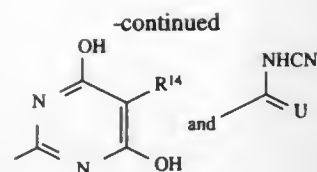
1. A cyclohexanol ester of the formula I:



(I) in which the radicals have the following meaning:

R<sup>1</sup> is CONHCOR<sup>15</sup>, CSNHR<sup>15</sup>, CONHSO<sub>2</sub>R<sup>14</sup>, CSNHSO<sub>2</sub>R<sup>14</sup> or CH<sub>2</sub>NHSO<sub>2</sub>R<sup>14</sup>, or R<sup>1</sup> is a radical selected from the following formulae:

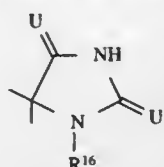




in which V is N or CH, W is N or CH, U is O or S, E is NR<sup>14</sup>, or NH, G is —N=, or



M is NR<sup>14</sup>, NH, CH<sub>2</sub>, or CR<sup>8R9</sup>, and aromatic rings may be substituted at least once by F, Cl, Br, I, OH, O—C<sub>1</sub>—C<sub>4</sub>-alkyl, C<sub>1</sub>—C<sub>4</sub>-alkyl, CF<sub>3</sub>, NO<sub>2</sub>, or CN, or R<sup>1</sup> forms, together with R<sup>2</sup>, the ring



R<sup>2</sup> is C<sub>1</sub>—C<sub>10</sub>-alkyl(R<sup>11</sup>)<sub>n</sub>, O—C<sub>1</sub>—C<sub>10</sub>-alkyl(R<sup>11</sup>)<sub>n</sub>, C<sub>2</sub>—C<sub>10</sub>-alkenyl(R<sup>11</sup>)<sub>n</sub>, O—C<sub>2</sub>—C<sub>10</sub>-alkenyl(R<sup>11</sup>)<sub>n</sub>, C<sub>2</sub>—C<sub>10</sub>-alkynyl(R<sup>11</sup>)<sub>n</sub>, O—C<sub>2</sub>—C<sub>10</sub>-alkynyl(R<sup>11</sup>)<sub>n</sub>, S—C<sub>1</sub>—C<sub>10</sub>-alkyl(R<sup>11</sup>)<sub>n</sub>, S—C<sub>2</sub>—C<sub>10</sub>-alkenyl(R<sup>11</sup>)<sub>n</sub>, S—C<sub>2</sub>—C<sub>10</sub>-alkynyl(R<sup>11</sup>)<sub>n</sub>, NH—C<sub>1</sub>—C<sub>10</sub>-alkyl(R<sup>11</sup>)<sub>n</sub>, NH—C<sub>2</sub>—C<sub>10</sub>-alkenyl(R<sup>11</sup>)<sub>n</sub>, or NH—C<sub>2</sub>—C<sub>10</sub>-alkynyl(R<sup>11</sup>)<sub>n</sub>, where R<sup>11</sup> is optionally substituted by R<sup>12</sup>;

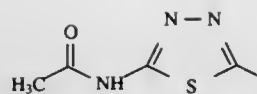
R<sup>11</sup> and R<sup>13</sup> are alkyl having from 1 to 10 carbon atoms, cycloalkyl having from 3 to 8 ring carbon atoms, phenyl, naphthyl, phenanthryl, pyridyl, thienyl, furyl, pyrimidyl, indolyl, imidazolyl, coumarinyl, phthaliminy, quinolyl, piperazinyl, tetrazolyl, triazolyl, oxazolyl or their thieno-fused, pyridino-fused, pyrimidino-fused or benzo-fused derivatives, where the aromatic radical or heteroaromatic radical may be substituted at least once, identically or differently, by F, Cl, Br, I, OH, —NO<sub>2</sub>, CN, C<sub>1</sub>—C<sub>4</sub>-alkoxy, C<sub>1</sub>—C<sub>4</sub>-alkyl, NR<sup>8R9</sup>, phenyl, benzyl, thienyl, furyl, imidazolyl, pyridyl, O-phenyl or O-benzyl, and R<sup>11</sup> and R<sup>13</sup> are identical or different; R<sup>3</sup> is a benzo-fused derivative of imidazolyl;

R<sup>4</sup>, R<sup>5</sup> and R<sup>6</sup> are H, OH, an OH group protected by customary alcohol protective groups, F, Cl or Br, or have the meanings given for R<sup>2</sup>, where R<sup>4</sup>, R<sup>5</sup> and R<sup>6</sup> are identical or different; R<sup>8</sup> and R<sup>9</sup> are H, C<sub>1</sub>—C<sub>4</sub>-alkyl, C<sub>1</sub>—C<sub>4</sub>-alkanoyl or phenyl which is optionally substituted by F, Cl, Br, I, OH, O—C<sub>1</sub>—C<sub>4</sub>-alkyl, CF<sub>3</sub>, —NO<sub>2</sub>, or CN, where R<sup>8</sup> and R<sup>9</sup> are identical or different, or R<sup>8</sup> and R<sup>9</sup> form, together with the nitrogen atom, a 4- to 10-membered, saturated heterocyclic ring in which a CH<sub>2</sub> group may be optionally replaced by O, S or NR<sup>10</sup>;

R<sup>10</sup> is H, C<sub>1</sub>—C<sub>4</sub>-alkyl, phenyl or benzyl;

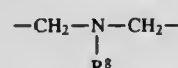
R<sup>12</sup> is phenyl, naphthyl, phenanthryl, pyridyl, thienyl, furyl, thiazolyl, pyrimidyl, indolyl, imidazolyl, coumarinyl, phthaliminy, quinolyl, piperazinyl, tetrazolyl, triazolyl, oxazolyl or their thieno-fused or benzo-fused derivatives, where the aromatic radical or heteroaromatic radical may be substituted at least once, identically or differently, by F, Cl, Br, I, OH, CF<sub>3</sub>, —NO<sub>2</sub>, CN, C<sub>1</sub>—C<sub>4</sub>-alkoxy, C<sub>1</sub>—C<sub>4</sub>-alkyl, NR<sup>8R9</sup>, phenyl, benzyl, thienyl, furyl, imidazolyl, pyridyl, O-phenyl or O-benzyl;

R<sup>14</sup> is hydrogen, C<sub>1</sub>—C<sub>10</sub>-alkyl, phenyl, naphthyl, phenanthryl, pyridyl, thienyl, furyl, thiazolyl, pyrimidyl, indolyl, imidazolyl, coumarinyl, phthaliminy, quinolyl, piperazinyl, tetrazolyl, triazolyl, oxazolyl or their thieno-fused or benzo-fused derivatives, where the aromatic radical or hetero-aromatic radical may be substituted at least once, identically or differently, by F, Cl, Br, I, OH, CF<sub>3</sub>, —NO<sub>2</sub>, CN, C<sub>1</sub>—C<sub>4</sub>-alkoxy, C<sub>1</sub>—C<sub>4</sub>-alkyl, NR<sup>8R9</sup>, phenyl, benzyl, thienyl, furyl, imidazolyl, pyridyl, O-phenyl or O-benzyl, or R<sup>14</sup> is a radical of the formula



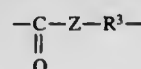
R<sup>15</sup> is C<sub>3</sub>—C<sub>10</sub>-alkenyl, C<sub>3</sub>—C<sub>10</sub>-alkenyl(R<sup>12</sup>), C<sub>1</sub>—C<sub>10</sub>-alkanoyl(R<sup>12</sup>), phenyl, naphthyl, phenanthryl, pyridyl, thienyl, furyl, thiazolyl, pyrimidyl, indolyl, imidazolyl, coumarinyl, phthaliminy, quinolyl, piperazinyl, tetrazolyl, triazolyl, oxazolyl or their thieno-fused or benzo-fused derivatives, where the aromatic radical or heteroaromatic radical may be substituted at least once, identically or differently, by F, Cl, Br, I, OH, CF<sub>3</sub>, —NO<sub>2</sub>, CN, C<sub>1</sub>—C<sub>4</sub>-alkoxy, C<sub>1</sub>—C<sub>4</sub>-alkyl, NR<sup>8R9</sup>, phenyl, benzyl, thienyl, furyl, imidazolyl, pyridyl, O-phenyl or O-benzyl;

R<sup>16</sup> is C<sub>1</sub>—C<sub>10</sub>-alkyl(R<sup>11</sup>)<sub>n</sub>, C<sub>3</sub>—C<sub>10</sub> alkenyl(R<sup>11</sup>)<sub>n</sub> or C<sub>3</sub>—C<sub>10</sub>-alkynyl(R<sup>11</sup>)<sub>n</sub>, where R<sup>11</sup> is optionally substituted by R<sup>12</sup>, X is (CH<sub>2</sub>)<sub>m</sub>, —CH=CH—, —C≡C—, —CH<sub>2</sub>—O—CH<sub>2</sub>—, —CH<sub>2</sub>—S—CH<sub>2</sub>— or



Y is (CH<sub>2</sub>)<sub>m</sub>, O, S or NR<sup>8</sup>,

Z is (CH<sub>2</sub>)<sub>m</sub>, [S, O, S—C<sub>1</sub>—C<sub>10</sub>-alkyl, O—C<sub>1</sub>—C<sub>10</sub>-alkyl,] CH=CH, CH=CF, CH=CCl, CH=CBr, CH<sub>2</sub>—CO, CH<sub>2</sub>—CHF, CH<sub>2</sub>—CHCl, CH<sub>2</sub>—CHBr, CH<sub>2</sub>—CHI, C=C, CH=C(C<sub>1</sub>—C<sub>4</sub>-alkyl), CH=C(CN), CH=C(NR<sup>8R9</sup>), CH=C(C<sub>1</sub>—C<sub>4</sub>-alkanoyl), or CH=C(R<sup>13</sup>) and, if Y is oxygen,



may together be an amino acid residue, selected from the group consisting of Ala, Arg, Asn, Asp, Cys, Gln, Glu, Gly, His, Ile, Leu, Lys, Phe, Pro, Ser, Thr, Trp, Tyr and their derivatives protected by customary protective groups,

n is zero, 1 or 2,

m is zero, 1, 2, 3 or 4, and also a physiologically tolerated salt of a compound of the formula I.

5,567,726

#### IMIDAZOLE, TRIAZOLE AND TETRAZOLE DERIVATIVES

Raymond Baker, Much Hadham; Jose L. Castro Pineiro; Alexander R. Guiblin, both of Harlow; Austin J. Reeve, Great Dunmow; Francine Sternfeld, London; Victor G. Matassa, Furneux Pelham, and Leslie J. Street, Harlow, all of United Kingdom, assignors to Merck, Sharp & Dohme Ltd., Hordesdon, England

PCT No. PCT/GB93/01495, § 371 Date Jan. 24, 1995, § 102(e) Date Jan. 24, 1995, PCT Pub. No. WO94/02477, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 15, 1993, Ser. No. 374,582

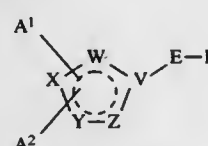
Claims priority, application United Kingdom, Jul. 24, 1992, 9215721; Dec. 8, 1992, 9225657

Int. Cl.<sup>6</sup> A61K 31/415; C07D 403/04

U.S. Cl. 514—383

9 Claims

1. A compound of formula I, or a pharmaceutically acceptable salt or prodrug thereof:



wherein the broken circle represents two non-adjacent double bonds in any position in the five-membered ring;

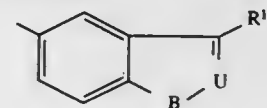
two, three or four of V, W, X, Y and Z represent nitrogen and the remainder represent carbon provided that, when two of V, W, X, Y and Z represent nitrogen and the remainder represent carbon, then the said nitrogen atoms are in non-adjacent positions within the five-membered ring;

A<sup>1</sup> represents hydrogen, hydrocarbon selected from the group consisting of: C<sub>1-6</sub> alkyl, C<sub>2-6</sub> alkenyl, C<sub>2-6</sub> alkynyl, C<sub>3-7</sub> cycloalkyl, C<sub>3-7</sub> cycloalkyl (C<sub>1-6</sub>) alkyl, aryl and aryl (C<sub>1-6</sub>) alkyl, where aryl is phenyl; a heterocyclic group selected from the group consisting of: C<sub>3-7</sub> heterocycloalkyl, C<sub>3-7</sub> heterocycloalkyl (C<sub>1-6</sub>) alkyl, heteroaryl and heteroaryl (C<sub>1-6</sub>) alkyl wherein heterocycloalkyl is selected from: azetidyl, pyrrolidyl, piperidyl, piperazinyl and morpholinyl; and heteroaryl is selected from: pyridyl, quinolyl, isoquinolyl, pyridazinyl, pyrimidinyl, pyrazinyl, pyranlyl, furyl, benzofuryl, dibenzofuryl, thienyl, benzthienyl, imidazolyl, oxadiazolyl and thiadiazolyl; halogen, cyano, trifluoromethyl, —OR<sup>4</sup>, —SR<sup>4</sup>, —NR<sup>4</sup>R<sup>5</sup>, —NR<sup>4</sup>COR<sup>5</sup>, —NR<sup>4</sup>CO<sub>2</sub>R<sup>5</sup>, —NR<sup>4</sup>SO<sub>2</sub>R<sup>5</sup>, or —NR<sup>4</sup>CTNR<sup>4</sup>R<sup>5</sup>;

A<sup>2</sup> represents a non-bonded electron pair when four of V, W, X, Y and Z represent nitrogen and the other represents carbon; or, when two or three of V, W, X, Y and Z represent nitrogen and the remainder represent carbon, A<sup>2</sup> represents hydrogen, hydrocarbon, a heterocyclic group, halogen, cyano, trifluoromethyl, —OR<sup>4</sup>, —SR<sup>4</sup>, —NR<sup>4</sup>R<sup>5</sup>, —NR<sup>4</sup>COR<sup>5</sup>, —NR<sup>4</sup>CO<sub>2</sub>R<sup>5</sup>, —NR<sup>4</sup>SO<sub>2</sub>R<sup>5</sup>, or —NR<sup>4</sup>CTNR<sup>4</sup>R<sup>5</sup>; wherein A<sup>1</sup> and A<sup>2</sup>, where A<sup>2</sup> is not a non-bonded electron pair can be optionally substituted with trifluoromethyl, C<sub>1-6</sub> alkoxy, C<sub>2-6</sub> alkoxy, C<sub>2-6</sub> alkyl, C<sub>2-6</sub> alkyl, C<sub>1-6</sub> alkylsulfonyl, arylsulfonyl, amino, mono- or di(C<sub>1-6</sub>)alkylamino, C<sub>2-6</sub> alkylcarbonylamino, arylcarbonylamino, C<sub>2-6</sub> alkoxy, C<sub>2-6</sub> alkoxy, C<sub>1-6</sub> alkylsulfonylamino, arylsulfonylamino, C<sub>1-6</sub> alkylsulfonylamino, aminocarbonylamino, mono- or di(C<sub>1-6</sub>)alkylaminocarbonyl, C<sub>1-6</sub> alkylaminosulfonyl, aminosulfonylmethyl, and mono- or di(C<sub>1-6</sub>)alkylaminosulfonylmethyl;

E represents a bond or a straight or branched alkylene chain containing from 1 to 4 carbon atoms;

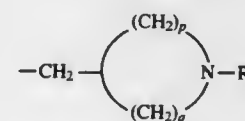
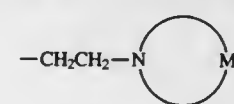
F represents a group of formula



U represents nitrogen or C—R<sup>2</sup>;

B represents oxygen, sulphur or N—R<sup>3</sup>;

R<sup>1</sup> represents a group of formula (i), (ii) or (iii):



in which

M represents the residue of an azetidine, pyrrolidine or piperidine ring wherein formula (i) represents azetidin-1-ylethyl, pyrrolidin-1-ylethyl or piperidin-1-ylethyl;

p is zero or 1 and q is an integer from 1 to 4, provided that the sum of p+q is 2, 3 or 4;

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup> and R<sup>6</sup> independently represent hydrogen or C<sub>1-6</sub> alkyl;

R<sup>2</sup> and R<sup>3</sup> independently represent hydrogen, hydrocarbon or a heterocyclic group, both as defined above, or R<sup>2</sup> and R<sup>3</sup> together represent a C<sub>2-6</sub> alkylene group;

R<sup>2</sup> represents hydrogen, hydrocarbon or a heterocyclic group, both as defined above;

T represents oxygen, sulphur or a group of formula —N—G; and

G represents hydrocarbon, a heterocyclic group, both as defined above, or an electron-withdrawing group.

5,567,727

Patent Not Issued For This Number

5,567,728

#### RECEPTOR LIGANDS

Ulf Norinder, Södertälje, Sweden; Jürgen Bajorath, Mountlake Terrace, Wash., and Jay F. Stearns, Santa Rosa, Calif., assignors to Karobio Aktiebolag, Huddinge, Sweden

PCT No. PCT/SE92/00307, § 371 Date Feb. 25, 1994, § 102(e) Date Feb. 25, 1994, PCT Pub. No. WO92/20331, PCT Pub. Date Nov. 26, 1992

PCT Filed May 12, 1992, Ser. No. 142,350

Claims priority, application Sweden, May 17, 1991, 9101509 Int. Cl.<sup>6</sup> A61K 31/34; C07D 307/80

U.S. Cl. 514—465

3 Claims

1. A method for preventing or treating cardiac arrhythmia, which method comprises administering to said patient an amount effective to treat said arrhythmia of a compound selected from the group consisting of 2-n-butyl-3-(3,5-diiodo-4-carboxymethoxy-benzoyl)benzofuran, 2-methyl-3-(3,5-diiodo-4-carboxymethoxy-benzoyl)benzofuran, and 2-butyl-3-(3-iodo-4-hydroxybenzoyl)benzofuran, together with a pharmaceutically acceptable carrier or diluent.

5,567,729

#### FARNESYL COMPOUNDS AS FARNESYL PROTEIN TRANSFERASE INHIBITORS TO TREAT RAS INDUCED TUMOR GROWTH

David L. Bradfute, Robert D. Simoni, and Thomas E. Meigs, all of Department of Biological Sciences, Stanford, Calif. 94305, assignors to David L. Bradfute, Wooster, Ohio; Thomas E. Meigs, Palo Alto, and Robert D. Simoni, Stanford, both of Calif.

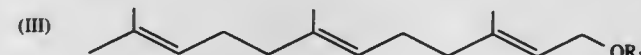
Filed Oct. 28, 1993, Ser. No. 144,700

Int. Cl.<sup>6</sup> A61K 31/22; 31/08

U.S. Cl. 514—546

7 Claims

1. A method for reducing the level of protein farnesylation in mammalian tumor cells in a mammalian host that are associated with abnormal activity of oncogenes in the ras family, wherein said tumor cells are sensitive to treatment with a compound with the formula:



where R<sub>1</sub> is a lower alkyl, or an acyl group



and where R<sub>2</sub> is any lower alkyl, said method comprising: administering to said mammalian host an amount effective to inhibit the activity of farnesyl protein transferase of said compound;



wherein the activity of farnesyl protein transferase and the growth of said mammalian tumor cells is reduced.

5,567,730

# METHOD OF STABILIZING AN $\omega$ -3 UNSATURATED FATTY ACID COMPOUND

Kazuo Miyashita, Hakodate; Toru Ota, Kameda-gun; Suguru Okazaki, Koga; Masazumi Nishikawa, and Kazuaki Maruyama, both of Tsukuba, all of Japan, assignors to Maruha Corporation, Chiyoda-Ku, Japan

Continuation of Ser. No. 88,148, Jun. 15, 1993, abandoned.

This application Feb. 8, 1995, Ser. No. 385,573

Claims priority, application Japan, Jul. 28, 1992, 4-201437

Int. Cl.<sup>6</sup> A61K 31/22;31/20

U.S. Cl. 514—549

8 Claims

1. A method of oxidatively stabilizing omega-3 unsaturated fatty acid compounds comprising dispersing one or more omega-3 unsaturated fatty acid compounds selected from the group consisting of an omega-3 unsaturated fatty acid, an acid derivative thereof and an oil or fat containing an omega-3 unsaturated fatty acid or acid derivative thereof in an aqueous solution without the use of an exogenously added emulsifier.

5,567,731

# GABA-ERGIC MODULATION OF EYE GROWTH

Alan M. Laties, Philadelphia, and Richard A. Stone, Haver-town, both of Pa., assignors to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 56,056, Apr. 30, 1993, Pat. No.

5,385,939. This application Sep. 27, 1994, Ser. No. 313,356

Int. Cl.<sup>6</sup> A61K 31/195;31/205

U.S. Cl. 514—554

1 Claim

1. A method of alleviating and controlling the development of amblyopia in the eye of a primate animal which comprises administering to such animal a therapeutically effective amount of a gamma aminobutyric acid antagonist relatively selective in inhibiting axial growth of the eye, said antagonist selected from the group consisting of 2-OH saclofen, phaclofen, 5-aminovaleric acid, 3-aminopropyl (diethoxymethyl) phosphinic acid, 3-aminopropyl (n-hexyl) phosphinic acid, and 3-aminopropyl phosphonic acid.

5,567,732

# EICOSAPENTAENOIC ACID-CONTAINING OIL AND METHODS FOR ITS PRODUCTION

David J. Kyle, and Raymond Gladue, both of Catonsville, Md., assignors to Martek Biosciences Corporation, Columbia, Md.

PCT No. PCT/US91/02052, § 371 Date Sep. 11, 1992, § 102(e) Date Sep. 11, 1992

Continuation-in-part of Ser. No. 496,572, Mar. 21, 1990, Pat. No. 5,244,921. This PCT application Mar. 20, 1991, Ser. No. 934,485

Int. Cl.<sup>6</sup> A61K 31/20

U.S. Cl. 514—560

5 Claims

1. A diatom grown heterotrophically containing a single cell oil comprising triglycerides containing EPA residues.

5,567,733

# IRRITATION RELIEF USING NONSTEROIDAL ANTI-INFLAMMATORY COMPOUNDS

Jon G. Dishler, 6295 S. Macon Way, Englewood, Colo. 80111

Filed Apr. 27, 1995, Ser. No. 429,833

Int. Cl.<sup>6</sup> A61K 31/135

U.S. Cl. 514—567

20 Claims

1. A method of relieving irritation to a mucous membrane of a patient comprising contacting the mucous membrane with a composition having an active ingredient consisting essentially of a non-steroidal anti-inflammatory agent.

5,567,734

# PHENYL-SUBSTITUTED ALKYL CARBOGUANIDIDES CARRYING PERFLUOROALKYL GROUPS, A PROCESS FOR THEIR PREPARATION, THEIR USE AS A MEDICAMENT OR A DIAGNOSTIC AGENT, AND A MEDICAMENT CONTAINING THEM

Jan-Robert Schwark, Frankfurt; Heinz-Werner Kleemann, Bad Homburg; Hans-Jochen Lang, Hofheim; Andreas Weichert, Egelsbach; Wolfgang Scholz, Eschborn, and Udo Albus, Florstadt, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jan. 23, 1995, Ser. No. 377,012

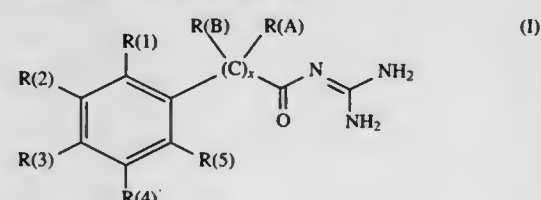
Claims priority, application Germany, Jan. 25, 1994, 44 02 057.0; Apr. 19, 1994, 44 13 615.3

Int. Cl.<sup>6</sup> A61K 31/165; C07C 233/34

U.S. Cl. 514—617

3 Claims

1. A phenyl-substituted alkylcarboguanidide, carrying at least one perfluoroalkyl group, of the formula I



in which:

R(A) is hydrogen, F, Cl, Br, I, CN, OR(6), (C<sub>1</sub>-C<sub>4</sub>)-alkyl, —C<sub>6</sub>F<sub>2n+1</sub> or NR(7)R(8);

b is 1, 2, 3, or 4;

R(6) is hydrogen, (C<sub>1</sub>-C<sub>4</sub>)-alkyl, (C<sub>1</sub>-C<sub>4</sub>)-perfluoroalkyl, phenyl or benzyl, where the aromatic radicals are unsubstituted or substituted by 1-3 substituents selected from the group consisting of F, Cl, CF<sub>3</sub>, methyl, methoxy and NR(9)(10), R(9) and R(10) are H, CH<sub>3</sub> or CF<sub>3</sub>;

R(7) and R(8) are, independently of each other, defined as R(6);

R(B) is, independently, defined as R(A);

X is 2;

R(1) is hydrogen, (C<sub>1</sub>-C<sub>4</sub>)-alkyl, —C<sub>6</sub>F<sub>2n+1</sub>, F, or Cl; e is 1, 2, 3, or 4;

R(2), R(3), R(4) and R(5) are, independently of each other, defined as R(1), with the condition, however, that at least one of the substituents R(1), R(2), R(3), R(4), R(5), R(A) and R(B) is a —C<sub>6</sub>F<sub>2n+1</sub> or a —C<sub>6</sub>F<sub>2n+1</sub> group, or a pharmaceutically tolerated salt thereof.

5,567,735

# THERAPEUTIC AMIDES

Keith Russell, Newark; Cyrus J. Ohnmacht, Wilmington, both of Del., and Keith H. Gibson, Macclesfield, England, assignors to Imperial Chemical Industries PLC, London, England Division of Ser. No. 329,188, Oct. 26, 1994, Pat. No. 5,474,999, which is a division of Ser. No. 126,350, Sep. 24, 1993, Pat. No. 5,382,598, which is a division of Ser. No. 918,982, Jul. 23, 1992, Pat. No. 5,272,163. This application Jun. 7, 1995, Ser. No. 476,407

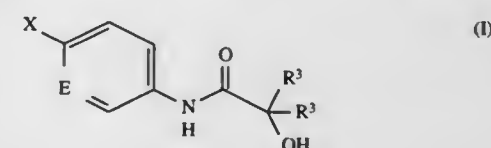
Claims priority, application United Kingdom, Jul. 25, 1991, 9116069; Apr. 30, 1992, 9209416

Int. Cl.<sup>6</sup> A61K 31/44;31/165

U.S. Cl. 514—628

6 Claims

1. A method of treating asthma comprising administering to a mammal in need of such treatment an effective amount of an amide of formula I:



wherein:

E is selected from nitrogen and CZ wherein C is a ring carbon and Z is a substituent defined below, wherein:

when E is CZ, X and Z are selected from the group consisting of:

(A) X is ArY wherein Y is a linking group selected from carbonyl, sulfinyl, and sulfonyl and Ar is selected from the group consisting of:

phenyl substituted with 0-2 substituents selected from halo, hydroxy, cyano, (1-4C)alkyl, and (1-4C)alkoxy, provided that the 4-position of said phenyl may be substituted by fluoro only, and that the said phenyl may not be 3,5-disubstituted;

six-membered heteroaryl rings containing 1-2 nitrogen atoms as the only heteroatoms;

five-membered heteroaryl rings containing from 1-2 heteroatoms selected from nitrogen, oxygen, and sulfur; provided that Ar is not 3-chlorophenyl, 3-bromophenyl, 3-iodophenyl, 3-(1-4C)alkylphenyl, or 4-pyridyl when Y is carbonyl, and that Ar is not 5-pyrimidinyl when Y is sulfonyl or carbonyl; and

Z is selected from hydrogen, cyano, halo, hydroxy, (1-4C)alkyl, and (1-4C)alkoxy;

(B) X is cyano and Z is selected from the group consisting of phenylthio, phenylsulfinyl, and phenylsulfonyl the phenyl rings of which are substituted with 0-2 substituents selected from halo, hydroxy, cyano, nitro, (1-4C)alkyl, and (1-4C)alkoxy;

when E is nitrogen, X is independently selected from any of the values for X given above in (A);

R<sup>2</sup> and R<sup>3</sup>

are independently selected from the group consisting of (1-3C)alkyl substituted by from 0 to 2k+1 groups selected from fluoro and chloro wherein k is the number of carbon atoms in the said (1-3C)alkyl, provided that R<sup>2</sup> and R<sup>3</sup> are not both methyl; or

together, with the carbon atom to which both R<sup>2</sup> and R<sup>3</sup> are attached, form a 3-5 membered cycloalkyl ring optionally substituted by from 0 to 2m-2 fluoro groups wherein m is the number of carbon atoms in said ring;

or a pharmaceutically acceptable in vivo hydrolyzable ester of said amide;

or a pharmaceutically acceptable salt of said amide or said ester.

5,567,736

# USE OF A CHOLINE SALT TO INHIBIT FATTY LIVER IN PATIENTS RECEIVING TOTAL PARENTERAL NUTRITION

Alan L. Buchman, 1280 W. Peachtree St., Atlanta, Ga. 30309; Donald J. Jenden, 3814 Castlerock Rd., Malibu, Calif. 90265; Marvin E. Ament, 291 S. Glenroy, Los Angeles, Calif. 90049; Kenneth Breslow, 3651 Meier St., Los Angeles, Calif. 90066, and Mark D. Dubin, 1609 S. Veteran Ave. #1, Los Angeles, Calif. 90024

Continuation of Ser. No. 970,086, Nov. 2, 1992, abandoned.

This application Sep. 6, 1994, Ser. No. 301,042

Int. Cl.<sup>6</sup> A61K 31/14

U.S. Cl. 514—642

3 Claims

1. A method for inhibiting fatty liver in a human patient receiving total parenteral nutrition, comprising administering a nutrient solution to the patient parenterally, wherein the nutrient solution comprises a choline salt and wherein the nutrient solution is administered in an amount sufficient to increase plasma free choline to at least a normal level.

5,567,737

Patent Not Issued For This Number

5,567,738

# USE OF 2-(4-(4-CHLOROPHENYL)CYCLOHEXYL)-3-HYDROXY-1,4-NAPHTHOQUINONE FOR THE TREATMENT OF CANCER

Alan T. Hudson, Beckenham, Great Britain, assignor to Glaxo Wellcome Inc., Research Triangle Park, N.C.

PCT No. PCT/GB93/01669, § 371 Date Jan. 31, 1995, § 102(e) Date Jan. 31, 1995, PCT Pub. No. WO94/03163, PCT Pub. Date Feb. 17, 1994

PCT Filed Aug. 6, 1993, Ser. No. 379,617

Claims priority, application United Kingdom, Aug. 7, 1992, 9216859

Int. Cl.<sup>6</sup> A61K 31/12

U.S. Cl. 514—682

6 Claims

1. A method of treating a mammal having a carcinoma tumour which comprises administering to said mammal an effective carcinoma tumour treatment amount of 2-[4-(4-chlorophenyl)cyclohexyl]-3-hydroxy-1,4-naphthoquinone in the form of its trans isomer or a mixture of its cis and trans isomers containing at least 95% of the trans isomer or a physiologically acceptable salt thereof.

5,567,739

# INSULATING FOAM OF LOW THERMAL CONDUCTIVITY AND METHOD OF PREPARATION

William J. Ward, III, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 19, 1995, Ser. No. 491,826

Int. Cl.<sup>6</sup> C08G 18/00; C08J 9/00

U.S. Cl. 521—123

9 Claims

1. A method for preparing an insulating foam of low thermal conductivity which comprises:

blowing a formable resinous foam with a gaseous mixture comprising carbon dioxide, and sealing said foam in a gas-imperious enclosure with (A) at least one gas having a thermal conductivity less than that of carbon dioxide, (B) at least one solid alkaline getter capable of carbon dioxide removal and (C) at least one drying agent effective to produce, at a temperature in the range of 20°-25° C. and in the presence of water vapor, a relative humidity greater than the equilibrium relative humidity over a saturated aqueous solution of said getter at that temperature and less than about 20%.

**5,567,740**  
**CONDUCTIVE POLYURETHANE FOAM**  
**COMPOSITIONS AND METHOD FOR PRODUCING**  
**SAME**

Sharon A. Free, Wallingford, Pa., assignor to Foamex, L.P., Linwood, Pa.

Filed Jun. 7, 1995, Ser. No. 483,377

Int. Cl.<sup>6</sup> C08G 08/38; A01B 1/00

U.S. Cl. 521—128

12 Claims

1. A three dimensional electrically conductive plastic foam structure comprising a polyurethane foam containing an effective amount for lowering the volume resistivity of said foam of an antistatic agent consisting essentially of tetracyanoquinodimethane.

**5,567,741**  
**AERATED ANAEROBIC COMPOSITIONS WITH**  
**ENHANCED BULK STABILITY**

T. E. Casey, Lucan, and Peter J. Nevin, Churchtown, both of Ireland, assignors to Loctite (Ireland) Limited, Ireland

Filed Jun. 3, 1993, Ser. No. 72,895

Int. Cl.<sup>6</sup> C08J 9/04

U.S. Cl. 521—133

17 Claims

1. A storage stable anaerobic composition comprising a curable acrylate monomer formulation containing one or more catalysts and/or activators having a viscosity of between about 50,000 to 5,000,000 mPa.s at 25° C., provided that the composition must include a viscosity enhancing material when the viscosity of the formulation without the viscosity enhancing material is between 50,000 and 100,000 mPa.s at 25° C. and a volume expansion due to aeration of about 1 to 20%, the volume expansion being in the form of stable, uniform, microcellular foam created by the aeration.

**5,567,742**  
**DIMENSIONALLY-STABLE POLYPROPYLENE FOAM**  
**EXPANDED WITH INORGANIC BLOWING AGENTS**  
**Chung P. Park, Pickerington, Ohio, assignor to The Dow Chemical Company, Midland, Mich.**

Continuation of Ser. No. 141,902, Oct. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 831,123, Feb. 4, 1992, abandoned. This application Jun. 28, 1994, Ser. No. 267,096

Int. Cl.<sup>6</sup> C08J 9/12; 9/14

U.S. Cl. 521—143

21 Claims

1. A dimensionally-stable, extruded propylene polymer foam, comprising: a propylene polymer material comprising greater than 50 percent by weight of propylene monomeric units, the foam having a blowing agent comprising at least about 15 percent by weight of one or more inorganic blowing agents, the foam having a density from about 10 to about 150 kilograms per cubic meter, the foam having an average cell wall thickness of less than about 35 micrometers, the foam being in plank form, the foam having a major dimension in cross-section of at least about 5 centimeters and a cross-sectional area of at least about 10 square centimeters.

**5,567,743**  
**RECLAMATION OF ESTER-CURED PHENOLIC RESIN**  
**BONDED FOUNDRY SANDS**

Andrew D. Busby, and Philip Vernon, both of Kidderminster, England, assignors to Asland Inc., Columbus, Ohio  
 PCT No. PCT/GB93/01792, § 371 Date May 12, 1995, § 102(e) Date May 12, 1995, PCT Pub. No. WO94/05448, PCT Pub. Date Mar. 17, 1994

PCT Filed Aug. 23, 1993, Ser. No. 392,980

Claims priority, application United Kingdom, Sep. 2, 1992, 9218596

Int. Cl.<sup>6</sup> B22C 1/02; 9/02; C08K 3/34

U.S. Cl. 523—143

10 Claims

1. A process comprising the thermal treatment of attrition reclaimed ester-cured phenolic resin bonded sand characterised in that prior to the thermal treatment the attrition reclaimed sand is contacted with an compound which converts potassium compounds to a form having a melting point of at least 550° C. and the thermal treatment is effected at a temperature below that at which the resulting potassium compound fuses.

**5,567,744**  
**HIGH WATER-ABSORBENT RESIN COMPOSITION**  
**Manabu Nagata; Takushi Yamamoto; Shinnichi Takemori; Naoyuki Hashimoto, all of Himeji; Hiroki Ishikawa, and Yozo Yamada, both of Kakegawa, all of Japan, assignors to Sumitomo Seika Chemicals Co., Ltd., Hyogo, and Uni-Charm Corporation, Ehime, both of Japan**

PCT No. PCT/JP93/00612, § 371 Date Nov. 17, 1994, § 102(e) Date Nov. 17, 1994, PCT Pub. No. WO93/24575, PCT Pub. Date Dec. 9, 1993

PCT Filed May 10, 1993, Ser. No. 338,468

Claims priority, application Japan, May 23, 1992, 4-155654  
 Int. Cl.<sup>6</sup> C08K 9/00; C08F 6/00; C08G 61/00; C08L 83/00

U.S. Cl. 523—200

11 Claims

1. A high water-absorbent resin composition, produced by forming a composite by fusing or fixing a thermoplastic resin onto a surface of high water-absorbent resin via an adhesive binder, wherein the composition comprises from 1 to 100 parts by weight of the thermoplastic resin and from 1 to 75 parts by weight of the solid component of the adhesive binder, based on 100 parts by weight of the high water-absorbent resin, and wherein said composite is obtained by the following steps:

stirring and mixing the high water-absorbent resin and a solvent containing the adhesive binder;  
 adding the thermoplastic resin, followed by further stirring and mixing;  
 distilling off the solvent in the adhesive binder while heating; and then  
 raising the temperature to a temperature sufficient to fuse the thermoplastic resin onto the surface of the high water-absorbent resin but not sufficient to coalesce the thermoplastic resin.

**5,567,745**  
**ACRYLIC SHEET HAVING UNIFORM DISTRIBUTION**  
**OF COLORING AND MINERAL FILLER BEFORE AND**  
**AFTER THERMOFORMING**

Ettore Minghetti; John E. Eitel, and Carol A. Wetter, all of Boone County, Ky., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Division of Ser. No. 392,650, Feb. 23, 1995, Pat. No.

5,521,243, which is a continuation-in-part of Ser. No. 157,253, Nov. 26, 1993, Pat. No. 4,840,833. This application Mar. 22, 1996, Ser. No. 620,510

Int. Cl.<sup>6</sup> C08F 265/06

U.S. Cl. 523—202

6 Claims

1. Method of making a thermoformable synthetic mineral sheet or slab comprising

- (1) preparing a syrup of polymethylmethacrylate dissolved in ethylenically unsaturated monomers of which at least 60% by weight are methyl methacrylate,
- (2) adding to and dispersing within said syrup
  - (a) about 0.01 to about 1.0 part crosslinking agent by weight per hundred parts by weight of monomers in the dispersion,
  - (b) an amount of chain terminator equal to a number in parts by weight per hundred parts by weight of monomers in the dispersion at most (x+0.2), where x is the amount of crosslinking agent as in (a) and at least 0.01 where x is 0.01 to 0.5 or at least (0.58x-0.28) where x is 0.5 to 1.0,
  - (c) solid particulates which will pass through a sieve having openings of 90 microns, said solid particulates comprising alumina trihydrate in an amount sufficient to comprise about 20% to about 60% by weight of the final composition, and
  - (d) sufficient fumed silica to obtain a viscosity in said syrup of at least 1,000 but no more than about 10,000 centipoise,
- (3) confining said syrup in a sheet forming mold, and
- (4) polymerizing said ethylenically unsaturated monomers in said syrup in the presence of said crosslinking agent and said chain terminator to form a solid sheet having a substantially fine-grained appearance, and wherein a one-half inch thick, flat thermoformable sheet or slab made from said composition will have a minimum bending radius of less than three inches.

flow over, around and between said ferromagnetic particles to form said matrix; and  
 cooling said compressed particles to solidify said matrix.

**5,567,747**  
**WATER-BASED PRINTING INK**  
**Anthony R. Cappuccio, Savannah, Ga., and Athanasios P. Rizopoulos, Bronx, N.Y., assignors to Sun Chemical Corporation, Fort Lee, N.J.**

Filed Jul. 18, 1995, Ser. No. 503,791

Int. Cl.<sup>6</sup> C08K 3/20; C08L 63/02

U.S. Cl. 523—403

13 Claims

1. A water-based oxidizing printing ink comprising:
  - (a) an epoxy ester resin;
  - (b) an inorganic and/or organic pigment;
  - (c) a drier;
  - (d) a cyclodextrin; and
  - (e) water.

**5,567,746**  
**MOLDABLE FERROMAGNETIC PARTICLES AND**  
**METHOD**

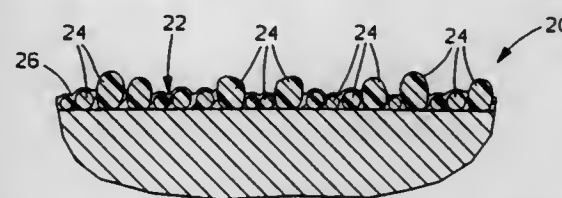
David E. Gay, Noblesville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 16, 1994, Ser. No. 357,815

Int. Cl.<sup>6</sup> C08K 7/16; B05D 7/00

U.S. Cl. 523—220

12 Claims



1. A method of making a magnetizable molding comprising a plurality of ferromagnetic particles each being insulated one from the next throughout said molding, said particles being distributed throughout a matrix of a thermoplastic polymer having a melt-flow temperature suitable to the end use of said molding comprising the steps of:

preparing a solution of a soluble binder polymer in a suitable solvent for spray-coating said ferromagnetic particles at a suitable coating temperature;  
 mixing particles of said thermoplastic polymer with said solution to form a slurry of said thermoplastic polymer particles in said solution, said thermoplastic polymer particles being substantially insoluble in said solution at said coating temperature;  
 spray-coating said ferromagnetic particles at said coating temperature with said slurry in a fluidized stream of said ferromagnetic particles so as to coat the surface of each of said ferromagnetic particles with said slurry;  
 evaporating said solvent from said slurry so as to leave a residual coating adhering to said surface and encapsulating said ferromagnetic particles, said residual coating comprising on a weight basis a majority amount of said thermoplastic particles dispersed throughout a lesser amount of said soluble binder polymer;  
 heating said coated ferromagnetic particles in a mold to at least about said melt-flow temperature;  
 compressing said coated particles in said mold under sufficient pressure to cause said thermoplastic particles adhering to said ferromagnetic particles to coalesce with each other and to

**5,567,748**  
**WATER COMPATIBLE AMINE TERMINATED RESIN**  
**USEFUL FOR CURING EPOXY RESINS**

Dieter H. Klein, Rheinmuenster, and Hans J. Wessely, Achem, both of Germany, assignors to The Dow Chemical Company, Midland, Mich.

PCT No. PCT/US92/11075, § 371 Date May 25, 1994, § 102(e) Date May 25, 1994, PCT Pub. No. WO93/12187, PCT Pub. Date Jun. 24, 1993

PCT Filed Dec. 17, 1992, Ser. No. 244,343

Claims priority, application United Kingdom, Dec. 17, 1991, 9126760; May 19, 1992, 9210645

Int. Cl.<sup>6</sup> C08K 3/20; C08L 63/02

U.S. Cl. 523—420

12 Claims

1. A water miscible or soluble amine terminated resin useful as a curing agent for an amine curable resin which is the reaction product of:

- A.) a polyamine component comprising one or more hydrophilic poly(oxyalkylene) amines, and optionally one or more hydrophobic polyamines;
- B.) a polyepoxide component consists essentially of i) one or more diglycidyl ethers of a polyalkylene glycol, ii) one or more diglycidyl ethers of a cycloalkylene glycol, or a mixture thereof and optionally iii) and one or more hydrophobic polyglycidyl ethers, or a reaction product of i), ii) or a mixture thereof, and optionally iii) with an amine extender having two active amine hydrogen atoms;
- C.) optionally, a reactive diluent which is capable of reacting with an epoxy resin; and
- D.) optionally, a catalyst for the reaction of an amine with an epoxy resin; and wherein component A is employed in an equivalent excess with respect to component B such that the terminal moieties of the reaction product are amine moieties capable of reacting with an epoxy resin, the composition has an amine hydrogen equivalent weight of from 140 to 240, and the combined amount of the poly(oxyalkylene) amine and the diglycidyl ether of polyalkylene glycol, diglycidyl ether of a cycloalkylene glycol, or a mixture thereof is sufficient to render the composition is water soluble or water miscible.



# 5,567,749 SEMICONDUCTOR DEVICE-ENCAPSULATING EPOXY RESIN COMPOSITION

Yasushi Sawamura, Aichi; Toshihiro Teshiba, Mie, and Masayuki Tanaka, Aichi, all of Japan, assignors to Toray Industries, Inc.

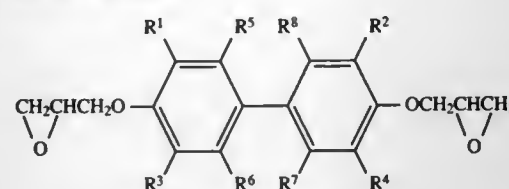
Continuation of Ser. No. 201,776, Feb. 25, 1994, abandoned, which is a continuation of Ser. No. 841,052, Feb. 25, 1992, abandoned. This application Oct. 25, 1994, Ser. No. 328,617 Claims priority, application Japan, Feb. 26, 1991, 3-030513; Feb. 26, 1991, 3-030515; Feb. 27, 1991, 3-032608

Int. Cl.<sup>6</sup> C08L 63/00

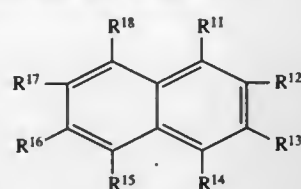
U.S. Cl. 523—443

6 Claims

1. A semiconductor-encapsulating epoxy resin composition comprising (i) an epoxy resin, (ii) a curing agent comprising a mixture of 4,4'-dihydroxybiphenyl and a tri- or higher polyphenol, and (iii) 75 to 95% by weight, based on the total weight of said epoxy resin composition, of a filler; said epoxy resin including at least one bifunctional epoxy resin selected from the group consisting of bifunctional epoxy resins having a biphenyl radical represented by the following formula (I):



wherein each of R<sup>1</sup> through R<sup>8</sup> independently represents a hydrogen atom, a halogen atom or an alkyl group having 1 to 4 carbon atoms, and bifunctional epoxy resins having a naphthalene radical represented by the following formula (II):



wherein two of R<sup>11</sup> through R<sup>18</sup> represent a 2,3-epoxypropoxy group and the others independently represent a hydrogen atom, a halogen atom or an alkyl group having 1 to 4 carbon atoms.

# 5,567,750 REDISPERSIBLE DISPERSION POWDER COMPOSITION

Joachim Schulze; Reinhard Haerzschel, both of Burghausen, and Reiner Figge, Ampfing, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Jun. 22, 1994, Ser. No. 263,465

Claims priority, application Germany, Jun. 24, 1993, 43 21 070.8

Int. Cl.<sup>6</sup> C08K 3/00

U.S. Cl. 524—3

20 Claims

1. A redispersible dispersion powder composition comprising  
a) a base polymer selected from the group consisting of vinyl ester polymers, styrene polymers, acrylate polymers and vinyl chloride polymers;  
b) from 2 to 15% by weight, based on the weight of the base polymer, of a polyvinyl alcohol having a degree of hydrolysis of from 85 to 95 mol % and a Höppler viscosity of from 2 to 25 mPa.s;  
c) from 3 to 30% by weight, based on the total weight of polymeric components, of an antiblocking agent; and  
d) from 1 to 15% by weight, based on the weight of the base polymer, of an aminofunctional polyvinyl alcohol soluble in cold water and having a Höppler viscosity of from 1 to 20 mPa.s and a saponification number of from 0 to 250, which

comprises residues of aminofunctional vinyl units of the formula CH<sub>2</sub>=CH—(CH<sub>2</sub>)<sub>x</sub>—NH<sub>2</sub> wherein x is a number of from 0 to 4.

# 5,567,751 ALKYL-TIN PVC STABILIZERS WITH ADDED AROMATIC ETHER ALCOHOL TO PREVENT PRECIPITATION

Samuel Hoch, Brooklyn, N.Y., assignor to Witco Corporation, Greenwich, Conn.

Filed Jun. 1, 1995, Ser. No. 457,813

Int. Cl.<sup>6</sup> C08K 5/58

U.S. Cl. 524—181

23 Claims

1. A homogeneous liquid stabilizer composition for vinyl halide compositions, which exhibits a reduced tendency to form precipitate, comprising

(a) an aromatic ether alcohol of the formula (1)



wherein Ar is aryl containing 6 to 10 carbon atoms, X independently at each occurrence is —H or —CH<sub>3</sub>; and n is 1 to 5; provided that when X is —H, then n is 1;  
(b) an alkyl phenol of the formula (2)



wherein k is 1 or 2 and A is straight or branched alkyl containing 1 to 12 carbon atoms; provided that the total number of carbon atoms in said 1 or 2 alkyl groups A is 6 to 24 carbon atoms; and

(c) an admixture of alkyl tin compounds including (i) one or more butyltin alkyl mercaptides corresponding to formula (3)



and (c) (ii) one or more butyltin hydroxyethyl mercaptides corresponding to formula (4)



and (c) (iii) one or more compounds selected from the group consisting of dibutyltin sulfides corresponding to formula (5a) and monobutyltin sulfides corresponding to formula (5b)



wherein R<sup>1</sup> is a butyl group; a is 1 to 2; and R<sup>2</sup> independently at each occurrence is straight or branched alkyl or alkenyl having 8 to 16 carbon atoms; which admixture is optionally admixed with one or more methyltin compounds selected from the group consisting of methyltin alkylmercaptides corresponding to formula (3) wherein R<sup>1</sup> is methyl, methyltin hydroxyethyl mercaptides corresponding to formula (4) wherein R<sup>1</sup> is methyl, dimethyl tin sulfides corresponding to formula (5a) wherein R<sup>1</sup> is methyl, and monomethyltin sulfides corresponding to formula (5b) wherein R<sup>1</sup> is methyl.

10. A polymeric composition of matter comprising a vinyl halide polymer and a stabilizer composition according to claim 1 in an amount thereof effective to impart to the polymeric composition increased stability against heat-mediated degradation of the polymer.

# 5,567,752 SILICON- AND NITROGEN- CONTAINING ADHESION PROMOTORS AND COMPOSITIONS CONTAINING THEM

Judith Stein, Schenectady; Jeffrey H. Wengrovius, Scotia, and Paul R. Willey, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

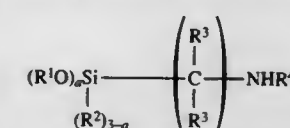
Continuation-in-part of Ser. No. 395,129, Feb. 27, 1995, abandoned. This application Nov. 22, 1995, Ser. No. 562,276

Int. Cl.<sup>6</sup> C08K 5/54

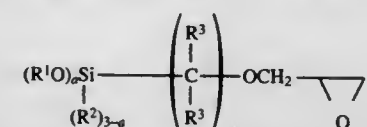
U.S. Cl. 524—188

14 Claims

1. An addition curable composition comprising a mixture of:  
(A) at least one polyorganosiloxane having alkenyl groups bonded to silicon;  
(B) at least one hydride polyorganosiloxane comprising at least one organosiloxane unit having an Si—H moiety;  
(C) as a catalyst, at least one platinum group metal compound in an amount effective to cause hydrosilylation of reagent A with reagent B; and  
(D) an adhesion promoting proportion of a silicon- and nitrogen-containing composition which is the reaction product of at least one aminoalkylsilane of the formula



with at least one glycidoxalkylsilane of the formula



wherein each of R<sup>1</sup> and R<sup>2</sup> is independently C<sub>1-8</sub> alkyl; each R<sup>3</sup> is independently hydrogen or C<sub>1-4</sub> primary or secondary alkyl; R<sup>4</sup> is hydrogen, C<sub>1-4</sub> primary or secondary alkyl or C<sub>6-10</sub> aryl or alkaryl; each a is independently 1–3 and each of m and n is independently 2 or 3.

# 5,567,753 ADHESIVE COMPOSITION WHICH CHANGES FROM COLORED TO COLORLESS UPON APPLICATION TO A SUBSTRATE

Ralph J. Shuman, Needham, and Barbara J. Burns, Auburn, both of Mass., assignors to Avery Dennison Corporation, Pasadena, Calif.

Filed Jan. 27, 1995, Ser. No. 380,096

Int. Cl.<sup>6</sup> C08K 5/17; 5/098; 5/13; C08L 39/06

U.S. Cl. 524—249

20 Claims

1. An adhesive composition which undergoes a change from colored to colorless upon application to a substrate, said adhesive composition comprising:

(a) a shape-giving base, said shape-giving base comprising a gel of a gel-forming salt of an aliphatic carboxylic acid having from about 8 to 36 carbon atoms with a cation selected from the group consisting of alkali metals, ammonia and lower alkylamines in an aqueous liquid selected from the group consisting of water and mixtures of water with water-miscible organic solvents;  
(b) an adhesive component selected from the group consisting of water-soluble and water dispersible adhesives;  
(c) a colored indicator which upon exposure to air becomes colorless, said colored indicator being a phthalein; and  
(d) triethanolamine.

# 5,567,754 PIGMENTS WITH IMPROVED DISPERSIBILITY IN THERMOPLASTIC RESINS

Rodney D. Stramel, Edmond, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Aug. 23, 1995, Ser. No. 518,372

Int. Cl.<sup>6</sup> C08K 5/101; 3/22; C09C 1/36

U.S. Cl. 524—308

46 Claims

1. A pigmentary material comprising an inorganic pigment having deposited thereon a partial ester polyol and an unsaturated monocarboxylic acid treating agent corresponding to the formula R(OH)<sub>x</sub>COOR' wherein R is an alkyl or aryl radical containing from about 2 to about 20 carbon atoms, R' is an unsaturated alkyl radical containing from about 6 to about 20 carbon atoms, and x is a number from about 2 to about 6; said partial ester polyol and unsaturated monocarboxylic acid treating agent being deposited upon said pigment in an amount of at least about 0.1 percent by weight based upon the weight of said pigment.

# 5,567,755 COATING SOLUTION FOR FORMING COMPOSITE METAL OXIDE FILM AND PROCESS FOR MAKING SAME

Akira Hashimoto, and Katsuya Tanitsu, both of Kanagawa, Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kanagawa, Japan

Division of Ser. No. 155,150, Nov. 22, 1993, Pat. No. 5,508,332, which is a division of Ser. No. 35,711, Mar. 23, 1993, Pat. No. 5,393,907. This application Apr. 17, 1995, Ser. No. 422,835

Claims priority, application Japan, Mar. 24, 1992, 4-113906; Aug. 27, 1992, 4-269040

Int. Cl.<sup>6</sup> C08K 5/10

U.S. Cl. 524—317

14 Claims

1. A coating composition solution for forming a composite metal oxide film comprising:

(A) at least one member selected from the group consisting of a reaction product, a partial hydrolyzate of said reaction product, and a partial acylated product of said reaction product, wherein said reaction product is obtained by a reaction between at least one compound containing a carbonyl group and at least one metal compound represented by formula (I):



wherein M<sub>1</sub> is Ti, Zr, Nb, Hf or Ta; A is —OR or a halogen atom, R is a saturated or unsaturated hydrocarbon having 1–6 carbon atoms; and n is an integer of 2–5;

(B) a polyhydric alcohol compound,  
(C) at least one compound selected from the group consisting of formulas (II), (III) and (IV); wherein,  
formula (II) is a metal carboxylate compound represented by:



wherein M<sub>2</sub> is Pb, Sr, Ba, Mg, Zn, La, Y or Li; R is a saturated or unsaturated hydrocarbon having 1–6 carbon atoms; and m is an integer of 1–4;

formula (III) is a metal nitrate compound represented by:



wherein M<sub>2</sub> is Pb, Sr, Ba, Mg, Zn, La, Y or Li; and m is an integer of 1–4; and  
formula (IV) is a metal nitrite compound represented by:



wherein M<sub>3</sub> is Sr, Ba or Li; and l is an integer of 1 or 2, and  
(D) an alcohol soluble polymer.

5,567,756

**PROTECTIVE COATING COMPOSITION AND METHOD OF USING SUCH COMPOSITION**

Ronald Swidler, Palo Alto, Calif., assignor to Cal-West Equipment Company, Inc., Sunnyvale, Calif.  
Division of Ser. No. 9,518, Jan. 27, 1993, Pat. No. 5,428,095, which is a continuation-in-part of Ser. No. 896,468, Jun. 9, 1992, Pat. No. 5,281,436. This application Dec. 7, 1994, Ser. No. 350,566

Int. Cl.<sup>6</sup> C08J 3/03; C08L 31/02; B05D 3/10  
U.S. Cl. 524—389 4 Claims

1. A surface protective composition, comprising:
  - a. between about 5 and 10% of a water solubilized acrylic acid copolymer by weight;
  - b. between about 1 and 5% of a pH-neutral acrylic copolymer;
  - c. between about 1 and 5% of an alkyl alcohol having four or fewer carbon atoms by weight;
  - d. between about 0.01 and 2% of a surfactant by weight, said surfactant including a fluorinated surfactant and a polyethoxy adduct surfactant, and wherein said polyethoxy adduct surfactant forms between about 0.05 and 0.15% of the composition by weight, and said fluorinated surfactant forms between about 0.02 and 1% of the composition by weight; and
  - e. an ultra-violet radiation blocker; and
  - f. water.

5,567,757

**LOW SPECIFIC GRAVITY BINDER FOR MAGNETS**

Thomas R. Szczepanski, North Royalton, Ohio, assignor to RJF International Corporation, Fairlawn, Ohio  
Filed Jul. 18, 1995, Ser. No. 503,870

Int. Cl.<sup>6</sup> C08K 3/10; C08L 23/04; H01F 1/117; 1/113  
U.S. Cl. 524—435 14 Claims

1. A flexible magnetic blend composite, comprising: ferrite magnet or magnetizable particles, rare earth magnet or magnetizable particles, or combinations thereof, and a polymeric binder blend, said binder blend comprising:
  - a. a semicrystalline polymer, a rubbery polymer, and a silicone elastomer lubricant, the melt index of said semi-crystalline polymer being from about 0.5 to about 20, and said rubbery polymer comprising polyisobutylene having a viscosity average molecular weight of from about 800,000 to about 3,000,000.

5,567,758

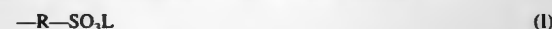
**THERMOPLASTIC POLYESTER RESIN COMPOSITION**

Nobuyuki Kinami; Masami Okamoto; Yoshihiro Shinoda, all of Ohtsu; Tsuyoshi Sekura, Urawa, and Akira Yamaguchi, Nii-gata, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, and Co-Op Chemical Co. Ltd., Tokyo, both of Japan  
Filed Aug. 16, 1995, Ser. No. 515,609

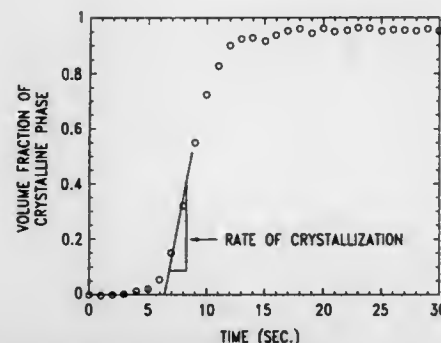
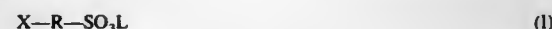
Claims priority, application Japan, Aug. 26, 1994, 6-202638; Jun. 2, 1995, 7-137035

Int. Cl.<sup>6</sup> C08K 3/34; 3/16 6 Claims

1. A composition comprising:
  - a. a thermoplastic polyester resin comprising polyester molecules ending in terminal groups, wherein all or a part of the terminal groups are represented by the general formula (I):



wherein R is a divalent aliphatic hydrocarbon having 1-20 carbon atoms and L is an alkali metal, and wherein 0.1-10 molar percent of said resin is derived from the compound represented by the general formula (II):



wherein X is an ester-forming group; and for each 100 parts by weight of said resin, 0.01-100 parts by weight of an inorganic compound mixture, wherein said inorganic compound mixture comprises one or more compounds selected from the group consisting of: inorganic compounds consisting of M, Mg, Si, O and F and inorganic compounds consisting of M, Mg and F, wherein M is an alkali metal; the energy of said composition satisfying the following formula (1) and formula (2):

$$U \leq 1,300 \text{ (cal/mole)} \quad (1)$$

$$\sigma/\sigma_e < 2.80 \times 10^5 \text{ (cal}^2\text{m}^4) \quad (2)$$

wherein U is an activation energy,  $\sigma$  is a lateral surface energy and  $\sigma_e$  is a fold surface energy.

5,567,759

**PROPYLENE POLYMER COMPOSITION**

Hiroshi Taniguchi, Ichihara; Akihiko Yamamoto, Yamaguchi; Takao Nomura, Toyota; Takeyoshi Nishio, Okazaki, and Hisayuki Iwai, Aichi, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan  
Continuation of Ser. No. 101,741, Aug. 4, 1993, abandoned.

This application Apr. 21, 1995, Ser. No. 427,623  
Claims priority, application Japan, Aug. 5, 1992, 4-209132

Int. Cl.<sup>6</sup> C08K 3/34 13 Claims

1. A propylene polymer composition comprising
  - (A) 55-77% by weight of a propylene block copolymer based on 100% by weight of the propylene polymer composition,
  - (B) 5-15% by weight of an ethylene-propylene copolymer rubber based on 100% by weight of the propylene polymer composition
  - (C) 5-15% by weight of an ethylene-propylene-diene copolymer rubber based on 100% by weight of the propylene polymer composition,
  - (D) 8-20% by weight of an ethylene-butene-1 copolymer rubber based on 100% by weight of the propylene polymer composition, and
  - (E) 5-15% by weight of talc based on 100% by weight of the propylene polymer composition, wherein the propylene block copolymer (A) contains ethylene structural units in an amount of 4-10 mol %, has 5-15 mol % by weight of a soluble portion in n-decane at a temperature of 15°-25° C., has a melt flow rate of 15-60 g/10 min and the n-decane soluble portion has an intrinsic viscosity ( $\eta$ ) of from 4.5-9 dl/g as measured at 135° C. in decalin, the ethylene-propylene copolymer rubber (B) contains ethylene structural units in an amount of 70-90 mol % and has a melt flow rate of 0.1-2.0 g/10 min, the ethylene-propylene-diene copolymer rubber (C) contains ethylene structural units in an amount of 70-90 mol %, and diene structural units in an amount of 8-13 mol %, and has a melt flow rate of 0.1-0.4 g/10 min, the ethylene-butene-1 copolymer rubber (D) contains ethylene structural units in an amount of 85-95 mol % and has a melt flow rate of 1.0-10.0 g/10 min, and

the talc (E) has an average particle diameter of 0.2-10  $\mu$ m.

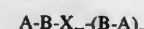
5,567,760

**FILMS FROM AQUEOUS DISPERSIONS OF BLOCK COPOLYMERS HAVING HYDROGENATED CONJUGATED DIENE BLOCK**

Brian W. Walther, and Gary R. Marchand, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 15, 1994, Ser. No. 339,862  
Int. Cl.<sup>6</sup> C08J 3/03; C08K 5/01; C08L 53/00; B29D 7/00  
U.S. Cl. 524—505 20 Claims

1. A process for preparing a film which comprises:
  - (1) depositing an aqueous dispersion on a surface under conditions so as to form a film, wherein the dispersion comprises:
    - (a) an organic phase comprising one or more block copolymer(s) corresponding to the formula:



wherein each A is a polymer block derived from monomers comprising one or more monovinylidene aromatic monomers and each B is a polymer block derived from monomers comprising one or more conjugated dienes and, optionally, one or more monovinylidene aromatic monomers, X is the remnant of a multifunctional coupling agent, m is 0 or 1, and n is an integer from 1 to 5, wherein each A polymer block has a weight average molecular weight from 4,000 to 15,000 Daltons, each B polymer block has a weight average molecular weight from 20,000 to 200,000 Daltons wherein the block copolymer(s) are hydrogenated such that 99.0 percent or greater of the residual olefinic unsaturation derived from the conjugated dienes is eliminated and contains sufficient branching such that the block copolymer is elastomeric, and (b) a surfactant in a sufficient amount to emulsify the organic phase, wherein the effective phase volume of the A polymer block in the organic phase is from about 8 to about 20 volume percent; (2) removing the film from the surface; and (3) annealing the film under conditions such that the film exhibits a tensile strength at break of 11.0 MPa or greater after annealing.

5,567,761

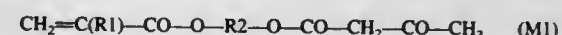
**AQUEOUS TWO-PART ISOCYANATE-FREE CURABLE, POLYURETHANE RESIN SYSTEMS**

Zhiqiang Song, Memphis, Tenn., assignor to Guertin Bros. Coatings and Sealants Ltd., Winnipeg, Canada

Continuation-in-part of Ser. No. 58,240, May 10, 1993, abandoned, and a continuation-in-part of Ser. No. 165,643, Dec. 13, 1993, abandoned. This application Sep. 28, 1994, Ser. No. 313,837

Int. Cl.<sup>6</sup> C08J 3/00; C08F 8/30; C08L 75/00  
U.S. Cl. 524—523 30 Claims

1. An ambient-temperature-curable aqueous polymer system, comprising:
  - (A) an acetoacetylated polymer; and
  - (B) a polyacrylate containing at least two (meth)acrylate end groups,
 in the form of an aqueous solution, suspension, or emulsion, wherein said acetoacetylated polymer is a water-dispersible acetoacetylated acrylic resin obtained by solution copolymerization of 10 to 60 wt. % of a (meth)acrylic monomer (M1) having the formula



wherein R1 is —H or —CH<sub>3</sub> and R2 is a linear or branched saturated C<sub>1-4</sub> alkylene group, 1 to 15 wt. % of a carboxyl vinyl

monomer (M2), and 25 to 89 wt. % of a copolymerizable vinyl monomer (M3) selected from the group consisting of C<sub>1-4</sub>-alkyl (meth)acrylate and styrene.

5,567,762

**ACRYLATE-STYRENE RESINS CROSS-LINKED BY A BLOCKED POLYISOCYANATE PREPARATION AND USES AS PAINT AND/OR LACQUER**

Henri Coyard, Orry La Ville, and Philippe Deligny, L'Etang La Ville, both of France, assignors to Societe Francaise Hoechst, Puteaux, France

Filed Mar. 13, 1995, Ser. No. 403,183  
Claims priority, application France, Mar. 14, 1994, 9402933  
Int. Cl.<sup>6</sup> C08J 3/00; C08K 3/20; C08L 75/00; B05D 3/02  
U.S. Cl. 524—590 20 Claims

1. A cross-linkable resin having blocked isocyanate groups, which is a reaction product of a copolymerizable and a polyisocyanate, characterized by the fact
  - i) that the polymerizable is based on (1) styrene, (2) at least two acrylic monomers of formula (I),



in which R represents a hydrogen atom or a methyl radical, R<sub>1</sub> represents a hydrogen atom, a linear or branched C<sub>1-14</sub> alkyl radical, a C<sub>1-4</sub> hydroxyalkyl radical, and amongst which at least one of these acrylic monomers possesses a hydroxyl group, and (3) at least one vinyl ester of a C<sub>9-19</sub> trialkyl-acetic acid.

- ii) that said polyisocyanate is selected from the group consisting of aliphatic polyisocyanates of formula (II)



in which A represents a linear or branched C<sub>4-10</sub> alkylene group and cyclic aromatic or cyclic aliphatic polyisocyanates and iii) that said polyisocyanate is partially and transitorily blocked in the form of urea by a pyrazole group of formula (III)



in which R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub>, different or identical, represent a hydrogen atom or a C<sub>1-4</sub> alkyl group.

5,567,763

**POLYURETHANE SPRAY SYSTEMS HAVING IMPROVED FLAME-RETARDANT PROPERTIES**

Sanjeev Madan, Coraopolis, Pa., and Peter K. Hyde-Smith, Mayville, Mich., assignors to Bayer Corporation, Pittsburgh, Pa., and Foamseal, Inc., Oxford, Mich.

Filed Aug. 15, 1994, Ser. No. 290,624  
Int. Cl.<sup>6</sup> C08K 3/38 17 Claims

1. A flame-retardant polyurethane spray system comprising a mixture, prepared at an isocyanate index of from 90 to 120, comprising
  - (A) an isocyanate composition comprising
    - (a) an organic polyisocyanate, and
    - (b) 20 to 35 percent by weight, relative to the organic polyisocyanate, of a halogen-containing organic flame retardant; and
  - (B) an isocyanate-reactive composition comprising
    - (a) 10 to 80 percent by weight of at least one isocyanate-reactive compound having a molecular weight of 400 to 10,000 and a functionality of 2 to 7;
    - (b) 1 to 50 percent by weight of at least one isocyanate-reactive compound having a molecular weight of less than 399 and a functionality of 2 to 6;



- (c) 3 to 15 percent by weight of an isocyanate-reactive tertiary amine polyether having a molecular weight of 100 to 1000 and having the formula



wherein

R is a saturated or unsaturated C<sub>2</sub>-C<sub>8</sub> aliphatic group optionally substituted with —OH or —NHR<sup>a</sup> wherein R<sup>a</sup> is C<sub>1</sub>-C<sub>8</sub> alkyl or C<sub>2</sub>-C<sub>8</sub> alkenyl; or a saturated or unsaturated C<sub>5</sub>-C<sub>8</sub> cycloaliphatic group optionally substituted with C<sub>1</sub>-C<sub>8</sub> alkyl, C<sub>2</sub>-C<sub>8</sub> alkenyl, C<sub>1</sub>-C<sub>8</sub> alkylene, —OH or —NHR<sup>a</sup> wherein R<sup>a</sup> is alkyl or alkenyl;

R<sup>1</sup> and R<sup>2</sup> are independently polyether groups terminated with isocyanate-reactive groups selected from —OH and —NHR<sup>b</sup> wherein R<sup>b</sup> is C<sub>1</sub>-C<sub>8</sub> alkyl or C<sub>2</sub>-C<sub>8</sub> alkenyl; and m is an integer of from 1 to 4;

- (d) 5 to 55 percent by weight of a combination of (i) one or more flame retardants, other than a halogen-containing organic flame retardant, selected from antimony oxides or mixtures of antimony oxides with one or more other flame retardants selected from zinc compounds, aluminum compounds, magnesium compounds, or molybdenum compounds with (ii) a halogen-containing organic flame retardant, with the proviso that the weight ratio of the total amount of halogen-containing organic flame retardant in compositions (A) and (B) to the amount of other flame retardants in composition (B) is from 0.4 to 1.5;

- (e) 0.01 to 1.5 percent by weight of an organic metal catalyst or a mixture thereof with a tertiary amine catalyst; and

(f) 0 to 15 percent by weight of additives, wherein the quantities of each component of isocyanate-reactive composition (B) are based on the total amount of components (B)(a), (B)(b), (B)(c), (B)(d), and (B)(e).

5,567,764

**CURABLE SILICONE COATINGS CONTAINING ALKOXY AND ALKENYL FUNCTIONAL SILOXANES**  
Michael J. Brasseur, Saginaw, Mich., and Kun-Long Chen, Taiwan, Taiwan, assignors to Dow Corning Corporation, Midland, Mich.

Filed Jul. 28, 1995, Ser. No. 508,783

Int. Cl.<sup>6</sup> C08K 5/06

U.S. Cl. 524—755

29 Claims

1. A curable silicone coating composition comprising:  
(A) a compound having its formula selected from the group consisting of:  
(i)  $RR^1R^2SiO(R_2SiO)_x(RR^1SiO)_y(RR^2SiO)_zSiRR^1R^2$ ,  
(ii)  $RR^1R^2SiO(RR^1SiO)_x(RR^2SiO)_ySiRR^1R^2$ ,  
(iii)  $RR^1R^2SiO(R_2SiO)_x(RR^2SiO)_ySiRR^1R^2$ ,  
(iv)  $RR^1R^2SiO(R_2SiO)_x(RR^1SiO)_ySiRR^1R^2$ ,  
(v)  $RR^1R^2SiO(R_2SiO)_xSiRR^1R^2$ ,  
(vi)  $RR^1R^2SiO(RR^1SiO)_xSiRR^1R^2$ , and  
(vii)  $RR^1R^2SiO(RR^2SiO)_xSiRR^1R^2$ ,

wherein R is a monovalent hydrocarbon or halohydrocarbon radical having from 1 to 20 carbon atoms, R<sup>1</sup> is selected from a group having the formula  $-(CH_2)_nSi(OR)_3$ , a group having the formula  $-(CH_2)_n(R_2SiO)_3$ , or R, R<sup>2</sup> is selected from vinyl, a group having the formula  $-(CH_2)_mCH=CH_2$ , or R wherein x has a value of from greater than zero to 9000, y has a value of from greater than zero to 1800, z has a value of from greater than zero to 900, the value of x+y+z is less than or equal to 9000, n has a value of from 2 to 20, m has a value of from 1 to 18, with the proviso that there is at least one group having its formula selected from  $-(CH_2)_nSi(OR)_3$  or  $-(CH_2)_n(R_2SiO)_3$ , and at least one vinyl group or the group having the formula  $-(CH_2)_mCH=CH_2$  per compound;

- (B) at least one organohydrogensilicon compound; and  
(C) a platinum group metal-containing catalyst.

5,567,765

**PHYSIOLOGICALLY ACCEPTABLE EMULSIONS CONTAINING PERFLUOROCARBON ETHER HYDRIDES AND METHODS OF USE**

George G. I. Moore, Afton; Richard M. Flynn, Mahtomedi, and Miguel A. Guerra, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 437,299, May 17, 1995, Pat. No.

5,502,094, which is a continuation-in-part of Ser. No. 246,962, May 20, 1994, Pat. No. 5,476,974. This application Feb. 23, 1996, Ser. No. 606,516

Int. Cl.<sup>6</sup> C08F 2/32

U.S. Cl. 524—801

9 Claims

1. An artificial blood comprising a physiologically acceptable aqueous emulsion of

a saturated C<sub>8</sub> to C<sub>12</sub> perfluorocarbon ether hydride selected from the group consisting of a hydroperfluoroaliphatic ether, a hydroperfluoroaliphatic ether substituted with a perfluoroalicyclic group, and a hydroperfluorocycloaliphatic ether and mixtures thereof, wherein said aliphatic ether has a straight-chain or a branched-chain of carbon atoms,

water and a surfactant, wherein the components are contained in the emulsion in amounts for acceptable physiological administration, said amounts being therapeutically effective for oxygen transport and delivery in humans.

5,567,766

**LAMINATING RESINS HAVING LOW ORGANIC EMISSION (III)**

Thomas W. Smeal, Murrysboro, and George L. Brownell, Mount Lebanon Township, both of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Division of Ser. No. 225,107, Apr. 8, 1994, Pat. No. 5,492,668, which is a continuation-in-part of Ser. No. 24,022, Mar. 1, 1993, abandoned. This application Dec. 11, 1995, Ser. No.

570,044

Int. Cl.<sup>6</sup> C08L 67/06

U.S. Cl. 525—44

6 Claims

1. A laminating resin composition characterized by low volatile emissions comprising (A) a base unsaturated polyester resin comprising glycols, unsaturated polycarboxylic acids or derivatives thereof, and, optionally, saturated dicarboxylic acids and (B) alkoxyated bisphenol-A diacrylate or dimethacrylate having at least two alkoxy groups, in a weight ratio of (A) to (B) of 2:1 to 0.5:1, and (C) about 10% to about 60% by weight, based on the total of components (A) and (B) of styrene and wherein said composition emits no more than 20.0 g/m<sup>2</sup> of volatile emissions as measured by Section 1162 of the Regulations of the South Coast (California) Air Quality District.

5,567,767

**LAMINATING RESINS HAVING LOW ORGANIC EMISSIONS (I)**

Thomas W. Smeal, Murrysboro, Westmoreland County, and George L. Brownell, Mount Lebanon Township, Allegheny County, both of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Division of Ser. No. 205,222, Mar. 3, 1994, Pat. No. 5,501,830, which is a continuation-in-part of Ser. No. 24,022, Mar. 1, 1993, abandoned. This application Dec. 11, 1995, Ser. No.

570,045

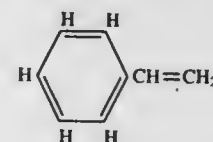
Int. Cl.<sup>6</sup> C08L 67/06

U.S. Cl. 525—44

4 Claims

1. A laminating resin composition characterized by low volatile

emissions comprising (A) a base unsaturated polyester resin comprising glycols, unsaturated polycarboxylic acids or derivatives thereof, and, optionally, saturated dicarboxylic acids and (B) alkoxyated bisphenol-A diacrylate or dimethacrylate having at least two alkoxy groups, in a weight ratio of (A) to (B) of 2:1 to 0.5:1, and (C) about 20% to about 60% by weight, based on the total of components (A) and (B) of a compound of the formula



where on H connected to the ring is substituted by CH<sub>3</sub>, and wherein said composition emits no more than 20.0 g/m<sup>2</sup> of volatile emissions as measured by Section 1162 of the Regulations of the South Coast (California) Air Quality District.

5,567,768

**POLY(VINYL ALCOHOL) BLENDS**

Robert M. Amici, Doylestown; Edward E. LaFleur, Warminster, and William J. Work, Huntingdon Valley, all of Pa., assignors to Rohm and Haas Company, Phila., Pa.

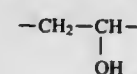
Division of Ser. No. 232,892, Apr. 25, 1994, Pat. No. 5,504,153, which is a division of Ser. No. 988,548, Dec. 10, 1992, Pat. No. 5,378,759, which is a continuation-in-part of Ser. No. 872,478, Apr. 23, 1992, abandoned. This application May 1, 1995, Ser. No. 431,810

Int. Cl.<sup>6</sup> C08L 29/04; 27/06; 27/08; 33/10

U.S. Cl. 525—57

1 Claim

1. A melt-processed polymeric blend comprising:  
a) from about 80 to about 98 parts, per 100 parts by weight of the blend, of a first polymer containing at least about 50 mol % units of the structure



and

- b) correspondingly, from about 2 to about 20 parts, per 100 parts by weight of the blend, of a second polymer containing about 60 to about 98 weight percent of acrylonitrile, methacrylonitrile, vinyl chloride, vinylidene chloride, vinyl esters, vinyl ethers, vinyl pyridine, or 2-vinyl-5-methylpyridine, and from about 2 to about 20 weight percent of (meth)acrylic acid, (meth)acrylic anhydride, fumaric acid, maleic acid, maleic anhydride, or itaconic acid, wherein the second polymer is selected from the group consisting of poly(acrylonitrile-methyl acrylate-itaconic acid), vinyl chloridevinyl acetate-unsaturated dibasic acid terpolymer, acrylonitrilealpha, beta-unsaturated carboxylic acid copolymer, poly(vinyl ether-maleic acid) copolymer, poly(vinyl acetate-crotonic acid) copolymer, poly(methyl vinyl ether-maleic acid) copolymer, poly((meth)acrylate-vinyl acetate-dicarboxylic acid) terpolymer, poly(acrylic acid-2 methyl-5-vinyl pyridine) copolymer, poly(vinylidene chloride-(meth)acrylic acid) copolymer, and poly(vinyl chloride-vinyl acetate-maleic anhydride) terpolymer.

5,567,769

**PREPARATION OF HOMOGENEOUS POLYMERS USING SUPERCRITICAL FLUID SOLUTIONS**

Annette D. Shine, Newark, Del.; Steven D. Smith, and Isao Noda, both of Fairfield, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio, and The Univ. of Delaware, Newark, Del.

Continuation of Ser. No. 155,041, Nov. 19, 1993, Pat. No. 5,412,027, which is a continuation of Ser. No. 675,764, Mar. 27, 1991, abandoned. This application Jan. 30, 1995, Ser. No. 381,608

Int. Cl.<sup>6</sup> C08G 63/48; C08L 51/08

U.S. Cl. 525—63

10 Claims

1. A process for converting a non-homogeneous equilibrium block or graft copolymer into a homogeneous non-equilibrium polymer, comprising rapidly expanding a heated single-phase solution of said polymer in a supercritical fluid solvent across a small diameter nozzle, whereby said supercritical fluid solution is removed and the solid polymer is precipitated at a temperature which is no more than 30° C. above the glass transition temperature of the polymer, and whereby, the non-equilibrium homogeneous morphology of the polymer is maintained.

5,567,770

**LIQUID CRYSTALLINE POLYMER BLENDS WITH IMPROVED WEAR PROPERTIES**

Robert R. Luise, Boothwyn, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 67,249, May 28, 1993, abandoned. This application May 17, 1994, Ser. No. 245,290

Int. Cl.<sup>6</sup> C08L 27/18; 27/12

U.S. Cl. 525—165

15 Claims

1. A blend comprised of (a) about 3 to about 50 weight percent of a tetrafluoroethylene polymer and (b) about 50 to about 97 weight percent of a liquid crystalline polymer having a glass transition temperature of about 140° C. or more, wherein said weight percents are based upon the total weight of components (a) and (b) only.

5,567,771

**CHLOROPRENE POLYMER COMPOSITION AND PROCESS FOR ITS PRODUCTION**

Tsuyoshi Tsuji, Hiroaki Oba, Kousuke Watanabe, and Masao Koga, all of Niigata-ken, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1995, Ser. No. 444,369

Claims priority, application Japan, May 20, 1994, 6-106914; Jun. 14, 1994, 6-131965; Nov. 8, 1994, 6-273529

Int. Cl.<sup>6</sup> C08L 11/00; 27/04

U.S. Cl. 525—215

6 Claims

1. A chloroprene polymer composition containing an  $\alpha,\beta$ -unsaturated carboxylate polymer which is a homopolymer of an  $\alpha,\beta$ -unsaturated carboxylate or a copolymer consisting essentially of two or more  $\alpha,\beta$ -unsaturated carboxylates, said  $\alpha,\beta$ -unsaturated carboxylate polymer having a number average molecular weight of at least 300,000.

5,567,772

# HIGH FLOW IONOMER RESIN COMPOSITIONS USEFUL FOR GOLF BALL COVERS

John F. Hagman, Wilmington, Del., and Robert J. Statz, Kennett Square, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 206,358, Mar. 7, 1994, abandoned. This application Dec. 28, 1994, Ser. No. 365,255  
Int. Cl.<sup>6</sup> C08L 33/02; 23/26; 23/08; A63B 37/12

U.S. Cl. 525—221

5 Claims

1. An ionomer composition, comprising a polymer, the polymer in the composition consisting essentially of:  
an ethylene/acid copolymer ionomer which is a partially neutralized copolymer of ethylene and methacrylic acid or acrylic acid, optionally containing a softening monomer, the acid copolymer before neutralization having a melt index of from about 160 to about 250, at least 40 percent of the acid groups present neutralized, to form the ionomer, the ionomer having an MI of 3.0 to 8.0.

5,567,773

# COLD SEALABLE COHESIVE POLYMERS

Dennis E. McGee, Penfield, and Robert E. Touhsant, Fairport, both of N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Apr. 4, 1995, Ser. No. 416,252

Int. Cl.<sup>6</sup> C08L 33/02

U.S. Cl. 525—221

37 Claims

1. An adhesive coating which is pressure sealable to itself and non-blocking to a dissimilar coating comprising a blend of (a) a soft polymer having a measured glass transition temperature below room temperature; and (b) a hard polymer having a measured glass transition temperature which is higher than the measured glass transition temperature of the soft polymer (a) in a low blocking, pressure sealable coating formable proportion.

5,567,774

# ANIONIC POLYMERIZATION PROCESS USING FUNCTIONALIZED INITIATORS

James A. Schwindeman, Lincoln; Eric J. Granger, Charlotte; John F. Engel, Belmont, and Conrad W. Kamienski, Gastonia, all of N.C., assignors to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 436,784, May 8, 1995, which is a continuation-in-part of Ser. No. 332,217, Oct. 31, 1994, abandoned, which is a continuation-in-part of Ser. No. 198,914, Feb. 18, 1994, abandoned. This application Jun. 2, 1995, Ser. No. 460,300

The portion of the term of this patent subsequent to May 8, 2015, has been disclaimed.

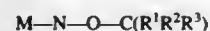
Int. Cl.<sup>6</sup> C08F 8/30; 8/08; 36/04; 4/08

U.S. Cl. 525—272

16 Claims

1. A process for the anionic polymerization of an anionically polymerizable monomer comprising the steps of:

a) initiating polymerization of a conjugated polyene hydrocarbon having 4 to 30 carbon atoms or a vinyl substituted aromatic hydrocarbon in a hydrocarbon or mixed hydrocarbon-polar solvent media at a temperature of 10°–70° C. with an initiator having the formula



wherein M is defined as an alkali metal, selected from the group consisting of lithium, sodium and potassium; Z is defined as a branched or straight chain hydrocarbon group which contains 3–25 carbon atoms, and R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are independently selected from hydrogen, alkyl groups, and aryl groups to produce an intermediate polymer and

b) reacting the intermediate polymer with a functionalizing compound to produce a functionalized polymer

c) optionally hydrogenating the functionalized polymer  
d) further reacting the functionalized polymer with one or more comonomers in the presence of a strong acid catalyst to simultaneously deprotect the polymer and polymerize the comonomers at both functional sites or  
e) further reacting the functionalized polymer with other comonomers in the absence of strong acid catalysts, then deprotecting the resultant copolymer and  
f) further reacting the resultant copolymer with the same or other comonomers.

5,567,775

# CRAFT CURING OF MODIFIED ISOMONOOLEFIN/ PARA-ALKYLSTYRENE COPOLYMERS

Hsien-Chang Wang, Bellaire, Tex.; Irwin J. Gardner, Scotch Plains, N.J., and James V. Fusco, Red Bank, N.J., assignors to Exxon Chemical Patents Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 402,792, Mar. 15, 1995, which is a division of Ser. No. 181,713, Jan. 14, 1994, Pat. No. 5,430,118, which is a division of Ser. No. 880,922, May 11, 1992, abandoned, which is a division of Ser. No. 442,028, Nov. 27, 1989, Pat. No. 5,162,445. This application Jun. 6, 1995, Ser. No. 469,285

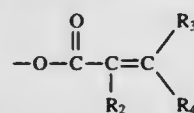
Int. Cl.<sup>6</sup> C08F 255/10; 257/02

U.S. Cl. 525—279

33 Claims

1. A curable polymer composition comprising a mixture of:

a) an elastomeric polymer containing from about 0.01 up to about 10 mole % of Y ester groups randomly distributed along and pendant to the elastomeric polymer chain, said Y ester groups having the structure:



wherein R<sub>2</sub> and R<sub>3</sub> are independently selected from the group consisting of hydrogen and an alkyl group containing 1 to about 6 carbon atoms and R<sub>4</sub> is selected from the group consisting of hydrogen, an alkyl group containing from 1 to about 28 carbon atoms, an aryl group and an alkenyl group containing from 2 to about 28 carbon atoms; and  
b) at least one free radically polymerizable monomer.

5,567,776

# CYCLOOLEFIN COPOLYMER COMPOSITION AND METHOD FOR THE PREPARATION THEREOF

Yoichiro Tsuji, Yoshiharu Abe, Toshihiro Sagane, and Toshi-masa Takata, all of Kuga-gun, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 185,846, Jan. 25, 1994, abandoned. This application May 8, 1995, Ser. No. 438,037

Claims priority, application Japan, May 26, 1992, 4-133821; May 26, 1992, 4-133822

Int. Cl.<sup>6</sup> C08L 45/00; 23/16

U.S. Cl. 525—289

1 Claim

1. A cycloolefin copolymer composition comprising (A) a hydrocarbon elastomer (A-1) component substantially free from a polymerizable double bond, and having an intrinsic viscosity (η), as measured in decalin at 135° C., of 0.05–10 dl/g and a glass transition temperature (T<sub>g</sub>) of less than 10° C., said hydrocarbon elastomer (A-1) component being

(i) an α-olefin copolymer or  
(ii) an α-olefin/cycloolefin copolymer, and  
(B) a cycloolefin random copolymer (B-1) component obtained

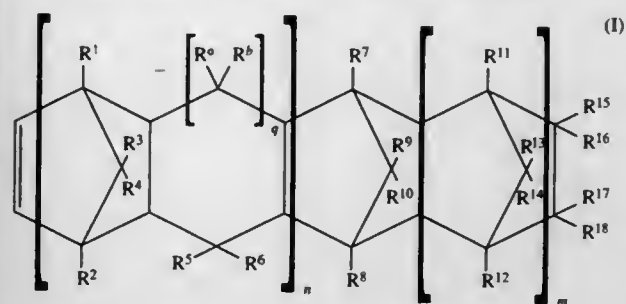
by copolymerization of

(a) an α-olefin of at least 2 carbon atoms and

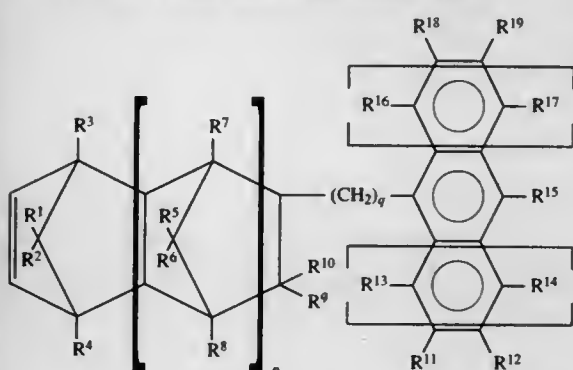
(b) a cycloolefin represented by the following formula (I) or (II),

wherein the copolymerization to obtain the cycloolefin copolymer (B-1) component is carried out in the presence of the hydrocarbon elastomer (A-1) component and the hydrocarbon elastomer (A-1) component is finely dispersed in the copolymer (B-1) component, and

wherein said hydrocarbon elastomer (A-1) component exists in said composition in an amount of 1–50% by weight;



wherein n is 0 or 1; m is 0 or a positive integer; q is 0 or 1; R<sup>1</sup>–R<sup>18</sup>, R<sup>a</sup> and R<sup>b</sup> are each independently a hydrogen atom, a halogen atom or a hydrocarbon group; R<sup>15</sup>–R<sup>18</sup> may be linked with one another to form a monocyclic or polycyclic group which may have a double bond; and R<sup>15</sup> and R<sup>16</sup>, or R<sup>17</sup> and R<sup>18</sup> MAY together form an alkylidene group;



wherein each p and q is independently 0 or an integer of 1 or more; each of m and n is independently 0, 1 or 2; R<sup>1</sup>–R<sup>19</sup> are each independently a hydrogen atom, a halogen atom, an aliphatic hydrocarbon group, an alicyclic hydrocarbon group, an aromatic hydrocarbon group or an alkoxy group; a carbon atom to which R<sup>9</sup> or R<sup>10</sup> is linked and a carbon atom to which R<sup>13</sup> or R<sup>11</sup> is linked may be bonded directly or by the way of an alkylene group of 1–3 carbon atoms, and R<sup>15</sup> and R<sup>12</sup>, or R<sup>15</sup> and R<sup>19</sup> may be linked together to form a monocyclic or polycyclic aromatic ring when each of n and m is 0.

5,567,777

# CYCLOOLEFIN COPOLYMER COMPOSITION AND METHOD FOR THE PREPARATION THEREOF

Yoichiro Tsuji, Yoshiharu Abe, Toshihiro Sagane, and Toshi-masa Takata, all of Kuga-gun, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 185,846, Jan. 25, 1994, abandoned.

This application Jan. 26, 1996, Ser. No. 589,599

Claims priority, application Japan, May 26, 1992, 4-133821; May 26, 1992, 4-133822

Int. Cl.<sup>6</sup> C08L 45/00; 23/16

U.S. Cl. 525—289

4 Claims

1. A cycloolefin copolymer composition comprising (A) a

hydrocarbon elastomer (A-2) component obtained by copolymerization of

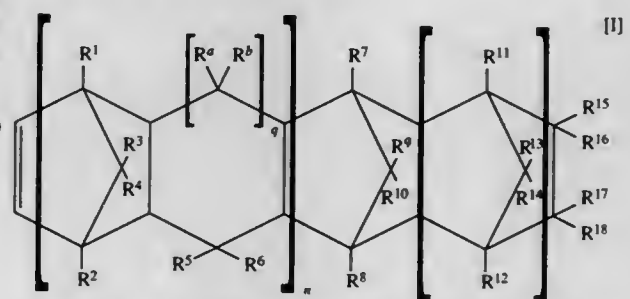
(i) an α-olefin of at least 2 carbon atoms and

(iii) a non-conjugated diene of 5–20 carbon atoms and having an intrinsic viscosity (η), as measured in decalin at 135° C., of 0.05–10 dl/g, a glass transition temperature (T<sub>g</sub>) of less than 10° C., a polymerizable carbon-carbon double bond, and an iodine value of 2–30 (g-iodine/100g-polymer), and (B) a cycloolefin copolymer (B-2) component obtained by copolymerization of

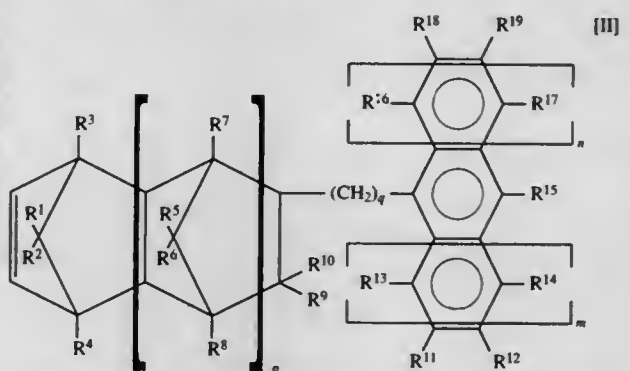
(a) an α-olefin of at least 2 carbon atoms and

(b) a cycloolefin represented by the following formula (I) or (II), wherein the copolymerization to obtain the cycloolefin copolymer component (B-2) is carried out in the presence of the hydrocarbon elastomer (A-2) component and the hydrocarbon elastomer (A-2) component is chemically bound to the copolymer (B-2) component, and

wherein said hydrocarbon elastomer (A-2) component exists in said composition in an amount of 1–50% by weight, and wherein said composition has improved impact resistance in comparison with the cycloolefin copolymer (B-2) component absent said elastomer component;



wherein n is 0 or 1; m is 0 or a positive integer; q is 0 or 1; R<sup>1</sup>–R<sup>18</sup>, R<sup>a</sup> and R<sup>b</sup> are each independently a hydrogen atom, a halogen atom or a hydrocarbon group; R<sup>15</sup>–R<sup>18</sup> may be linked with one another to form a monocyclic or polycyclic group which may have a double bond; and R<sup>15</sup> and R<sup>16</sup>, or R<sup>17</sup> and R<sup>18</sup> may together form an alkylidene group;



wherein each p and q is independently 0 or an integer of 1 or more; each of m and n is independently 0, 1 or 2; R<sup>1</sup>–R<sup>19</sup> are each independently a hydrogen atom, a halogen atom, an aliphatic hydrocarbon group, an alicyclic hydrocarbon group, an aromatic hydrocarbon group or an alkoxy group; a carbon atom to which R<sup>9</sup> or R<sup>10</sup> is linked and a carbon atom to which R<sup>13</sup> or R<sup>11</sup> is linked may be bonded directly or by way of an alkylene group of 1–3 carbon atoms, and R<sup>15</sup> and R<sup>12</sup>, or R<sup>15</sup> and R<sup>19</sup> may be linked together to form a monocyclic or polycyclic aromatic ring when each of n and m is 0.



5,567,778

**PROCESS FOR PRODUCING AN OPTICAL FILTER**

Teruo Sakagami; Takeo Ogihara; Yasufumi Fujii, and Hiroki Katono, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 208,890, Mar. 14, 1994, Pat. No. 5,466,755, which is a continuation-in-part of Ser. No. 106,976, Aug. 16, 1993, abandoned. This application Apr. 5, 1995, Ser. No. 417,775

Claims priority, application Japan, Aug. 20, 1992, 242585; Mar. 18, 1993, 082527

Int. Cl.<sup>6</sup> C08F 2/44; C08K 5/098

U.S. Cl. 525—326.6

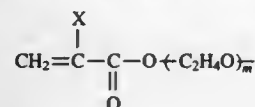
5 Claims

1. A process for producing an optical filter comprising the steps of:

- (a) copolymerizing 100 parts by weight of a monomer mixture composed of a monomer represented by the following formula (I) and a monomer copolymerizable therewith in the presence of 0.1 to 40 parts by weight, based upon the weight of the copolymer, of a metallic compound mainly composed of a copper compound;



wherein n is 1 or 2 and R represents



in which X represents a hydrogen atom or a methyl group and m is an integer of 0 to 5, and

- (b) extracting and removing from the copolymer an acid component produced from the reaction of a phosphorous group in the monomer (I) and the metallic compound.

5,567,779

**SUPER-ABSORBENT POLYMERS**

Günter Sackmann; Rolf-Volker Meyer, both of Leverkusen; Siegfried Korte, Odenthal, and Sergej Schapowalow, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen

Division of Ser. No. 391,506, Feb. 21, 1995, Pat. No. 5,496,890. This application Oct. 20, 1995, Ser. No. 546,446  
Claims priority, application Germany, Mar. 3, 1994, 44 06 951.0

Int. Cl.<sup>6</sup> C08F 8/12

U.S. Cl. 525—329.1

11 Claims

1. A process for the production of super-absorbent polymers, characterised in that fine-particle aqueous emulsions of particularly high molecular weight homopolymers and/or copolymers of acrylonitrile are partly hydrolyzed by reaction with aqueous solutions of alkali metal hydroxides, wherein, after the reaction, 10–20 mole-% of the nitrile groups remain unchanged, the polymers are precipitated in powder form by addition of water-miscible organic solvents, separated off, dried and then optionally heated for a short time.

5,567,780

**IMPACT MODIFIED POLYPHENYLENE ETHER BLENDS**  
Farid F. Khouri, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 31, 1995, Ser. No. 522,203

Int. Cl.<sup>6</sup> C08G 65/48

U.S. Cl. 525—394

17 Claims

1. A process for making polyphenylene ether blends comprising

the step of compounding:

- (a) functionalized polyphenylene ethers;  
(b) orthoester or orthocarbonate functionalized rubbers; and  
(c) polyesters.

5,567,781

**COATING COMPOSITIONS CONTAINING HIGH MOLECULAR WEIGHT POLYESTER-EPOXY COPOLYMERS AND HAVING IMPROVED RESISTANCE TO FAILURE DURING FABRICATION**

Phillip C. Martino, Gibsonia, and Kenneth G. Davis, Pittsburgh, both of Pa., assignors to The Valspar Corporation, Minneapolis, Minn.

Continuation of Ser. No. 11,362, Jan. 29, 1993, abandoned.

This application Jun. 7, 1995, Ser. No. 485,668

Int. Cl.<sup>6</sup> C08F 20/00; B32B 27/06

U.S. Cl. 525—438

12 Claims

1. A method of forming a metal substrate bearing a draw-resistant coating, which comprises applying to the substrate a curable liquid coating composition and heat curing the coating, the liquid coating composition comprising a hydroxyl-functional block copolymer polyester reaction product of an epoxy resin and a carboxyl-functional polyester, and a hydroxyl-reactive crosslinking agent providing a sufficiently high crosslink density so that the craze resistance of the heat cured coating upon drawing diminishes by no more than 20% when aged at room temperature for a ten day period.

5,567,782

**BONDING WITH POLYEPOXIDE-POLYOXYALKYLENEMONOAMINES PRODUCT**

Manfred Marten, Mainz, and Bernhard Wehner, Villmar, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 355,303, Dec. 12, 1994. This application Apr. 5, 1995, Ser. No. 417,202

Claims priority, application Germany, Dec. 15, 1993, 43 42 721.7

Int. Cl.<sup>6</sup> C08L 63/02; 63/04; C09J 163/02; 163/04

U.S. Cl. 525—523

23 Claims

1. A method of bonding two materials, comprising the steps of coating a layer of an epoxy resin adhesive composition on a surface of a first material and contacting the coated surface of the first material with a surface of a second material, wherein the epoxy resin composition consists essentially of

- (A) a compound that contains at least two 1,2-epoxide groups and that is a reaction product of:  
(A1) a compound that contains at least two 1,2-epoxide groups per molecule, and  
(A2) a polyoxyalkylenemonoamine that has a number average molecular weight between 130 and 900, and, optionally, one or both of  
(A3) a polyoxyalkylenemonoamine that has a molecular weight of from 900 to 5000, and  
(A4) a polycarboxylic acid, and  
(B) a hardener.

5,567,783

**POLYPHOSPHAZENES BEARING CROWN ETHER AND RELATED PODAND SIDE GROUPS AS SOLID SOLVENTS FOR IONIC CONDUCTION**

Harry R. Allcock; Stephen J. M. O'Connor; Mark E. Napierala; Charles G. Cameron, and David Olmeyer, all of State College, Pa., assignors to The Penn State Research Foundation, University Park, Pa.

Filed Mar. 7, 1995, Ser. No. 400,061

Int. Cl.<sup>6</sup> C08G 79/02; 79/04

U.S. Cl. 525—538

9 Claims

1. A polyphosphazene polymer of the following formula:



wherein x and y are approximately 1,

m=2, and

the value of n is such that the polymer is a flexible, amorphous polymer suitable for use as a solid polymer electrolyte.

3. A polyphosphazene polymer of the following formula:



wherein

m=0–3,

R is C1–C4 alkyl, and

the value of n is such that the polymer is a flexible, amorphous polymer suitable for use as a solid polymer electrolyte.

5,567,784

**PROCESS FOR PRODUCING DIENE RUBBERS POLYMERISED BY MEANS OF ND CATALYSTS AND EXHIBITING REDUCED COLD FLOW AND LOW INTRINSIC ODOR**

Wolfgang Wieder, Leverkusen; Dieter Kuhlmann, Pulheim, and Wolfgang Nentwig, Bergisch Gladbach, all of Germany, assignors to Bayer AG, Leverkusen, Germany

Filed Sep. 20, 1995, Ser. No. 530,625

Claims priority, application Germany, Oct. 10, 1994, 44 36 059.2

Int. Cl.<sup>6</sup> C08C 2/00

U.S. Cl. 526—164

3 Claims

1. A process for producing diene rubbers by polymerization with Nd catalysts and which exhibit reduced cold flow and low intrinsic odor, comprising the steps of polymerizing diolefines adiabatically at temperatures of –20° C. to 150° C. in the presence of inert organic solvents and in the presence of metallo-organic mixed catalysts based on neodymium carboxylate, subsequently depressurizing the reaction mixture obtained in this manner by reducing the pressure, and thereafter treating the reaction mixture with disulphur dichloride, sulphur dichloride and/or thionyl chloride.

5,567,785

**SUSPENSION POLYMERS BASED ON ACRYLATES AND METHACRYLATES**

Andreas Deckers, Ludwigshafen, and Norbert Guentherberg, Speyer, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Aug. 17, 1993, Ser. No. 107,076

Claims priority, application Germany, Aug. 22, 1992, 42 27 869.4

Int. Cl.<sup>6</sup> C08F 2/00

U.S. Cl. 526—212

8 Claims

1. A process for preparing polymers derived from 50 to 100% by weight of at least one monomer selected from the group consisting of C<sub>1</sub>–C<sub>18</sub>-alkyl esters of acrylic acid and methacrylic acid, and 0 to 50% by weight units of other free radical-polymerizable monomers by suspension polymerization, which process comprises: polymerizing the monomer(s) in the presence of a polymerization initiator

and in the presence of a mixture of citric acid and a trialkali metal citrate as a buffer wherein, the polymerization is carried out in the presence of 0.001 to 2% by weight of buffer, based on the water present in the reaction mixture and wherein, the molar ratio of citric acid to citrate is in the range from 1:100 to 1:1.

5,567,786

**POLYMERIZABLE COMPOSITION OF VINYLPIRROLIDONE AND VINYL CAPROLACTAM**

Susan Y. Tseng, Staten Island, N.Y., and Philip F. Wolf, Bridgewater, N.J., assignors to ISP Investments Inc., Wilmington, Del.

Filed Feb. 6, 1996, Ser. No. 595,902

Int. Cl.<sup>6</sup> C08F 226/10; 2/00

U.S. Cl. 526—264

8 Claims

1. A polymerizable composition consisting essentially of about 50 to about 90% by weight of vinyl pyrrolidone monomer, about 10 to about 50% by weight of vinyl caprolactam monomer, and about 0.5 to about 7% by weight of a crosslinker, which composition is capable of proliferous polymerization in the absence of base at about 80° to about 120° C.

5,567,787

**CROSSLINKED TERPOLYMERS OF HIGH SALT TOLERANCE**

Yoon T. Kwak; Kolazi S. Narayanan, both of Wayne, and Stephen L. Kopolow, Plainsboro, all of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Filed Feb. 1, 1996, Ser. No. 595,057

Int. Cl.<sup>6</sup> C08F 222/06; 216/12

U.S. Cl. 526—271

12 Claims

1. A 1–8% crosslinked terpolymer having high salt tolerance of C<sub>1</sub> to C<sub>4</sub> alkyl vinyl ether, maleic anhydride and a C<sub>6</sub> to C<sub>18</sub> alkyl vinyl ether in a mole ratio of 1–3:1:0.01–0.20, a pH of from about 4 to about 11 and a Brookfield viscosity of from about 10,000 to about 150,000 cps.

5,567,788

**LIQUID RESIN-FORMING COMPOSITION AND TWO-PACKAGE SYSTEM FOR PROVIDING THE COMPOSITION**

Charles A. Zezza, Bridgewater, N.J., assignor to Rhone-Poulenc Inc., Cranbury, N.J.

Filed Dec. 21, 1993, Ser. No. 171,217

Int. Cl.<sup>6</sup> C08F 236/22

U.S. Cl. 526—334

28 Claims

1. A liquid resin-forming composition which comprises a polyether-ene, a free radical-polymerizable monomer, a free radical initiator and a promoter, the polyether-ene and free radical-polymerizable monomer when mixed together having a volatility as measured by ASTM-D-2369 of not greater than about 40 weight percent, a flash point as measured by ASTM-D-3278 of not less than about 71° C. (160° F.) and a viscosity at 25° C. (77° F.) and 50 rpm spindle speed as measured by ASTM-D-2393 of not greater than about 100 centipoises and wherein this liquid resin forming composition has a surface cure time of not more than about 480 minutes at 25° C.

4. The composition of claim 1 wherein the polyether-ene is a polyallyl glycidyl ether of the formula





5,567,795

## PROCESS FOR PREPARING HYPERBRANCHED POLYMERS

Richard Vicari, Kathleen N. Juneau, and Carl D. Murphy, all of Corpus Christi, Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

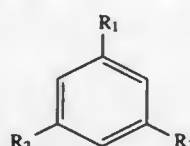
Filed Aug. 18, 1995, Ser. No. 516,587

Int. Cl.<sup>6</sup> C08G 65/38

U.S. Cl. 528—206

19 Claims

1. A process for preparing a highly branched macromolecule polymer comprising the step of reacting a branching monomer having functional groups thereon, having the formula:



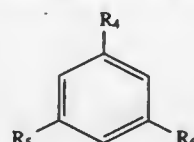
wherein  $R_1$  is independently selected from the group consisting of:

COOR where R is H, alkyl ( $C_1$ – $C_{20}$ ) or aromatic;  
 $C(O)OC_6H_5$ ;  
 $O-CH_2CH_2OH$ ;  
 $O-C(O)-CH_3$ ; and  
 $N-CH_2CH_2OH$ ;

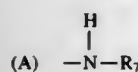
$R_2$  and  $R_3$  are each independently selected from the group consisting of:

COOR where R is H, alkyl ( $C_1$ – $C_{20}$ ) or aromatic;  
 $OH$ ;  
 $NH_2$ ; and  
 $O-C(O)-CH_3$ ;

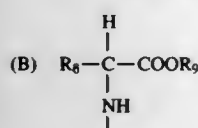
with the proviso that (a) when  $R_1$  is  $-COOR$ ,  $R_2$  and  $R_3$  must be the same but not equal to  $R_1$ , and  $R_2$  and  $R_3$  are either  $OH$  or  $O-C(O)-CH_3$ ; and (b) when  $R_1$  is  $-C(O)OC_6H_5$ ,  $R_2$  and  $R_3$  are equal and are either  $OH$  or  $NH_2$ ; and (c) when  $R_1$  is  $-CH_2CH_2OH$ ,  $R_2$  and  $R_3$  are equal, and  $R_2$  and  $R_3$  are COOR; with an end-capping monomer having the formula:



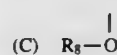
wherein  $R_4$  is selected from the group consisting of COOR wherein R is H, alkyl ( $C_1$ – $C_{20}$ ) or aromatic;  $C(O)OC_6H_5$ ;  $O-CH_2CH_2OH$ ;  $O-C(O)-CH_3$ ; and  $N-CH_2CH_2OH$ ;  $R_5$  and  $R_6$  are each independently selected from the group consisting of:



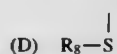
where  $R_7$  is a substituted or unsubstituted aryl or alkyl group;



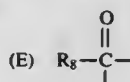
where  $R_8$  is a substituted or unsubstituted heterocyclic, aryl, or alkyl group and  $R_9$  is H or alkyl;



where  $R_8$  is a substituted or unsubstituted heterocyclic, aryl, or alkyl group;



where  $R_8$  is a substituted or unsubstituted heterocyclic, aryl, or alkyl group;



where  $R_8$  is a substituted or unsubstituted heterocyclic, aryl, or alkyl group; and

(F) chiral or racemic phosphine ligands, at a temperature of at least about 25° C. and for a period of time to produce said highly branched polymer;

with the proviso that, in the above terms, alkyl means  $C_1$ – $C_{20}$ ; aryl means phenyl and naphthyl; aromatic means substituted and unsubstituted phenyl and naphthyl; and heterocyclic means a 5–10 membered mono- or fused-ring system containing carbon and nitrogen, oxygen, and/or sulfur.

5,567,796

## POLYESTER FIBER

Sigeki Nakatsukasa; Kenichi Yoshioka; Kiyoshi Hirakawa; Kazuhiko Tanaka; Masao Kawamoto; Nozomu Sugoh; Atsuko Migaki, and Shunro Taniguchi, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

PCT No. PCT/JP94/01242, § 371 Date Mar. 23, 1995, § 102(e) Date Mar. 23, 1995, PCT Pub. No. WO95/04846, PCT Pub. Date Feb. 16, 1995

PCT Filed Jul. 28, 1994, Ser. No. 397,252

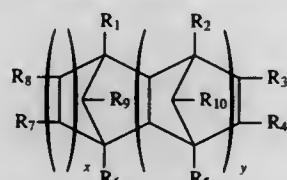
Claims priority, application Japan, Aug. 6, 1993, 5-196530; Oct. 4, 1993, 5-248239; Nov. 26, 1993, 5-296381; Nov. 26, 1993, 5-296383

Int. Cl.<sup>6</sup> C08G 63/02

U.S. Cl. 528—272

5 Claims

1. A polyester fiber comprising a polyester containing 2 to 20 mole % of a copolymerization component of a compound represented by the following structural formula (1)



wherein  $R_1$  through  $R_{10}$  each represents a group selected from the group consisting of ester-forming functional groups, hydrogen atom and alkyl groups, one or two of  $R_1$  through  $R_{10}$  being ester-forming functional groups,  $x$  is 0 or 1, and  $y$  is an integer satisfying the following condition:

$$1 \leq x+y \leq 3$$

5,567,797

## POLYAMIDE COMPOSITION AND PROCESS FOR ITS PRODUCTION

Hubert Christ, Golzheim-Merzenich, and Wolfgang Schneider, Stommeln, both of Germany, assignors to A. Schulman, Inc., Akron, Ohio

PCT No. PCT/EP93/01580, § 371 Date Feb. 27, 1995, § 102(e) Date Feb. 27, 1995, PCT Pub. No. WO94/02548, PCT Pub. Date Feb. 3, 1994

PCT Filed Jun. 22, 1993, Ser. No. 374,693

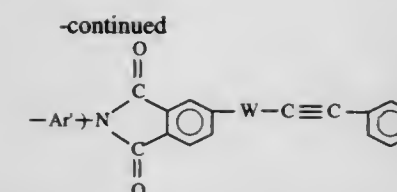
Claims priority, application Germany, Jul. 25, 1992, 42 24 668.7; Feb. 1, 1993, 43 02 703.2

Int. Cl.<sup>6</sup> C08G 8/04; 4/00; C08L 77/00

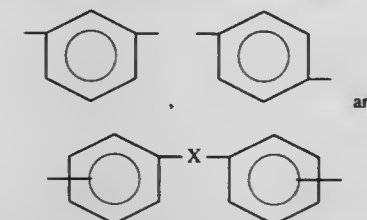
U.S. Cl. 528—310

10 Claims

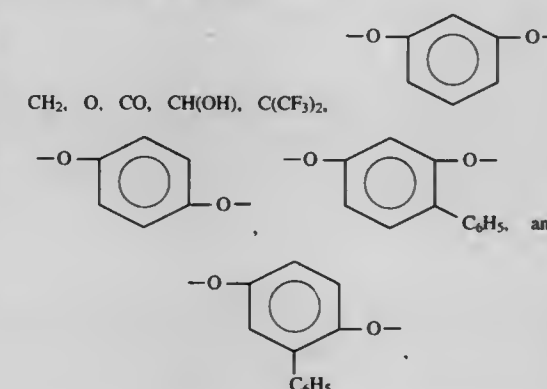
1. Polyamide composition containing 0.1 to 1 wt. % terephthalaldehyde and/or an acetal thereof with a  $C_1$ – $C_4$  alcohol based on the weight of polyamide composition.



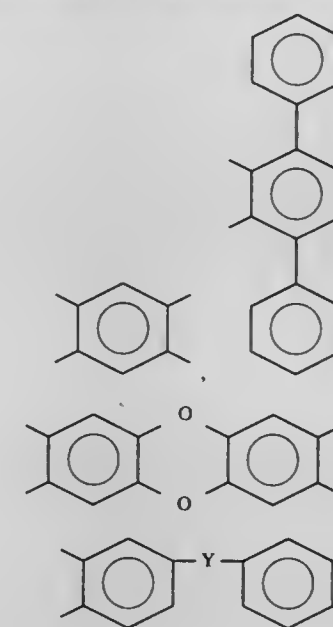
wherein  $Ar'$  is a radical selected from the group consisting of



wherein the catenation is selected from the group consisting of 2,2';2,3';2,4'; 3,3';3,4' and 4,4', and X is a bond or X is a radical selected from the group consisting of



Wherein  $Ar$  is a radical selected from the group consisting of



Wherein Y is a bond or Y is a radical selected from the group consisting of

5,567,798

## REPULPABLE WET STRENGTH RESINS FOR PAPER AND PAPERBOARD

Margaret A. Dulany, Decatur; Chad E. Garvey, Ball Ground; Clay E. Ringold, Decatur, and Ramji Srinivasan, Duluth, all of Ga., assignors to Georgia-Pacific Resins, Inc., Atlanta, Ga.

Filed Sep. 12, 1994, Ser. No. 304,220

Int. Cl.<sup>6</sup> C08G 69/26

U.S. Cl. 528—332

11 Claims

1. A process for preparing a cationic thermosetting resin comprising:  
 reacting a polyamine with a polycarboxylic acid to form a polyamidoamine,  
 reacting the polyamidoamine with a dialdehyde to form a chain-extended polymer, and  
 reacting the chain extended polymer with epichlorohydrin.

5,567,799

Patent Not Issued For This Number

5,567,800

## IMIDE OLIGOMERS ENDCAPPED WITH PHENYLETHYNYL PHTHALIC ANHYDRIDES AND POLYMERS THEREFROM

Paul M. Hergenrother, Yorktown, and Joseph G. Smith, Jr., Grafton, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

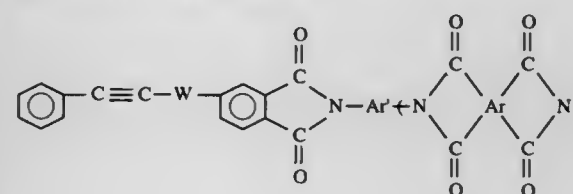
Filed Oct. 28, 1994, Ser. No. 330,773

Int. Cl.<sup>6</sup> C08G 73/10; 69/26

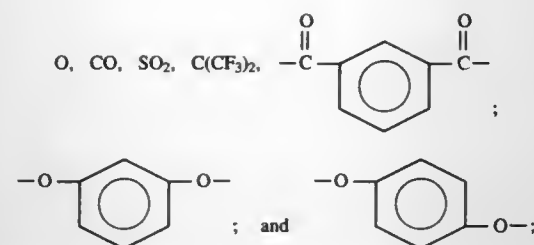
U.S. Cl. 528—353

29 Claims

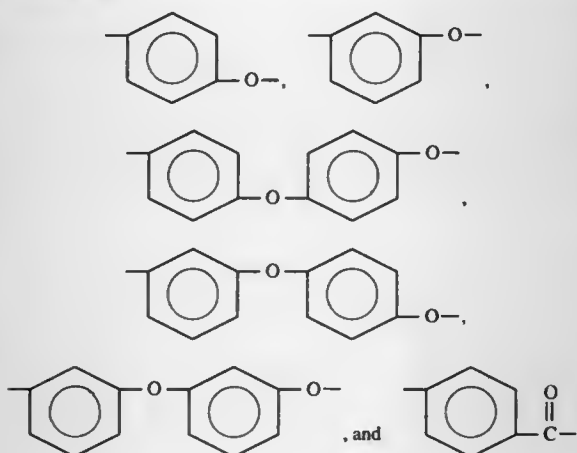
1. A controlled molecular weight imide oligomer terminated with phenylethynyl phthalimide consisting of repeat units having the general structural formula



Wherein Y is a bond or Y is a radical selected from the group consisting of



Wherein W is a bond or W is a radical selected from the group consisting of



## 5,567,801

**GAS PHASE PROCESS FOR FORMING POLYKETONES**  
 Paul K. Hanna, East Windsor, and Teresa M. Cheron, Yonkers, both of N.J., assignors to Akzo Nobel NV, Arnhem, Netherlands

PCT No. PCT/US93/05711, § 371 Date Dec. 8, 1994, § 102(e) Date Dec. 8, 1994, PCT Pub. No. WO93/25602, PCT Pub. Date Dec. 23, 1993

Continuation-in-part of Ser. No. 898,627, Jun. 15, 1992, abandoned. This PCT application Jun. 15, 1993, Ser. No. 351,290. The portion of the term of this patent subsequent to Jun. 15, 1992, has been disclaimed.

Int. Cl.<sup>6</sup> C08G 67/02

U.S. Cl. 528—392

5 Claims

1. In a gas phase process for catalytically polymerizing carbon monoxide and at least one olefinically unsaturated hydrocarbon to form a polyketone, wherein the improvement comprises conducting the polymerization in the presence of a catalyst support which is substantially saturated with an amount of a liquid, non-polymerizable diluent which is effective in increasing the amount of polyketone formed.

## 5,567,802

**POLYCARBONATE REDISTRIBUTION METHOD EMPLOYING PHOSPHONIUM HYDROXIDES**  
 Patrick J. McCloskey, Watervliet, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 20, 1995, Ser. No. 559,869

Int. Cl.<sup>6</sup> C08F 6/00

U.S. Cl. 528—487

8 Claims

1. A method for redistributing an organic polycarbonate composition comprising contacting, at a temperature in the range of about 180°–320° C., an initial linear or branched organic polycarbonate composition characterized by an initial weight average molecular weight in the range of about 500–200,000 as measured by gel

permeation chromatography relative to polystyrene, with about 15–1000 moles, per million moles of carbonate structural units in the initial polycarbonate composition, of a tetraorganophosphonium hydroxide, whereby a redistributed polycarbonate composition is formed having a weight average molecular weight which is different from the initial molecular weight.

## 5,567,803

## ANTI-OBESITY PROTEINS

Margret Basinski, Indianapolis; Richard D. DiMarchi, Carmel; David B. Flora, Greenfield; William F. Heath, Jr., Fishers; James A. Hoffmann, Greenwood; Brigitte E. Schoner, Monrovia; James E. Shields, Noblesville, and David L. Smiley, Greenfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 381,047, Jan. 31, 1995, abandoned. This application Feb. 6, 1995, Ser. No. 383,649

Int. Cl.<sup>6</sup> A61K 38/00; C07K 7/10

U.S. Cl. 530—324

21 Claims

1. A biologically active peptide of the formula: SEQ ID No. 1 or a pharmaceutically acceptable salt thereof.

## 5,567,804

## NEW PEPTIDES DERIVED FROM TRIFLUOROMETHYLKETONES

Guillaume de Nanteuil, Suresnes; Bernard Portevin, Elancourt, and Emmanuel Canet, Paris, all of France, assignors to Adir et Compagnie, Courbevoie, France

Filed May 5, 1995, Ser. No. 437,433

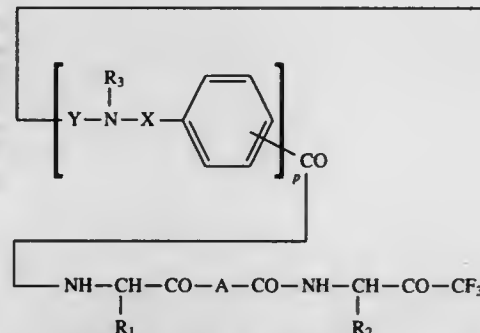
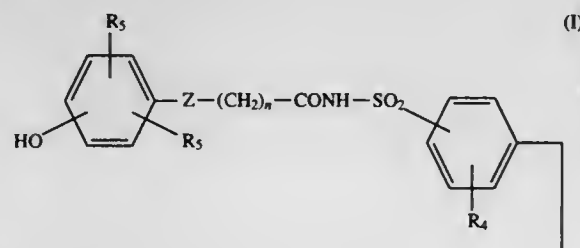
Claims priority, application France, May 5, 1994, 94 05494

Int. Cl.<sup>6</sup> A61K 38/06

U.S. Cl. 530—331

9 Claims

1. A compound of formula (I):



R<sub>1</sub> represents linear or branched (C<sub>1</sub>–C<sub>6</sub>) alkyl or (C<sub>3</sub>–C<sub>7</sub>) cycloalkyl.

R<sub>2</sub> represents linear or branched (C<sub>1</sub>–C<sub>6</sub>) alkyl or (C<sub>3</sub>–C<sub>7</sub>) cycloalkyl.

R<sub>3</sub> represents hydrogen or linear or branched (C<sub>1</sub>–C<sub>6</sub>) alkyl.

R<sub>4</sub> represents halogen or linear or branched (C<sub>1</sub>–C<sub>6</sub>) alkyl or linear or branched (C<sub>1</sub>–C<sub>6</sub>) alkoxy.

R<sub>5</sub> represents linear or branched (C<sub>1</sub>–C<sub>6</sub>) alkyl.

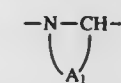
X and Y, which are different, represent CO or SO<sub>2</sub>.

n represents 1, 2 or 3.

p represents 1.

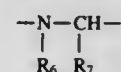
Z represents sulfur or oxygen.

A represents any one of the following groups:



in which:

A<sub>1</sub> represents, with the nitrogen and carbon atoms to which it is attached, a 2-azabicyclo[2.2.2]octane, 2-azabicyclo[2.2.1]heptane, perhydroindole, perhydroisindole, indoline, isoindoline, perhydroquinoline, perhydroisoquinoline, 1,2,3,4-tetrahydroisoquinoline, 1,2,3,4-tetrahydroquinoline, cyclopenta[b]pyrrolidine, 1,3-thiazolidine or pyrrolidine ring system, or,



in which:

R<sub>6</sub> represents hydrogen, linear or branched (C<sub>1</sub>–C<sub>6</sub>) alkyl, (C<sub>3</sub>–C<sub>6</sub>) cycloalkyl or 2-indanyl.

R<sub>7</sub> represents hydrogen or linear or branched (C<sub>1</sub>–C<sub>6</sub>) alkyl, which compounds of formula (I) comprise the corresponding hydrates of the ketone function COCF<sub>3</sub>, the enantiomers, diastereoisomers and epimers thereof and the addition salts thereof with a pharmaceutically acceptable base.

## 5,567,805

## THE CELLULAR RECEPTOR FOR THE CS3 PEPTIDE OF HUMAN IMMUNODEFICIENCY VIRUS

Lee A. Henderson; David H. Coy, and Robert F. Garry, Jr., all of New Orleans, La., assignors to Administrators of the Tulane Educational Fund, New Orleans, La.

Continuation of Ser. No. 68,562, May 27, 1993, abandoned, which is a continuation of Ser. No. 626,652, Dec. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 592,016, Oct. 2, 1990, abandoned, which is a continuation of Ser. No. 491,137, Mar. 9, 1990, abandoned. This application Sep. 7, 1994, Ser. No. 302,228

Int. Cl.<sup>6</sup> C07K 14/435

U.S. Cl. 530—350

5 Claims

1. A substantially purified protein comprising a CS3 receptor protein which binds to the peptide LQARILAVERYLKDQQL.

## 5,567,806

## COLLAGEN CROSSLINKED WITH A CROSSLINKING AGENT FOR THE MANUFACTURE OF A SUTURABLE, BIOCOMPATIBLE SLOWRESORBING MEMBRANE, AND SUCH A MEMBRANE

Nabil Abdul-Malak, 27, rue Frederic Mistral, 69300 Caluire; Jean Fourcart, Place de l'Orme Baslieux les Fismes, 51170 Fismes, and Alain Huc, 26, chemin des Santons, 69110 Ste Foy les Lyon, all of France

Continuation of Ser. No. 185,917, May 24, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 469,790

Claims priority, application France, Aug. 2, 1991, 91 09909

Int. Cl.<sup>6</sup> A61K 35/32; 38/39; C07K 14/78; A61L 15/20

U.S. Cl. 530—356

31 Claims

1. A process of manufacture of a suturable, biocompatible, controlled-resorbing, mixed membrane, comprising the following steps:

- preparing a sponge of a mixture of a collagen material and of a glycosaminoglycan;
- compressing said sponge under a pressure of about 150 bars;
- pouring a collage gel onto said sponge; and
- cross-linking said sponge with said collagen gel, with a cross-linking agent.

## 5,567,807

## PROCESSES FOR THE PURIFICATION OF HUMAN RECOMBINANT DECORIN AND THE DETECTION OF GUANIDINIUM IONS

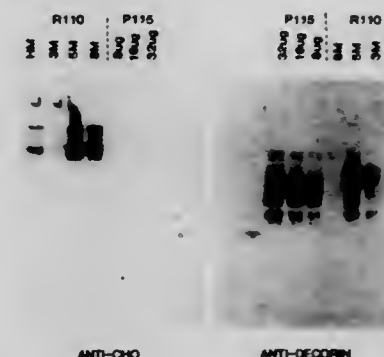
William S. Craig; John R. Harper, both of San Diego; Paul J. Kostel, San Diego; Jonathan R. Parker, Jamul, and Thomas S. Vedvick, Carlsbad, all of Calif., assignors to La Jolla Cancer Research Foundation, La Jolla, Calif.

Filed Jul. 8, 1994, Ser. No. 272,919

Int. Cl.<sup>6</sup> C07K 1/20; 14/00

U.S. Cl. 530—395

15 Claims

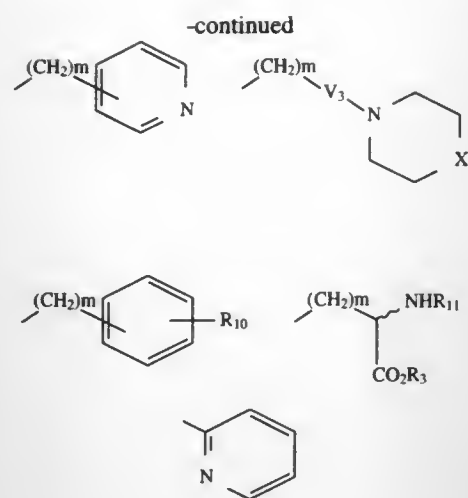


1. A process for the preparation of substantially pure human recombinant decorin from a cell culture medium, containing said decorin which comprises the steps of:

- contacting the decorin-containing medium on a first strong-anionic exchange resin, comprising:
  - first, loading the decorin-containing medium onto the resin in a solution having a salt concentration of about 0.1 to about 0.4 molar;
  - then washing the first resin with a buffer solution having an eluting salt concentration from about 0.3 to about 0.4 molar;
  - then eluting the bound human recombinant decorin with a buffer solution having an eluting salt concentration from about 0.9 to about 1.2 molar;
- contacting the decorin-containing fractions resulting from step (a)(3) on a hydrophobic interactive chromatography (HIC) resin, comprising:
  - loading the decorin-containing fractions onto the HIC resin in a solution containing about 1 to about 2 molar guanidinium hydrochloride (GuHCl);
  - washing the HIC resin with a buffer solution containing about 1 to about 2 molar GuHCl and which GuHCl concentration is higher than the GuHCl concentration of step (b)(1);
  - eluting the bound human recombinant decorin from the HIC column with a buffer solution containing about 2.4 to about 3 molar GuHCl;
- contacting the decorin-containing eluant fractions resulting from step (b)(3) on a second strong-anionic exchange resin, comprising:
  - diluting the decorin-containing fractions to obtain a GuHCl concentration of less than about 0.3 molar and loading the diluted solution onto the second ion exchange resin;
  - washing the second ion exchange resin with a buffer solution having an eluting salt concentration from about 0.3 to about 0.4 molar;
  - eluting the bound human recombinant decorin with a buffer solution having an eluting salt concentration from about 0.9 to about 1.2 molar to obtain substantially purified human recombinant decorin.







wherein

m is an integer from 1 to 3;  
 $R_7$  is hydrogen,  $C_1-C_6$  alkyl,  $-CH_2CH_2S(O)_kCH_3$ , or  $Ar-Y-$  wherein k is an integer from 0 to 2;  
 $R_8$  is hydrogen, hydroxy, amino,  $C_1-C_6$  alkyl, N-methylamino, N,N-dimethylamino,  $-CO_2R_3$ ,  $-OC(O)R_9$  wherein  $R_9$  is hydrogen,  $C_1-C_6$  alkyl, or phenyl;  
 $R_{10}$  is 1 or 2 substituents independently chosen from the group consisting of: hydrogen,  $C_1-C_4$  alkyl,  $C_1-C_4$  alkoxy, or halogen;  
 $R_{11}$  is hydrogen,  $C_1-C_6$  alkyl, or  $Ar-Y-$  group;  
 $V_1$  is O, S, or NH;  
 $V_2$  is N or CH;  
 $V_3$  is a direct bond or  $-C(O)-$ ;  
 or stereoisomers or pharmaceutically acceptable salts thereof.

5,567,815

### TERTIARY AMINE CONTAINING ANTONIC INITIATORS USED IN PREPARING POLYMERS AND PROCESS FOR THE PREPARATION THEREOF

James E. Hall, Mogadore; David F. Lawson, Uniontown, and Thomas A. Antkowiak, Wadsworth, all of Ohio, assignors to Bridgestone Corporation, Tokyo, Japan

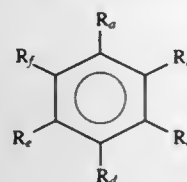
Filed Jul. 18, 1994, Ser. No. 276,363

Int. Cl.<sup>6</sup> C07D 223/04; 295/04

U.S. Cl. 540-541

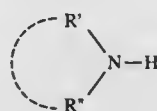
7 Claims

I. A method of preparing an anionic initiator by reacting:  
 (1) an organolithium compound with (2) a precursor functionalizing agent formed by reacting (a) a diisopropenyl benzene having the formula:



wherein two of the  $R_1-R_6$  radicals are isopropenyl and the remain-

ing  $R_1-R_6$  radicals are independently selected from the group consisting of hydrogen, alkyl and cycloalkyl containing 1 to 6 carbon atoms, with (b) a secondary amine having the structural formula:



wherein  $R'$  and  $R''$  are the same or different and are selected from the group consisting of  $C_{1-20}$  alkyl groups,  $C_{4-20}$  cycloalkyl groups, aryl groups, alkoxy groups, alkoxyalkyl and arylalkyl groups, or  $R'$  and  $R''$  are linked to form  $-(CH_2)_p-$  wherein p is an integer from 3 to 20, or said secondary amine is a heterocyclic ring compound selected from the group consisting of: piperidine, pyrrolidine, hexamethyleneimine, dodecamethyleneimine, morpholine, thiomorpholine, N-methyl-piperazine, N-aryl-piperazine, 1-(2-pyridyl)-piperazine, pyrrole, 3-pyrroline, pyrazole, imidazole, indole, indoline and purine.

5,567,816

### PREPARATION OF ACYCLOVIR USING 1,3 DIOXOLANE

George C. Schloemer, Longmont; Yeun-Kwei Han, and Peter J. Harrington, both of Louisville, all of Colo., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

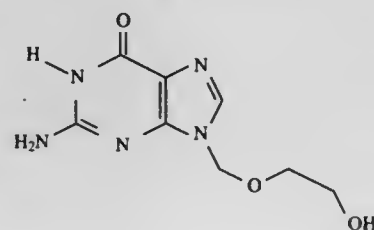
Continuation-in-part of Ser. No. 280,269, Jul. 26, 1994, abandoned. This application Apr. 27, 1995, Ser. No. 426,005

Int. Cl.<sup>6</sup> C07D 473/18

U.S. Cl. 544-276

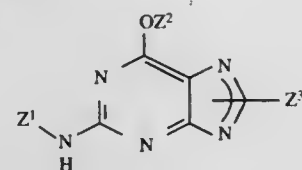
25 Claims

I. A process for preparing a compound represented by the formula:



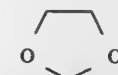
said process comprising:

a) contacting a compound or mixture of compounds represented by Formula (2):



wherein:

$Z^1$  is hydrogen or  $R^1R^2R^3Si$ ;  
 $Z^2$  is hydrogen or  $R^1R^2R^3Si$ ;  
 $Z^3$  is hydrogen or  $R^1R^2R^3Si$ ;  
 in which  $R^1$ ,  $R^2$ , and  $R^3$  are independently lower alkyl; provided that at least one of  $Z^1$ ,  $Z^2$  and  $Z^3$  is  $R^1R^2R^3Si$ ; with a compound of Formula (3):



in the presence of a selective alkylation catalyst selected from the group consisting of trifluoromethanesulfonic acid, trimethylsilyl trifluoromethanesulfonate, and bistrimethylsilyl sulfonate, and b) hydrolyzing the product thus formed.

5,567,817

### TRIAZOLE ANTIFUNGAL AGENTS

Stephen J. Ray, Deal, and Kenneth Richardson, Birmington; both of England, assignors to Pfizer Inc., New York, N.Y. Continuation of Ser. No. 139,972, Oct. 20, 1993, abandoned, which is a division of Ser. No. 956,569, Oct. 5, 1992, Pat. No. 5,278,175, which is a continuation of Ser. No. 646,564, Jan. 25, 1991, abandoned. This application May 1, 1995, Ser. No. 432,414

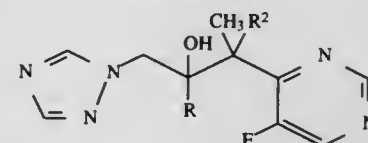
Claims priority, application United Kingdom, Feb. 2, 1990, 9002375

Int. Cl.<sup>6</sup> C07D 403/10

U.S. Cl. 544-333

12 Claims

I. A compound of the formula



or a pharmaceutically acceptable salt thereof, wherein R is 2,4-difluorophenyl, and  $R^2$  is hydrogen or methyl.

5,567,818

### PROCESSES FOR PREPARING 2-(1-AZABICYCLO[2.2.2]OCT-3-YL)-1H-BENZ[DE]ISOQUINOLIN-1-ONE DERIVATIVES AND INTERMEDIATES USEFUL THEREIN

Bruce A. Kowalczyk, Cupertino, and Charles A. Dvorak, Palo Alto, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 8, 1994, Ser. No. 272,715

Int. Cl.<sup>6</sup> C07D 455/08

U.S. Cl. 546-97

31 Claims

I. A process for preparing 2-(1-azabicyclo[2.2.2]oct-3-yl)-3-hydroxy-2,3,3a,4,5,6-hexahydro-1H-benz[de]isoquinolin-1-one and salts, individual stereoisomers and mixtures of stereoisomers thereof, which process comprises:

- reducing 2-(1-azabicyclo[2.2.2]oct-3-yl)-2,3-dihydro-1H-benz[de]isoquinolin-1,3-dione to give a diastereomeric mixture of 2-(1-azabicyclo[2.2.2]oct-3-yl)-3-hydroxy-2,3,3a,4,5,6-hexahydro-1H-benz[de]isoquinolin-1-one;
- optionally separating the diastereomeric mixture of 2-(1-azabicyclo[2.2.2]oct-3-yl)-3-hydroxy-2,3,3a,4,5,6-hexahydro-1H-benz[de]isoquinolin-1-one into individual stereoisomers or mixtures of stereoisomers;
- optionally converting 2-(1-azabicyclo[2.2.2]oct-3-yl)-3-hydroxy-2,3,3a,4,5,6-hexahydro-1H-benz[de]isoquinolin-1-one to an acceptable acid or base addition salt; and
- optionally converting an acid or base addition salt of 2-(1-azabicyclo[2.2.2]oct-3-yl)-3-hydroxy-2,3,3a,4,5,6-hexahydro-1H-benz[de]isoquinolin-1-one to non-salt form.

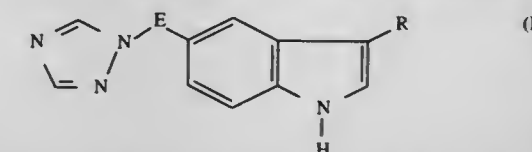
5,567,819  
 (3) PROCESS FOR PREPARING INDOLE DERIVATIVES CONTAINING A 1,2,4-TRIAZOL-1-YL SUBSTITUENT  
 Peter G. Houghton, Basingbourn, Great Britain, assignor to Merck, Sharp & Dohme, Ltd., Hoddesdon, England  
 Filed Jan. 20, 1995, Ser. No. 373,288  
 Claims priority, application United Kingdom, Jul. 22, 1992, 9215526

Int. Cl.<sup>6</sup> C07D 401/14; 403/14; 403/06; 403/04

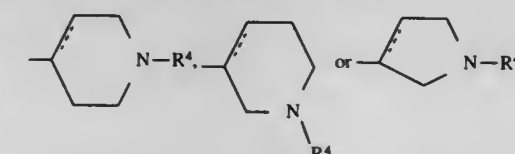
U.S. Cl. 546-201

9 Claims

I. A process for the preparation of a compound of formula I:

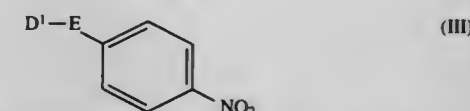


wherein E represents a bond or a straight or branched alkylene chain containing from 1 to 4 carbon atoms; and R represents  $-CH_2-CHR^1-NR^2R^3$  or a group of formula

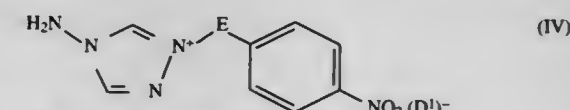


in which the broken line represents an optional chemical bond; and  $R^1$ ,  $R^2$ ,  $R^3$  and  $R^4$  independently represent hydrogen or  $C_{1-6}$  alkyl; which process comprises the following steps:

(i) reaction of 4-amino-1,2,4-triazole of formula II with a compound of formula III:

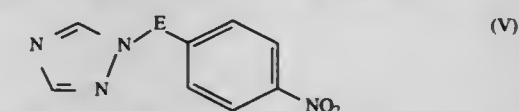


wherein E is as defined above, and  $D^1$  represents a readily displaceable group, being a halogen atom; to obtain a compound of formula IV:



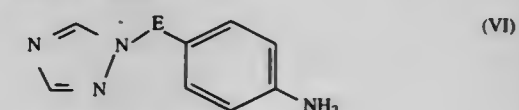
where E and  $D^1$  are as defined above;

(ii) deamination of the aminotriazolium salt of formula IV thereby obtained by treatment with nitrous acid followed by neutralization, to obtain a compound of formula V:



wherein E is as defined above;

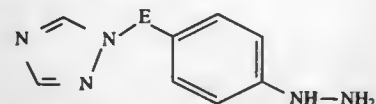
(iii) reduction of the nitro compound of formula V thereby obtained by transfer hydrogenation using a hydrogenation catalyst in the presence of a hydrogen donor, to obtain a compound of formula VI:



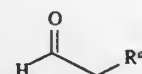
wherein E is as defined above; and



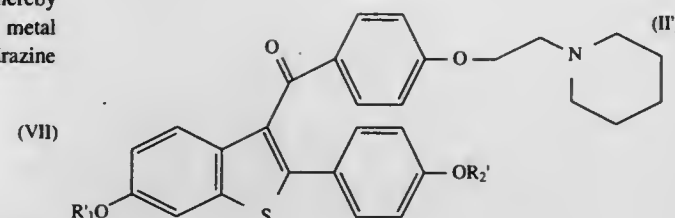
(iv) treatment of the aniline derivative of formula VI thereby obtained with nitrous acid and then with an alkali metal sulphite, followed by acidification, to obtain a hydrazine derivative of formula VII:



wherein E is as defined above; which compound is subsequently reacted in situ with a compound of formula VIII or a carbonyl-protected form thereof:

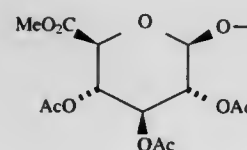


wherein R<sup>a</sup> corresponds to the group R as defined above or represents a t-butoxycarbonyl protected derivative thereof, or R<sup>a</sup> represents a group of formula —CH<sub>2</sub>—CHR<sup>1</sup>D<sup>2</sup> in which R<sup>1</sup> is as defined above and D<sup>2</sup> represents a readily displaceable group, being a halogen atom: followed, as necessary, by removal of the t-butoxycarbonyl protecting group, where present, from the group R<sup>a</sup>.

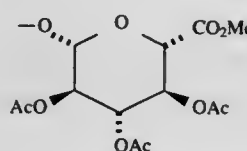


wherein R<sub>1</sub> is a hydroxy protecting group or a group of the formula

(VIII)



or R<sub>2</sub><sup>1</sup> is a hydroxy protecting group or a group of the formula



5,567,820

#### GLUCOPYRANOSIDE BENZOTHIOPHENES

Jeffrey A. Dodge; Terry D. Lindstrom, both of Indianapolis; Charles W. Lugar, III, McCordsville, and Gilbert S. Staten, Camby, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

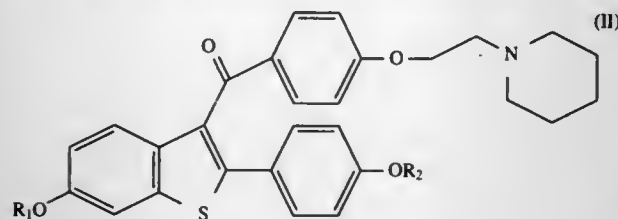
Division of Ser. No. 246,655, May 20, 1994. This application Mar. 15, 1995, Ser. No. 404,701

Int. Cl.<sup>6</sup> C07D 409/14

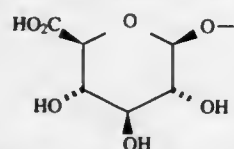
U.S. Cl. 546—202

3 Claims

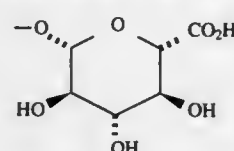
1. A process for preparing a compound of the formula



wherein R<sub>1</sub> is hydrogen or a group of the formula



and R<sub>2</sub> is hydrogen or a group of the formula



or a salt or solvate thereof, with the proviso that one of R<sub>1</sub> or R<sub>2</sub> is hydrogen, comprising reacting a compound of the formula

or a salt or solvate thereof, with the proviso that one of R<sub>1</sub><sup>1</sup> and R<sub>2</sub><sup>1</sup> is a hydroxy protecting group, and the other is not, with a suitable base, and a hydroxy-protecting group cleaving agent, in a suitable polar organic solvent, for a time and at a temperature sufficient to provide a compound of formula (II).

5,567,821

#### BIS-(2,5-POLYTHIO-1,3,4-THIAZIOLES), RUBBERS CONTAINING SUCH COMPOUNDS, AND A METHOD OF PREPARATION OF BIS-(2,5-POLYTHIO-1,3,4-THIAZIOLES)

(i) Joseph A. Kuczkowski, Munroe Falls; Michael B. Rodgers, Akron, and Kevin L. Rollick, Munroe Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 189,332, Jan. 31, 1994, which is a division of Ser. No. 935,324, Aug. 26, 1992, Pat. No. 5,310,921. This application May 5, 1995, Ser. No. 435,507

Int. Cl.<sup>6</sup> C07D 513/18

(ii)

U.S. Cl. 548—126

5 Claims

1. A process for the preparation of bis-(2,5-polythio-1,3,4-thiaziole) comprising reacting 2,5-dimercapto-1,3,4-thiaziole and elemental sulfur in water with hydrogen peroxide at a temperature ranging from 20° C. to 100° C. wherein the molar ratio of 2,5-dimercapto-1,3,4-thiaziole to hydrogen peroxide is 1:1 to 1.5:1 and the molar ratio of 2,5-dimercapto-1,3,4-thiaziole to elemental sulfur ranges from 16:1 to 1:1.

5,567,822

#### PROCESS FOR THE PREPARATION OF 2-AMINO-7-NITROBENZO-THIAZOLES

Francois Audiau, Charenton le Pont; Patrick Jimonet, Villepreux, and Serge Mignani, Chatenay Malabry, all of France, assignors to Rhone-Poulenc Rorer S.A., Antony, France

PCT No. PCT/FR92/01165, § 371 Date Jun. 13, 1994, § 102(e) Date Jun. 13, 1994, PCT Pub. No. WO93/12099, PCT Pub. Date Jun. 24, 1993

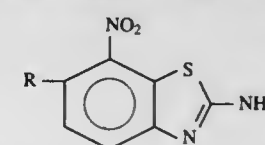
PCT Filed Dec. 9, 1992, Ser. No. 244,390

Claims priority, application France, Dec. 13, 1991, 91 15486 Int. Cl.<sup>6</sup> C07D 277/68; 277/82

U.S. Cl. 548—164

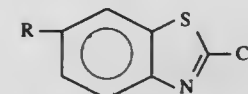
10 Claims

1. Process for the preparation of the compounds of formula:



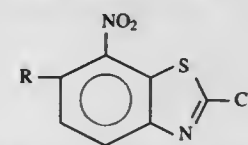
in which R represents a polyfluoroalkoxy radical, comprising nitrating

a) a derivative of formula:



in which R has the same meanings as in formula (I), and

b) reacting compound of formula:



in which R has the same meanings as in formula (I), thus obtained with ammonium hydroxide.

5,567,824

#### PALLADIUM CATALYZED RING CLOSURE OF TRIAZOLYLTRYPTAMINE

Cheng Y. Chen, Colonia; Robert D. Larsen, Bridgewater, and Thomas R. Verhoeven, Cranford, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

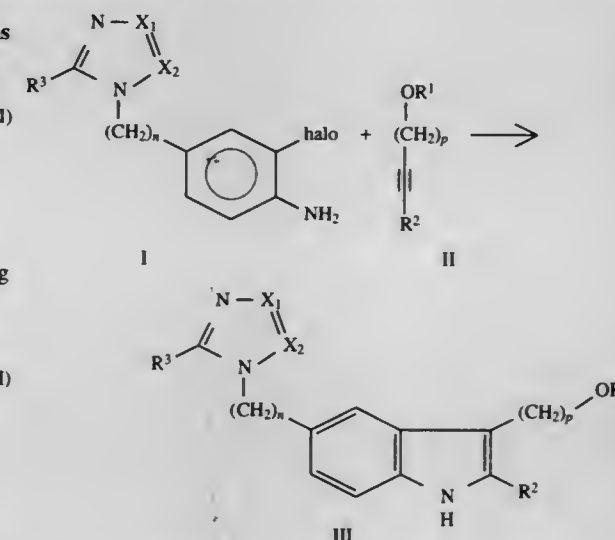
Filed May 24, 1994, Ser. No. 248,288

Int. Cl.<sup>6</sup> C07D 401/12

U.S. Cl. 548—252

21 Claims

1. A process comprising the step of contacting a compound of Structure I with a compound of Structure II to form a compound of Structure III:



said process being carried out in an organic solvent at a temperature in the range of about 70° to 120° C., in the presence of a soluble palladium catalyst, and in the presence of an inorganic or organic amine compound which functions as a proton acceptor and does not chemically react with said catalyst, wherein:

X<sub>1</sub> and X<sub>2</sub> are independently ring nitrogen or carbon atoms;

halo represents Br or I;

n is an integer from 0–1;

p is an integer from 1–4;

R<sup>3</sup> is H or linear or branched C<sub>1</sub>–C<sub>4</sub> alkyl;

R<sup>1</sup> is H or a radical which functions as a hydroxy protecting group, and

R<sup>2</sup> is a radical which functions as a terminal acetylene carbon protecting group, wherein said process is conducted in the absence of triphenylphosphine, lithium chloride or tetrabutyl ammonium chloride.

5,567,823

#### PROCESS FOR THE PREPARATION OF AN HIV PROTEASE INHIBITING COMPOUND

Jien-Heh J. Tien, Libertyville, Ill.; Jerome A. Menzia, Kenosha, Wis., and Arthur J. Cooper, Lake Villa, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Jun. 6, 1995, Ser. No. 469,965

Int. Cl.<sup>6</sup> C07D 417/12

U.S. Cl. 548—204

8 Claims

1. A process for the preparation of (2S,3S,5S)-5-(N-((N-methyl-N-((2-isopropyl-4-thiazolyl)methyl)amino)carbonyl)-L-valinyl)amino)-2-(N-((5-thiazolyl)methoxycarbonyl)amino)-1,6-diphenyl-3-hydroxyhexane or an acid addition salt thereof comprising converting a mixed anhydride derivative of N-((N-methyl-N-((2-isopropyl-4-thiazolyl)methyl)amino)carbonyl)-L-valine to an activated ester derivative of N-((N-methyl-N-((2-isopropyl-4-thiazolyl)methyl)amino)carbonyl)-L-valine, followed by reacting the activated ester with (2S,3S,5S)-5-amino-2-(N-((5-thiazolyl)methoxycarbonyl)amino)-1,6-diphenyl-3-hydroxyhexane.

5,567,825

#### METHOD FOR THE PREPARATION OF A TRIAZOLE COMPOUND

Hideo Ohi, and Noriyuki Ozawa, both of Shizuoka-ken, Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, and Ihara Chemical Industry Co., Ltd., both of Tokyo, Japan

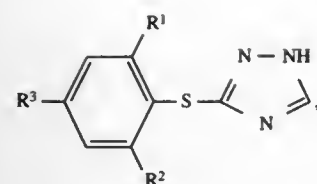
Filed Dec. 22, 1995, Ser. No. 577,878

Claims priority, application Japan, Dec. 22, 1994, 6-320865 Int. Cl.<sup>6</sup> C07D 249/12

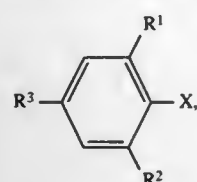
U.S. Cl. 548—264.2

5 Claims

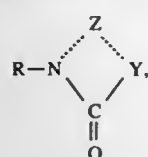
1. In a synthetic method for the preparation of a 3-(2,4,6-trialkylphenylthio)-1H-1,2,4-triazole compound represented by the general formula



in which  $R^1$ ,  $R^2$  and  $R^3$  are each, independently from the others, a lower alkyl group, by the reaction between a 1,3,5-trialkyl-2-halogenobenzene represented by the general formula



in which  $R^1$ ,  $R^2$  and  $R^3$  each have the same meaning as defined above and X is a halogen atom, and an alkali metal salt of 3-mercapto-1H-1,2,4-triazole in the presence of a copper catalyst, the improvement which comprises conducting the reaction in an organic compound as a solvent represented by the general formula



in which R is a lower alkyl group, Y is a methylene group or an N-(lower alkyl)imino group and Z is a divalent hydrocarbon group to form a 5-membered ring or 6-membered ring together with the group  $-N-CO-Y-$ .

## 5,567,826

# PROCESS FOR THE PRODUCTION OF TERMINALLY NITROGEN HETEROCYCLE SUBSTITUTED (METH)ACRYLATE BY THE USE OF A MIXTURE OF AN ALKALI METAL AND ALKALINE EARTH METAL CATALYST

Joachim Knebel, Darmstadt; Peter J. Arndt, Seeheim-Jugenheim, and Werner Ude, Darmstadt-Arhelgen, all of Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Germany

Continuation of Ser. No. 59,318, May 11, 1993, abandoned.

This application Dec. 22, 1994, Ser. No. 361,372

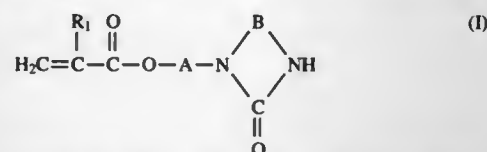
Claims priority, application Germany, May 23, 1992, 42 17 124.5

Int. Cl.<sup>6</sup> C07D 233/32; 247/02; 239/10; 243/04; 245/02

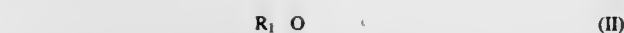
U.S. Cl. 548—324.1

7 Claims

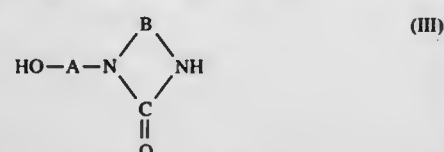
1. A process for producing a (meth) acrylate of the Formula



wherein  $R_1$  is hydrogen or methyl, and A and B are each independently unbranched or branched alkylene groups of 2 to 5 C atoms, which comprises reacting an acrylate or methacrylate of the Formula (II)



where  $R_1$  is defined as above and  $R_2$  is alkyl with 1 to 4 C atoms, with a heterocyclic compound of the Formula (III)



wherein the reaction is performed in the presence of a 0.01 to 0.1 wt. % of a mixture of an alkali metal catalyst and an alkaline earth metal catalyst, wherein the amount of alkali metal catalyst is 5 to 95 w/w percent and the amount of alkaline earth metal catalyst is 95 to 5 w/w based on the total amount of alkali metal and alkaline earth metal catalysts.

## 5,567,827

# 4-HYDROXYPHENYLTHIO DERIVATIVES, THEIR PREPARATION AND THEIR USE FOR THE PREPARATION OF

## AMINOALKOXYPHENYLSULFONYL DERIVATIVES

Jean Gubin, Bruxelles, and Henri Inion, Wemmel, both of Belgium, assignors to Elf Sanofi, Paris, France

Division of Ser. No. 302,427, Sep. 8, 1994, Pat. No. 5,508,431,

which is a division of Ser. No. 80,171, Jun. 23, 1993, Pat. No.

5,401,855. This application Jun. 7, 1995, Ser. No. 478,603

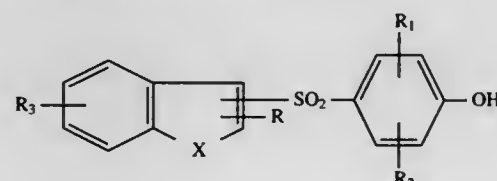
Claims priority, application Japan, Jun. 23, 1992, 92 07659

Int. Cl.<sup>6</sup> C07D 209/04

U.S. Cl. 548—484

8 Claims

1. Process for the preparation of a 4-hydroxyphenylsulfonyl compound of the general formula:



in which:

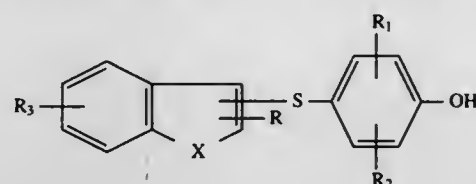
$R_1$  and  $R_2$ , which are identical or different, are selected from the group consisting of hydrogen, methyl, ethyl and halogen

R is selected from the group consisting of  $(C_1-C_6)$  alkyl,  $(C_3-C_6)$  cycloalkyl and phenyl,

$R_3$  is selected from the group consisting of hydrogen and halogen,

X is selected from the group consisting of  $-O-$ ,  $-S-$  and  $-NR_4-$  in which  $R_4$  is selected from the group consisting of hydrogen and  $(C_1-C_4)$  alkyl,

wherein a 4-hydroxyphenylthio compound of general formula:



in which R,  $R_1$ ,  $R_2$ ,  $R_3$  and X have the same meaning as stated above, is oxidized in a solvent by means of an oxidizing agent to produce the desired compound.

## 5,567,828

# COMPOUNDS AND COMPOSITIONS WITH NITROGEN-CONTAINING NON-BASIC SIDE

Jeffrey A. Dodge, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

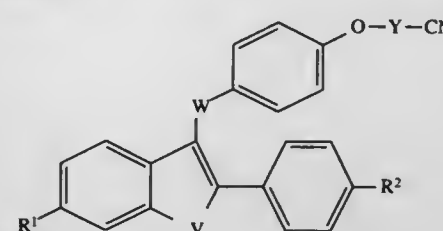
Filed Jun. 7, 1995, Ser. No. 476,154

Int. Cl.<sup>6</sup> C07D 333/58; 307/81; C07C 255/33; A61K 31/38

U.S. Cl. 549—51

14 Claims

1. A compound with nitrogen-containing non-basic side chains of formula II



wherein

$R^1$  and  $R^2$ , independently, are H, OH,  $O(C_1-C_6)$  alkyl,

$O-C(O)-(C_1-C_6)$  alkyl,  $O-C(O)-O(C_1-C_6)$  alkyl,

$O-C(O)-Ar$ ,  $O-C(O)-O-Ar$ ,  $O-SO_2-(C_4-C_6)$  alkyl,

chloro, fluoro, or bromo;

W is CHOH, C(O), or  $CH_2$ ;

Y is  $(CH_2)_n$ , or  $CH(C_1-C_4)$  alkyl;

V is S, O, or  $CH_2CH_2$ ;

n is 1, 2, or 3; and

Ar is optionally substituted phenyl.

## 5,567,829

# METHOD FOR RECOVERING PHENOL AND XANTHENE VALUES FROM WASTE POLYCARBONATE

Andrew J. Caruso, and Julia L. Lee, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 17, 1995, Ser. No. 422,472

Int. Cl.<sup>6</sup> C07D 311/82; C07C 69/96; 37/68

U.S. Cl. 549—388

17 Claims

1. A method for salvaging organic values from scrap aromatic polycarbonate comprising effecting reaction, at a temperature of 100°–250° C. and in the presence of an effective amount of a strong acid catalyst, a mixture comprising scrap aromatic polycarbonate and a  $C_{1-4}$  alkylated phenol, the weight ratio of said alkylated phenol to said scrap polycarbonate being about 2–1000:1.

## 5,567,830

# PROCESS FOR SYNTHESIS OF ACETYLENIC CARBINOLS

Ravindra B. Upasani, Foothill Ranch, Calif., assignor to Cocosys, Inc., Irvine, Calif.

Filed Feb. 14, 1994, Ser. No. 195,464

Int. Cl.<sup>6</sup> C07J 41/00

U.S. Cl. 552—575

18 Claims

1. A method for the preparation of an acetylenic carbinol, comprising:

reacting 1,2-dibromoethylene with an alkyl, aryl or heteroaryl lithium in a dry inert solvent to give an organometallic reagent; followed by

reacting said organometallic reagent with a carbonyl-containing compound whereby a carbonyl group of said carbonyl-containing compound reacts with said organometallic reagent to give the acetylenic carbinol.

## 5,567,831

# NON-STEROIDAL SULFATASE INHIBITOR COMPOUNDS AND THEIR METHOD OF USE

Pui-kai Li, Library, Pa., assignor to Duguesne University of the Holy Ghost, Pittsburgh, Pa.

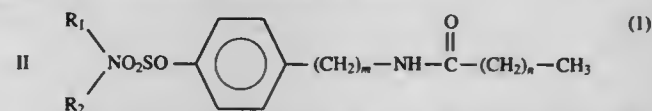
Filed Aug. 16, 1995, Ser. No. 516,021

Int. Cl.<sup>6</sup> A61K 31/16; 31/165; 31/185

U.S. Cl. 554—43

20 Claims

1. A compound comprising the formula (I)



wherein (a)  $R_1$  is selected from the group consisting of hydrogen and a lower alkyl group, (b)  $R_2$  is selected from the group consisting of H and a lower alkyl group, (c) m is an integer from 0 to 4, and (d) n is an integer from 5 to 14.

## 5,567,832

# POLYMERIC MULTINARY AZANES, METHODS FOR THEIR PREPARATION AND THEIR USE

Nils Perchenek, Leverkusen; Hans-Peter Baldus, Burscheid; Josua Löffelholz, and Martin Jansen, both of Bonn, all of Germany, assignors to Bayer AG, Leverkusen, Germany

Filed Apr. 25, 1994, Ser. No. 231,787

Claims priority, application Germany, May 3, 1993, 43 14 497.7

Int. Cl.<sup>6</sup> C07F 19/00

U.S. Cl. 556—28

7 Claims

1. A polymeric multinary azane built up from units of the general formula  $[E(NR^1R^2)(NR^3R^4)]_n$ , wherein E is selected from B, Al, Ga, In, Si, Ge, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo or W and  $R^1$ ,  $R^2$ ,  $R^3$  are selected from H,  $C_1-C_6$  alkyl, vinyl or phenyl, wherein at least two of the named elements E are included, with the exception of the combination Si—B, and every atom E is coordinated by from three to six nitrogen atoms, wherein  $0 \leq a \leq 6$ ,  $1 \leq b \leq 6$ ,  $3 \leq (a+b) \leq 6$  and a and b are whole numbers.

## 5,567,833

# CURING AGENT, PREPARATION THEREOF AND CURABLE COMPOSITION COMPRISING THE SAME

Takahisa Iwahara; Makoto Chiba; Tomoko Takahara, and Kazuya Yonezawa, all of Kobe, Japan, assignors to Kanegafuchi Chemical Industry Co., Ltd., Osaka, Japan

Division of Ser. No. 29,993, Mar. 8, 1993, Pat. No. 5,409,995,

which is a continuation of Ser. No. 640,415, Jan. 28, 1991,

abandoned. This application Sep. 26, 1994, Ser. No. 313,923

Claims priority, application Japan, May 29, 1989, 1-135666;

May 29, 1989, 1-135667; May 29, 1989, 1-135668; Jun. 1, 1989,

1-139940; Jun. 7, 1989, 1-145672; Jun. 7, 1989, 1-145673; Jun.

7, 1989, 1-145674; Jun. 15, 1989, 1-153143; WIPO, May 29,

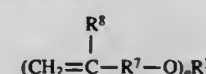
1990, PCT/SP90/00686

Int. Cl.<sup>6</sup> C07F 7/08

U.S. Cl. 556—434

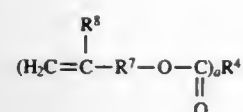
5 Claims

1. An organic curing agent having at least two hydrosilyl groups in a molecule, which is prepared by reacting (A) a non-polymeric organic compound having at least one alkenyl group in a molecule, of the formula:

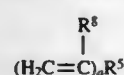


wherein  $R^7$  is a hydrocarbon group having 0 to 18 carbon atoms which may have at least one ether linkage,  $R^8$  is a hydrogen atom or a methyl group,  $R^3$  is an organic group having 1 to 30 carbon atoms, and a is an integer of 1 to 4, the formula:

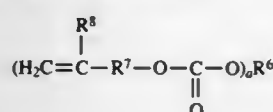




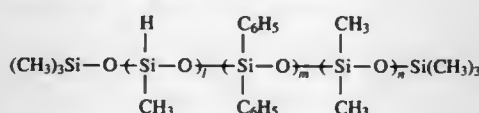
wherein  $\text{R}^7$  is a hydrocarbon group having 0 to 18 carbon atoms which may have at least one ether linkage,  $\text{R}^8$  is a hydrogen atom or a methyl group,  $\text{R}^4$  is an organic group having 1 to 30 carbon atoms, and  $n$  is an integer of 1 to 4, the formula:



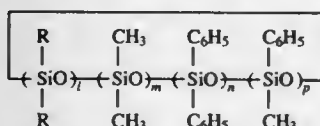
wherein  $\text{R}^8$  is a hydrogen atom or a methyl group,  $\text{R}^5$  is a mono-, di-, tri-, or tetra-valent hydrocarbon group having 2 to 50 carbon atoms, and  $n$  is an integer of 1 to 4, or the formula:



wherein  $\text{R}^7$  is a hydrocarbon group having 0 to 18 carbon atoms which may have at least one ether linkage,  $\text{R}^8$  is a hydrogen atom and a methyl group,  $\text{R}^6$  is an organic group having 1 to 30 carbon atoms, and  $n$  is an integer of 1 to 4, with (B) a polyvalent hydrosilicon compound of the formula:



wherein  $l \geq 2$  and  $l+m+n=3-50$ , or the formula:



wherein  $l \geq 2$ ,  $p+l+m+n=3-20$ , and  $\text{R}=\text{CH}_3$ ,  $\text{C}_2\text{H}_5$ , or  $\text{C}_6\text{H}_5$ , in the presence of a hydrosilylation catalyst so that at least two hydrosilyl groups remain after the reaction.

5,567,834

#### PROCESS FOR PREPARATION OF $\beta$ -ALKENYLTRIMETHYLSILANES

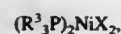
Howard M. Bank, Freeland, and Binh T. Nguyen, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 31, 1996, Ser. No. 594,963  
Int. Cl. C07F 7/08

U.S. Cl. 556-442 17 Claims  
1. A process for making  $\beta$ -alkenyltrimethylsilanes and trimethylsilyl carboxylates, the process comprising contacting a mixture comprising hexamethyldisilane and an alkene carboxylate described by formula



with a catalyst described by formula



at a temperature within a range of about 100° C. to 250° C.; where each  $\text{R}^1$  is independently selected from a group consisting of hydrogen, saturated hydrocarbon radicals comprising about 1 to 18

carbon atoms, aralkyls, and aryls;  $\text{R}^2$  is selected from a group consisting of saturated hydrocarbon radicals comprising about 1 to 18 carbon atoms, aralkyls, and aryls; each  $\text{R}^3$  is an independently selected alkyl comprising about 1 to 8 carbon atoms; Ph is phenyl; and each X is an independently selected halogen atom selected from a group consisting of bromine and chlorine.

5,567,835

#### PREPARATION OF A VINYLSELOXANE-BENZOCYCLOBUTENE FROM A HYDROLYZABLE VINYLSELOXANE-BENZOCYCLOBUTENE

Robert A. DeVries, and Edmund J. Stark, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 27, 1995, Ser. No. 549,136  
Int. Cl. C07F 7/08

U.S. Cl. 556-453 9 Claims  
1. A process comprising reacting a hydrolyzable hydrosilating reagent with an acetylene-BCB under such conditions to form a hydrolyzable vinylsilane-BCB, then hydrolyzing the hydrolyzable vinylsilane-BCB to form a vinylsiloxane-BCB.

5,567,836

#### PROCESS FOR SEPARATION OF METHYLTRICHLOROSILANE FROM DIMETHYLDICHLOROSILANE

Michael Diaz, Lexington, Ky.; Roland L. Halm; Michael A. McIntyre, both of Midland, Mich., and Oliver K. Wilding, Lagrange, Ky., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 29, 1995, Ser. No. 564,550  
Int. Cl. C07F 7/08

U.S. Cl. 556-466 9 Claims  
1. A process for separation of methyltrichlorosilane from dimethyldichlorosilane, the process comprising:

- (A) contacting a mixture comprising methyltrichlorosilane and dimethyldichlorosilane with activated carbon, where the methyltrichlorosilane is selectively adsorbed by the activated carbon and
- (B) recovering dimethyldichlorosilane reduced in methyltrichlorosilane concentration.

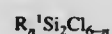
5,567,837

#### DISUBSTITUTED PALLADIUM CATALYSTS FOR REACTING ORGANIC HALIDES WITH DISILANES

Howard M. Bank, Freeland; Brian M. Naasz, DeWitt, and Binh T. Nguyen, Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 31, 1996, Ser. No. 593,317  
Int. Cl. C07F 7/08

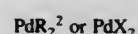
U.S. Cl. 556-468 17 Claims  
1. A process for forming monosilanes from disilanes, the process comprising contacting a mixture comprising a disilane described by formula



and an organic halide described by formula



with a disubstituted palladium catalyst described by formula



at a temperature within a range of about 100° C. to 250° C., where each  $\text{R}^1$  is an independently selected monovalent hydrocarbon

5,567,840

#### SUBSTITUTED AMINOALKYLPHOSPHINIC ACIDS

Roger G. Hall, Manchester, England; Ludwig Maier, Ariesheim, and Wolfgang Fröstl, Basle, both of Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Division of Ser. No. 147,799, Nov. 4, 1993, Pat. No. 5,461,040, which is a division of Ser. No. 873,488, Apr. 22, 1992, Pat. No. 5,281,747, which is a continuation of Ser. No. 725,956, Jun. 27, 1993, abandoned, which is a continuation of Ser. No. 519,707, May 7, 1990, abandoned. This application Jun. 5, 1995, Ser. No. 461,090

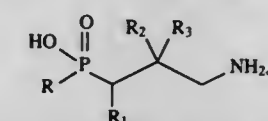
Claims priority, application United Kingdom, May 13, 1989, 8911017

Int. Cl. C07F 9/30

U.S. Cl. 562-11

17 Claims

1. A P-substituted aminoalkylphosphinic acid of the formula



wherein R denotes an optionally fluorinated methyl group,  $\text{R}_1$  denotes hydrogen, lower alkyl, lower alkoxy, hydroxy, halogen or a fluorinated methyl group and  $\text{R}_2$  and  $\text{R}_3$  denote hydrogen or  $\text{R}_2$  denotes hydroxy, lower alkoxy or halogen and  $\text{R}_3$  is hydrogen or  $\text{R}_2$  and  $\text{R}_3$  together represent an oxo group, with the exception of P-(3-amino-2-oxo-propyl)-P-methyl-phosphinic acid and racemic P-(3-amino-2-hydroxy-propyl)-P-methyl-phosphinic acid, or a salt thereof with the exception of alkali metal salts and the ammonium salt of P-(3-aminopropyl)-P-methyl-phosphinic acid.

5,567,838

#### TRANSESTERIFICATION REACTION OF ALKOXYLATED BISPHENOL-A AND METHYL METHACRYLATE

Joseph Pugach, Monroeville; Jeffrey S. Salek, Oakdale, and John E. Aiken, Monroeville, all of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Filed Jun. 2, 1995, Ser. No. 459,863

Int. Cl. C07C 69/76

U.S. Cl. 560-60

20 Claims

1. A method of making alkoxyated bisphenol-A dimethacrylate, comprising the steps of:

- (a) combining (i) alkoxyated bisphenol-A, and (ii) methyl methacrylate;
- (b) reacting said combined compounds in the presence of a basic catalyst comprising a compound selected from the group consisting of alkoxides and hydroxide of potassium, wherein the transesterification products alkoxyated bisphenol-A dimethacrylate and methanol are formed; and
- (c) removing methanol with a saturated hydrocarbon azeotrope.

5,567,839

#### PROCESS FOR THE PREPARATION OF VINYL ACETATE

David J. Gulliver, Surrey, and Simon J. Kitchen, South Yorkshire, both of England, assignors to BP Chemicals Limited, London, England

Filed Nov. 18, 1994, Ser. No. 342,314

Claims priority, application United Kingdom, Nov. 19, 1993, 9323823; Nov. 19, 1993, 9323857

Int. Cl. C07C 67/05

U.S. Cl. 560-245

15 Claims

1. A process for the production of vinyl acetate which comprises contacting ethylene, acetic acid and an oxygen-containing gas, at a temperature in the range 100° to 200° C. and at a pressure in the range atmospheric to 20 bar, with a shell impregnated catalyst comprised of palladium and optionally gold deposited on a catalyst support which is prepared by a process comprising the steps in sequence of:

- (1) impregnating the catalyst support with aqueous solutions of water-soluble palladium and optional gold compounds,
- (2) contacting the impregnated support from Step (1) with a solution of a barium salt capable of reacting with the water-soluble palladium and optional gold compounds to precipitate water-insoluble palladium and optional gold compounds on the support,
- (3) converting the precipitated water-insoluble palladium and optional gold compounds formed in Step (2) into palladium and optional gold metal by treatment with a reducing agent,
- (4) washing the product of Step (3) with water, and
- (5) contacting the product of Step (4) with a promoter and optionally a barium salt additive and drying the catalyst.

5,567,841

#### ALPHA-PHOSPHONOSULFONATE SQUALENE SYNTHETASE INHIBITORS AND METHOD

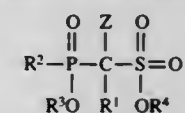
David R. Magnin, Hamilton; Scott A. Biller, Ewing; John K. Dickson, Jr., Mount Holly, all of N.J.; R. Michael Lawrence, Yardley, Pa., and Richard B. Sulsky, Franklin Park, N.J., assignors to Bristol-Myers Squibb Company, Princeton, N.J. Division of Ser. No. 266,843, Jul. 5, 1994, Pat. No. 5,470,845, which is a division of Ser. No. 104,762, Aug. 20, 1993, abandoned, which is a continuation-in-part of Ser. No. 967,904, Oct. 28, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 464,226

Int. Cl. C07F 9/38

U.S. Cl. 562-23

11 Claims

1. A method for forming an enantiomer of a phosphonosulfonate compound having the structure



wherein

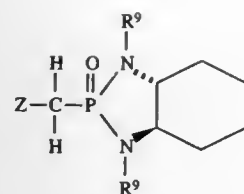
$\text{R}^2$  is  $\text{OR}^5$ ,

$\text{R}^3$  and  $\text{R}^5$  represents an alkali metal ion;

$\text{R}^4$  is an alkali metal ion;

$\text{R}^1$  is a lipophilic group containing at least 7 carbons;

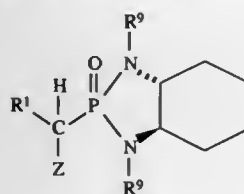
Z is H, halogen, lower alkyl or lower alkenyl, by any of the following processes: A) which comprises providing a methylphosphondiamide compound of the structure



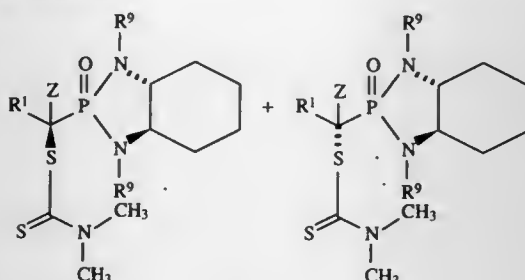
wherein  $R^9$  is alkyl or arylalkyl,  
treating the above diamide with a metalating agent to form an anion of the diamide,  
alkylating the anion of the diamide by treating with a halide of the structure



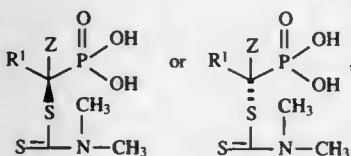
where X is I, Cl, Br, tosylate, or  $CF_3SO_3-$ , to form the alkylated compound



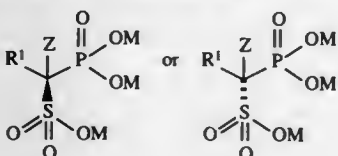
treating the above alkylated diamide with a metalating agent to form the metalated alkylated compound,  
subjecting the metalated alkylated compound to sulfuration with tetramethylthiuram disulfide, to form a mixture of isomers of the structures



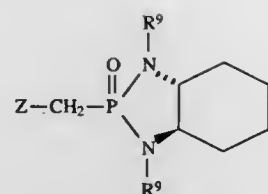
separating the isomers into the  $\alpha$ -(S) isomer and  $\alpha$ -(R) isomer,  
treating the desired isomer with an acid to form the desired diacid



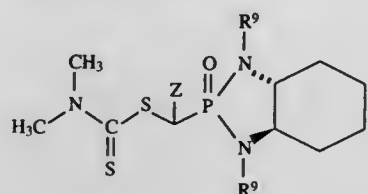
treating the diacid with an oxidizing agent and then with base to form the desired enantiomer



where M is an alkali metal;  
or B) forming an enantiomer of said phosphonosulfonate compound, which comprises providing a methylphosphondiamide of the structure



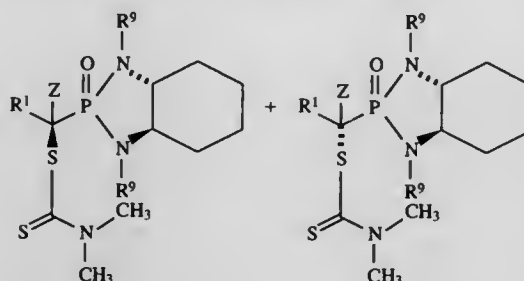
wherein  $R^9$  is alkyl or arylalkyl,  
treating the above diamide with a metalating agent to form the corresponding anion salt,  
treating the anion salt with sulfur and a dialkylthiocarbamoyl halide to form a dithiocarbamoylate of the structure



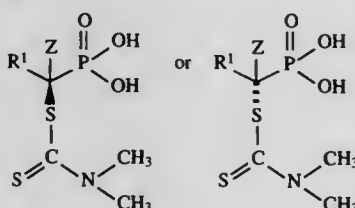
treating the dithiocarbamoylate with a metalating agent to form the corresponding metalated compound,  
treating the so-formed metalated compound with an alkylating agent



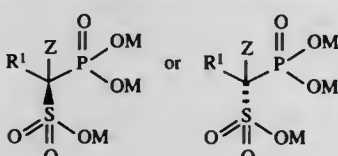
to form a mixture of isomers of the structure



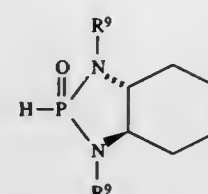
separating the isomers,  
treating the desired isomer with an acid to form the desired diacid



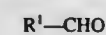
treating the desired diacid with an oxidizing agent and then with base to form the desired enantiomer



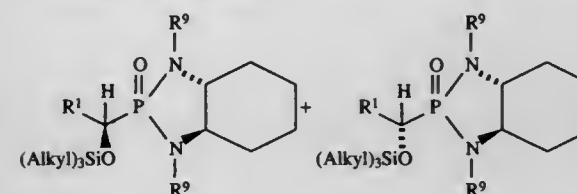
where M is an alkali metal;  
or C) forming an enantiomer of said phosphonosulfonate compound, which comprises providing a phosphorous diamide of the structure



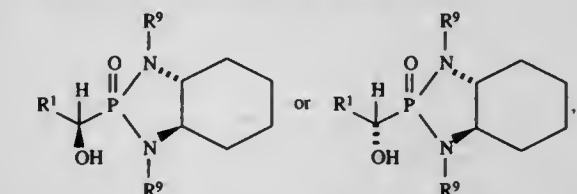
wherein  $R^9$  is alkyl, aryl or arylalkyl,  
treating the diamide with an aldehyde of the structure



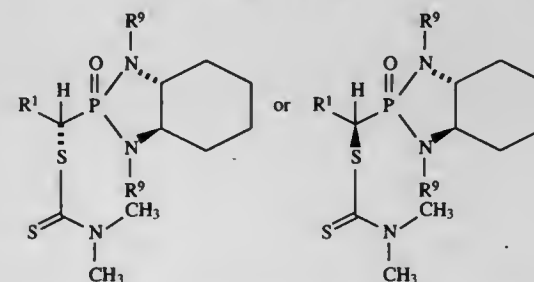
and a silylating compound to form a mixture of protected isomers of the structures



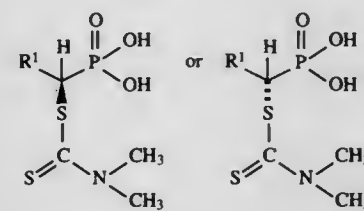
separating the isomers,  
reacting the desired isomer with a fluoride source to form a deprotected compound of the structure



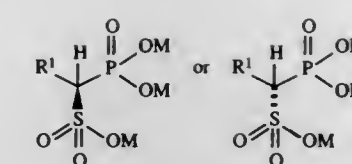
treating either deprotected isomer with dimethyldithiocarbamic acid, zinc salt and triphenylphosphine and diisopropylazodicarboxylate (DIAD) to form the isomer



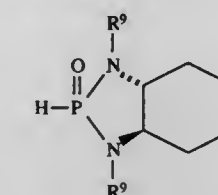
treating the desired isomer with an acid to form the desired diacid



treating the desired diacid with an oxidizing agent and then with base to form the desired enantiomer



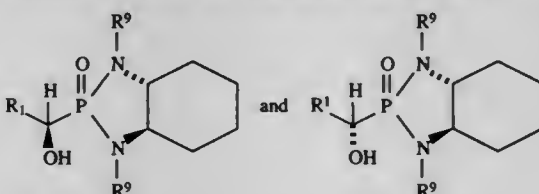
where M is an alkali metal;  
or D) forming an enantiomer of said phosphonosulfonate compound, which comprises providing a phosphorous diamide of the structure



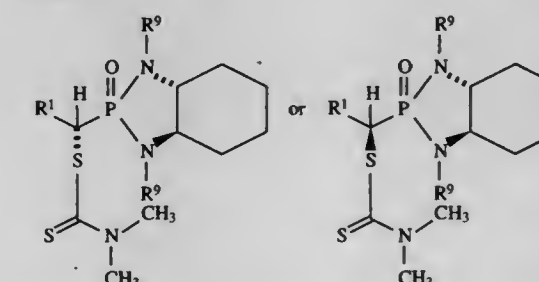
wherein  $R^9$  is alkyl or arylalkyl, treating the diamide with an aldehyde of the structure



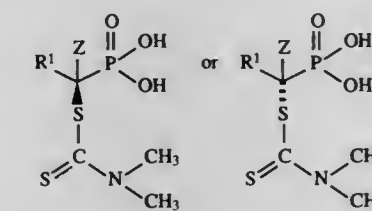
and a base including a fluoride source to form a mixture of isomers of deprotected compound of the structures



separating the isomers,  
treating either deprotected isomer with dimethyldithiocarbamic acid, zinc salt, triphenylphosphine and DIAD to form the isomer

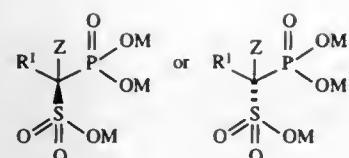


treating the desired isomer with an acid to form the desired diacid

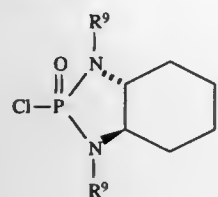


treating the desired diacid with an oxidizing agent and then with base to form the desired enantiomer

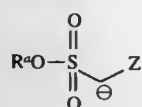




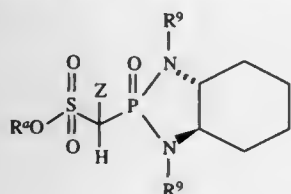
where M is an alkali metal;  
or E) forming an enantiomer of said phosphonosulfonate compound, which comprises providing an acid chloride of the structure



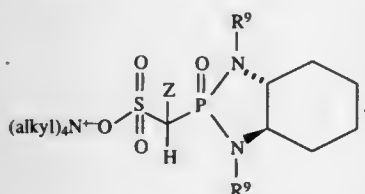
reacting the acid chloride with the metalated anion



(where R<sup>a</sup> is alkyl or cycloalkyl) to form



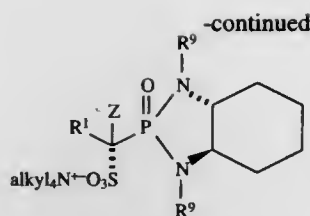
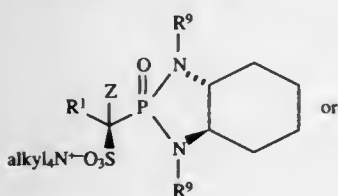
treating the product with (alkyl)<sub>4</sub>N<sup>+</sup>I<sup>-</sup> to form the corresponding ammonium compound



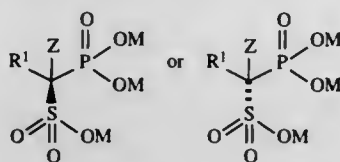
treating the above de alkylated compound with a metalating agent and then with an alkylating agent

R<sup>1</sup>X

to form the alkylated compound



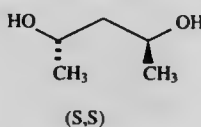
treating the desired isomer with an acid and then with an ion exchange resin to form the desired enantiomer



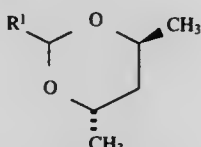
where M is an alkali metal;  
or F) forming an enantiomer of said phosphonosulfonate compound, which comprises treating an aldehyde of the structure

R<sup>1</sup>CHO

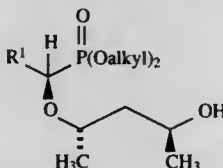
where R<sup>1</sup> is as defined in claim 1 with an (S,S)-diol



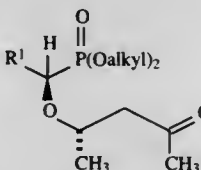
in the presence of an acid catalyst to form the acetal of the structure



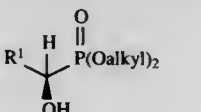
treating the acetal with a trialkylphosphite in the presence of titanium tetrachloride to form the alcohol



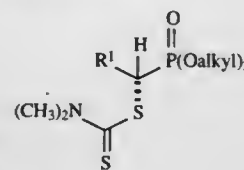
treating the above alcohol with an oxidizing agent to form a compound of the structure



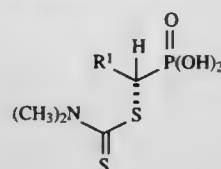
treating the above with p-toluenesulfonic acid in the presence of dioxane to form the diester



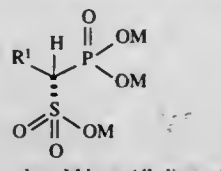
treating the above diester with triphenyl phosphine, dimethyldithiocarbamic acid, zinc salt and diisopropyl azodicarboxylate to form



treating the above diester with a bromotrimethylsilane to form the diacid



treating the diacid with an oxidizing agent and then with a strong base to form the desired enantiomer



where M is an Alkali metal.

where M is an alkali metal.

5,567,842

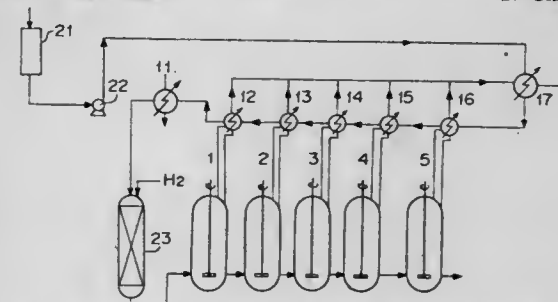
**PROCESS FOR PRODUCING TEREPHTHALIC ACID**  
Yoshiaki Izumisawa, Tokyo; Tukasawa Kawahara, and Akihiko Toyosawa, both of Kitakyushu, all of Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan  
Filed Oct. 30, 1995, Ser. No. 550,400

Claims priority, application Japan, Nov. 16, 1994, 6-282178; Nov. 16, 1994, 6-282179

Int. Cl. C07C 51/43

U.S. Cl. 562-486

17 Claims



1. A process for producing terephthalic acid, which comprises dissolving crude terephthalic acid in an aqueous medium, contacting it with a platinum group metal catalyst for purification under a temperature condition of from 260° to 320° C., crystallizing terephthalic acid from the aqueous solution of terephthalic acid by cooling the aqueous solution stepwise in a plurality of crystallizers connected in series, in such a manner that in a first crystallization zone, the crystallization temperature is adjusted to a level within a range of from 240° to 260° C. and agitating is carried out by impeller with a power requirement of impeller within a range of from 0.4 to 10 kw/m<sup>3</sup> and then in a second crystallization zone, the crystallization temperature is adjusted to a level within a range of from 180° to 230° C., which is lower by from 20° to 60° C. than the crystallization temperature in the first crystallization zone,

followed by solid-liquid separation, and drying the separated terephthalic acid crystals to obtain terephthalic acid particles wherein the proportion of particles having particle sizes exceeding 210 μm is at most 10 wt%.

5,567,843

**PROCESS FOR MAKING 2-ARYL BENZ (OX, THI, IMID)AZOLES AND 2-AMINOARYL AMINO BENZ (OX, THI, IMID)AZOLES**

Zenon Lysenko, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 20, 1995, Ser. No. 407,349

Int. Cl. C07B 43/02; C07D 263/57; 235/18; 277/66

U.S. Cl. 562-804

11 Claims

1. A process for preparing a 2-(aryl)-benz(ox, thi, imid)azole, comprising:

- contacting an aromatic aldehyde with hydroxylamine under conditions such that an aromatic aldehyde oxime is formed;
- contacting said aromatic aldehyde oxime under aqueous conditions with hypochlorous acid formed in situ from a mixture of HCl and a peroxysulfate salt or a mixture of sodium hypochlorite and a protic acid such that an aromatic hydroxamoyl halide is formed; and
- contacting the aromatic hydroxamoyl halide with an aromatic amine compound which has a primary amine group ortho to a hydroxyl group, a thiol group or another primary amine group to form a 2-(aryl)-benz(ox, thi, imid)azole.

5,567,844

**PROCESS FOR PREPARING 1-PHENYL-2-AMINO-3-FLUORO-1-PROPANOLS**

Giancarlo Jommi, Milan; Dario Chiarino, Monza, and Roberto Pagliarin, San Giorgio Su Legnano, all of Italy, assignors to Zambon S.p.A., Vicenza, Italy

Division of Ser. No. 65,521, May 24, 1993, Pat. No. 5,332,835, which is a continuation of Ser. No. 913,466, Jul. 15, 1992, abandoned, which is a division of Ser. No. 870,777, Apr. 21, 1992, Pat. No. 5,153,328, which is a continuation of Ser. No. 545,145, Jun. 28, 1990, abandoned, which is a continuation of Ser. No. 158,682, Feb. 22, 1988, abandoned, which is a division of Ser. No. 697,568, Feb. 1, 1985, Pat. No. 4,743,700. This application May 10, 1994, Ser. No. 240,432

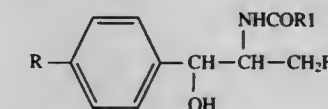
Claims priority, application Italy, Feb. 3, 1984, 19435/84. The portion of the term of this patent subsequent to Sep. 14, 2009, has been disclaimed.

Int. Cl. C04D 263/10; C07C 231/10; 233/05

U.S. Cl. 564-209

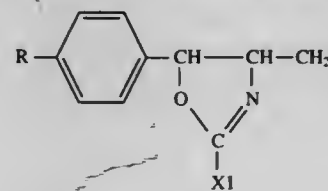
1 Claim

1. A process for preparing a compound of formula



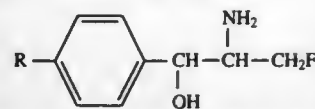
wherein R is NO<sub>2</sub>, CH<sub>3</sub>S—, CH<sub>3</sub>SO—, or CH<sub>3</sub>SO<sub>2</sub>—; and R<sub>1</sub> is mono, di or tri-halomethyl,

comprising hydrolyzing with an inorganic acid the protective group —O—C(X<sub>1</sub>)=N— from a compound of the formula



wherein R is as defined above, Y is F, and X<sub>1</sub> is methyl, phenyl, benzyl, trifluoromethyl or 4-nitro-phenyl;

to give a compound of the formula



isolating and recovering said compound of formula (VII), and then reacting said compound of formula (VII) with a haloacetic acid of formula  $R_1\text{COOH}$ , wherein  $R_1$  is as defined above and a catalytic amount of trialkyl amine.

5,567,845

### FUEL ADDITIVES, THEIR PREPARATION AND GASOLINE ENGINE FUELS CONTAINING THE ADDITIVES

Lothar Franz, Mutterstadt; Juergen Mohr, Gruenstadt; Peter Schreyer, Weinheim; Juergen Thomas, Fussgoenheim; Knut Oppenlaender, Ludwigshafen, and Wolfgang Guenther, Mettenheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

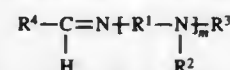
Division of Ser. No. 208,819, Mar. 11, 1994, Pat. No. 5,496,383. This application Oct. 16, 1995, Ser. No. 543,303 Claims priority, application Germany, Mar. 23, 1993, 43 09 271.3

Int. Cl.<sup>6</sup> C10C 1/22

U.S. Cl. 564—278

3 Claims

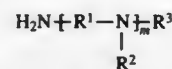
1. A hydrocarbon-substituted azomethine of the formula II



where  $m$  is 1–10,  $R^1$  is branched or straight-chain alkylene of 2 to 6 carbon atoms and the radicals  $R^1$  may be different from one another when  $m > 1$ ,  $R^2$  and  $R^3$  independently of one another are each hydrogen, alkyl of 1 to 6 carbon atoms or hydroxylalkyl of 1 to 6 carbon atoms, or  $R^2$  and  $R^3$ , together with the nitrogen to which they are bonded, form a heterocyclic ring which may have further heteroatoms, and

where  $R^4$  is an aliphatic hydrocarbon having alkyl side groups and a number average molecular weight of from 250 to 5,000, obtained by

- hydroformylating a long-chain olefin having a number average molecular weight of from 250 to 5,000 in the presence of CO and  $H_2$  at from 80° to 200° C. and  $CO/H_2$  pressures of up to 600 bar, and
- reacting the reaction product with a polyamine of the following formula I



where  $R^1$ ,  $R^2$  and  $R^3$  have the above meanings.

5,567,846

### FLUORINATED AROMATIC DINITRO COMPOUNDS AND DIAMINES

Zhenyu Yang, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

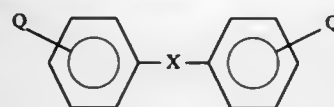
Division of Ser. No. 136,528, Oct. 13, 1993, Pat. No. 5,442,030. This application Jun. 6, 1995, Ser. No. 468,406

Int. Cl.<sup>6</sup> C07C 211/00

U.S. Cl. 564—307

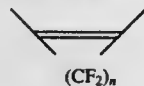
5 Claims

1. A compound of the formula



wherein  $X$  is selected from the group consisting of

(VII)

(CF<sub>2</sub>)<sub>n</sub>

and



(I)

(II)

$n$  is 2, 3, or 4;

both of  $Q$  are either  $-NH_2$  or  $-NO_2$ ; and provided that:

when both of  $Q$  are  $-NO_2$ ,  $X$  is (II), and each of  $Q$  is attached to the 3 position of the respective benzene ring or each of  $Q$  is attached to the 4 position of a respective benzene ring;

when both of  $Q$  are  $-NH_2$ , and  $X$  is (I), each of  $Q$  is attached to the 4 position of the respective benzene ring or each of  $Q$  is attached to the 3 position of the respective benzene ring; and when both of  $Q$  are  $-NH_2$ , and  $X$  is (II), each of  $Q$  is attached to the 3 position of the respective benzene ring.

5,567,847

### DISPROPORTIONATION OF AMINES TO PRODUCE SECONDARY AMINES

Gamini A. Vedage, Bethlehem, and John N. Armor, Orefield, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 21, 1995, Ser. No. 393,145

Int. Cl.<sup>6</sup> C07C 209/64

U.S. Cl. 564—493

11 Claims

1. In a process for the production of amines by the catalytic disproportionation of a feedstock containing a primary amine to produce a reaction product containing a secondary amine wherein a feed stock containing an aliphatic primary amine is contacted with hydrogen in the presence of a hydrogenation catalyst under conditions for effecting disproportionation of said primary amine to produce said secondary amine, the improvement which comprises:

- disproportionating a feedstock consisting essentially of an aliphatic primary monoamine having from 2 to 10 carbon atoms; and
- utilizing a catalyst comprising cobalt or nickel in combination with at least one other metal selected from the group consisting of rhodium, palladium, ruthenium or platinum.

5,567,848

### ALKYNE HYDROSILATION USING CYCLOALKADIENE-PLATINUM COMPLEX AS CATALYST

Aroop K. Roy, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jan. 16, 1996, Ser. No. 599,425

Int. Cl.<sup>6</sup> C07F 7/08

U.S. Cl. 512—479

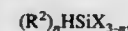
20 Claims

1. A process for hydrosilation of an alkyne, the process comprising: contacting at a temperature within a range of about 40° C. to 150° C. an alkyne described by formula



where  $R^1$  is selected from a group consisting of hydrogen

atom and alkyls comprising one to about ten carbon atoms; with a hydrosilane described by formula



where each  $R^2$  is independently selected from a group consisting of alkyls comprising one to about 20 carbon atoms and aryls, each  $X$  is an independently selected halogen, and  $n=0$  to 3; in the presence of a platinum catalyst consisting essentially of a cycloalkadiene-platinum complex described by formula  $PtR^3_2$  or  $Pt(R^3)_2X_2$ , where  $R^3$  is a cycloalkadiene comprising about six to 20 carbon atoms and  $X$  is as previously described.

5,567,849

### NOVEL BORANE-SULFIDE HYDROBORATION AGENTS

Herbert C. Brown, West Lafayette, Ind., assignor to Aldrich Chemical Company, Inc., Milwaukee, Wis.

Filed May 9, 1995, Ser. No. 437,582

Int. Cl.<sup>6</sup> C07F 5/02; C01B 6/10

U.S. Cl. 568—6

13 Claims

1. A borane-sulfide represented by the formula



wherein  $B$  is boron,  $H$  is hydrogen,  $R^1$  is a straight or branched chain alkyl or alkoxy group having from 1 to 5 carbon atoms,  $R^2$  is a straight or branched chain alkyl or alkoxy group having from 1 to 5 carbon atoms with the limitation that at least one  $R$  group must be a C3–C5 branched chain alkyl when the other is straight chain alkyl, and  $S$  is sulfur.

5,567,850

### METHOD FOR MAKING ACYL SUBSTITUTED RESORCINOLS

James E. Pickett, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 8, 1994, Ser. No. 336,135

Int. Cl.<sup>6</sup> C07C 45/45

U.S. Cl. 568—322

12 Claims

1. A method for making acyl substituted resorcinols, said method comprises the step of contacting:

- resorcinols;
- acid halides; and
- a catalytic amount of transition metal Lewis acids, wherein said catalytic amount is about 0.1 to about 50.0 mole percent of said transition metal Lewis acids based on total moles of resorcinol employed.

5,567,851

### CYCLOHEXENE DIOL DERIVATIVES

Setichi Takano, and Kunio Ogasawara, both of Sendai, Japan, assignors to Chisso Corporation, Osaka, Japan

Division of Ser. No. 251,260, May 31, 1994, Pat. No.

5,442,098. This application May 24, 1995, Ser. No. 448,665

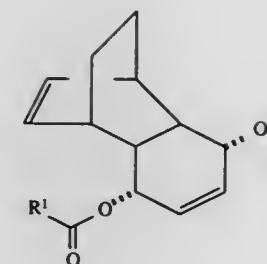
Claims priority, application Japan, May 31, 1993, 5-149822

Int. Cl.<sup>6</sup> C07C 45/41

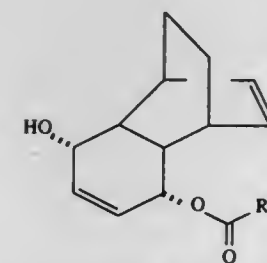
U.S. Cl. 568—354

12 Claims

1. A process for producing an optically active cyclohexene diol derivative represented by the general formula (1) or (1')

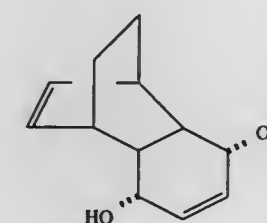


(1)



(1')

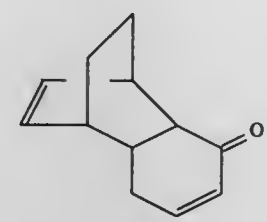
where  $R'$  is alkyl, comprising reacting by selectively positioning transesterification a cyclohexene diol as a starting material represented by the formula:



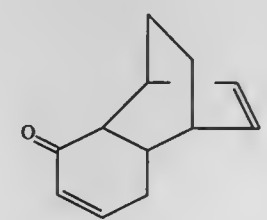
(3)

with an acylating agent in the presence of lipase, and obtaining the said optically active cyclohexene diol derivative.

2. A process for producing an optically active cyclohexanone derivative represented by the formula



(2)



(2')

comprising the step of converting the optically active cyclohexene diol derivative of claim 1, represented by formula (1) or (1'), to said optically active cyclohexanone derivative of formula (2) and (2') in the presence of a palladium complex as catalyst.



5,567,852

# INTERMEDIATES FOR THE PREPARATION OF VITAMIN A AND CAROTENOIDS AND PROCESS FOR THEIR PREPARATION

Hugues Bienayme, Lyon, and Pierre Meilland, Chaponost, both of France, assignors to Rhone-Poulenc Nutrition Animale, Antony, France

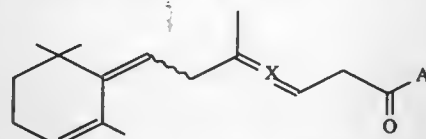
Filed Oct. 7, 1994, Ser. No. 320,185

Claims priority, application France, Oct. 7, 1993, 93 11944  
Int. Cl.<sup>6</sup> C07C 49/21

U.S. Cl. 568—378

2 Claims

1. A compound corresponding to the formula (II):



in which A represents a hydrogen or an alkyl, alkenyl or alkoxy group (unit), each containing 1 to 4 carbon atoms and in which X represents a carbon atom.

5,567,853

# PURIFICATION OF ACETONE

Vijai P. Gupta, Berwyn, Pa., assignor to Arco Chemical Technology, L.P., Greenville, Del.

Filed Feb. 17, 1995, Ser. No. 526,151

Int. Cl.<sup>6</sup> C07C 49/04

U.S. Cl. 568—411

7 Claims

1. The method for the separation of methanol and aldehyde impurities from acetone which comprises contacting the impure acetone with a solution of a catalytic amount of a sodium or potassium compound in ethylene glycol or propylene glycol at conditions of elevated temperature effective to polymerize the aldehyde impurities, separating the polymerized aldehyde impurities by distillation from an acetone and methanol mixture, and separating purified acetone from the methanol by extractive distillation using the said glycol as extractive distillation solvent.

5,567,854

# PROCESS FOR SEPARATING MIXTURES OF NITROBENZALDEHYDE ISOMERS

Wolfram Kissener, Neunkirchen; Herbert Emde, Köln, and Achim Fessenbecker, Heidelberg, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sep. 22, 1995, Ser. No. 532,513

Claims priority, application Germany, Sep. 29, 1994, 44 34 848.7

Int. Cl.<sup>6</sup> C07C 45/82

U.S. Cl. 568—424

7 Claims

1. A process for separating mixtures of nitrobenzaldehyde isomers, which comprises to distill mixtures of nitrobenzaldehyde isomers at bottom temperatures of at most 200° C. in the presence of one or more members of the group consisting of monomeric aromatic amines, polymeric aromatic amines, phenols and N- and S-containing phenothiazines.

5,567,855

# METHODS FOR STEREOSPECIFIC SYNTHESIS OF POLYENE AIDENYDES

Steven K. White; Chan K. Hwang, and David T. Winn, all of San Diego, Calif., assignors to Ligand Pharmaceuticals Incorporated, San Diego, Calif.

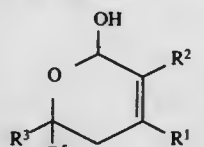
Continuation-in-part of Ser. No. 52,040, Apr. 21, 1996, abandoned. This application Apr. 21, 1994, Ser. No. 230,939

Int. Cl.<sup>6</sup> C07C 45/47

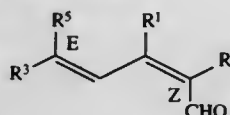
U.S. Cl. 568—449

4 Claims

1. A method for producing a cis-olefin, comprising: combining a lactol of the formula



with acid and solvent reactants; heating said reactants; and quenching and separating the predominant resulting aldehyde product having the formula



wherein R<sup>1</sup> represents a lower or branched alkyl having 1-12 carbons, or phenyl, and can be methyl only if R<sup>2</sup> is a hydrogen or a lower alkyl having 1-8 carbons,

R<sup>2</sup> represents hydrogen, a lower alkyl having 1-8 carbons, or halogen, or R<sup>1</sup> and R<sup>2</sup> taken together form a phenyl, cyclohexyl, or cyclopentyl ring,

R<sup>3</sup> represents a lower alkyl having 1-8 carbons, polyene compounds of the formula R<sup>1</sup>-CH=CH-C(R<sup>1</sup>)=CH-(E or Z orientation), cycloalkyl, or aryl, and

R<sup>3</sup> represents hydrogen, a lower alkyl having 1-8 carbons, or halogen.

5,567,856

# SYNTHESIS OF AND HYDROFORMYLATION WITH FLUORO-SUBSTITUTED BIDENTATEPHOSPHINE LIGANDS

Jerry D. Unruh; Brigitte E. Segmüller; Gabriel R. Chapa, all of Corpus Christi, and Kent E. Pryor, Houston, all of Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

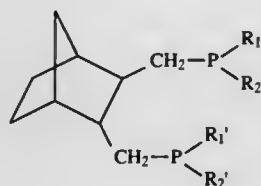
Filed May 30, 1995, Ser. No. 453,283

Int. Cl.<sup>6</sup> C07C 45/49; 45/50

U.S. Cl. 568—454

19 Claims

1. A process for the hydroformylation of an ethylenically unsaturated compound having from 2-25 carbon atoms with hydrogen and carbon monoxide in a liquid phase reaction zone to produce an aldehyde derivative of said ethylenically-unsaturated compound, comprising hydroformylating said compound in the presence of rhodium in complex combination with a bidentate ligand of the formula:



wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>1</sub>' and R<sub>2</sub>' are organic radicals selected from alicyclic, aliphatic and aromatic groups of which at least one

is substituted with at least one electronegative moiety and wherein the methylene groups are present at the trans-2,3 positions on the norbornane moiety.

5,567,857

# FLUOROALKYLETHOXYLATE COMPOSITIONS HAVING ENHANCED WATER SOLUBILITY

Hsu-Nan Huang, Newark, and Robert A. Halling, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

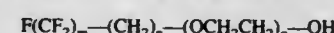
Filed Jun. 21, 1994, Ser. No. 263,091

Int. Cl.<sup>6</sup> C07C 43/11

U.S. Cl. 568—615

11 Claims

1. An improved composition comprising a mixture of fluoroalkylethoxylates having the general formula:



wherein

F(CF<sub>2</sub>)<sub>m</sub>— is a linear perfluoroalkyl group;

m is an integer in the range between 2 and about 20;

n is an integer in the range between 1 and 3; and

p is an integer in the range between 1 and about 40;

wherein the improvement comprises solubility in water at a concentration of at least 40% by weight without formation of sediment, by the presence of at least 5 weight percent of molecules in which m is 8 or higher or mixtures of the same, but in no more than 5 weight percent of the molecules is m equal to 14 or higher or mixtures of the same, and the distribution of molecules in said mixture has an average p in the range of between 8 and 17.

5,567,858

# PROPENYL ETHER MONOMERS FOR PHOTOPOLYMERIZATION

James V. Crivello, Clifton Park, N.Y., assignor to Rensselaer Polytechnic Institute, Troy, N.Y.

Division of Ser. No. 232,507, Apr. 25, 1994, Pat. No. 5,486,545, which is a division of Ser. No. 988,214, Dec. 9, 1992, abandoned. This application Dec. 12, 1995, Ser. No. 571,200

Int. Cl.<sup>6</sup> C07C 43/11

U.S. Cl. 568—616

4 Claims

1. A compound of formula



wherein p is an integer from two to twenty.

5,567,859

# POLYOXYPROPYLENE/POLYOXYETHYLENE COPOLYMERS WITH IMPROVED BIOLOGICAL ACTIVITY

R. Martin Emanuele, Alpharetta; Mannarsamy Balasubramanian, Roswell, and Hameedsulthan S. Allaudeen, Alpharetta, all of Ga., assignors to CytRx Corporation, Norcross, Ga. Continuation-in-part of Ser. No. 87,136, Jul. 2, 1993, Pat. No. 5,523,492, which is a continuation of Ser. No. 847,874, Mar. 13, 1992, abandoned, which is a continuation-in-part of Ser. No. 673,289, Mar. 19, 1991, abandoned. This application Aug. 9, 1994, Ser. No. 292,803

Int. Cl.<sup>6</sup> C07C 43/11

U.S. Cl. 568—624

12 Claims

1. A polyoxypropylene/polyoxyethylene block copolymer comprising the formula:



wherein "a" is an integer such that the molecular weight of the hydrophobe (C<sub>3</sub>H<sub>6</sub>O) is between approximately 1,200 to 15,000

Daltons and "b" is an integer such that the percentage of the hydrophile (C<sub>2</sub>H<sub>4</sub>O) is between approximately 1% and 50% by weight of the total molecular weight of the copolymer and such that the polydispersity value of the copolymer is less than approximately 1.17.

5,567,860

# HIGH PURITY TERTIARY OLEFIN PROCESS USING REMOVAL OF SECONDARY ETHERS

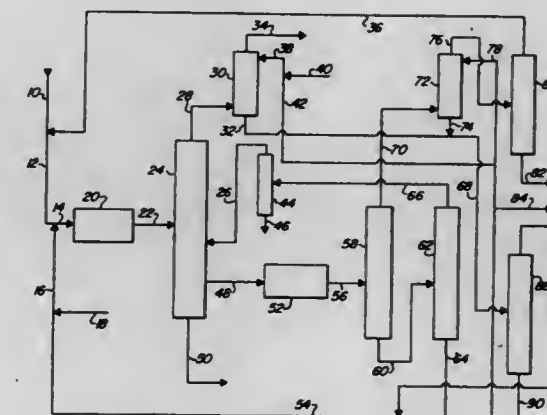
John R. Mowry, Mount Prospect, Ill.; Jacqueline A. Harris, Ash, England; Charles P. Luebke, Mount Prospect, and David A. Hamm, Hinsdale, both of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 928,584, Aug. 13, 1992, abandoned. This application Oct. 4, 1994, Ser. No. 317,947

Int. Cl.<sup>6</sup> C07C 1/00; 41/00

U.S. Cl. 585—639

27 Claims



1. A process for producing R<sub>2</sub>-isoolefins, where R<sub>2</sub> is one of a C<sub>4</sub> and a C<sub>5</sub> alkyl group, from a feed stream comprising R<sub>1</sub>-O-tertiary-R<sub>2</sub> and R<sub>1</sub>-O-secondary-R<sub>2</sub>, where R<sub>1</sub> is an alkyl group comprising from 1 to 5 carbon atoms, which process comprises the steps of:

(a) passing a feed stream comprising an R<sub>1</sub>-O-tertiary-R<sub>2</sub> and an R<sub>1</sub>-O-secondary-R<sub>2</sub> and having a first ratio of R<sub>1</sub>-O-tertiary-R<sub>2</sub>/R<sub>1</sub>-O-secondary-R<sub>2</sub> into a decomposition zone maintained at decomposition conditions effective to decompose said R<sub>1</sub>-O-tertiary-R<sub>2</sub> to an R<sub>2</sub>-isoolefin corresponding to said R<sub>2</sub> and recovering therefrom a decomposition effluent stream comprising said R<sub>2</sub>-isoolefin and said R<sub>1</sub>-O-secondary-R<sub>2</sub>;

(b) passing at least a portion of said decomposition effluent stream into a first separation zone operated at conditions effective to separate said portion of said decomposition effluent stream into a product stream comprising said R<sub>2</sub>-isoolefin and a first recycle stream comprising said R<sub>1</sub>-O-secondary-R<sub>2</sub>;

(c) passing at least a portion of said first recycle stream having a second ratio of R<sub>1</sub>-O-tertiary-R<sub>2</sub>/R<sub>1</sub>-O-secondary-R<sub>2</sub> that is less than said first ratio into a second separation zone operated at conditions effective to selectively separate said portion of said first recycle stream into a drag stream having a first concentration of said R<sub>1</sub>-O-secondary-R<sub>2</sub> and a second recycle stream having a second concentration of said R<sub>1</sub>-O-secondary-R<sub>2</sub> that is less than said first concentration;

(d) recycling at least a portion of said second recycle stream to said decomposition zone; and

(e) withdrawing said drag stream from said process.

5,567,861

## INBRED CORN LINE PHN46

William S. Niebur, Victor, France, assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Continuation of Ser. No. 542,353, Jun. 20, 1990, abandoned.

This application Aug. 3, 1993, Ser. No. 101,808

Int. Cl.<sup>6</sup> A01H 5/00; 4/00; C12N 5/04

U.S. Cl. 800—200

8 Claims

1. Inbred corn seed designated PHN46, having the ATCC Accession No. 97133.

5,567,862

## SYNTHETIC INSECTICIDAL CRYSTAL PROTEIN GENE

Michael J. Adang; Thomas A. Rocheleau; Donald J. Merlo, and Elizabeth E. Murray, all of Madison, Wis., assignors to Mycogen Plant Sciences, Inc., San Diego, Calif.

Division of Ser. No. 57,191, May 3, 1993, Pat. No. 5,380,831,

which is a continuation of Ser. No. 827,844, Jan. 28, 1992,

abandoned, which is a continuation-in-part of Ser. No.

242,482, Sep. 9, 1988, abandoned, which is a continuation-in-

part of Ser. No. 848,733, Apr. 4, 1986, abandoned, which is a

continuation-in-part of Ser. No. 535,354, Sep. 24, 1983, aban-

doned. This application Jan. 6, 1995, Ser. No. 369,839

Int. Cl.<sup>6</sup> A01H 4/00; C12N 5/14; 15/32

U.S. Cl. 800—205

24 Claims

1. A plant cell comprising a heterologous modified structural gene derived from a *Bacillus thuringiensis* gene encoding a pesticidal protein toxin, said plant cell produced by the steps of

(a) analyzing the coding sequence of a gene derived from a *Bacillus thuringiensis* which encodes a pesticidal protein toxin;

(b) a portion of said coding sequence to yield a modified structural gene which contains a greater number of codons preferred by said plant cell than did said coding sequence prior to modification, said modification comprising reducing the number of codons having CG in codon positions II and III in a region between plant polyadenylation signals in said coding sequence;

(c) inserting said modified structural gene into the genome of a plant cell; and

(d) maintaining said plant cell under conditions suitable to allow replication of said plant cell to produce additional plant cells having said modified structural gene the genome of said additional plant cells, wherein said modified structural gene is expressed to produce a pesticidal protein toxin.

13. A plant cell comprising a heterologous modified structural gene derived from a *Bacillus thuringiensis* gene encoding a pesticidal protein toxin, said plant cell produced by the steps of

(a) analyzing the coding sequence of a gene derived from a *Bacillus thuringiensis* which encodes a pesticidal protein toxin;

(b) modifying a portion of said codon sequence to yield a modified structural gene which contains a greater number of codons preferred by said plant cell than did said coding sequence prior to modification, and wherein said modification results in fewer occurrences of the sequence AATGAA in said modified structural gene than in said coding sequence;

(c) inserting said modified structural gene into the genome of a plant cell; and

(d) maintaining said plant cell under conditions suitable to allow replication of said plant cell to produce additional plant cells having said modified structural gene in the genome of said additional plant cells, wherein said modified structural gene is expressed to produce a pesticidal protein toxin.

## ELECTRICAL

5,567,863

## INTENSITY ACOUSTIC CALIBRATOR

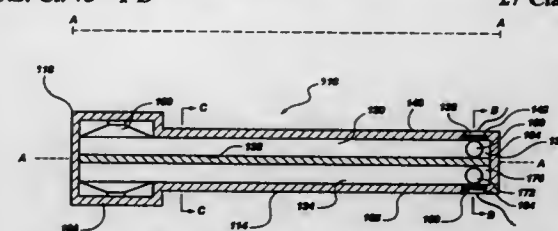
Brian G. Larson, and Larry J. Davis, both of Provo, Utah, assignors to Larson-Davis, Inc., Provo, Utah

Filed May 15, 1995, Ser. No. 440,640

Int. Cl.<sup>6</sup> G01L 27/00

U.S. Cl. 73—1 D

27 Claims



1. An intensity acoustic calibrator for testing microphones, comprising:

housing means having at least first and second wave guide channels formed therein and receiving means formed in the housing means adjacent each wave guide channel for holding at least two test acoustic transducers such that at least one acoustic transducer is in acoustic communication with the first wave guide channel, and isolated from the second wave guide channel, and such that another acoustic transducer is in acoustic communication with the second wave guide channel;

acoustic transmitter means disposed at the housing means for emitting sound so as to develop at least one standing wave pattern within each of the first and second wave guide channels; and

control means in communication with said acoustic transmitter means for enabling a user to select magnitude and phase differentials emitted by the acoustic transmitter means into the first and second wave guide channels, respectively.

5,567,864

## METHOD AND APPARATUS FOR CALIBRATION OF A TRANSDUCER FLYING HEIGHT MEASUREMENT INSTRUMENT

Warren P. Coon, Poway; Stuart C. Watkins, and Charles M. Kropp, both of San Diego, all of Calif., assignors to Sunward Technologies, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 412,036, Apr. 12, 1995, which is a continuation of Ser. No. 13,682, Feb. 4, 1993, abandoned.

This application Jun. 22, 1994, Ser. No. 263,999

Int. Cl.<sup>6</sup> G01B 21/30

U.S. Cl. 73—1 J

13 Claims

1. A method for calibrating a flying height measurement instrument having a measurement disk, using a calibration slider having a dominant surface having at least three support structures apart sufficiently to support the calibration slider of the flying height measurement instrument, including the steps of:

(a) measuring the height of the each support structure of a calibration slider;

(b) installing a first calibration slider into the flying height measurement instrument;

(c) placing the first calibration slider on the measurement disk;

(d) measuring the distance between the dominant surface of the calibration slider and the surface of the measuring disk of the flying height measurement instrument;

(e) replacing the first calibration slider with a second calibration slider;

(f) measuring the distance between the dominant surface of the second calibration slider and the measurement disk;

(g) generating a map such that for a plurality of values output by the flying height measurement instrument during a dynamic measurement of a conventional slider, there is a corresponding value that is essentially equal to an actual distance between the conventional slider and the measurement disk.

5,567,865

## METHOD FOR DETERMINING THE SIZE OF AIRBORNE WATER DROPLETS

Thomas Hauf, Seefeld, Germany, assignor to Deutsche Forschungsanstalt für Luft- und Raumfahrt e.V., Köln, Germany

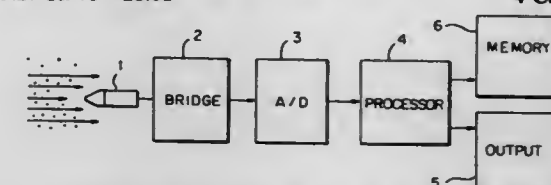
Filed Sep. 14, 1995, Ser. No. 528,494

Claims priority, application Germany, Sep. 14, 1994, 44 32 714.5

Int. Cl.<sup>6</sup> G01N 37/00

U.S. Cl. 73—28.01

4 Claims



1. A method for determining the size of airborne water droplets having a diameter in the range from 1 to 100  $\mu\text{m}$  and a velocity of from 50 to 150 m/s relative to a measurement probe, using the measurement probe, an operating device with an integrated A/D converter, and a signal processor; the method comprising the following steps:

(a) providing a flat platinum film approximately 0.5  $\mu\text{m}$  thick, vapor-deposited onto a quartz disk and orienting a film-bearing face of the disk to an oncoming water-droplet-bearing air flow axially perpendicular to the film-bearing face, the disk being integrated into a probe body of the measurement probe on a flow-facing front face of the probe body oriented toward impacting water droplets of the flow, the film having an area smaller than 1  $\text{mm}^2$ ;

keeping a temperature of the film constant at a temperature above 100° C. by means of a bridge circuit in the operating device with a regulating frequency of more than 200 kHz;

(b) digitizing an analog voltage output signal of the bridge circuit over predetermined measuring time intervals by means of the A/D converter at a selected frequency from 0.1 to 1 MHz and

further processing the digitized output signal of the bridge circuit by means of a computer program of the signal processor, which program:

(i) recognizes a signal of an individual impacting droplet and distinguishes the signal of the droplet from signal fluctuations caused by air-flow velocity fluctuations;

(ii) also identifies the signal of a droplet, even if the signal of the droplet that impacted previously has not yet decayed to a baseline value; and

(iii) for each droplet signal, calculates the area below the squared voltage signal as the electrical energy consumed in vaporizing the droplet, and from that determines the droplet mass, the electrical energy being equivalent to the requisite quantity of heat supplied to the droplet for heating it to boiling temperature and then completely evaporating it.

5,567,866

## SIDE LOAD TESTER

Victor A. Popp, Hingham, Mass., assignor to Instron Corporation, Canton, Mass.

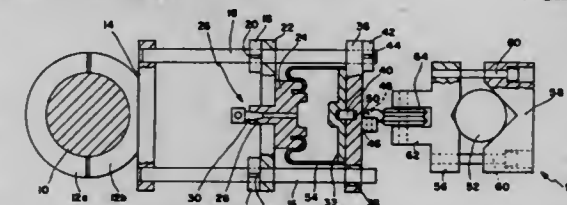
Continuation of Ser. No. 916,341, Jul. 17, 1992, abandoned.

This application Oct. 18, 1994, Ser. No. 324,627

Int. Cl.<sup>6</sup> G01N 3/00

U.S. Cl. 73—11.09

7 Claims



1. A tester for applying a predetermined side load to a device under test which comprises:



a mount for positioning said tester against movement, a first plate immovably connected with said mount, a movable second plate for reciprocal movement relative to said first plate along first line of direction, an air actuator therebetween for selectively moving said second plate relative to said first plate, said actuator including a stationary member, a movable member, and an elastomeric air bag therebetween, and grip for holding said device facilitating reciprocal movement of said grip and said device along a second line of direction, said second plate being slidably mounted on columns fixedly mounted in said first plate, and said air bag through said second plate causing continued maintenance of said predetermined side load on said device during said movement of said grip and said device along said second direction.

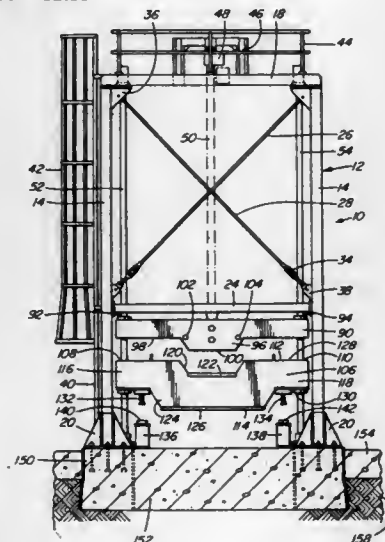
5,567,867

# **DROP WEIGHT TYPE IMPACT TESTING MACHINE** Ladislao M. Nazar, 9511 Florimond Road, Richmond, British Columbia, Canada

Filed Aug. 4, 1995, Ser. No. 511,437  
Int. Cl.<sup>6</sup> G01M 7/00

U.S. Cl. 73—12.13

4 Claims



1. An impact testing apparatus, comprising: a main frame; spaced-apart vertical guide columns mounted on the main frame; an impact hammer beam slidably mounted on the guide columns; a hoist near the top of the main frame; a lifting beam guidably mounted on the guide columns above the impact hammer beam and operatively connectable to the hoist, one said beam being selectively engageable with a second said beam, whereby the lifting beam can raise the impact hammer beam; and a safety catch releasably interconnecting the beams and an actuator operatively connected to the catch.

5,567,868

## **PLANAR MANIFOLD ASSEMBLY**

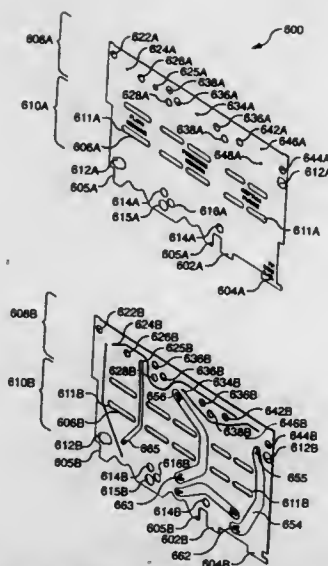
Stephen R. Craig; Paul B. Welsh, both of Wilmington, Del., and Robert C. Henderson, Avondale, Pa., assignors to Hewlett-Packard Company, Legal Department, Palo Alto, Calif.

Filed Jan. 23, 1995, Ser. No. 376,614  
Int. Cl.<sup>6</sup> G01N 30/04

U.S. Cl. 73—23.42

10 Claims

1. A planar manifold assembly constructed for use in performing a plurality of fluid-handling functions with respect to a fluid flow in a selected portion of an analytical instrument, comprising:



- a planar manifold including first and second plates, each of said plates having inner and outer surfaces, said first plate having a first plurality of pneumatic channels located in its respective inner surface, and a third plate having first and second surfaces respectively bonded to portions of the inner surfaces of the first and second plates, respectively, wherein the second surface of the third plate further comprises a second plurality of pneumatic channels, said outer surfaces forming respective first and second planar manifold outer surfaces, and selected ones of said pneumatic channels communicating with selected ones of the first and second planar manifold outer surfaces at respective manifold ports;
- a plurality of fluid-handling functional devices for performing respective fluid-handling functions, each of the fluid-handling functional devices having a device port; and means for surface mounting the device port to a selected one of the manifold ports so as to effect a fluid-tight connection between the device port and the selected manifold port; wherein said plurality of fluid-handling functions is performed according to a predetermined configuration of the fluid-handling devices, the pneumatic channels, and the manifold ports.

5,567,869

## **METHOD AND APPARATUS FOR QUANTITATION OF RELEVANT BLOOD PARAMETERS**

Ole Hauch, Hellerup; Jens B. Knudsen, Farum, and Thomas M. Plum, Skodsborg, all of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

PCT No. PCT/DK92/00382, § 371 Date Aug. 3, 1994, § 102(e) Date Aug. 3, 1994, PCT Pub. No. WO93/12422, PCT Pub. Date Jun. 24, 1993

PCT Filed Dec. 18, 1992, Ser. No. 244,966

Claims priority, application Denmark, Dec. 19, 1991, 2031/91 Int. Cl.<sup>6</sup> G01N 21/00; 33/49; 33/86

U.S. Cl. 73—64.410

19 Claims

1. A method for quantitation of blood parameters, said blood parameters being coagulation time, sedimentation rate, hemocrit, fibrinogen concentration, platelet related coagulation activity, activity of the fibrinolytic system of the blood, rate of fibrinogen degeneration, amount of fibrin, and original fibrinogen concentration, comprising the following steps:
  - (a) providing a sample of plasma, serum or whole blood;
  - (b) entering the sample into a cuvette with an internal dimension less than 1 mm;
  - (c) illuminating the sample by a light source;
  - (d) measuring and recording the changes of light properties caused by the sample as a function of time to obtain a light signal versus time curve;

5,567,871

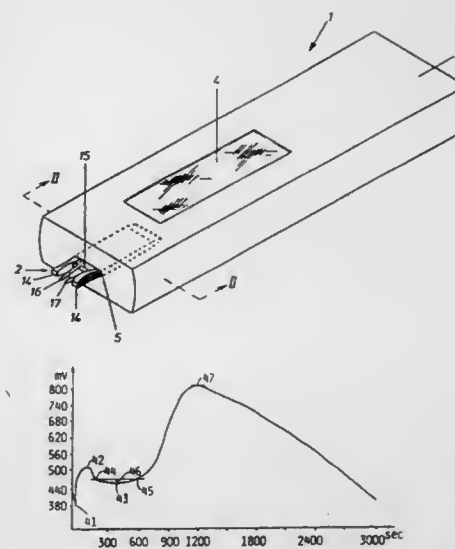
## **PROCEDURE AND APPARATUS FOR CHECKING THE STATE OF DEGRADATION OF WOODEN STRUCTURES, ESPECIALLY POLES**

Jean-Luc Sandoz, 23 avenue de la Gare, 1022 Chavannes Sur Renens - Suisse, France

Filed Apr. 5, 1995, Ser. No. 416,620  
Int. Cl.<sup>6</sup> G01N 3/00

U.S. Cl. 73—85

8 Claims



- (e) calculating parameters of the recorded light signal/time curve; and
- (f) interpreting the parameters as blood parameters.

5,567,870

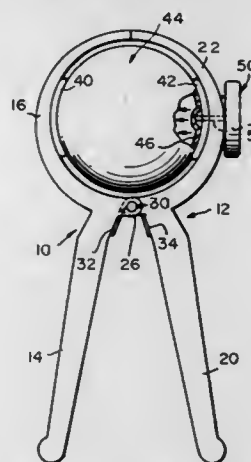
## **BALL TESTER**

William P. Harris, 112 Marble Canyon Dr., Folsom, Calif. 95630

Filed May 19, 1995, Ser. No. 446,110  
Int. Cl.<sup>6</sup> G01N 3/48

U.S. Cl. 73—81

5 Claims



1. A ball pressure and playing condition tester comprising a pair of arms pivotally interconnected with one another, each of said arms including a hand grip portion and a ball clamping portion, said hand grip portions being movable toward and away from one another, said clamping portions being movable toward and away from one another, ball support members carried by each of said clamping portions at an intermediate portion thereof and having facing surfaces supporting and centering a ball within the tester, said clamping portions extending from said intermediate portions toward one another and terminating in end surfaces which are engageable with one another to positively limit movement of said clamping portions toward one another and to position said ball support members so that the distance between said facing surfaces is substantially equal to the outer diameter of a ball to be tested thereby ensuring uniform clamping pressure on a ball clamped between said clamping portions, and pressure measuring means supported by one of said arms and including ball engaging means for engaging a ball, said measuring means providing an indication of the pressure of a ball clamped between said ball support members.

5,567,872

## **SCANNING ATOMIC FORCE MICROSCOPE**

Masafumi Kyogaku, and Kiyoshi Takimoto, both of Atsugi, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1995, Ser. No. 399,521

Claims priority, application Japan, Mar. 8, 1994, 6-036735 Int. Cl.<sup>6</sup> G01B 5/28

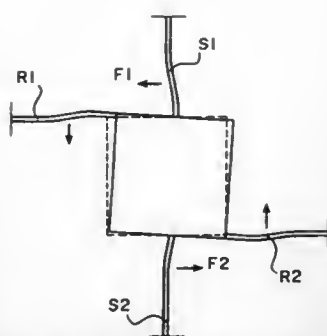
U.S. Cl. 73—105

6 Claims

1. A scanning atomic force microscope, which comprises: a probe which is arranged in the vicinity of a sample surface to oppose the sample surface; support means for supporting said probe; moving means for moving said probe relative to the sample; and signal detection means for detecting a signal corresponding to a structure of the sample surface obtained by said probe, and in which said signal detection means comprises a laser beam oscillation element for oscillating a laser beam, and a laser beam receiving unit for receiving the laser beam which is emitted from said laser beam oscillation element and is reflected by said support means, comprising:
  - laser beam output means having a function of controlling said laser beam oscillation element to discontinuously emit the laser beam,
  - wherein said laser beam output means controls said laser beam oscillation element to emit the laser beam in synchronism with a timing at which said probe is located on a predetermined measurement point on the sample surface or a measurement region.







a seismic mass comprising a plate whose main plane comprises the first and second directions (x and y, respectively) and is movable laterally in its plane;

two hanging legs between the frame and the mass, said legs being rigid along the third direction and flexible along the first direction;

two resonator beams extending between the frame and the mass along the first direction;

wherein:

the hanging legs extend substantially along the second direction, each one of said legs being directed toward the center of gravity of the mass and extending symmetrically with respect to said center of gravity; and

the resonator beams are parallel, but non collinear, and are symmetrical with respect to the center of gravity of the mass.

5,567,880

## SEMICONDUCTOR ACCELEROMETER

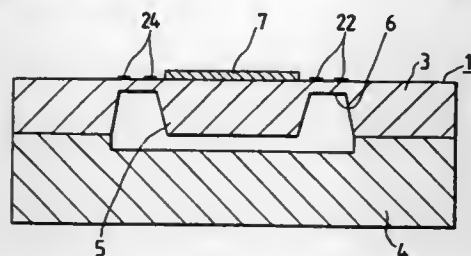
Yoshihiro Yokota; Shotaro Naito; Toshihiko Suzuki, all of Katsuta, and Akira Koide, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 14, 1993, Ser. No. 60,832

Claims priority, application Japan, May 15, 1992, 4-123220  
Int. Cl.<sup>6</sup> G01P 15/08

U.S. Cl. 73—514.33

5 Claims



1. A semiconductor accelerometer comprising:

a mass portion formed at a center of a silicon plate having two major surfaces;

a frame portion formed around the circumference of the silicon plate so as to surround said mass portion;

a diaphragm portion formed in the silicon plate between said mass portion and said frame portion so as to bridge said mass portion with said frame portion, one of said two major surfaces of the silicon plate serving as a common planar major surface for said mass portion, said frame portion and said diaphragm portion;

piezoresistance elements formed on the common planar major surface at said diaphragm portion;

an additional metal film having a higher density than that of the silicon plate formed on said mass portion on the other of said two major surfaces of said silicon plate, said additional metal film and said further additional metal film constituting

a further additional metal film having a higher density than that of the silicon plate formed on said mass portion on the other of said two major surfaces of said silicon plate, said additional metal film and said further additional metal film constituting

in combination with said mass portion of the silicon plate a weight which responds to an acceleration acting thereon, and the mass of said additional metal film and said further additional film being selected in such a manner that the center of gravity of the weight is located within an area in said mass portion having a depth corresponding to the thickness of said diaphragm portion and defined by an extension of said diaphragm portion.

5,567,881

## METHOD AND APPARATUS FOR INSPECTING A STRUCTURAL PART HAVING SURFACE IRREGULARITIES

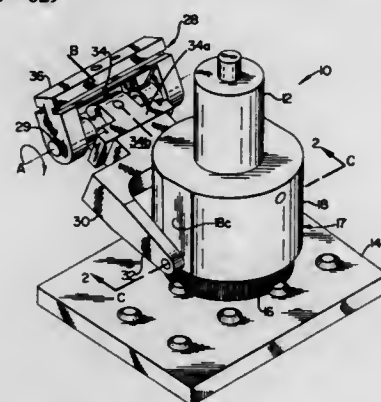
Eugene A. Myers, St. Charles, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed May 5, 1995, Ser. No. 485,580

Int. Cl.<sup>6</sup> G01N 24/00; 29/00

U.S. Cl. 73—629

13 Claims



1. An inspection apparatus comprising:

a sensor housing defining an internal cavity opening through a first end of said sensor housing;

a sensor disposed at least partially within the internal cavity of said sensor housing for inspecting the surface of a structural part and for acquiring signals that indicate the presence of defects in the part;

a plurality of compliant fibers extending outwardly from the first end of said sensor housing and circumferentially about the opening defined by the first end of said sensor housing such that said sensor can transmit signals to and receive signals from the surface of the structural part independent of said plurality of compliant fibers, wherein each compliant fiber extends from a first end to an opposed second end, and wherein said plurality of compliant fibers have a predetermined compressive stiffness and a predetermined bending stiffness;

a sensor housing support assembly, operably connected to said sensor housing, for independently positioning said sensor housing in at least two mutually perpendicular directions such that parts having a compound curvature may be inspected, wherein said sensor housing support assembly comprises biasing means for urging said sensor housing in the direction of the surface of the part such that the respective second ends of said plurality of compliant fibers contact the surface of the part, wherein the predetermined compressive stiffness of said plurality of compliant fibers is sufficient to support said sensor housing above the surface of the part such that said sensor remains in a predetermined position relative to the surface of the part, and wherein the predetermined bending stiffness of said plurality of compliant fibers is sufficient to permit said compliant fibers to flex laterally to accommodate obstructions on the surface of the part while maintaining said sensor in the predetermined position relative to the surface of the part such that accurate signals which indicate the presence of defects in the part are acquired by said sensor.

5,567,882

## PRESSURE SENSOR USING A FIELD EMISSION COLD CATHODE

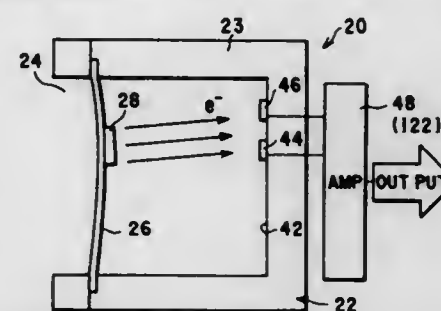
Kouichi Ichimura, Yokohama; Masayuki Nakamoto, Chigasaki; Masao Obama, Yokosuka, and Hiroshi Masumoto, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 11, 1995, Ser. No. 526,699

Claims priority, application Japan, Sep. 16, 1994, 6-222158  
Int. Cl.<sup>6</sup> G01L 9/00

U.S. Cl. 73—717

11 Claims



1. A pressure sensor comprising:

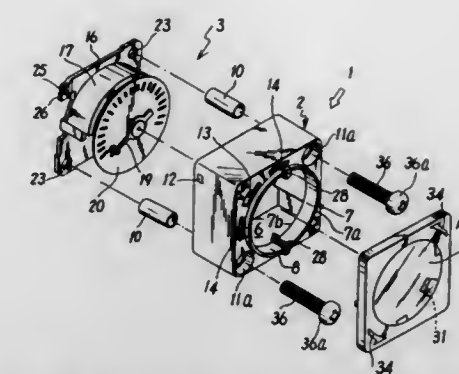
an air-tight vacuum chamber having a pressure-reception diaphragm which is deformable by pressure and to which pressure of an object to be measured is applied;

a field emission cold cathode device provided on said pressure-reception diaphragm within said air-tight vacuum chamber and having emitter electrodes for emitting electrons in a beam direction and gate electrodes for drawing out electrons from said emitter electrodes;

first and second anode electrodes arranged to face said field emission cold cathode device within said air-tight vacuum chamber;

an amplifier connected to said first and second anode electrodes and amplifying a variation in difference between electron amounts respectively flowing through said first and second anode electrodes from said emitter electrodes; and  
a transducer for converting an output from said amplifier into a signal representing pressure.

wherein said emitter electrodes and said first and second anode electrodes are arranged such that when the pressure of the object is applied to said pressure-reception diaphragm the beam direction is changed by a deformation of said pressure-reception diaphragm, and causes the variation in difference between electron amounts respectively flowing through said first and second anode electrodes from said emitter electrodes.



ment, wherein a screw insertion hole receiving said mounting screw penetrates said case in a front-to-back direction, a counterbore receiving a head of the mounting screw is formed on a front end of the screw insertion hole, and the counterbore is covered by said front cover;

wherein arcuate shaped mounting holes having a narrower width portion and a wider width portion are provided at a plurality of points outside the window hole on the front surface of the case;

engaging pieces engaging with and being locked in the mounting holes are provided at positions corresponding to said mounting hole on the case wherein, upon engaging said engaging pieces in the mounting holes and locking said engaging pieces at said narrower width portion, the cover is mounted on the case; and

said cover is provided with an indicating unit indicating a direction of rotation permitting one of removal of and insertion of said cover on said case, said indicating unit being integrally molded and comprising plastic wherein said front cover includes a transparent portion and said indicating unit includes an opaque portion, said indicating unit being positioned so as to correspond to the counterbore of the screw insertion hole and wherein the head of the mounting screw is positioned in the counterbore so as to form a background for the indicating unit when viewing said indicating unit and assists in reading the indicating unit.

5,567,884

## CIRCUIT BOARD ASSEMBLY TORSION TESTER AND METHOD

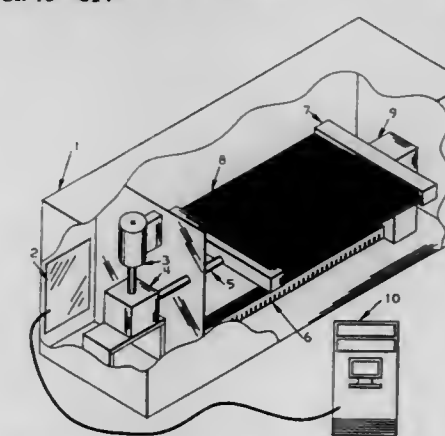
Gerard T. Dickinson, Owego, N.Y.; James L. McGinniss, Jr., Friendsville, Pa.; Ronald F. Tokarz, Maine, N.Y., and Aleksander Zubelewicz, Binghamton, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 9, 1994, Ser. No. 208,774

Int. Cl.<sup>6</sup> G01N 3/20

U.S. Cl. 73—814

40 Claims



1. A machine for testing circuit boards comprising:

5,567,883

## BOURDON TUBE PRESSURE GAUGE HAVING A REMOVABLE COVER

Yuki Nara, Yawara-mura, Japan, assignor to SMC Corporation, Tokyo, Japan

Filed Aug. 10, 1995, Ser. No. 512,787

Claims priority, application Japan, Aug. 25, 1994, 6-224310  
Int. Cl.<sup>6</sup> G01L 7/04

U.S. Cl. 73—741

2 Claims

1. A Bourdon tube pressure gauge, comprising:

an internal device having a dial plate; said internal device converting deformation of a Bourdon tube deformed by fluid pressure into movement of an indicating needle and indicating the deformation on said dial plate,

a window hole having a rear surface thereof opened permitting viewing of the dial plate,

a case within which said internal device is accommodated, a front cover removably mounted on a front surface of the case and having at least a transparent portion corresponding with said window hole,

a back cover covering the rear surface of the case, and at least one mounting screw fixing said case to fluid pressure equip-

fixturing means to hold two opposite edges of a circuit board along the length of each such edge;  
motor means to rotate the fixturing means to twist the circuit board to induct cyclic torsion stress in the circuit board; and  
automatic control means to regulate the motor for providing predetermined torsion cycles.

5,567,885

## MEASURING FLUID FLOW RATE

Robert M. Garside, Cumbria, England, assignor to British Nuclear Fuels PLC, England

PCT No. PCT/GB94/01021, § 371 Date Mar. 1, 1995, § 102(e)  
Date Mar. 1, 1995, PCT Pub. No. WO94/27118, PCT Pub.  
Date Nov. 24, 1994

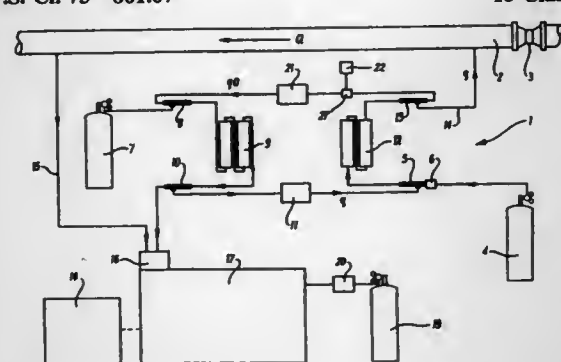
PCT Filed May 12, 1994, Ser. No. 362,599

Claims priority, application United Kingdom, May 12, 1993,  
9309720

Int. Cl.<sup>6</sup> G01F 1/704

U.S. Cl. 73—861.07

13 Claims



1. A method of measuring the flow rate of a fluid stream, the method comprising the steps of injecting a tracer gas into a gas stream having a pre-determined substantially constant flow rate during a measurement period, introducing the resulting tracer stock gas stream into the fluid stream at said substantially constant flow rate, obtaining a sample of said fluid stream at a location downstream of the point at which the tracer stock gas stream is introduced and measuring the relative concentration of the tracer stock gas in the fluid stream sample, the method further including the steps of extracting a sample of said tracer stock gas stream at a location upstream of the point at which the tracer stock gas stream is introduced into the fluid stream, injecting said extracted tracer stock gas stream sample at a flow rate which can be varied into the gas stream to form a tracer stock gas sample-in-gas stream, obtaining a sample of said tracer stock gas sample-in-gas stream at a location downstream of the point at which the tracer stock gas stream sample is injected, measuring the relative concentration of the tracer stock gas stream sample in the tracer stock gas sample-in-gas stream and adjusting the flow rate of the extracted tracer stock gas stream sample so as to equalize the value of the two measured concentrations, whereby the conditions, necessary to equalize the concentration values correspond to the flow rate of the fluid stream.

5,567,886  
HYDRAULIC IMPULSE SCREWDRIVER  
PARTICULARLY FOR TIGHTENING SCREW  
CONNECTIONS

Konrad K. Kettner, Aalen-Hofherrnweller, Germany, assignor to Cooper Industries, Inc., Houston, Tex.

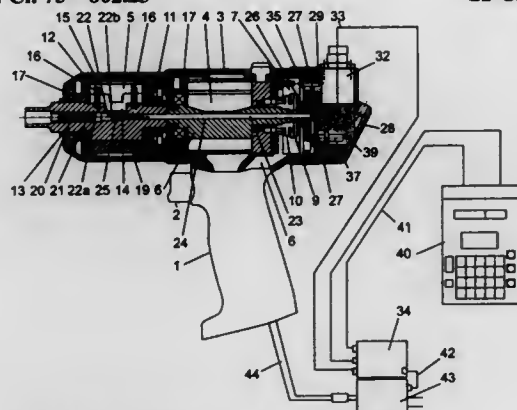
Filed Aug. 17, 1995, Ser. No. 516,327

Claims priority, application Germany, Aug. 18, 1994, 44 29  
282.1

Int. Cl.<sup>6</sup> G02L 5/24

U.S. Cl. 73—862.23

22 Claims



1. A hydraulic impulse screwdriver, comprising:
  - a control circuit,
  - a drive shaft,
  - a compressed-air motor having a motor shaft, a compressed air inlet, and an outlet,
  - a striker having a pressurizing cylinder chamber, said striker connected to the outlet of the compressed-air motor for impulse-like driving of the drive shaft,
  - a shut-off device for torque-dependent interruption of the compressed-air inlet to the compressed-air motor, the shutoff device including a servoelement seated in the motor shaft of the compressed-air motor and forming a pressure-carrying link between the pressurizing cylinder chamber of the striker and the shut-off device, by which a torque-related signal is fed to the control circuit, which control circuit interrupts the compressed-air inlet to the compressed-air motor when a specified torque limit value is reached,
  - a bending bar in the shut-off device that is arranged in cooperation with said servoelement, the bending bar being provided with a transducer to determine a bending moment dependent on an impulse pressure in the striker pressurizing cylinder chamber, and
  - an electronic evaluation unit for comparing the bending moment with the specified torque limit value so that the shut-off device is operated when said specified torque limit value is reached.

5,567,887

ANHYDROUS AMMONIA GAS SAMPLER AND  
CONCENTRATION SYSTEM

Anthony J. Schleisman, Plano, and David S. Bollinger, Grapevine, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

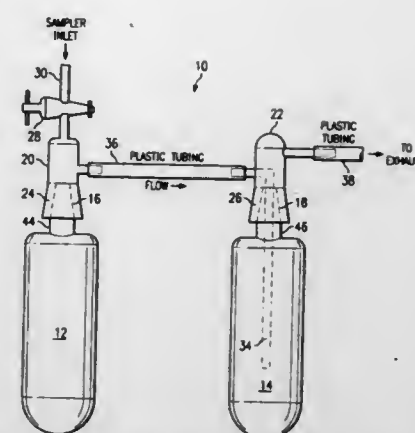
Continuation of Ser. No. 209,028, Mar. 10, 1994. This application  
Jul. 31, 1995, Ser. No. 509,213

Int. Cl.<sup>6</sup> B01D 7/00

U.S. Cl. 73—863.12

20 Claims

1. A method of separating contaminants from ammonia for analysis of the contamination of the ammonia, comprising the steps of:
  - injecting ammonia into a container subject to atmospheric pressure and having a temperature sufficiently low to solidify said ammonia;
  - subjecting said container and solidified ammonia to atmospheric pressure and ambient room temperature to facilitate evaporation of said ammonia; and



venting said evaporated ammonia from said container, said contaminants remaining in said container.

5,567,888

## SAMPLING DEVICE

Timothy Boyle, c/o Lintec Marketing 6 Headland Road, Castle Cove, New South Wales 2069, Australia, and Patrick O'Brien, Blink Bonie Lodge, Warrinya, New South Wales 2781, Australia

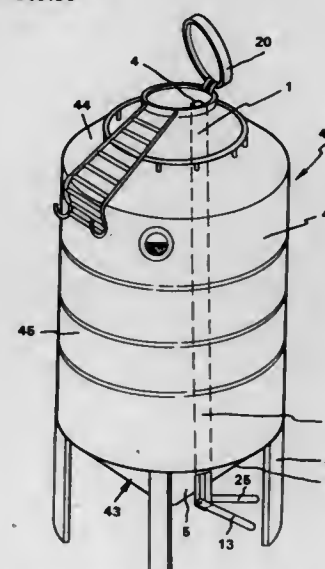
Filed Dec. 27, 1994, Ser. No. 365,600

Claims priority, application Australia, Dec. 24, 1993,  
PM3154; Jun. 16, 1994, PM6252

Int. Cl.<sup>6</sup> G01N 1/00

U.S. Cl. 73—863.86

11 Claims



1. A storage container with a device for obtaining a sample of stockpiled granular material, comprising:
  - a silo having a base and a top;
  - an elongated tubular member extending through said base and into said silo, said tubular member being provided with an array of interspaced first holes along at least one side of said tubular member, said tubular member being mounted to said silo at said base and proximately to said top;
  - an elongated plate with a plurality of interspaced second holes, said elongate plate being juxtaposed to said one side of said tubular member; and
  - manually operable shifting means operatively connected to said plate for manually shifting said plate longitudinally along said one side of said tubular member alternately to place said second holes in alignment with respective ones of said first holes to enable collection of granular samples via said tubular member from said silo and to displace said first holes relative to said second holes to prevent entry of granular material into

said tubular member from said silo, said shifting means essentially comprising a mechanical lever linkage including a moving part extending through said base and further including a manually operable lever pivoting about an anchorage, said lever being pivotally connected to said moving part and located outside said silo wherein said silo is provided at said top with a lid for covering an opening in said top, further comprising additional shifting means operatively connected to said lid and to said tubular member for enabling a manual shifting of said lid relative to said top to alternately open and close said opening.

5,567,889

LYSIMETER FOR COLLECTING CHEMICAL SAMPLES  
FROM THE VADOSE ZONE

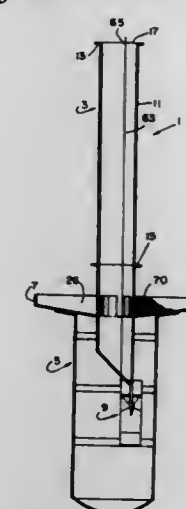
Patrick K. Sullivan; Dayananda Vithanage, and Robert E. Bourke, all of Honolulu, HI., assignors to Oceanit Laboratories, Inc., Honolulu, HI.

Division of Ser. No. 873,161, Apr. 24, 1992. This application  
Jun. 5, 1995, Ser. No. 465,560

Int. Cl.<sup>6</sup> G01N 1/20

U.S. Cl. 73—863.23

2 Claims



1. The method of installing and using a lysimeter, comprising excavating a large opening about four feet in diameter and about twelve feet deep, placing finely grained material in a bottom of the opening, placing a cylindrical collection chamber having a spherical bottom wall on the finely grained material, supporting a circular lysimeter pan having a conically shaped bottom on a sloping upper flange of the collection chamber, placing a filter pack in the lysimeter pan, mounting a sample pipe on a central tube of the lysimeter pan and extending the sample pipe to the surface, backfilling the excavated earth over the lysimeter pan around the sample pipe, inserting a sampler through the sample pipe and central tube and positioning the sampler at a lower end of the central tube, flowing water through the backfilled earth and filter pack to a wick at the bottom of the lysimeter pan, flowing water through the wick and through openings in the central tube, flowing water down along an inner wall of the central tube, collecting water in a sloped upward opening groove along an open lower sloping edge of the central tube, flowing water from the groove through a drain tube, through a funnel and into a collection flask, lowering the sampler from its position adjacent to the drain tube, disengaging the sampler from the drain tube, centering the sampler and raising the sampler through the central tube and sample pipe, measuring characteristics of the water from the flask, sterilizing the flask and replacing the flask in the sampler, lowering the sampler through the sample pipe and central tube, and positioning the sampler beneath the drain tube and closing an upper end of the sample pipe.



**5,567,890**  
**IRON-BASED POWDER COMPOSITION HAVING GOOD DIMENSIONAL STABILITY AFTER SINTERING**  
 Caroline Lindberg, and Björn Johansson, both of Höganas, Sweden, assignors to Höganas AB, Höganas, Sweden  
 PCT No. PCT/SE92/00399, § 371 Date Dec. 10, 1993, § 102(e) Date Dec. 10, 1993, PCT Pub. No. WO92/22395, PCT Pub. Date Dec. 23, 1992  
 PCT Filed Jun. 12, 1992, Ser. No. 162,101  
 Claims priority, application Sweden, Jun. 12, 1991, 9101819  
 Int. Cl.<sup>6</sup> C22C 33/00

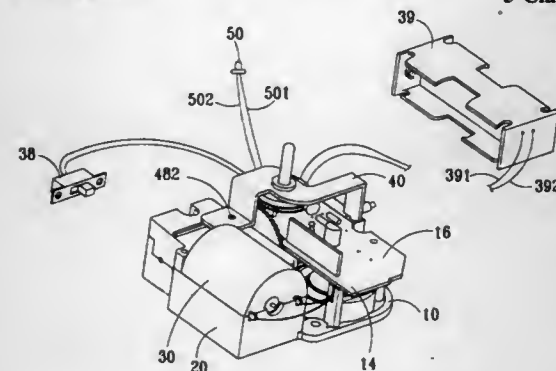
U.S. Cl. 75—243 12 Claims  
 1. A compacted and sintered iron-based powder composition which in addition to iron consists essentially of  
 0.5-4.5% by weight Ni  
 0.65-2.25% by weight Mo  
 0.35-0.65% by weight C,  
 less than about 2% by weight of impurities and optionally lubricant, wherein the powder is sintered at a temperature not greater than 1140° C. and a variation of dimensional change no greater than 0.07%, irrespective of density variations within the range of 6.8-7.2 g/cm<sup>3</sup> in the green body, is obtained during sintering.

**5,567,891**  
**RARE EARTH ELEMENT-METAL-HYDROGEN-BORON PERMANENT MAGNET**  
 Jacob G. Bogatin, Richboro, Pa., and Andrey Belov, Budapest, Hungary, assignors to YBM Technologies, Inc., Newtown, Pa.  
 Continuation of Ser. No. 191,999, Feb. 4, 1994, Pat. No. 5,454,998. This application May 8, 1995, Ser. No. 437,719  
 Int. Cl.<sup>6</sup> C22C 30/00

U.S. Cl. 75—244 5 Claims  
 1. A permanent magnet comprising, by atomic percent:  
 10-24% R;  
 2-28% boron;  
 greater than 0.3%-18.12% hydrogen; and  
 balance being M,  
 wherein R is at least one element selected from group consisting of: La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Y and Sc, and  
 wherein M is at least one metal selected from group consisting of: Fe, Co, Ni, Li, Be, Mg, As, Si, Ti, V, Cr, Mn, Cu, Zn, Ga, Ge, Zn, Nb, Mo, Ru, Rh, Pd, Ag, Sb, Te, Hf, Ta, W, Re, Os, Ir, Pt, Au, and Bi.

**5,567,892**  
**MOTOR DRIVING ELECTRONIC MUSIC BOX**  
 Lung-Hsi Huang, Taichung Hsien, Taiwan, assignor to Kyoh Precision Industry Co., Ltd., Taipei, Taiwan  
 Filed Sep. 5, 1995, Ser. No. 524,385  
 Int. Cl.<sup>6</sup> G10F 1/06

U.S. Cl. 84—95.2 5 Claims

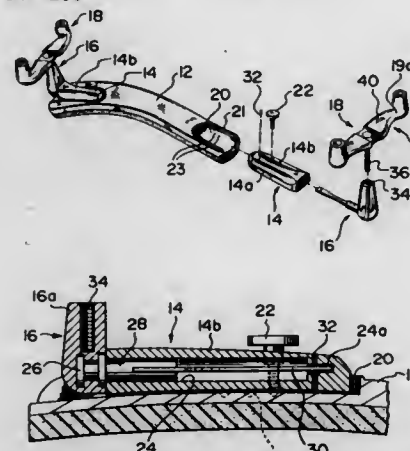


1. A motor driven electronic music box comprising;

a motor in a motor cavity between a motor base and a motor cover,  
 and a shaft end of the motor meshes with a scroll gear to drive a gear train in a gear cavity situated between the motor base and the motor cover to connect to an output shaft to provide a horizontal output;  
 one side of the motor base connects to a base, and the base includes a fixing ring with a plurality of sound holes,  
 the fixing ring has a clasp to fix a speaker;  
 the base includes several bosses to support a circuit board,  
 the circuit board is connected to the motor and the speaker.

**5,567,893**  
**SHOULDER REST FOR VIOLIN OR LIKE INSTRUMENT**  
 Michael Kun, R.R. 1, Oxford Mills, Ontario, Canada  
 Filed Oct. 31, 1995, Ser. No. 551,139  
 Int. Cl.<sup>6</sup> G10D 1/02

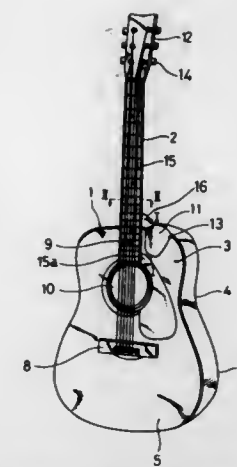
U.S. Cl. 84—280 7 Claims



5. A shoulder rest for an instrument such as a violin or viola, comprising an elongated support suitable for resting on a user's shoulder, and attachment means adjacent each end of the support for attachment to the instrument with the support spaced away from the back of the instrument, wherein at least one of said attachment means comprises:  
 a parallel guide means at one end of said support;  
 a base part movable in said guide means for longitudinal adjustment relative to said guide means, said base part having means for fixing the position of the base part relative to said support, said base part having a bore generally aligned with the support;  
 a pedestal connected to said base part by a shaft rotatable within said bore, and a clamping member carried by said pedestal and terminating in means engageable with a back portion of said instrument,  
 and wherein said shaft is fixed to the outer end of a torsion spring which spring has a second, inner, end non-rotatably held by the base part, whereby angular displacement of said support relative to said clamping member is resisted by said torsion spring.

**5,567,894**  
**STRINGED MUSICAL INSTRUMENT**  
 Shigeki Shiomi, 1-1-14 Kasugade-naka, Konohana-ku, Osaka, Japan  
 Continuation of Ser. No. 218,794, Mar. 28, 1994, abandoned.  
 This application Jul. 7, 1995, Ser. No. 501,589  
 Int. Cl.<sup>6</sup> G01D 3/00:1/08

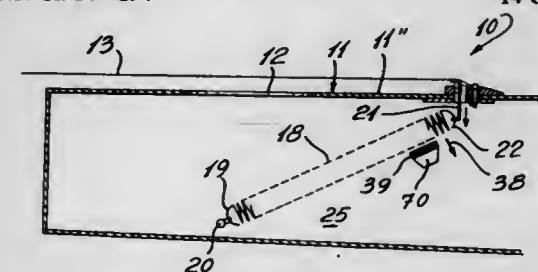
U.S. Cl. 84—291 8 Claims  
 1. A stringed musical instrument comprising a body, the body comprising an upper sounding board, a lower sounding board and a side wall for defining a resonant cavity, a neck protruding away



from the body, a plurality of strings tensioned between the body and the neck, the body having shoulders extending at substantially right angles from both sides of the neck at the point where the body intersects the neck, the body having a concave depression in a portion of the upper sounding board of the body extending at a substantially right angle from the neck, the concave depression gradually increasing in depth and width as it advances from the upper sounding board towards the side wall, and a portion of the concave depression having a depth more than half and less than two thirds of an entire depth of the side wall.

**5,567,895**  
**SOUND REVERBERATOR MOUNTED IN A SOUND BOX OF A STRING MUSICAL INSTRUMENT**  
 Roberto Aspri, 12145 de l'Acadie, Montreal, Quebec, Canada, and Claude Mauffette, 4641 Melrose, Montreal, Quebec, Canada  
 Continuation-in-part of Ser. No. 401,234, Mar. 9, 1995, abandoned. This application Jul. 12, 1995, Ser. No. 501,375  
 Int. Cl.<sup>6</sup> G10D 3/02

U.S. Cl. 84—294 14 Claims

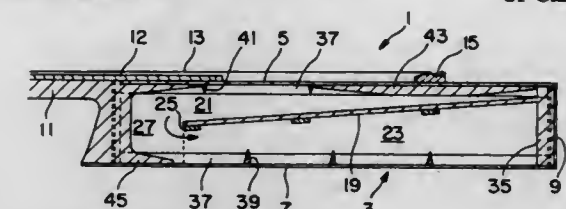


1. A sound reverberator for a string musical instrument having a sound box and strings tensioned over a saddle member of a bridge piece connected to a top wall of said sound box, said reverberator comprising one or more pre-tensioned metal springs secured internally of said sound box, a metallic transfer member secured to a free end of said springs internally of said sound box, said transfer member having string engaging means at a top end for releasably engaging said strings of said musical instrument to transfer vibrations from said strings to associated ones of said one or more metal springs to produce reverberated sounds internally of said general sound box to modify the tonality of sound generated by said sound box as a result of setting the strings in vibration.

**5,567,896**  
**STRING INSTRUMENT WITH SOUND AMPLIFICATION**  
 Peter Gottschall, Mörikestrasse 5, D-88524 Uttenweiler, Germany

Filed Jul. 13, 1995, Ser. No. 501,787  
 Claims priority, application Switzerland, Dec. 23, 1994, 03913/94; Jun. 2, 1995, 01619/95  
 Int. Cl.<sup>6</sup> G10D 3/02

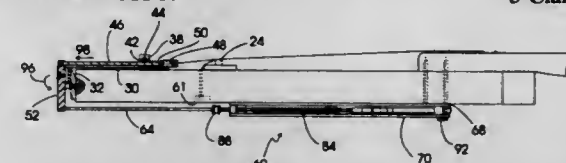
U.S. Cl. 84—294 21 Claims



1. A musical string instrument, comprising:  
 means defining a resonator comprising belly means and back means connected by side means and provided with at least one sound hole;  
 means for supporting at least one string adapted to be vibrated;  
 means for transmitting vibrations induced in said string to said resonator; and  
 amplifier means comprising a single substantially planar member mounted in said resonator to extend at a downward inclination relative to said belly means to divide said resonator into two chambers and having a substantially free edge for forming connecting passage means between said two chambers.

**5,567,897**  
**GUITAR PULL STRING DEVICE**  
 Paul A. McEwen, 111 Belle Glen Dr., Nashville, Tenn. 37221  
 Filed Jan. 16, 1996, Ser. No. 587,415  
 Int. Cl.<sup>6</sup> G10D 3/14

U.S. Cl. 84—312 R 3 Claims



1. A string tension adjustment mechanism for a stringed musical instrument having a body with opposing ends, a bout at one end of said body and a neck attached to the other end of said body by screws and strings extending from a point adjacent said bout over said body to said neck, said mechanism including means attached to a string of the instrument for holding said string at one level of tension when said string tension adjustment mechanism is in an at rest mode and for applying additional tension to said string when said string tension adjustment mechanism is activated, means for moving said string holding means between said at rest position and said activated position, said instrument having a strap post screwed into the bout of the instrument, a shoulder strap connected to said instrument, said moving means being actuated by a force applied to said shoulder strap, said string tension adjustment mechanism including a bout mounted mechanism and a back mounted mechanism, said bout mounted mechanism attached to the bout of the instrument by the screw holding the strap post to the instrument and the back mounted mechanism being attached to the instrument by the screws mounting the neck of the instrument to the body of the instrument.

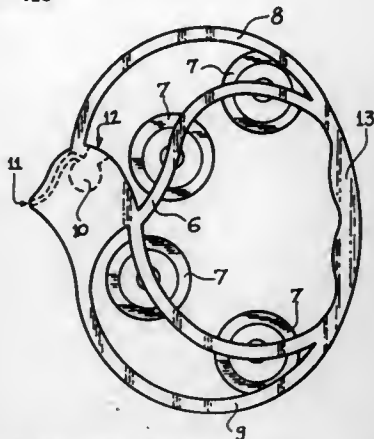
5,567,898

**WHISTLE AND TAMBOURINE COMBINATION**  
Efraim Shalev, Laurel Canyon Annex, North Hollywood, Calif.  
91605

Filed Jan. 30, 1995, Ser. No. 380,395  
Int. Cl.<sup>6</sup> G10D 13/02

U.S. Cl. 84—418

1 Claim



1. A musical instrument comprising:  
a tambourine body supporting a plurality of jingle members inside of a protective frame member such that the edges of said jingles are not exposed outside of said frame member, said frame member having a built-in whistle including an entrance hole and an exit hole such that when air is blown into said whistle member a whistling sound is produced.

5,567,899

**BEATER ROTARY SHAFT ARRANGEMENT FOR DUAL DRUM PEDAL**

Yoshiki Hoshino, Aichi-ken, Japan, assignor to Hoshino Gakki Co., Ltd., Japan

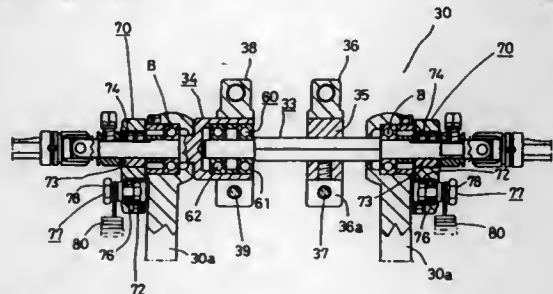
Filed Apr. 28, 1995, Ser. No. 430,494

Claims priority, application Japan, Jan. 18, 1995, 7-000567 U

Int. Cl.<sup>6</sup> G10D 13/02

U.S. Cl. 84—422.1

11 Claims



1. Dual drum pedals, comprising:  
a first shaft support;  
a first rotary shaft supported for rotation at the first support;  
a first pedal;  
first means connecting the first pedal to the first rotary shaft for rotating the first rotary shaft in a first direction upon operation of the pedal;  
a first rotary beater supported on the first shaft for being swung from a position away from a drum head to a position to beat the drum head when the first pedal is operated to operate the first rotary shaft to rotate in a first direction;  
a second shaft support;  
a second rotary shaft supported for rotation at the second support;  
a second pedal;  
second means connecting the second pedal to the second rotary shaft for rotating the second rotary shaft in a second direction upon operation of the pedal;

a second beater supported on the second rotary shaft for being swung from a position away from a drum head to a position to beat the drum head when the second pedal is operated to operate the second rotary shaft to rotate in the second direction;

the first rotary shaft including a first end with a bearing disposed therein;

the second rotary shaft including a second end received in the bearing of the first shaft for the bearing to link the first and second rotary shafts, while permitting the first and second rotary shafts to rotate independently of each other for moving the respective beaters against the drum head.

5,567,900

**ELECTRONIC TONE GENERATOR SYSTEM WITH CPU AND DSP**

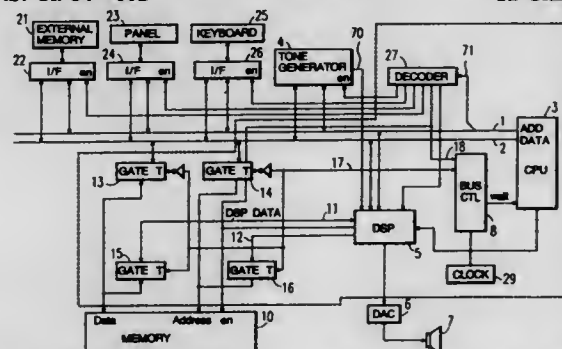
Iwao Higashi, Shimonoseki, Japan, assignor to Yamaha Corporation, Japan

Filed Jun. 10, 1994, Ser. No. 257,929

Claims priority, application Japan, Jun. 15, 1993, 5-143160 Int. Cl.<sup>6</sup> G10H 1/18

U.S. Cl. 84—602

12 Claims



1. A tone signal control system for controlling a tone signal supplied from a tone generator, the system comprising:  
a central processing unit for executing a computational and control operation in accordance with an externally stored program;  
a digital signal processor for executing a computational and control operation in accordance with an internally stored program;  
a memory accessible by both said central processing unit and said digital signal processor, said central processing unit and said digital signal processor generating an access signal to access said memory; and  
access control means for controlling access by said central processing unit and said digital signal processor to said memory, said access control means giving an access priority to said digital signal processor when said access signal by said central processing unit and said access signal by said digital signal processor are generated at the same time.

5,567,901

**METHOD AND APPARATUS FOR CHANGING THE TIMBRE AND/OR PITCH OF AUDIO SIGNALS**

Brian C. Gibson; Christopher M. Jublen, and Brian J. Roden, all of Victoria, Canada, assignors to IVL Technologies Ltd., Victoria, Canada

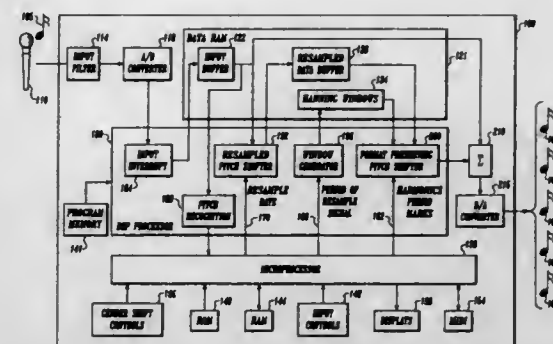
Filed Jan. 18, 1995, Ser. No. 374,110

Int. Cl.<sup>6</sup> G10H 7/00

U.S. Cl. 84—603

30 Claims

1. A method of creating a timbre shifted output signal from an input signal, comprising the steps of:  
receiving a digital representation of an input signal that has been sampled at a first rate and resampling the digital representation of the input signal at a second rate that differs from the first rate; and



creating a digital representation of the timbre shifted output signal by periodically extracting a segment of the resampled input signal and replicating the extracted segments at a rate equal to a fundamental frequency of the output signal.

changed, and via said second threshold the velocity of the key and the user's finger as distance between said light detector and said key varies.

5,567,903

**TRANSDUCER ASSEMBLY FOR A STRINGED MUSICAL INSTRUMENT**

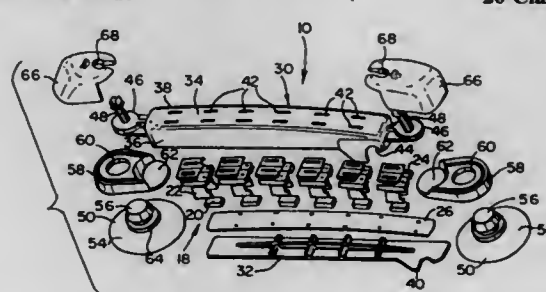
Jonathan Coopersmith, Philadelphia; Nathaniel Weiss, Merion Station, both of Pa., and Henry Madden, Modesto, Calif., assignors to Lyrrus Incorporated, Philadelphia, Pa.

Continuation-in-part of Ser. No. 168,267, Dec. 14, 1993, Pat. No. 5,408,911, which is a division of Ser. No. 664,208, Mar. 4, 1991, Pat. No. 5,270,475. This application Jan. 19, 1995, Ser. No. 375,017

Int. Cl.<sup>6</sup> G10H 3/08

U.S. Cl. 84—723

26 Claims



1. A transducer assembly for use with a stringed instrument having a plurality of strings, the transducer assembly for detecting and converting string vibrations into electrical signals representative of the string vibrations, comprising:

an elongate housing;  
a plurality of transducers for detecting vibrations of each of the strings individually and converting respective string vibrations into corresponding electrical signals, wherein the plurality of transducers are located within the housing;  
at least one coupling member;  
a quick connect device coupled to the housing with the at least one coupling member for quickly connecting and disconnecting the housing only to a surface of the instrument proximate the strings, wherein the quick connect device comprises at least one suction cup and the coupling member includes a circular opening for receiving a head of the at least one suction cup and securing the suction cup thereto, and upon attachment, the surface of the instrument remains free of any indications related to the quick connect device; and  
means for interfacing the electrical signals with an electronic device.

5,567,902

**METHOD AND APPARATUS FOR OPTICALLY SENSING THE POSITION AND VELOCITY OF PIANO KEYS**

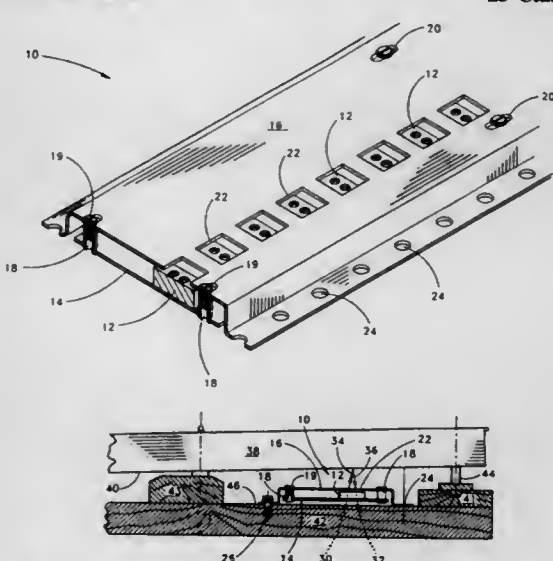
Thomas E. Kimble, and David R. Wade, both of Cincinnati, Ohio, assignors to Baldwin Piano and Organ Company, Loveland, Ohio

Filed Jan. 6, 1995, Ser. No. 369,882

Int. Cl.<sup>6</sup> G10H 1/02; H03K 17/94

U.S. Cl. 84—658

25 Claims



21. A method of determining the position and velocity of an electronic keyboard musical instrument key, comprising the steps of:

(a) providing a key having an upper tactile surface, said key being movable by a human user's finger pressing against said tactile surface in a substantially vertical direction, said key having a bottom surface including a substantially flat region;  
(b) emitting optical energy from a light source positioned beneath said key, said optical energy being aimed at said substantially flat region on the key's bottom surface, and at least a portion of said optical energy being reflected from said substantially flat region;  
(c) detecting said reflected optical energy via a light detector positioned beneath said key, and producing an analog electrical signal related to a distance between said light detector and the substantially flat region of said key; and  
(d) receiving said electrical signal produced by said light detector via an electrical circuit, and determining the moment of time when said electrical signal crosses both a first and a second threshold, thereby determining via said first threshold when the distance between said light detector and said key has

5,567,904

Patent Not Issued For This Number

5,567,905

**GAS GENERANT COMPOSITIONS CONTAINING D 1-TARTARIC ACID**

Michael W. Barnes; Thomas M. Deppert, both of Brigham City, and Robert D. Taylor, Hyrum, all of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Jan. 30, 1996, Ser. No. 594,079

Int. Cl.<sup>6</sup> C06B 45/12; 29/08

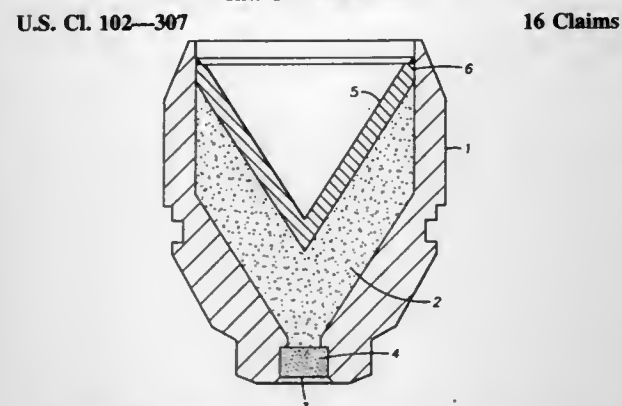
U.S. Cl. 102—289

3 Claims

1. In a gas generant composition comprising fuel and oxidizer, at least about 10 wt % of said fuel comprising tartaric acid, the improvement wherein said tartaric acid is d,l-tartaric acid.

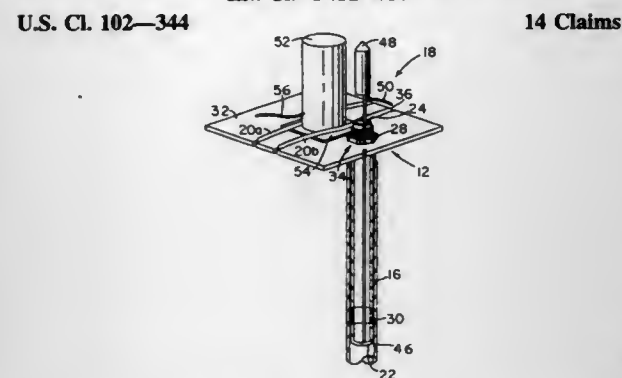


**5,567,906**  
**TUNGSTEN ENHANCED LINER FOR A SHAPED**  
**CHARGE**  
**James W. Reese, Sugar Land, and Terry L. Slagle, Houston,**  
**both of Tex., assignors to Western Atlas International, Inc.,**  
**Houston, Tex.**  
**Continuation-in-part of Ser. No. 442,186, May 15, 1995. This**  
**application Jun. 30, 1995, Ser. No. 497,259**  
**Int. Cl.<sup>6</sup> F42B 1/02**



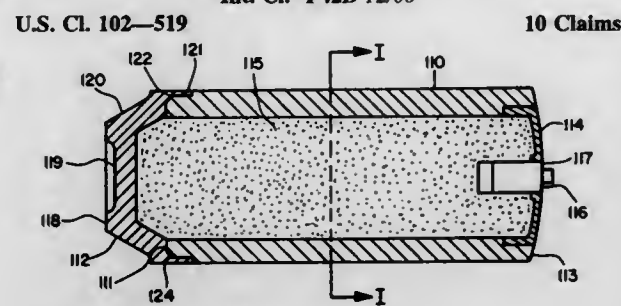
1. A liner for a shaped charge comprising:  
a mixture of powdered tungsten and powdered metal binder including approximately 80 percent by weight of said tungsten and approximately 20 percent by weight of said binder, said binder comprising a malleable, ductile metal selected from the group consisting of lead, bismuth, silver, gold, tin, uranium, antimony, zinc, cobalt and nickel, said mixture compressively formed into a substantially conically shaped rigid body.

5,567,907  
FIREWORKS SUPPORT APPARATUS  
Thomas C. Westfall, 518 Ohio, Kansas City, Kans. 66101  
Filed Aug. 22, 1994, Ser. No. 293,306  
Int. Cl.<sup>6</sup> F42B 4/26



1. A fireworks support apparatus comprising:  
a fireworks support assembly including a support structure having a fireworks support face;  
means for positioning said support face above a support level;  
and  
at least one elastomeric band positioned adjacent said support face in a spanning relationship with at least a portion of said support face, said band being configured for retaining at least one pyrotechnic device between said band and support face while elastomerically stretched.

5,567,908  
ADVANCED ANTI SHIP PENETRATOR WARHEAD  
Melvin J. Mc Cubbin; James A. Weeks, both of Ridgecrest,  
Calif., and Paul A. Miles, Sterling, Va., assignors to The  
United of America as represented by the Secretary of the  
Navy, Washington, D.C.  
Filed Apr. 25, 1980, Ser. No. 146,849  
Int. Cl.<sup>6</sup> F42B 12/00



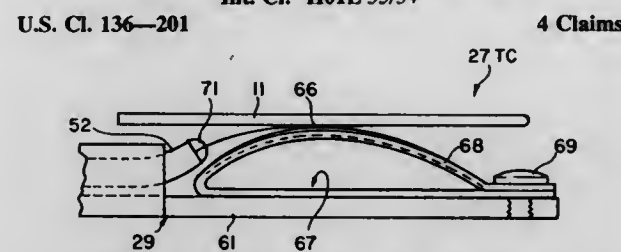
1. An anti-ship warhead comprising:  
a reactive casing having a forward end and an aft end;  
a prehardened steel penetrator of a cup-like design having a flat, frontal surface that has a shallow indentation of a predetermined size at the center thereof fixedly attached to said forward end of said casing;  
an end plate fixedly attached to said aft end of said casing;  
an explosive located inside said casing; and  
a fuze fixedly attached to said end plate, whereupon impact with a predesignated target said opening means simultaneously opens and tears an entry through the walls of the target and said fuze detonates said explosive and said reactive case generating an increased static peak pressure and impulse over conventional warheads.

5,567,909

METHOD FOR SUPPORTING A WAFER IN A  
COMBINED WAFER SUPPORT AND TEMPERATURE  
MONITORING DEVICE

Shannon J. Kelsey, Los Gatos; Robert J. Steger, Cupertino, all of Calif.; Robert J. Steger, Cupertino, and Shannon J. Kelsey, Los Gatos, assignors to Applied Materials Inc., Santa Clara, Calif.

Division of Ser. No. 664,578, Mar. 4, 1991, Pat. No. 5,356,486.  
 This application Sep. 20, 1994, Ser. No. 309,305  
 Int. Cl.<sup>6</sup> H01L 35/34



1. A method for supporting a semiconductor wafer in a combined wafer support and thermocouple assembly, the method comprising the steps of:

- placing a thermocouple, which has a thermocouple junction, on a support member of low mass and low heat constant, the support member being part of one of a plurality of support fingers in a wafer support basket;
- placing a wafer on the wafer support basket, and thereby compressing the thermocouple junction between the wafer and the support member, whereby good thermal connection is made for accurate wafer temperature measurement; and
- shielding the thermocouple junction, with the support member, from any radiation emanating from a position beneath the wafer.

OCTOBER 22, 1996

ELECTRICAL

2835

**5,567,910**  
**COATING FOR AMMONIUM NITRATE PRILLS**  
**Arun K. Chattopadhyay, Brossard, Canada, assignor to ICI**  
**Canada Inc., McMasterville, Canada**  
**Filed May 25, 1994, Ser. No. 248,643**  
**Int. Cl.<sup>6</sup> C06B 45/18**

**U.S. Cl. 149—3** **16 Claims**

1. A coating for ammonium nitrate pills comprised of metal ions selected from the group consisting of alkalis, alkaline earths, aluminum, zinc or some combination thereof, combined with stearic acid in stoichiometric ratios to make a stearic salt wherein said salt is in combination with a dispersing agent consisting of stearamide, distearamide, and a combination thereof wherein said salt comprises from about 1 to 80 weight percent of said coating.

5,567,911  
PARTICULATE EXPLOSIVE, MANUFACTURING  
METHOD AND USE  
Gunnar Ekman, Nora, Sweden, assignor to Nitro Nobel AB,  
Nora, Sweden  
Filed Dec. 15, 1994, Ser. No. 356,678  
Claims priority, application Sweden, Dec. 16, 1993, 93041747  
Int. Cl.<sup>6</sup> C06B 31/28

U.S. Cl. 149—446 17 Claims

1. Explosive in granulated or particulate form, wherein the major part of the granules comprises an emulsion having a continuous fuel phase and a discontinuous oxidizer phase containing oxidizing salts, and wherein the fuel phase is soft or deformable upon compaction so as to enable compaction in the absence of any substantial destruction of said emulsion structure, at least a part of the oxidizing salts in the discontinuous phase is present in a solid crystalline or amorphous form, the surfaces of said granules are at least partially covered by dry crystals of said oxidizing salts of said discontinuous phase that are capable of inhibiting agglomeration of adjacent granules prior to charging, and the amount of emulsion containing granules in the explosive is above 90 percent by weight.

5,567,912

**INSENSITIVE ENERGETIC COMPOSITIONS, AND RELATED ARTICLES AND SYSTEMS AND PROCESSES**

Thelma G. Manning, Montville; Joseph Turci, Long Valley, both of N.J.; Mark J. Mezger, Mt. Bethel, Pa., and Bernard Strauss, Rockaway, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 983,954, Dec. 1, 1992, abandoned. This application Oct. 11, 1994, Ser. No. 322,863

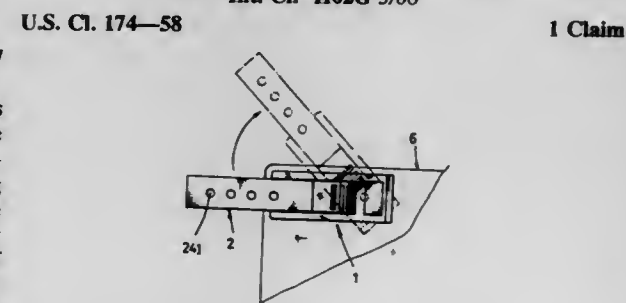
U.S. Cl. 149—12 2 Claims

[illegible]

1. An insensitive energetic composition for use as an explosive in munitions, said composition being clusters of coated powder where the powder is a crystalline heterocyclic nitramine and the coating is a combination of a normally solid cellulose acetate ester and at least one member selected from alkyl nitrate nitramine and

a liquid alkyl nitrate ester, and where: (a) the crystalline heterocyclic nitramine is HMX or RDX and is the principal energetic filler in the composition and is present in about 85 to about 87% by weight, (b) the acetate ester functions as a nonenergetic binder and the nitramine and the nitrate ester function as energetic plasticizers, and (c) the nitro nitramine and nitrate ester are selected from the group of Methyl Nena, Ethyl Nena, metriol trinitrate, diethylene glycol dinitrate, triethylene glycol-dinitrate and mixtures thereof and are present in an amount sufficient to provide a glass transition temperature of less than minus 45 degrees Centigrade ( $-45^{\circ}\text{C}.$ ).

**5,567,913**  
**ELECTRICAL BOX MOUNTING STAND**  
Chung-I Lin, 3F., No. 3, Alley 33, Lane 422, Ming-Tsu Rd.,  
Lu-Chou Hsiang, Taipei Hsien, Taiwan  
Filed Apr. 14, 1994, Ser. No. 227,255  
Int. Cl.<sup>6</sup> H02G 3/08



1. An electrical box mounting stand comprising:  
an electrical box with a bottom, and a base frame made of a substantially rectangular shape fastened to said bottom of said electrical box; said base frame having a middle, a top surface, a bottom surface, and first and second ends; a pivot hole having a side wall arranged in said middle of said base frame two half-round grooves bilaterally disposed within said pivot hole, a locating rib transversely raised from said side wall of said pivot hole, a longitudinal bottom recess at said flint end of said base frame and linked to said pivot hole, a bottom block extending at a fight angle from said bottom surface at said second end of said base frame, a circular post upstanding from said top surface at said second end for plugging into a corresponding pin hole on a bottom surface of said electrical box for permitting said base frame to be turned about said pin hole, and a through hole extending through said top surface at said first end for receiving a tie screw threaded into said bottom surface of said electrical box for affixing said base frame to said electrical box,

a leg having an elongated body and a transverse pivot at a first end of said elongated body, said pivot received in said pivot hole of said base frame and pivoting between said half-round grooves, said elongated leg body having a second end extending out of said base flame through said pivot hole, said leg further having a side and a transverse notch arranged at said side between said pivot and said elongated leg body, said transverse pivot having a plurality of parallel slots into which said locating rib engages alternatively, said elongated leg body including a series of mounting holes for fastening said electrical box to and spacing said electrical box from a supporting wall,

wherein said leg can be alternatively set in a vertical position permitting said transverse notch to be engaged with said bottom block or a horizontal position permitting said elongated body to be received in said bottom recess.

5,567,914

**SPLICE CLOSURE WITH ANIMAL PROTECTION**

Joe T. Minarovic, and Kenneth D. Rebers, both of Austin, Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 30, 1994, Ser. No. 315,551

Int. Cl.<sup>6</sup> H05K 5/03

U.S. Cl. 174—93

10 Claims



1. An article for providing environmental protection to a cable splice, the article comprising:

a body member having a hollow inner portion, a wall, and at least one cable entrance providing access to said inner portion;

means for sealing said cable entrance; and

a layer of abrasive material applied to a portion of said wall of said body member, said layer of abrasive material having a hardness of at least 3.0 Mohs and a thickness of at least 50 microns, and including a mesh substrate having a coating of said abrasive material, said mesh substrate having a maximum spacing of four square centimeters.

5,567,915

Patent Not Issued For This Number

5,567,916

**GROMMET**

John J. Napiorkowski, Irving, Tex.; Walter K. Butler, III, Sebago, Me.; Mark P. Cote, Springvale, Me., and Thomas W. Kroll, Portland, Me., assignors to Siecor Corporation, Hickory, N.C.

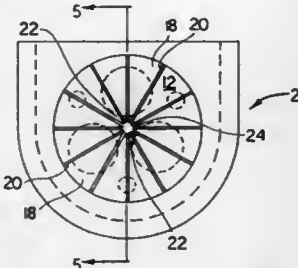
Continuation of Ser. No. 74,601, Jun. 11, 1993, abandoned.

This application Mar. 13, 1995, Ser. No. 402,808

Int. Cl.<sup>6</sup> H01B 17/26; B65D 55/00

U.S. Cl. 174—153 G

1 Claim



1. A grommet comprising an outer peripheral section and a central section, said central section comprising a first surface having a first pattern comprising a plurality of circles oriented around the center of the central section, said central section comprising a second surface opposite the first surface and having a second pattern comprising a plurality of scored lines extending radially out from the center of the central section in a star pattern, wherein each of the plurality of the circles having one of said score lines crossing the center of the circles on the first surface such that the thickness of the central section is least where one of the scored lines is opposite one of the plurality of the circles.

5,567,917

**METAL BASE BOARD AND ELECTRONIC EQUIPMENT USING THE SAME**

Satoru Hayashi, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

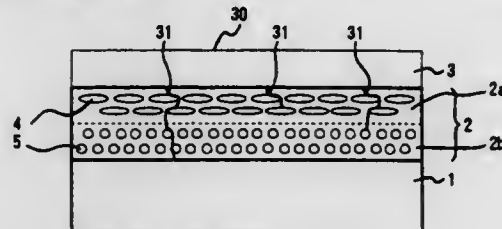
Division of Ser. No. 285,699, Aug. 4, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 488,050

Claims priority, application Japan, Aug. 6, 1993, 5-196398

Int. Cl.<sup>6</sup> H05K 1/02

U.S. Cl. 174—258

1 Claim



1. A metal base board comprising:

a metallic base section;

a circuit conductor section; and

an insulating section provided between said circuit conductor section and said base section;

whereby said insulating section comprises a plurality of insulating layers, each insulating layer comprising an organic insulating material with a plurality of flaky inorganic filler materials added therein, at least two of said materials having flakes with a different average dimensions and said flaky inorganic fillers being disposed in said insulating section in a plurality of strata.

5,567,918

**METHOD AND APPARATUS FOR INITIATING A WEIGHING OPERATION**

Rudolf Bachmann, Bertschikon, and Beat Hartmann, Effretikon, both of Switzerland, assignors to Mettler-Toledo AG, Greifensee, Switzerland

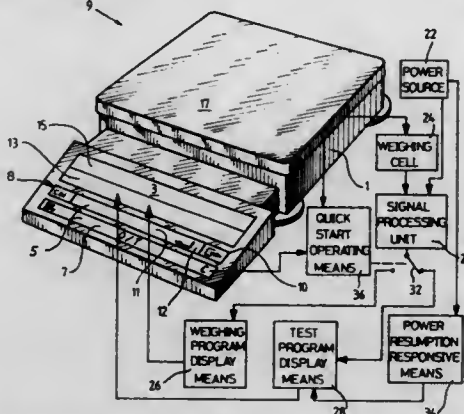
Filed Feb. 23, 1994, Ser. No. 200,439

Claims priority, application Switzerland, Feb. 26, 1993, 590/93

Int. Cl.<sup>6</sup> G01G 19/22; 19/52

U.S. Cl. 177—25.13

4 Claims



1. A method for initiating the operation of a weighing scale (9) having a housing (1), a load-receiving member (17) connected for movement relative to said housing, weighing cell means (24) responsive to the application of a load to said load-receiving member for generating a weighing signal as a function of the magnitude of said load, a signal processing unit (20) for processing said weighing signal, a keyboard (5) for entering start-up parameters and functions into said signal processing unit, said keyboard having a tare key member (7), and alphanumeric display means (3) operable by said signal processing unit to display initially a test

menu display when said signal processing unit is in a first condition, and to subsequently display a load-responsive display when said signal processing unit is in a second condition, said method including the step of:

selectively operating one of said tare key (7) and load-receiving members (17) to switch said signal processing unit from said first condition to said second condition.

5,567,920

**POSITION READING APPARATUS AND KEY BOARD APPARATUS**

Toshiaki Watanabe; Shinji Saeki, and Yoshiyuki Morita, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Tokyo, Japan

PCT No. PCT/JP93/00230, § 371 Date Dec. 29, 1993, § 102(e) Date Dec. 29, 1993, PCT Pub. No. WO93/18448, PCT Pub. Date Sep. 16, 1993

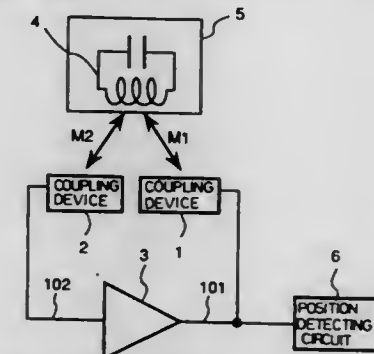
PCT Filed Feb. 25, 1993, Ser. No. 140,073

Claims priority, application Japan, Mar. 2, 1992, 4-044930; Mar. 19, 1992, 4-063922; May 12, 1992, 4-119260

Int. Cl.<sup>6</sup> G08C 21/00

U.S. Cl. 178—18

35 Claims



1. A position reading apparatus comprising: an amplifier; a first coupling means connected to an output of the amplifier; a second coupling means connected to an input of the amplifier; a position detecting means connected to the input or the output of the amplifier; and a position pointer having a resonant circuit; wherein, when the resonant circuit is electromagnetically coupled to both the first coupling means and the second coupling means, the resonant circuit, the amplifier, the first coupling means and the second coupling means form a positive feedback loop which generates an oscillation signal at a resonant frequency of the resonant circuit; and the position detecting means obtains position information representative of the position of the position pointer relative to the first and second coupling means from amplitude information taken from the oscillation signal.

5,567,921

Patent Not Issued For This Number

5,567,922

**SOUND INSULATING VEHICLE BODY PART**

Jean-Claude Schmuck, Houlbec Cocherel; Claude Jeannot, Poissy, and Claude Buisson, Conflans Ste Honorine, all of France, assignors to Matec Holding AG, Kusnacht, Switzerland

Continuation of Ser. No. 873,832, Apr. 27, 1992, abandoned.

This application Feb. 22, 1994, Ser. No. 200,538

Claims priority, application Switzerland, Apr. 26, 1991, 1265/91

Int. Cl.<sup>6</sup> E04B 1/82

U.S. Cl. 181—284

29 Claims

1. Inherently stable self-supporting composite part for engine hoods for acoustic screening of noise sources, comprising: a shaped outside sheet of thermosetting plastic material and having an inside form and an inner surface; a noise-insulating inside packing fastened directly to the outside sheet, which inside packing has a continuous inner surface opposite said outside sheet inner surface, and where said

5,567,919

**GRAVIMETRIC FEEDING SYSTEM FOR BOILER FUEL AND SORBENT**

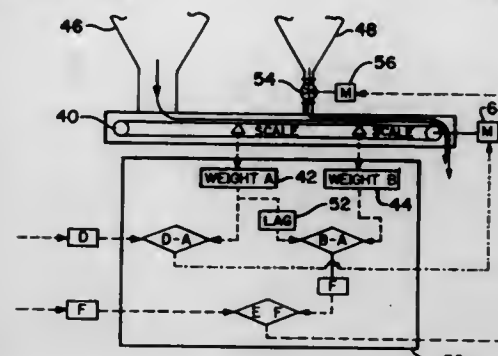
Gary A. Cote, Granville, Mass., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 22, 1993, Ser. No. 172,623

Int. Cl.<sup>6</sup> G01G 19/52; B67D 5/08

U.S. Cl. 177—50

8 Claims



1. Apparatus which comprises: a circulating fluidized bed boiler; a gravimetric control and supply system which includes a loop shaped continuous belt for moving materials in a generally horizontal direction to supply fuel and sorbent to the circulating fluidized bed boiler;

first and second belt scales disposed at spaced axial points along said belt;

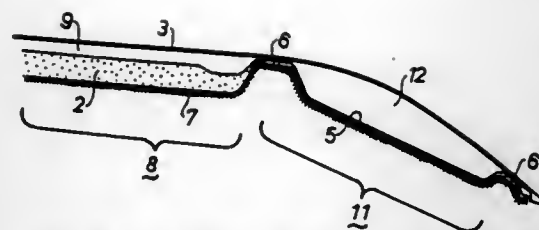
means for continuously moving said belt sequentially past said first belt scale and then past said second belt scale and then dumping all material from said belt;

first means for depositing fuel on said continuous belt before said first belt scale whereby the fuel will continue past said first belt scale and said second belt scale and will then be dumped off said belt;

second means for depositing sorbent material on said continuous belt intermediate said first and second belt scales so that first belt scale measures the quantity of fuel added to said continuous belt and said second belt scale measures the weight of both said fuel and said sorbent added to said belt;

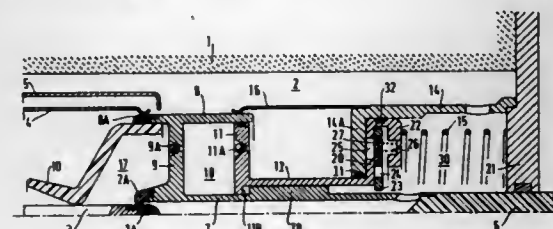
means for determining the time required for fuel on said belt to move from the location of said first belt scale to said second belt scale and means for comparing the weight at said first belt scale, after the lapse of the time required for fuel to pass from said first belt scale to said second belt scale to the instantaneous weight of fuel and sorbent at said second belt scale.





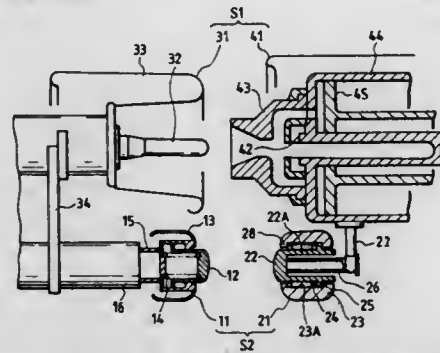
inside packing is adapted corresponding to the inside form of the outside sheet and has countersunk deformations, which together with the outside sheet form open acoustically effective hollow spaces between said outside sheet inner surface and said inside packing continuous inner surface; the inner packing comprising a fiber fleece adhered with a phenolic resin, and covered with a fiber mat in direct contact with said fiber fleece; and said outer sheet and said inside packing cooperating to form a self-supporting structure, independent of the engine hood.

**5,567,923**  
**PUFFER CIRCUIT-BREAKER HAVING A PNEUMATICALLY-LOCKED SEMI-MOVING PISTON**  
 Michel Perret, Bourgoin-Jallieu, France, assignor to GEC Alsthom T&D SA, Paris, France  
 Filed Jan. 11, 1995, Ser. No. 371,394  
 Claims priority, application France, Jan. 25, 1994, 94 00762  
 Int. Cl.<sup>6</sup> H01H 33/91  
 U.S. Cl. 218—60 6 Claims



1. A puffer-type circuit-breaker comprising:  
 a casing filled with a dielectric gas under pressure, and two arcing contacts that co-operate with each other, at least one of which is part of a moving contact assembly that is secured to a drive member, and that is operative for displacement axially inside the casing between a closed position and an open position, the moving contact assembly including a first tube and a second tube that is coaxial with the first tube, the first tube and the second tube being interconnected by a first annular wall so as to define a blast chamber on one side of the first annular wall, a compression chamber on the other side of said annular wall and which communicates with the blast chamber, and a semi-moving piston having one end which closes the compression chamber, wherein the circuit-breaker further comprises first mechanical means for holding the piston stationary during a first portion of the displacement of the moving contact assembly from the closed position to the open position, second mechanical means for axially displacing the piston with the moving contact assembly during a second portion of the displacement of the moving contact assembly, and pneumatic means for co-operating with the first mechanical means in holding the piston stationary during the first portion of displacement.

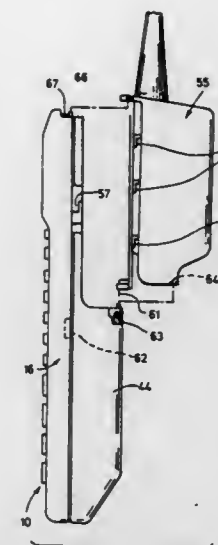
**5,567,924**  
**CIRCUIT BREAKER WITH PARALLEL RESISTOR**  
 Makoto Yano, Mito; Masanori Tsukushi, and Noriyuki Yaginuma, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
 Filed Mar. 28, 1995, Ser. No. 411,315  
 Claims priority, application Japan, Mar. 31, 1994, 6-062482  
 Int. Cl.<sup>6</sup> H01H 9/30  
 U.S. Cl. 218—143 20 Claims



1. A circuit breaker with a parallel resistance, having a resistance closing contact (S2) coupled in parallel with a main contact (S1) for interrupting electric current, wherein interrupting and closing actions of a movable electrode (22) with respect to a stationary electrode (12) on the side of said resistance closing contact (S2) are adapted to precede interrupting and closing actions of said main contact (S1), wherein a movable unit (21) on the side of said resistance closing contact (S2) comprises:  
 the movable electrode (22) which is adapted to move integral with a movable unit (41) on the side of said main contact (S1); and an electric field relaxation shield (23) for relaxing electric field around said movable electrode (22), wherein said shield (23) is adapted to fit on said movable electrode (22) allowing its relative movement relative to said movable electrode (22) via an elastic member (24) in the axial directions such that when said movable electrode (22) of said resistance closing contact (S2) moves toward the stationary electrode (12) thereof during a closing action of said main contact (S1), compression of said elastic member (24) allows a relative movement due to inertia between said movable electrode (22) and said shield (23), then followed by restoration of said elastic member (24), these compression and restoration of the elastic member in conjunction enabling said shield (23) to follow lagging behind a forward movement of said movable electrode (22), and during an interrupting action of said main contact (S1), said shield (23) which is now latched to said movable electrode (22) of said resistance closing contact (S2) by means of said elastic member (24) in a restored state is caused to move integral with said movable electrode (22) in a backward direction which is opposite to the stationary electrode.

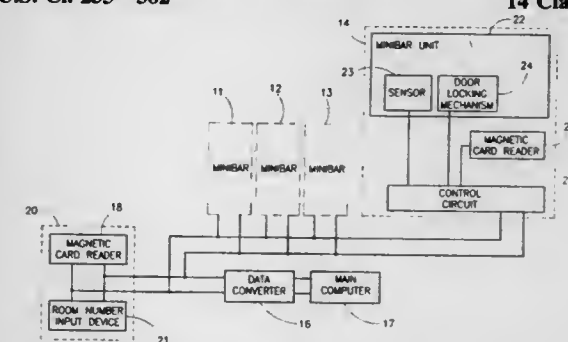
**5,567,925**  
**HAND-HELD DATA CAPTURE SYSTEM WITH INTERCHANGEABLE MODULES**  
 Steven E. Koenck; Phillip Miller; George E. Hanson; Darald R. Schultz, and Jeffrey S. Krunnusz, all of Cedar Rapids, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa  
 Continuation of Ser. No. 71,555, Jun. 4, 1993, Pat. No. 5,331,136, which is a continuation of Ser. No. 660,615, Feb. 25, 1991, Pat. No. 5,218,187, which is a continuation-in-part of Ser. No. 467,096, Jan. 18, 1990, Pat. No. 5,052,020. This application Jul. 19, 1994, Ser. No. 277,559  
 Int. Cl.<sup>6</sup> G06F 17/00  
 U.S. Cl. 235—375 15 Claims

1. A hand-held data collection terminal comprising:  
 a base module having a housing including a data input means, the base module including a first microprocessor for controlling the base module, and for communicating data and control



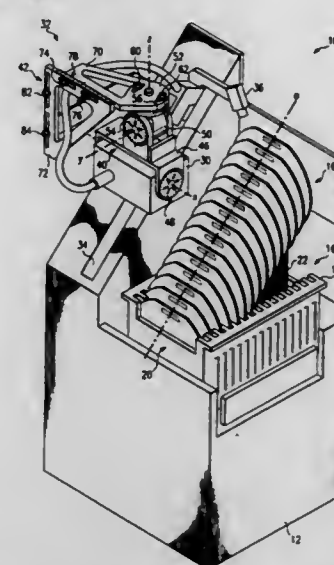
signals to and from the base module according to a predefined communication procedure;  
 a communication module comprising a second microprocessor and an interface circuit, the interface circuit communicatively coupling the first and second microprocessors;  
 the second microprocessor and the interface circuit providing for the emulation of data communication between the first and second microprocessors according to the predefined communication procedure of the first microprocessor; and  
 the base module receiving the communication module such that the base module and the communication module comprise a single, hand-held unit.

**5,567,926**  
**MINIBAR SYSTEM**  
 Amram Asher, Sitriya, and Nathan Lahav, Zichron Yaacov, both of Israel, assignors to Tadiran Appliances Ltd., Tel-Aviv, Israel  
 Continuation-in-part of Ser. No. 651,434, Feb. 7, 1991, abandoned. This application Feb. 8, 1993, Ser. No. 456,041  
 Int. Cl.<sup>6</sup> G06K 5/00  
 U.S. Cl. 235—382 14 Claims



1. A computerized system for the operation of minibar units located in a plurality of hotel rooms, comprising in combination a central computer-control unit connected with each of the minibars, means for coding the lock of a given minibar upon the check-in of a hotel guest according to his credit card and for providing an identical code at the control unit, or for providing the guest with an electronic card having an individual access code, so as to enable the guest to open the minibar whenever desired by inserting his credit card or access card into a suitable opening in the minibar, and means for denying further access by such guest by a command issued by the control unit upon check-out of the guest or for any other compelling reason, there being provided a master card suited for the opening of a number of minibars, for use of servicing personnel.

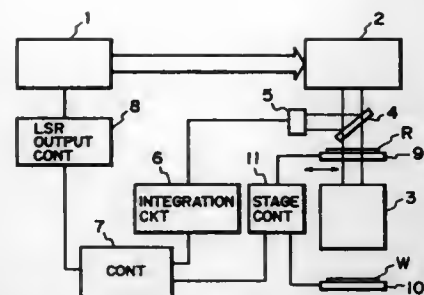
**5,567,927**  
**APPARATUS FOR SEMICONDUCTOR WAFER IDENTIFICATION**  
 Randolph W. Kahn, Sherman, and James C. Reed, Jr., Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.  
 Filed Jul. 25, 1994, Ser. No. 280,099  
 Int. Cl.<sup>6</sup> G06K 7/10  
 U.S. Cl. 235—462 10 Claims



1. Apparatus for identifying a plurality of semiconductor wafers residing in a plurality of slots of a cassette, each of said plurality of semiconductor wafers having a bar code inscription thereon, the apparatus comprising:  
 a batch wafer presentation system for receiving said cassette carrying said plurality of semiconductor wafers, said presentation system arranging said plurality of wafers along a presentation axis to expose said bar code inscription on each of said plurality of semiconductor wafers;  
 a laser scanner; and  
 an arm assembly coupled to said batch wafer presentation system and controllably moveable along a track parallel with said presentation axis, said arm assembly securing said laser scanner in an adjustable angular and spatial position relative to said plurality of semiconductor wafers, wherein said arm assembly further comprises an angular position mount adjustably rotatably positioning said laser scanner about a first, second and third axes and having first, second and third rotational graduated scales indicative of the angular position of said laser scanner about said respective axes.

**5,567,928**  
**SCANNING EXPOSURE APPARATUS AND METHOD INCLUDING CONTROLLING IRRADIATION TIMING OF AN IRRADIATION BEAM WITH RESPECT TO RELATIVE MOVEMENT BETWEEN THE BEAM AND A SUBSTRATE**  
 Naoto Sano, Utsunomiya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan  
 Filed Jul. 26, 1994, Ser. No. 280,823  
 Claims priority, application Japan, Jul. 26, 1993, 5-183963  
 Int. Cl.<sup>6</sup> G011 1/32  
 U.S. Cl. 250—205 44 Claims

1. A scanning type exposure apparatus comprising:  
 an irradiation source for irradiating an irradiating beam, which has an intensity fluctuation upon a start of irradiation, to illuminate a mask with the irradiation beam;  
 relative movement means for imparting relative movement between the irradiation beam and both a mask and a substrate to be exposed to a pattern of the mask, wherein said relative



movement means causes the relative movement to start before a start of illumination of the mask with the irradiation beam; and  
control means for controlling said irradiation source to start irradiation of the irradiation beam after a start of the relative movement and before a start of the illumination of the mask to reduce intensity fluctuation of the irradiation beam.

5,567,929

## FLAT PANEL DETECTOR AND IMAGE SENSOR

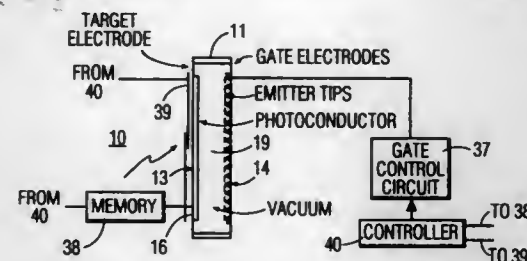
Donald R. Ouimette, Plantsville, Conn., assignor to University of Connecticut, Farmington, Conn.

Filed Feb. 21, 1995, Ser. No. 391,709

Int. Cl.<sup>6</sup> H01J 40/14

U.S. Cl. 250—214 VT

18 Claims



1. A flat panel image sensor comprising a housing including first and second surfaces, said surfaces being parallel to one another and including a vacuum therebetween, said first surface including a window for radiation, said window comprising a layer of a radiation-transparent, electrically-conducting material, a photoconductor layer positioned on the underside of said electrically-conducting layer and being electrically coupled thereto, said photoconductor layer having a surface facing said vacuum, said first surface being positioned to receive a multi-pixel radiation image, said second surface comprising an array of electron beam sources, said sensor including means for impressing a voltage on said electrically-conducting layer for establishing a bias field across said photoconductor layer, and means for activating said electron beam sources in a manner to discharge consecutive charges on said photoconductor layer corresponding to consecutive pixel positions of said image, and read out means connected to said electrically-conducting layer for reading out the signals produced by the discharges.

5,567,930

## SENSOR APPARATUS FOR DETECTING A DISPLACEMENT OF AN OBJECT IN A VISUALLY OBSCURED ENVIRONMENT

Roy B. Melton, Pottstown, Pa., assignor to The West Company, Incorporated, Lionville, Pa.

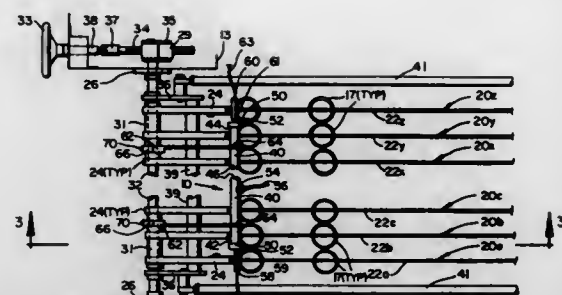
Filed Jun. 6, 1995, Ser. No. 468,469

Int. Cl.<sup>6</sup> H01J 3/14

U.S. Cl. 250—216

10 Claims

1. A sensor apparatus for detecting a displacement of an object in a visually obscured environment comprising:



a tube having a first open end, a second open end and a hollow interior, the tube being in contact with the object;  
a pressurized gas port located on the tube in fluid communication with the hollow interior of the tube;  
a photo-emitter located adjacent to the first open end of the tube, in an aligned position with the first and second open ends of the tube; and  
a photo-receiver located adjacent to the second open end of the tube, in an aligned position with the photo-emitter.

5,567,931

## VARIABLE BEAM DETECTION USING A DYNAMIC DETECTION THRESHOLD

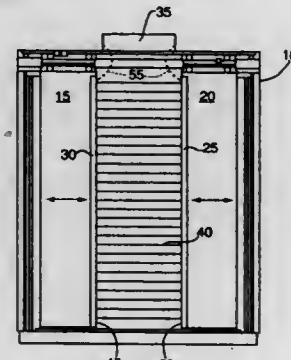
Brian J. Amend, Old Lyme, and Michael Garfinkel, West Hartford, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Oct. 25, 1994, Ser. No. 329,025

Int. Cl.<sup>6</sup> G01V 9/04

U.S. Cl. 250—221

13 Claims



1. A beam detection apparatus for detection of obstructions in an elevator doorway, said apparatus comprising:  
a. a plurality of emitters for radiating beams of energy, said plurality of emitters being disposed near a first elevator door;  
b. a plurality of detectors, for providing detector signals in response to the beams of energy radiated by said plurality of emitters, said plurality of detectors being disposed near a second elevator door; and  
c. means for determining if the beams of energy are obstructed by analyzing the detector signals and implementing a dynamic detection threshold.

5,567,932

## GEOMEMBRANE BARRIERS USING INTEGRAL FIBER OPTICS TO MONITOR BARRIER INTEGRITY

George E. Staller, and Robert P. Wemple, both of Albuquerque, N.M., assignors to Sandia Corporation, Albuquerque, N.M.

Filed Aug. 1, 1995, Ser. No. 509,850

Int. Cl.<sup>6</sup> G02B 6/00; H01J 5/16

U.S. Cl. 250—227.14

20 Claims

1. A barrier for a containment site, comprising:  
containing means for restraining contents within a containment site, said containing means having a first surface for facing

5,567,934

## METHOD AND APPARATUS FOR ILLUMINATION AND IMAGING OF A SURFACE USING OPAQUE SHROUD

Joe Zheng, Brookfield, Conn., and John Sussmeier, Wappingers Falls, N.Y., assignors to United Parcel Service of America, Inc., Atlanta, Ga.

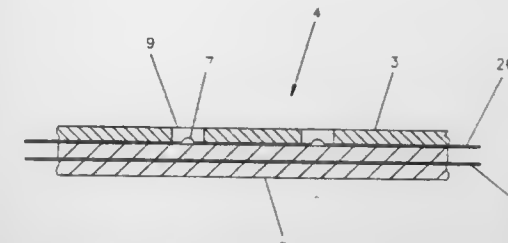
Division of Ser. No. 20,295, Feb. 19, 1993, Pat. No. 5,399,852.

This application Feb. 9, 1995, Ser. No. 386,155

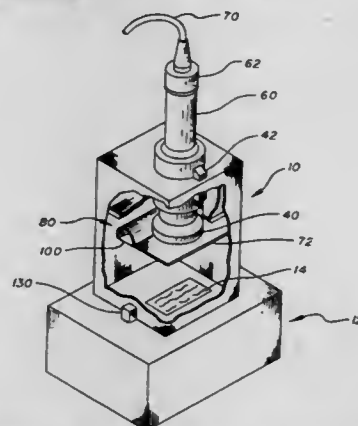
Int. Cl.<sup>6</sup> H01L 27/00; G06K 7/10

U.S. Cl. 250—237 R

8 Claims



the contents of the containment site and an opposed second surface, said containing means comprising a geomembrane extending in a longitudinal direction; and  
light transmission means for transmitting an optical signal, said light transmission means having a first end and a second end and being integral with said geomembrane, said light transmission means comprising a fiber optic strand having a tensile strength greater than or equal to the tensile strength of said geomembrane;  
wherein a change in a received optical signal transmitted through said fiber optic strand is indicative of a change in said geomembrane.



1. An apparatus for illumination and imaging of a surface, comprising:

- (a) a shroud having an opaque side wall, a lower edge of said side wall defining a bottom opening;
- (b) means, mounted in said shroud, for illuminating the surface through said bottom opening; and
- (c) means, mounted in said shroud, comprising a CCD-based camera, for obtaining an image of the illuminated surface and providing an output signal representative of said obtained image; further comprising means for preventing activation of said illumination means and said image obtaining means except when said lower edge of said shroud side wall is in contact with the surface.

5,567,933

## OPTICAL FIBER DETECTION SYSTEM WITH DISTURBANCE AND POSITIVE CUT-LOOP DETECTION CAPABILITIES

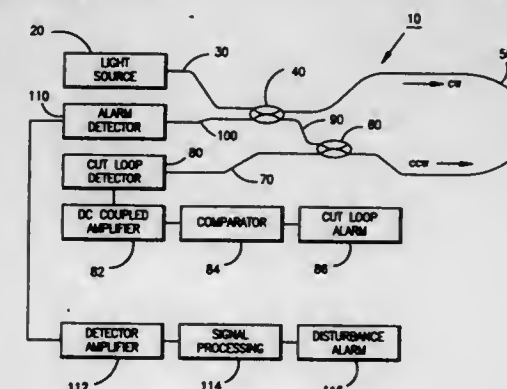
Jeffrey C. Robinson, Falkville, and Brian B. Crawford, Madison, both of Ala., assignors to Mason & Hanger National, Inc., Huntsville, Ala.

Filed Feb. 14, 1995, Ser. No. 388,459

Int. Cl.<sup>6</sup> G01J 1/04; G01B 9/10

U.S. Cl. 250—227.15

19 Claims







5,567,942

## INFRARED ARRAY SENSOR SYSTEM

Jue H. Lee, Seoul, and Seong M. Cho, Kyungki-do, both of Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

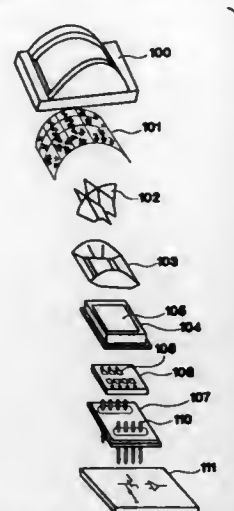
Filed Dec. 30, 1994, Ser. No. 366,882

Claims priority, application Rep. of Korea, Dec. 31, 1993, 32044/1993

Int. Cl.<sup>6</sup> G01J 5/08

U.S. Cl. 250—353

17 Claims



1. An infrared array sensor system for sensing a position of an objecting a certain space comprising:

Fresnel lenses for focusing infrared rays incident thereto from a plurality of divided regions;

a plurality of guides for guiding the infrared rays focused by the Fresnel lenses in predetermined directions, each said direction corresponding to one of said divided regions;

a filter for filtering a desired wavelength band of the guided infrared rays;

a plurality of infrared sensor elements for sensing the filtered rays, the infrared sensor elements corresponding to the directions of the infrared rays guided by the guides, respectively; and

circuit means for processing signals respectively outputted from the infrared sensor elements.

5,567,943

## PERSONAL RADIATION DETECTION DEVICE

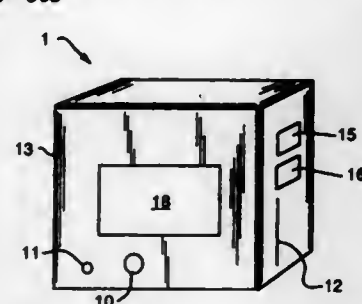
Craig A. Plevinsky, 7 Woodbury Dr., Cherry Hill, N.J. 08003

Filed Nov. 3, 1995, Ser. No. 552,946

Int. Cl.<sup>6</sup> G01T 1/202

U.S. Cl. 250—368

17 Claims



1. A miniaturized ionizing detection device comprising:

a. a housing forming an enclosure with an area that is accessible to the entry of ionizing radiation;

b. at least one layer of a rare earth intensifying screen having a speed class that is contained within the housing;

c. a specular reflector that is positioned in an overlapping manner on one side of the rare earth intensifying screen such that any visible light generated is reflected back towards the screen;

d. a plurality of photoresistors located adjacent the rare earth intensifying screen on the side of the screen opposite the specular reflector, said photoresistors being in parallel, said photoresistors capable of detecting light generated and conducting voltage upon detection;

e. a resistor that is connected to the plurality of photoresistors and reduces the resistance of the plurality of photoresistors;

f. an operational amplifier connected to the resistor having an input that rises upon generation of voltage and an output;

g. a variable resistor connected to the operational amplifier that supplies a voltage level to the input of the operational amplifier;

h. a battery source contained within the housing having sufficient voltage to operate the device; and

i. at least one indicator selected from the group including visible and audible indicators, said indicator contained within the housing and having an alarm detectable on an outside surface of the housing.

5,567,944

## COMPTON CAMERA FOR IN VIVO MEDICAL IMAGING OF RADIOPHARMACEUTICALS

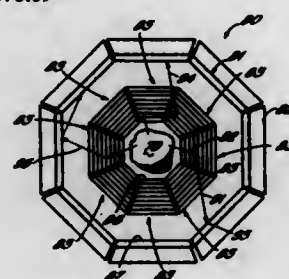
Ronald C. Robe, Hamilton, and John D. Valentine, Cincinnati, both of Ohio, assignors to University of Cincinnati, Cincinnati, Ohio

Filed Apr. 28, 1995, Ser. No. 430,414

Int. Cl.<sup>6</sup> G01T 1/24

U.S. Cl. 250—370.09

17 Claims



1. A method of imaging a radioactive source comprising detecting x, y and z coordinates of a Compton scatter interaction in a primary detector system by a photon emitted from said active source wherein said photon has a known energy;

measuring x, y, z coordinates and Energy ( $E_{sc}$ ) of said photon absorbed by a secondary detector system;

determining energy deposited in said primary detector system ( $\Delta E$ ) of said photon by subtracting  $E_{sc}$  from the known energy of said emitted photon;

determining if said photon had 0, 1 or more than 1 interactions in said primary detector system;

calculating the source location of said photon if said photon had only one Compton scatter interaction in said primary detector system;

repeating these steps with additional emitted photons and summing collected source data to provide a source image.

5,567,945

## COMPACT ATOMIC ABSORPTION ANALYZER

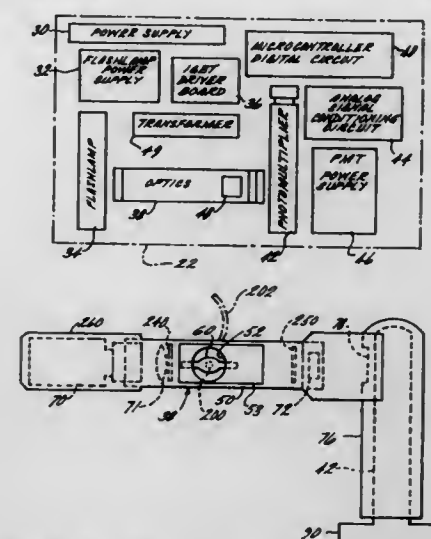
Eric Drevline, Tariffville, and Louis C. Burke, East Granby, both of Conn., assignors to Analytical Precision, Inc., Tariffville, Conn.

Filed Nov. 16, 1994, Ser. No. 340,289

Int. Cl.<sup>6</sup> G01J 3/42; 3/443; G01N 21/71

U.S. Cl. 250—372

38 Claims



1. A spectroscopic analyzer comprising:  
a receptacle for receiving a sample to be analyzed;  
electronic heating means for subjecting a sample received in said receptacle to thermal energy sufficient to excite an element of the sample to a level at which the element radiates a line-emission spectra characteristic of the element;  
a light source for generating a light beam having an ultraviolet component, said receptacle being disposed within a path of said light beam wherein said line-emission spectra combines with said light beam generating a spectral distribution of light;  
a photomultiplier positioned within said path for receiving said spectral distribution of light and providing a spectral signal indicative thereof; and  
signal processing means for processing said spectral signal to provide a processed signal indicative of the element of said sample.

5,567,947

## SPECTRAL LINE DISCRIMINATOR FOR PASSIVE DETECTION OF FLUORESCENCE

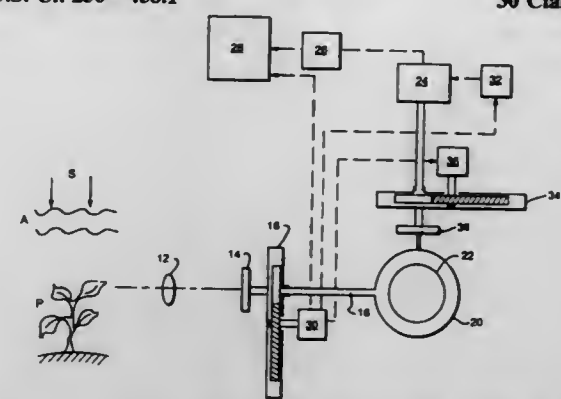
Paul L. Kebabian, Acton, Mass., assignor to Aerodyne Research, Inc., Billerica, Mass.

Filed Jun. 1, 1995, Ser. No. 456,760

Int. Cl.<sup>6</sup> G01N 21/64

U.S. Cl. 250—458.1

30 Claims



1. A method of detecting fluorescence in the A-band or the B-band from a sunlit target, the method comprising the steps of:

A. passing light comprising the A-band or B-band fluorescence into a cavity containing oxygen gas;

B. periodically interrupting passage of the light into the cavity; and

C. detecting fluorescence by the oxygen gas while the passage of the light into the cavity is interrupted so as to provide an output indicative of the fluorescence in said A-band or B-band.

5,567,948

## COMPOSITE MATERIAL DOSIMETERS

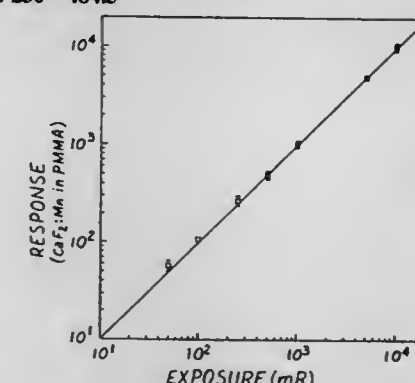
Steven D. Miller, Richland, Wash., assignor to Battelle Memorial Institute, Richland, Wash.

Continuation-in-part of Ser. No. 253,888, Jun. 3, 1994, abandoned. This application Jun. 2, 1995, Ser. No. 460,518

Int. Cl.<sup>6</sup> G01T 1/10

U.S. Cl. 250—484.5

15 Claims



1. A method of measuring radiation dose, comprising the steps of:

(a) exposing a dosimeter having a bi-element dosimeter material in a polymer matrix to radiation;

(b) stimulating the irradiated dosimeter with visible light substantially free of ultraviolet light; and

(c) counting photons emitted from the bi-element dosimeter material as a result of the light stimulation.

5,567,946

## DECONNABLE SELF-READING POCKET DOSIMETER CONTAINMENT WITH SELF-CONTAINED LIGHT

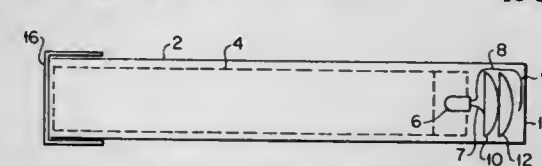
Robyn L. Stevens, Greg N. Arnold, both of Idaho Falls, and Ryan G. McBride, Rexburg, all of Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 3, 1995, Ser. No. 433,302

Int. Cl.<sup>6</sup> G01T 1/14

U.S. Cl. 250—376

16 Claims



1. A reusable, deconnable container for a self-reading pocket dosimeter comprising:

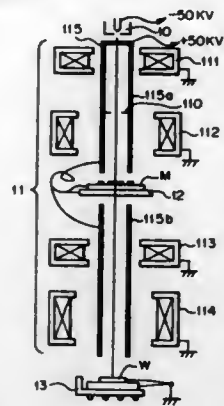
a transparent tube adapted to receive the self-reading pocket dosimeter;

a light source mounted at one end of said transparent tube; and

an eyepiece mounted on an end opposite said one end containing said light source for viewing a read-out of the self-reading pocket dosimeter.



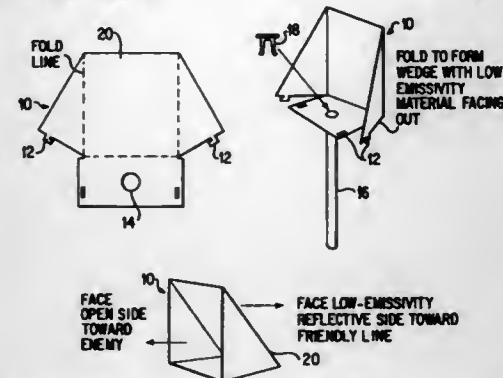
**5,567,949**  
**CHARGED PARTICLE BEAM TRANSFER APPARATUS**  
 Teruaki Okino, Kanagawa-ken, Japan, assignor to Nikon Corporation, Tokyo, Japan  
 Filed Oct. 19, 1995, Ser. No. 545,506  
 Claims priority, application Japan, Oct. 26, 1994, 6-262281  
 Int. Cl.<sup>6</sup> H01L 21/30  
 U.S. Cl. 250—492.23



1. A charged particle beam transfer apparatus in which a charged particle beam emitted from an irradiation source is led to a mask, and the charged particle beam having passed through said mask is made incident on a surface, to which transfer is to be made, at an intensity correlating with a degree of scattering of said charged particle beam, said charged particle beam transfer apparatus comprising:

a speed control device for controlling a speed of said charged particle beam so that said charged particle beam having passed through said mask is incident on said surface at a lower speed than that of said charged particle beam at the time of passing through said mask.

**5,567,950**  
**BISPECTRAL LANE MARKER**  
 David L. Meeker, and Kenneth G. Hall, both of Vickersburg, Miss., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.  
 Filed Jan. 24, 1995, Ser. No. 378,139  
 Int. Cl.<sup>6</sup> G01S 17/02  
 U.S. Cl. 250—504 R

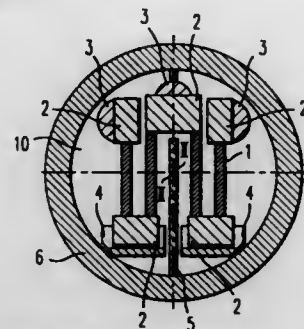


1. A bispectral lane marker used with a thermal imaging system that detects infrared electromagnetic (EM) radiation comprising:

a rigid multi-faced structure formed by at least one surface with concavity with means for rigidly maintaining the at least one surface with concavity and a means for supporting the lane marker;

the rigid multi-faced structure includes a bispectral differentiating means disposed on an exposed portion of the at least one surface with concavity for enabling infrared EM detection of the marker by the thermal imaging system.

**5,567,951**  
**RADIATING APPARATUS**  
 Dieter Baschant, Dessau; Heinz Gatzmanga, Köthen, and Heinz Juppe, Dessau, all of Germany, assignors to Heraeus Noblelight GmbH, Hanau, Germany  
 Filed May 31, 1995, Ser. No. 455,828  
 Claims priority, application Germany, Jun. 1, 1994, 44 19 285.1  
 Int. Cl.<sup>6</sup> A61N 5/06  
 U.S. Cl. 250—504 R



1. A radiating apparatus, comprising:

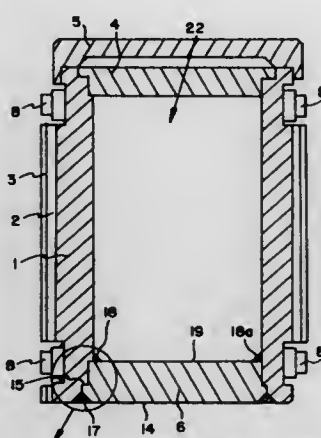
a housing being broad in the direction transverse to an emission direction as compared with a height in the emission direction;

a carbon strip segmented over its length by forming a plurality of segments joined together to form a radiation source within the housing;

a plurality of support members each of which supports one end of each of said segments; and

wherein at least a first one and a last one of said support members are electrical contacts.

**5,567,952**  
**FIXING MEANS FOR THE BASE OF A RADIOACTIVE MATERIAL TRANSPORT AND/OR STORAGE CONTAINER**  
 Bernard Kirchner, Gif sur Yvette, and René Chiocca, Paris, both of France, assignors to Transnucleaire, Paris, France  
 Filed Feb. 1, 1995, Ser. No. 381,525  
 Claims priority, application France, Feb. 1, 1994, 94 01313  
 Int. Cl.<sup>6</sup> G21F 5/00  
 U.S. Cl. 250—506.1



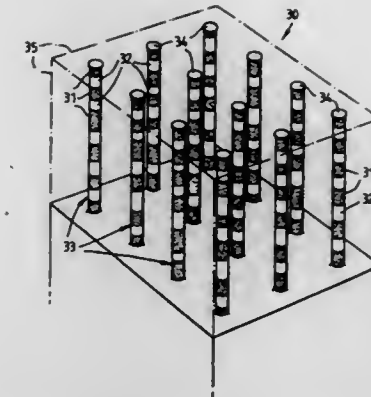
1. In a container for transport and storage of highly radioactive material, the container being made of thick metal and comprising (i) a tube having an internal wall, and (ii) a base having a lateral wall, said base being non-removably sealed to one end of the tube, and said internal wall and lateral wall forming a right cylinder with a circular cross section in contact with each other,

a means for fixing the base of the container, said means comprising:

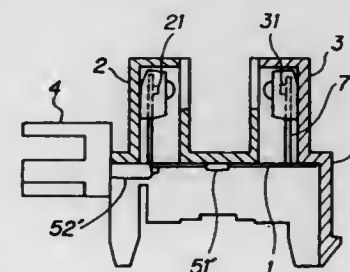
(a) a shrink fitting of the lateral wall with a portion of the internal wall in contact therewith, the base being disposed such that the lateral wall is entirely inside the tube with said portion of the internal wall comprising an opposed shoulder which cooperates with a corresponding shoulder in the lateral wall;

(b) a first continuous weld seam on an external surface of the base in contact with the tube, and

(c) a second continuous weld seam on an internal surface of the base in contact with the tube.



**5,567,953**  
**PHOTO INTERRUPTER AND A METHOD OF MANUFACTURING THE SAME**  
 Teruhiko Horinouchi, Kashihara, and Nobumasa Ono, Hashimoto, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan  
 Filed Dec. 27, 1994, Ser. No. 363,815  
 Claims priority, application Japan, Dec. 27, 1993, 5-332509  
 Int. Cl.<sup>6</sup> G02B 27/00  
 U.S. Cl. 250—551



1. A photo interrupter comprising:

a light-emitting element;

a light-receiving element;

a lead frame having both said light-emitting element and said light-receiving element located thereon;

a casing covering said light-emitting element, said light-receiving element and said lead frame; and

a connector attached to said casing, wherein said lead frame includes a lead pattern including a bent portion, for connecting input/output terminals of both said light emitting element and said light-receiving element, said lead pattern in direct physical and electrical contact with said connector.

**5,567,954**  
**LIGHT EMITTING DEVICE WITH POROUS MATERIAL**  
 Peter J. Dobson; Peter A. Leigh, both of Oxford, and Richard O. Pearson, London, all of United Kingdom, assignors to Secretary of State for Defence, Hants, United Kingdom  
 PCT No. PCT/GB93/01316, § 371 Date Feb. 28, 1995, § 102(c) Date Feb. 28, 1995, PCT Pub. No. WO94/00685, PCT Pub. Date Jan. 6, 1994  
 PCT Filed Jun. 22, 1993, Ser. No. 360,778  
 Claims priority, application United Kingdom, Jun. 30, 1992, 9213824  
 Int. Cl.<sup>6</sup> H01L 33/00

U.S. Cl. 257—3

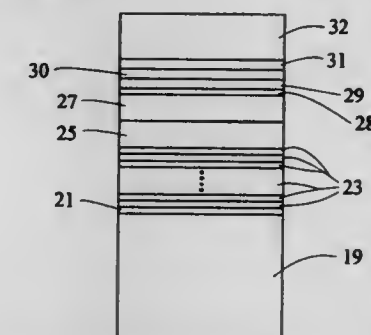
1. A light emitting device comprising:

a semiconductor material, at least a portion of said semiconductor is a porous material of low dimensionality;

a discontinuous layer comprising islands of electrically conducting material located upon at least a portion of said porous material; and

contacting means for applying an electrical potential across said electrically conducting material and said porous material.

**5,567,955**  
**METHOD FOR INFRARED THERMAL IMAGING USING INTEGRATED GASA QUANTUM WELL MID-INFRARED DETECTOR AND NEAR-INFRARED LIGHT EMITTER AND SI CHARGE COUPLED DEVICE**  
 Hui C. Lin, Orleans, Canada, assignor to National Research Council of Canada, Ottawa, Canada  
 Filed May 4, 1995, Ser. No. 434,842  
 Int. Cl.<sup>6</sup> H01L 29/06; 31/0328; 31/0336; 31/072  
 U.S. Cl. 257—21



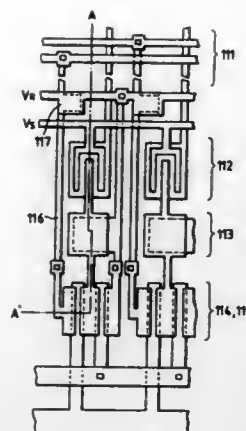
1. A far infrared (FIR) to near infrared (NIR) light converter comprising a quantum well intersubband photodetector (QWIP) integrated vertically with a light emitting diode (LED) on a substrate, the substrate being sufficiently transparent so as to allow FIR energy to pass therethrough to the QWIP, and means for applying a bias current to the QWIP and LED for passing the same bias current through the QWIP and LED.

**5,567,956**  
**INFORMATION PROCESSING APPARATUS INCLUDING A PHOTOELECTRIC CONVERSION ELEMENT HAVING A SEMICONDUCTOR LAYER WITH A VARYING ENERGY BAND GAP WIDTH**  
 Masato Yamanobe, Machida; Shinichi Takeda; Takayuki Ishii, both of Hiratsuka; Toshihiro Saika, Zama, and Isao Kobayashi, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
 Division of Ser. No. 157,442, Nov. 26, 1993, which is a continuation of Ser. No. 857,949, Mar. 26, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 478,444  
 Claims priority, application Japan, Mar. 27, 1991, 3-85753; Jul. 25, 1991, 3-207173  
 Int. Cl.<sup>6</sup> H01L 29/04; 31/036; 31/0376; 31/20  
 U.S. Cl. 257—55

1. An information processing apparatus comprising:

(1) a photoelectric conversion element comprising a photoelectric conversion section comprising:

an insulating layer having first and second opposed surfaces;



a photoconductive semiconductor layer having first and second opposed surfaces and an intermediate region disposed therebetween, the second surface of said photoconductive semiconductor layer being adjacent to the first surface of said insulating layer, said photoconductive semiconductor layer comprising a non-monocrystalline matrix of silicon atoms and including hydrogen atoms distributed nonuniformly, wherein a concentration of the hydrogen atoms in said photoconductive semiconductor layer is greater near the first and second surfaces of said photoconductive semiconductor layer than in the intermediate region, so that an energy band gap width of said photoconductive semiconductor layer varies between the first and second surfaces of said photoconductive semiconductor layer;

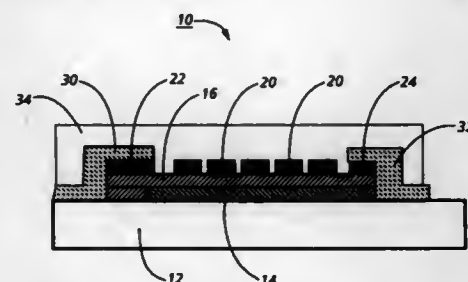
first and second electrodes electrically connected to the first surface of said photoconductive semiconductor layer; and a third electrode provided at the second surface of said insulating layer, and opposite to a site between said first and second electrodes;

- (2) original-conveying means for conveying an original having image information to be photoelectrically converted to an electrical signal by said photoelectric conversion element;
- (3) an image information processing unit for processing the electrical signal having the image information;
- (4) a driving circuit for driving said photoelectric conversion element; and
- (5) image information recording means for recording the image information.

**5,567,957**  
**SEGMENTED RESISTANCE LAYERS WITH STORAGE NODES**  
 David Biegelsen, Portola Valley; Warren B. Jackson, San Francisco, and Richard L. Weisfield, Los Altos, all of Calif., assignors to Xerox Corporation, Stamford, Conn.  
 Filed Jan. 3, 1995, Ser. No. 368,138  
 Int. Cl.<sup>6</sup> H01L 29/04

U.S. Cl. 257—57

15 Claims



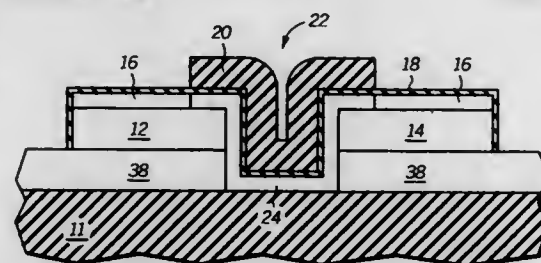
1. A resistance layer structure comprised of: a plurality of conductive storage nodes for storing induced charges; at least two conductive current electrodes; and

an electrically controllable resistance layer having an electrical input, said electrically controllable resistance layer being in a low resistance, touching relationship with both said storage nodes and said at least two conductive current electrodes, said electrically controllable resistance layer having a relatively high resistance when a first electrical signal is applied to said electrical input and relatively low resistance when a second electrical signal is applied to said electrical input; wherein charge flows relatively quickly between said storage nodes and said at least two conductive current electrodes, when said second electrical signal is applied to said electrical input, and wherein charge flows relatively slowly between said storage nodes and said at least two conductive current electrodes when said first electrical signal is applied to said electrical input.

**5,567,958**  
**HIGH-PERFORMANCE THIN-FILM TRANSISTOR AND SRAM MEMORY CELL**  
 Marius Oriowski; James D. Hayden, and Bich-Yen Nguyen, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.  
 Filed May 31, 1995, Ser. No. 452,944  
 Int. Cl.<sup>6</sup> H01L 29/78

U.S. Cl. 257—66

12 Claims



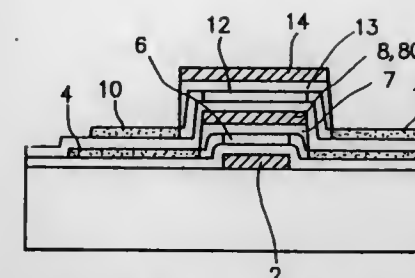
5. A semiconductor device having a thin-film transistor comprising: a first insulating layer; a second insulating layer overlying the first insulating layer; a first semiconductor layer overlying the second insulating layer, the first semiconductor layer and the second insulating layer having an opening therethrough exposing a portion of the first insulating layer, wherein the opening has first and second wall surfaces extending from the exposed portion of the first insulating layer to an upper surface of the first semiconductor layer; a second semiconductor layer overlying the upper surface of the first semiconductor layer, the first and second wall surfaces, and the exposed portion of the first insulating layer; a gate dielectric layer overlying the second semiconductor layer; and a gate electrode overlying the gate dielectric layer and defining a channel region in the second semiconductor layer, the channel region extending from the exposed portion of the first insulating layer to the upper surface of the first semiconductor layer.

**5,567,959**  
**LAMINATED COMPLEMENTARY THIN FILM TRANSISTOR DEVICE WITH IMPROVED THRESHOLD ADAPTABILITY**  
 Akira Mineji, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan  
 Filed Dec. 15, 1994, Ser. No. 356,558  
 Claims priority, application Japan, Dec. 27, 1993, 5-333208  
 Int. Cl.<sup>6</sup> H01L 27/108; 29/76; 27/01

U.S. Cl. 257—69

10 Claims

1. A laminated complementary thin film transistor device comprising: an insulating substrate (1); and

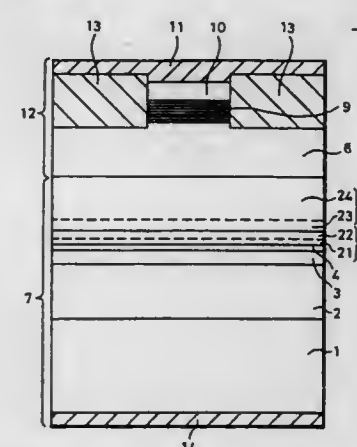


- a combination of a lower thin film transistor formed on said insulating substrate and an upper thin film transistor laminated over said lower transistor, said combination of said lower transistor and said upper transistor having: a lower channel (6), a source electrode (4), and a drain electrode (5) formed in said lower transistor; an upper channel (12) formed in said upper transistor; a lower gate electrode (2) formed on said insulating substrate (1) and disposed under said lower channel (6), said lower gate electrode (2) extending beyond the area of said lower channel (6), said source electrode (4), and said drain electrode (5); an intermediate gate electrode (8) disposed between said lower channel (6) and said upper channel (12); and an upper gate electrode (14) disposed over said upper channel (12).

**5,567,960**  
**II/VI-COMPOUND SEMICONDUCTOR LIGHT EMITTING DEVICE**  
 Akira Ishibashi; Satoshi Ito; Hiroyuki Okuyama, all of Kanagawa; Kazushi Nakano, Tokyo; Kenji Kondo, Kanagawa, and Reiko Takeishi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan  
 Filed Apr. 27, 1995, Ser. No. 429,850  
 Claims priority, application Japan, Apr. 28, 1994, 6-092552; Nov. 9, 1994, 6-275285  
 Int. Cl.<sup>6</sup> H01L 33/00; H01S 3/19

U.S. Cl. 257—103

14 Claims U.S. Cl. 257—296

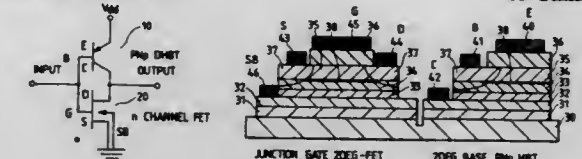


1. A II/VI-compound semiconductor light emitting device comprising: an active layer; and a p-side cladding layer, where an active-layer side portion of said p-side cladding layer is a lightly impurity-doped region or a non-doped region.

**5,567,961**  
**SEMICONDUCTOR DEVICE**  
 Toshiyuki Usagawa, Yono; Atsushi Takai, and Hiroyuki Itoh, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
 Filed Aug. 3, 1993, Ser. No. 100,718  
 Claims priority, application Japan, Aug. 21, 1992, 4-222498  
 Int. Cl.<sup>6</sup> H01L 31/0328; 31/0336; 31/072

U.S. Cl. 257—197

40 Claims

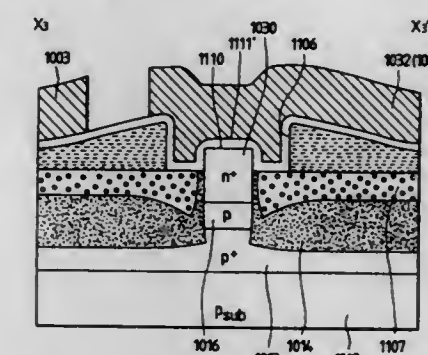


1. A semiconductor device comprising: a bipolar transistor including an emitter, a base and a collector, wherein hetero junctions are each created between said emitter and said base of said bipolar transistor and between said base and said collector of said bipolar transistor; and a field-effect transistor having a polarity different from a polarity of said bipolar transistor, said field-effect transistor including a gate, a source and a drain; wherein said base of said bipolar transistor and said gate of said field-effect transistor are connected to each other to serve as an input terminal, wherein said collector of said bipolar transistor and said drain of said field-effect transistor are connected to each other to serve as an output terminal, and wherein said emitter of said bipolar transistor is connected to a first power supply and said source of said field-effect transistor is connected to a second power supply.

**5,567,962**  
**SEMICONDUCTOR MEMORY DEVICE**  
 Mamoru Miyawaki, Tokyo; Akira Ishizaki, Atsugi; Genzo Momma, Hiratsuka; Hiroshi Yuzurihara, Isehara, and Tetsunobu Kohchi, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
 Division of Ser. No. 870,258, Apr. 17, 1992, Pat. No. 5,331,197.  
 This application Jun. 21, 1994, Ser. No. 263,147  
 Claims priority, application Japan, Apr. 23, 1991, 3-92294; Apr. 23, 1991, 3-92295; Apr. 26, 1991, 3-97256  
 Int. Cl.<sup>6</sup> H01L 29/78

U.S. Cl. 257—296

10 Claims

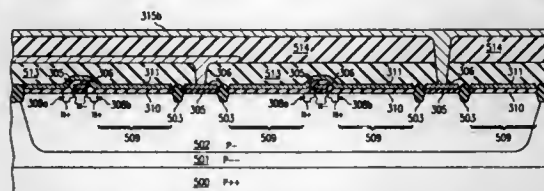


1. A semiconductor device comprising: a convex section provided on a surface of a semiconductor body, and having source, drain, and channel regions; a gate electrode having opposing sections sandwiching said channel region; a gate insulation film provided between said channel region and said gate electrode; a film capable of performing a memory function provided at one of said source and drain regions, and having a top section and opposing sections sandwiching said convex section;



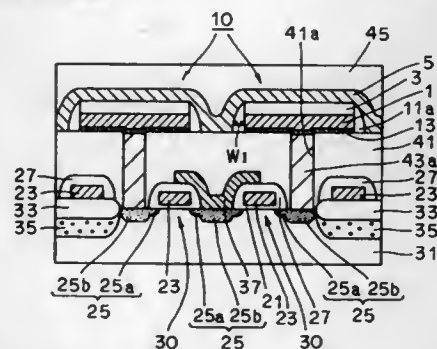
an electrode having a top section and an opposing section provided on said film and capable of performing a memory function; and  
a region doped with an impurity of high concentration disposed adjacent to said channel region, and having the same conductivity type as that of said channel region.

**5,567,963**  
**MULTI-BIT DATA STORAGE LOCATION**  
G. R. Mohan Rao, Dallas, Tex., assignor to Cirrus Logic, Inc.  
Division of Ser. No. 288,580, Aug. 10, 1994, Pat. No. 5,452,244. This application Mar. 27, 1995, Ser. No. 440,868  
Int. Cl.<sup>6</sup> H01L 27/108; G11C 11/24  
U.S. Cl. 257—296 25 Claims



1. A multi-bit data storage location formed at the face of a layer of semiconductor of a first conductivity type comprising:
  - a first transistor having a source/drain region of a second conductivity type formed in said layer and a gate disposed insulatively adjacent a first channel area of said layer laterally adjacent said source/drain;
  - a second transistor having a gate disposed insulatively adjacent a second channel area of said layer;
  - a first capacitor including capacitor conductor disposed insulatively adjacent a first capacitor area of said layer, said first capacitor area disposed lateral to said first channel area; and
  - a second capacitor including capacitor conductor disposed insulatively adjacent a second capacitor area of said layer, said second capacitor area disposed lateral to said second channel area.

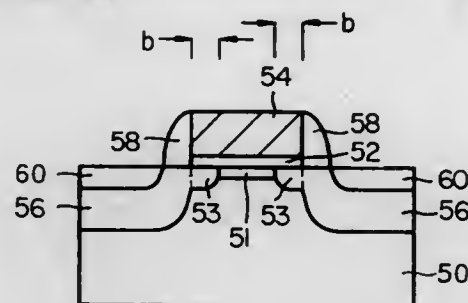
**5,567,964**  
**SEMICONDUCTOR DEVICE**  
Keiichi Kashiwara, and Hiromi Itoh, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 267,180, Jun. 28, 1994, abandoned.  
This application Sep. 11, 1995, Ser. No. 526,392  
Claims priority, application Japan, Jun. 29, 1993, 5-159206; Apr. 7, 1994, 6-069774  
Int. Cl.<sup>6</sup> H01L 27/108; 29/76; 27/088  
U.S. Cl. 257—310 9 Claims



1. A semiconductor device, comprising:
  - a semiconductor substrate having a main surface;
  - a conductive region formed in the main surface of said semiconductor substrate;

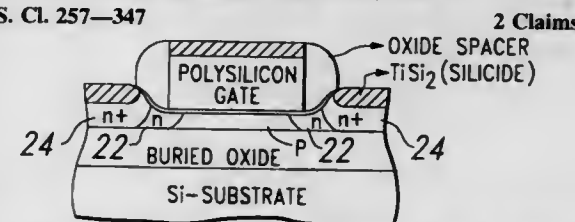
an insulating layer formed on the main surface of said semiconductor substrate and covering said conductive region, said insulating layer having a hole extending from a top surface of said insulating layer and reaching a surface of said conductive region;  
a lower electrode layer formed on the top surface of said insulating layer to be connected electrically to said conductive region through said hole;  
a capacitor insulating layer including a high permittivity dielectric material and formed only on said lower electrode layer;  
a sidewall insulating layer covering at least a sidewall surface of said lower electrode layer; and  
an upper electrode layer formed directly on said capacitor insulating layer and directly on said sidewall insulating layer and covering said lower electrode layer; wherein the capacitor insulating layer is formed of a material different from that of the sidewall insulating layer.

**5,567,965**  
**HIGH-VOLTAGE TRANSISTOR WITH LDD REGIONS**  
Jhang-rae Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea  
Filed May 16, 1995, Ser. No. 441,838  
Claims priority, application Rep. of Korea, May 16, 1994, 94-10668  
Int. Cl.<sup>6</sup> H01L 27/088  
U.S. Cl. 257—336 22 Claims



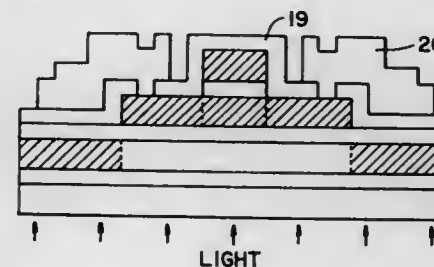
1. A metal oxide semiconductor (MOS) transistor comprising:
  - a semiconductor substrate of a first conductivity type;
  - a gate electrode formed by interposing a conductive layer over a gate insulation film on said semiconductor substrate;
  - an insulation spacer formed on the sidewalls of said gate electrode;
  - a first impurity region of the first conductivity type formed on the substrate surface under said gate electrode and having a first impurity concentration;
  - a pair of second impurity regions of a second conductivity type, being opposite to the first conductivity type, formed on the left and right of said first impurity region, respectively, and having a second impurity concentration;
  - a pair of third impurity regions formed between said first and second impurity regions, having a smaller junction depth than that of said second impurity region and a third impurity concentration being lower than that of said second impurity region; and
  - a pair of fourth impurity regions aligned with said insulation spacer, respectively embedded in and having a higher concentration than said pair of second impurity regions.

**5,567,966**  
**LOCAL THINNING OF CHANNEL REGION FOR ULTRA-THIN FILM SOI MOSFET WITH ELEVATED SOURCE/DRAIN**  
Jeong-Mo Hwang, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.  
Division of Ser. No. 420,882, Apr. 11, 1995, abandoned, which is a continuation of Ser. No. 128,944, Sep. 29, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 478,310  
Int. Cl.<sup>6</sup> H01L 27/01; 27/12; 29/76  
U.S. Cl. 257—347 2 Claims



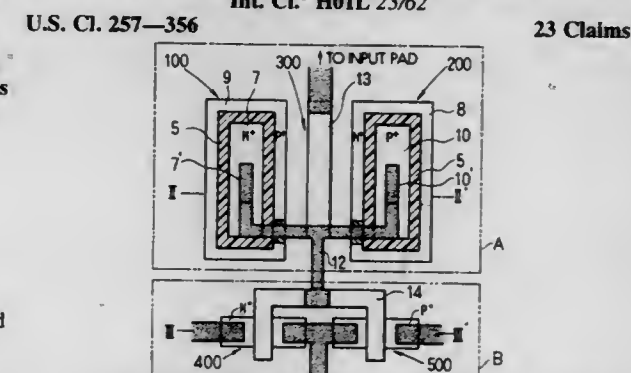
1. A semiconductor-on-insulator transistor having elevated source/drain regions and a channel, said transistor comprising:
  - a semiconductor substrate;
  - an insulating layer situated on and abutting said semiconductor substrate;
  - a semiconductor layer situated on and abutting said insulating layer, said semiconductor layer having a thin portion, thicker portions, and transition portions where the layer transitions from the thicker portions to the thinner portion;
  - a gate structure insulatively disposed over said thin portion of said semiconductor layer; and
  - wherein the channel is situated in said thin portion of said semiconductor layer, lightly doped diffusion regions are situated in said transition portions of said semiconductor layer, and said elevated source/drain regions are situated in said thicker portions of said semiconductor layer.

**5,567,967**  
**SEMICONDUCTOR DEVICE HAVING A CRYSTALLIZED ISLAND SEMICONDUCTOR LAYER**  
Naoto Kusumoto, Kanagawa, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan  
Filed Jun. 27, 1994, Ser. No. 265,750  
Claims priority, application Japan, Jun. 28, 1993, 5-181848  
Int. Cl.<sup>6</sup> H01L 27/01; 27/12; 31/0392  
U.S. Cl. 257—353 41 Claims



31. A semiconductor device comprising:
  - a transparent substrate;
  - an active semiconductor layer comprising silicon formed over said transparent substrate; and
  - a light-blocking layer adjacent to said active semiconductor layer between said active semiconductor layer and said transparent substrate, wherein the light-blocking layer comprises amorphous silicon.

**5,567,968**  
**SEMICONDUCTOR DEVICE HAVING SOI STRUCTURE AND METHOD FOR FABRICATING THE SAME**  
Kazuhiro Tsuruta, Toyooka; Harutsugu Fukumoto, Anjo, and Seiji Fujino, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan  
Filed May 3, 1995, Ser. No. 432,643  
Claims priority, application Japan, May 18, 1994, 6-103985  
Int. Cl.<sup>6</sup> H01L 23/62 23 Claims

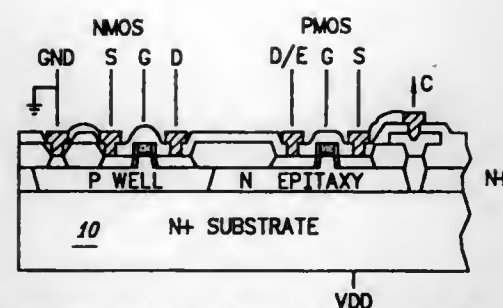


1. A semiconductor device having an SOI structure, comprising:
  - a semiconductor substrate;
  - a MOSFET formed on said semiconductor substrate; and
  - an element region disposed on said semiconductor substrate with a region-isolation dielectric layer interposed therebetween and electrically isolated from said semiconductor substrate and said MOSFET, said element region comprising:
    - a semiconductor film forming an electrical conductive path disposed in said element region;
    - a first semiconductor layer of a first conductivity type disposed on said semiconductor film forming said electrical conductive path in such a manner that a first connection interface is defined between said first semiconductor layer and said semiconductor film forming said electrical conductive path; and
    - a second semiconductor layer of a second conductivity type disposed on said semiconductor film forming said electrical conductive path in such a manner that a second connection interface is defined between said second semiconductor layer and said semiconductor film forming said electrical conductive path,

**5,567,969**  
**COMPOUND MODULATED INTEGRATED TRANSISTOR STRUCTURE WITH REDUCED BIPOLAR SWITCH BACK EFFECT**

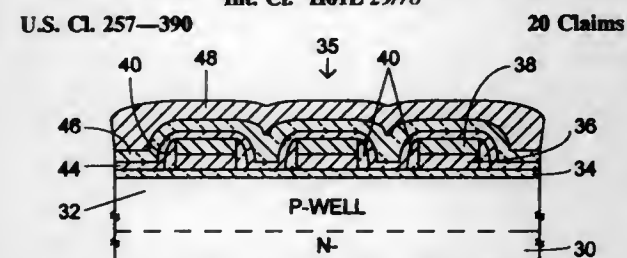
John H. Hall, 3169 Payne Ave., San Jose, Calif. 95117  
Filed Apr. 20, 1995, Ser. No. 425,173  
Int. Cl.<sup>6</sup> H01L 29/76; 29/94; 31/062; 27/095  
U.S. Cl. 257—370 12 Claims

1. A merged emitter BICMOS integrated device structure comprising:
  - a semiconductor body including a doped epitaxial layer on a heavier doped substrate, said substrate having a first major surface on which said epitaxial layer is formed and a second major surface opposing said first major surface,



a P-channel field effect transistor in a first device region in said epitaxial layer and abutting a surface of said epitaxial layer, an N-channel field effect transistor in a second device region in said epitaxial layer and abutting said surface of said epitaxial layer, and a positive voltage contact on said second major surface for supplying current through said substrate to said P-channel field effect transistor whereby switch back effect in said P-channel field effect transistor is reduced.

**5,567,970**  
**POST METAL MASK ROM WITH THIN GLASS DIELECTRIC LAYER FORMED OVER WORD LINES**  
Shing-Ren Sheu, Tau-Yuan; Chen-Chiu Hsue, and Chen-Hui Chung, both of Hsin-Chu, all of Taiwan, assignors to United Microelectronics Corporation, Hsin-Chu, Taiwan  
Division of Ser. No. 140,401, Oct. 25, 1993, Pat. No. 5,429,975.  
This application Apr. 27, 1995, Ser. No. 430,192  
Int. Cl.<sup>6</sup> H01L 29/78

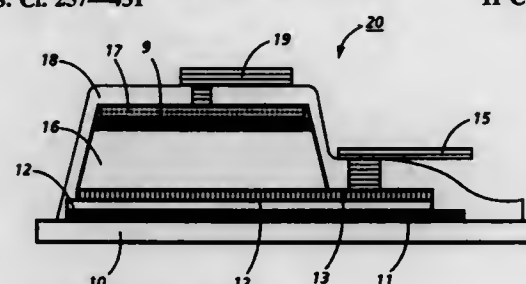


1. A Read Only Memory device with an array of cells with a thin doped glass overlayer and with improved metallurgy comprising: a plurality of closely spaced line regions with a first impurity type in and adjacent to the surface of a semiconductor substrate having a background impurity of a second opposite type, a thin insulating layer on the surface of said substrate, a plurality of closely spaced, parallel, electrically conductive lines on the thin insulating layer arranged orthogonally relative to said line regions, reflowed glass insulating layers over said conductive lines having a thickness of about 2500Å, said glass insulating layers comprising a sublayer of undoped glass and an overlayer of doped glass, said underlayer having a thickness of between about 500Å and about 1500Å and said overlayer having a thickness of about 1000Å and about 1500Å, a contact to said device, an etched, patterned metal layer on said glass insulating layer, said overlayer having been substantially removed by etching where said metal layer has been etched, an ion implantation pattern in which impurity ions have been implanted into said substrate adjacent to said conductive lines, said device having been passivated, and said implanted impurity ions having been activated by annealing said device, whereby the metallurgy and the electrical contacts to the substrate, line regions and conductor lines are protected from adverse effect during annealing.

**5,567,971**  
**VARIABLE SIZE LIGHT SENSOR ELEMENT**  
Warren B. Jackson, San Francisco, and David K. Biegelsen, Portola Valley, both of Calif., assignors to Xerox Corporation, Stamford, Conn.  
Filed Jun. 7, 1995, Ser. No. 479,874  
Int. Cl.<sup>6</sup> H01L 27/14

U.S. Cl. 257—431

11 Claims

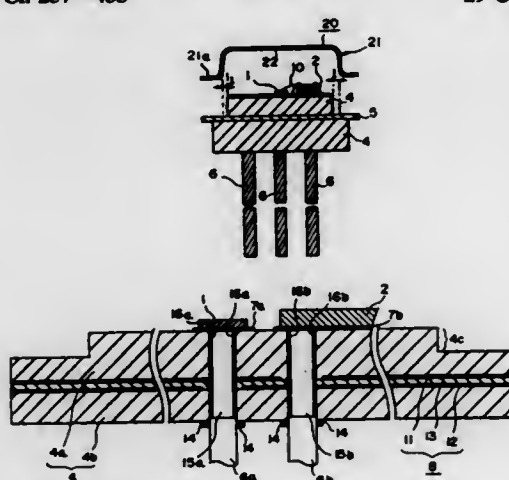


1. A sensor element comprising a collection electrode, a radiation sensor in contact with the collection electrode, the radiation sensor configured to produce a detectable response at the collection electrode upon incidence of radiation in a responsive zone, and a gate electrode layer separated from the radiation sensor by a dielectric layer, with adjustments to voltage applied to the gate electrode layer inducing changes in areal extent of the responsive zone of the radiation sensor.

**5,567,972**  
**OPTICAL ELEMENT MOUNTED ON A BASE HAVING A CAPACITOR IMBEDDED THEREIN**  
Takato Abe, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan  
Continuation-in-part of Ser. No. 147,489, Nov. 5, 1993, abandoned. This application Oct. 24, 1994, Ser. No. 328,259  
Int. Cl.<sup>6</sup> H01L 31/0203

U.S. Cl. 257—433

29 Claims



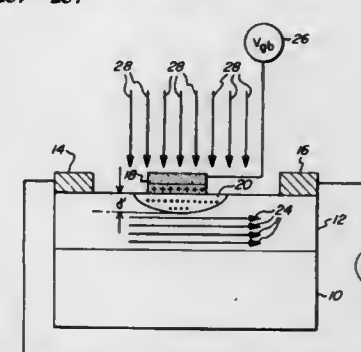
1. An optical device, comprising: a base including a lower cylindrical base member having a central line and a first diameter and having a top surface and a bottom surface opposite to the top surface, a first electrode layer on the top surface of the lower base member, a dielectric layer on the first electrode, a second electrode layer on the dielectric layer, and an upper base member on the second electrode layer, the upper base member including a first cylindrical portion having a central line identical with the central line of the lower cylindrical base member and a

diameter equal to the first diameter, and having a top surface and a bottom surface opposite to the top surface, the bottom surface of the first cylindrical portion facing the second electrode layer, and a second cylindrical portion having a central line identical with the central line of the first cylindrical member and a second diameter smaller than the first diameter and having a top surface and a bottom surface facing the top surface of the first cylindrical portion; a plurality of elongated leads supported by said base, said leads being elongated so as to protrude from the bottom surface of the lower base member; a ring-shaped flange on the top surface of the first cylindrical portion of the upper base member, said ring-shaped flange protruding from a side surface of said base; a conductive pattern formed on the top surface of the second cylindrical portion of the upper base member, said conductive pattern being electrically coupled to said leads; and a photo diode mounted on the center of the top surface of the second cylindrical portion of the upper base member, so that the position of the photo diode is determined by the upper base member.

**5,567,973**  
**OPTICAL FIELD-EFFECT TRANSISTOR WITH IMPROVED SENSITIVITY**  
Arthur Paoletta, Howell, N.J., and Bahram Nabet, Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.  
Filed Aug. 4, 1995, Ser. No. 511,274  
Int. Cl.<sup>6</sup> H01L 31/062; 31/113

U.S. Cl. 257—257

10 Claims



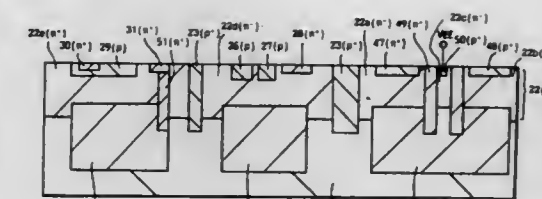
1. An optically sensitive semiconductor device comprising: a substrate; a doped channel placed on said substrate; an ohmic source placed on said doped channel; an ohmic drain placed on said doped channel; and an optically transparent semiconductor gate placed on said doped channel between said ohmic source and said ohmic drain.

**5,567,974**  
**SEMICONDUCTOR DEVICE TO ABSORB STRAY CARRIERS**  
Nobuyuki Yoshitake, and Shinji Takakura, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan  
Filed Dec. 5, 1994, Ser. No. 341,229  
Claims priority, application Japan, Dec. 21, 1993, 5-345293  
Int. Cl.<sup>6</sup> H01L 31/00

U.S. Cl. 257—443

5 Claims

1. A semiconductor device comprising: a semiconductor body of a first conductivity type; a plurality of semiconductor layers of a second conductivity type provided on said semiconductor body of the first conductivity type and electrically isolated from each other; and

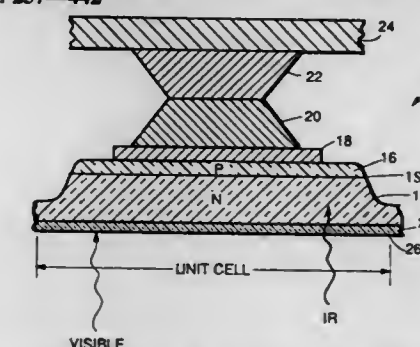


said semiconductor body of the first conductivity type and said semiconductor layers of the second conductivity type making a plurality of photodiodes, wherein a semiconductor region of the second conductivity type is provided between at least one pair of adjacent ones of said semiconductor layers of the second conductivity type to absorb stray carriers.

**5,567,975**  
**GROUP II-VI RADIATION DETECTOR FOR SIMULTANEOUS VISIBLE AND IR DETECTION**  
Devin T. Walsh, and Michael Ray, both of Goleta, Calif., assignors to Santa Barbara Research Center, Goleta, Calif.  
Filed Jun. 30, 1994, Ser. No. 269,819  
Int. Cl.<sup>6</sup> H01L 31/0256; 31/0296; 29/22

U.S. Cl. 257—442

5 Claims



1. A radiation detector for electromagnetic radiation having wavelengths within an IR radiation spectrum and within a visible radiation spectrum having a radiation receiving surface, comprising:

a unit cell comprised of a first layer of Group II-VI material that is compositionally differentiated into at least two regions; wherein a first region of said first layer is responsive to first electromagnetic radiation entering through said surface that has wavelengths within the IR radiation spectrum for absorbing the first electromagnetic radiation for generating first detectable charge carriers therefrom; and a second region of said first layer is comprised of highly compositionally graded Group II-VI material and is responsive to second electromagnetic radiation entering through said surface that the wavelengths within the visible radiation spectrum for absorbing the second electromagnetic radiation for generating second detectable charge carriers therefrom.

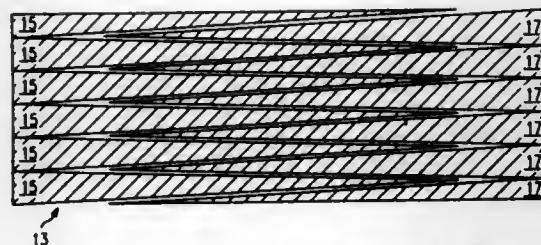
**5,567,976**  
**POSITION SENSING PHOTODIODE DEVICE**  
Eugene G. Dierschke, Dallas, and John H. Berlien, Jr., Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.  
Filed May 3, 1995, Ser. No. 433,304  
Int. Cl.<sup>6</sup> H01L 31/00

U.S. Cl. 257—443

14 Claims

1. A position sensitive device, comprising: a semiconductor substrate; an epitaxial layer disposed over said semiconductor substrate;



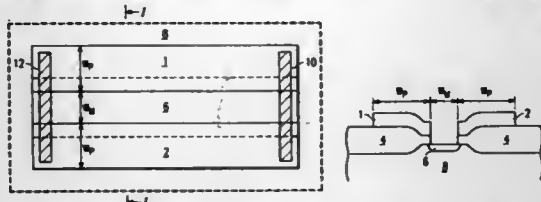


- a first plurality of tapered photosensitive regions disposed over said epitaxial layer and extending from a first edge of said device towards the opposite edge of said device;
- a first current output coupled to said first plurality of photosensitive regions;
- a second plurality of tapered photosensitive regions disposed over said epitaxial layer and extending from said opposite edge of said device towards said first edge of said device, and being interdigitated with said first plurality of photosensitive regions;
- a second current output coupled to said second plurality of said photosensitive regions; and
- a tortuous interface region between said first plurality of photosensitive regions and said second plurality of photosensitive regions, said interface region providing a predetermined spacing between said first and second photosensitive regions;
- whereby the position of a spot of light incident on said device can be calculated from the currents present at said first and second current outputs.

**5,567,977**  
**PRECISION INTEGRATED RESISTOR**

**Jean Jimenez, Voiron, France, assignor to SGS- Thomson  
Microelectronics, S.A., Gentilly Cedex, France  
Division of Ser. No. 949,619, Sep. 23, 1992, Pat. No. 5,422,298.  
This application Feb. 6, 1995, Ser. No. 383,904**

**Claims priority, application France, Sep. 26, 1991, 91/12143**  
**Int. Cl.<sup>6</sup> H01L 27/04**  
**U.S. Cl. 257—538** **21 Claims**

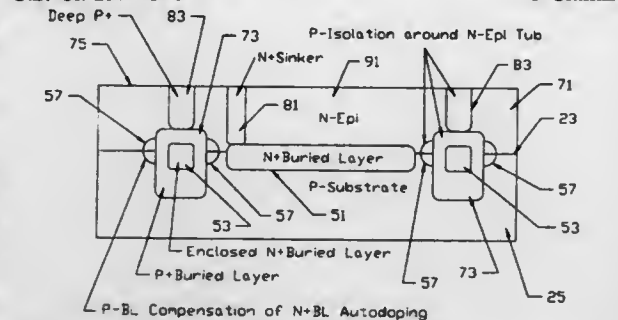


1. A precision resistor formed on a semiconductor substrate, comprising:
- a first and a second stripe made of a resistive conductive material disposed on an insulating material, said first and second stripe each having a first sheet resistance per square  $R_p$  and a patterned width  $W_p$ ;
  - a doped third stripe in said semiconductor substrate, having a patterned width  $W_M$  which is substantially equal to a lateral separation between said first and second stripes, and lying directly beneath a gap between said first and second stripes, and having a second resistance per square  $R_M$ ;
- first and second metallizations connected respectively to first and second extremities of said three stripes;
- wherein said widths  $W_p$  and  $W_M$ , and said sheet resistances  $R_p$  and  $R_M$ , are related as  $R_p W_p - 2 R_M W_M$ .

**5,567,978**  
**HIGH VOLTAGE, JUNCTION ISOLATION**  
**SEMICONDUCTOR DEVICE HAVING DUAL**  
**CONDUCTIVITY TAPE BURIED REGIONS AND ITS**  
**PROCESS OF MANUFACTURE**  
**Lawrence G. Pearce, Palm Bay, Fla., assignor to Harris Cor-**  
**poration, Melbourne, Fla.**

Filed Feb. 3, 1995, Ser. No. 383,261  
Int. Cl.<sup>6</sup> H01L 29/00

U.S. Cl. 257—550 5 Claims



1. A semiconductor device comprising:
  - a semiconductor substrate of a first conductivity type having a first surface;
  - a semiconductor layer of a second conductivity type formed on said first surface said semiconductor substrate and forming a first PN junction at an interface therewith;
  - a first semiconductor region of said second conductivity type and having an impurity concentration greater than of said semiconductor layer, buried in said semiconductor layer at a first portion of said interface;
  - a second semiconductor region of said second conductivity type and having an impurity concentration greater than of said semiconductor layer, buried in said semiconductor layer at a second portion of said interface spaced apart from said first portion of said interface;
  - a third semiconductor region of said first conductivity type and having a first impurity concentration and encapsulating said second semiconductor region; and
  - a fourth semiconductor region of said first conductivity type and having a second impurity concentration less than said first impurity concentration, and extending from said third semiconductor region at said interface.

5,567,979  
ORIENTED FERROELECTRIC THIN-FILM ELEMENT  
AND MANUFACTURING METHOD THEREFOR

Keiichi Nashimoto, and Atsushi Masuda, Kanagawa, both of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan  
Filed May 27, 1994, Ser. No. 250,702

Claims priority, application Japan, May 31, 1993, 5-149871  
Int. Cl.<sup>6</sup> H01L 29/04



1. An oriented ferroelectric thin film element comprising:  
a semiconductor single crystal (100) substrate;  
a buffer layer having a crystal orientation of (111) and random in-plane directions, said buffer layer being provided on said semiconductor single-crystal substrate; and

a ferroelectric thin film having a crystal orientation of one of (111) and (0001), said ferroelectric thin film being provided on said buffer layer.

5,567,980  
NATIVE OXIDE OF AN ALUMINUM-BEARING GROUP  
III-V SEMICONDUCTOR

**Nick Holonyak, Jr., Urbana, and John M. Dallesasse, Wheaton, both of Ill., assignors to The Board of Trustees Of The University Of Illinois, Urbana, Ill.**

Continuation of Ser. No. 117,435, Sep. 7, 1993, abandoned,  
which is a division of Ser. No. 721,843, Jun. 24, 1991, Pat. No.  
5,262,360, which is a continuation-in-part of Ser. No. 636,313,  
Dec. 31, 1990, abandoned. This application Jan. 26, 1995, Ser.  
No. 378,102

U.S. Cl. 257-631



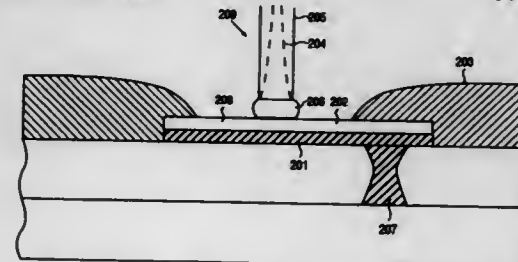
1. A diffusing mask comprising part of a semiconductor body, said mask being formed by exposing an aluminum-bearing Group III-V semiconductor material to a water-containing environment and a temperature of at least 375° C. to convert at least a portion of said aluminum-bearing Group III-V semiconductor material to a native oxide, the molar of said native oxide being substantially the same as or less than the molar volume of said aluminum-bearing Group III-V semiconductor material.

5,567,981  
BONDING PAD STRUCTURE HAVING AN INTERPOSED  
RIGID LAYER

Ameet S. Bhansali, Fremont, Calif.; Gay M. Samuelson, Tempe, Ariz.; Venkatesan Murali, San Jose, Calif.; Michael J. Gasparek, Tempe, Ariz.; Shou H. Chen, Mesa, Ariz.; Nicholas P. Mencinger, Tempe, Ariz.; Ching C. Lee, Penang, Malaysia, and Kevin Jeng, Cupertino, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 31, 1993, Ser. No. 40,521  
Int. Cl.<sup>6</sup> H01L 23/58; 23/495; 23/48

U.S. Cl. 257—643



1. An integrated circuit device having a bonding region, said integrated circuit device comprising:  
a silicon layer having diffusion regions formed therein;  
a plurality of device layers, said device layers formed over said silicon layer and said diffusion regions so as to form an integrated circuit device;  
a compliant dielectric layer overlying said device layers;

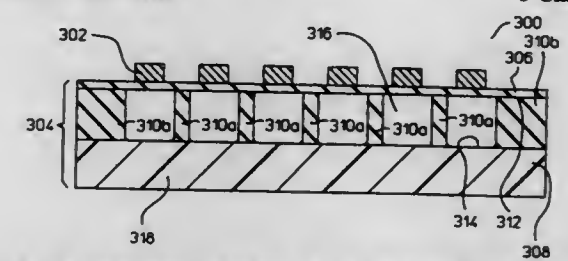
- a bonding pad, said bonding pad formed so as to overlie said compliant dielectric layer, said bonding pad electrically coupled to at least one of said plurality of device layers;
- a lead, said lead attached to said bonding pad so as to provide for electrical coupling to said bonding pad; and
- a rigid interposed layer, said rigid interposed layer directly overlying said compliant dielectric layer, and being directly below said bonding pad, wherein said rigid interposed layer comprises a material selected from the group consisting of copper and nickel and molybdenum and titanium or any combination thereof.

**5,567,982**  
**AIR-DIELECTRIC TRANSMISSION LINES FOR**  
**INTEGRATED CIRCUITS**

Dirk J. Bartelink, 13170 La Cresta Dr., Los Altos Hills, Calif. 94022

Filed Sep. 30, 1994, Ser. No. 316,195  
Int. Cl.<sup>6</sup> H01L 29/41

U.S. Cl. 257-664



1. An interconnect structure in an integrated circuit device comprising:
- a first membrane-like structure having first and second opposite surfaces;
  - a supporting base structure having a first surface;
  - a first set of support members positioned between the first surface of the first membrane-like structure and the first surface of the supporting base structure, the first set of support members being generally orthogonal to the first surface of the first membrane-like structure and the first surface of the supporting base structure, the first set of support members being comprised of a dielectric material; and
  - a first conductive structure positioned adjacent to the first membrane-like structure;
- wherein the sidewalls of the first conductive structure are centered around the sidewalls of a given corresponding first set of support members.

5,567,983  
SEMICONDUCTOR APPARATUS CAPABLE OF  
COOLING A SEMICONDUCTOR ELEMENT WITH  
RADIATION EFFICIENCY

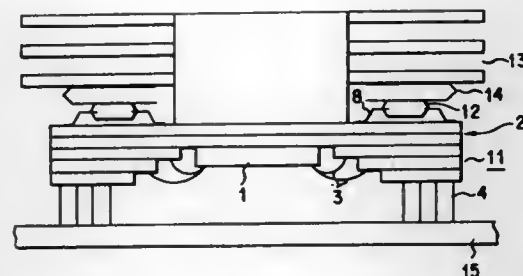
Naohiko Hirano, and Yasuhiro Yamaji, both of Kawasaki,  
Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki,  
Japan

Continuation of Ser. No. 179,715, Jan. 11, 1994, abandoned.  
This application Jun. 6, 1995, Ser. No. 466,705

Claims priority, application Japan, Apr. 5, 1993, 5-101911  
Int. Cl.<sup>6</sup> H01L 23/34; 23/02

U.S. Cl. 257-722

1. A semiconductor apparatus comprising:
  - a circuit board;
  - an exothermic element mounted on said circuit board;
  - a package for covering said exothermic element;
  - a first semiconductor element mounted on said exothermic element and exposed to a coolant flow;
  - a heat sink attached to said first semiconductor element to cool said first semiconductor element by the coolant flow, said heat sink including a plurality of cooling fins to receive said coolant flow;



a plurality of second semiconductor elements mounted on said package; and  
a plurality of conductive auxiliary members, each connected at one end to one of said plurality of cooling fins and at the other end to one of said plurality of second semiconductor elements.

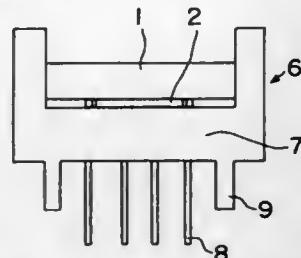
#### 5,567,984 PROCESS FOR FABRICATING AN ELECTRONIC CIRCUIT PACKAGE

Jerzy M. Zalesinski, Essex Junction, Vt., and Alan J. Emerick, Warren Center, Pa., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 351,761, Dec. 8, 1994. This application Jun. 6, 1995, Ser. No. 468,313  
Int. Cl.<sup>6</sup> H01L 23/48; 23/04

U.S. Cl. 257—697

12 Claims



1. A carrier which comprises a main body portion that contains stand-off portions and holds a desired array of electrically conductive pins protruding from major surfaces thereof; and being fabricated from a polymeric composition; and wherein electrically conductive pins of said array each contain a bump located on an intermediate portion of a pin held within said main body portion of said carrier.

#### 5,567,985 ELECTRONIC APPARATUS WITH COMPLIANT METAL CHIP-SUBSTRATE BONDING LAYER(S)

Charles D. Iacovangelo, Niskayuna, and Paul J. DiConza, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 279,379, Jul. 25, 1994, abandoned. This application Jun. 1, 1995, Ser. No. 457,551  
Int. Cl.<sup>6</sup> H01L 23/02; 39/02

U.S. Cl. 257—701

20 Claims

1. An electronic structure comprising:  
a substrate comprising a dielectric material with a metallizable surface;  
a mixed metal layer having a thickness of at least about 5 microns deposited over said substrate, said mixed metal layer comprising at least one ductile, thermally conductive metal having a coefficient of thermal expansion of at least about 7 ppm/°C. and at least one other metal having a coefficient of thermal expansion up to about 5 ppm/°C.; and

at least one integrated circuit chip mounted with one side in contact with only said mixed metal layer, said chip comprising a material having a higher coefficient of thermal expansion than said substrate.

#### 5,567,986 HEAT SINK

Yoshio Ishida, Osaka, Japan, assignor to Diamond Electric Mfg. Co., Ltd., Osaka, Japan

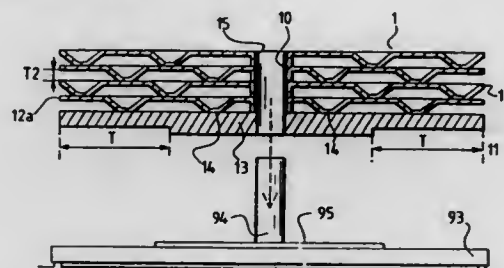
Filed May 27, 1994, Ser. No. 249,353

Claims priority, application Japan, Jun. 4, 1993, 5-160102; Sep. 20, 1993, 5-257819

Int. Cl.<sup>6</sup> H01L 23/10; 23/34

U.S. Cl. 257—707

23 Claims



1. A heat sink comprising: a heat receiving plate; and a heat radiating means for radiating heat from a heat generating body stacked on said heat receiving plate, wherein an interval between said heat receiving plate and said heat radiating means is defined by a plurality of bosses geometrically disposed on said heat radiating means, said plurality of bosses being integrally formed on said heat radiating means, wherein a bottom surface of each boss is soldered onto said heat receiving plate.

#### 5,567,987 SEMICONDUCTOR DEVICE HAVING A MULTI-LAYER METALLIZATION STRUCTURE

Sang-in Lee, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

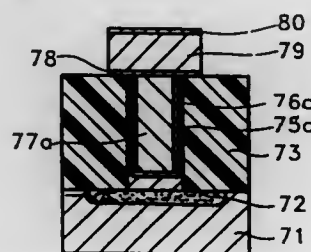
Division of Ser. No. 341,982, Nov. 16, 1994, which is a division of Ser. No. 172,216, Dec. 23, 1993. This application Jun. 7, 1995, Ser. No. 480,975

Claims priority, application Rep. of Korea, Dec. 30, 1992, 92-26603

Int. Cl.<sup>6</sup> H01L 23/52; 29/43

U.S. Cl. 257—751

13 Claims



1. A semiconductor device, comprising:  
a substrate;  
an insulating layer formed on said substrate;  
an opening formed in said insulating layer, said opening including a bottom surface comprised of a portion of said substrate;  
a diffusion barrier layer formed on said bottom surface of said opening and on walls of said insulating layer defining said opening, said diffusion barrier layer being comprised of at least first and second sub-layers;  
a nucleation layer formed on said diffusion barrier layer, said nucleation layer containing hydrogen;

a first metal layer formed on said nucleation layer, said first metal layer including a plug portion filling said opening;  
an intermediate layer formed on said first metal layer, upper edges of said diffusion barrier layer and said nucleation layer, and surface portions of said insulating layer adjacent to said opening; and  
a second metal layer formed on said intermediate layer.

#### 5,567,988

#### INTEGRATED CIRCUIT INTERCONNECT STRUCTURE WITH BACK REFLECTION SUPPRESSING ELECTRONIC "SPEED BUMPS"

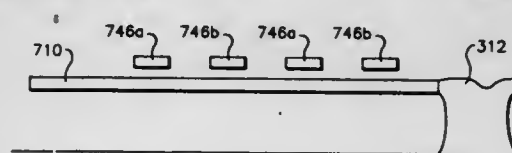
Michael D. Rostoker, Boulder Creek, and Nicholas F. Pasch, Pacifica, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation-in-part of Ser. No. 106,175, Aug. 13, 1993, Pat. No. 5,442,225. This application Jun. 7, 1995, Ser. No. 483,113

Int. Cl.<sup>6</sup> H01L 23/48; 23/52; 29/40

U.S. Cl. 257—754

55 Claims



1. An interconnect structure for a microelectronic device having a substrate, comprising:  
a contact formed on the substrate;  
an interconnect which is formed on the substrate and connected to the contact; and  
a plurality of electronic speed bumps which are spaced along the interconnect for disturbing electrical signals propagating along the interconnect toward the contact.

#### 5,567,989

#### HIGHLY INTEGRATED SEMICONDUCTOR WIRING STRUCTURE

Sang-pil Sim, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

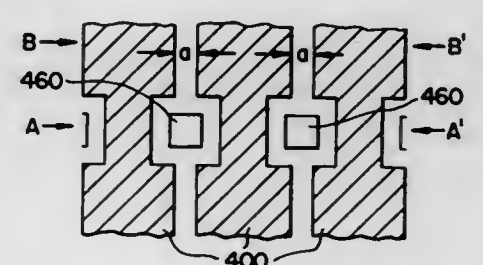
Filed Jul. 27, 1994, Ser. No. 280,887

Claims priority, application Rep. of Korea, Jul. 27, 1993, 1993-14293

Int. Cl.<sup>6</sup> H01L 23/48

U.S. Cl. 257—774

7 Claims



1. A highly integrated semiconductor wiring structure comprising:  
a plurality of wiring layers and a self-aligned contact hole formed therebetween;  
said self-aligned contact hole being formed between and spaced from respective and adjacent ones of said plurality of wiring layers having a respective first wiring width thereat; and  
a remaining portion of each of said plurality of wiring layers having a second wiring width wider than said first wiring width in portions of said plurality of wiring layers other than where said self-aligned contact hole is formed.

#### 5,567,990

#### RESIN-ENCAPSULATED SEMICONDUCTOR DEVICE

Tatsuo Kawata, Shimodate; Hiroshi Suzuki, Hitachi; Hiroki Sashima, Shimodate; Kazuhiko Miyabayashi, Shimodate, and Osamu Horie, Shimodate, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

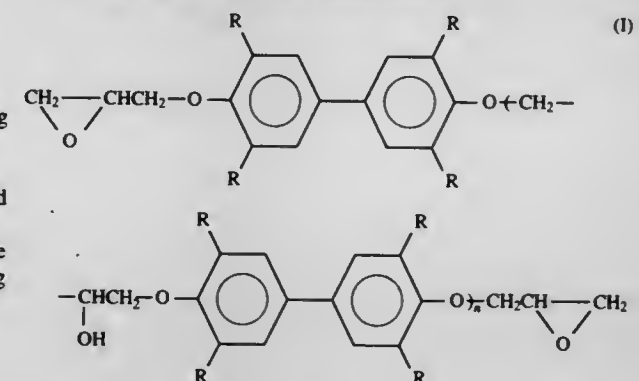
Filed Aug. 7, 1995, Ser. No. 511,866

Claims priority, application Japan, Aug. 11, 1994, 6-189686  
Int. Cl.<sup>6</sup> H01L 23/29

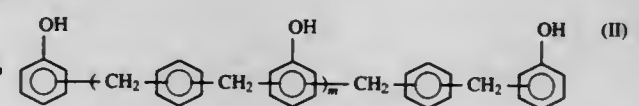
U.S. Cl. 257—788

4 Claims

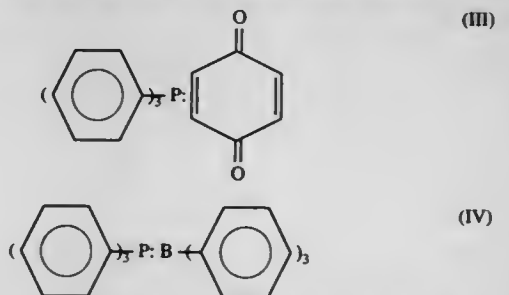
1. A thin, resin-encapsulated semiconductor device for surface mounting wherein a Si chip type element is encapsulated in a package by molding an epoxy resin encapsulating material, wherein the Si chip is at least 25 mm<sup>2</sup> in area or has a side of at least 5 mm in length, the package is not more than 3 mm in thickness, and the epoxy resin encapsulating material comprises  
(A) an epoxy resin component comprising an epoxy resin represented by the following general formula (I),



wherein R is H or CH<sub>3</sub>, and n is a number of 0 to 3,  
(B) a curing agent represented by the following general formula (II),



wherein m is a number of 0 to 30,  
(C) at least one cure accelerator selected from the group consisting of a compound represented by the following formula (III) and a compound represented by the following formula (IV),



(D) a release agent selected from the group consisting of a polyethylene wax, a mixture of a polyethylene wax and carnauba wax and a mixture of a polyethylene wax and a montanic ester wax, and  
(E) fused silica as a filler, the fused silica being 65 to 90% by volume of the epoxy resin encapsulating material.



5,567,991

# ELECTRIC VEHICLE RELAY ASSEMBLY USING FLEXIBLE CIRCUIT CONNECTOR COUPLING THE RELAY TO THE RELAY CIRCUIT

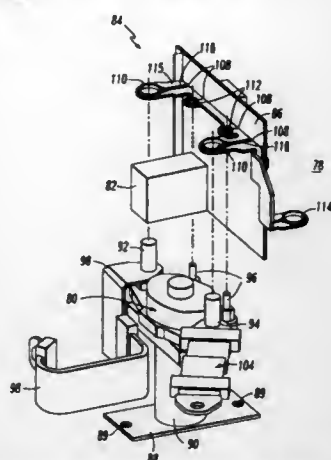
David L. Schantz; James H. DeOms, Glen Arm; Ronnie L. Starling, Columbia, and Michael J. Ankrom, Baltimore, all of Md., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Jun. 10, 1994, Ser. No. 258,117

Int. Cl.<sup>6</sup> H01R 9/09

U.S. Cl. 307—10.1

8 Claims



1. An electric vehicle relay assembly comprising:
  - a main relay;
  - a flexible circuit electrically connected to the main relay;
  - connection means for mounting the flexible circuit onto the main relay; and
  - a wiring board affixed to the flexible circuit, the wiring board including relay circuitry electrically connected to the flexible circuit for controlling the main relay.

5,567,992

# ARRANGEMENT FOR A CRUISE CONTROL SYSTEM FOR A MOTOR VEHICLE

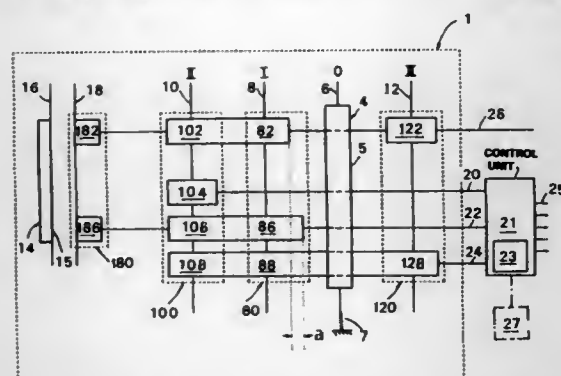
Micael Grahn, and Håkan Tordby, both of Trollhättan, Sweden, assignors to Saab Automobile Aktiebolag, Sweden  
PCT No. PCT/SE94/00299, § 371 Date Nov. 22, 1994, § 102(e) Date Nov. 22, 1994, PCT Pub. No. WO94/22687, PCT Pub. Date Oct. 13, 1994

PCT Filed Apr. 5, 1994, Ser. No. 338,630

Claims priority, application Sweden, Apr. 7, 1993, 9301162  
Int. Cl.<sup>6</sup> B60K 31/00

U.S. Cl. 307—10.1

16 Claims



1. Arrangement for a cruise control system for a motor vehicle, comprising:
  - an electrical control unit having a memory for storing a set speed;

a plurality of input signal lines connected to the control unit, the control unit generating output signals for controlling the cruise control system in response to signals on the input signal lines;

a source of power; and

a switch connected between the source of power and the input signal lines to selectively connect the source of power to the plurality of input signal lines, the switch having a neutral position, first and second operating positions spaced in a first direction from the neutral position, first and second contact units and a moveable contact moveable in the first direction from the neutral position to the first and the second positions, the first and second contact units and the moveable contact being arranged with the source of power and the input signal lines such that, when the moveable contact is in the first position, signals are applied to the input signal lines to cause the output signals from the control unit to temporarily deactivate the cruise control system without cancellation of the set speed and, in the second position, the signals applied to the input signal lines result in output signals representative of a first predetermined cruise control function being generated, the switch being further structured and arranged such that the second position can only be reached by the moveable contact first passing through the first position, so that the first contact unit applies signals via the input signal lines to the control unit as the moveable contact passes therethrough to temporarily deactivate the cruise control system.

5,567,993

# PROGRAMMABLE POWER SUPPLY SYSTEM AND METHODS

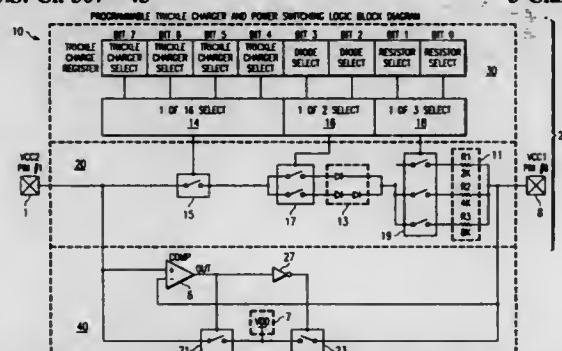
Brian W. Jones, Richardson, and Alan M. Morton, Dallas, both of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Jun. 23, 1994, Ser. No. 264,389

Int. Cl.<sup>6</sup> H02J 3/14

U.S. Cl. 307—43

5 Claims



1. A programmable power controller for controlling power between a first power source and a second power source and powering first circuitry, wherein said first power sources acts as a primary power source having a first voltage and said second power source having a second voltage comprising:
  - (a) a control register having a first field, said first field used to activate circuitry used to direct power from said primary power source to said second power source;
  - (b) circuitry to compare said first voltage and said second voltage to determine which is greater and to couple said primary power source or said second power source, depending on which is greater, to said first circuitry so as to provide power to said first circuitry; and

wherein the there are at least three electrical paths from said first power source and further wherein said first path has a resistance of 2K  $\Omega$ , said second path has a resistance of 4K  $\Omega$ , and said third path has a resistance of 8K  $\Omega$ .

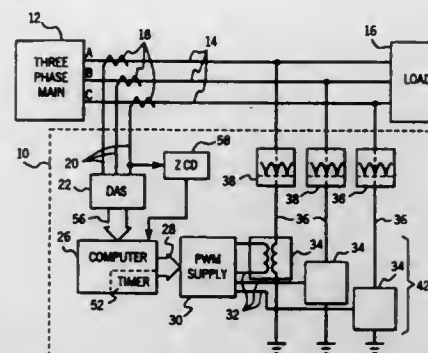
5,567,994

# ACTIVE HARMONIC FILTER WITH TIME DOMAIN ANALYSIS

Gerald W. Davis, Franklin, Wis.; Shiping Huang, Swansea, United Kingdom, and Peter J. Unsworth, Brighton, England, assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.  
Filed Sep. 29, 1995, Ser. No. 536,894  
Int. Cl.<sup>6</sup> H02M 1/12

U.S. Cl. 307—105

11 Claims



1. A hybrid filter removing harmonic components from an AC power source, the AC power source providing an actual current waveform including a fundamental and harmonic frequency component flowing through a line connected to a load, the filter comprising:
  - a current transducer connected to the line to provide a current signal indicating the actual current waveform in the line;
  - an electronic computer operating according to a stored program and receiving the current signal to determine a harmonic-less current waveform matching the power characteristics of the actual current waveform;
  - a controllable voltage source producing a voltage proportional to the difference between the harmonic-less current waveform and the actual current waveform;
  - a passive resonant circuit attached at a first end to the line and having an impedance minima at a frequency near the harmonic frequency component and attached at a second end to the controllable voltage source.

5,567,995

# MULTI WINDING SPIRAL GENERATOR

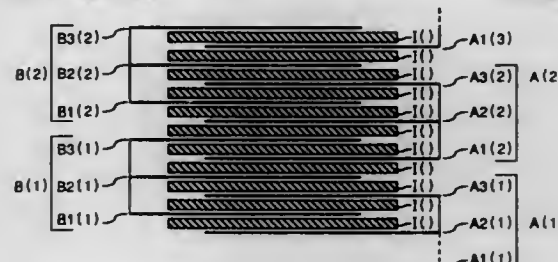
James P. O'Loughlin, Placitas, and Steve E. Calico, Albuquerque, both of N.M., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 20, 1994, Ser. No. 326,623

Int. Cl.<sup>6</sup> H03K 3/00

U.S. Cl. 307—109

12 Claims



1. A multiwinding spiral generator comprising:
  - a first group of at least three conductor ribbons which are wound in a spiral forming several layers, said conductor ribbons in said first group all having a first edge along the entire lengths at which they are electrically connected;
  - at least a second group of at least three conductor ribbons which are each individually sandwiched between one of the three conductor ribbons in the first group, said conductor ribbons in

said second group all having a second edge along their entire lengths along which they are electrically connected; and  
a means for insulating the first and second group of conductor ribbons so that none of the conductor ribbons in the first group come into contact with conductor ribbons of the second group.

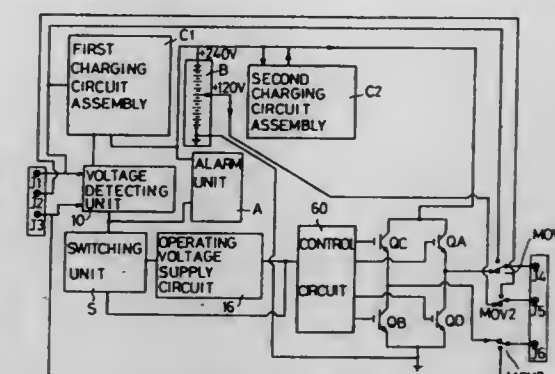
5,567,996

# AC POWER SUPPLY UNIT

Shih-Chung Yu, No. 18, Lane179-21, Hsin-Ping Rd., Tai-Ping Hsiang, Taichung Hsien, Taiwan  
Filed Jan. 30, 1995, Ser. No. 380,180  
Int. Cl.<sup>6</sup> H01H 47/00

U.S. Cl. 307—125

12 Claims



1. An ac power supply unit for supplying power to an ac load, said ac power supply unit comprising:
  - first, second and third output terminals, said load being adapted to be connected to selected ones of said first and second output terminals, said first and third output terminals, and said second and third output terminals;
  - a dc voltage supply unit for supplying a high dc voltage output, said voltage supply unit having a positive terminal, a center tap terminal connected electrically to said second output terminal, and a ground terminal;
  - a first voltage-controlled switch interconnecting said positive terminal of said dc voltage supply unit and said first output terminal;
  - a second voltage-controlled switch interconnecting said third output terminal and said ground terminal of said dc voltage supply unit;
  - a third voltage-controlled switch interconnecting said positive terminal of said dc voltage supply unit and said third output terminal;
  - a fourth voltage-controlled switch interconnecting said first output terminal and said ground terminal of said dc voltage supply unit; and
  - a control circuit connected electrically to said first, second, third and fourth voltage-controlled switches, said control circuit controlling said first and second voltage-controlled switches to conduct and said third and fourth voltage-controlled switches to be in a cut-off state during a high cycle of a predetermined frequency cycle and further controlling said third and fourth voltage-controlled switches to conduct and said first and second voltage-controlled switches to be in a cut-off state during a low cycle of said frequency cycle, thereby providing a first ac voltage output measured across said first and second output terminals when said load is connected between said first and second output terminals, a second ac voltage output which is equal in magnitude to and which is in phase with said first ac voltage output and which is measured across said second and third output terminals when said load is connected between said second and third output terminals, and a third ac voltage output which is equal to a sum of said first and second ac voltage outputs and which

is measured across said first and third output terminals when said load is connected between said first and third output terminals.

5,567,997

# THREE-VALUE POWER SUPPLY DEVICE AND IMAGE FORMING APPARATUS UTILIZING THE SAME

Koji Suzuki, Yokohama, and Hiroshi Saito, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

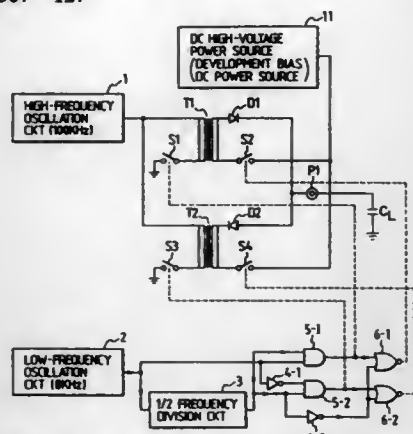
Filed Jul. 27, 1993, Ser. No. 97,000

Claims priority, application Japan, Jul. 28, 1992, 4-201008; Oct. 29, 1992, 4-291201

Int. Cl.<sup>6</sup> H02M 3/00

U.S. Cl. 307-127

19 Claims



1. A three-value power supply device comprising: a high frequency-driven converter of a positive output; a high frequency-driven converter of a negative output; an output terminal; and high-speed switch means for supplying or not supplying said output terminal with the positive or negative output at desired timings of frequency sufficiently lower than the high frequency.

5,567,998

# ELECTRIC MOTOR WITH ROTOR SUPPORT MEANS

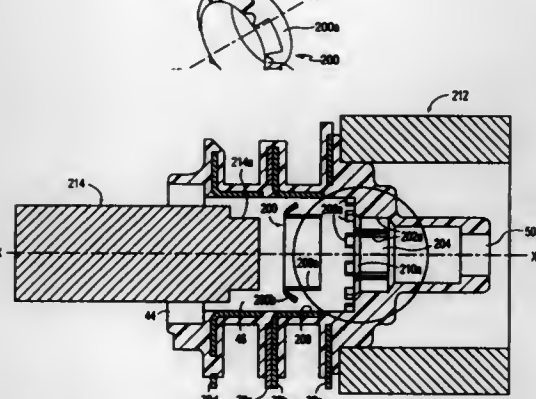
David J. Ineson, Oakville, and Lawrence W. Dupre, Southington, both of Conn., assignors to Philips Electronics North America Corporation, New York, N.Y.

Filed Oct. 14, 1994, Ser. No. 323,207

Int. Cl.<sup>6</sup> H02K 5/16

U.S. Cl. 310-90

11 Claims



1. An electric motor including a stator disposed around a central axis and having first and second ends, a rotor and including first and second ends, and rotor support means for supporting said rotor

relative to the stator for rotation about said axis, said rotor support means comprising, disposed at one of said rotor ends:

- a first bearing member extending axially from the first end of the rotor and comprising a plastic material forming a bearing surface having a circular cross section centered about said axis;
- a bearing support comprising a plastic part of the motor, said part including:
  - first sidewall means comprising at least one surface defining an axially-extending first bore having a predefined geometrical shape and a predetermined cross-sectional area;
  - second sidewall means comprising at least one surface defining an axially-extending second bore having a predefined geometrical shape and a predetermined cross-sectional area which is larger than the predetermined cross-sectional area of the first bore;
  - end-wall means defining an end of the second bore adjacent a respective end of the first bore;
- a metallic second bearing member including:
  - an axially-extending annular portion having an outer surface which is shaped and dimensioned to have an interference fit with the at least one surface of the first sidewall means and having an inner bearing surface which is shaped and dimensioned to substantially conform to the bearing surface of the first bearing member and to facilitate free rotation of said bearing surfaces against each other;
  - a locking portion comprising a plurality of locking tabs which are angularly-spaced around the axis and extend outwardly from the annular portion, each of the locking tabs having a bendable portion from which said tab extends at an acute angle relative to said axis without forcibly contacting the second sidewall means during axial insertion into the second bore and, upon contacting the end-wall means, bends to an increasing angle and pierces the second sidewall means to secure the second bearing member within the bearing support.

5,567,999

# BOBBIN STRUCTURE FOR ELECTROMAGNETIC COIL ASSEMBLY

Richard A. Baronosky, Indian Lake Estates, Fla.; Martin Kaplan, Avon, and Peter Senak, Jr., Bristol, both of Conn., assignors to Dana Corporation, Toledo, Ohio

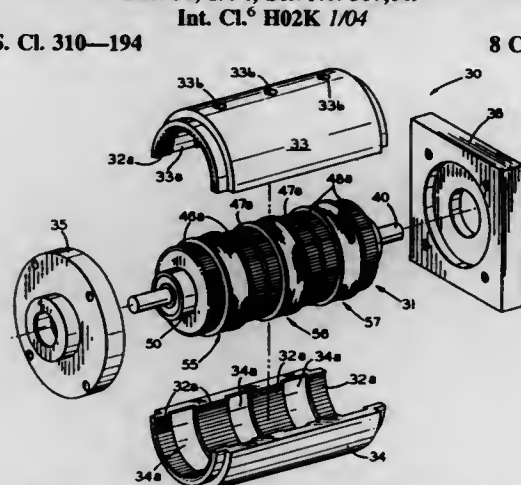
Continuation-in-part of Ser. No. 177,357, Jan. 3, 1994, Pat. No. 5,481,147, which is a continuation-in-part of Ser. No. 839,200, Feb. 20, 1992, Pat. No. 5,485,046. This application

Dec. 30, 1994, Ser. No. 367,049

Int. Cl.<sup>6</sup> H02K 1/04

U.S. Cl. 310-194

8 Claims



1. A bobbin for use in an electric motor comprising: a pair of generally hollow semi-cylindrical side portions, each of said side portions including a plurality of smaller diameter regions which are separated from one another by larger diameter regions; and a flexible hinge portion joining said side portions together.

5,568,000

# MULTIPLE POLE, SHADED POLE SUBFRACTIONAL-HORSEPOWER INDUCTION MOTOR

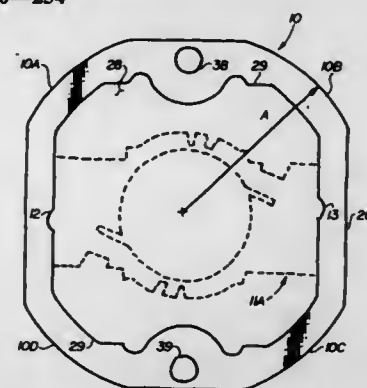
John B. Hanneken, Tempe, Ariz., assignor to Dial Manufacturing, Inc., Phoenix, Ariz.

Filed Sep. 26, 1994, Ser. No. 311,942

Int. Cl.<sup>6</sup> H02K 1/00

U.S. Cl. 310-254

8 Claims



1. A concentric shaded multiple-pole subfractional horsepower induction motor including:
  - a stator including:
    - an outer portion including a plurality of registered laminations each having a selected width and being of substantially equal shape and dimension stacked one on top of the other, said outer portion circumscribing and defining a first inner open space;
    - an inner portion including a plurality of registered laminations each of substantially equal shape and dimension stacked one on top of the other, said inner portion of said stator core circumscribing and defining a second inner open space, and including first and second pole tip portions;
  - at least a pair of shaded poles on said inner portion of said stator;
  - at least one bobbin on said inner portion of said stator;
  - at least first and second pairs of reluctance gaps on said inner portion of said stator, the reluctance gaps each being spaced apart from one of said shaped poles along an arc by 90 degrees or less, each of said first and second pairs of reluctance gaps being formed in a different one of said first and second pole tip portions, the reluctance gaps in each of said pairs being spaced apart along an arc of less than forty degrees;
  - a cylindrical armature rotatably mounted in said second inner open space, said armature having a selected diameter, the ratio of said diameter to said width of each of said stator laminations in said outer portion being in the range of 1:2.36 to 1:4.4.

5,568,001

# SAW DEVICE HAVING ACOUSTIC ELEMENTS WITH DIVERSE MASS LOADING AND METHOD FOR FORMING SAME

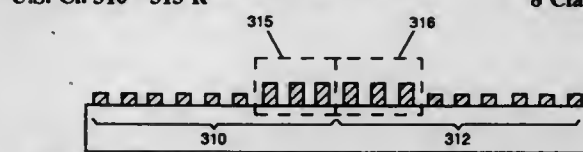
Roger A. Davenport, Ft. Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 25, 1994, Ser. No. 345,042

Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 310-313 R

8 Claims



1. A surface acoustic wave (SAW) device, comprising: a piezoelectric substrate; and

a first SAW transducer disposed on the piezoelectric substrate, the first SAW transducer having a plurality of interdigitated transducer fingers including first and second distinct portions that have a common acoustic track; wherein the first portion is located at an edge of the transducer along the common acoustic track, and consists of a plurality of adjacent transducer fingers each having a metallization thickness in height greater than that of each finger in the second portion.

5,568,002

# IIDT TYPE SURFACE ACOUSTIC WAVE DEVICE

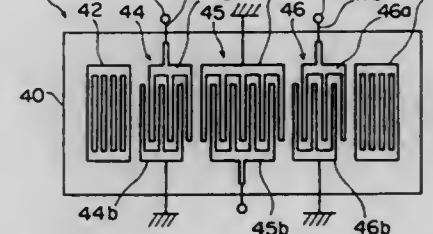
Takaharu Kawakatsu, Yutaka Tada, and Hideharu Ieki, all of Nagakakyu, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Continuation of Ser. No. 174,053, Dec. 28, 1993, abandoned. This application Oct. 10, 1995, Ser. No. 541,935

Claims priority, application Japan, Jan. 5, 1993, 5-000350 Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 310-313 B

12 Claims



1. An IIDT type surface acoustic wave device comprising a piezoelectric substrate and at least three interdigital transducers formed on a surface of said piezoelectric substrate along a direction of surface wave propagation and each provided with a pair of comb electrodes having plural electrode fingers interdigitating with each other, said interdigital transducers each being one of two types, said two types comprising an input and an output interdigital transducer along the direction of surface wave propagation, said transducers of the same type comprising an even number and being divided into first and second groups wherein a group may comprise a single transducer, each interdigital transducer in a first group being inverted in phase with respect to each interdigital transducer in a second group, said two groups being formed along a center of a region provided with all said interdigital transducers, said two groups of said transducers being connected in series to each other.

5,568,003

# METHOD AND APPARATUS FOR PRODUCING REPEATABLE MOTION FROM BIASED PIEZOELECTRIC TRANSDUCERS

Leslie L. Deck, Middletown, Conn., assignor to Zygo Corporation, Middlefield, Conn.

Filed Sep. 28, 1994, Ser. No. 313,768

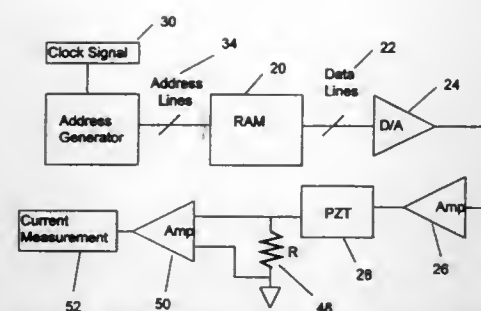
Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 310-316

24 Claims

1. A method for producing a repeatable motion profile from a biased piezoelectric transducer comprising the steps of: retrievably accessing a first set of stored calibration voltage values corresponding to points in a desired predetermined voltage profile for said piezoelectric transducer comprising associated gain current values for predetermined points along said voltage profile; driving said piezoelectric transducer with said retrievably accessed calibration voltage values for producing said repeatable motion profile; measuring a gain current associated with said motion at measurement points in said motion profile for providing corre-





sponding measured values, said measurement points corresponding to said points associated with said stored calibration values;

comparing said measured gain current values with said stored calibration values for detecting any changes in gain of said piezoelectric transducer from said stored values, and correcting for any differences in said gain from said stored values; whereby said repeatable motion profile may be produced.

5,568,004

**ELECTROMECHANICAL POSITIONING DEVICE**

Stephan Kleindiek, Tübingen, Germany, assignor to National Semiconductor Corporation, Santa Clara, Calif.

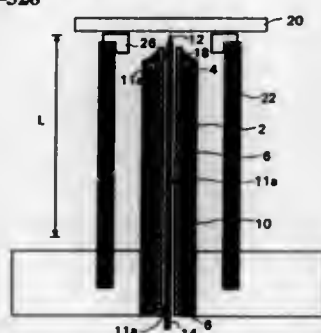
PCT No. PCT/EP93/02414, § 371 Date Apr. 19, 1994, § 102(e) Date Apr. 19, 1994, PCT Pub. No. WO94/06160, PCT Pub. Date Mar. 17, 1994

PCT Filed Sep. 7, 1993, Ser. No. 211,897

Claims priority, application European Pat. Off., Sep. 7, 1992, 922026968

Int. Cl.<sup>6</sup> H01L 41/09

U.S. Cl. 310—328



1. An electromechanical positioning device for exactly placing a tip means (12), including the tip of a probe which is capable of producing an output, into a space of atomic order at the surface of a sample (20), said device comprising a piezo-tube (2) having electrodes (4,6) connected to variable voltages for the generation of movement actions of said tip means, wherein said tip means (12) is connected to a low-mass support means (10), said support means is frictionally mounted inside said piezo-tube to be movable along a friction surface in a direction perpendicular to the surface of the sample, and said piezo-tube comprises means for generating and transmitting electrically controllable movement actions to said support means (10) in response to said variable voltages.

5,568,005

**ACOUSTIC-MAGNETIC POWER GENERATOR**

Dan A. Davidson, 4901 Laguna Ave., Sierra Vista, Ariz. 85636

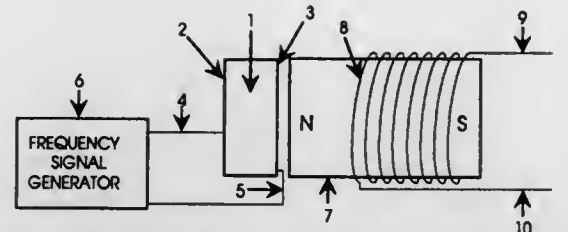
Filed Jan. 24, 1995, Ser. No. 377,203

Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 310—328

4 Claims

1. An acoustic magnetic power generator composed of an alternating current signal generator connected to an acoustic transducer



which stimulates the core of a permanent magnet such that the atoms of the magnet are caused to vibrate which in turn causes the magnetic field to vibrate and causes a current and voltage to be generated in an output coil wrapped around a permanent magnet or in the magnetic field of the permanent magnet which said current and voltage can be used for powering a load.

5,568,006

**SURFACE MOUNT CRYSTAL PACKAGE WITH RECEPTACLE MOUNTING**

Marlin Luff, Wheaton; William Skoda, Oak Park, and William Kiscellus, Addison, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

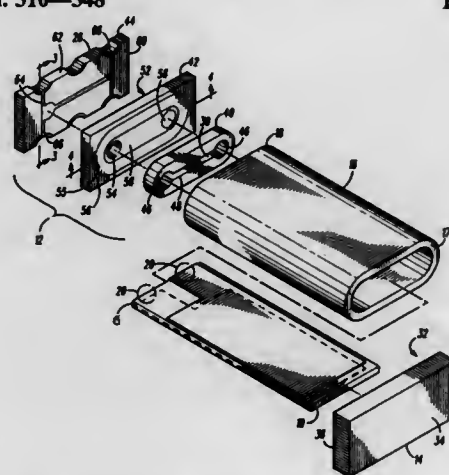
Filed Apr. 28, 1995, Ser. No. 431,169

Int. Cl.<sup>6</sup> H01L 41/053

U.S. Cl. 310—348

12 Claims

16 Claims



1. A surface mountable crystal package, comprising:  
a proximal base including an inner, middle and outer section having connecting metalization for providing an electrical path;  
the inner section comprises a dielectric material and has a substantially oblong receptacle defined by two aperture sections connected with a channel being substantially complementarily configured to receive at least a proximal portion of a crystal resonator;  
a distal cap having an inner face, an outer face and a distal conductive portion;  
a sleeve having a distal portion and a proximal portion, the distal portion being connected to the distal cap and the proximal portion being connected to the proximal base; and  
the inner section of the proximal base being configured to at least partially be received in the sleeve.

5,568,007

**LAMP UNIT AND OPTICAL ANALYZER USING THE SAME**

Hiroaki Yamura; Takeshi Kanomata, and Shin-ichi Kikuchi, all of Hachioji, Japan, assignors to Jasco Corporation, Hachioji, Japan

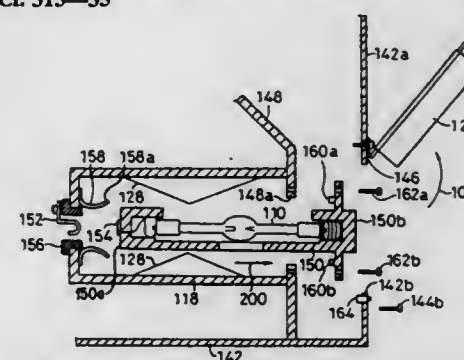
Filed Jul. 25, 1994, Ser. No. 280,348

Claims priority, application Japan, Jul. 28, 1993, 5-207164; Nov. 29, 1993, 5-068421 U

Int. Cl.<sup>6</sup> H01J 61/82; G01J 3/10

U.S. Cl. 313—35

3 Claims



1. An optical analyzer comprising:  
a lamp removably installed in a case of a main body of said optical analyzer in the vicinity of an opening which is provided in a wall portion of said case and which is large enough to pass at least said lamp therethrough;  
a fan provided at the wall portion of said case in such a manner as to fill up said opening;  
a lamp replacing mechanism for replacing said lamp from the outside of said case through said opening; and  
a means for analyzing light emitted from said lamp assembly.

5,568,008

**METAL HALIDE LAMP WITH A ONE-PART ARRANGEMENT OF A FRONT COVER AND A REFLECTOR**

Mitsuo Narita, Himeji, Japan, assignor to Ushiodenki Kabushiki Kaisha, Japan

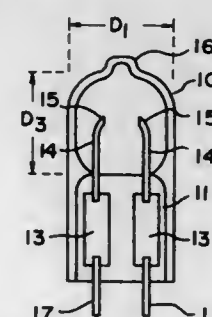
Filed Feb. 27, 1995, Ser. No. 395,505

Claims priority, application Japan, Feb. 25, 1994, 6-051102; Apr. 20, 1994, 6-104407

Int. Cl.<sup>6</sup> H01J 5/16; 61/40; 17/04; 61/04

U.S. Cl. 313—113

5 Claims



1. A metal halide lamp device with a one-piece arrangement of a front cover and a reflector, and with a metal halide lamp, said metal halide lamp having a unidirectional base and a unidirectional sealed end and being positioned within an inner space defined by the front cover and reflector so as to be surrounded thereby; wherein the metal halide lamp is configured in accordance with the relationship:  $10 < V/(L \cdot T) < 25$ , where T is a wall thickness between inner and outer surfaces of a bulb which forms an emission part of the metal halide lamp in mm, L is a distance electrodes of the lamp in mm and V is a lighting voltage of the lamp in volts.

5,568,009

**ELECTRIC LAMP HAVING A LAMP CAP WITH SOLDER-FREE CONNECTIONS**

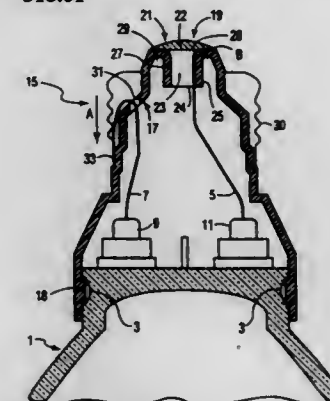
Harish Gandhi, Morgantown, W. Va., assignor to Philips Electronics North America Corporation, New York, N.Y.

Filed Dec. 29, 1994, Ser. No. 366,135

Int. Cl.<sup>6</sup> H01J 5/48

U.S. Cl. 313—318.01

19 Claims



1. An electric lamp comprising  
a lamp envelope,  
a light source within said lamp envelope which is energizable for emitting light,  
a conductive lead extending from said light source within said lamp envelope to the exterior of said envelope, and  
a lamp cap having an electrically insulative portion and a lamp cap contact, said lead being clamped between said lamp contact and said electrically insulative portion, characterized in that:  
said lamp cap contact comprises (i) a contact portion for contacting a corresponding contact in a socket and (ii) a rigid shank extending from said contact portion; and  
said insulative portion having a bore wall defining a clamping bore for receiving said shank, said bore being sized and said insulative portion surrounding said clamping bore having an elasticity selected such that (i) said first electric lead is securely clamped between said shank and said bore wall when said shank is inserted into said clamping bore with said contact portion seated against said insulative portion and (ii) said lamp contact is secured in said clamping bore solely by friction between said shank and said bore wall, said shank and bore being free of any snap-type engagements.

5,568,010

**CATHODE RAY TUBE WITH IMPROVED YOKE CLAMP**

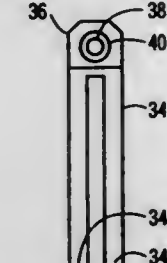
Chin Y. Cha, Bloomfield, and Shridhar V. Iyer, Ann Arbor, both of Mich., assignors to Philips Electronics North America Corporation, New York, N.Y.

Filed Nov. 16, 1995, Ser. No. 558,516

Int. Cl.<sup>6</sup> H01J 29/70; 29/74

U.S. Cl. 313—440

6 Claims



1. A cathode ray tube having a glass envelope and including a deflection coil mounted on the outside of the glass envelope, the deflection coil mounted via a mounting assembly including a

clamp comprising a band encircling the assembly and securing the assembly to the envelope, the clamp including means for adjustably securing the ends of the band, characterized in that the band is divided into a plurality of sub bands which are separated from one another along substantially the entire length of the band, whereby the stresses induced in the glass envelope in the region of the clamp are reduced.

5,568,011

## COLOR PICTURE TUBE FACEPLATE PANEL

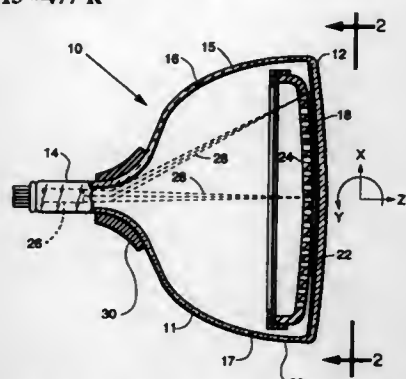
Frank R. Ragland, Jr., and Stephen T. Opreko, both of Lancaster, Pa., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Feb. 15, 1995, Ser. No. 388,853

Int. Cl.<sup>6</sup> H01J 31/00

U.S. Cl. 313—477 R

4 Claims



1. In a color picture tube including an envelope comprising a faceplate panel, a funnel and a neck, said faceplate panel including a transparent rectangular faceplate having a cathodoluminescent screen on an interior surface thereof and a peripheral sidewall, said faceplate panel having two long sides, two short sides and four corners, and a minor axis of said panel passing through the center of said panel and paralleling said two short sides, the improvement comprising

said faceplate panel having an interior blend radius from said faceplate to said sidewall that varies around the periphery of said panel, wherein the interior blend radius at each of the corners of said panel is the shortest interior blend radius, the interior blend radius at each of the ends of the minor axis is the longest interior blend radius, and the length of the interior blend radius at each of the ends of the major axis is between the lengths of the longest and shortest interior blend radii.

5,568,012

## FLUORESCENT DISPLAY TUBE WHEREIN GRID ELECTRODES ARE FORMED ON RIBS CONTACTING FLUORESCENT SEGMENTS, AND PROCESS OF MANUFACTURING THE DISPLAY TUBE

Jun Mohri, Ogori, and Noboru Endoh, Yasumachi, both of Japan, assignors to Noritake Co., Limited, Aichi-ken, and Kyushu Noritake Co., Ltd., Fukuoka-ken, both of Japan

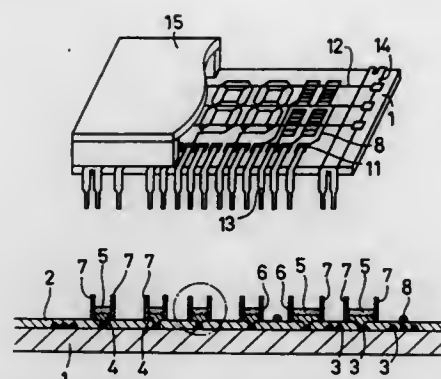
Filed Aug. 22, 1994, Ser. No. 293,923

Int. Cl.<sup>6</sup> H01J 17/49

U.S. Cl. 313—517

8 Claims

1. A fluorescent display tube comprising:  
a substrate;  
a plurality of anodes formed on the substrate, fluorescent layers formed on the respective anodes;  
cathodes located above said fluorescent layers to generate electrons which strike the fluorescent layers;  
ribs formed of an electrically insulating material on the substrate so as to surround at least a portion of a periphery of each of said anodes and having a larger height from the substrate than said fluorescent layers;



each of said ribs consisting of a plurality of layers laminated by screen printing using an insulator paste which includes said electrically insulating material; and  
grid electrodes formed on the respective ribs to control activation of said fluorescent layers.

5,568,013

## MICRO-FABRICATED ELECTRON MULTIPLIERS

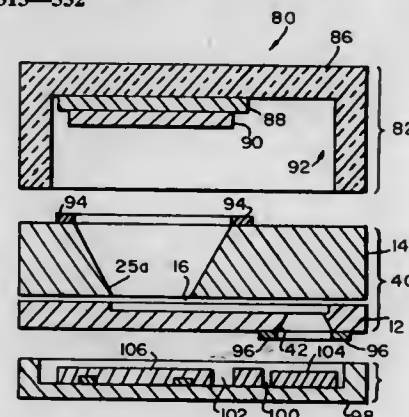
Alan M. Then, Auburn, Mass.; Gregory L. Snider, South Bend, Ind.; Robert J. Soave, Cortland, N.Y., and G. William Tasker, West Brookfield, Mass., assignors to Center for Advanced Fiberoptic Applications, Southbridge, Mass.

Filed Jul. 29, 1994, Ser. No. 282,004

Int. Cl.<sup>6</sup> H01J 43/04

U.S. Cl. 313—532

33 Claims



1. An electron multiplier comprising:  
a substrate with at least one channel having opposite ends;  
a channel cover disposed over the substrate for enclosing the at least one channel and being bonded thereto, said cover having at least one aperture formed therein located in communication with an end of said at least one channel, and one of the substrate and the cover having an aperture formed therein for communication with the other end of the at least one channel; and  
a thin-film dynode formed in the enclosed channel including an electron emissive portion overlying a current carrying portion overlying an isolation layer for isolating the emissive and current carrying portions of the dynode from the substrate and channel cover.

5,568,014

## TRAVELING-WAVE TUBE AMPLIFIER HAVING COLLECTOR POTENTIAL LOWER THAN BODY POTENTIAL

Yasuhiro Aoki, Yokohama; Kiyoshi Momota, Tochigi-ken; Tet-suo Yamamoto, Machida; Hideki Ide, and Hiroshi Onihashi, both of Ootawara, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

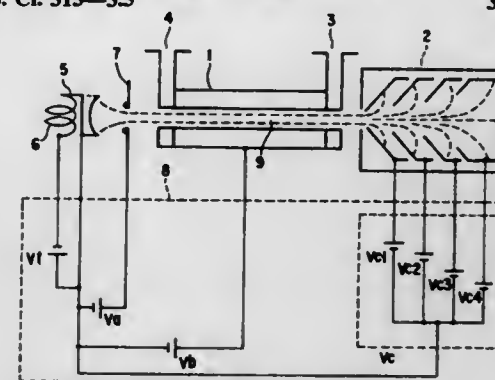
Filed Dec. 8, 1993, Ser. No. 162,887

Claims priority, application Japan, Dec. 9, 1992, 4-351496; Sep. 10, 1993, 5-248459

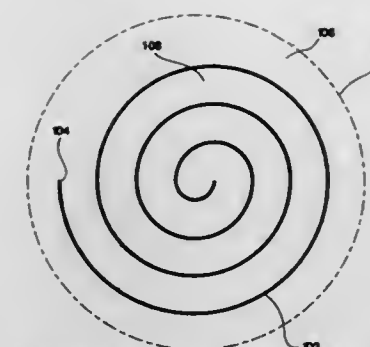
Int. Cl.<sup>6</sup> H01J 25/34

U.S. Cl. 315—3.5

3 Claims



1. A travelling-wave tube amplifier comprising:  
a traveling-wave tube including:  
an electron gun assembly having a cathode for discharging electrons as an electron beam,  
an interaction circuit operatively connected to said electron gun assembly, said interaction circuit having a slow-wave circuit, for transmitting a RF wave applied to the slow-wave circuit and for causing the RF wave to interact with the electron beam produced by the electron gun assembly, and  
a plurality of collector electrodes operatively connected to said interaction circuit for collecting electrons in the electron beam interacted with by said interaction circuit; and  
a power supply connected to said travelling-wave tube for applying separate operational voltages to each of said cathode, said interaction circuit, and said plurality of collector electrodes of said traveling-wave tube,  
wherein the voltage of said collector electrodes is set to be lower than the voltage of said interaction circuit, and the voltage for said cathode is set to be lower than a small-signal synchronous voltage at which a small-signal gain of said traveling wave tube is maximized, and  
wherein said traveling-wave tube comprises at least three collector electrodes, and the voltage for said cathode is not more than 99.5% of the small-signal synchronous voltage.



a cooling member in contact with the outer surface of the window defining (i) a channel operatively connected to the pump having a spiral path for transporting the microwave or RF absorbing cooling fluid over the outer surface of the window, and (ii) a medium adjacent to the channel which allows the electric field oriented parallel to the surface of the window to pass through the window and sustain the plasma while the microwave absorbing cooling fluid is flowing through the channel.

5,568,016

## POWER SUPPLY FOR AN ELECTROLUMINESCENT PANEL OR THE LIKE

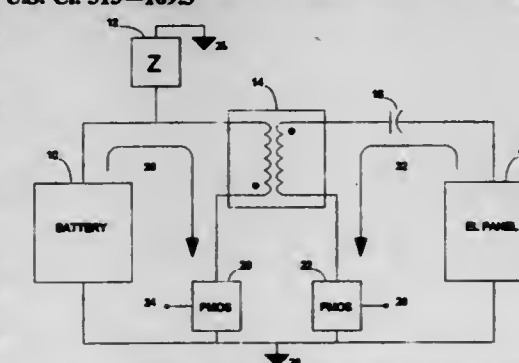
Paul Beard, Milpitas, Calif., assignor to Norand Corporation, Cedar Rapids, Iowa

Filed Oct. 18, 1994, Ser. No. 324,648

Int. Cl.<sup>6</sup> G09G 3/10

U.S. Cl. 315—169.3

8 Claims



1. A power supply circuit for applying voltages of alternating current to an electroluminescent panel having first and second terminals, said power supply circuit comprising:

- a voltage converter for converting a primary voltage to a secondary voltage;
- an electric power source for providing an electric current, said source coupled through said voltage converter to the electroluminescent panel;
- a charge controller coupled in series with the voltage converter to the power source and through said voltage converter to said electroluminescent panel for controlling the transfer of energy from said power source through said voltage converter to said electroluminescent panel for charging said electroluminescent panel; and
- a discharge controller coupled in series with the voltage converter to the electroluminescent panel and through said voltage converter to the power source for controlling the transfer of energy from said electroluminescent panel through said voltage converter to said power source for discharging said electroluminescent panel, wherein said voltage converter has a primary port and a secondary port, the primary port having first terminal coupled to said power source and second terminal coupled to said charge controller, the secondary port having first terminal coupled to the electroluminescent panel and second terminal coupled to said discharge controller.

5,568,015

## FLUID-COOLED DIELECTRIC WINDOW FOR A PLASMA SYSTEM

William M. Holber, Cambridge; Donald K. Smith, Belmont; Matthew M. Besen, Tewksbury, all of Mass.; Matthew P. Fitzner, Nashua, N.H., and Eric J. Georgelin, Canton, Mass., assignors to Applied Science and Technology, Inc., Woburn, Mass.

Filed Feb. 16, 1995, Ser. No. 389,250

Int. Cl.<sup>6</sup> H01P 1/08; H05H 1/34

U.S. Cl. 315—39

19 Claims

8. A plasma system comprising:  
a microwave generator that generates an electric field;  
a chamber for sustaining a plasma, the chamber having a dielectric window with an outer surface;  
a pump;  
a source of microwave or RF absorbing cooling fluid coupled to the pump; and



5,568,017

# POWER SUPPLY SYSTEM FOR DISCHARGE LAMPS, AND A VEHICLE HEADLAMP USING SUCH A POWER SUPPLY SYSTEM

Pierre Albou, Paris, France, assignor to Valeo Vision, Bobigny Cedex, France

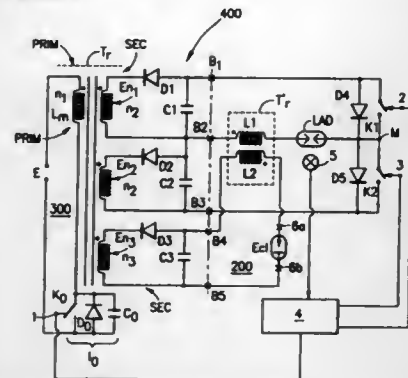
Continuation of Ser. No. 52,555, Apr. 23, 1993, abandoned.

This application Mar. 29, 1995, Ser. No. 412,603

Claims priority, application France, Apr. 24, 1992, 92 05079  
Int. Cl.<sup>6</sup> H05B 37/02

U.S. Cl. 315—219

8 Claims



1. An electric lighting system comprising a discharge lamp having a first and a second terminal, and a power supply circuit connected to the discharge lamp, wherein the power supply circuit comprises:
  - a starting means having a first terminal and an output terminal; an alternating low voltage generating circuit; and
  - a working power supply means connected to the alternating voltage generating circuit for supplying power continuously to the discharge lamp, wherein the working power supply means comprises:
    - a rectifying means for rectifying at least one cycle of said alternating voltage and having at least one pair of output terminals for producing a mean rectified voltage between the pair of output terminals, and a third terminal adapted to be maintained at a potential intermediate between those of the pair of output terminals;
    - a pair of interrupters connected in series with the output terminals of the rectifying means and defining a common point connected to the first terminal of the discharge lamp,
    - the power supply circuit further including a control circuit for producing a voltage and a current whereby to maintain the light output of the discharge lamp,
    - the second terminal of the discharge lamp being connected to the output terminal of the starting means,
    - the first terminal of the starting means being connected to the third terminal of the rectifying means;
    - the alternating low voltage generating circuit comprising:
      - a wave generator, quasi-resonant in voltage and comprising a step-up voltage transformer having a primary winding and at least one secondary winding,
    - the system further comprising a source of direct current voltage and
      - at least one interrupter, quasi-resonant in voltage, having a control electrode and a high voltage output, the direct current voltage source having a first and a second terminal, the first terminal being connected to the primary winding of the transformer, and the at least one interrupter being connected between the primary winding and the second terminal of the direct current voltage source, with its control electrode connected to the control circuit and its high voltage output comprising the at least one secondary winding of the transformer;
  - the pair of interrupters connected in series with the rectifying means constituting a half wave bridge, being arranged to operate independently of the switching of the quasi-resonant interrupter and in phase opposition to each other, each interrupter of said pair having a control electrode connected to the

control means so as to be activated by the control means at a frequency lower than that of the quasi-resonant interrupter.

5,568,018

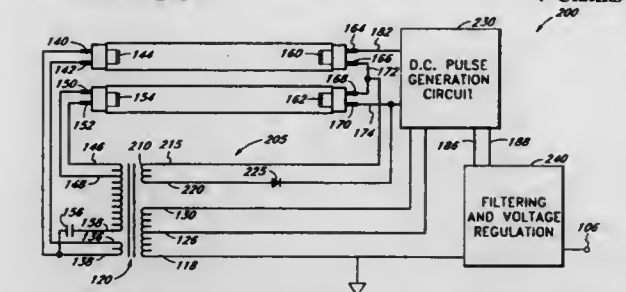
# FLUORESCENT LIGHT BALLAST CIRCUIT

Fred A. Muzic, 16411 Underhill La., Huntington Beach, Calif. 92647, assignor to Fred A. Muzic, Huntington Beach, Calif.

Continuation of Ser. No. 115,476, Sep. 1, 1993, abandoned.  
This application Mar. 17, 1995, Ser. No. 407,393  
Int. Cl.<sup>6</sup> H05B 41/16

U.S. Cl. 315—276

7 Claims



1. A lighting apparatus having first and second fluorescent lamps, said first fluorescent lamp having a first filament at one end and a second filament at another end, each of said filaments of said first lamp being connected across first and second contacts, and said second fluorescent lamp having a first filament at one end and a second filament at another end, each of said filaments of said second lamp being connected across first and second contacts, said apparatus comprising:
  - a step-up voltage transformer having a low voltage input side and a high voltage output side;
  - a DC pulse generation circuit comprising a transistor, for periodically varying voltage at said low voltage input side of said transformer to induce a periodically varying voltage at said high voltage output side of said transformer;
  - said first contact of said first filament of said first lamp and said second contact of said first filament of said second lamp both being connected to said DC pulse generation circuit, and said second contact of said first filament of said first lamp being connected to said first contact of said first filament of said second lamp to provide a pair of series connected first filaments, said contacts of said second filaments of said first and second lamps each being connected to said high voltage output side of said step-up voltage transformer, whereby said DC pulse generating circuit produces a current flow through said pair of series connected first filaments which oscillates in accordance with said periodically varying voltage;
  - a current altering circuit which causes the current in one of the series connected first filaments to be unequal to the current in the other of the series connected first filaments each time the current flow through said series connected first filaments oscillates; whereby the circuit equalizes the voltages across the first and second lamps immediately prior to ignition of first and second lamps.

5,568,019

# MULTI-GAP HIGH IMPEDANCE PLASMA OPENING SWITCH

Rodney J. Mason, Los Alamos, N.M., assignor to The Regents of University of California, Oakland, Calif.

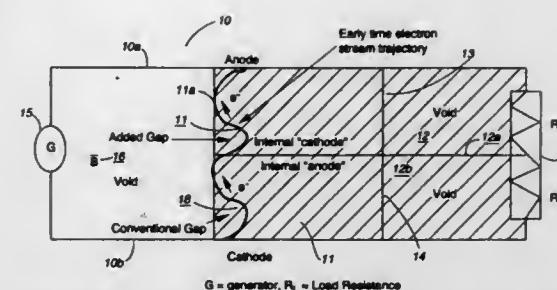
Filed Dec. 5, 1994, Ser. No. 349,337

Int. Cl.<sup>6</sup> H01J 11/04

U.S. Cl. 315—344

10 Claims

1. A high impedance plasma opening switch for connecting an electrical generator to a load comprising:
  - an anode connected between said generator and said load;
  - a cathode spaced apart from said anode and connected between said generator and said load;



- at least one electrode, defining a proximal end and a distal end, disposed between said anode and said cathode, and having said distal end electrically connected to said load and no external connection to said proximal end;
- plasma injected through ports in said anode and cathode between said anode and said at least one electrode and between said cathode and said at least one electrode, said plasma forming—density—gaps at said cathode and at said at least one electrode upon the establishment of a magnetic B-field between said anode and said cathode.

5,568,020

# RINGING FREE DEFLECTION YOKE

Kenji Kaneko, Iwai, and Takashi Takemoto, Mitsukaidou, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

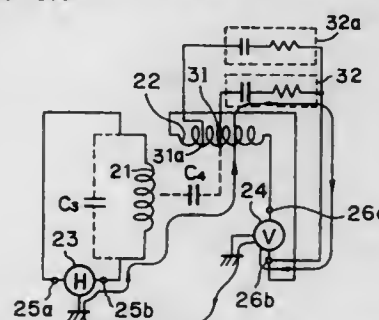
Filed Oct. 19, 1994, Ser. No. 325,707

Claims priority, application Japan, Oct. 20, 1993, 5-285863

Int. Cl.<sup>6</sup> G09G 1/04; H01J 29/56; H01H 1/00

U.S. Cl. 315—370

6 Claims



1. A deflection yoke including a horizontal deflection coil and a vertical deflection coil, comprising:
  - at least one intermediate tap provided on said vertical deflection coil; and
  - circuit element means provided only between said intermediate tap and a hot terminal of said vertical deflection coil for allowing current to pass having a frequency component higher than a maximum frequency component of vertical deflection current flowing through said vertical deflection coil.

5,568,021

# ELECTROSTATIC ACCELERATOR UP TO 200 KV

Stefan Bederka, Bratislava, and Reinhard Simon, Darmstadt, both of Germany, assignors to Gesellschaft für Schwerionenforschung mbH, Darmstadt, Germany

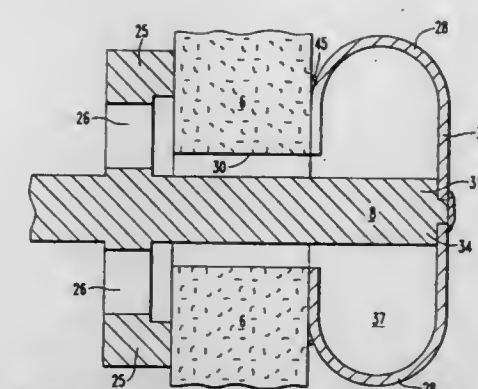
Continuation-in-part of Ser. No. 34,106, Mar. 22, 1993, abandoned. This application Apr. 26, 1994, Ser. No. 233,724

Int. Cl.<sup>6</sup> H05H 7/00

U.S. Cl. 315—506

4 Claims

1. An electrostatic accelerator for generating a particle beam of electrically charged particles in the energy range of 200 keV and directing it onto a target within a closed vacuum system, comprising the following features:
  - a) an ion source for the generation of a beam of charged particles,



- b) a staged accelerators structure arranged adjacent said ion source and including a number of drift tubes disposed adjacent to one another in axially aligned spaced relationship so as to permit passage of said beam therethrough, said drift tubes being insulated and spaced from one another by means of ceramic tube portions arranged one after the other in serial alignment and connected to said drift tubes so as to form, together, a tubular unitary structure, each of said drift tubes of the accelerator structure being provided with a radially projecting circumferential contact and centering disc having opposite sides to which the ends of the adjacent ceramic tube portions are mounted, said contact and centering discs projecting radially beyond said ceramic tube portions and being sealingly connected thereto by a U-shaped metallic spring ring which is open toward said disc and which has legs of unequal length, with the outer, longer legs being welded onto the circumferential edge of the radially projecting disc portions and the inner, shorter legs being soldered to the outside of the adjacent tube portions next to the end faces thereof,
- c) a high voltage multiplier for providing accelerator voltages applied to said drift tubes,
- d) a target disposed on a cooled carrier arranged at the end of said accelerator structure opposite said ion source, and
- e) said accelerator structure with said drift tubes being arranged coaxially within the high voltage multiplier and said high voltage multiplier being annular and extending over the whole length of the accelerator structure and also being divided into stages which are arranged adjacent the corresponding drift tubes to which they are connected for providing thereto said accelerator voltages.

5,568,022

# INTEGRATED COMPLIANCE SERVOVALE

Stephen J. Tranovich, Valencia, Calif., assignor to HR Textron Inc., Valencia, Calif.

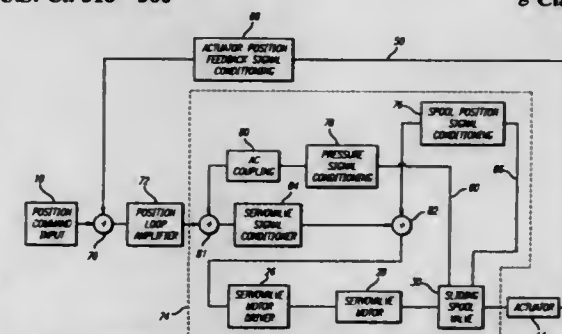
Division of Ser. No. 308,713, Sep. 19, 1994, Pat. No. 5,500,580.

This application Oct. 16, 1995, Ser. No. 543,567

Int. Cl.<sup>6</sup> F15B 9/09

U.S. Cl. 318—566

8 Claims



1. A compliance system for use in providing a natural appearance to the movements of simulated living beings by dynamically altering the apparent stiffness of the system by providing a feedback signal which is proportional to forces applied by and to an

actuator but which is completely independent of the actuator position feedback loop gain, said system comprising:

an electrohydraulic servovalve including a drive motor for controlling the position of a spool valve to control the flow of fluid from a source thereof;

a source of command signals coupled to said electrohydraulic servovalve for commanding at least a portion of said simulated living being to move;

an actuator including a piston coupled between said electrohydraulic servovalve and said at least one portion of said simulated living being to receive said fluid from said electrohydraulic servovalve to impart said commanded motion to said being;

means for continuously sensing the pressure appearing on each side of said piston and providing a first electrical feedback signal proportional thereto; and

means for coupling said first electrical feedback signal to said drive motor.

5,568,023

## ELECTRIC POWER TRAIN CONTROL

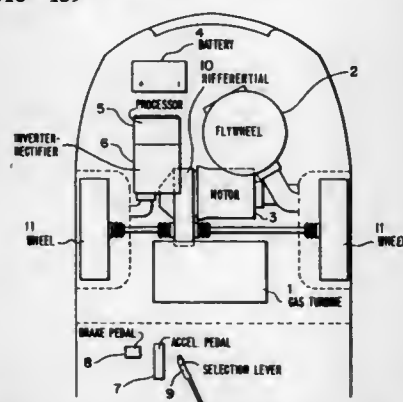
William Grayer, 15720 Ventura Blvd., #411, Encino, Calif. 91436; William R. Olson, 1196 Mellow La., Simi Valley, Calif. 93065, and Harold A. Rosen, 14629 Hilltree Rd., Santa Monica, Calif. 90402

Filed May 18, 1994, Ser. No. 246,230

Int. Cl.<sup>6</sup> H02P 1/00

U.S. Cl. 318—139

11 Claims



1. A shared processor control system for a power train of a hybrid electric vehicle operating responsive to operation of an accelerator pedal and a brake pedal and including a gas turbine powering a first motor-generator, a flywheel powering a second motor-generator, and a traction third motor-generator operatively coupled for selectively driving and being driven by vehicle wheels, each of said first, said second and said third motor-generators being commonly connected to a high voltage bus via respective rectifier-inverters controlled by a single controller, said control system characterized in that operation of said accelerator pedal produces substantially instantaneous torque from said third motor-generator applied to an output shaft with proportional increased load on said bus from said traction motor thereby producing a voltage drop, said voltage drop initiating increased power output from said flywheel motor-generator to hold up said bus voltage, thereby decreasing flywheel shaft speed, said decreasing shaft speed producing a proportional increase in speed of said gas turbine to thereby cause increased flow of fuel to the gas turbine and to permit an increase in voltage provided by said first motor generator.

5,568,024  
DRIVE CONTROL SYSTEM AND METHOD FOR BATTERY CAR

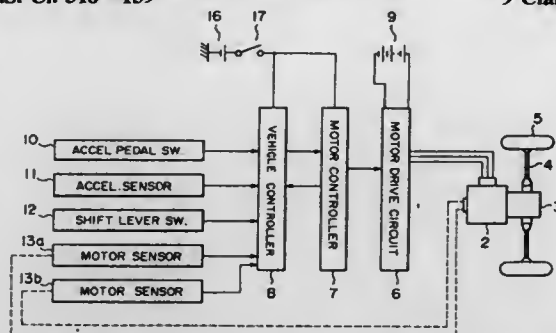
Akira Suzuki, Nogi-Machi, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1995, Ser. No. 442,697

Claims priority, application Japan, May 20, 1994, 6-107071 Int. Cl.<sup>6</sup> B60L 15/20

U.S. Cl. 318—139

9 Claims



1. A drive control system for a battery car driven by a motor and provided with an accelerator pedal, a brake pedal and a shift lever, comprising:

acceleration detecting means for detecting a depression degree of the accelerator pedal and further an acceleration rate of the depressed accelerator pedal and for generating a depression degree signal;

shift lever detecting means for detecting a shift position of the shift lever and for generating a shift position signal;

motor rotational speed and direction detecting means for detecting a motor rotational speed and a motor rotational direction for generating a motor rotational direction signal; and

motor torque control means having first means responsive to said depression degree signal for operation to decide whether the depression degree of the accelerator pedal is less than a predetermined value, said motor torque control means further having second means responsive to said shift position signal and said motor rotational direction signal for operation to judge whether the motor rotational direction is opposite to a travel direction represented by said shift position signal, said motor torque control means, upon the operation of said first and second means, controlling the motor torque in such a way that the vehicle can be once stopped and then driven in accordance with ordinary drive torque determined according to the depression rate of the accelerator pedal so as to improve the driveability of the battery car on a sloping road.

5. A method of controlling a battery car driven by a motor and provided with an accelerator pedal, a brake pedal and a shift lever, comprising the steps of:

checking whether a vehicle speed is lower than a predetermined value;

checking whether the shift lever is shifted to an operational range other than a neutral range;

checking whether a motor rotational direction is opposite to that determined by the shift lever;

checking whether the accelerator pedal is depressed;

checking whether an acceleration rate is smaller than a predetermined value;

checking whether the battery car is stopped;

changing a motor torque to stop the battery car;

checking whether the battery car is being caused to move down;

repeating the step of checking again whether the acceleration rate is smaller than the predetermined value; and

executing an ordinary drive control, until an integrated torque-up rate becomes zero or negative so as to stop the battery car.

5,568,025

## ABNORMALLY DETECTING DEVICE FOR RELAY

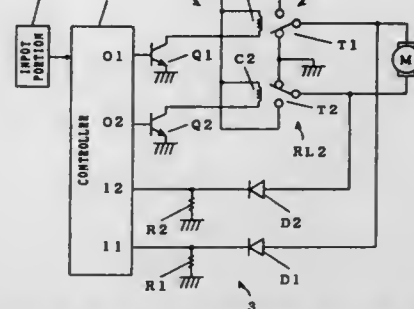
Yoshitaka Sumida, Yokkaichi, and Shinichiro Takahashi, Osaka, both of Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan

Filed Oct. 26, 1994, Ser. No. 329,254

Claims priority, application Japan, Nov. 2, 1993, 5-063607 U Int. Cl.<sup>6</sup> H02P 1/00

U.S. Cl. 318—287

7 Claims



1. A device for detecting an abnormality in relays for driving a motor selectively in both forward direction and a reverse direction, comprising

a power supply;

a motor driving portion including a first switching element for forward rotation, a second switching element for backward rotation, a first motor driving relay for forward rotation operated in response to turning-on of said first switching element, and a second motor driving relay for backward rotation operated in response to turning-on of said second switching element, said motor driving portion passing current from said power supply through said motor in directions of the forward and backward rotations by operation of said first and second relays, respectively, to drive said motor;

an input portion for providing a forward rotation command and a backward rotation command;

a controller for outputting a switching control signal to said first and second switching elements in response to said forward and backward rotation commands, respectively; and

a signal detecting portion for detecting current through said motor to output a detection signal to said controller, wherein said controller senses said detection signal indicating a current flow through said motor when said first and second switching elements are off, thereby detecting an abnormality in said motor driving relays, and said controller turns on said first and second switching elements by outputting said switching control signal to said first and second switching elements to provide the same potential across said motor.

5,568,026

## SYNCHRONIZING WINDSHIELD WIPERS

David W. Welch, Columbus, Miss., assignor to United Technologies Motor Systems, Inc., Columbus, Miss.

Filed Mar. 7, 1995, Ser. No. 407,838

Int. Cl.<sup>6</sup> B60S 1/08; H02P 5/52

U.S. Cl. 318—443

11 Claims

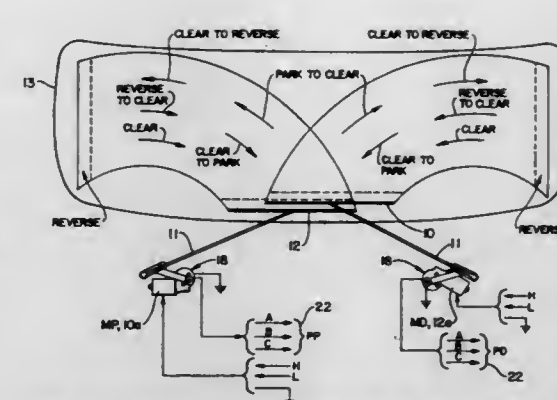
1. A windshield wiper system comprising a first wiper blade, a first motor for operating the first wiper blade, a second wiper blade, a second motor for operating the second wiper blade, characterized by:

a first drive for providing operating power to the first motor in response to a first motor drive signal;

a second drive for providing operating power to the second motor in response to a second motor drive signal;

first encoder means for providing a first position signal indicating the position of the first blade;

second encoder means for providing a second position signal indicating the position of the second blade;



signal processing means for providing the first and second motor drive signals; for receiving the first and second position signals; for providing a coast signal if the first blade has reached a first location before the second blade has reached a second location; for interrupting the first motor drive signal in response to the coast signal; for providing a dynamic braking signal if the second blade has not reached the first position after a selected elapsed time following the coast signal; and first dynamic braking means responsive to the dynamic braking signal for dynamically braking the first motor.

5,568,027

## SMOOTH RAIN-RESPONSIVE WIPER CONTROL

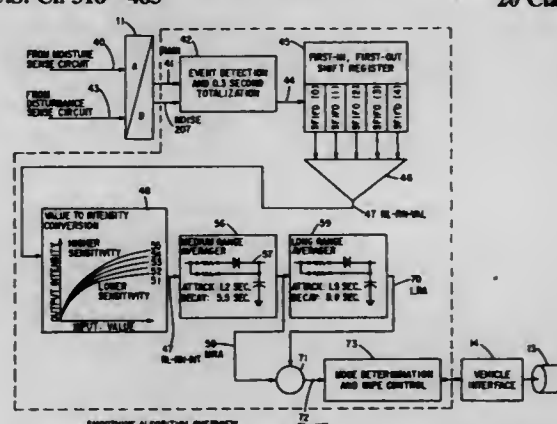
Rein S. Teder, Bloomington, Minn., assignor to Libbey-Owens-Ford Co., Toledo, Ohio

Filed May 19, 1995, Ser. No. 444,904

Int. Cl.<sup>6</sup> H02H 07/08

U.S. Cl. 318—483

20 Claims



1. A rain responsive windshield wiper control system for a vehicle of the type having a windshield, a windshield wiper adapted to be driven by a windshield wiper motor for sweeping moisture from the windshield, the windshield wiper control system comprising:

(a) a sensor disposed at a predetermined location on a vehicle windshield traversed by the wiper for generating an output indicative of the moisture impinging on the windshield proximate the predetermined location, said sensor means producing a recent rain flux value;

(b) a plurality of averaging means operatively coupled to receive said recent rain flux values and to produce outputs to a combining means for forming a single weighted average value of rain flux;

(c) wiper mode control means operatively coupled to receive said single weighted average value of rain flux for establishing a sweep rate for the windshield wiper; and

(d) means for electrically driving the wiper motor at the sweep rate determined by the wiper mode control means.



5,568,028

## TOOL LIFE MANAGEMENT SYSTEM

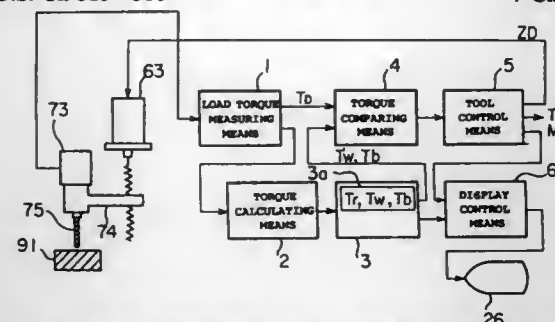
Tatsuhiko Uchiyama; Masanobu Takemoto, and Toshiyuki Ogata, all of Kamanashi, Japan, assignors to Fanuc Ltd., Japan

Filed Sep. 23, 1994, Ser. No. 312,274

Claims priority, application Japan, Oct. 13, 1993, 5-255626  
Int. Cl.<sup>6</sup> G06F 15/46

U.S. Cl. 318—566

7 Claims



1. A tool life management system for managing a tool life, comprising:

- load torque measuring means for measuring an initial load torque of a spindle attached to a tool during an initial machining operation and for measuring an actual load torque of the spindle attached to the tool during a subsequent actual machining operation, by using an observer and excluding a friction torque from a disturbance load torque;
- torque calculating means for calculating a tool wear detection torque based on a reference load torque, and for calculating a tool breakage detection torque based on a tool diameter, the reference load torque being said initial load torque of the spindle;
- a memory for storing the reference load torque, the tool wear detection torque and the tool breakage detection torque;
- torque comparing means for comparing said actual load torque of the spindle with each of the tool wear detection torque and the tool breakage detection torque, and for outputting a result of the comparison; and
- tool control means for controlling said tool in accordance with the result of the comparison.

5,568,029

## JOINT CONTROL SYSTEM WITH LINEAR ACTUATION

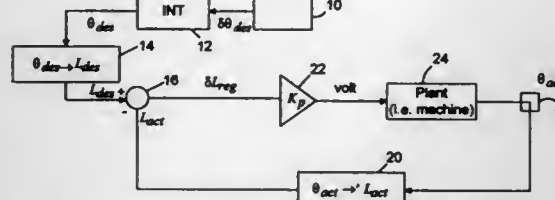
Danley C. K. Chan, and Peter D. Lawrence, both of Vancouver, Canada, assignors to The University of British Columbia, Vancouver, B.C., Canada

Filed Jan. 13, 1995, Ser. No. 372,752

Int. Cl.<sup>6</sup> B25J 9/18

U.S. Cl. 318—568.11

12 Claims



1. A closed loop control system for controlling the operation of a linear actuator means to manipulate an articulated joint of a tele-operated machine, comprising means to input a desired change ( $\delta\theta_{des}$ ) in angular position of said joint, means for converting said desired change in angular position ( $\delta\theta_{des}$ ) for said joint to a desired length ( $L_{des}$ ) of said linear actuator means, means for sensing angular position  $\theta_{act}$  of said joint, means for converting said sensed angular position ( $\theta_{act}$ ) into an actual length ( $L_{act}$ ) of said linear actuator means, means for determining a required change in length ( $\delta L_{req}$ ) from the desired length ( $L_{des}$ ) by subtracting said actual

length ( $L_{act}$ ) from said desired length ( $L_{des}$ ) to define said required change in length ( $\delta L_{req}$ ) of said linear actuator.

5,568,030

## TRAVEL CONTROL METHOD, TRAVEL CONTROL DEVICE, AND MOBILE ROBOT FOR MOBILE ROBOT SYSTEMS

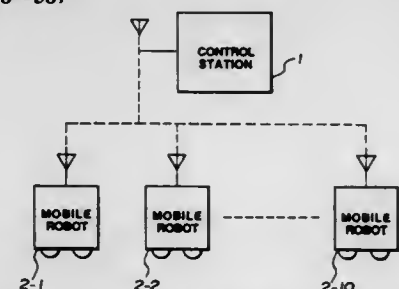
Yuji Nishikawa, and Masanori Onishi, both of Ise, Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan  
Division of Ser. No. 912,977, Jul. 8, 1992, Pat. No. 5,488,277, which is a continuation of Ser. No. 513,546, Apr. 24, 1990, Pat. No. 5,179,329. This application Jun. 7, 1995, Ser. No. 480,303

Claims priority, application Japan, Apr. 25, 1989, 1-105491; May 30, 1989, 1-137290; May 30, 1989, 1-137291; May 30, 1989, 1-137292; May 30, 1989, 1-137293; May 31, 1989, 1-138219; May 24, 1989, 1-130959; May 29, 1989, 1-134883; May 29, 1989, 1-134884; Jun. 20, 1989, 1-157838; Jun. 20, 1989, 1-157839

Int. Cl.<sup>6</sup> H02J 7/00; G06F 15/50

U.S. Cl. 318—587

4 Claims



1. A travel control method for a mobile robot system comprising a plurality of mobile robots, a control station for controlling said mobile robots and radio communication apparatus for communicating between each of said mobile robots and said control station, each of said mobile robots having a map memory for storing travel map information, means for determining a best travel route to a destination based on said travel map information, and at least one sensor mounted on each of said robots for detecting said best travel route, said travel control method comprising the steps of:

- designating by means of said control station a destination for each of said mobile robots;
- communicating said determinations to said mobile robots via said radio communication apparatus;
- determining within each of said mobile robots said best travel route based on said travel map information read out from said map memory when said designation has been designated by said control station;
- transmitting from each of said mobile robots to said control station a request to reserve each position on said best travel route determined by said mobile robot;
- reserving in said control station said best travel route for each of said mobile robots based on said reservation request from each of said mobile robots;
- moving each of said mobile robots automatically along said reserved best travel route, each of said mobile by the at least one sensor;
- storing data indicative of the travel configuration of said mobile robot and data indicative of unidirectional travel, said travel configuration including transverse movement and forward and backward movement; and
- controlling the travel of the mobile robot according to the contents of said travel state memory.

5,568,031

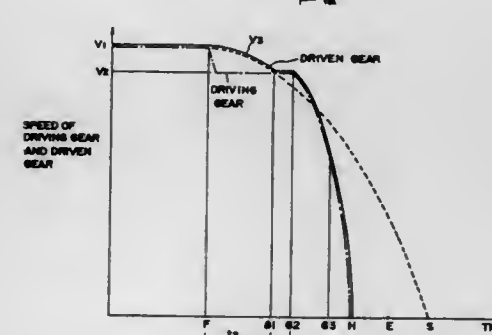
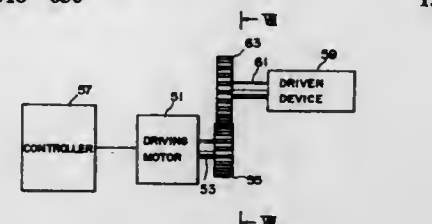
## APPARATUS AND METHOD FOR CONTROLLING A DRIVING MOTOR

Noriyuki Jinbo, Toyohashi, and Akira Takasu, Toyokawa, both of Japan, assignors to Minolta Co., Ltd., Osaka, Japan  
Filed Jun. 21, 1995, Ser. No. 493,164

Claims priority, application Japan, Jul. 7, 1994, 6-155705  
Int. Cl.<sup>6</sup> G05B 19/416

U.S. Cl. 318—630

15 Claims



1. An apparatus for controlling a driving motor comprising:
- a driving motor which turns at a predetermined first speed;
  - a first gear engaged with said driving motor;
  - a second gear, engaged with said first gear with a backlash, for transmitting a driving power to a driven device;
  - a directing device for directing the slowing down of the driving speed of the driven device;
  - a slowdown device for changing the speed of said driving motor from the first speed to a slower second speed in response to the output of said directing device;
  - a waiting device for waiting for a predetermined period after the slowdown operation of said slowdown device with keeping the second speed, and
  - a brake device for braking the driving motor rapidly after said waiting device waits for the predetermined period.

5,568,032

## POSITION CONTROL SYSTEM

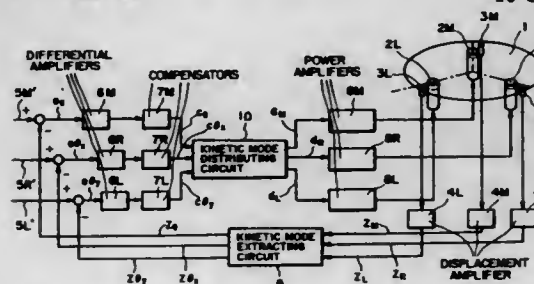
Shinji Wakui, Utsunomiya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1995, Ser. No. 448,660

Claims priority, application Japan, May 24, 1994, 6-132405  
Int. Cl.<sup>6</sup> H01L 21/68

U.S. Cl. 318—632

10 Claims



1. A position control system, comprising:
- a plurality of actuators for moving an object;
  - a plurality of sensors for detecting the state of the object;

- a first circuit for extracting a state signal, in each of different kinetic modes related to the object, from outputs of said sensors;
- a compensating circuit for compensating for the state signals in the respective kinetic modes;
- a second circuit for distributing an output of said compensating circuit and for providing drive signals for said actuators in accordance therewith; and
- a driver for driving said actuators in response to the drive signals.

5,568,033

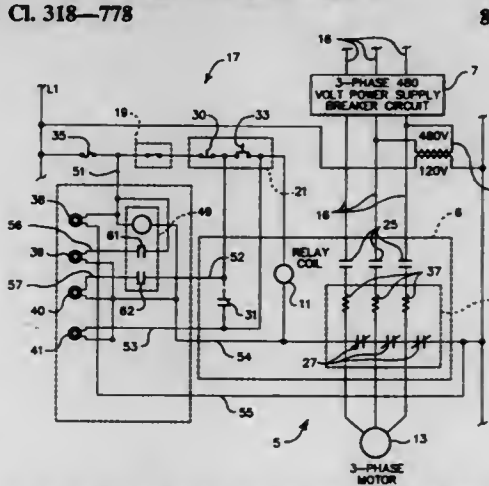
## ON-SITE ELECTRIC MOTOR START-UP DIAGNOSTIC TOOL

Walter S. Brunson, 525 Magnolia Dr., Kuttawa, Ky. 42055  
Continuation-in-part of Ser. No. 242,466, May 13, 1994, Pat. No. 5,416,399. This application May 10, 1995, Ser. No. 438,561

Int. Cl.<sup>6</sup> H02H 3/04; 7/08

U.S. Cl. 318—778

8 Claims



1. An on-site electric motor start-up diagnostic tool attachable to a motor start-up control panel, the panel including at least one normally open drive contact for providing electrical power to an electric motor to drive the motor when the at least one normally open drive contact is closed, a drive relay coil to close the at least one normally open drive contact when energized as power passes from a first end thereof through the drive relay coil to a second end thereof, an auxiliary power supply source for providing a voltage potential across a positive line and a negative line, at least one normally closed stop switch connectable thereto, a load power line for providing power to the at least one normally closed stop switch, a first control wire for receiving power from the at least one normally closed stop switch passing therethrough from the load power line, a second control wire attached to the first end of the drive relay coil, a normally open start switch receiving power from the first control wire and providing that power to the first end of the drive relay coil when closed, a normally open seal-in contact closed when the drive relay coil is energized, the normally open seal-in contact receiving power from the first control wire and providing that power to the first end of the drive relay coil when closed, at least one normally closed overload block contact connected to the second end of the drive relay coil and to the negative line for grounding the second end of the drive relay coil when closed, and an overload circuit including means for detecting an overload condition of the electric motor and means for opening the at least one overload block contact when an overload condition of the electric motor is detected thereby, said on-site electric motor start-up diagnostic tool comprising:

- a first indicator for indicating the presence of a voltage potential between the load power line and the negative line;
- a second indicator for indicating the presence of a voltage potential between the load power line and the second end of the drive relay coil;

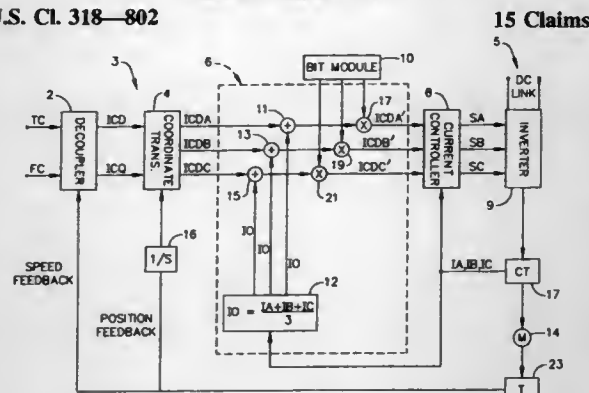
- a third indicator for indicating the presence of a voltage potential between the first control wire and the second end of the drive relay coil; and
- a fourth indicator for indicating the presence of a voltage potential between the second control wire and the second end of the drive relay coil.

**5,568,034**  
**FAULT-TOLERANT VARIABLE SPEED INDUCTION MOTOR DRIVE**

Colin Huggett, Torrance, and Gabor Kalman, Palos Verdes, both of Calif., assignors to AlliedSignal Inc., Morris Township, N.J.

Filed Mar. 27, 1995, Ser. No. 411,134  
Int. Cl.<sup>6</sup> H02P 5/34

U.S. Cl. 318—802



1. A drive arrangement for a fault tolerant variable speed induction motor having three phase circuits, comprising:
- means responsive to torque and flux current command signals for providing first and second current command signals;
  - means for converting the first and second current command signals to a three-phase output with sinusoidally varying signals;
  - means for modifying the three-phase output and for providing a modified three-phase output which enables the motor to operate even if one of the phase circuits is open;
  - means responsive to the modified three-phase output for providing first, second and third gate logic signals; and
  - means responsive to the first, second and third gate logic signals driving the motor.

**5,568,035**  
**VARIABLE-CAPACITANCE POWER SUPPLY APPARATUS**

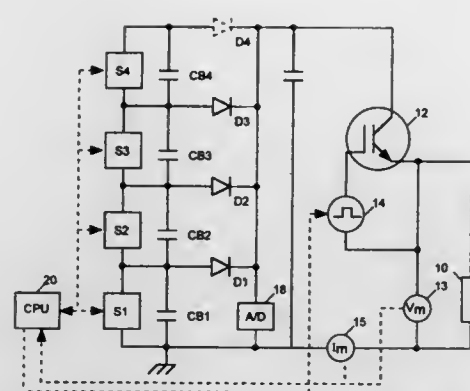
Katsuhisa Kato, Koshigaya, and Toshihiko Onozawa, Koga, both of Japan, assignors to Sony/Tektronix Corporation, Tokyo, Japan

Filed Sep. 28, 1994, Ser. No. 314,464  
Claims priority, application Japan, Oct. 15, 1993, 5-281631  
Int. Cl.<sup>6</sup> H02M 7/00; 3/18

U.S. Cl. 320—1

3 Claims

1. A power supply apparatus comprising:
- a plurality of series-coupled capacitors having one end thereof grounded and the other end coupled to an output terminal;
  - means for independently charging each of the plurality of series-coupled capacitors;
  - means for detecting a voltage across each of the plurality of capacitors;
  - means for coupling the nodes between adjacent ones of the plurality of series-coupled capacitors to the output terminal; and
  - means responsive to the voltages detected by the detecting means for controlling the charging means to produce an



appropriate output power at the output terminal in accordance with a selected total capacitance of the plurality of series-coupled capacitors.

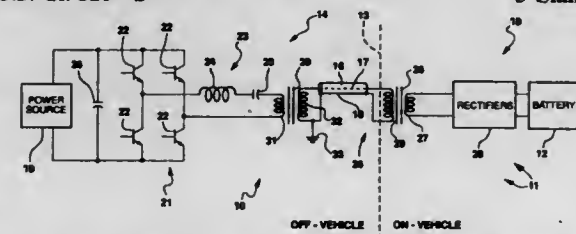
**5,568,036**  
**CONTACTLESS BATTERY CHARGING SYSTEM WITH HIGH VOLTAGE CABLE**

Stephen J. Hulsey, Los Angeles; George R. Woody, Redondo Beach, and Ray G. Radys, Santa Monica, all of Calif., assignors to Delco Electronics Corp., Kokomo, Ind.

Filed Dec. 2, 1994, Ser. No. 348,663  
Int. Cl.<sup>6</sup> H01M 10/46

U.S. Cl. 320—2

5 Claims



3. A cable system for use with a battery charging system that charges a battery of an electric vehicle, wherein the battery charging system includes a primary power converter that is coupled to a power source that is located external to the electric vehicle, and a secondary power converter disposed on the electric vehicle that is coupled to the battery of the electric vehicle, and wherein the primary and secondary power converters are connected by way of a power cable, wherein the improvement comprises:
- a coaxial power cable having a central conductor and a ground return;
  - an isolation transformer having a primary winding coupled to an output of the primary power converter and having a secondary winding coupled to the central conductor and ground return of the coaxial power cable, and wherein the isolation transformer has a predetermined step up turns ratio to increase the voltage and lower the current carried by the coaxial power cable.

**5,568,037**  
**BATTERY CHARGING SYSTEM HAVING REMOTELY LOCATED CHARGING UNITS**

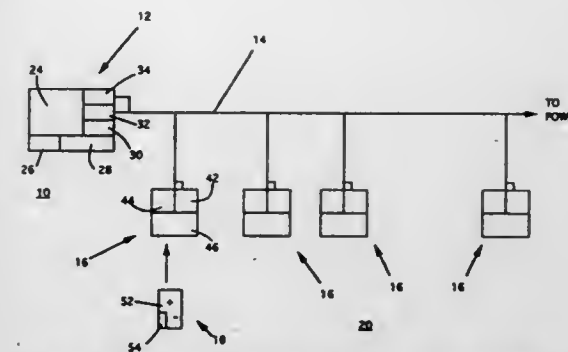
Kenneth M. Massaroni, Plantation, Fla., and Vernon Meadows, Lilburn, Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 3, 1995, Ser. No. 415,920  
Int. Cl.<sup>6</sup> H02J 7/00

U.S. Cl. 320—2

12 Claims

1. A battery charging system, comprising:
- a battery pack including at least one battery cell and a battery identification means;
  - a system controller having a memory containing charge instructions corresponding to said battery pack;
  - at least one battery charging unit for charging said battery pack; and



means for affecting communication between said system controller and said at least one battery charging unit via a common power line to which each battery charging unit and said system controller is connected.

**5,568,038**  
**PORTABLE ELECTRIC EQUIPMENT AND RECHARGEABLE BUILT-IN BATTERIES**

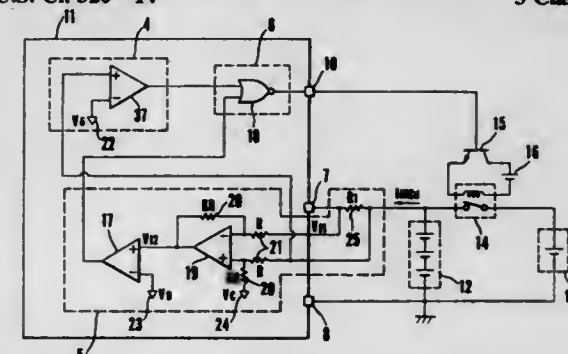
Satoshi Tatsumi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 22, 1994, Ser. No. 344,347

Claims priority, application Japan, Nov. 26, 1993, 5-296490  
Int. Cl.<sup>6</sup> H01M 10/46; H02J 3/32; 7/34

U.S. Cl. 320—14

3 Claims



1. A battery system for battery-driven portable electronic equipment, comprising a first battery chargeable and serving as a direct power supply source, a second battery connected parallel to said first battery through a switch, a voltage detection circuit detecting an output voltage from said first battery, consumption current detection circuit detecting a state of a consumption current of said portable electronic equipment, and switch control circuit controlling opening and closing of said switch in accordance with an output from said voltage detection circuit and an output from said consumption current detection circuit, wherein said switch is closed to charge said first battery by said second battery when the output voltage from said first battery becomes smaller than a predetermined value and the consumption current is sufficiently small, and

said portable electronic equipment is a cellular radio telephone set or a mobile radio telephone set of a portable type, said consumption current detection circuit is a circuit for detecting a busy/non-busy state of said telephone, and said switch is closed to charge said first battery by said second battery when the output voltage from said battery becomes smaller than the predetermined value in a non-busy state of said telephone.

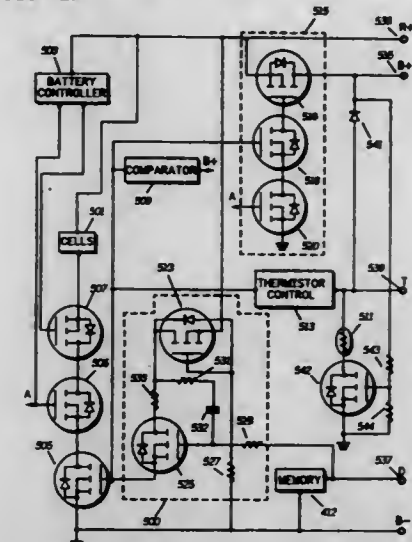
**5,568,039**  
**APPARATUS AND METHOD OF PROVIDING AN INITIATION VOLTAGE TO A RECHARGEABLE BATTERY SYSTEM**

Jose M. Fernandez, Lawrenceville, Ga., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 16, 1994, Ser. No. 357,891  
Int. Cl.<sup>6</sup> H02J 7/04

U.S. Cl. 320—29

24 Claims



1. A device used with a rechargeable battery for providing a initiation voltage to a battery controller which has been operationally disabled due to an event associated with said rechargeable battery, said rechargeable battery charged by a charging system and including at least one cell, a charging terminal for supplying a charging current to said rechargeable battery and a data terminal for supplying information to said charging system, said device comprising:

- at least one switch for detecting a first voltage applied to said data terminal by said charging system;
- a coupling means for supplying a second voltage from said charging terminal to said battery controller to enable said battery controller; and
- wherein a battery controller directs said voltage potential of said at least one cell to said charging terminal for detection by said charging system.

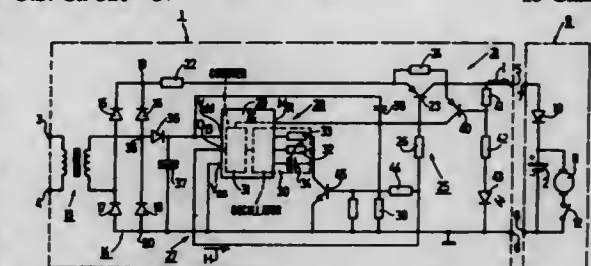
**5,568,040**  
**CHARGING ARRANGEMENT FOR THE TIME-CONTROLLED CHARGING OF AT LEAST ONE RECHARGEABLE CELL**

Erich Krainer, and Martin Sonnek, both of St. Veit an der Glan, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 19, 1994, Ser. No. 308,769  
Claims priority, application Austria, Sep. 30, 1993, 1967/93  
Int. Cl.<sup>6</sup> H02J 7/04

U.S. Cl. 320—37

13 Claims



1. A charging arrangement for the time-controlled charging of at least one rechargeable cell, comprising: a supply device which enables a charging current (I) to be supplied to the at least one



rechargeable cell, a switching device which allows the flow of a charging current to the at least one rechargeable cell to be started and stopped, and a control device which controls the switching device and comprises a time signal generation stage which, upon expiration of a time interval after a beginning of the flow of a charging current, supplies a time signal (H) which controls the switching device so as to stop the flow of charging current, wherein the time signal generation stage comprises a temperature measurement device for measuring the ambient temperature of the charging arrangement, wherein the temperature measurement device, in the case of a variation of the ambient temperature, controls the time signal generation stage for the time-shifted supply of the time signal (H) to stop the flow of charging current to the at least one rechargeable cell as a function of said ambient temperature.

5,568,041

### LOW-COST POWER FACTOR CORRECTION CIRCUIT AND METHOD FOR ELECTRONIC BALLASTS

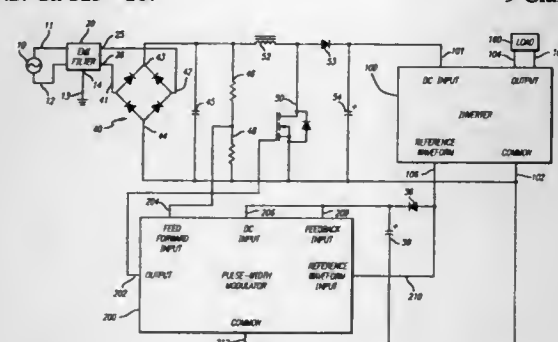
Bryce L. Hesterman, Fort Wayne, Ind., assignor to MagneTek, Inc., Nashville, Tenn.

Filed Feb. 9, 1995, Ser. No. 385,906

Int. Cl.<sup>6</sup> G05F 1/70

U.S. Cl. 323—207

9 Claims



1. A power factor corrected circuit comprising: rectifier means for rectifying voltage from an AC source; power converter means actuated by a control pulse signal for converting the rectified voltage into current pulses, the magnitude of the current pulses being dependent upon the duty cycle of the pulse signal; capacitive bulk energy storage means for storing the output of the power converter means as a bulk DC voltage; feedback signal means for developing a feedback signal related to the level of the bulk DC voltage; oscillating inverter means for converting the bulk DC voltage into an AC signal for driving a load at a frequency that is substantially greater than the frequency of the AC source; means for providing a reference waveform signal that is derived from the oscillations of the inverter; pulse-width modulation means for providing as an output the control pulse signal, the pulse width modulation means including comparator means for comparing a combination of the reference waveform signal and the feedback signal with a threshold voltage, the pulse width modulation means further including an output terminal that is actuated when the combination of the reference waveform signal and the feedback signal exceeds the threshold voltage, such that a change in the level of the feedback signal causes an adjustment of the duty cycle of the control pulse signal so as to regulate the level of the bulk DC voltage.

### 5,568,042 MONITORING AND CONTROL OF A FILTER IN A POWER NETWORK

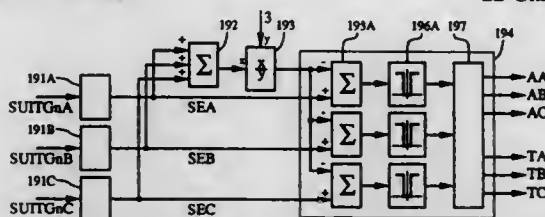
Krister Nyberg, Smedjebacken, and Urban Aström, Faxdalen, both of Sweden, assignors to ASEA Brown Boveri AB, Vasteras, Sweden

Filed Mar. 15, 1994, Ser. No. 305,328

Claims priority, application Sweden, Sep. 20, 1993, 93030500 Int. Cl.<sup>6</sup> G05F 1/70

U.S. Cl. 323—211

22 Claims



1. A method for monitoring and controlling a plant component, for a tunable filter for harmonic filtering in a converter plant for high-voltage direct current, connected to an electric power network with a fundamental frequency corresponding to a period T, said component having a reactive impedance changeable via a control member, comprising the steps of: sensing a voltage occurring in the plant component and a current flowing through the plant component; forming the phase difference between a selected tone of said sensed voltage and of said sensed current, the selected tone having a frequency equal to an integer multiple of said fundamental frequency ( $n \times 2\pi/T$ , where n is a positive integer); forming a state signal SUITGn in dependence on said phase difference; and supplying the state signal to the control member for changing the reactive impedance of the plant component such that the magnitude of said phase difference is minimized; wherein said step of forming the phase difference further comprises the steps of: (a) forming a sine and a cosine signal, both of a frequency equal to the frequency of the selected tone; (b) forming a first product R1 in dependence on the product between the sensed value of said voltage and the sine signal, forming a second product R2 in dependence on the product between the sensed value of said voltage and the cosine signal, forming a third product R3 in dependence on the product between the sensed value of said current and the sine signal, and forming a fourth product R4 in dependence on the product between the sensed value of said current and the cosine signal; (c) integrating each of said first, second, third and fourth products over at least one of time equal to said period and a multiple of said period; and (d) forming respective signals SUCOSn, SUSINn, SICOSn and SISINn in dependence on the integrated first, second, third and fourth products, and forming the state signal in dependence on a quotient SUTGn of the signal SUSINn and the signal SUCOSn and on a quotient SITGn of the signal SISINn and the signal SICOSn.

5,568,043

### DUAL VOLTAGE GENERATION CIRCUIT

Ming-Jer Wu, Taoyuan, Taiwan, assignor to Acer Peripherals, Inc., Taoyuan, Taiwan

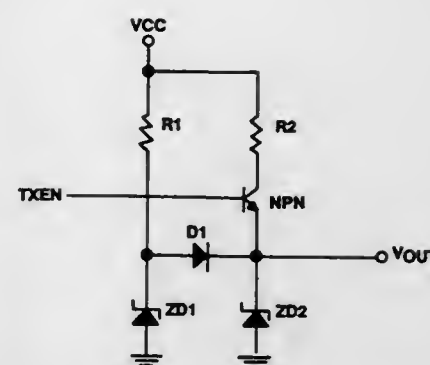
Filed Aug. 1, 1995, Ser. No. 509,735

Int. Cl.<sup>6</sup> G05F 1/613; 1/618; 1/325

U.S. Cl. 323—231

1 Claim

1. A dual voltage generation circuit for, responsive to a switching signal, selectively generating a constant voltage at an output terminal, comprising:



- a switch transistor, having an emitter, a collector and a base, for inputting the switching signal at the base, the collector being coupled to a reference voltage via a first current-regulating element;
- a first zener diode having an anode coupled to a reference ground and a cathode coupled to the reference voltage via a second current-regulating element;
- a second zener diode having an anode and a cathode, the anode being coupled to the reference ground, the cathode being coupled to the emitter of the switch transistor;
- a diode having an anode coupled to the cathode of the first zener diode, and a cathode coupled to the cathode of the second zener diode; wherein the output terminal is formed at the cathode of the second zener diode.

5,568,044

### VOLTAGE REGULATOR THAT OPERATES IN EITHER PWM OR PFM MODE

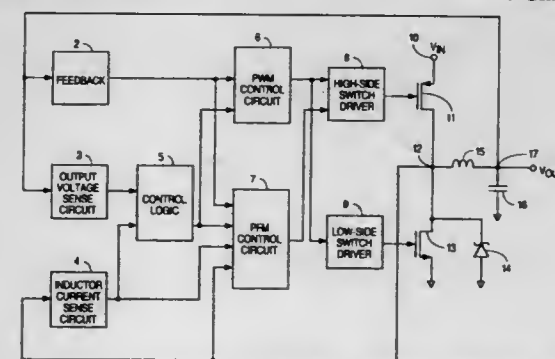
Harry J. Bittner, Santa Clara, Calif., assignor to Micrel, Inc., San Jose, Calif.

Filed Sep. 27, 1994, Ser. No. 313,489

Int. Cl.<sup>6</sup> G05F 1/40

U.S. Cl. 323—272

6 Claims



1. A method performed by a switching regulator comprising the steps of: generating a regulated output voltage and an output current at an output terminal of said regulator using a switching device, said switching device having an on state and an off state, said switching device providing said output current; comparing one or more signals corresponding to said output current to one or more threshold current levels, said one or more threshold current levels corresponding to predetermined output current levels; generating one or more first control signals in response to said step of comparing; controlling said switching device with a first control circuit in response to said one or more first control signals indicating said output current is greater than a first current level, wherein said first control circuit comprises: a square wave generator outputting a square wave having a first frequency and having a duty cycle corresponding to

5,568,045

### REFERENCE VOLTAGE GENERATOR OF A BAND-GAP REGULATOR TYPE USED IN CMOS TRANSISTOR CIRCUIT

Shin-ichi Kozechi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

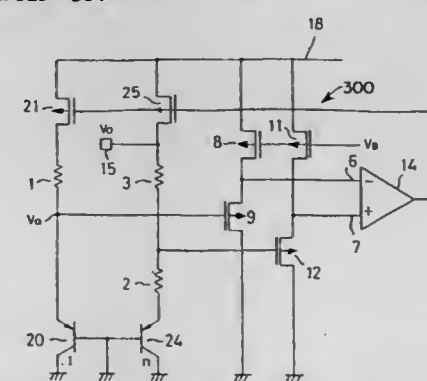
Filed Dec. 9, 1993, Ser. No. 164,149

Claims priority, application Japan, Dec. 9, 1992, 4-351931

Int. Cl.<sup>6</sup> G05F 3/16

U.S. Cl. 323—314

6 Claims



1. A reference voltage generator comprising first and second bipolar transistors; a resistor circuit coupled to said first and second bipolar transistors to make said first and second bipolar transistors operative in different current densities from each other to thereby produce a predetermined voltage relative to a difference in base-emitter voltages between said first and second bipolar transistors; a level shift circuit receiving and shifting said predetermined voltage to produce a level-shifter voltage; an operational amplifier composed of field effect transistors and receiving said level-shifted voltage to control a current flowing through said resistor circuit in response thereto; and first and second field effect transistors each having a gate supplied with an output voltage of said operational amplifier, said resistor circuit including a first resistor connected between said first field effect transistor and said first bipolar transistor and second and third resistors connected in series between said second field effect transistor and said second bipolar transistor, wherein each of said first and second bipolar transistors has a base and a collector connected to a reference potential line.

5,568,046

## INACTIVE STATE TERMINATION TESTER

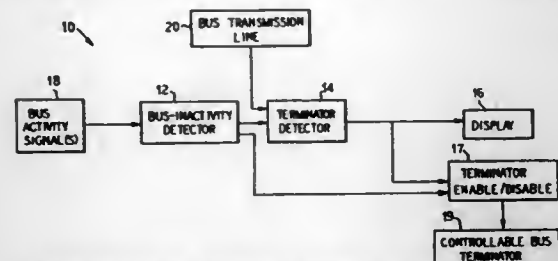
Francis M. Samela, Lombard, Ill., and Joseph R. Llorens, Winfield, both of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 333,777, Nov. 3, 1994, Pat. No. 5,510,701, which is a continuation-in-part of Ser. No. 285,970, Aug. 4, 1994, Pat. No. 5,465,042. This application Dec. 16, 1994, Ser. No. 357,429

Int. Cl.<sup>6</sup> G01R 31/02; H01H 35/00

U.S. Cl. 324—71.1

22 Claims



1. An inactive state termination tester for determining the number of terminators connected to a bus, said inactive state termination tester comprising:

- means for detecting bus inactivity to produce a bus inactivity signal;
- means for detecting said number of terminators connected to said bus, when said bus inactivity signal is received, to produce a terminator detection signal corresponding to said number or terminators connected to said bus;
- means for providing a signal for terminator enablement or disablement, respectively, depending on if there are not enough or too many terminators detected on said bus; and
- means for generating a signal to maintain terminator enablement or disablement whenever bus activity is resumed.

5,568,047

## CURRENT SENSOR AND METHOD USING DIFFERENTIALLY GENERATED FEEDBACK

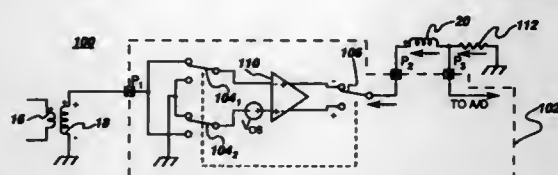
Daniel A. Staver, Scotia, and Juha M. Hakkarainen, Delmar, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 10, 1994, Ser. No. 288,177

Int. Cl.<sup>6</sup> G01R 33/00

U.S. Cl. 324—127

18 Claims



9. In a current sensor having one signal interface channel including a respective transformer having a primary winding, a secondary winding and a feedback winding each being magnetically coupled to each other through a common magnetic core, a feedback generating circuit responsive to an AC signal in said secondary winding for supplying a feedback signal to said feedback winding, said feedback signal being free of any polarity reversal and effective for maintaining a flux in said magnetic core substantially near zero, said feedback generating circuit comprising:

- an operational amplifier having a first differential input port, a second differential input port at which a DC offset voltage may develop, and first and second differential output ports; and
- a switching assembly adapted to generate a compensating AC signal from said DC offset voltage, said compensating AC signal being coupled to said operational amplifier through said primary and secondary windings;

said switching assembly comprising:

first and second input switches for respectively coupling during a first switching period the first input port to said secondary winding and the second input port to a predetermined electrical ground, and for respectively coupling during a second switching period the second input port to said secondary winding and the first input port to the predetermined electrical ground; and

an output switch for coupling during the first switching period the first output port to said feedback winding, said output switch coupling during the second switching period the second output port to said feedback winding.

5,568,048

## THREE SENSOR ROTATIONAL POSITION AND DISPLACEMENT DETECTION APPARATUS WITH COMMON MODE NOISE REJECTION

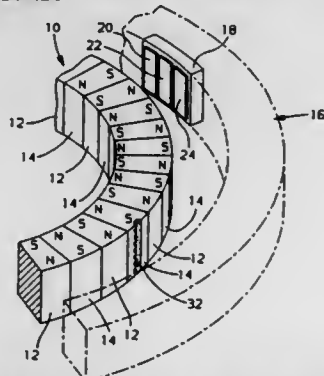
Thaddeus Schroeder, Rochester Hills, and Andrzej M. Pawlak, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 14, 1994, Ser. No. 355,748

Int. Cl.<sup>6</sup> G01B 7/30; G01R 33/09

U.S. Cl. 324—207.21

15 Claims



1. A sensing apparatus for sensing absolute angular position and angular displacement of a rotating automotive part, comprising:

- a multipole magnetic ring mechanically linked to the automotive part so as to rotate in proportion to automotive part rotation, the multipole magnetic ring including a set of adjacent permanent magnet sections of alternating magnetic polarity having a substantially common pole pitch, wherein a portion of a predetermined permanent magnet section of the multipole magnetic ring is characterized by a significant variation in magnetic field intensity;

- a pair of matched sensors for outputting signals indicating magnetic field intensity, the pair positioned adjacent the multipole magnetic ring and spaced along the direction of rotation of the multipole magnetic ring by a spacing that is a predetermined function of the substantially common pole pitch;

- a third matched sensor for outputting a signal indicating magnetic field intensity, the third sensor positioned adjacent the multipole magnetic ring and spaced from a predetermined one of the pair of matched sensors along the direction of rotation of the multipole magnetic ring by a third sensor spacing that is a predetermined function of the substantially common pole pitch, the third sensor spacing providing that the magnetic field intensity at the third sensor will be significantly different than the magnetic field intensity at the predetermined one of the pair when the predetermined permanent magnetic section passes by the third matched sensor and when the predetermined permanent section passes by the predetermined one of the pair;

circuitry for detecting a significant deviation between the output signal of the third matched sensor and the output signal of the predetermined one of the pair of matched sensors and sensing an absolute angular position of the automotive part when the significant deviation is detected;

comparator circuitry for detecting a predetermined change in the relative magnitude of the output signals of the pair of matched

sensors and for providing a comparator output signal indicating the detected predetermined change; and circuitry electrically connected and responsive to the comparator output signal for detecting a displacement of the automotive part when the predetermined change in the relative magnitude is detected.

5,568,049

## FIBER OPTIC FARADAY FLUX TRANSFORMER SENSOR AND SYSTEM

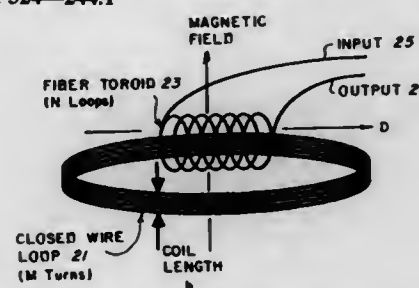
Frank Bucholtz, Crofton, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 22, 1993, Ser. No. 140,389

Int. Cl.<sup>6</sup> G01R 33/032; 19/00

U.S. Cl. 324—244.1

2 Claims



1. A fiber optic Faraday sensor comprising:
  - a closed loop of wire being responsive to a first time-varying magnetic field from a remote source for producing a secondary time-varying magnetic field which varies as a function of the first time-varying magnetic field; and
  - an optical fiber loop having a plurality of turns arranged in a preselected configuration adjacent to said closed loop of wire and adapted to receive and pass therethrough input light having a fixed state of linear polarization, said optical fiber being responsive to the secondary time-varying magnetic field and to the input light for producing an output light having a polarization state which rotates as a function of the secondary time-varying magnetic field applied thereto, said plurality of turns of optical fiber being wound in a toroidal configuration around said closed loop of wire.

5,568,050

## METHOD OF MAGNETIC RESONANCE IMAGING TOMOGRAPHY FOR THE SIMULTANEOUS PRODUCTION OF A PLURALITY OF IMAGE SLICES

Jürgen Hennig, Johann-von-Weerth-Str. 12, D-79100 Freiburg, Germany

Filed Aug. 3, 1995, Ser. No. 510,611

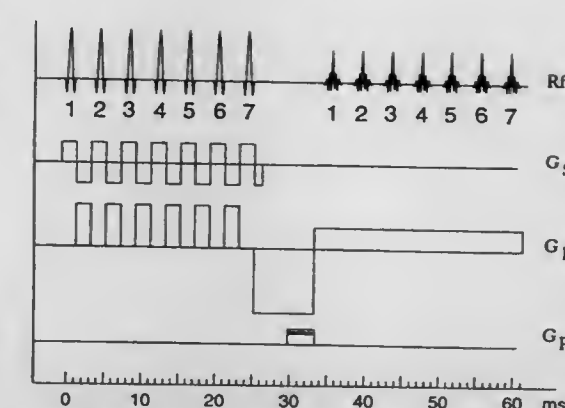
Claims priority, application Germany, Aug. 27, 1994, 44 30 460.9

Int. Cl.<sup>6</sup> G01V 3/00

U.S. Cl. 324—309

7 Claims

1. A method for the production and recording of NMR signals in chosen regions of an investigational object comprising the steps of:
  - applying a first slice selection gradient having a slice selection gradient direction;
  - irradiating a first narrow band RF pulse in the presence of the first slice selection gradient to produce an first NMR signal in a first selected slice of the investigational object;
  - applying a first read gradient having a read gradient direction perpendicular to the slice selection gradient direction;
  - applying an additional slice selection gradient;
  - irradiating an additional narrow band RF pulse in the presence of the additional slice selection gradient to produce an additional NMR signal in an additional selected slice of the investigational object;
  - applying an additional read gradient;



- g) applying a final slice selection gradient;
- h) irradiating a final narrow band RF pulse in the presence of the final slice selection gradient to produce a final NMR signal in a final selected slice of the investigational object;
- i) applying a final read gradient; and
- j) reading out, in time sequence and in the presence of the final read gradient, the first, additional, and last NMR signals.

5,568,051

## MAGNETIC RESONANCE IMAGING APPARATUS HAVING SUPERIMPOSED GRADIENT COIL

Hitoshi Yamagata, Tochigi-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Continuation of Ser. No. 57,571, May 6, 1993, abandoned.

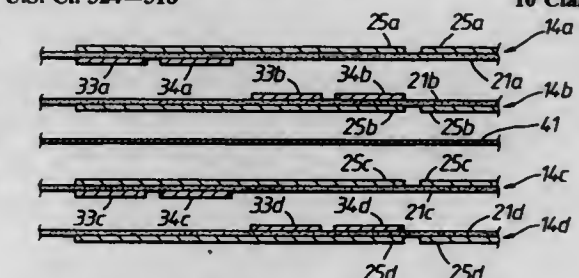
This application Sep. 20, 1994, Ser. No. 308,968

Claims priority, application Japan, May 12, 1992, 4-119128

Int. Cl.<sup>6</sup> G01R 33/28

U.S. Cl. 324—318

10 Claims



1. A magnetic resonance imaging apparatus comprising:
  - magnet means for producing a static magnetic field along a predetermined axis;
  - radio-frequency means for transmitting a radio-frequency pulse and for receiving a magnetic resonance signal induced from an object;
  - gradient means for producing a gradient magnetic field, the gradient means comprising a plurality of gradient coil elements superimposed on one another along a direction orthogonal to the predetermined axis and each gradient coil element capable of producing a gradient magnetic field along a common direction, wherein each of the gradient coil elements comprises:
    - a substrate;
    - a gradient coil pattern formed on a first surface of the substrate for producing the gradient magnetic field; and
    - a lead portion formed on a second surface of the substrate opposite to the first surface and connected to an end of the gradient coil pattern for supplying electrical power to the gradient coil pattern;
  - wherein the second surfaces of at least a pair of gradient coil elements confront each other, the lead portions respectively connected to the pair of gradient coil elements positioned in non-contacting relation; and
  - shield means for shielding the gradient magnetic field outside the gradient means, the shield means comprising a plurality of shield coil elements superimposed on one another along a





applying test signals to the integrated circuit chip via the inner and outer leads while exposing the integrated circuit chip to a test temperature and a test voltage; and after said step of applying test signals, severing each corresponding wire at the ball portion formed on each pad, thereby forming a corresponding connection bump on each pad.

5,568,058

## AUTOMATIC MOTOR TESTER

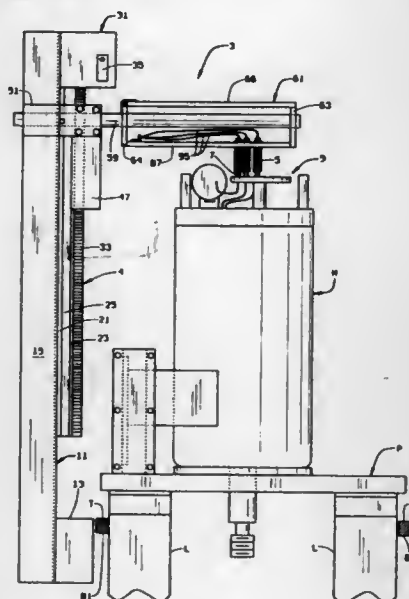
Wendell Davis, Montgomery County, Kans., assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 20, 1994, Ser. No. 246,680

Int. Cl.<sup>6</sup> G01R 31/34

U.S. Cl. 324—772

23 Claims



1. An automatic tester for testing electric motors, the motors each including a control circuit having contacts; the tester including:

- a support;
  - at least one test contact operably mounted to said support to be spaced from said motor, said at least one test contact being removably connectable to said motor control circuit contacts;
  - a contact housing mounted to said support, said at least one test contact being mounted in said contact housing, said contact housing being stationary during a motor test procedure;
  - a controller in electrical communication with said at least one test contact, said controller sending a signal to and receiving a signal from said motor to test said motor; and
  - a lifter, said motor being positioned with respect to said lifter such that operation of said lifter moves said motor to bring said motor control circuit contacts into contact with said at least one test contact;
- said contact housing being movable relative to said support to adjust the position of said test contact such that said motor circuit test contact will be brought into contact with said test contact when said motor is moved by said lifter.

5,568,059

## CURRENT SENSOR AND MOTOR ROTATION SENSOR USING SUCH CURRENT SENSOR

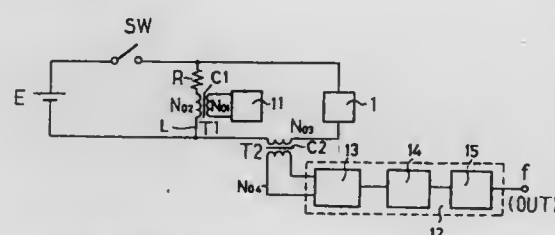
Koichi Futsuhara, and Masayoshi Sakai, both of Saitama-ken, Japan, assignors to The Nippon Signal Co., Ltd., Japan  
PCT No. PCT/JP93/00419, § 371 Date Nov. 30, 1994, § 102(e)  
Date Nov. 30, 1994, PCT Pub. No. WO94/23307, PCT Pub. Date Oct. 13, 1994

PCT Filed Apr. 1, 1993, Ser. No. 343,608

Int. Cl.<sup>6</sup> G01R 31/34

U.S. Cl. 324—772

5 Claims



1. A current sensor comprising:
  - a first transformer having a secondary side winding forming a portion of a current line through which current passes;
  - transmitting means for transmitting an alternating current signal to said current line via said first transformer;
  - a second transformer having a primary side winding forming a portion of a load drive line connected in parallel with said current line, at least one of the first and second transformers having a saturable magnetic core; and
  - receiving means for receiving via said second transformer the alternating current signal transmitted from said transmitting means and generating output of logic value 1 when a level of the alternating current signal level is higher than a predetermined level, the output of logic value 1 indicating absence of load current.

5,568,060

## CIRCUIT BOARD INSERTION CIRCUITRY FOR HIGH RELIABILITY BACKPLANES

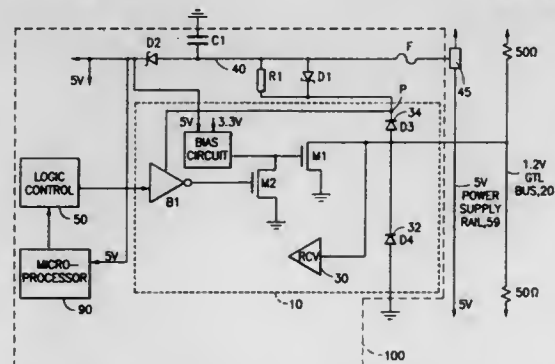
William G. Bartholomay, Orange; Eugene L. Parrella, Shelton; Daniel C. Upp, Southbury, and Mikio S. Ichiba, Fairfield, all of Conn., assignors to TransSwitch Corporation, Shelton, Conn.

Filed Jul. 20, 1995, Ser. No. 504,568

Int. Cl.<sup>6</sup> H03K 19/0185

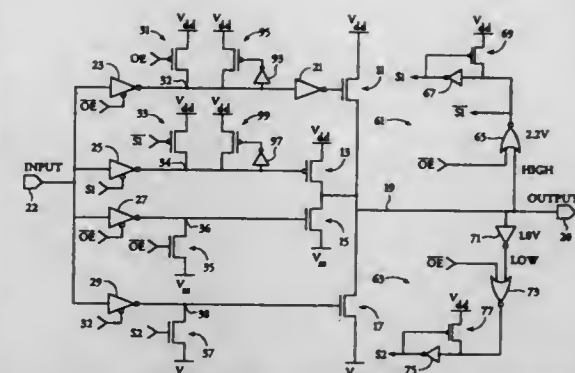
U.S. Cl. 326—86

20 Claims



1. Apparatus on a circuit board for temporarily controlling the output of a transceiver on the circuit board which is otherwise controlled by a bias circuit and which is to be coupled to an open drain data bus, the apparatus being used in conjunction with a staggered electrical connector which first connects the circuit board to a high system voltage rail and then to the open drain data bus, said apparatus comprising:

- a) an isolated circuit means on the circuit board, with the isolated circuit means being coupled to the high system voltage rail upon connection of the circuit board to the high system voltage rail, and also being coupled to the transceiver, said isolated circuit means for controlling the output of the transceiver by quickly receiving a high system voltage from the high system voltage rail upon connection of the circuit board to the high system voltage rail, and by using said high system voltage in order to tristate the output of the transceiver within at most one millisecond after the staggered electrical connector connects the circuit board to the high system voltage rail, and prior to the staggered electrical connector being connecting to the data bus; and
- b) tristate override means for turning off control of the transceiver by said isolation circuit means after the electrical connector connects the circuit board to the high system voltage rail, and after the bias circuit is fully powered so that it can properly control the transceiver output.



by a ramp rate for a signal transition that is at most two times higher at its output than at its input, a first set of pull-up and pull-down output transistors connected in series between first and second voltage supply lines with an output node formed between said pull-up and pull-down output transistors said input translators driving respective control gates of said pull-up and pull-down output transistors, wherein said input translator that drives said pull-up transistor of said first set of output transistors has an input transition voltage that is lower than a nominal transition voltage of the circuit and said input translator that drives said pull-down transistor of said first set of output transistors has a different input transition voltage that is higher than said nominal transition voltage, said nominal transition voltage being between voltage levels of said first and second voltage supply lines and between predefined logic low and logic high voltage levels for input signals received at said input of the circuit, and means connected in parallel with said input translators to said control gates for shutting off said pull-up and pull-down output transistors whenever said input translators are in a high impedance state.

5,568,061

## REDUNDANT LINE DECODER MASTER ENABLE

David C. McClure, Carrollton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

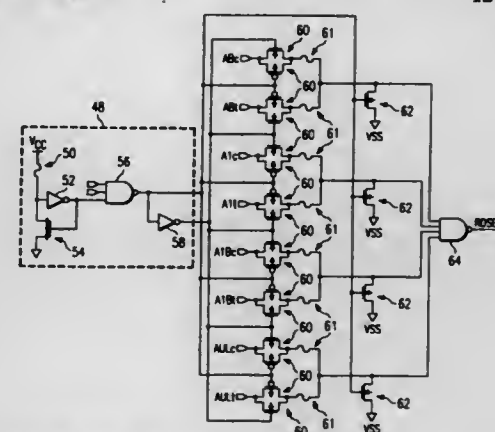
Continuation of Ser. No. 129,766, Sep. 30, 1993, abandoned.

This application Jun. 19, 1995, Ser. No. 492,219

Int. Cl.<sup>6</sup> H03K 19/003

U.S. Cl. 326—13

12 Claims



1. A redundant line decoder comprising:
  - a programmable master enable circuit that outputs a master enable signal in an enabling state when the master enable circuit is programmed to an enable state and when an additional enable signal has an enabled state;
  - a decoder circuit programmed with an address to which the decoder is responsive, and receiving the master enable signal and address signals, and outputting a redundant line select signal when the programmed address is received while the master enable signal is in an enabling state, and wherein no enable signals other than the master enable signal are received by the decoder circuit; and
  - a word line that receives the redundant line select signal, and that is selected by receiving only the redundant line select signal.

5,568,062

## LOW NOISE TRI-STATE OUTPUT BUFFER

Cecil H. Kaplinsky, 140 Melville Ave., Palo Alto, Calif. 94301

Filed Jul. 14, 1995, Ser. No. 502,531

Int. Cl.<sup>6</sup> H03K 17/16

U.S. Cl. 326—27

8 Claims

1. A buffer circuit, comprising
  - a first pair of tristate input translators connected in parallel to an input of the circuit, each input translator being characterized

5,568,063  
SIGNAL TRANSMITTING DEVICE, CIRCUIT BLOCK AND INTEGRATED CIRCUIT SUITED TO FAST SIGNAL TRANSMISSION

Toshitsugu Takekuma, Ebina; Ryoichi Kurihara, and Akira Yamagiwa, both of Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

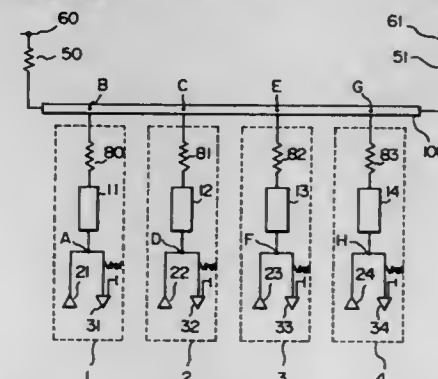
Continuation of Ser. No. 269,352, Jun. 30, 1994. This application Jun. 7, 1995, Ser. No. 476,576

Claims priority, application Japan, Dec. 28, 1993, 5-334631

Int. Cl.<sup>6</sup> H03K 17/16; 19/0175

U.S. Cl. 326—30

11 Claims



1. A signal transmitting device comprising:
  - a main transmission line, said main transmission line being terminated at both ends thereof with the same termination voltage; and
  - a circuit block connected with said main transmission line; said circuit block comprising:
    - a driving circuit including an output circuit of a push-pull type for driving a signal,



a receiving circuit including a differential input circuit for receiving a signal,  
sub-transmission lines connected to said main transmission line and each of said driving circuit and said receiving circuit, and  
a resistor connected between said main transmission line and each of said sub-transmission lines, said resistor having a resistance value to provide impedance matching between the main transmission line and the sub-transmission lines to suppress reflections at branch points between the main transmission line and the sub-transmission lines.

5,568,064

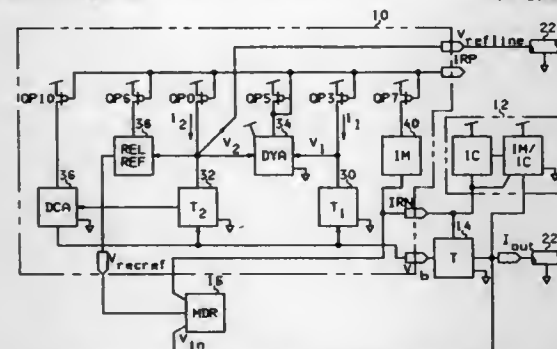
# BIDIRECTIONAL TRANSMISSION LINE DRIVER/RECEIVER

Gregory E. Beers; Richard F. Franken, both of Austin, and Mithkal M. Smadi, Round Rock, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y. Continuation-in-part of Ser. No. 376,708, Jan. 23, 1995. This application May 8, 1995, Ser. No. 438,134

Int. Cl.<sup>6</sup> H03K 19/0175

U.S. Cl. 326—31

19 Claims



1. Circuitry for generating and receiving digital signals over a transmission line in response to digital data input and control signals, comprising:

- a reference circuit providing a first and second reference signal;
- a signal source connected to the transmission line for generating a variable level digital signal;
- an output reference level adjusting and switching circuit responsive to the digital data input and the first reference signal and connected to the signal source for selecting the level of the variable level digital signal and switching the signal source between a first and second output state so that the signal source generates a digital signal to the transmission line which follows the digital data input at the selected output signal level;
- a variable input impedance circuit connected to the transmission line responsive to the second reference signal for receiving variable level digital signals from the transmission line; and
- a detecting circuit connected to receive the variable level digital signals from the variable input impedance circuit, the detecting circuit being responsive to the first reference signal, for detecting logic states of the variable level digital signals as determined by the first reference signal, and for converting the detected logic states into corresponding logic signals of predetermined output levels.

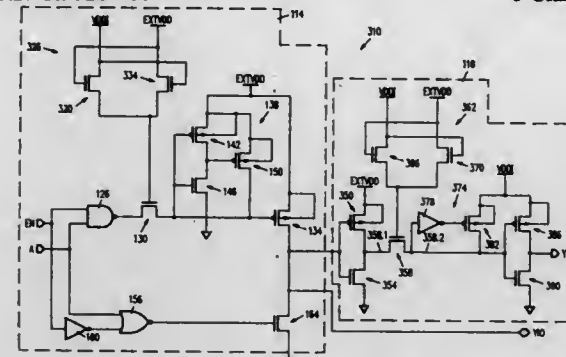
## 5,568,065 CIRCUIT FOR CONNECTING A NODE TO A VOLTAGE SOURCE SELECTED FROM ALTERNATIVE VOLTAGE SOURCES

Joseph D. Wert, Arlington, and Richard L. Duncan, Bedford, both of Tex., assignors to National Semiconductor Corporation, Santa Clara, Calif. Division of Ser. No. 352,482, Dec. 9, 1994, which is a continuation of Ser. No. 72,896, Jun. 7, 1993, Pat. No. 5,406,140. This application Jun. 1, 1995, Ser. No. 457,894

Int. Cl.<sup>6</sup> H03K 19/00:5/24

U.S. Cl. 326—33

6 Claims



1. A circuit for selectively coupling a circuit node to one voltage source of two alternative power supply voltage sources comprising:

- a first transistor selectively coupling the circuit node to a first power supply voltage source of the two alternative power supply voltage sources, the first transistor having a gate coupled to a second power supply voltage source of the two alternative power supply voltage sources; and
- a second transistor selectively coupling the circuit node to the second power supply voltage source, the second transistor having a gate coupled to the first power supply voltage source; wherein the circuit passes the lowest voltage supplied by the two alternative voltage sources to the circuit node.

5,568,066

# SENSE AMPLIFIER AND OR GATE FOR A HIGH DENSITY PROGRAMMABLE LOGIC DEVICE

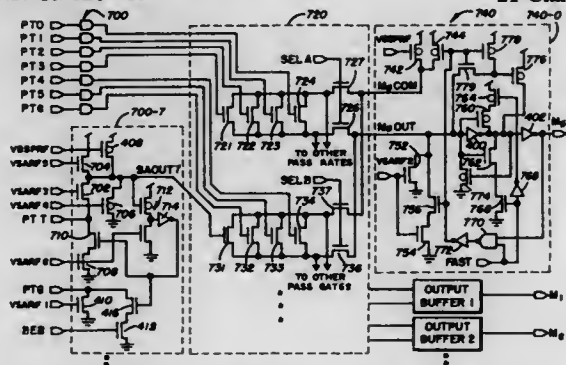
Bradley A. Sharpe-Geisler, San Jose, and Fabiano Fontana, Santa Clara, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 17, 1994, Ser. No. 341,432

Int. Cl.<sup>6</sup> H03K 19/173

U.S. Cl. 326—39

21 Claims



1. A programmable logic device (PLD) having inputs provided on product term (PT) lines, an upper power supply  $V_{DD}$ , a lower voltage supply ( $V_{SS}$ ) and outputs ( $M_N$ ), the PLD comprising:  
OR gates having outputs forming the outputs ( $M_N$ ), and inputs;  
and  
sense amplifiers, each sense amplifier comprising a cascode transistor having a source connected to one of the PT lines, a

gate connected to a reference potential and a drain connected to one of the OR gate inputs and configured for providing a signal at the given OR gate input which transitions between voltage values having a range less than a range between the upper power supply ( $V_{DD}$ ) and the lower power supply ( $V_{SS}$ ).

5,568,067

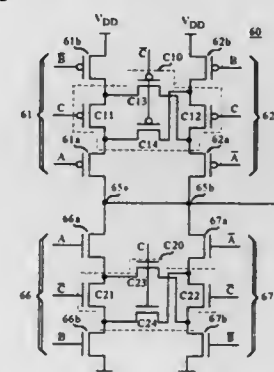
# CONFIGURABLE XNOR/XOR ELEMENT

Mark W. McDermott, and John E. Turner, both of Austin, Tex., assignors to Cyrix Corporation, Richardson, Tex. Filed Jun. 30, 1995, Ser. No. 497,007

Int. Cl.<sup>6</sup> H03K 19/094:19/21

U.S. Cl. 326—55

8 Claims



1. A configurable XNOR/XOR logic element receiving A and B inputs and providing a Y output, comprising:

- (a) first parallel transistors including a B-input p-transistor in parallel with a B-input n-transistor; and
- (b) second parallel transistors including an A-input p-transistor in parallel with a A-input n-transistor; and
- (c) the first and second parallel transistors being selectively intercoupled by a first coupling circuit;
- (d) third parallel transistors including an A-input n-transistor in parallel with a A-input p-transistor; and
- (e) fourth parallel transistors including an B-input n-transistor in parallel with a B-input p-transistor; and
- (f) the third and fourth parallel transistors being selectively intercoupled by a second coupling circuit;
- (g) the A-input p-transistor of the second parallel transistors being coupled in series to the A-input n-transistor of the third parallel transistors to define a first output node, and the A-input p-transistor of the second parallel transistors being coupled in series to the A-input n-transistor of the third parallel transistors to define a second output node, the first and second output nodes being coupled to provide the Y output;
- (h) the first and second coupling circuits being controlled by a C input such that:
- (i) if the C input is asserted, then (a) the B-input and B-input p-transistors of the first parallel transistors are respectively cross-coupled to the A-input and A-input p-transistors of the second parallel transistors, and (b) the A-input and A-input n-transistors of the third parallel transistors are respectively cross-coupled to the B-input and B-input n-transistors of the fourth parallel transistors, thereby configuring the XNOR/XOR logic element as an XNOR gate with a corresponding Y output; or
- (j) if the C input is deasserted, then (a) the B-input and B-input p-transistors of the first parallel transistors are respectively series-coupled to the A-input and A-input p-transistors of the second parallel transistors, and (b) the A-input and A-input n-transistors of the third parallel transistors are respectively series-coupled to the B-input and B-input n-transistors of the fourth parallel transistors, thereby configuring the XNOR/XOR logic element as an XOR gate with a corresponding Y output.

5,568,068

# BUFFER CIRCUIT FOR REGULATING DRIVING CURRENT

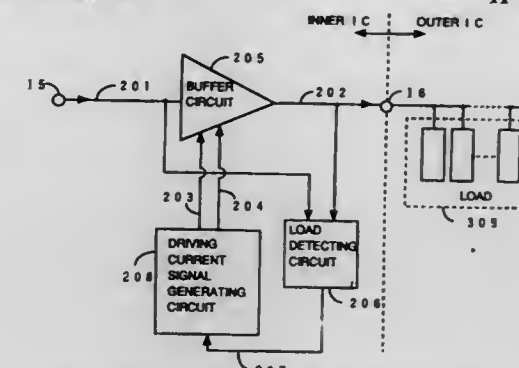
Yoshiyuki Ota; Ichiro Tomioka, both of Kanagawa, and Eiji Murakami, Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, and Mitsubishi Electric Semiconductor Software Co., Ltd., Itami, both of Japan Filed Sep. 26, 1995, Ser. No. 534,114

Claims priority, application Japan, Jun. 8, 1995, 7-141896

Int. Cl.<sup>6</sup> H03K 19/003

U.S. Cl. 326—82

11 Claims



1. A buffer circuit with driving current adjusting function comprises:

- a buffer circuit which is controlled by a control signal for supplying a most appropriate driving current to a load;
- a load detecting circuit for detecting a phase difference between an input signal and an output signal of said buffer circuit and for outputting voltage corresponding to said phase difference;
- a control signal generating circuit for generating a signal which controls the driving current of said buffer circuit in response to an output signal of said load detecting circuit;
- said control signal generating circuit controls said buffer circuit so that driving current may increase when delay time between input and output of said buffer circuit becomes long, and also controls said buffer circuit so that driving current may decrease when delay time between input and output of said buffer circuit becomes short.

5,568,069

# HIGH SPEED, LOW POWER PIPELINED LOGIC CIRCUIT

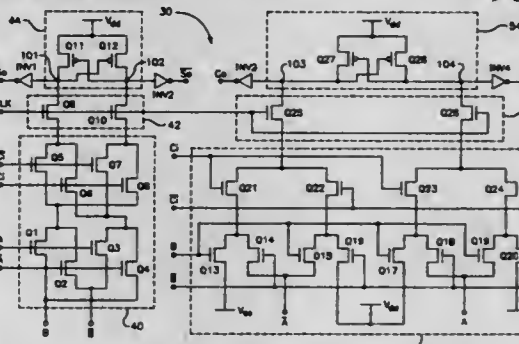
Lap-Wai Chow, South Pasadena, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 27, 1995, Ser. No. 395,409

Int. Cl.<sup>6</sup> H03K 19/0948:19/096

U.S. Cl. 326—113

9 Claims



1. A complementary pipelined logic circuit, comprising:  
a voltage supply node;  
an N-channel pass-gate logic unit having a plurality of pairs of complementary inputs and producing a pair of complementary outputs with a predetermined voltage swing;

a load circuit connected to said voltage supply node to establish a pair of complementary logic outputs with a voltage swing greater than the output voltage swing of said logic unit, a control circuit interfacing between said logic unit and said load circuit, said control circuit having a clock input and operating in response to a clock signal applied to said clock input to control the logic states of said load circuit logic outputs in accordance with the logic states of said logic unit outputs, and a pair of inverters connected to respective ones of said load circuit complementary logic outputs, with a HI logic state at one of said logic outputs substantially inhibiting the flow of static current through its associated inverter, said inverters producing outputs suitable for direct application to the inputs of another logic circuit with a pass-gate architecture.

5,568,070

# MULTIPLEXER W/ SELECTIVE SWITCHING FOR EXTERNAL SIGNALS

Akitoshi Osaki, and Hideo Matsui, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

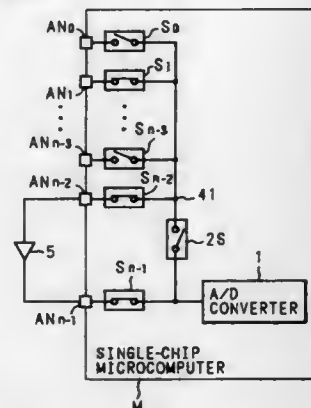
Filed Aug. 25, 1995, Ser. No. 519,335

Claims priority, application Japan, Dec. 8, 1994, 6-305192

Int. Cl.<sup>6</sup> H03K 119/173

U.S. Cl. 326—113

8 Claims



1. A multiplexer for alternatively selecting a plurality of signals, the multiplexer comprising:
    - a plurality of first signal terminals;
    - a second signal terminal;
    - a third signal terminal;
    - a plurality of first switching divisions for selecting a signal terminal from the first signal terminals, each of the first switching divisions having a first terminal connected to each of the first signal terminals and a second terminal;
    - a second switching division having a first terminal connected to the second signal terminal and a second terminal connected to the second terminal of each of the first switching divisions;
    - a third switching division having a first terminal connected to the third signal terminal and a second terminal;
    - a fourth switching division interposed between the second terminal of each of the first and second switching divisions, and the second terminal of the third switching division;
- wherein the fourth switching division is opened in response to the closing of the second and third switching divisions.

5,568,071

# PULSE PHASE DIFFERENCE ENCODING CIRCUIT

Kouichi Hoshino, Ohbu, Takamoto Watanabe, Nagoya, and Yoshinori Ohtsuka, Okazaki, all of Japan, assignors to Nippon Soken Inc., Nishio, and Nippondenso Co., Ltd., Kariya, both of Japan

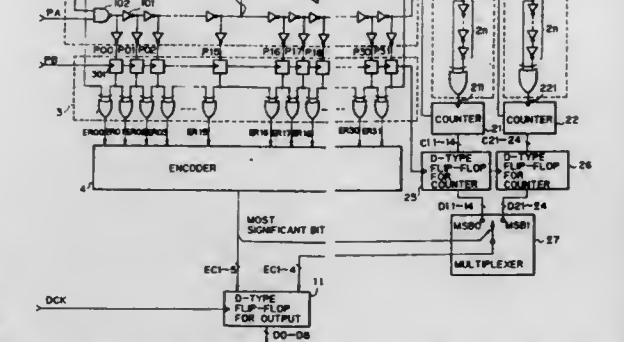
Continuation of Ser. No. 172,383, Dec. 23, 1993, abandoned, which is a continuation of Ser. No. 909,211, Jul. 6, 1992, Pat. No. 5,289,135, which is a continuation of Ser. No. 645,874, Jan. 25, 1991, Pat. No. 5,128,624. This application Jan. 19, 1995, Ser. No. 375,252

Claims priority, application Japan, Jan. 25, 1990, 2-15865

Int. Cl.<sup>6</sup> H03K 21/00

U.S. Cl. 377—43

65 Claims



1. An apparatus for producing an indication indicative of a time difference between first and second indicia, said apparatus comprising:
  - a recirculating delay line, receiving said first indicia, formed of multiple delay elements connected together such that a delay element at a second end is connected to a delay element at a first end, and generating an output indicative of a position of said first indicia in said delay line, said output having a plurality of possible states each of which represents a different position of said first indicia in said delay line;

- a counter, connected to said recirculating delay line, counting a number of times that said first indicia recirculates between said delay element at said second end and said delay element at said first end; and
- a latch, receiving said second indicia, latching said delay line output and an output indicative of contents of said counter, when said second indicia occurs.

5,568,072

# CIRCUIT INDICATING THE PHASE RELATION BETWEEN SEVERAL SIGNALS HAVING THE SAME FREQUENCY

Jean-Pierre Schoellkopf, Grenoble, France, assignor to SGS-Thomson Microelectronics S.A., Saint-Genis Pouilly, France

Filed Oct. 3, 1994, Ser. No. 317,132

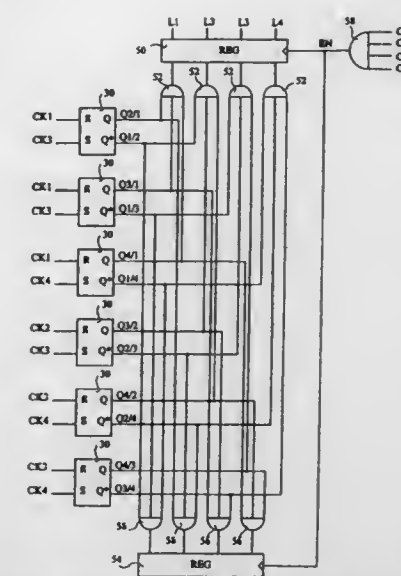
Claims priority, application France, Oct. 11, 1993, 93 12452

Int. Cl.<sup>6</sup> H03K 5/13; H03L 7/00

U.S. Cl. 327—12

29 Claims

1. A circuit for indicating a first or a last signal activated among a plurality of signals, comprising:
  - a plurality of flip-flops respectively associated with a plurality of pairs of the plurality of signals, a first signal of each pair being applied to a reset input of a flip-flop and a second signal of each pair being applied to a set input of the flip-flop; and
  - a plurality of logic gates, each logic gate being respectively associated with one of the plurality of signals, and connected to outputs of a group of flip-flops of the plurality of the flip-flops, each flip-flop of the group of flip-flops receiving the one of the plurality of signals respectively associated with the logic gate, as one of a first signal and a second signal of a pair respectively associated with the flip-flop, an output signal provided by each of the plurality of logic gates indicating



whether the respectively associated one of the plurality of signals is the first or the last activated signal relative to all of the plurality of signals.

5,568,073

# DATA COMPARING SENSE AMPLIFIER

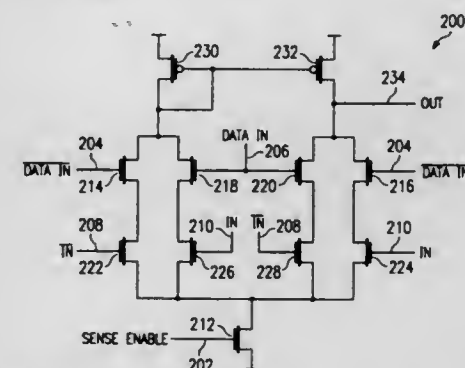
David C. McClure, Carrollton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Dec. 22, 1993, Ser. No. 172,853

Int. Cl.<sup>6</sup> G01R 19/00; G11C 7/00

U.S. Cl. 327—51

20 Claims



18. A sense amplifier, comprising:
  - a first data signal, a second data signal, a third data signal, and a fourth data signal, wherein the first data signal and the second data signal are signals from a memory array; and
  - a sense amplifier which has a first differential pair of transistors comprised of a first transistor and a second transistor, a second differential pair of transistors comprised of a third transistor and a fourth transistor, a first enable pair of transistors comprised of a fifth transistor and a sixth transistor, a second enable pair of transistors comprised of a seventh transistor and an eighth transistor, and a load element having a first connection point and a second connection point, with each transistor having a first terminal, a second terminal, and a third terminal; the first terminal of the first transistor is connected to the second terminal of the fifth transistor, the first terminal of the second transistor is connected to the second terminal of the sixth transistor, the first terminal of the third transistor is connected to the second terminal of the seventh transistor, the first terminal of the fourth transistor is connected to the second terminal of the eighth transistor, the first terminal of the fifth transistor and the first terminal of the seventh transistor are connected to the first connection point of the load element, and the first terminal of the sixth transistor and the first terminal of the eighth transistor are connected to the second connection point of the load element.

5,568,074

# VOLTAGE MONITORING CIRCUIT

Kouichi Kitaguchi, and Yoshihide Okumura, both of Itami, Japan, assignors to Kanebo, Ltd., and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

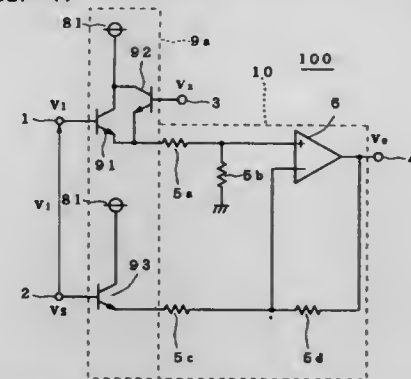
Filed Sep. 20, 1994, Ser. No. 309,899

Claims priority, application Japan, Oct. 8, 1993, 5-252880

Int. Cl.<sup>6</sup> H03K 5/22; 17/04

U.S. Cl. 327—77

11 Claims



1. A voltage monitoring circuit comprising:
  - (a) first and second input terminals between which an input voltage which changes to a desired value is applied and an output terminal;
  - (b) a differential amplifier having an output end connected to said output terminal and first and second input ends, and
  - (c) voltage converting means having,
    - (c-1) first and second input ends respectively connected to said first and second input terminals for receiving first and second potentials representing said input voltage,
    - (c-2) a reference potential input end to which a reference potential set in the vicinity of said desired value is applied, and
    - (c-3) first and second output ends connected to said first and second input ends of said differential amplifier, respectively.

for applying said input voltage between said first output end and said second output end when said input voltage is closer to said desired value than said reference potential, and applying a potential difference between said reference potential and said second potential between said first output end and said second output end when said input voltage is farther from said desired value than said reference potential; wherein a result of monitoring a change in said input voltage is provided to said output terminal.



5,568,075

## TIMING SIGNAL GENERATOR

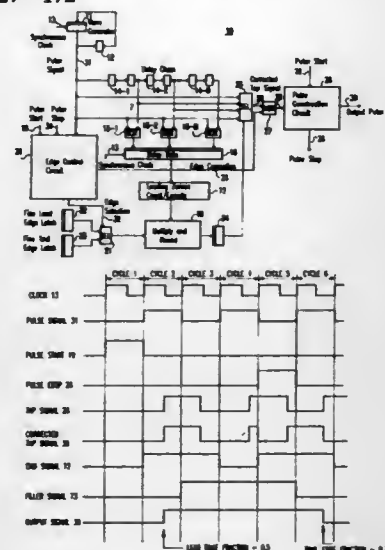
Brian W. Curran, Saugerties, N.Y., and Rafael Blanco, Burlington, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 224,927, Apr. 8, 1994. This application May 30, 1995, Ser. No. 453,587

Int. Cl.<sup>6</sup> H03K 5/13

U.S. Cl. 327-172

13 Claims



1. A timing signal generator for generating a timing signal with independent, dynamic location of leading and trailing edges with respect to an external synchronizing clock signal, comprising in combination:

- means for coupling said external synchronizing clock signal to said timing signal generator;
- means for generating a digital wave train continuously synchronized with said external synchronizing clock signal;
- a delay chain comprised of a plurality of stages connected in series, one to another;
- said delay chain comprised of a sufficient number of stages such that an edge of said digital wave train will not propagate completely through said chain in one cycle of said external synchronizing clock signal;
- means to couple said digital wave train to said delay chain so that an edge of said digital wave train commences propagation along said delay chain synchronously with an edge of said external synchronizing clock signal;
- means coupled to each inverter stage to determine a location value of a timing signal stage in said delay chain of a last stage reached by said edge of said digital wave train during one clock cycle of said external synchronizing clock cycle;
- means for storing a fine edge value that specifies a location of a timing signal edge as a fraction of a clock cycle of said external synchronizing clock cycle;
- means for combining said fine edge value with said location value to determine a fine edge stage in said delay chain where an edge of said digital wave train is located with respect to an edge of said external synchronizing clock signal at a location specified by said fine edge value;
- means for constructing a timing signal; and
- means for selectively connecting said fine edge stage in said delay chain to said means for constructing a timing signal in order to locate said timing signal edge at said location specified by said fine edge value.

5,568,076

## METHOD OF CONVERTING SHORT DURATION INPUT PULSES TO LONGER DURATION OUTPUT PULSES

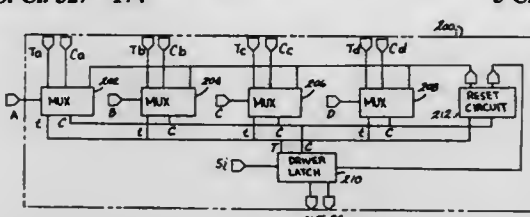
Antonio R. Pelella, Highland Falls, and Yuen H. Chan, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 309,811, Sep. 21, 1994. This application Jun. 2, 1995, Ser. No. 459,048

Int. Cl.<sup>6</sup> H03K 3/017; 3/356; 17/62

U.S. Cl. 327-174

5 Claims



1. A method of converting input pulses representing output signals of a plurality of circuits providing short duration output pulses to relatively longer duration output pulses for logic circuits requiring relatively longer duration input signals, the method comprising the steps of:

- multiplexing a plurality of the input pulses under control of select pulses;
- storing an individual one of the multiplexed input pulses in a data latch connected to an output terminal; and
- concomitantly providing to the output terminal an output pulse representative of the one input pulse, independent of the operation of the latch.

5,568,077

## LATCH CIRCUIT

Fumiki Sato, and Kouichi Fujita, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

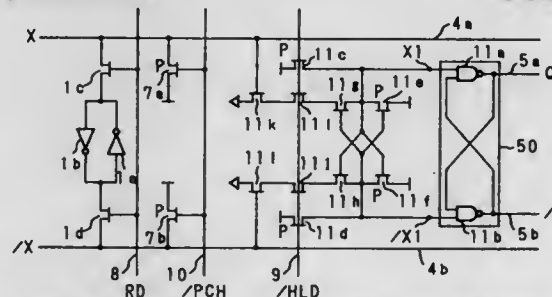
Filed May 24, 1995, Ser. No. 449,147

Claims priority, application Japan, Nov. 7, 1994, 6-272576

Int. Cl.<sup>6</sup> H03K 3/286; 3/356

U.S. Cl. 327-199

6 Claims



1. A latch circuit portion corresponding to 1 bit, for holding and outputting a signal value of 1 bit whose positive logic value is given via a first signal line and whose negative logic value is given via a second signal line, comprising:

- a flip-flop composed of a plurality of logic gates, for holding a given signal value and for outputting the positive logic value of the given signal to a third signal line and the negative logic value of the given signal to a fourth signal line; and
- an amplifier coupled to an input of said flip-flop and having a characteristic such that, an input voltage to said flip-flop, when a signal to be held is given, starts to fall before the time point when a drop in voltage of either said first signal line or said second signal line becomes larger than the difference between a source voltage and a threshold voltage of one of said logic gates constituting said flip-flop.

5,568,078

## CLOCK DELAY COMPENSATING AND DUTY CONTROLLING APPARATUS OF A PHASE-LOCKED LOOP

Seung Y. Lee, Seoul, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungki-Do, Rep. of Korea

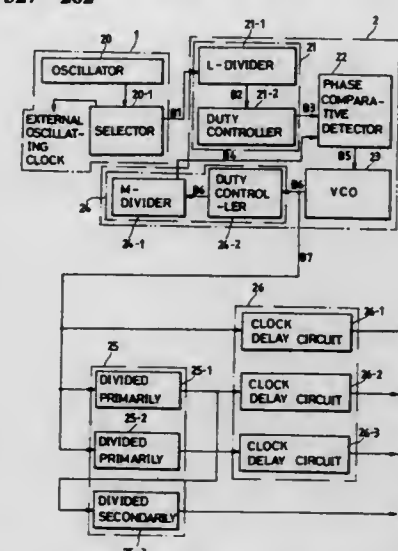
Filed Jun. 5, 1995, Ser. No. 464,324

Claims priority, application Rep. of Korea, Dec. 30, 1994, 94-39868

Int. Cl.<sup>6</sup> H03L 7/00; H03K 5/159

U.S. Cl. 327-262

2 Claims



1. A phase-locked loop circuit of a video signal receiving system comprising:

- an oscillating circuit which generates a reference oscillating clock, an L-dividing circuit which divides the reference clock from said oscillating circuit, a phase comparative detecting circuit which receives a first clock signal from said L-dividing circuit, a voltage-controlled oscillating circuit which is controlled by a second clock signal from said phase comparative detecting circuit, an M-dividing circuit which divides a third clock signal from said voltage-controlled oscillating circuit and passes it to the phase comparative detecting circuit, and a dividing circuit portion including at least one dividing circuit, said dividing circuit portion coupled to the voltage-controlled oscillating circuit to divide the third clock signal;
- a selecting circuit coupled between an output terminal of said oscillating circuit and an input terminal of said L-dividing circuit, said selecting circuit selecting said reference oscillating clock from said oscillating circuit and an external oscillating clock signal;
- a first duty controlling circuit coupled between an output terminal of said L-dividing circuit and a first input terminal of said phase comparative detecting circuit, said first duty controlling circuit controlling a duty ratio of said first clock signal received by said L-dividing circuit;
- a second duty controlling circuit coupled between an input terminal of said M-dividing circuit and an output of said voltage-controlled oscillating circuit, said second duty controlling circuit controlling a duty ratio of said third clock signal which is supplied to a second input terminal of said phase comparative detecting circuit through said M-dividing circuit; and
- a clock delay circuit portion coupled to said dividing circuit portion and said voltage-controlled oscillator circuit output, said clock delay circuit portion including at least one clock delay circuit to provide a delayed signal to an output of the phase-locked loop circuit.

5,568,079

## STEP-UP METHOD AND STEP-UP CIRCUIT

Kenzo Ohno, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

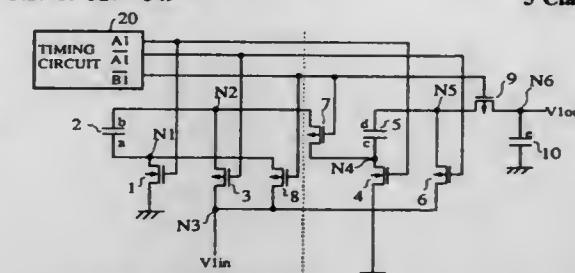
Filed Sep. 8, 1995, Ser. No. 525,012

Claims priority, application Japan, Sep. 9, 1994, 6-215837

Int. Cl.<sup>6</sup> G06F 7/556

U.S. Cl. 327-349

5 Claims



1. A step-up circuit comprising:

- a first switching element, a first capacitor element, and a second switching element connected in series between a first power source and a second power source in this order;
- a third switching element for selectively connecting a node between said first switching element and said first capacitor element to the second power source;
- a fourth switching element, a second capacitor element, and a fifth switching element connected in series between the first power source and the second power source in this order;
- a sixth switching element for selectively connecting a node between said first capacitor element and said second switching element to a node between said second capacitor element and said fourth switching element; and
- a timing signal generator for supplying control signals to said first to sixth switching elements.

5,568,080

## COMPUTATIONAL CIRCUIT

Guoliang Shou, Sunao Takatori, and Makoto Yamamoto, all of Tokyo, Japan, assignors to Yozan Inc, Tokyo, and Sharp Corporation, Osaka, both of Japan

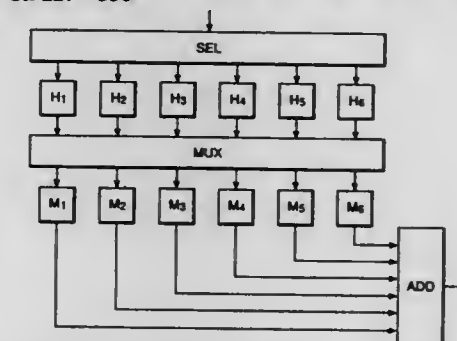
Division of Ser. No. 262,059, Jun. 17, 1994, and Ser. No. 242,837, Mar. 16, 1994, Pat. No. 5,440,605. This application Jun. 6, 1995, Ser. No. 467,827

Claims priority, application Japan, Jun. 17, 1993, 5-171041; Jun. 18, 1993, 5-172551; Jun. 18, 1993, 5-172552; Jun. 22, 1993, 5-174713; Jun. 24, 1993, 5-177362; Jun. 30, 1993, 5-187215; Sep. 20, 1993, 5-256355; Sep. 20, 1993, 5-256359; Sep. 20, 1993, 5-256367; Sep. 20, 1993, 5-256518; Sep. 20, 1993, 5-256557; Sep. 20, 1993, 5-256558; Apr. 1, 1994, 5-087720

Int. Cl.<sup>6</sup> G06F 7/44; G06G 7/16

U.S. Cl. 227-356

2 Claims



1. A computational circuit comprising:

- a selector having one input terminal and a plurality of output terminals for selectively connecting an input at said input terminal to one of said output terminals;

a plurality of sample/hold circuits each of which is connected to respective output terminals of said selector for holding data output from said selector;

a multiplexer, connecting to said plurality of sample/hold circuits, having a plurality of input terminals and at least one output terminal for selectively connecting one of said input terminals thereof to said output terminal thereof; and

a computational unit connected to said at least one output terminal of said multiplexer.

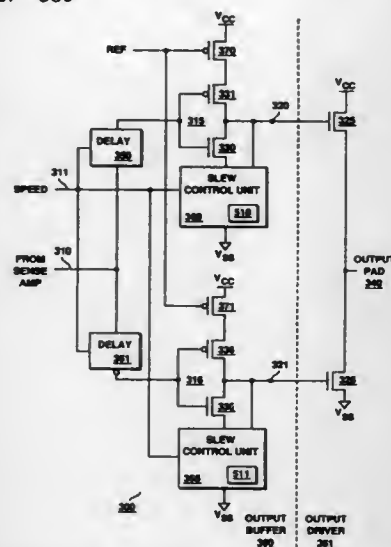
5,568,081

**VARIABLE SLEW CONTROL FOR OUTPUT BUFFERS**  
Henry Y. Lui, San Jose, and Sammy S. Y. Cheung, Pleasanton, both of Calif., assignors to Cypress Semiconductor Corporation, San Jose, Calif.

Filed Jun. 7, 1995, Ser. No. 483,068

Int. Cl.<sup>6</sup> H03K 17/16; 17/687

U.S. Cl. 327—380

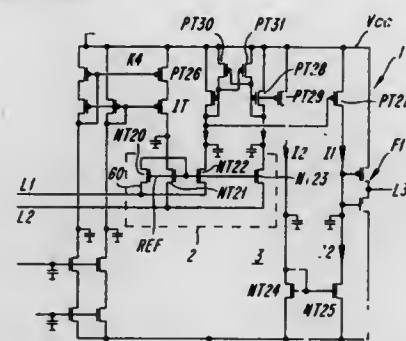


1. An output circuit comprising:
  - a first line that receives an input signal to said output circuit;
  - a second line selectable to have one of a first and second state;
  - a first circuit coupled to said first line having a first slew node, said first circuit responsive to said input signal that controls a voltage on said first slew node;
  - a second circuit coupled to said first line having a second slew node, said second circuit responsive to said input signal that controls a voltage on said second slew node;
  - a driver circuit coupled to said first circuit and to said second circuit said driver circuit having a first transistor responsive to said voltage on said first slew node and a second transistor responsive to said voltage on said second slew node that generates an output signal;
  - a first variable slew control circuit coupled to said first slew node, said first circuit, and said second line, said first variable slew control circuit increases a rate at which current at said first slew node is driven to ground when said voltage at said first slew node is below a first predetermined voltage; and
  - a second variable slew control circuit coupled to said second slew node, said second circuit and said second line, said second variable slew control circuit decreases a rate at which current at said second slew node is driven to ground when said voltage at said second slew node approaches a second predetermined voltage.

**5,568,082**  
**SIGNAL-RECEIVING AND SIGNAL-PROCESSING UNIT**  
Mats O. J. Hedberg, Handen, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden  
Filed Feb. 21, 1995, Ser. No. 391,005  
Claims priority, application Sweden, Feb. 21, 1994, 9400593  
Int. Cl.<sup>6</sup> H03K 17/687; 17/60

U.S. Cl. 327—437

70 Claims



1. A signal receiving and processing unit connected to at least one conductor for transmitting information carrying signals as voltage pulses comprising:
  - a signal receiving circuit including a first transistor, directly connected to the conductor, for affecting a current according to variations in the voltage pulses and a voltage value of a voltage pulse, wherein the current is in a form of pulses that pass through the transistor and is generated by the voltage pulse variations and voltage level;
  - a signal processing circuit for processing the affected current according to a signal information carrying form; and
  - a floating current mirror circuit including at least a second transistor coordinated with the first transistor.

**5,568,083**  
**SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING AN INTERNALLY PRODUCED OPERATION VOLTAGE MATCHED TO OPERATION SPEED OF CIRCUIT**

Akira Uchiyama, Kodaira; Ryuji Shibata, Higashiyamato; Yoshinobu Nakagome, Hamura, and Masaharu Kubo, Hachioji, all of Japan, assignors to Hitachi, Ltd., and Hitachi Microcomputer System Ltd., both of Tokyo, Japan

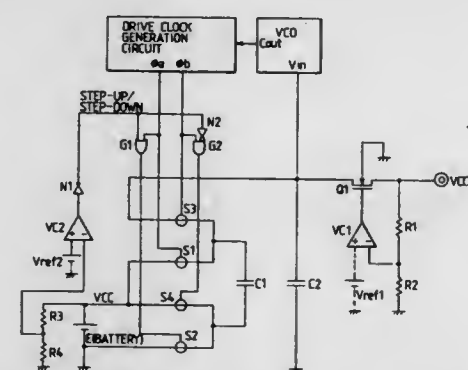
Filed Jun. 22, 1994, Ser. No. 263,720

Claims priority, application Japan, Jul. 2, 1993, 5-190890

Int. Cl.<sup>6</sup> G05F 1/10

U.S. Cl. 327—538

9 Claims



1. A semiconductor integrated circuit device formed on a single semiconductor chip, comprising:
  - an external power supply terminal connected with a battery as an external power supply;
  - an internal circuit including a plurality of MOSFETs; and

an internal power supply means connected to said external power supply terminal and providing on the basis of said external power supply an operation voltage to be supplied to said internal circuit,

wherein said internal power supply means includes:

detection means connected to said external power supply terminal to detect a voltage of said battery;

voltage conversion means to selectively perform a step-up or step-down operation on the battery voltage, said voltage conversion means including a selection function to select one of the step-up and step-down operations according to a detection signal outputted from said detection means and a conversion execution function to execute a selected operation in response to a clock signal;

supply means to supply as the operation voltage to said internal circuit a voltage which is responsive to a voltage outputted from said voltage conversion means;

clock signal generation means to form said clock signal supplied to said voltage conversion means; and

control means connected to said clock signal generation means to control a frequency of the generated clock signal so that the operation voltage outputted from said supply means conforms to an internal power supply voltage for achieving an operation speed required of said internal circuit.

5,568,084

**CIRCUIT FOR PROVIDING A COMPENSATED BIAS VOLTAGE**

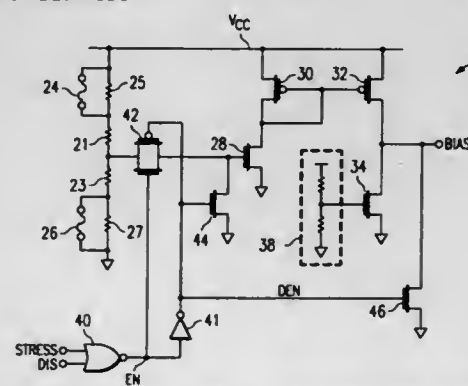
David C. McClure, Denton, and Thomas A. Teel, Carrollton, both of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Dec. 16, 1994, Ser. No. 357,664

Int. Cl.<sup>6</sup> G05F 1/10

U.S. Cl. 327—538

4 Claims



1. A circuit for producing a compensated bias voltage in an integrated circuit, comprising:
  - a resistor divider coupled between a power supply voltage and a reference voltage, for producing a divided voltage;
  - a current mirror, having a reference leg and an output leg, wherein the current through the reference leg is controlled by the divided voltage, and wherein the output leg comprises:
    - a mirror transistor, for conducting a mirrored current corresponding to the current through the reference leg; and
    - a load for conducting the mirrored current and for producing a bias voltage at a bias output node responsive to the mirrored current; and
  - a pass gate, coupled between the voltage divider and the current mirror, for disconnecting the voltage divider from the current mirror responsive to a disable signal.

5,568,085

**UNIT FOR STABILIZING VOLTAGE ON A CAPACITIVE NODE**

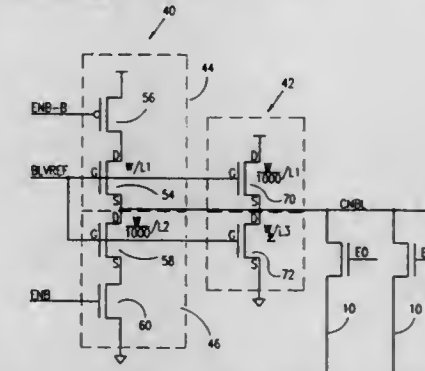
Boaz Eitan, Ra'anana, Israel; Reza Kazerooni, Alameda, Calif.; Alex Shubert, and John H. Pasternak, both of Fremont, Calif., assignors to WaferScale Integration Inc., Fremont, Calif.

Filed May 16, 1994, Ser. No. 242,947

Int. Cl.<sup>6</sup> G05F 1/10

U.S. Cl. 327—546

5 Claims



5. A unit for setting a minimum spread of voltage level for a capacitive node having variable current capability and a voltage level which varies between positive and ground supply voltage levels, the unit comprising:

a switchable high power unit activatable during an active mode; and

a low power unit;

wherein each power unit is connected between positive and ground supplies and each power unit comprises:

an amplifying transistor connected to said capacitive node, and to one of said positive and ground supplies wherein said amplifying transistor is controlled by a bit line reference signal; and

a leakage transistor connected to said capacitive node and to a different one of said positive and ground supplies different from the one provided to said amplifying transistor,

wherein said leakage transistor is controlled by said bit line reference signal; and

wherein a maximum current of said leakage transistor is much smaller than a maximum current of said amplifying transistor.

5,568,086

**LINEAR POWER AMPLIFIER FOR HIGH EFFICIENCY MULTI-CARRIER PERFORMANCE**

Jack J. Schuss, Newton; Peter R. Maloney, Norwood, both of Mass.; David M. Upton, Mont Vernon, N.H., and Robert J. McMorro, Lincoln, Mass., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 25, 1995, Ser. No. 450,055

Int. Cl.<sup>6</sup> H03F 3/68; 1/36

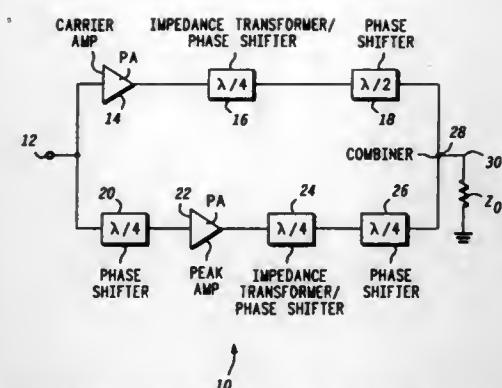
U.S. Cl. 330—124 R

20 Claims

10. A method of amplifying a multi-carrier signal of low and high power levels comprising the steps of:

- (a) amplifying said low power levels of said multi-carrier signal in a carrier amplifier to produce a first signal;
- (b) transforming said first signal in a first quarter-wave transformer section, said first quarter-wave transformer section for transforming an optimum load impedance of said carrier amplifier to a normalized impedance;
- (c) phase shifting said first signal by a half-wavelength;
- (d) phase shifting said multi-carrier signal by a quarter-wavelength to produce a second signal;
- (e) amplifying said second signal in a peak amplifier;





- (f) transforming said second signal in a second quarter-wave transformer section, said second quarter-wave transformer section for transforming an optimum load impedance of said peak amplifier to a normalized impedance;
- (g) phase shifting said second signal by a quarter-wavelength; and
- (h) combining said first and second signals to produce an output signal.

5,568,087

## PRE-DISTORTING LINEARIZATION CIRCUIT

Giuliano Gatti, Wassenaar, Netherlands, assignor to Agence Spatiale Europeenne, Paris, France

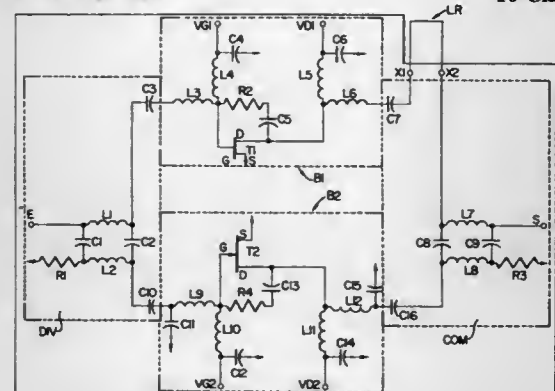
Filed Jun. 12, 1995, Ser. No. 489,223

Claims priority, application France, Jun. 13, 1994, 94 07179

Int. Cl.<sup>6</sup> H03F 1/32;3/16

U.S. Cl. 330-149

10 Claims



1. A pre-distorting linearization circuit, comprising a splitter circuit with an input forming the input of the linearization circuit and first and second outputs feeding first and second parallel stages respectively, of which at least one has a defined distortion characteristic, and a combining circuit receiving the signals provided by the first and second stages at first and second inputs respectively and having a recombination output which forms the output of the linearization circuit, wherein the first and second stages have first and second transistors respectively having different dimensions, which confer different non-linearity characteristics thereon, such that for the same voltage on the input of the linearization circuit, the first stage exhibits a higher degree of non-linearity than the second stage.

5,568,088

## WASTE ENERGY CONTROL AND MANAGEMENT IN POWER AMPLIFIER

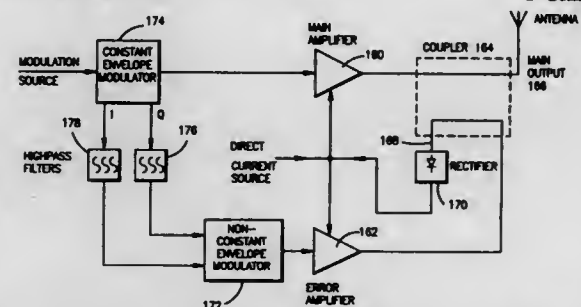
Paul W. Dent, Stehag, Sweden, and Ross W. Lampe, Raleigh, N.C., assignors to Ericsson GE Mobile Communications Inc., Research Triangle Park, N.C.

Division of Ser. No. 179,947, Jan. 11, 1994. This application Jun. 7, 1995, Ser. No. 472,247

Int. Cl.<sup>6</sup> H03F 3/68;1/32

U.S. Cl. 330-151

1 Claim



1. A device for increasing the energy efficiency of an amplifier using feedforward linearization, comprising:
- a direct current power source to power said amplifier;
  - a first non-linear amplifier for producing a main output signal;
  - a second amplifier for amplifying an error signal;
  - combining means for combining said error signal with said main signal to produce a corrected sum signal and a waste energy signal; and
  - rectifier means for converting said waste energy signal to a direct current that is supplied back to said direct current power source to reduce net power consumption.

5,568,089

## FULLY DIFFERENTIAL AMPLIFIER INCLUDING COMMON MODE FEEDBACK CIRCUIT

Tsuguo Maru, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

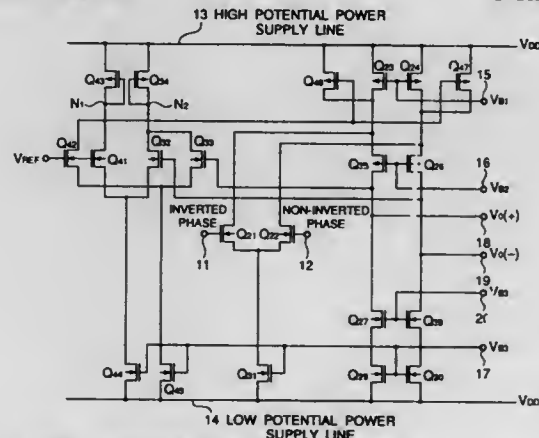
Filed Jun. 15, 1994, Ser. No. 260,315

Claims priority, application Japan, Jun. 15, 1993, 5-142472

Int. Cl.<sup>6</sup> H03C 3/45

U.S. Cl. 330-253

8 Claims



2. A fully differential amplifier, comprising:
- a differential amplifier having positive and negative output terminals;
  - a common-mode feedback circuit for setting an operating point potential of said positive and negative output terminals of said differential amplifier having an active load, said common-mode feedback circuit including:
  - a first differential pair for receiving a reference potential given from an external source and a positive output potential of said differential amplifier;

5,568,091

## DIFFERENTIAL AMPLIFIER WITH COMMON-MODE REJECTION FOR LOW SUPPLY VOLTAGES

Joao N. V. L. Ramalho, and Johannes O. Voorman, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

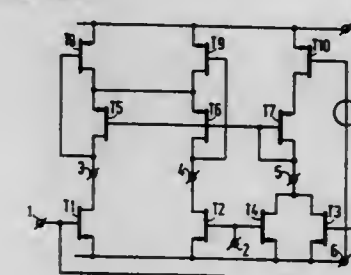
Filed Jun. 15, 1995, Ser. No. 490,824

Claims priority, application European Pat. Off., Jun. 15, 1994, 94201714

Int. Cl.<sup>6</sup> H03F 3/45

U.S. Cl. 330-258

11 Claims



- a second differential pair for receiving said reference potential and a negative output potential of said differential amplifier; and

a sum current feedback means for producing a sum current of output currents of said first and second differential pairs to a bias current for said active load of said differential amplifier, so that a difference between a common-mode output potential of said differential amplifier and said reference potential is fed back to said differential amplifier in the form of the sum current, so as to controllably equalize the common-mode output potential of said differential amplifier with said reference potential, wherein said sum current feedback means includes:

- a first transistor connected to said first and second differential pairs as a common active load; and
  - second and third transistors connected to said differential amplifier as an active load,
- said first, second and third transistors being connected to constitute a current mirror circuit.

5,568,090

## AMPLIFIER CIRCUIT WITH DYNAMIC OUTPUT STAGE BIASING

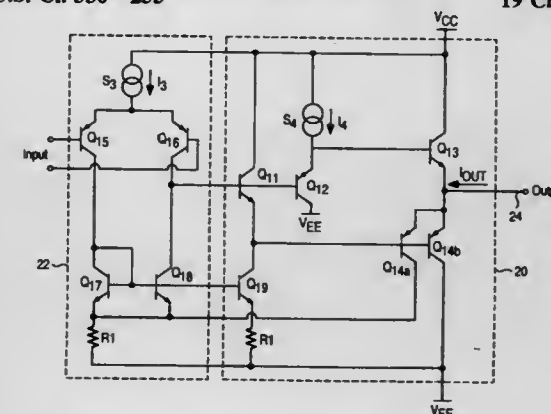
Joseph R. Pierret, San Jose, Calif., assignor to Elantec, Inc., Milpitas, Calif.

Filed Jul. 25, 1995, Ser. No. 506,529

Int. Cl.<sup>6</sup> H03F 3/45;3/30

U.S. Cl. 330-255

19 Claims



1. An amplifier circuit, comprising:
- a gain stage having a current mirror load circuit including a first transistor with a base coupled to a base of a second transistor and including a first resistor coupled to the emitters of each of the first and second transistors;
  - circuit that generates an output bias electrical current in response to the voltage on the bases of the first and second transistors;
  - output stage having an output transistor biased by the output bias electrical current and having a circuit that senses an output current at an output node and that feeds back a portion of the output current to the first resistor such that the portion of the output current adjusts the voltage on the bases of the first and second transistors in the current mirror load circuit.

1. A differential amplifier with common-mode rejection, comprising: first through fourth transistors each having a first main electrode, a second main electrode and a control electrode, a current mirror having an input terminal, a first output terminal and a second output terminal, wherein:

- the first and the third transistor each have their control electrodes coupled to a first input terminal of the differential amplifier,
- the second and the fourth transistor each have their control electrodes coupled to a second input terminal of the differential amplifier,
- the first through the fourth transistor have their second main electrodes coupled to a first supply terminal,
- the first and the second transistor have their first main electrodes coupled, respectively, to the first and the second output terminal of the current mirror,
- the third and the fourth transistor have their first main electrodes coupled to the input terminal of the current mirror, wherein the current mirror comprises a fifth through tenth transistor each having a first main electrode, a second main electrode and a control electrode,
- the fifth, the sixth and the seventh transistor having their first main electrodes coupled, respectively, to the first output terminal, the second output terminal and the input terminal of the current mirror, having their second main electrodes coupled to the first main electrodes of the eighth, the ninth and the tenth transistor, respectively, and having their control electrodes coupled to the first main electrode of the seventh transistor,
- the eighth, the ninth and the tenth transistor have their second main electrodes coupled to a second supply terminal,
- the eighth and the ninth transistor have their control electrodes coupled, respectively, to the first and the second output terminal of the current mirror,
- the tenth transistor having its control electrode coupled to a first reference voltage source which generates a first reference voltage, and
- the eighth transistor has its first main electrode coupled to the first main electrode of the ninth transistor.

5,568,092

# ATTENUATED FEEDBACK TYPE DIFFERENTIAL AMPLIFIER

Toshifumi Shimizu, Hiroshi Narikawa, and Yoshiyuki Tamura, all of Kanagawa, Japan, assignors to NEC Corporation, Japan

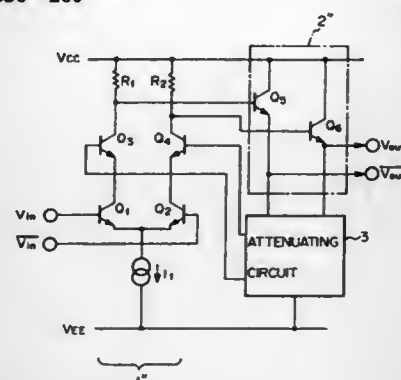
Filed May 24, 1995, Ser. No. 449,528

Claims priority, application Japan, May 24, 1994, 6-109855

Int. Cl.<sup>6</sup> H03F 3/45

U.S. Cl. 330—260

11 Claims



1. A differential amplifier comprising: first and second power supply terminals; an input stage, connected between said first and second power supply terminals, for receiving first and second input signals and outputting first and second intermediate signals in response to said first and second input signals; an output stage, connected to said first power supply terminal and to said input stage, for receiving said first and second intermediate signals and outputting first and second output signals in response to said first and second intermediate signals; and an attenuating circuit, connected between said output stage and said second power supply terminal and to said input stage, for attenuating said first and second output signals to generate first and second attenuation signals in response to said first and second output signals and transmitting said first and second attenuation signals to said input stage,

wherein said input stage includes

a first current source connected to said second power supply terminal,

first and second transistors having bases for receiving said first and second input signals, respectively, and emitters connected to said first current source,

a third transistor having an emitter connected to a collector of said first transistor and a base for receiving said second attenuation signal,

a fourth transistor having an emitter connected to a collector of said second transistor and a base for receiving said first attenuation signal,

a first resistor connected between said first power supply terminal and a collector of said third transistor, and

a second resistor connected between said first power supply terminal and a collector of said fourth transistor,

wherein said output stage includes

a first emitter follower for receiving said first intermediate signal to generate said first output signal, and

a second emitter follower for receiving said second intermediate signal to generate said second output signal.

5,568,093

# EFFICIENT, HIGH FREQUENCY, CLASS A-B AMPLIFIER FOR TRANSLATING LOW VOLTAGE CLOCK SIGNAL LEVELS TO CMOS LOGIC LEVELS

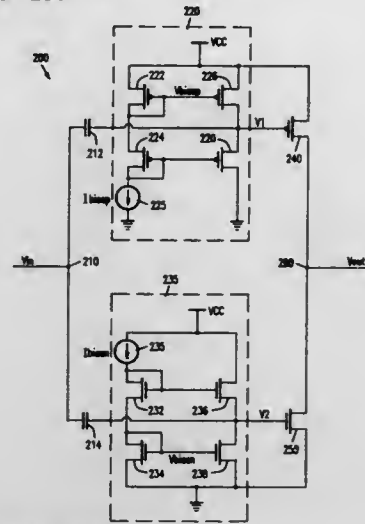
Reuven Holzer, Herzlia, Israel, assignor to National Semiconductor Corporation, Del.

Filed May 18, 1995, Ser. No. 443,955

Int. Cl.<sup>6</sup> H03F 3/30

U.S. Cl. 330—264

23 Claims



1. An amplifier comprising: an input node; a first transistor and a second transistor, each having a gate coupled to the input node, wherein the first and second transistors are coupled in series between a supply voltage and a reference voltage and the first transistor has a conductivity type that is complementary to that of the second transistor; an output node between the first and second transistors; a first bias circuit coupled to the gate of the first transistor, wherein the first bias circuit biases the gate of the first transistor so that a gate-source voltage of the first transistor is offset from a threshold voltage of the first transistor and the first transistor operates in weak inversion mode; and a second bias circuit coupled to the gate of the second transistor, wherein the second bias circuit biases the gate of the second transistor so that a gate-source voltage of the second transistor is offset from a threshold voltage of the second transistor and the second transistor operates in weak inversion mode.

5,568,094

# RF POWER AMPLIFIER WITH INCREASED EFFICIENCY AT LOW POWER

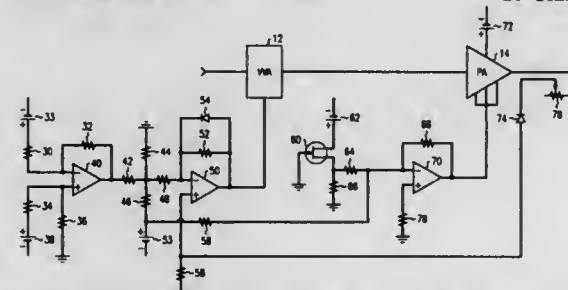
John W. Bowen, Buck, Dwight Daugherty, Lancaster; Stuart H. Wemple, Berks, all of Pa., and Melvin West, Jr., Burlington, N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Dec. 15, 1994, Ser. No. 356,812

Int. Cl.<sup>6</sup> H03G 3/30

U.S. Cl. 330—279

10 Claims



1. An apparatus for controlling efficiency in an RF power amplifier comprising: a voltage variable attenuator;

RF power amplification means; and dynamic voltage controlling means of said RF power amplification means including a voltage ratio technique between said voltage variable attenuator and a plurality of gates of said RF power amplification means controlling RF power output and a power amplifier multi-stage driver circuit includes at least one operational amplifier to create a ratio portion of a proportional control signal to control a plurality of gate biases of said power amplifier.

5,568,095

# BALANCED OSCILLATOR AND TRANSMITTER ARRANGEMENT

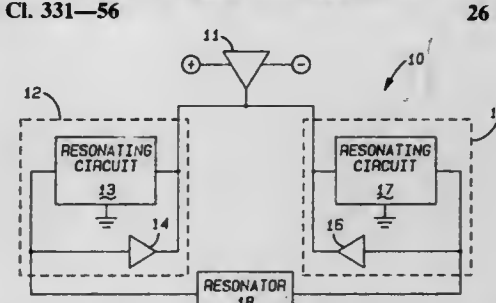
John P. Hill, Westland, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Continuation-in-part of Ser. No. 342,721, Nov. 21, 1994, Pat. No. 5,486,793. This application May 24, 1995, Ser. No. 448,759

Int. Cl.<sup>6</sup> H03B 5/36; H04L 27/04

U.S. Cl. 331—56

26 Claims



1. A transmitter for transmitting an output signal having a single frequency, the transmitter having an output impedance, an antenna for radiating the output signal corresponding with a first and second oscillating output, and a balanced oscillator for generating the first and second oscillator outputs, said balanced oscillator comprising:

a resonator for generating a reference signal;

a first oscillator for providing the first oscillating output in response to the reference signal; and

a second oscillator for providing the second oscillating output in response to said reference signal.

5,568,096

# APPARATUS AND METHOD FOR USING NEGATIVE FM FEEDBACK IN HIGH QUALITY OSCILLATOR DEVICES

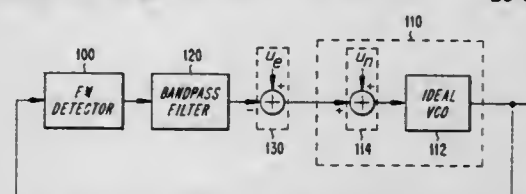
Jacobus Haartsen, Staffanstorps, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Apr. 19, 1995, Ser. No. 424,079

Int. Cl.<sup>6</sup> H03C 3/00; H03L 7/02

U.S. Cl. 331—1 R

26 Claims



1. An apparatus for increasing the stability of an output of an oscillating device while increasing a Q-value of the oscillating device comprising: an FM detector for measuring FM noise output from the oscillating device; suppressing means for suppressing frequency variations at the output of the oscillating device while increasing the Q-value by a correction signal generated directly from said FM noise output by the oscillating device and in proportion to said FM noise measured by said FM detector; and

a bandpass filter connected to the output of said FM detector for preventing said suppressing means from applying said correction signal in a predetermined low frequency range.

5,568,097

# ULTRA HIGH AVAILABILITY CLOCK CHIP

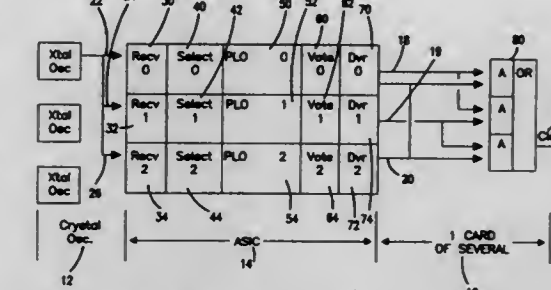
Gil R. Woodman, Jr., San Jose, Calif., assignor to International Business Machines Inc., San Jose, Calif.

Filed Sep. 25, 1995, Ser. No. 533,367

Int. Cl.<sup>6</sup> H03B 28/00; H03L 7/00; 7/07

U.S. Cl. 331—2

18 Claims



1. An ultra high availability clock for use by multiple card assemblies, comprising:

a plurality of crystal oscillators for providing a plurality of clock signals;

a plurality of receivers, coupled to the crystal oscillators, each receiver receiving a clock signal from a crystal oscillator;

a plurality of selection means, redundantly coupled to each receiver, each selection means selecting one of the clock signals received by the receivers as a reference oscillator signal;

a plurality of phase locking means, a phase locking means being coupled to each selection means, the phase locking means receiving a selected reference oscillator signal from a selection means and providing a phase-locked clock signal in response thereto, the phase-locked clock signal being phase-locked to the input reference oscillator signal; and

at least one majority logic voting means, redundantly coupled to each phase locking means, for providing a clock output signal reflecting the state of the majority of the phase-locked clock signals.

5,568,098

# FREQUENCY SYNTHESIZER FOR USE IN RADIO TRANSMITTER AND RECEIVER

Hiroshi Horie, Hino, and Tsutomu Tobita, Oume, both of Japan, assignors to Toshiba Corporation, Kanagawa-ken, Japan

PCT No. PCT/JP94/00441, § 371 Date Aug. 11, 1995, § 102(e) Date Aug. 11, 1995, PCT Pub. No. WO94/22224, PCT Pub. Date Sep. 29, 1994

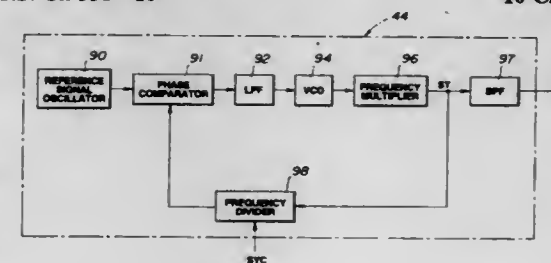
PCT Filed Mar. 18, 1994, Ser. No. 505,326

Claims priority, application Japan, Mar. 18, 1993, 5-58659

Int. Cl.<sup>6</sup> H03L 7/08; 7/18

U.S. Cl. 331—16

10 Claims





1. A frequency synthesizer comprising:  
reference oscillator means for generating a reference oscillation signal;  
phase comparing means for generating a phase error signal concerning said reference oscillation signal and a frequency-divided signal;  
a loop filter operative on the basis of said phase error signal for generating and outputting a control voltage;  
voltage-controlled oscillator means for generating an oscillation signal of a frequency responsive to said control voltage;  
frequency-multiplying means for sending out a frequency-multiplied signal which is a frequency-multiplied version of said oscillation signal;  
frequency-dividing means for frequency-dividing said frequency-multiplied signal to supply said frequency-divided signal to said phase comparing means; and  
a band pass filter for letting a predetermined frequency band of said frequency-multiplied signal pass as an output of the frequency synthesizer.

5,568,099

# HIGH FREQUENCY DIFFERENTIAL VCO WITH COMMON BIASED CLIPPER

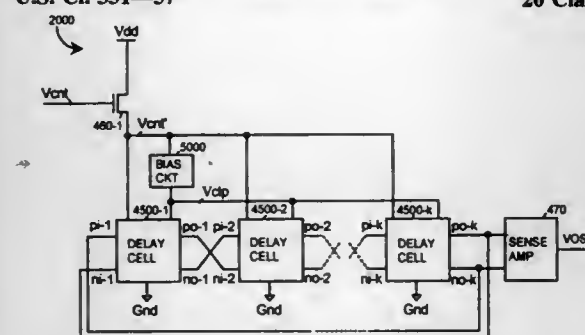
He Du, Sunnyvale, Calif., assignor to Cirrus Logic, Inc., Fremont, Calif.

Filed Sep. 27, 1995, Ser. No. 534,538

Int. Cl.<sup>6</sup> H03B 5/24; H03L 7/009

U.S. Cl. 331—57

20 Claims



1. A voltage controlled oscillator circuit comprising:  
a plurality of voltage controlled differential delay cells connected together to form a ring oscillator, individual ones of said plurality of voltage controlled differential delay cells having a power node, first and second pluralities of transistors connected to said power node, and a clipper transistor connected to said first and second pluralities of transistors, wherein said power node is connected to a control voltage, said first and second pluralities of transistors define first and second outputs such that each of said first plurality of transistors is turned on and each of said second plurality of transistors is turned off when generating first and second logic states respectively at said first and second outputs, and each of said second plurality of transistors is turned on and each of said first plurality of transistors is turned off when generating said second and first logic states respectively at said first and second outputs, and said clipper transistor has a gate, a drain, and a source, said drain and source connected respectively to said first and second outputs; and  
a biasing circuit connected to said control voltage and said individual ones of said plurality of voltage controlled differential delay cells, for providing a voltage to said gate of said clipper transistor of said individual ones of said plurality of voltage controlled differential delay cells, said biasing circuit including a third plurality of transistors connected together and individually having substantially the same operating characteristics as a corresponding one of said first plurality of transistors and said clipper transistor so that said voltage provided to said gate of said clipper transistor of said individual ones of said voltage controlled differential delay cells

increases as said control voltage increases and decreases as said control voltage decreases.

5,568,100

# SYNCHRONOUS POWER DOWN CLOCK OSCILLATOR DEVICE

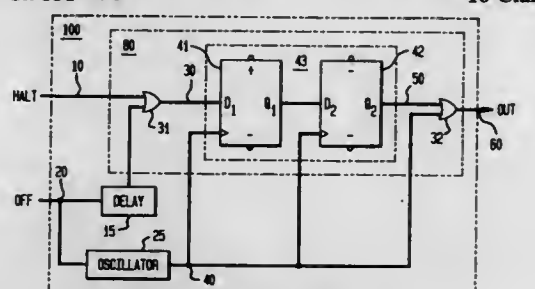
Bart N. Locanthi, Beaverton, Oreg., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 22, 1995, Ser. No. 532,186

Int. Cl.<sup>6</sup> H03B 5/06; H03K 3/012; 3/014; H03L 3/00

U.S. Cl. 331—74

16 Claims



1. A clock oscillator device, comprising:  
an oscillator for generating an oscillator signal; and  
a clock output controller for generating a uniform clock signal using the oscillator signal, an OFF signal and a HALT signal, the uniform clock signal comprising one of a non-oscillating signal and an oscillating signal.

5,568,101

# DISTRIBUTED CONSTANT TYPE MULTIPLE-LINE CIRCUIT

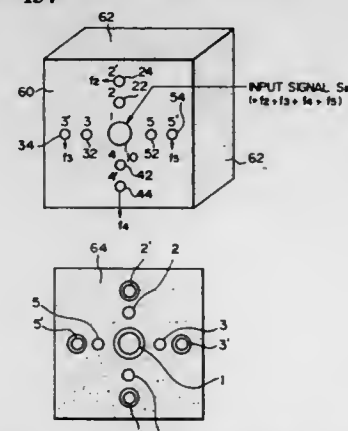
Yoshihiro Konishi, Sagami, Tokyo; Yoshio Okuma, Tokyo; Yoshihiko Baba, and Hideki Fujiwara, both of Ichikawa, all of Japan, assignors to Uniden Corporation, Chiba, Japan

Filed May 31, 1995, Ser. No. 454,711

Claims priority, application Japan, Apr. 25, 1995, 7-101200  
Int. Cl.<sup>6</sup> H01P 1/213; 5/12

U.S. Cl. 333—134

10 Claims



1. A distributed constant type multiple-line circuit comprising:  
a dielectric block having shield conductors on a rear surface thereof and on peripheral side surfaces thereof;  
a central conductor extending through said dielectric block in a front-to-rear thickness direction at a central portion of said dielectric block, a length of said central conductor being equal to one quarter of a wavelength of a central frequency in a frequency band, and a rear end of said central conductor being isolated from said shield conductor on the rear surface of said dielectric block;  
a first plurality of conductors positioned around and parallel to said central conductor and inductively coupled therewith, a

length of each of said first conductors being equal to one quarter of a wavelength of a predetermined frequency in said frequency band, and rear ends of said first conductors being shorted with said shield conductor on the rear surface of said dielectric block; and

a second plurality of conductors positioned nearby and parallel to said first conductors and inductively coupled therewith, respectively a length of each of said second conductors being equal to a length of a corresponding one of said first conductors, and the rear ends of said second conductors being isolated from said shield conductor on the rear surface of said dielectric block,

wherein a front end of said central conductor receives an input signal, front ends of said second plurality of conductors provide output signals, and the lengths of said central conductor and said first plurality of conductors are the same to have the same resonant frequencies so that resonant frequency signal included in said input signal is output from the front ends of said second conductors, whereby said circuit comprises a splitter.

5,568,102

# CLOSED SUPERCONDUCTIVE MAGNET WITH HOMOGENEOUS IMAGING VOLUME

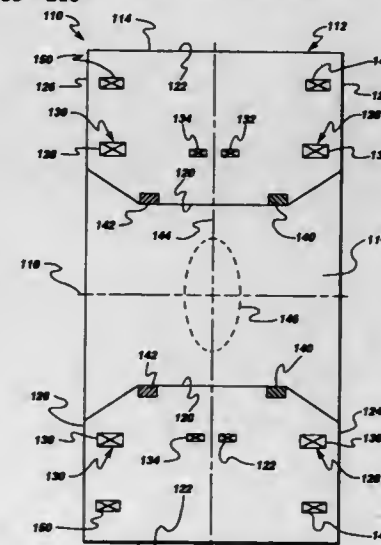
Bizhan Dorri, Clifton Park; Evangelos T. Laskaris, Schenectady, and Michele D. Ogle, Burnt Hills, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 20, 1996, Ser. No. 603,520

Int. Cl.<sup>6</sup> H01F 6/06; G01V 3/00

U.S. Cl. 335—216

2 Claims



1. A closed magnetic-resonance-imaging magnet comprising a single superconductive coil assembly including:  
a) a generally toroidal-shaped coil housing surrounding a bore and having a generally longitudinally-extending axis;  
b) a pair of longitudinally-spaced-apart, generally identical, and generally annular-shaped superconductive main coils each generally coaxially aligned with said axis, each having a generally identical first magnetic-field direction within said bore generally parallel to the axis, each disposed within said coil housing, and each having a longitudinally-outermost portion;  
c) a pair of longitudinally-spaced-apart, generally identical, and generally annular-shaped permanent magnet arrays each generally coaxially aligned with said axis, each radially disposed inward and apart from said pair of superconductive main coils, and each longitudinally disposed completely between said longitudinally-outermost portions of said pair of superconductive main coils; and  
d) at least one generally annular-shaped additional superconductive main coil generally coaxially aligned with said axis,

having a magnetic-field direction within said bore generally identical to said first magnetic-field direction, and disposed within said coil housing and longitudinally between said pair of permanent magnet arrays,

wherein said pair of permanent magnet arrays each is longitudinally disposed a generally identical distance from a plane which is oriented perpendicular to said axis and which is disposed longitudinally midway between said pair of superconductive main coils,

wherein said pair of permanent magnet arrays each has a magnetic field direction within said bore generally opposite to said first magnetic-field direction,

wherein said pair of permanent magnet arrays is disposed within said coil housing,

wherein said radius of said bore is generally constant as one moves longitudinally across and between said pair of permanent magnet arrays, and

wherein said coil housing has spaced-apart longitudinally-outermost ends and wherein said bore has a radius which linearly increases as one moves longitudinally outward from proximate said pair of permanent magnet arrays to proximate said longitudinally-outermost ends of said coil housing.

5,568,103

# CURRENT CONTROL CIRCUIT OF RING OSCILLATOR

Teruya Nakashima, Kanagawa, and Takehiko Uemeyama, Hyogo, both of Japan, assignors to Mitsubishi Electric Engineering Co., Ltd., and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

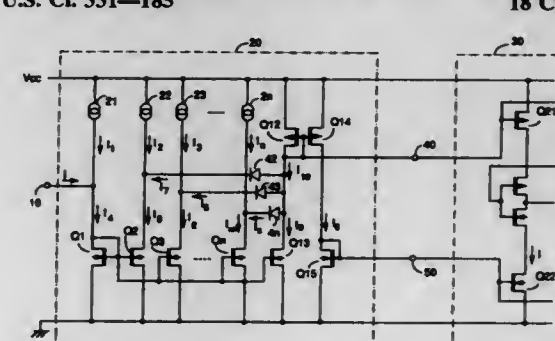
Filed Jul. 11, 1995, Ser. No. 499,917

Claims priority, application Japan, Dec. 28, 1994, 6-326974

Int. Cl.<sup>6</sup> H03B 5/24; 5/00; H03L 7/00; 7/085

U.S. Cl. 331—185

18 Claims



1. A current control circuit of a ring oscillator comprising:  
a first circuit having a first current source and a first transistor connected in series;  
a second circuit connected with said first circuit in parallel and having at least one second constant current sources and at least one second transistor connected in series, said at least one second transistor being current mirrored with said first transistor;  
a third circuit connected with said first circuit in parallel and having a third transistor and a fourth transistor connected being current mirrored with said first transistor;  
at least one diode element connected to a connecting point of said third transistor and said fourth transistor for supplying current to connecting points of the second transistor;  
an input terminal connected with the connecting point of said first constant current source and said first transistor; and  
a fourth circuit connected with said first circuit in parallel and connected with an output terminal for supplying current.

5,568,104

# OPEN MRI SUPERCONDUCTIVE MAGNET WITH CRYOGENIC-FLUID COOLING

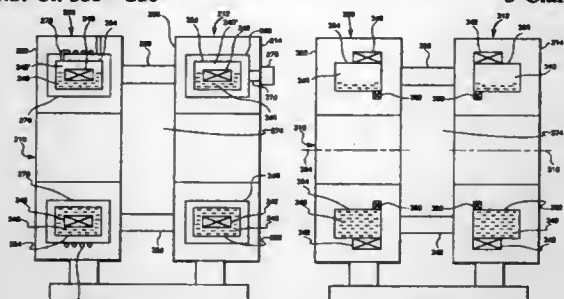
Evangelos T. Laskaris, Schenectady, and Bizhan N. M. N. Dorri, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 23, 1995, Ser. No. 553,738

Int. Cl.<sup>6</sup> F25B 19/00; G01V 3/00

U.S. Cl. 335—216

3 Claims



1. An open magnetic resonance imaging magnet comprising:  
a) a first superconductive coil assembly including:

- (1) a generally toroidal-shaped first coil housing surrounding a first bore and having a generally longitudinal first axis;
- (2) a first cryogenic fluid disposed within said first coil housing; and
- (3) a generally annular-shaped first superconductive main coil generally coaxially aligned with said first axis, disposed within said first coil housing, and disposed in thermal contact with said first cryogenic fluid;

b) a second superconductive coil assembly including:

- (1) a generally toroidal-shaped second coil housing longitudinally spaced apart from said first coil housing, surrounding a second bore and having a generally longitudinal second axis generally coaxially aligned with said first axis; and
- (2) a second cryogenic fluid disposed within said second coil housing; and

(3) a generally annular-shaped second superconductive main coil generally coaxially aligned with said second axis, disposed within said second coil housing, and disposed in thermal contact with said second cryogenic fluid;

c) a plurality of structural posts each having a first end attached to said first coil housing and having a second end attached to said second coil housing, wherein said second superconductive coil assembly is a generally mirror image of said first superconductive coil assembly about a plane oriented perpendicular to said first axis and disposed longitudinally midway between said first and second coil housings;

d) a first dewar disposed within and generally spaced-apart from said first coil housing and containing said first cryogenic fluid; and

e) a second dewar disposed within and generally spaced-apart from said second coil housing and containing said second cryogenic fluid, wherein said first superconductive main coil is disposed outside of and in solid-conduction thermal contact with said first dewar and said second superconductive main coil is disposed outside of and in solid-conduction thermal contact with said second dewar.

2. An open magnetic resonance imaging magnet comprising:

a) a first superconductive coil assembly including:

- (1) a generally toroidal-shaped first coil housing surrounding a first bore and having a generally longitudinal first axis;
- (2) a first cryogenic fluid disposed within said first coil housing; and
- (3) a generally annular-shaped first superconductive main coil generally coaxially aligned with said first axis, disposed within said first coil housing, and disposed in thermal contact with said first cryogenic fluid;

b) a second superconductive coil assembly including:

- (1) a generally toroidal-shaped second coil housing longitudinally spaced apart from said first coil housing, surrounding a second bore and having a generally longitudinal second axis generally coaxially aligned with said first axis; and

(2) a second cryogenic fluid disposed within said second coil housing; and

(3) a generally annular-shaped second superconductive main coil generally coaxially aligned with said second axis, disposed within said second coil housing, and disposed in thermal contact with said second cryogenic fluid; and

c) a plurality of structural posts each having a first end attached to said first coil housing and having a second end attached to said second coil housing, wherein said second superconductive coil assembly is a generally mirror image of said first superconductive coil assembly about a plane oriented perpendicular to said first axis and disposed longitudinally midway between said first and second coil housings,

wherein said first superconductive coil assembly includes a thermal shield disposed within and generally spaced-apart from said first coil housing and generally surrounding and generally spaced apart from said first superconductive main coil, wherein said thermal shield is the only thermal shield disposed within said first coil housing, and also including a cryocooler coldhead having a cold stage in solid-conduction thermal contact with said thermal shield.

5,568,105

# SPURIOUS FREQUENCY SUPPRESSOR

Thomas M. O'Leary, Dracut; Peter R. Drake, Southborough, both of Mass., and Philip R. Merrill, deceased, late of Nashua, N.H., assignors to Raytheon Company, Lexington, Mass.

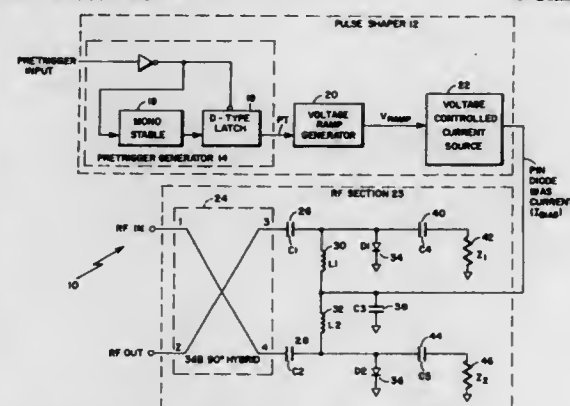
Division of Ser. No. 19,324, Feb. 10, 1993, Pat. No. 5,381,110.

This application Nov. 18, 1994, Ser. No. 275,898

Int. Cl.<sup>6</sup> H03H 7/24

U.S. Cl. 333—81 R

4 Claims



1. A spurious frequency suppressor comprising:  
a directional coupler having four ports, a first port being an input port and a second port being an output port;  
said input port of said directional coupler being provided with an RF input pulse;

means coupled to a third port and a fourth port of said directional coupler for attenuating said RF input pulse in accordance with a control signal said attenuating means comprising a PIN diode network means for controlling the amount of attenuation of said RF input pulse and for changing the fall time of said RF input pulse in accordance with said control signal; and

means coupled to said attenuating means for generating said control signal said control signal generating means comprising pulse shaping means for generating a bias current for said PIN diode network means, said pulse shaping means comprising:

- means for adjusting the pulse width of a trigger signal in response to a pretrigger input signal;
- means coupled to said adjusting means for generating a voltage ramp signal; and
- means coupled to said voltage ramp signal generating means for generating said bias current for said PIN diode network means.

5,568,106

# TUNABLE MILLIMETER WAVE FILTER USING FERROMAGNETIC METAL FILMS

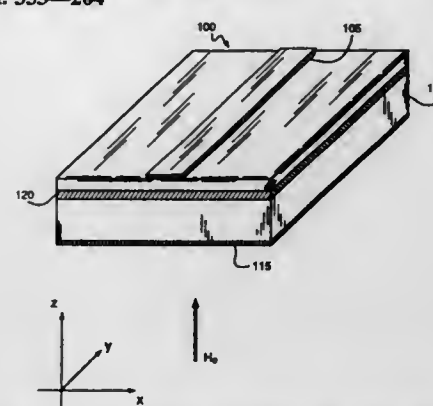
Ta-Ming Fang; Hoton How, and Carmine Vittoria, all of Massachusetts Technological Laboratory 330 Pleasant St., Belmont, Mass. 02178

Filed Apr. 4, 1994, Ser. No. 222,468

Int. Cl.<sup>6</sup> H01P 1/20

U.S. Cl. 333—204

12 Claims



1. An anti-resonant frequency tunable band-pass filter comprising:

an electro-magnetic (E-M) wave propagation means for transmitting a sequence of E-M signals therein;

a magnetic biasing means;

said E-M wave propagation means comprising a ferromagnetic anti-resonance (FMAR) frequency tuning means wherein said magnetic biasing means biases said E-M wave propagation means substantially at a ferromagnetic anti-resonance (FMAR) frequency of said FMAR frequency tuning means for controlling and frequency tuning said filter.

5,568,107

# TRANSMISSION LINE HAVING IMPEDANCE SET BY REFERENCE PLANE FENESTRATION

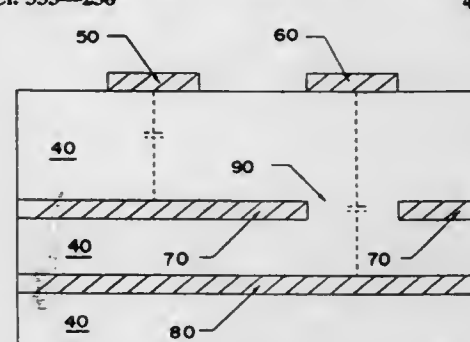
David C. Buuck, Santa Clara, and Mark Gloster, Aptos, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 1, 1995, Ser. No. 431,841

Int. Cl.<sup>6</sup> H01P 3/08

U.S. Cl. 333—238

4 Claims



1. A circuit arrangement comprising:

substrate having an exterior surface;

a circuit trace positioned on said exterior surface;

a first conductive reference plane positioned inside said substrate substantially parallel to and at a first distance away from said exterior surface and beneath at least part of said circuit trace; and

a second conductive reference plane positioned inside said substrate substantially parallel to and at a second distance away

from said exterior surface, said second distance being greater than said first distance, and beneath at least said part of said circuit trace;

said first conductive reference plane having a plurality of apertures at positions beneath at least said part of said circuit trace to expose said circuit trace to corresponding portions of said second conductive reference plane lying beneath said apertures, the spacing and size of said apertures being selected to determine an impedance of said part of said circuit trace.

5,568,108

# SECURITY RELAY WITH GUIDED SWITCH STACK AND MONOSTABLE DRIVE

Eberhard Kirsch, Rubäckerstr. 9, Wehingen, Germany

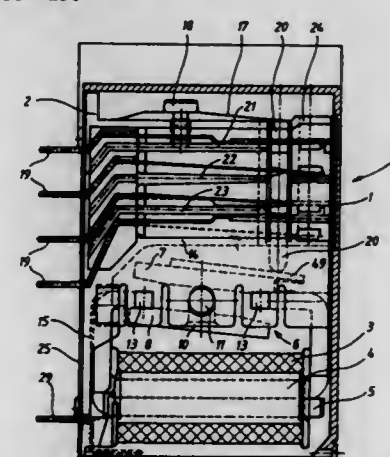
Filed Sep. 12, 1994, Ser. No. 304,965

Claims priority, application Germany, Jan. 13, 1993, 43 00 594.2

Int. Cl.<sup>6</sup> H01M 67/02

U.S. Cl. 335—130

4 Claims



1. Security relay with guided stack switch and polarized monostable drive, having individual contact stacks separated from each other and activated by a common actuator, characterized in that,

for driving the actuator there is provided a mechanically symmetrical H-armature (6), which is constructed magnetically asymmetrical with a permanent magnet (9), the H-armature (6) is arranged with its longitudinal axis somewhat parallel to the longitudinal axis of a drive coil (3), whereby the rotational axis (11) of the H-armature (6) stands perpendicular to the longitudinal axis of the drive coil (3) and the actuator (20) is moved by an actuator plate (49) arranged in an elongation of the H-armature (6).

5,568,109

# NORMAL CONDUCTING BENDING ELECTROMAGNET

Takeshi Takayama, Sayama, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Dec. 22, 1994, Ser. No. 363,005

Claims priority, application Japan, Dec. 28, 1993, 5-337241

Int. Cl.<sup>6</sup> H01J 37/147

U.S. Cl. 335—213

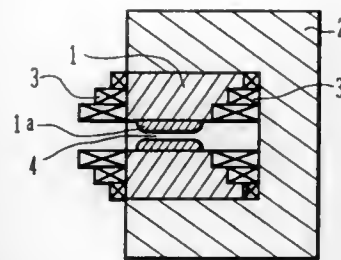
13 Claims

1. A normal conducting bending electromagnet comprising:

a pair of pole pieces having respective pole piece faces, said pole pieces being disposed with the pole piece faces thereof facing each other with a substantially constant gap therebetween, a magnetic field for forming a charged particle beam arc orbit being generated in said gap between said pole pieces; a yoke coupled to said pole pieces for forming a closed magnetic circuit with said gap; and

a pair of coils for generating a magnetomotive force and generating magnetic fluxes in said magnetic circuit,





wherein:

at least one side wall of each of said pole pieces is slanted or stepped along a virtual slanted plane at least partially along the magnetic path of said pole pieces, said slanted side wall or said virtual slanted plane having a slant angle in the range from 30° to 60° relative to said pole piece faces, and the pole piece width at the plane coupling to said yoke being set wider than the width of said pole piece faces with said gap being interposed therebetween;  
the width of said pole piece face is in the range from 4 cm to 20 cm;  
said gap has a height along the magnetic path which is in the range from 1 cm to 6 cm; and  
said at least one slanted or stepped side wall of each of said pole pieces includes a stepped portion having at least three steps.

5,568,110

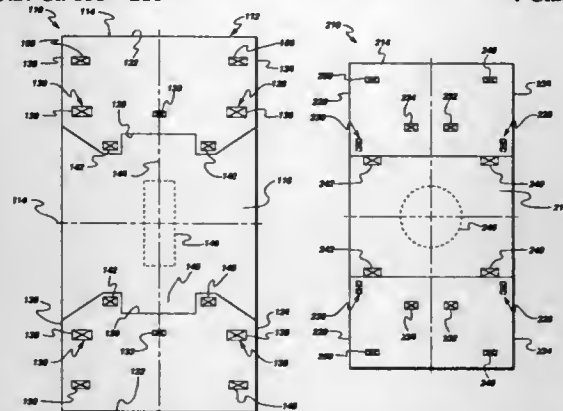
**CLOSED MRI MAGNET HAVING REDUCED LENGTH**  
Bizhan Dorri, Clifton Park; Evangelos T. Laskaris, Schenectady, and Michele D. Ogle, Burnt Hills, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 20, 1996, Ser. No. 603,522

Int. Cl.<sup>6</sup> H01F 6/06; G01V 3/00

U.S. Cl. 335—216

4 Claims



1. A closed magnetic-resonance-imaging magnet comprising a single superconductive coil assembly including:

- a generally toroidal-shaped coil housing surrounding a bore and having a generally longitudinally-extending axis;
- a pair of longitudinally-spaced apart, generally identical, and generally annular-shaped superconductive main coils each generally coaxially aligned with said axis, each carrying a generally identical first electric current in an identical first electric-current direction, each disposed within said coil housing, and each having a longitudinally-outermost portion; and
- a pair of longitudinally-spaced apart, generally identical, and generally annular-shaped bucking coils each generally coaxially aligned with said axis, each carrying a generally identical second electric current in a direction opposite to said first electric-current direction, each radially disposed inward and apart from said pair of superconductive main coils, and each longitudinally disposed completely between said longitudinally-outermost portions of said pair of superconductive main coils,

wherein said pair of bucking coils each is longitudinally disposed a generally identical distance from a plane which is oriented perpendicular to said axis and which is disposed longitudinally midway between said pair of superconductive main coils, and

wherein said pair of bucking coils: are resistive bucking coils disposed outside said coil housing in said bore; produce generally time-constant and generally identical magnetic fields; and are the only resistive coils in said bore producing a time-constant magnetic field.

3. A closed magnetic-resonance-imaging magnet comprising a single superconductive coil assembly including:

- a generally toroidal-shaped coil housing surrounding a bore and having a generally longitudinally-extending axis;
- a pair of longitudinally-spaced apart, generally identical, and generally annular-shaped superconductive main coils each generally coaxially aligned with said axis, each carrying a generally identical first electric current in an identical first electric-current direction, each disposed within said coil housing, and each having a longitudinally-outermost portion; and
- a pair of longitudinally-spaced apart, generally identical, and generally annular-shaped bucking coils each generally coaxially aligned with said axis, each carrying a generally identical second electric current in a direction opposite to said first electric-current direction, each radially disposed inward and apart from said pair of superconductive main coils, and each longitudinally disposed completely between said longitudinally-outermost portions of said pair of superconductive main coils;

wherein said pair of bucking coils each is longitudinally disposed a generally identical distance from a plane which is oriented perpendicular to said axis and which is disposed longitudinally midway between said pair of superconductive main coils,

wherein said coil housing has spaced-apart longitudinally-outermost ends, and wherein said bore has a radius which increases as one moves longitudinally outward from said pair of bucking coils to said longitudinally-outermost ends of said coil housing,

wherein said radius of said bore is generally constant as one moves longitudinally across said pair of bucking coils,

wherein said radius of said bore is generally constant as one moves longitudinally between said pair of bucking coils, and wherein said radius of said bore longitudinally between said pair of bucking coils is greater than said radius of said bore longitudinally across said pair of bucking coils.

5,568,111

**FERRITE COMMON MODE CHOKE ADAPTED FOR CIRCUIT BOARD MOUNTING**

Alexander Metsler, Newton, Mass., assignor to Steward, Inc., Chattanooga, Tenn.

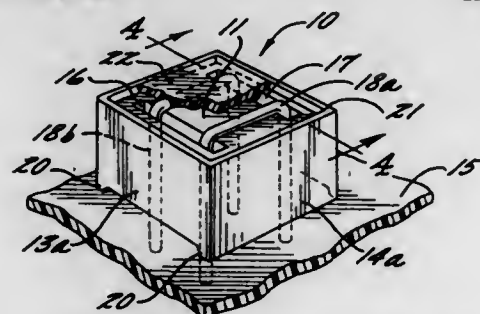
Division of Ser. No. 237,451, May 3, 1994, Pat. No. 5,455,552.

This application May 1, 1995, Ser. No. 432,082

Int. Cl.<sup>6</sup> H01F 15/02; 27/30

U.S. Cl. 336—65

13 Claims



1. A common mode choke adapted to be mounted on a circuit board, said common mode choke comprising:

5,568,113

**MAGNETIC TYPE POWER SWITCH**

Mel-huey Chen, 4th Fl., No.29, Lane 58, Sec. 1, Lihsing Rd., Sanchung City, Taipei Hsien, Taiwan

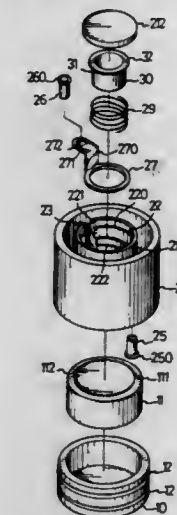
Filed Jun. 30, 1995, Ser. No. 497,170

Claims priority, application China, Aug. 3, 1994, 94218054.2

Int. Cl.<sup>6</sup> H01H 3/00

U.S. Cl. 335—195

4 Claims



1. A magnetic type power switch comprising:

- a base having a space for receiving a battery therein;
- a battery located in the space in the base, the battery having a positive terminal and a negative terminal;
- a body detachably coupled to the base, the body comprising a first electrical contact means contacting the negative terminal of the battery and a second electrical contact means;
- a slider in electrical contact with the second electrical contact means and movably received in the body; and
- a magnetic element located exteriorly of the body and base, and remotely effecting the position of the slider by changing a distance between the magnetic element and the base to selectively move the slider into contact with the positive terminal of the battery thereby selectively turning on/off power.

5,568,112

**METHOD AND APPARATUS FOR REDUCING THE STRENGTH OF PULSATING MAGNETIC FIELDS**

Jorge Cure, 3244 NW. 25 Way, Boca Raton, Fla. 33434

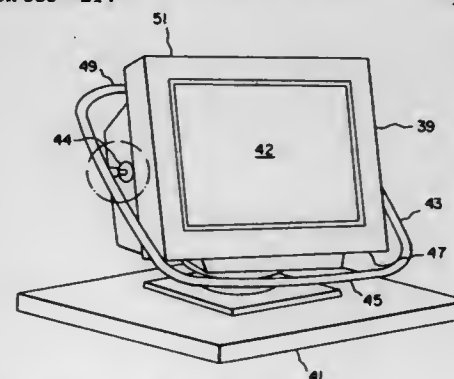
Continuation-in-part of Ser. No. 883,103, May 14, 1992, abandoned.

This application Aug. 20, 1993, Ser. No. 110,082

Int. Cl.<sup>6</sup> H01H 5/00

U.S. Cl. 335—214

19 Claims



1. In combination with a cathode ray tube device enclosed in a housing, an apparatus for reducing stray pulsating magnetic fields, comprising a system of electrically insulated conducting loop circuits contained within an enclosing form, said enclosing form being disposed externally and in proximity with the housing of said cathode ray tube device.

5,568,114

**WINDING SUPPORT BODY FOR TRANSFORMERS/ REACTORS WITH SUPERCONDUCTORS**

Thomas Fogelberg, Ludvika; Uno Gäfvert, and Sven Hörnfeldt, both of Västerås, all of Sweden, assignors to ASEA Brown Boveri AB, Västerås, Sweden

PCT No. PCT/SE93/00676, § 371 Date Jan. 19, 1995, § 102(e) Date Jan. 19, 1995, PCT Pub. No. WO94/06133, PCT Pub. Date Mar. 17, 1994

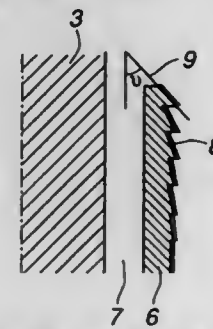
PCT Filed Aug. 27, 1993, Ser. No. 373,221

Claims priority, application Sweden, Aug. 27, 1992, 9202455

Int. Cl.<sup>6</sup> H01F 7/22

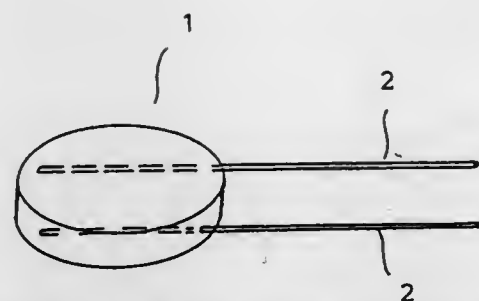
U.S. Cl. 336—206

1 Claim



1. A winding support body for a winding with conductors in the form of a superconducting tape, characterized in that the winding support body consists of a substantially straight, circular-

cylindrical tubular body (6) and that, on the side of the body where the winding is to be placed and out towards the ends of the body, a helical slot is provided along the body with a plane surface with a width equal to the width of the tape such that each turn of the slot around the body practically forms the envelope surface of a straight frustum of a cone and that the angle ( $\nu$ ) between a generatrix (9) of the envelope surface and the centre axis of the body increases for each turn out towards the ends of the body in such a way that the envelope surface for each turn at all points coincides with the direction of the magnetic field which is generated by the winding.



where  $M^1$  is one or more elements selected from the group consisting of the elements belonging to the group 3A of the International Periodic Table excluding La,  $N^1$  is one or more elements selected from the group consisting of the elements belonging to the group 2A of the International Periodic Table,  $P^2$  is one or more elements selected from the group consisting of the elements of the groups 4A, 5A, 6A, 7A and 8 of the International Periodic Table whose oxides exhibit p-type characteristics, and  $N^2$  is one or more elements selected from the group consisting of the elements of groups 4A, 5A, 6A, 7A and 8 of the International Periodic Table whose oxides exhibit n-type characteristics, wherein x, y and z are larger than 0 and smaller than 1 and satisfy the following formulas

$$0.001 \leq x/(1-y-z) < 0.20$$

$$0.05 \leq y/(1-y-z) \leq 0.80$$

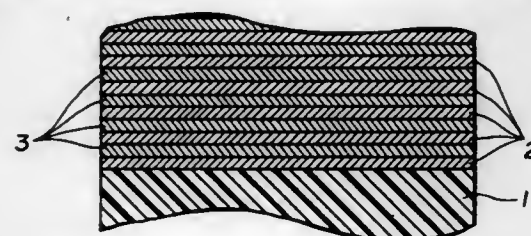
$$0 < z/(1-y-z) \leq 0.90.$$

**5,568,115**  
**ARTIFICIAL LATTICE FILM AND MAGNETO-RESISTANCE EFFECT ELEMENT USING THE SAME**  
Hiroshi Kano; Atsuko Suzuki; Kiyoshi Kagawa, and Akihiko Okabe, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

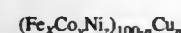
Filed Dec. 15, 1994, Ser. No. 356,588  
Claims priority, application Japan, Dec. 27, 1993, 5-329317  
Int. Cl.<sup>6</sup> H01L 43/00

U.S. Cl. 338—32 R

7 Claims



1. A magneto-resistance effect element comprising:  
a non-magnetic substrate having a Young's modulus of  $1.0 \times 10^9$  Nm<sup>-2</sup> or more; and  
a sputtered artificial lattice film disposed on a surface of the substrate, said artificial lattice film having a multilayer structure of alternating magnetic layers and conductive layers, each said magnetic layer having a composition of the formula



wherein x, y, z and n are atomic percentages such that  
 $10 \leq x \leq 25$ ,  
 $40 \leq y \leq 80$ ,  
 $10 \leq z \leq 40$ ,  
 $x+y+z=100$ , and  
 $1 \leq n \leq 50$ , and having a film thickness of about 1 nm, and each said conductive layer consisting of Cu or Cr and having a film thickness of from about 1.8 to about 2.8 nm, said magneto-resistance effect element having an MR ratio of at least about 4%.

**5,568,116**  
**CERAMIC COMPOSITION FOR THERMISTOR AND THERMISTOR ELEMENT**  
Masaki Iwaya; Kyohai Hayashi; Hiroshi Matsuzaki, and Yoshirou Suematsu, all of Atschi, Japan, assignors to NGK Spark Plug Co., Ltd., Atschi, Japan

Filed May 24, 1994, Ser. No. 248,015  
Claims priority, application Japan, May 24, 1993, 5-144294;  
Dec. 22, 1993, 5-346653

Int. Cl.<sup>6</sup> H01C 7/10

U.S. Cl. 338—22 SD

30 Claims

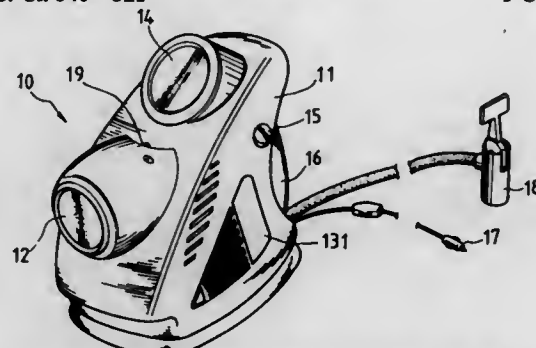
1. A ceramic composition for thermistor, said ceramic composition having a negative temperature coefficient and being represented by the formula  $(M^1_{1-x}N^1_x)(P^2_{1-y-z}N^2_yAl_z)O_3$

**5,568,117**  
**COMBINED ELECTRIC PUMP AND ILLUMINATING/ALARM DEVICE**  
Kun-Shan Hsu, No. 3, Ha Ko Llau, Pei Hou Lei, Chia Yi, Taiwan

Filed Nov. 7, 1995, Ser. No. 554,835  
Int. Cl.<sup>6</sup> G08B 23/00

U.S. Cl. 340—321

1 Claim



1. A portable lamp and electric pump system comprising:  
(a) a housing member having a pair of laterally opposed side portions and a front portion extending therebetween;  
(b) electric air pump means secured to said housing member for generating pressurized air, said electric air pump means having coupled thereto air outlet means for expulsion of said pressurized air;  
(c) a pressure gauge secured to said front portion of said housing for indicating the pressure of said pressurized air generated by said electric air pump means;  
(d) an illumination lamp secured to said front portion of said housing member;  
(e) at least a pair of alarm lamps secured respectively to said side portions of said housing member for generating an illuminated distress signal, said alarm lamps being coupled to said illumination lamp and said electric air pump means for selectively actuated simultaneous operation therewith;

- (f) switch means coupled to said electric air pump means and said illumination and alarm lamps for selective actuation thereof; and,  
(g) a power plug coupled to said electric air pump means and said illumination and alarm lamps, said power plug being adapted for coupling with an external power source;  
(h) wherein said front portion of said housing member is characterized by a sloped contour to extend in both a vertical direction and a longitudinal direction, said illumination lamp being disposed in vertically and longitudinally displaced relation to said pressure gauge.

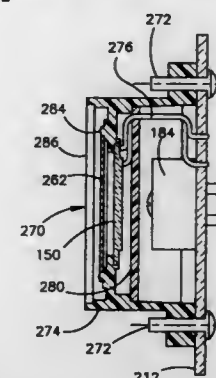
**5,568,118**  
**FAILSAFE MODULE**

Christian J. Andersen, Cadillac, and David W. Bull, Hersey, both of Mich., assignors to Nartron Corporation, Reed City, Mich.

Division of Ser. No. 100,068, Jul. 29, 1993, Pat. No. 5,373,281, which is a continuation-in-part of Ser. No. 746,124, Aug. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 742,962, Aug. 9, 1991, abandoned. This application Oct. 20, 1994, Ser. No. 326,599  
Int. Cl.<sup>6</sup> G08B 3/00

U.S. Cl. 340—384.1

13 Claims



1. An audio alarm device, comprising:  
a) a generally planar transducer for converting electrical signals to a vibratory motion of a face of the generally planar transducer to produce an audible sound;  
b) a transducer supporting assembly that includes a transducer housing supporting said generally planar transducer within an enclosed cavity bounded in part by inwardly facing interior walls of said transducer housing;  
c) a thin reverberator plate mounted to said transducer housing within said cavity in spaced relation to the vibrating face of the transducer for facilitating transmission of sound through a wall of said transducer housing;  
d) electronic driving circuitry located outside said cavity and coupled to the transducer by a signal conveying conductor that enters the cavity and a power supply for actuating said transducer to produce an audible sound having a periodically varying frequency; and  
e) a potting material contacting said housing through which the conductor for activating the transducer extends for encapsulating and insulating said cavity.

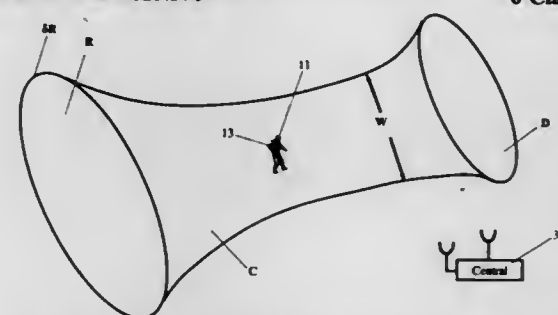
**5,568,119**  
**ARRESTEE MONITORING WITH VARIABLE SITE BOUNDARIES**

John F. Schipper, Palo Alto, and James M. Janky, Los Altos, both of Calif., assignors to Trimble Navigation Limited, Sunnyvale, Calif.

Filed Dec. 21, 1993, Ser. No. 171,228  
Int. Cl.<sup>6</sup> B08B 23/00; G01J 3/48

U.S. Cl. 340—825.370

6 Claims



1. A method for monitoring the location of a site arrestee with reference to a permitted site, the method comprising the steps of:  
designating a first site, having a connected and closed curve of arbitrary shape as a first site boundary, as a permitted site, where a selected site arrestee is permitted to remain for a first time interval  $t_0 \leq t < t_1$ , where  $t_0$  and  $t_1$  are selected times, with  $t_0 < t_1$ ;  
positioning a location-determining (LD) unit on the body of the site arrestee, the LD unit including an antenna and receiver/processor for receiving a timed sequence of radiowave signals from each of three or more electromagnetic signal transmitters whose transmitter locations are spaced apart from each other and from the permitted site and are known with high accuracy, where each of these electromagnetic signals has an identifying indicia and these signals contain information that allows the present location of the LD unit to be determined within the first site or outside the first site entirely by the timing relationships of the sequences of radiowave signals received by the LD unit from the signal transmitters, with no other signal sent or received by the LD unit being used in this determination of the LD unit present location;  
providing locking means for locking the LD unit to the arrestee's body so that the LD unit cannot be removed or disabled except by a special means for removal of the LD unit;  
providing the LD unit receiver/processor with an electronically sensible map of a selected portion of the Earth's surface that includes the coordinates of the permitted site or of the boundary of the first site;  
causing the LD unit receiver/processor to determine, at a selected sequence of two or more interrogation times, the present location of the LD unit and to determine whether the arrestee's present location is within the first site at such interrogation times;  
causing the LD unit to communicate an alarm signal if one or more of a specified group of conditions is present;  
designating a second site, which has a connected and closed curve of arbitrary shape as a second site boundary and is spaced apart from the first site, and a selected corridor that extends between and is connected to the first site and the second site, where the combined region consisting of the first site, the second site and the corridor has a closed continuous curve of arbitrary shape as a combined region boundary;  
redefining, for a second selected time interval  $t_1 \leq t < t_2$ , the permitted site to include the first site, the second site and the corridor, where  $t_2$  is a selected time  $> t_1$ ; and  
redefining, for a third selected time interval  $t_2 \leq t < t_3$ , the permitted site to include at least one of the first site and the second site, where  $t_3$  is a selected time  $> t_2$ .



5,568,120

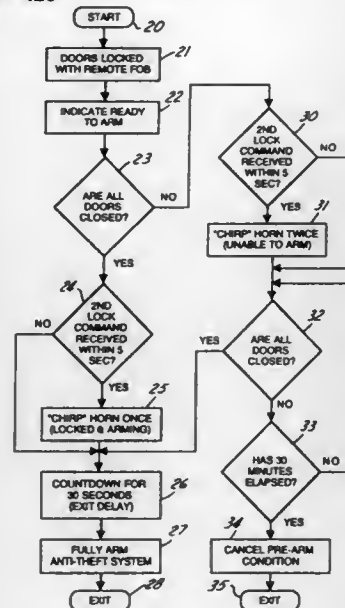
## ANTI-THEFT SYSTEM WITH REMOTE CONTROLLED VERIFICATION OF ARMING

Thomas J. LeMense, Livonia, and David R. Tengler, West Bloomfield, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 6, 1994, Ser. No. 350,296  
Int. Cl.<sup>6</sup> B60R 25/10

U.S. Cl. 340—426

4 Claims



1. A remote controlled anti-theft system for a transportation vehicle providing on-demand audible verification of anti-theft system operation, comprising:

a portable transmitter transmitting a lock code in response to a manual activation;

door lock actuators for locking doors of said transportation vehicle in response to a lock command signal;

door position sensors associated with said doors, each generating a respective door-closed signal when a respective one of said doors is closed;

a sound transducer producing an audible sound output in response to an energizing signal; and

a vehicle-mounted control module responsive to a first occurrence of said lock code to 1) generate said lock command signal which is sent to said door lock actuators and 2) enter an armed state of said anti-theft system if each of said door position sensors produces a door-closed signal, said control module further being responsive to a second occurrence of said lock code received within a predetermined time of said first occurrence of said lock code to generate a first energizing signal to produce a first audible sound output verifying that said armed state has been entered if said lock command has been sent and each of said door position sensors produces a door-closed signal or to generate a second energizing signal to produce a second audible sound output verifying that said armed state has not been entered if at least one of said door position sensors fails to produce a door-closed signal, said control module not producing any energizing signal absent said second occurrence of said lock code regardless of whether said armed state has been entered.

5,568,121

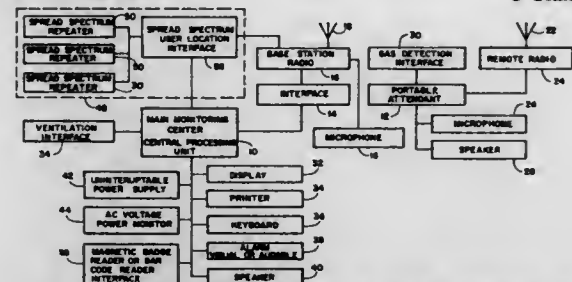
## WIRELESS SYSTEM FOR SENSING INFORMATION AT REMOTE LOCATIONS AND COMMUNICATING WITH A MAIN MONITORING CENTER

David M. Lamensdorf, 26135 Bella Santa Dr., Valencia, Calif. 91355

Filed May 27, 1993, Ser. No. 68,921  
Int. Cl.<sup>6</sup> G08B 1/08

U.S. Cl. 340—539

8 Claims



1. A system for sensing information at remote, potentially hazardous, locations and transmitting sensed information to a central location which comprises:

a main monitoring center including radio means for transmitting signals to, and receiving signals from, at least one remote portable electronic attendant;

at least one remote portable attendant including radio means for receiving information containing signals from, and transmitting information containing signals to, said main monitoring center;

means at said remote portable attendant independent of said main monitoring center for periodically producing an audible and/or visual warning at said remote portable attendant on a selected schedule independent from any other remote portable attendant on the system;

manual acknowledgement means at said remote portable attendant for sending an acknowledgement signal to said main monitoring center; and

automatic means for generating an alarm signal at a remote portable attendant and for sending an alarm signal to said main monitoring center if acknowledgement is not completed within a selected period.

5,568,122

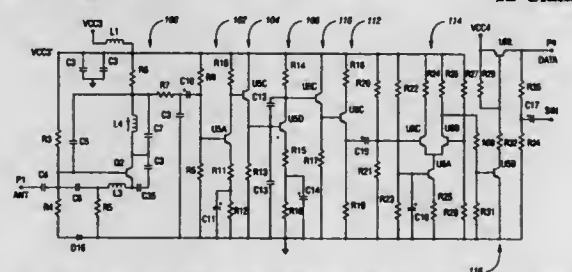
## WIRELESS AUDIBLE INDICATION SYSTEM WITH LOW POWER SIGNAL PROCESSING

Thomas G. Xydis, Ann Arbor, Mich., assignor to Dimango Products

Filed Oct. 21, 1994, Ser. No. 282,760  
Int. Cl.<sup>6</sup> G08B 1/08; G08C 1/00

U.S. Cl. 340—539

12 Claims



1. A receiver for use in an audible indication system with a corresponding transmitter capable of transmitting a radio frequency signal, the receiver comprising:

a radio frequency detector which produces a first intermediate signal upon receiving the radio frequency signal from the corresponding transmitter;

a signal processing circuit, coupled to the radio frequency detector, which produces a second intermediate signal in dependence upon the first intermediate signal, the signal processing

circuit having a series of one or more cascaded stages which includes a peak detector stage; and  
a sound generator, coupled to the signal processing circuit, which generates an audible indication in dependence upon the second intermediate signal;

wherein the peak detector stage includes a transistor having an emitter, a collector, and a base, wherein the emitter is coupled to a first supply voltage by a parallel combination of a resistor and a capacitor, wherein the collector is coupled to a second supply voltage, and wherein the peak detector stage is operative to peak detect a signal applied at the base to produce a peak detected signal at the emitter.

in which said second housing is separate from said first housing to permit said second housing to be positioned, in use, outside said interior space; said disable switch having a manual operator and a transmitting portion carried by said second housing, and a receiving portion carried by said first housing.

5,568,124

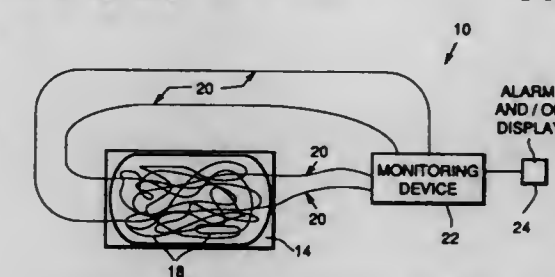
## METHOD TO DETECT PENETRATION OF A SURFACE AND APPARATUS IMPLEMENTING SAME

Richard J. Joyce, Thousand Oaks, and Allan R. Kramer, Simi Valley, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 20, 1993, Ser. No. 64,680  
Int. Cl.<sup>6</sup> G08B 13/00

U.S. Cl. 340—550

2 Claims



1. Apparatus for detecting unauthorized disturbance of a protected surface, comprising:

a substrate adapted to conformably encase and adhere to the protected surface, wherein said substrate is comprised of a conductive compound;

a plurality of frangible conduit means embedded in said substrate and randomly overlaying at least a first portion of the protected surface, each of said plurality of frangible conduit means having its ends protruding from said substrate, wherein said plurality of frangible conduit means are embedded in said substrate and comprise a plurality of electrically conductive wires having a frangible insulative covering thereon;

monitor means, coupled to said protruding ends of said plurality of frangible conduit means, for monitoring the integrity of the continuity of each of said plurality of frangible conduit means and for switching from a first state to a second state whenever the continuity of any of said plurality of frangible conduit means is broken, wherein said monitor means is further coupled to said substrate and switches from said first state to said second state whenever conduction is detected between any of said plurality of frangible conduit means and said substrate, and

display means coupled to said monitor means for displaying said first and second states of said monitor means.

5,568,125

## TWO-STAGE ANNEALING PROCESS FOR AMORPHOUS RIBBON USED IN AN EAS MARKER

Nen-Chin Liu, Parkland, Fla., assignor to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Continuation-in-part of Ser. No. 269,651, Jun. 30, 1994, Pat. No. 5,469,140, and a continuation-in-part of Ser. No. 392,070, Feb. 22, 1995, and a continuation-in-part of Ser. No. 420,757, Apr. 12, 1995. This application Jul. 28, 1995, Ser. No. 508,580  
Int. Cl.<sup>6</sup> G08B 13/24

U.S. Cl. 340—551

49 Claims

38. A magnetomechanical electronic article surveillance system comprising:

(a) generating means for generating an electromagnetic field alternating at a selected frequency in an interrogation zone, said generating means including an interrogation coil;

(b) a marker secured to an article appointed for passage through said interrogation zone, said marker including an amorphous

5,568,123

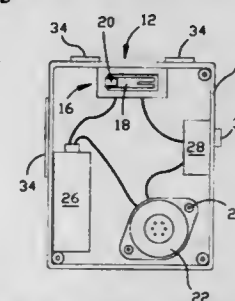
## CHILD PROTECTIVE CABINET ALARM

Charles F. Derheim, 34811 18th Ave. S.W., Federal Way, Wash. 98023

Filed Jun. 15, 1995, Ser. No. 490,817  
Int. Cl.<sup>6</sup> G08B 13/08

U.S. Cl. 340—545

5 Claims



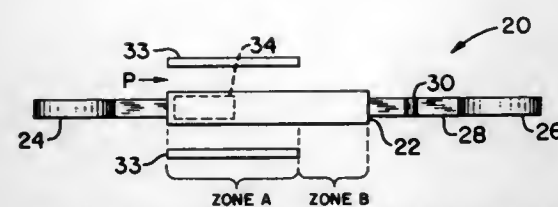
5. For use with an outwardly opening closure for an opening in a structure, said structure defining an interior space accessible through said opening, and said closure having a closed position in which it closes said opening and being movable outwardly away from said interior space and said opening from said closed position to an open position to provide access to said interior space, a warning device to signal that said closure has been moved out of said closed position toward said open position, comprising:

a first housing and a second housing; said first housing having an outer face and a mounting end substantially perpendicular to said face, said mounting end being attachable to said structure to position said first housing inside said interior space with said face directed outwardly adjacent to said opening, and said face being bounded by a periphery and having an aperture extending therethrough within said periphery;

an audible alarm carried by one of said housings;

an activator switch mounted in said first housing and having a projecting portion biased into a projecting position in which it projects outwardly through said aperture; said projecting portion being movable out of said projecting position toward said face and into a depressed position, and said projecting portion being and remaining within said periphery when it is in either of said projecting and depressed positions and as it moves between said projecting and depressed positions; and said activator switch normally being operatively connected to said alarm so that said alarm is activated when said projecting portion is in said projecting position and is deactivated when said projecting portion is in said depressed position; and  
a disable switch mounted on said second housing in a position accessible for manual operation and being manually movable into a position in which it prevents activation of said alarm by movement of said projecting portion into said projecting position;

wherein said projecting portion is configured to be contacted and moved into said depressed position by said closure when said mounting end is attached to said structure, said face is directed outwardly adjacent to said opening, and said closure is moved into said closed position;



magnetostriuctive element formed by first annealing an amorphous metal alloy in the presence of a saturating magnetic field and then second annealing the amorphous metal alloy in the absence of the saturating magnetic field, said marker also including a biasing element located adjacent to said magnetostriuctive element, said biasing element being magnetically biased to cause said magnetostriuctive element to be mechanically resonant when exposed to said alternating field; and (c) detecting means for detecting said mechanical resonance of said magnetostriuctive element.

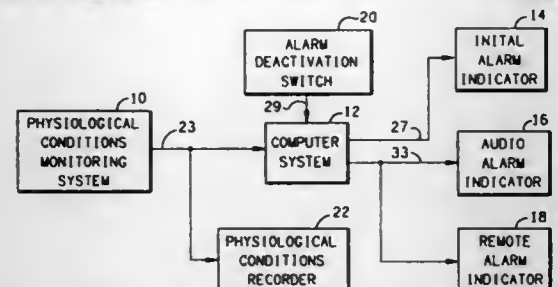
### 5,568,126 PROVIDING AN ALARM IN RESPONSE TO A DETERMINATION THAT A PERSON MAY HAVE SUDDENLY EXPERIENCED FEAR

Stig L. Andersen, 154 Solana Point Cir., Solana Beach, Calif. 92075, and Jens O. Sorensen, P.O. Box 2274, Rancho Santa Fe, Calif. 92067

Filed Jul. 10, 1995, Ser. No. 500,235  
Int. Cl.<sup>6</sup> G08B 21/00

U.S. Cl. 340—574

39 Claims



1. A system for providing an alarm when a person suddenly experiences fear, comprising:  
monitoring means for coupling to a person for monitoring at least one physiological condition of the person to provide physiological data signal(s) that are indicative of the status of the monitored physiological condition(s);  
a computer system coupled to the monitoring means for processing the physiological data signal(s) to determine whether the person may have suddenly experienced fear;  
alarm-indicating means coupled to the computer system for providing an alarm indication in response to a determination by said processing that the person may have suddenly experienced fear; and  
means for providing an alarm deactivation signal that causes the computer system to deactivate the alarm-indicating means;  
wherein the alarm-indicating means are so adapted and/or disposed as to provide an initial alarm indication that is perceivable by the person to whom the monitoring means are coupled;  
wherein the initial alarm indication commences shortly after said determination and the alarm-indicating means further includes a second alarm-indicating means that is so coupled to the computer system as to commence a second alarm indication a given interval after commencement of the initial alarm indication if the alarm-indicating means is not deactivated within said given interval following commencement of the initial alarm indication; and  
wherein the computer system determines the duration of said given interval in accordance with predetermined characteristics of the physiological data signal(s) processed by the computer system.

### 5,568,127 DROWSINESS WARNING DEVICE AND NECK SUPPORT

Harry H. J. Bang, Pacific Palisades, Calif., assignor to Richard M. Bang

Filed Oct. 27, 1995, Ser. No. 549,281  
Int. Cl.<sup>6</sup> G08B 21/00

U.S. Cl. 340—575

19 Claims



1. A drowsiness warning device, comprising:  
a band securable about a wearer's neck; and  
alarm means positioned by the band below a wearer's chin, for producing an aural warning as the chin contacts the alarm means, wherein the alarm means includes an upper rounded dome extending above an upper edge of the band and positioned immediately below the chin, and a lower elongated body secured within the band.

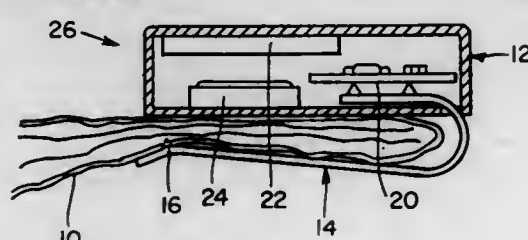
### 5,568,128 SELF LEARNING DIAPER WETNESS DETECTOR AND TOILET TRAINER

Rajesh M. Nair, 9 Saxford La., Nashua, N.H. 03063

Filed Nov. 14, 1994, Ser. No. 337,879  
Int. Cl.<sup>6</sup> G08B 21/00

U.S. Cl. 340—604

5 Claims



1. A wetness detector comprising:  
a housing;  
a biased attachment clip for attaching said housing to the outside of an undergarment proximate the waist band of the undergarment, said biased attachment clip extending over the waist band, a terminal end of said biased attachment clip extending inside the undergarment;  
a pair of spaced electrodes affixed directly on the terminal end of said biased attachment clip and directed towards the housing so that said clip functions both as an attachment means for attaching the housing to the outside of the undergarment and as the electrodes thereby eliminating the need for additional electrodes; and  
means, located within the housing and connected to said electrodes, for sensing wetness of said undergarment.

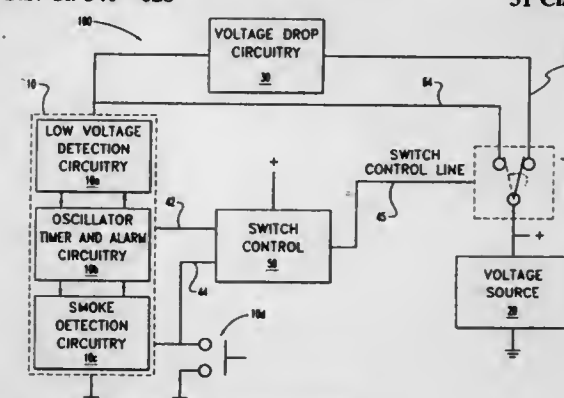
### 5,568,129 ALARM DEVICE INCLUDING A SELF-TEST REMINDER CIRCUIT

Ronald Sisselman, 13 Cedar Gate Cir., Aurora, Ill. 60506, and Gerald D. Rork, 924 Willow La., Sleepy Hollow, Ill. 60118

Filed Sep. 8, 1994, Ser. No. 302,634  
Int. Cl.<sup>6</sup> G08B 17/10

U.S. Cl. 340—628

31 Claims



1. A smoke alarm device, comprising:  
smoke alarm circuitry;  
a test switch connected to said smoke alarm circuitry for actuation by a user for testing said smoke alarm circuitry;  
a reminder indicator;  
a reminder circuit connected to said test switch for turning on said reminder indicator to remind said user to test said smoke alarm circuitry, wherein said reminder indicator once activated, said reminder indicator remains enabled for a prolonged period of time unless acted upon by said user.

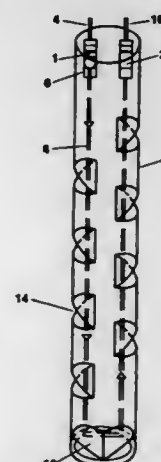
### 5,568,130 FIRE DETECTOR

Ernest A. Dahl, 3247 Breaker Dr., Ventura, Calif. 93003

Filed Sep. 30, 1994, Ser. No. 312,946  
Int. Cl.<sup>6</sup> G08B 17/10

U.S. Cl. 340—630

20 Claims



1. An apparatus for detecting the amount of smoke in an environment, comprising:  
a slender, straight, enclosing light guide having a length, a first end and a second end, said light guide being unapertured along its length, said light guide including a first lengthwise linear array of notches and a second lengthwise linear array of notches, each said notch having two clear notch sides which provide therebetween an inwardly recessed interspace for said environment;  
a light source, at said first end, for generating a light beam, said light beam having an initial light intensity, said light beam

subsequently passing through said notch sides and said inwardly recessed interspaces of said first lengthwise array of notches;  
a first reflector, at said second end, for reflecting said light beam which has previously passed through said notch sides and said inwardly recessed interspaces of said first lengthwise array of notches;  
a second reflector, at said second end, for reflecting said light beam which has previously been reflected by said first reflector, said light beam subsequently passing through said notch sides and said inwardly recessed interspaces of said second lengthwise array of notches;  
a light sensor, at said first end, for receiving said light beam, said light beam having previously passed through said notch sides and said inwardly recessed interspaces of said second lengthwise array of notches, said light sensor generating an analog signal which indicates said attenuated light intensity, said initial light intensity having been reduced to said attenuated light intensity in proportion to the amount of said smoke through which said light beam has passed in said inwardly recessed interspaces of said first lengthwise array of notches and said second lengthwise array of notches.

### 5,568,131 MOTOR ROTATION JUDGEMENT CIRCUIT AND APPARATUS USING SUCH CIRCUIT FOR VERIFYING THAT A MOTOR IS STOPPED

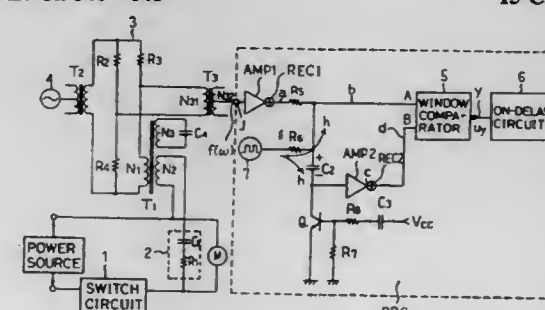
Masayoshi Sakai, and Koichi Futsuhara, both of Saitama-ken, Japan, assignors to The Nippon Signal Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/00411, § 371 Date Nov. 29, 1994, § 102(e) Date Nov. 29, 1994, PCT Pub. No. WO94/23303, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 31, 1993, Ser. No. 338,522  
Int. Cl.<sup>6</sup> G08B 21/00

U.S. Cl. 340—648

15 Claims

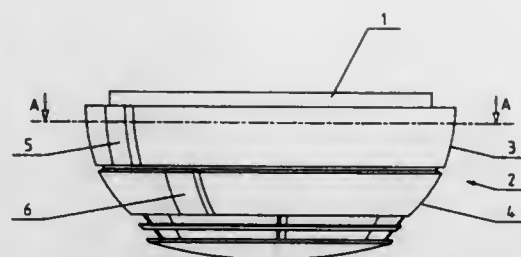


1. A motor rotation judgement circuit comprising:  
a sensor signal input terminal for input of output signals generated from a sensor in accordance with rotation or non-rotation conditions of a motor;  
high frequency signal generation means for generating a high frequency signal for superimposing on an input signal input by way of said sensor signal input terminal;  
amplifying means for amplifying said input signal superimposed with the high frequency signal, and saturating the amplified input signal when the amplified input signal is at the level of the input signal for the motor is rotating;  
a capacitor interposed between said high frequency signal generation means and said amplifying means, for transmitting said input signal superimposed with the high frequency signal to said amplifying means;  
rectifying means for rectifying the output of said amplifying means; and  
a two input window comparator having a first input terminal for direct input of said input signal superimposed with the high frequency signal, and a second input terminal for input of the rectified output from said rectifying means, which generates a motor stopped judgement output of logic value 1, only when



the levels of both signals input to the first input terminal and to the second input terminal are simultaneously within predetermined threshold value ranges determined by an upper limit value and a lower limit value pre-set for each input terminal, wherein

the respective threshold value ranges of the first and second input terminals are set so that the level of the signal for input to the first input terminal becomes outside the threshold value range when the sensor is faulty, and the level of the signal for input to the second input terminal becomes outside the threshold value range when the motor is rotating.



wherein the fastener part comprises a first indicator element whose rotational position relative to the insert part indicates whether the second fastener means properly engages the first fastener means.

#### 5,568,132 LOAD INSULATOR

Hugh M. Pratt, Marchioness Building, Commercial Road, Bristol BS1 6TG, Great Britain

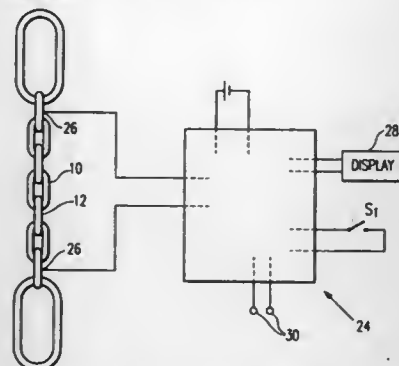
Filed Feb. 1, 1994, Ser. No. 190,776

Claims priority, application United Kingdom, Feb. 3, 1993, 9302122

Int. Cl.<sup>6</sup> G08B 21/00

U.S. Cl. 340—657

22 Claims



1. A load insulator for interposition into a loaded line, the load insulator comprising:

- a chain having at least two mechanical links interlocked together;
- an electrical insulator arranged between the at least two mechanical links to electrically isolate the at least two mechanical links from each other; and
- a housing at least partially enclosing the two mechanical links for substantially restricting the movement of the at least two mechanical links with respect to the electrical insulator.

#### 5,568,133 FIRE ALARM

Bernhard Durrer, Wilen-Wollerau; Hans Böttschi, Männedorf, and Peter Gruber, Stäfa, all of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Continuation-in-part of Ser. No. 205,578, Mar. 3, 1994, abandoned. This application Dec. 12, 1995, Ser. No. 570,814

Claims priority, application Switzerland, Mar. 19, 1993, 846/93

Int. Cl.<sup>6</sup> G08B 23/00

U.S. Cl. 340—693

16 Claims

1. A fire alarm comprising a mounting portion and an insert portion attached to the mounting portion, wherein the mounting portion comprises first fastener means, and

- wherein the insert portion comprises:
  - an insert part having a coupling end;
  - a fastener part rotatably coupled to the insert part at the coupling end of the insert part, and comprising second fastener means for engaging the first fastener means upon rotation of the fastener part relative to the insert part through a delimited angular range;

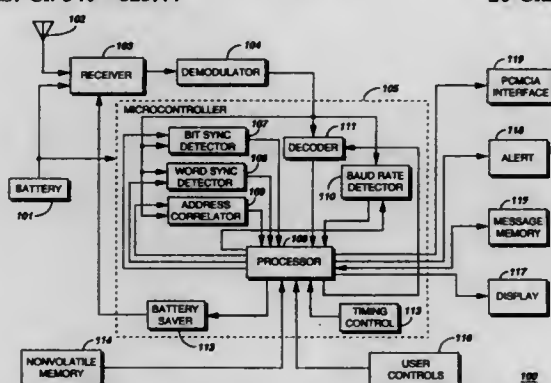
#### 5,568,134 SELECTIVE CALL RECEIVER WITH COMPUTER INTERFACE MESSAGE NOTIFICATION

Gregory L. Cannon, Keller, Tex.; William J. Macko, West Palm Beach; Gregory W. Fuller, Boca Raton, both of Fla.; Nancy M. Cannon, Keller, Tex., and Gregg E. Rasor, Boynton Beach, Fla., assignors to Motorola, Inc., Schaumburg, Ill. Division of Ser. No. 963,345, Oct. 19, 1992, Pat. No. 5,455,572. This application Jan. 31, 1995, Ser. No. 391,296

Int. Cl.<sup>6</sup> G08B 5/22

U.S. Cl. 340—825.44

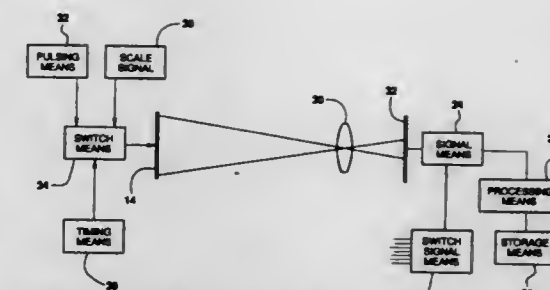
20 Claims



1. A selective call messaging peripheral capable of receiving at least one message and communicating the at least one message to an electronic information processing device, the selective call messaging peripheral comprising:

- a microcontroller including a processor for executing a microcode program that controls operation of the selective call messaging peripheral;
- a receiver coupled to the microcontroller, the receiver operating to receive and demodulate an information signal providing a recovered information signal including an address signal and the at least one message;
- a correlator coupled to the receiver, the correlator performing a comparison between the address signal recovered from the received information signal and a predetermined address associated with the selective call messaging peripheral and generating an address detection when the recovered address is substantially equivalent to the predetermined address indicating selection of the selective call messaging peripheral; and
- a PCMCIA memory only interface coupled to and controlled by the microcontroller, the PCMCIA memory only interface communicating notification of the address detection to the electronic information processing device by simulating disengagement of the PCMCIA memory only interface between the selective call messaging peripheral and the electronic information processing device, disengagement of the PCMCIA memory only interface being simulated by changing an impedance present at a connection corresponding with at least one card detect signal on the selective call messaging peripheral's PCMCIA memory only interface from a first electrical state approximating a zero impedance reference with respect

to a relative ground reference potential for the PCMCIA memory only interface to a second electrical state approximating an infinite impedance and then returning the impedance to the first electrical state, the simulated disengagement causing the electronic information processing device to issue the message read command to the selective call messaging peripheral, and in response to receiving a message read command from the electronic information processing device, the PCMCIA memory only interface is configured by the microcontroller to permit the electronic information processing device to read the at least one message from the selective call messaging peripheral.



storing a scale on the second vehicle which is proportional to the predetermined light distance (L), comparing the length of the image (I) with the scale to produce a signal representing the distance (D) between the vehicles, characterized by establishing the predetermined light distance (L) as a constant and fixed length from vehicle to vehicle by using the standard license plate holder on the first vehicle.

#### 5,568,135 REMOTE CONTROL METHOD AND UNIT FOR A RADIO UNIT

Yutaka Shinozaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

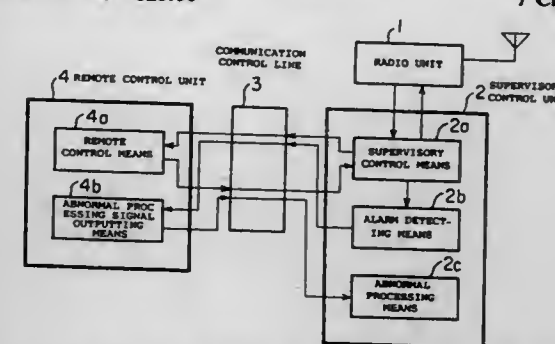
Filed Oct. 25, 1993, Ser. No. 142,212

Claims priority, application Japan, Oct. 26, 1992, 4-287587

Int. Cl.<sup>6</sup> G05B 23/02

U.S. Cl. 340—825.06

7 Claims



1. A remote control method for a radio unit by a supervisory control unit which is located in the vicinity of the radio unit, and monitors and controls an operating state of the radio unit, and a remote control unit which is connected to the supervisory control unit through a communication control line, and controls the radio unit through the supervisory control unit, the method comprising the steps of:

- transmitting an alarm signal indicative of abnormality of an operation of said supervisory control unit from said supervisory control unit to said remote control unit via said communication control line; and
- making a decision that abnormality occurs in said supervisory control unit or said communication control line when said alarm signal is received by said remote control unit.

#### 5,568,136 METHOD AND APPARATUS FOR IDENTIFYING AND MEASURING THE DISTANCE BETWEEN VEHICLES

Peter A. Hochstein, 2966 River Valley Dr., Troy, Mich. 48098, and Dennis Foy, 5703 N. Paradise View, Scottsdale, Ariz. 85250

Filed Sep. 5, 1995, Ser. No. 523,543

Int. Cl.<sup>6</sup> G08G 1/16

U.S. Cl. 340—903

16 Claims

1. A method of measuring the distance between vehicles comprising the steps of:

- emitting light from first and second light positions spaced apart a predetermined light distance (L) on a first vehicle,
- passing the emitted light through a lens mounted on a second vehicle and having a focal length (f) to present an image having a length (I) of the predetermined light distance (L) at the focal length (f) from the lens,
- sensing the length of the image (I) at the focal length,
- producing a signal representing the length of the image (I).

#### 5,568,137 VEHICLE LANE GUIDE AND ALERTING DEVICE

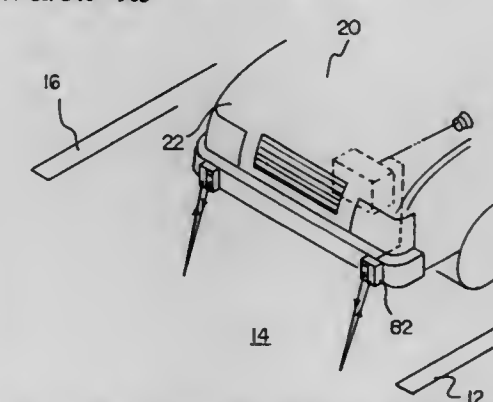
Jian S. Liu, 249 W. Dayton Yellow Springs Rd., #345, Fairborn, Ohio 45324

Filed Sep. 26, 1995, Ser. No. 533,711

Int. Cl.<sup>6</sup> G08G 1/09

U.S. Cl. 340—905

1 Claim



1. A vehicle lane guide and alerting device for monitoring a position of a vehicle on a delimited lane of a roadway and providing an alarm when the vehicle moves out of that lane comprising, in combination:

- a vehicle roadway having at least one lane delimited by light-reflective lane markers and with the markers having a higher reflectivity than the roadway itself;
- a vehicle positionable upon the roadway and having a path of travel on the lane;
- a pair of transceivers each coupled to the front end of the vehicle and each comprising:
  - a rigid box-shaped plastic housing,
  - photo sensor means including a cadmium sulfide photo detector and level resistor coupled to a front end of the vehicle for capturing light that is reflected from the roadway, wherein the photo sensor means is directional so as to not be triggered by lines crossing the road perpendicular to vehicle travel,
  - manually adjustable differentiator means coupled to the photo sensor means for discriminating and amplifying a sharp change in the reflected light above a user-selected level when the vehicle crosses the lane markers on the roadway, the differentiator means comprising an operational amplifier, a direct current blocking capacitor, a level resistor, and a manually adjustable potentiometer situated on a dash of the vehicle,
  - buffer means coupled to the differentiator means for registering the change in the reflected light, the buffer means comprising a D-flip flop with an associated resistive and capacitive support network, whereby the D-flip flop delivers a high level voltage from a D-terminal thereof to a Q-terminal thereof thus





5,568,143

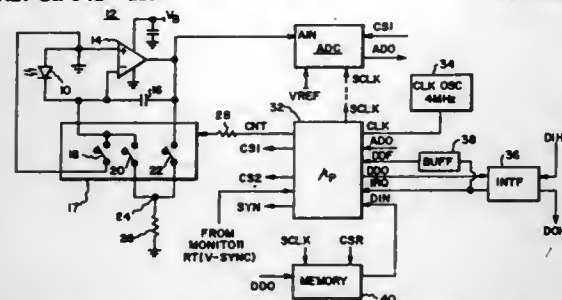
## ANALOG TO DIGITAL CONVERSION SYSTEM HAVING AUTOMATICALLY AND DYNAMICALLY VARIABLE RESOLUTION RANGE

Robert J. Hutchison, Pittsford, and John A. Teleska, Rochester, both of N.Y., assignors to Lucid Technologies Inc, Henrietta, N.Y.

Filed Oct. 27, 1994, Ser. No. 330,399  
Int. Cl.<sup>6</sup> H03M 1/18

U.S. Cl. 341-139

26 Claims



1. An analog to digital converter system for digitizing an analog signal over a resolution range which dynamically and automatically increases inversely with the amplitude of said analog signal, said converter system comprising an integrator of said analog signal which provides an output the amplitude of which changes with time, a sampler which takes samples of said output after each of a plurality of successive increments of time occurring until one of said samples of said output first becomes greater than a certain amplitude, a counter of the occurrence of said samples providing a digital signal representing in numerical value the number of said successive increments of time until said one of said samples occurs and defining said resolution range, thereby digitizing said analog signal over said resolution range.

5,568,144

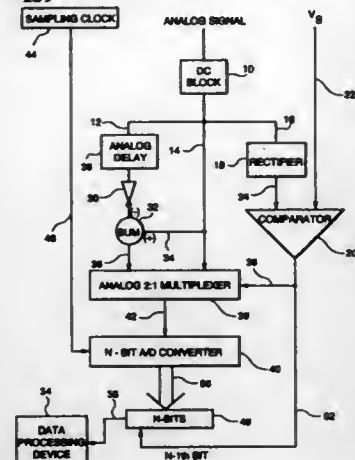
## METHOD FOR IMPROVING WAVEFORM DIGITIZATION AND CIRCUIT FOR IMPLEMENTING SAID METHOD

Richard Y. Chiao, Clifton Park; Ralph A. Hewes, and Robert S. Gilmore, both of Burnt Hills, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 1, 1994, Ser. No. 348,011  
Int. Cl.<sup>6</sup> H03M 1/18

U.S. Cl. 341-139

21 Claims



1. A method for digitizing waveforms, comprising the steps of: selecting a signal threshold value which partitions the dynamic range of the waveform to be digitized into a small signal region and a large signal region; sampling said waveform to obtain a sampled signal therefrom at a given sampling frequency; comparing each sampled signal with the signal threshold value to determine whether said sampled signal is within said small signal region or said large signal region; and directly digitizing said sampled

signal if said sampled signal is within said small signal region or differentially digitizing said sampled signal if said sampled signal is within said large signal region, wherein differentially digitizing the sampled signal includes digitizing a value representing the difference between the sampled signal at the present sampling instant and the previous sampling instant.

5,568,145

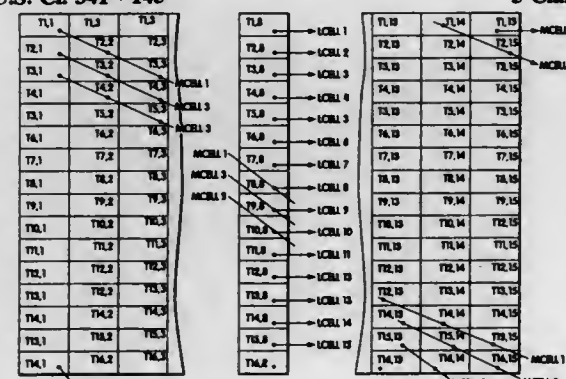
## MOS CURRENT SOURCE LAYOUT TECHNIQUE TO MINIMIZE DEVIATION

David C. Reynolds, Georgetown, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Oct. 19, 1994, Ser. No. 325,483  
Int. Cl.<sup>6</sup> H03M 1/68

U.S. Cl. 341-145

5 Claims



1. A current source device comprising: a plurality of current source cells arranged in an array of a plurality of columns and rows; a plurality of least significant bit cells, each least significant bit cell including at least one current source cell, the plurality of least significant bit cells including current source cells from among a centrally located column or row of the array; and a plurality of most significant bit cells, each most significant bit cell including a plurality of current source cells electrically added together and physically located along a diagonal path across the columns and rows of the array.

5,568,146

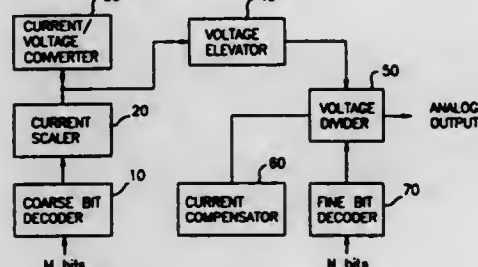
## DIGITAL/ANALOG CONVERTER

Yong-In Park, Seoul, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Choongchungbook-Do, Rep. of Korea

Filed Jan. 4, 1995, Ser. No. 368,445  
Claims priority, application Rep. of Korea, May 17, 1994, 10843/1994

U.S. Cl. 341-145

11 Claims



1. A digital/analog converter comprising: coarse bit decoding means for decoding M higher-order bits of an (M+N)-bit input digital signal; fine bit decoding means for decoding N lower order bits of the (M+N)-bit input digital signal;

5,568,148

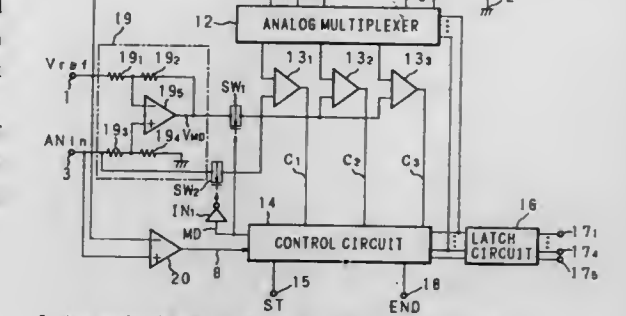
## ANALOG/DIGITAL CONVERSION CIRCUIT

Takehiro Furukawa; Eizo Yamashita, and Nobuyuki Saiki, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1994, Ser. No. 336,698  
Claims priority, application Japan, Nov. 8, 1993, 5-278554  
Int. Cl.<sup>6</sup> H03M 1/12

U.S. Cl. 341-155

5 Claims



1. An analog/digital conversion circuit, comprising: voltage comparing means for comparing a voltage to be converted with a reference voltage; voltage adjusting means for adjusting the voltage to be converted, to a voltage that can be digital converted using said reference voltage by extracting an excess voltage when the voltage to be converted is higher than said reference voltage as a result of the comparison by said voltage comparing means; digital converting means for converting the voltage to be converted or the excess voltage to digital values by comparing the voltage to be converted or the excess voltage with a comparison voltage derived by dividing said reference voltage; and control means for supplying to said digital converting means, as a result of the comparison by said voltage comparing means, the voltage to be converted when the voltage to be converted is not higher than said reference voltage, or the excess voltage when the voltage to be converted is higher than said reference voltage, and for setting a digital value of one place up the highest digit place of the digital values obtained from the comparison between the excess voltage and the comparison voltage, to be 1(one) when the voltage to be converted is higher than said reference voltage.

5,568,147

## DIGITAL-TO-ANALOG CONVERTER FOR REDUCING OCCUPIED AREA THEREOF

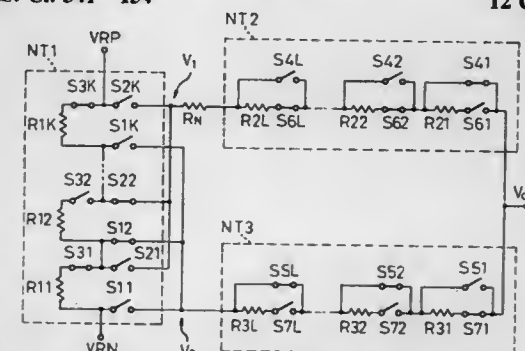
Atsushi Matsuda, and Tachio Yuasa, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 2, 1994, Ser. No. 334,343

Claims priority, application Japan, Dec. 28, 1993, 5-336843  
Int. Cl.<sup>6</sup> H03M 1/68

U.S. Cl. 341-154

12 Claims



1. A digital-to-analog converter for providing an analog output according to a digital input signal, comprising: a first partial circuit, disposed between a first reference voltage input terminal and a second reference voltage input terminal, having a first row of K resistors of the same resistance value and groups of switches provided for the resistors, to select "K-1" resistors among said K resistors; a second partial circuit, connected with said first partial circuit, having a second row of L resistors, a first group of switches connected in series with said resistors, respectively, and a second group of switches connected in parallel with said series-connected second row of resistors and said first group of switches, respectively; and a third partial circuit, connected with said first partial circuit, having a third row of L resistors, a third group of switches connected in series with said resistors, respectively, and a fourth group of switches connected in parallel with said series-connected third row of resistors and said third group of switches, respectively.

5,568,149

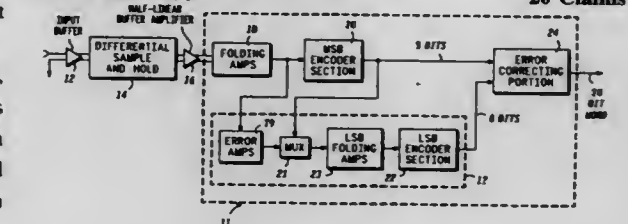
## A/D CONVERTER SUBSYSTEM WITH HALF LINEAR BUFFER AMPLIFIER

Alvin D. Francon, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 24, 1995, Ser. No. 518,734  
Int. Cl.<sup>6</sup> H03F 3/45

U.S. Cl. 341-156

20 Claims



1. An A/D converter subsystem for converting an analog signal to digital words comprising: a sample and hold circuit for sampling said analog signal and providing first and second differential signals, said differential signals being substantially out of phase, each differential signal having a positive going portion and a negative going portion;

- a half-linear buffer amplifier for linearly amplifying said positive going portion of said differential signals and non-linearly amplifying said negative going portion of said differential signals, said half-linear buffer amplifier providing first and second differential output signals that are substantially out of phase, said differential output signals having a positive going portion and a negative going portion;
- a plurality of folding amplifiers in a parallel configuration for amplifying said positive going portion of said differential output signals, said each of said folding amplifiers providing a single ended output signal based on said positive going portion of said differential output signals;
- a most significant bit (MSB) encoder section for providing most significant output bits based on each of said single ended output signals; and
- a least significant bit (LSB) encoder section for providing least significant output bits based on said most significant output bits and said each of said single ended output signals.

5,568,150

# METHOD AND APPARATUS FOR HYBRID ANALOG-DIGITAL PULSE COMPRESSION

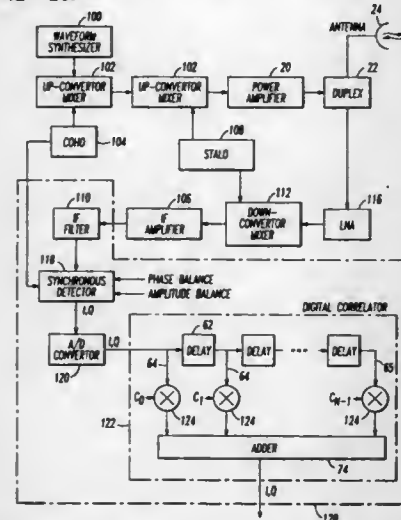
John W. Taylor, Jr.; Herman J. Blinichoff, both of Baltimore; Micheal J. Martineau, Ellicott City, and Scott A. Hyer, Columbia, all of Md., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Jul. 31, 1995, Ser. No. 509,625

Int. Cl.<sup>6</sup> G01S 7/292

U.S. Cl. 342—189

33 Claims



1. A hybrid analog-digital pulse compressor, comprising:
- an analog intermediate frequency filter receiving echo signals of a transmitted pulse and having a passband less than a frequency sweep of said transmitted pulse, said analog intermediate frequency filter filtering and weighting said echo signals, and said transmitted pulse being an FM signal;
- converting means for converting output of said analog intermediate frequency filter into digital baseband signals; and
- a digital correlator for digitally correlating said digital baseband signals to complete pulse compression of said echo signals.

## STATISTICAL AVERAGING METHOD FOR WIND PROFILER DOPPLER SPECTRA

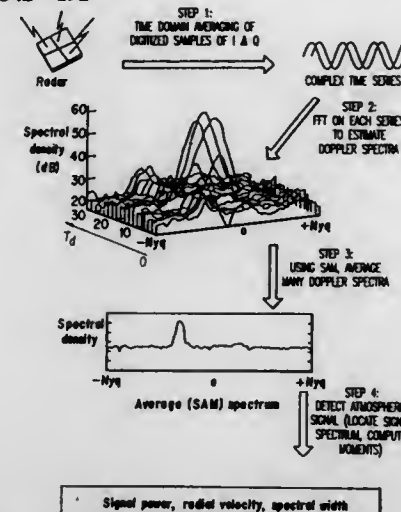
David A. Merritt, 982 N. Cedar Brook Rd., Boulder, Colo. 80304

Filed May 17, 1995, Ser. No. 442,969

Int. Cl.<sup>6</sup> G01S 7/41;13/95

U.S. Cl. 342—192

4 Claims



1. A method for Doppler spectral averaging, the method comprising:
- (a) collecting a statistical sample set for each Doppler velocity, antenna beam, and radar range using radar Doppler spectral values sampled over time;
- (b) detecting multiple signal sources in said radar Doppler spectral values by using differences in statistical and physical properties of said radar Doppler spectral values;
- (c) separating signals from said multiple signal sources over time, over Doppler velocity, and over radar range;
- (d) identifying contamination in said radar Doppler spectral values using said statistical and physical properties;
- (e) eliminating said contamination, leaving atmospheric signal and radar system noise when these are observable;
- (f) identifying said atmospheric signal based upon said statistical properties and physical properties;
- (g) estimating an average spectrum using a subset of said samples identified with said atmospheric signal and with said radar system noise; and
- (h) indicating a presence of useful signal from said radar Doppler spectral values in accordance with said average spectrum.

5,568,152

# INTEGRATED IMAGE TRANSFER FOR REMOTE TARGET LOCATION

James M. Janky, Los Altos; Peter V. W. Loomis, Sunnyvale, and John F. Schipper, Palo Alto, all of Calif., assignors to Trimble Navigation Limited, Sunnyvale, Calif.

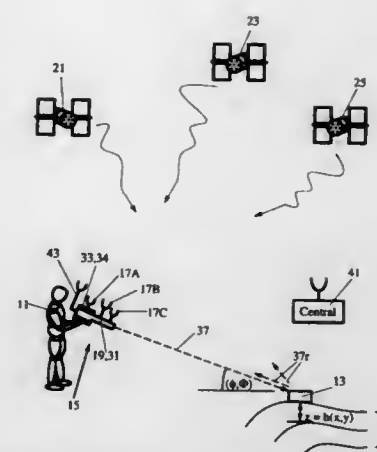
Filed Feb. 4, 1994, Ser. No. 191,815

Int. Cl.<sup>6</sup> G01S 5/02; F41G 1/00

U.S. Cl. 342—357

3 Claims

1. A handheld system for accurately determining the location of an object by an observer that is spaced apart from the object, the system comprising:
- viewer means having a boresight and image viewer, for allowing an observer to view a designated object that is spaced apart from the observer along a line of sight from the observer to the object and for issuing an output image signal containing the visual image of the object sensed by the viewer means;
- position determination means, attached to the viewer means, for determining the angular orientation of a selected line in a selected plane containing the position determination means and for determining the location of a selected point in the selected plane, the position determination means comprising:



at least three SATPS signal antennas, numbered 1, 2, 3 and arranged non-collinearly in the selected plane, to each receive SATPS signals from three or more SATPS satellites and to issue these signals as antenna output signals, where antenna *i* is located at a selected positive distance *L*(*i,j*) from antenna *j* (*i,j*=1, 2, 3) and *L*(*i,j*) does not exceed one half meter; and

an SATPS signal receiver/processor that receives and processes the SATPS signals received by the SATPS antennas, that determines location coordinates of each SATPS antenna, that determines an azimuthal angle  $\phi$  and a polar angle  $\theta$  of the observer-object line of sight relative to the selected plane and the selected line, that receives the viewer means output image signal, that determines location coordinates of the object, and that issues the object location coordinates as an output location signal;

wherein the object is located on a known, single-valued two-dimensional surface that is approximately represented locally in a Cartesian coordinate system (*x*, *y*, *z*) by a first relation

$$z=h(x,y)$$

in the receiver/processor, wherein location coordinates for the observer in this local Cartesian coordinate system are known and are given by (*x*<sub>o</sub>, *y*<sub>o</sub>, *z*<sub>o</sub>), wherein location coordinates (*x*<sub>o</sub>, *y*<sub>o</sub>, *z*<sub>o</sub>) of the object are determined by simultaneously solving this first relation and the three relations given by

$$(x_o - x_r)/(\sin \phi)(\sin \theta) = S,$$

$$(y_o - y_r)/(\cos \phi)(\sin \theta) = S,$$

$$(z_o - z_r)/(\cos \theta) = (h(x_o, y_o) - z_r)/(\cos \theta) = S,$$

for the values of the variables *x*<sub>o</sub>, *y*<sub>o</sub>, *z*<sub>o</sub> and *s*, wherein the quantity *s* represents a calculated distance between the viewer means and the object; and

display means for receiving the output image signal and the output location signal and for displaying a visual image of the object sensed by the viewer means, with at least one of the set of object location coordinates and the set of viewer means location coordinates being superimposed on this visual image.

5,568,153

# INDIVIDUALLY DEFINED PERSONAL HOME AREA FOR SUBSCRIBERS IN A CELLULAR TELECOMMUNICATIONS NETWORK

André Béliveau, Laval, Canada, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

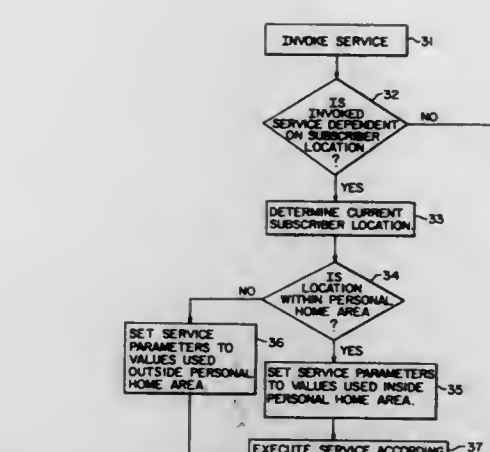
Filed May 30, 1995, Ser. No. 454,414

Int. Cl.<sup>6</sup> G01S 5/02

U.S. Cl. 342—357

12 Claims

7. A method of administering a personal home area for a subscriber within a cellular telecommunications network having a plurality of cell sites, said method comprising the steps of:



storing in a home location register, geographic coordinates of a home location for said subscriber;

defining a personal home area centered on said home location of said subscriber;

determining a current geographic location of said subscriber upon invoking a service;

determining whether said current geographic location of said subscriber is located within said personal home area;

setting parameters for said service to values used inside said personal home area upon determining that said subscriber is located within said personal home area; and

setting parameters for said service to values used outside said personal home area upon determining that said subscriber is not located within said personal home area.

5,568,154

# SYSTEM AND A METHOD FOR THE INSTANTANEOUS DETERMINATION OF THE FREQUENCIES AND ANGLES OF ARRIVAL OF SIMULTANEOUSLY INCOMING RF SIGNALS

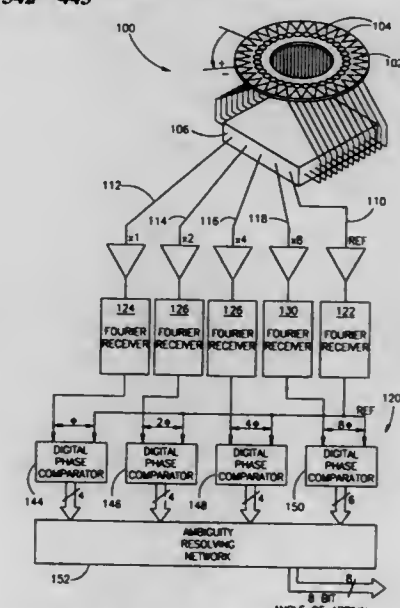
Yakov Cohen, Haifa, Israel, assignor to State of Israel-Ministry of Defense Armament Development Authority-Rafael, Haifa, Israel

Filed May 22, 1995, Ser. No. 446,973

Int. Cl.<sup>6</sup> G01S 5/02

U.S. Cl. 342—443

12 Claims



12. A method for the instantaneous determination of the frequencies and angles of arrival of a plurality of simultaneously incoming signals, comprising the steps of:



- (a) receiving the plurality of simultaneously incoming signals;
- (b) providing at least one superimposed output signal of the plurality of simultaneously incoming signals, where the at least one superimposed output signal includes phase information associated with the angles of arrival of the plurality of simultaneously incoming signals;
- (c) sampling the at least one superimposed output signal for periodically producing a sample of the at least one superimposed output signals;
- (d) frequency differentiating the sample into a train of discrete waveforms, each of the train of discrete waveforms being associated with one of the plurality of simultaneously incoming signals, and each of the train of discrete waveforms including phase information associated with one of the plurality of simultaneously incoming signals;
- (e) determining from one of the train of discrete waveforms the frequency of one incoming signal of the plurality of simultaneously incoming signals; and
- (f) determining from the phase information of one of the train of discrete waveforms the angle of arrival of the one incoming signal of the plurality of simultaneously incoming signals.

5,568,155

# ANTENNA DEVICES HAVING DOUBLE-RESONANCE CHARACTERISTICS

Kolchi Tsunekawa, and Seiji Hagiwara, both of Yokosuka, Japan, assignors to NTT Mobile Communications Network Incorporation, Tokyo, Japan

PCT No. PCT/JP93/01770, § 371 Date Nov. 7, 1994, § 102(e) Date Nov. 7, 1994, PCT Pub. No. WO94/14210, PCT Pub. Date Jun. 23, 1994

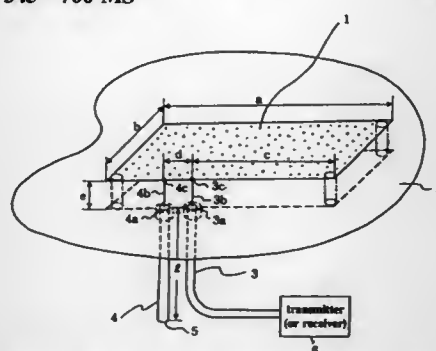
PCT Filed Dec. 7, 1993, Ser. No. 284,494

Claims priority, application Japan, Dec. 7, 1992, 4-326998; Jul. 6, 1993, 5-167115

Int. Cl.<sup>6</sup> H01Q 1/32

U.S. Cl. 343—700 MS

6 Claims



1. An antenna device having double resonance characteristics, comprising:

- a conductive ground plane;
- a conductive planar radiation element arranged approximately parallel to said conductive ground plane, said conductive planar radiation element having a substantially rectangular shape;
- an insulator between said conductive ground plane and said conductive planar radiation element;
- a feed line having a grounded conductor connected to said conductive ground plane and a non-grounded conductor connected to said conductive planar radiation element at a first contact point;
- a parasitic line having a grounded conductor connected to said conductive ground plane and a non-grounded conductor connected to said conductive planar radiation element at second contact point a distance from said first contact point, a terminal end of said parasitic line being open-circuited, said parasitic line being located at a first end of said conductive planar radiation element at approximately a middle of one of two mutually opposing edges of said conductive planar radiation element; and

$\lambda$  being a resonant wavelength of said antenna device when said grounded conductor and said non-grounded conductor of said parasitic line are short-circuited, an electrical length of said parasitic line being:

$$(1/4 + m/2) \times \lambda$$

where  $m$  is an integer equal to or greater than 0;

said antenna device having a higher resonant frequency and a lower resonant frequency equal to about half of said higher resonant frequency; and

said parasitic line appearing as an open-circuit at said higher resonant frequency and as a closed-circuit at said lower resonant frequency.

5,568,156

# HIGH FREQUENCY WAVE GLASS ANTENNA FOR AN AUTOMOBILE

Fumitaka Terashima; Toshihiko Saitou, and Kiyoshi Shibata, all of Kawasaki, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Continuation of Ser. No. 133,212, Oct. 7, 1993, abandoned.

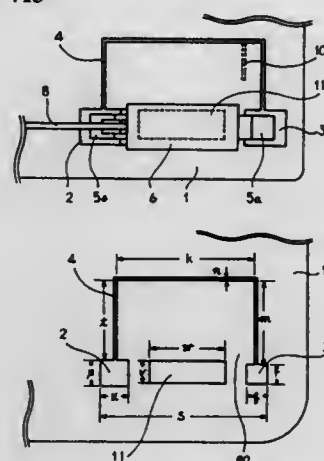
This application May 1, 1995, Ser. No. 432,080

Claims priority, application Japan, Oct. 9, 1992, 4-298018

Int. Cl.<sup>6</sup> H01Q 1/32

U.S. Cl. 343—713

14 Claims



1. A high frequency wave glass antenna for an automobile comprising:

- a line shaped antenna provided on a glass plate of a window of an automobile, said line shaped antenna having a shape selected from the group consisting of a circular, elliptic and a polygonal shape, said line shaped antenna having an opening portion enclosed by said line shaped antenna and having two ends forming a mouth of said opening, a first end of said two ends of the antenna conductor is connected to an electricity feeding portion and a second end of said two ends is connected to a grounding conductor;
- a preamplifier circuit provided on the glass plate of the window for amplifying a signal received by the antenna conductor;
- an insular conductor capacitively coupled to the preamplifier circuit; and
- wherein an area of the grounding conductor is not smaller than 2.5 cm<sup>2</sup>.

5,568,157

# DUAL PURPOSE, LOW PROFILE ANTENNA

Philip M. Anderson, Shepton Mallett, United Kingdom, assignor to Securicor Datatrak Limited, United Kingdom

Continuation of Ser. No. 184,469, Jan. 21, 1994, abandoned.

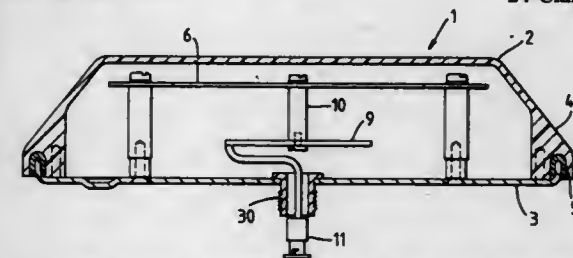
This application Jun. 30, 1995, Ser. No. 497,140

Claims priority, application United Kingdom, Jan. 25, 1993, 9301400

Int. Cl.<sup>6</sup> H01Q 1/32

U.S. Cl. 343—713

24 Claims



1. A dual purpose antenna comprising first and second planar conductive antenna elements separated by a dielectric and usable with radio signals in two widely separated regions of the radio spectrum simultaneously,

the first element being a radiating/receiving element for the high frequency signals in the higher region and the second element serving both as part of a resonant circuit including the first element in its high frequency operation and as a low frequency voltage probe for receiving the E-component of signals in the low frequency region,

the size of the second element being negligible compared to the wavelength of the signals in the low frequency region such that the second element is effective to sample the voltage produced at a point in space by the E-component of signals in the low frequency region,

whereby integrated into the antenna there is a high frequency section including the first and second elements, the first element being electrically connected to circuitry arranged such that the high frequency section is tuned and loaded for operation in the high frequency region, and there is a low frequency section comprising the second element which is electrically connected to circuitry arranged for the second element to act as a voltage probe to receive the E-component of signals in the low frequency region at the same time as the high frequency section operates in the high frequency region widely separated from the low frequency region.

5,568,158

# ELECTRONIC VARIABLE POLARIZATION ANTENNA FEED APPARATUS

Harry J. Gould, 1649 E. Hale, Mesa, Ariz. 85203

Continuation-in-part of Ser. No. 855,250, Mar. 23, 1992, abandoned, which is a continuation-in-part of Ser. No. 562,686, Aug. 6, 1990, abandoned. This application Mar. 17, 1994, Ser. No. 210,132

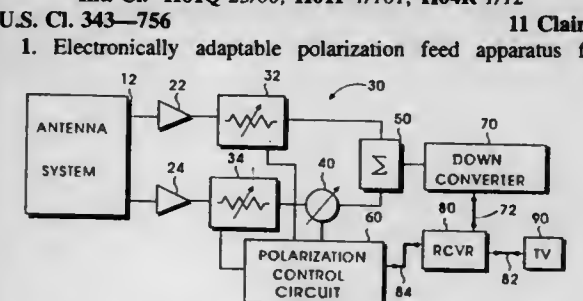
The portion of the term of this patent subsequent to Sep. 14, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> H01Q 23/00; H01P 1/161; H04R 1/12

U.S. Cl. 343—756

11 Claims

1. Electronically adaptable polarization feed apparatus for



receiving polarized radio frequency (RF) signals for providing a maximum signal to noise ratio of the received RF signal comprising, in combination:

antenna means for receiving polarized RF signals, and having a first port for receiving components of a first polarization sense of an RF signal and a second port for receiving components of a second polarization sense of the RF signal, and in which the second polarization sense is substantially orthogonal to the first polarization sense;

first amplifier means connected to the first port of the antenna means for amplifying the components of the first polarization sense;

first variable attenuating means connected to the first amplifier means for attenuating only the amplified components of the first polarization sense;

second amplifier means connected to the second port of the antenna means for amplifying the components of the second polarization sense;

second variable attenuating means connected to the second amplifier means for attenuating only the amplified components of the second polarization sense;

switchable one hundred eighty degree phase shift means for providing a desired phase relationship between the components of the first polarization sense and the components of the second polarizations sense;

a single combiner for combining the components of the first and second polarization senses from the first and second attenuating means; and

means for adjusting the first and second variable attenuating means and for switching the phase shift means to provide a maximum signal to noise ratio of the received RF signal.

5,568,159

# FLARED NOTCH SLOT ANTENNA

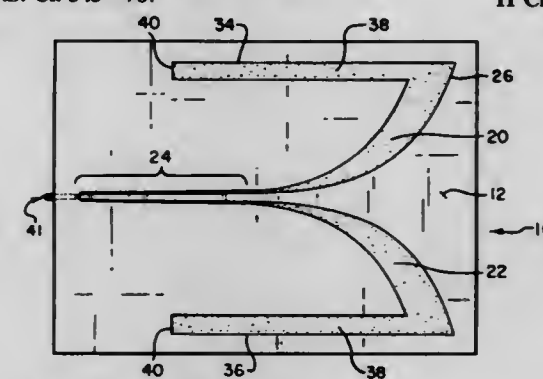
Edward L. Pelton, San Diego, and John R. Glabe, Ramona, both of Calif., assignors to McDonnell Douglas Corporation, Huntington Beach, Calif.

Continuation-in-part of Ser. No. 241,565, May 12, 1994, abandoned. This application Mar. 14, 1995, Ser. No. 403,404

Int. Cl.<sup>6</sup> H01Q 13/18

U.S. Cl. 343—767

11 Claims



1. A slot antenna, comprising:

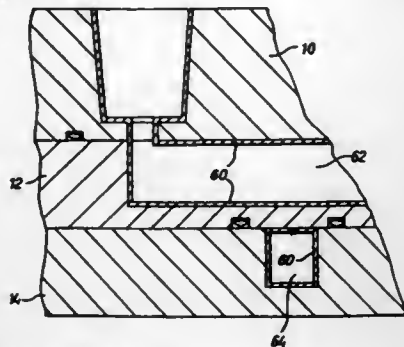
a generally planar electrically conductive sheet having first and second major surfaces and edges;

a portion of the conductive sheet being removed to form a single slot, said slot including a pair of symmetrical slot sections having facing edges separated by a strip of said conductive sheet, and a linking portion of the slot interconnecting the two slot sections at a first end of each slot section;

said conductive sheet strip having a transition portion extending away from first ends of the slot sections where slot sections facing edges are substantially parallel to one another, and beyond the transition portion facing edges of the slot sections continuously curving away from each other to form a radiating aperture therebetween; and

an electromagnetic energy absorbing body enclosing the electrically conductive sheet first major surface and edges while leaving the slot sections free on the sheet second major surface.

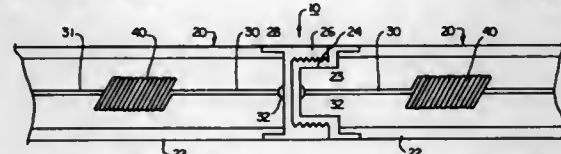
**5,568,160**  
**PLANAR HORN ARRAY MICROWAVE ANTENNA**  
 John L. F. C. Collins, 3 Cupar Road, Largoward, Leven, Fife KY9 1HX, United Kingdom  
 Continuation of Ser. No. 965,383, Dec. 14, 1992, abandoned.  
 This application Feb. 10, 1995, Ser. No. 388,161  
 Claims priority, application United Kingdom, Jun. 14, 1990, 9013337; Jun. 15, 1990, 9013366; Jan. 8, 1991, 9100322  
 Int. Cl.<sup>6</sup> H01Q 13/00; 13/02  
 U.S. Cl. 343—778 6 Claims



1. An antenna comprising:

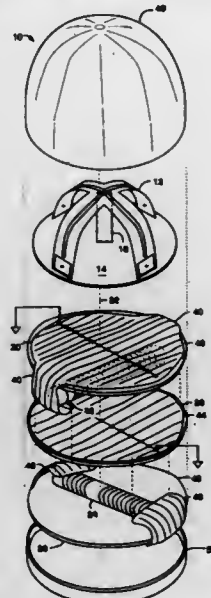
- a first planar member formed from a plastics material, the first planar member having an upper planar face, a plurality of horns extending from the upper planar face interiorly of the first planar member, a lower planar face, and projecting ribs on said lower planar face;
- a second planar member formed from a plastics material, the second planar member having an upper planar face provided with projecting ribs corresponding to those on the lower planar face of the first planar member, said upper planar face of the second planar member also being formed with a system of open-topped channels;
- said first and second planar members being in face-to-face relationship with said ribs in contact;
- a rib weld on said first and second planar members fixing said first and second planar members together to form a unitary assembly, whereby said open-topped channels are closed by the first planar member to form waveguide channels communicating with said horns; and
- at least those exposed faces of the assembly defining the horns and the waveguide channels being metallized.

**5,568,161**  
**SECTIONALIZED ANTENNA**  
 Leon F. Fulmer, Sr., Prosperity, S.C., assignor to Glassmaster Company, Newberry, S.C.  
 Filed Aug. 5, 1994, Ser. No. 286,537  
 Int. Cl.<sup>6</sup> H01Q 21/00  
 U.S. Cl. 343—816 12 Claims



1. A dipole section for an electromagnetic, co-linear, stacked dipole antenna, comprising:
- a) a support tube having two ends;
  - b) a pair of connector fittings, one being located at each end of said support tube;
  - c) a pair of electrically conductive elements disposed end-to-end within said support tube, each of said elements having one end electrically connected with one of said connector fittings; and
  - d) a phasing section disposed between the adjacent ends of said conductive elements and operative to shift the phase of current through said elements.

**5,568,162**  
**GPS NAVIGATION AND DIFFERENTIAL-CORRECTION BEACON ANTENNA COMBINATION**  
 Robert A. Samsel, Saratoga; Brian G. Westfall, Mountain View, and Stephen K. Will, Sunnyvale, all of Calif., assignors to Trimble Navigation Limited, Sunnyvale, Calif.  
 Filed Aug. 8, 1994, Ser. No. 287,188  
 Int. Cl.<sup>6</sup> H01Q 7/04; 1/52  
 U.S. Cl. 343—842 6 Claims

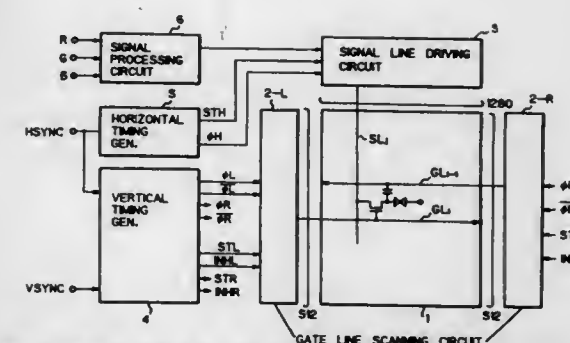


1. An antenna system, comprising:

- a microwave receiver antenna for receiving microwave radio transmissions from orbiting global positioning system (GPS) satellites and for connection to a GPS navigation receiver;
- magnetic loop antenna means for connection to said GPS navigation receiver, and proximate to the microwave receiver antenna, and for receiving radio beacon transmissions that include differential correction information;
- a radome providing for the enclosure and protection from weather and mechanical injury of the microwave receiver antenna and the magnetic loop antenna means disposed within, wherein the radome is comprised of material transparent to microwave radio signals and the relative placement of the microwave receiver antenna and the magnetic loop antenna means within the radome provides for a view of the sky by the microwave receiver antenna that is unobstructed by the magnetic loop antenna means; and
- radio electrostatic field shielding means comprising a plurality of similarly-oriented conductors that surround the magnetic loop antenna means where each of said conductors is open-ended and has a single connection to ground, wherein parasitic currents that would otherwise desensitize the magnetic loop antenna are prevented by open-ending said conductors.

**5,568,163**  
**APPARATUS FOR DRIVING GATE STORAGE TYPE LIQUID CRYSTAL DISPLAY PANEL CAPABLE OF SIMULTANEOUSLY DRIVING TWO SCAN LINES**  
 Fujio Okumura, Tokyo, Japan, assignor to NEC Corporation, Japan  
 Filed Sep. 2, 1994, Ser. No. 300,800  
 Claims priority, application Japan, Sep. 6, 1993, 5-220749  
 Int. Cl.<sup>6</sup> G09G 3/36  
 U.S. Cl. 345—100 10 Claims

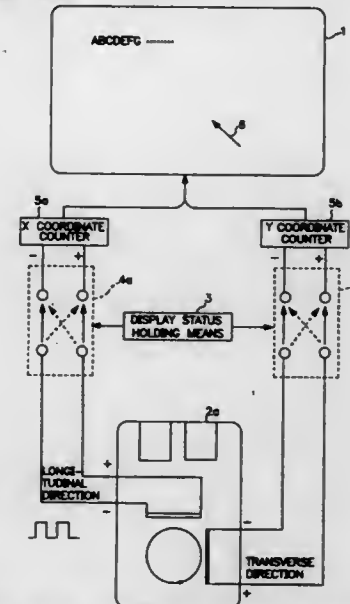
1. An apparatus for driving a liquid crystal display panel having a plurality of gate lines, a plurality of signal lines and a plurality of pixels, each pixel including a liquid crystal cell, a switching transistor connected between said liquid crystal cell and one of said signal lines and having a gate connected to one of said gate lines,



and a storage capacitor connected between said liquid crystal cell and another gate line adjacent to the same one of said gate lines, the apparatus comprising:

- means for simultaneously generating two gate pulse signals and transmitting the two gate pulse signals to two adjacent ones of said gate lines; and
- means for controlling pulse widths of the two gate pulse signals so that at least one of a rising edge and a falling edge of one of the two gate pulses is different from that of the other, wherein the storage capacitor belonging to one of said gate lines is connected to another of said gate lines located upstream in a scanning direction, and said pulse width controlling means turning OFF the other gate line prior to turning OFF the one gate line.

**5,568,164**  
**CURSOR DISPLAY SYSTEM**  
 Hirooobu Ogawa, Kawasaki, Japan, assignor to Fujitsu Limited, Japan  
 Continuation of Ser. No. 278,157, Jul. 21, 1994, abandoned.  
 This application Nov. 1, 1995, Ser. No. 551,369  
 Claims priority, application Japan, Dec. 21, 1993, 5-321594  
 Int. Cl.<sup>6</sup> G09G 3/36  
 U.S. Cl. 345—145 3 Claims



1. A cursor display system for displaying a cursor on a display screen of a display device adapted to permit turning of an image on said display screen through 180 degrees, said cursor display system comprising:
- display means for turning said image on said display screen through 180 degrees;
  - a pointing device moveable to control a movement of said cursor appearing on said display screen and transmitting data indicative of operating directions of said pointing device;
  - display status holding means for storing status data indicating whether said display device is operating in a normal status or

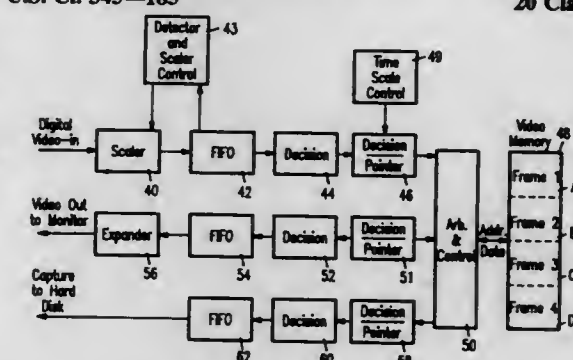
in an inverted status in which said display means turns said image through 180 degrees;

changeover means for inverting the data indicative of said operating directions of said pointing device when said status data indicates said inverted status;

cursor position calculating means for calculating a display position of said cursor to be displayed on said display screen of said display device, based on the inverted data from said changeover means; and

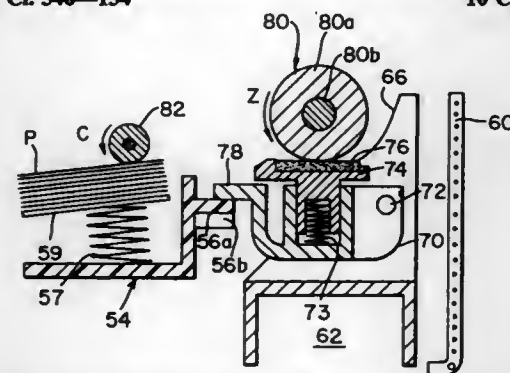
said display device displaying said cursor on said display screen based on said calculated display position such that said displayed cursor moves on said display screen in the same direction as a direction of movement of said pointing device when said display device operates in said inverted status.

**5,568,165**  
**VIDEO PROCESSING TECHNIQUE USING MULTI-BUFFER VIDEO MEMORY**  
 Scott A. Kimura, Saratoga, Calif., assignor to AuraVision Corporation, Fremont, Calif.  
 Filed Oct. 22, 1993, Ser. No. 142,623  
 Int. Cl.<sup>6</sup> G09G 5/00  
 U.S. Cl. 345—185 20 Claims





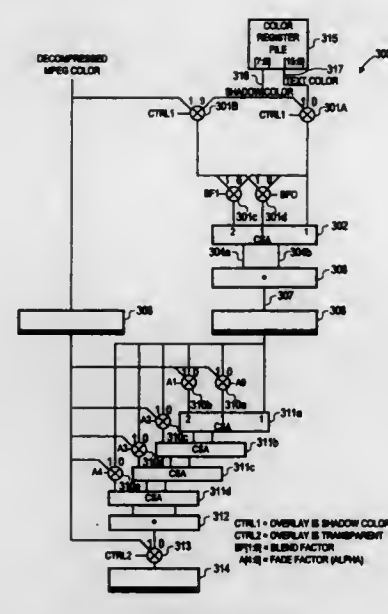
**5,568,166**  
**CASSETTE ACTUATED PAPER JAM RELEASE FOR RECORDING APPARATUS**  
 Manabu Yamazaki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan  
 Filed Feb. 4, 1994, Ser. No. 191,510  
 Claims priority, application Japan, Feb. 5, 1993, 5-002911 U  
 Int. Cl.<sup>6</sup> G01D 15/24; 15/26; 15/34; B65H 5/00  
 U.S. Cl. 346—134 **10 Claims**



1. A recording apparatus comprising:
  - a housing;
  - a paper cassette insertable into the housing to a loaded position at which paper sheets are advanced from the cassette to a paper feed path in the housing, said cassette being removable from the housing;
  - a sheet handling device supported by the housing, said housing located in the paper feed path downstream from the loaded position of the cassette, said sheet handling device including a rotatable feed component, a pressing component to retain a sheet of paper against the feed component, and a movable holder to support the pressing component for movement between an active position against the feed component and a retracted position spaced from the feed component; and
  - cooperating means, including a lifting and support component on the cassette, and a lifted and supported portion on the holder, for lifting and supporting the holder so that the pressing component is retained in said active position upon insertion of the cassette to said loaded position, and for moving said pressing component to said retracted position upon removal of the cassette from the housing.

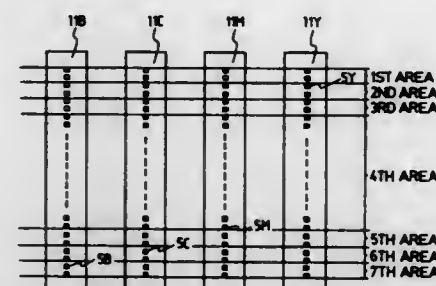
**5,568,167**  
**SYSTEM FOR PROVIDING ANTIALIASED VIDEO OVERLAYS**  
 David E. Galbi, Sunnyvale, and Stephen C. Purcell, Mountain View, both of Calif., assignors to C-Cube Microsystems, Inc., Milpitas, Calif.  
 Filed Sep. 23, 1994, Ser. No. 311,670  
 Int. Cl.<sup>6</sup> H04N 9/74 **21 Claims**

1. A system for superimposing a lyrics overlay image on a video image, comprising:
  - a first input circuit for receiving a first data stream of symbols, said symbols encoding pixels of said lyrics overlay image by reference to a color map;
  - a second input circuit for receiving a second data stream including color intensity values of pixels of said video image;
  - a decoding circuit receiving said first data stream of symbols and providing a third data stream including color intensity values of said pixels of said lyrics overlay image, said color intensity values in said third data stream corresponding to color intensity values corresponding to colors specified in said color map;
  - an image blending circuit receiving said second and third data streams, said image blending circuit providing a fourth data stream including weighted sums of color intensity values in said second and third data streams.



**5,568,168**  
**RECORDING METHOD WITH SCANNING BOUNDARY STREAK REDUCTION**  
 Kenjiro Watanabe, Ohta-ku, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan  
 Continuation of Ser. No. 866,298, Apr. 13, 1992, abandoned, which is a continuation of Ser. No. 489,356, Mar. 6, 1990, abandoned. This application Mar. 8, 1993, Ser. No. 28,612  
 Claims priority, application Japan, Mar. 7, 1989, 1-052862  
 Int. Cl.<sup>6</sup> B41J 2/21 **17 Claims**

U.S. Cl. 347—43



1. A printing method for printing by integrally scanning first, second, third, and fourth arrays of discharge ports in a direction transverse to a conveying direction of a recording medium, each array comprising a plurality of discharge ports and each array capable of recording with one of black, cyan, magenta, and yellow colors, said method comprising the steps of:
  - scanning in one scan:
    - a first area recordable only with the first discharge port array,
    - a second area recordable only with the first and second discharge port arrays,
    - a third area recordable only with the first, second, and third discharge port arrays,
    - a fourth area recordable only with the first, second, third, and fourth discharge port arrays,
    - a fifth area recordable only with the second, third, and fourth discharge port arrays,
    - a sixth area recordable only with the third and fourth discharge port arrays, and
    - a seventh area recordable only with the fourth discharge port array,
  - wherein, in a subsequent scan different from the one scan:
    - the fifth area is recordable only with the first discharge port array,

the sixth area is recordable only with the first and second discharge port arrays, and  
 the seventh area is recordable only with the first, second, and third discharge port arrays.

**5,568,169**  
**METHOD AND APPARATUS USING TWO DIFFERENT BLACK INKS TO REDUCE INTERCOLOR BLEEDING AND PROVIDE HIGH QUALITY EDGE DEFINITION WITH THERMAL INK JET SYSTEMS**  
 Lesley P. Dudek, Webster, N.Y.; Vaughan L. Dewar, Bartlett, Tenn.; Michael C. Ferringer, and Peter A. Torpey, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.  
 Filed Oct. 19, 1994, Ser. No. 325,016  
 Int. Cl.<sup>6</sup> B41J 2/21; 2/205 **19 Claims**

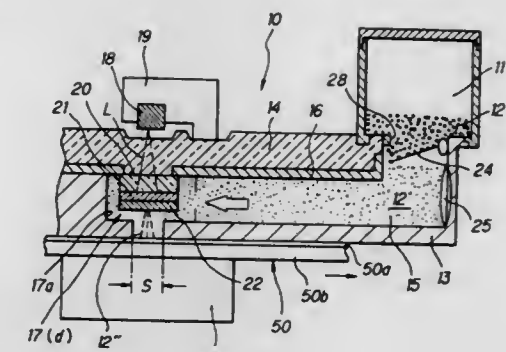
U.S. Cl. 347—43

FAST AND SLOW DRY INKS	SLOW DRY BLACK ONLY	FAST AND SLOW DRY INKS	SLOW DRY BLACK ONLY	FAST AND SLOW DRY INKS
SLOW DRY BLACK ONLY	FAST AND SLOW DRY INKS	SLOW DRY BLACK ONLY	FAST AND SLOW DRY INKS	SLOW DRY BLACK ONLY
FAST AND SLOW DRY INKS	SLOW DRY BLACK ONLY	FAST AND SLOW DRY INKS	SLOW DRY BLACK ONLY	FAST AND SLOW DRY INKS
SLOW DRY BLACK ONLY	FAST AND SLOW DRY INKS	SLOW DRY BLACK ONLY	FAST AND SLOW DRY INKS	SLOW DRY BLACK ONLY
FAST AND SLOW DRY INKS	SLOW DRY BLACK ONLY	FAST AND SLOW DRY INKS	SLOW DRY BLACK ONLY	FAST AND SLOW DRY INKS

1. A color ink jet printing device for producing reduced inter-color bleeding of inks comprising:
  - an ink jet printer including at least one printhead for printing a color image onto a recording medium;
  - at least three separate ink supplies in communication with said at least one printhead, a first supply containing a slow drying black ink, a second supply containing a fast drying black ink and a third supply containing a fast drying non-black color ink;
  - determining means communicating with the ink jet printer for determining black portions of the color image to be printed on the recording medium; and
  - control means for driving the ink jet printer to deposit on select black a partial tone, using said fast drying black ink and subsequently deposit a whole tone superposed on said partial tone using said slow drying black ink.

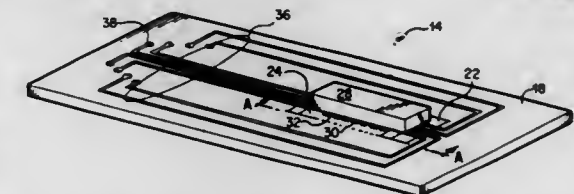
**5,568,170**  
**LASER RECORDING APPARATUS FOR VAPORIZING COLDER DYE ACROSS A GAP, AND RECORDING METHOD THEREOF**  
 Hideki Hirano, Kanagawa; Hidemi Tomita, Tokyo, and Kenji Shinozaki, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan  
 Filed Jun. 13, 1994, Ser. No. 258,737  
 Claims priority, application Japan, Jun. 14, 1993, 5-168697  
 Int. Cl.<sup>6</sup> B41J 2/435 **15 Claims**

1. A recording apparatus which comprises a recording part in which a layer of a heat-fusible recording material is formed opposite a recording medium with a gap between, said recording part being so constructed as to selectively heat said heat-fusible recording material, thereby vaporizing or ablating it, and transfer the vapor to said recording medium through said gap, said recording material containing a heat energy absorber which promotes the heating of the recording material.



**5,568,171**  
**COMPACT INKJET SUBSTRATE WITH A MINIMAL NUMBER OF CIRCUIT INTERCONNECTS LOCATED AT THE END THEREOF**  
 Brian J. Keefe, La Jolla; Winthrop D. Childers; Steven W. Steinfield, both of San Diego, and W. Bruce Reid, Solana Beach, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.  
 Continuation-in-part of Ser. No. 179,866, Jan. 11, 1994, which is a continuation of Ser. No. 862,086, Apr. 2, 1992, Pat. No. 5,278,584. This application Oct. 6, 1994, Ser. No. 319,895  
 Int. Cl.<sup>6</sup> B41J 2/05 **39 Claims**

U.S. Cl. 347—58



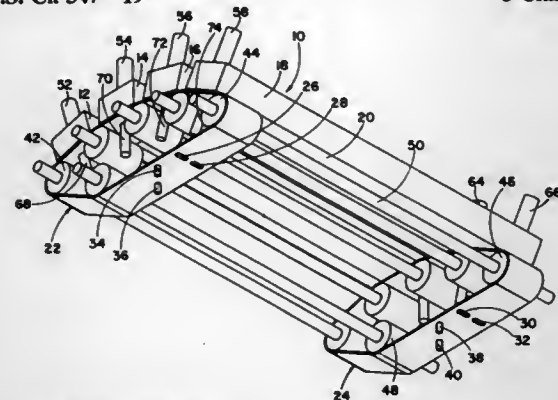
1. A printhead member having an array of inkjet nozzle orifices in fluid communication with an ink reservoir, with the array extending a distance in a given longitudinal direction, comprising:
  - a substrate having end-portion spaced apart in the longitudinal direction at opposite ends of the substrate, a plurality of actuation elements and a plurality of ink election chambers which are respectively aligned with the nozzle orifices, each of said ink ejection chambers containing at least one of said actuation elements for propelling ink through its respective nozzle orifice;
  - a plurality of ink channels in fluid communication with said ink ejection chambers for supplying ink from the ink reservoir;
  - first circuitry on said substrate connected to said actuation elements and having a plurality of interconnect junctions located only at said end-portion of the substrate; and
  - second circuitry on said printhead member and connected to said first circuitry through said interconnect junctions for carrying a plurality of actuation signals to said actuation elements, said second circuitry having transmission circuitry including a given number of actuation lines which are connected to said first circuitry through said interconnect junctions, wherein said substrate includes a given number of ink ejection chambers, wherein said first circuitry includes demultiplexing means connected between said interconnect junctions and said actuation elements in said given number of ink ejection chambers, and wherein said given number of actuation lines is less than said given number of ink ejection chambers.

# 5,568,172 PRINTING METHOD AND APPARATUS FOR REGISTERING DOTS

Bruce Cowger, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.  
Division of Ser. No. 939,506, Sep. 2, 1992, Pat. No. 5,444,469.  
This application Feb. 17, 1995, Ser. No. 390,608  
Int. Cl.<sup>6</sup> B41J 2/01

U.S. Cl. 347—19

8 Claims



1. A printer comprising:  
a first dot-generating element having dot-generators thereon for generating dots on paper;  
a second dot-generating element having dot-generators thereon for generating dots on paper;  
a paper carrier, including a mark disposed on said paper carrier;  
means for driving the paper carrier past said first and second dot-generating elements for printing dots on paper in the carrier;  
means for sensing a first position of said mark relative to said first dot-generating element;  
means for sensing a second position of said mark relative to said second dot-generating element, said second position being one at which dots printed on paper in said carrier by said first dot-generating element at said first position are registered with dots printed on such paper by said second dot-generating element at said second position; and  
means for using said first sensed position and said second sensed position to register dots printed by said dot-generating elements.

# 5,568,173 INK JET PRINTING METHOD

Luc Leenders, Herentals; Herman Remmerle, Edegem, and Carlo Uyttendaele, Berchem, all of Belgium, assignors to AGFA-GEVAERT, N.V., Mortsel, Belgium

Filed Aug. 26, 1994, Ser. No. 295,058

Claims priority, application European Pat. Off., Sep. 7, 1993, 93202599; Dec. 29, 1993, 93203720

Int. Cl.<sup>6</sup> B41J 2/205; B41M 5/20

U.S. Cl. 347—96

28 Claims

1. A printing method which comprises the steps of:  
(1) projecting by means of a plurality of jets a plurality of liquids, each containing different concentrations of at least one substantially light-insensitive organic silver salt, in the form of droplets onto a receiving material containing at least one organic reducing agent for said substantially light-insensitive organic silver salt, said liquid droplets with said receiving material thus forming a silver image or potential silver image thereon, and  
(2) in the event of incomplete silver image formation, carrying out one of the following processes on said receiving material during or after liquid droplet deposition to complete said silver image formation: uniform heating, uniform exposure to chemically active electromagnetic radiation and uniform heating together with uniform exposure to chemically active electromagnetic radiation.

# 5,568,174 CONNECTOR AND PRINTER HEAD USING THE SAME

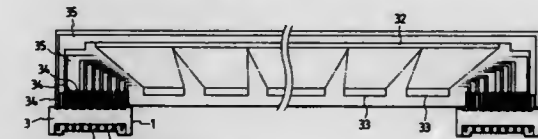
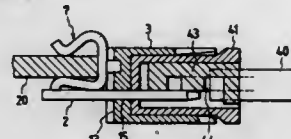
Takaya Nagahata; Tokihiko Kishimoto, both of Kyoto, and Kolchi Wada, Yamagata, all of Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Filed Dec. 6, 1993, Ser. No. 163,031

Claims priority, application Japan, Mar. 12, 1993, 5-052234  
Int. Cl.<sup>6</sup> B41J 2/335

U.S. Cl. 347—200

6 Claims



4. A print head comprising:  
a circuit board including:  
a plurality of printing elements linearly formed on said circuit board;  
a plurality of driving circuits for driving said printing elements;  
a plurality of connection terminals to be connected to an external control circuit board; and  
conductor pattern lines formed on said circuit board to connect with said printing elements, said driving circuits and connection terminals; and  
a connector attached to the circuit board adjacent to the connection terminals, said connector comprising:  
a plurality of terminal pins, each of terminal pins including a linear base portion having a pointed front portion and an integral grip portion for gripping said circuit board; and  
a connector housing being opened at one side, and having insertion holes spaced by a predetermined distance from each other at another side opposite to said one side for respectively passing said terminal pins;  
wherein said terminal pins are spaced a predetermined distance from one another in juxtaposed relation to one another, with said grip portions disposed at the same side; and  
wherein each of said terminal pins is inserted into a corresponding one of said insertion holes of said connector housing from the pointed front end portion of said each of said terminal pins, so that said terminal pins are attached to said connector housing.

# 5,568,175 THERMAL PRINT HEAD

Suhn-Ji Suh, and Hong-Geun Yang, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 6, 1995, Ser. No. 554,338

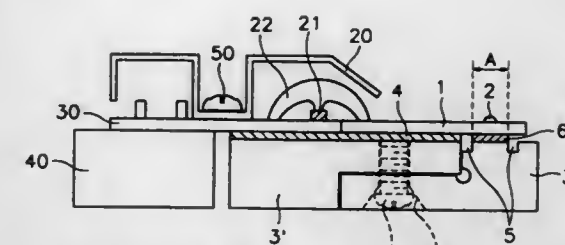
Claims priority, application Rep. of Korea, Jun. 21, 1995, 95-16688

Int. Cl.<sup>6</sup> B41J 2/335; 2/34

U.S. Cl. 347—200

14 Claims

1. A thermal print head, comprising:  
a resistance substrate having a front and rear surface;  
a plurality of heating elements for converting electrical energy into heat energy, formed on the front surface of the resistance substrate;  
a cooling board for dissipating heat generated from the heating elements and the resistance substrate, wherein the cooling board is divided into separable first and second parts, the first part being disposed opposite the rear surface of the resistance substrate and below the heating elements; and



a cooling compound with high thermal conductivity inserted between the first part of the cooling board and the rear surface of the resistance substrate.

# 5,568,176 THERMAL PRINT HEAD AND METHOD OF MAKING THE SAME

Kyung-Ha Moon; Bae-Won Lee, both of Suwon, and Hong-Geun Yang, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

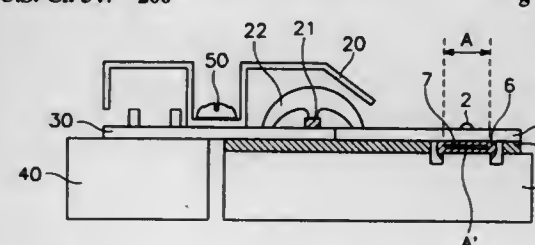
Filed Nov. 20, 1995, Ser. No. 560,914

Claims priority, application Rep. of Korea, Jul. 14, 1995, 95-20790

Int. Cl.<sup>6</sup> B41J 2/335

U.S. Cl. 347—200

8 Claims



1. A thermal print head, comprising:  
a resistance substrate having front and rear surfaces, the rear surface having first and second regions, the front surface having a third region opposite the first region;  
a plurality of heating elements mounted on the resistance substrate in the third region;  
a cooling board positioned near the rear surface of the resistance substrate, the cooling board having a principle plane with a first part corresponding to the first region of the rear surface of the resistance substrate and with a second part corresponding to the second region of the rear surface of the resistance substrate;  
a cooling compound with high thermal conductivity, positioned between the first region of the resistance substrate and the first part of the cooling board;  
a metal film with high thermal conductivity, positioned inside the cooling compound; and  
an adhesive positioned between the second region of the rear surface of the resistance substrate and the second part of the cooling board, the adhesive bonding the resistance substrate and the cooling board, wherein at least one groove is formed on the principal plane of the cooling board, the at least one groove being formed between the first region and the second region, thereby separating the cooling compound from the adhesive.

# 5,568,177 THERMAL TRANSFER PRINTING RIBBON FOR PRINTING SECURITY BAR CODE SYMBOLS

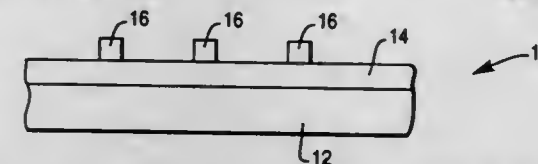
Shashi G. Talwalkar, Kettering, and Marion E. McCreight, West Carrollton, both of Ohio, assignors to AT&T Global Information Solutions Company, Dayton, Ohio

Filed Apr. 3, 1995, Ser. No. 415,276

Int. Cl.<sup>6</sup> B41J 31/05; 31/08

U.S. Cl. 347—217

18 Claims



1. A thermal transfer printing ribbon for printing security bar code symbols, comprising:  
a base having a top surface;  
a first visible coating layer adhered to said top surface of said base, said first visible coating layer having a top surface; and  
a second magnetic recognition characteristics coating layer adhered to said top surface of said first visible coating layer.

# 5,568,178 METHOD AND APPARATUS FOR DRIVING EDGE-EMISSION TYPE ELECTROLUMINESCENT ELEMENTS, METHOD AND APPARATUS FOR DRIVING A LINE HEAD HAVING A PLURALITY OF EDGE-EMISSION TYPE ELECTROLUMINESCENT ELEMENTS AND IMAGE FORMING APPARATUS FOR FORMING IMAGE DATA ON

Kei Hara, Shizuoka-ken, and Shigeru Morino, Numazu, both of Japan, assignors to Kabushiki Kaisha TEC, Tokyo, Japan

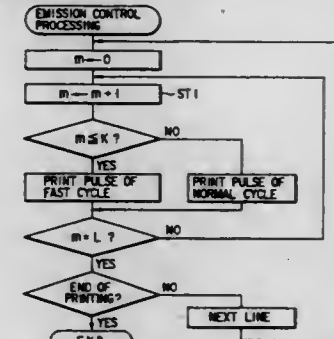
Filed Dec. 15, 1993, Ser. No. 167,335

Claims priority, application Japan, Dec. 25, 1992, 4-347268

Int. Cl.<sup>6</sup> B41J 2/47; 2/435; 2/45

U.S. Cl. 347—237

12 Claims



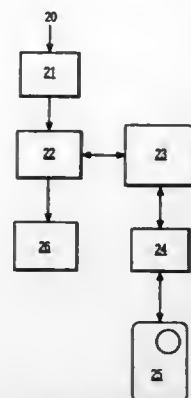
1. A method for driving edge-emission type electroluminescent elements to emit light to expose an image carrier and to form image data clearly on the image carrier, comprising:  
a one-pixel starting step of supplying a first set of pulses of a series of pulses forming one pixel of image data to electrodes of the electroluminescent elements at a first cycle, the first set of pulses causing a potential difference across the electrodes to exceed a preset threshold value at which the electroluminescent elements emit light; and  
a one-pixel ending step, continuous with said one-pixel starting step, of supplying a second set of pulses of the series of pulses forming one pixel of image data to the electrodes of the electroluminescent elements at a second cycle slower than the first cycle, the second set of pulses causing a potential difference across the electrodes to exceed the preset threshold value at which the electroluminescent elements emit light; and  
wherein the electroluminescent elements emit sufficient light during said first set of pulses to cause the image carrier to be exposed, and emit sufficient light during said second set of pulses to maintain exposure of the image carrier.



5,568,179  
METHOD AND APPARATUS FOR DEVICE CONTROL BY  
DATA TRANSMISSION IN TV LINES  
Eric Diehl, Strasbourg, and Joel Hamon, Lipsheim, both of  
France, assignors to Thomas Consumer Electronics, S.A.,  
Courbevoie, France  
Filed May 19, 1993, Ser. No. 64,522  
Claims priority, application European Pat. Off., May 19,  
1992, 92401364

U.S. Cl. 348—6

## 11 Claims



4. In a system for processing a video signal including data other than video and audio data, said data occurring during a horizontal line interval within a vertical blanking interval, said data other than video and audio data being organized in packets of data, each of said packets including descriptor data and application data, apparatus comprising:

a data extractor for extracting said descriptor data and said application data;  
first and second means for evaluating said application data; and  
a data dispatcher for decoding said descriptor data to select a particular one of said first and second evaluating means to evaluate said application data, and for directing said application data to only said particular evaluating means;  
said first evaluating means comprising a pay TV decoder processor and said second evaluating means comprising a control access processor included in a smart card for processing at least a portion of said application data directed to said second evaluating means.

5,568,180

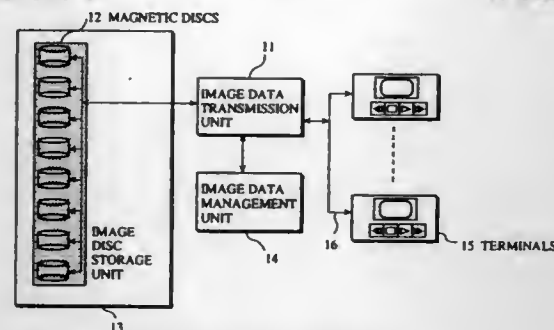
**VIDEO-ON-DEMAND SYSTEM OF REDUCED STORAGE CAPACITY WHICH CAN PROVIDE NONINTERRUPTED BROADCAST TO A PLURALITY OF USERS**

Tadashi Okamoto, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd. Osaka, Japan

Filed Apr. 6, 1995, Ser. No. 418,584  
Claims priority, application Japan, Apr. 11, 1994, 6-072224  
Int. Cl.<sup>6</sup> H04N 7/173

U.S. Cl. 348—7

## 28 Claims



1. A video-on-demand system, comprising:  
an image data storage device, including a plurality of recording  
media for storing a plurality of programs, for storing image

data for the programs divided into a plurality of blocks which are distributed among all of the recording media;

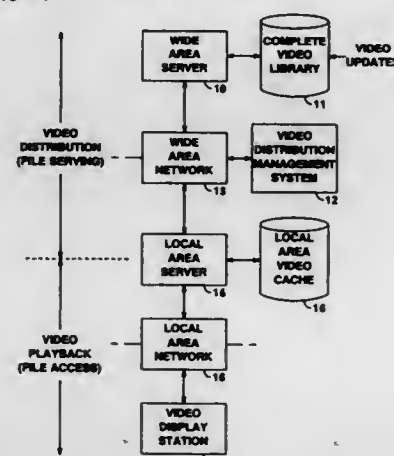
an image data management device, including image data management tables in which management information for the image data is stored, for consulting the image data management tables and transmitting management information separately for each block, when there is a request from outside the device for information about one of the programs, wherein the image data management tables comprise a title table for corresponding a title of each of the programs with starting block identification information for each of the programs, a block table for corresponding block identification information for each of the blocks with starting frame identification information for each of the blocks, and a frame table for corresponding frame identification information for each frame with position information showing at which position on which recording medium out of the recording media each of the frames is stored; and

an image data transmission device for requesting to the image data management device for management information related to a block which is to be transmitted in a transmission of a program requested by a user, for receiving the management information from the image data management device, for retrieving image block data separately for each block from the recording media and for transmitting the image block data to the user.

**5,568,181**  
**MULTIMEDIA DISTRIBUTION OVER WIDE AREA**  
**NETWORKS**  
David G. Greenwood, Chapel Hill, and David B. Lindquist,  
Raleigh, both of N.C., assignors to International Business  
Machines Corporation, Armonk, N.Y.  
Continuation of Ser. No. 164,174, Dec. 9, 1993, abandoned.  
This application May 1, 1995, Ser. No. 432,548  
Int. Cl.<sup>6</sup> H04N 7/10

U.S. Cl. 348—7

## 26 Claims

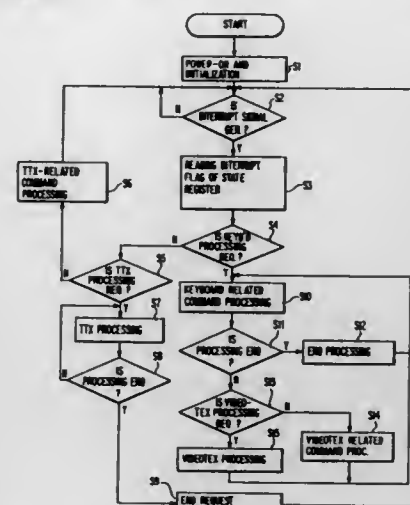


1. A method of controlling the distribution of full motion video files, comprising the steps of  
determining if a cache at a network server contains a requested video file responsive to a request from a viewing station to view the video file,  
requesting the transmission of the requested file from a shared video library at a rate lower than a real time playback rate of the video file in the event the cache does not contain the requested file, and  
activating the transmission of the requested video file in the cache to the viewing station at a real time playback rate.

5,568,182  
TELETEXT AND VIDEOTEX PROCESSING SYSTEM  
AND METHOD  
Moon H. Suh, Seoul, Rep. of Korea, assignor to Samsung  
Electronics Co., Ltd., Kyungki-do, Rep. of Korea  
Filed Jul. 25, 1994, Ser. No. 280,547  
Claims priority, application Rep. of Korea, Jul. 23, 1993,  
93-14182

U.S. Cl. 348—13      Int. Cl.<sup>6</sup> H04N 7/14

## 10 Claims



9. A method for controlling a teletext and videotex processing system including an interrupt controlled central processor unit, said method comprising the steps of:

- (a) detecting an interrupt request signal;
- (b) identifying whether the interrupt request signal is a keyboard processing request signal or not based on settings of a plurality of interrupt flags;
- (c) when said interrupt request signal does not correspond to said keyboard processing request signal, performing teletex (ITX) processing;
- (d) when said interrupt request signal corresponds to said keyboard processing request signal, performing a command related with said keyboard when the interrupt request corresponds to said keyboard processing request signal identified during step (b) and then determining whether the processing end request exists; and
- (e) performing videotex processing when the videotex processing request exists before ending during step (d) and performing a command related to said videotex.

5,568,183

**NETWORK VIDEOCONFERENCING SYSTEM**

Leo M. Corjens, Norcross; Kenneth A. Franklin, Lawrenceville; Richard C. Mays, Atlanta, and Curtis M. Smith, Lawrenceville, all of Ga., assignors to Videoconferencing Systems, Inc., Norcross, Ga.

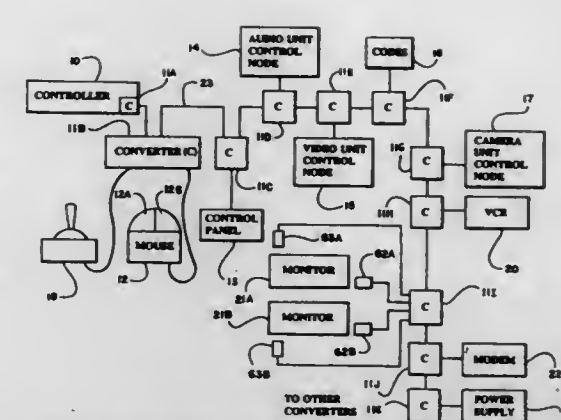
Continuation of Ser. No. 139,645, Oct. 20, 1993, abandoned.

This application Jan. 17, 1995, Ser. No. 373,868

U.S. Cl. 348—15

## 20 Claims

1. A videoconferencing system, comprising:
  - a network for carrying network standard signals;
  - a user input device responsive to input by a user for providing user control signals, said user control signals being included in a predetermined set of user control signals;
  - a first converter, connected to said user input device and to said network, for receiving said user control signals, for converting said user control signals into network standard user control signals, and for placing said network standard user control signals onto said network;



a camera assembly responsive to received camera control signals for providing a picture, said received camera control signals being included in a predetermined set of camera control signals;

a second converter, connected to said network and to said camera assembly, for receiving network standard camera control signals, for converting said network standard camera control signals into said received camera control signals, and for providing said received camera control signals to said camera assembly;

a monitor, functionally connected to said camera assembly, for displaying said picture; and

a controller, connected to said network, for receiving said network standard user control signals, for determining a camera assembly action specified by said network standard user control signals, for determining said network standard camera control signals necessary to implement said camera assembly action, and for placing said network standard camera control signals onto said network.

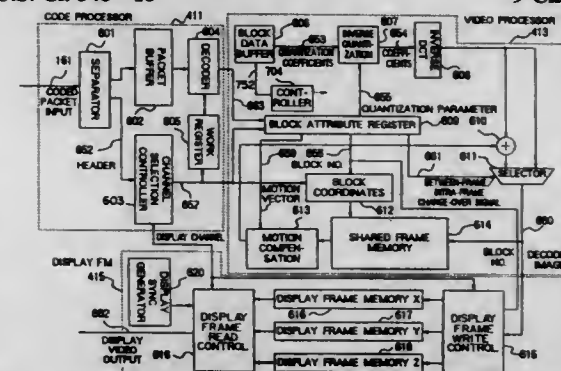
5,568,184  
MULTI-POINT MOTION PICTURE ENCODING AND  
DECODING APPARATUS

**Koichi Shibata, Kokubunji, and Taizo Kinoshita, Musashimura-  
rayama, both of Japan, assignors to Hitachi, Ltd., Tokyo,  
Japan**

Division of Ser. No. 170,750, Dec. 21, 1993, Pat. No. 5,446,491. This application May 15, 1995, Ser. No. 440,710 Int. Cl.<sup>6</sup> H04N 7/15

U.S. Cl. 348—15

## 9 Claims



1. A display system for displaying a plurality of video windows on a display screen comprising:

a receiving means for receiving video data packets from a plurality of video sources in a time sharing manner, each of said video data packets including coded video information for representing a partial image contained within one of a plurality of blocks constituting a video frame, attribute information for indicating at least a location of a block corresponding thereto within the video frame and identification information of the video source;

a decoder means connected to said receiving means for decoding the coded video information extracted from each of said video data packets and for outputting a partial image corresponding to one of said blocks in the video frame;

a set of frame memories for assembling partial images into video frames, each of said frame memories having a plurality of window areas located in a predetermined layout defined therein, a set of said window areas each located at a same location within respective said frame memories being associated with a same video source with respect to each other;

a writing means for writing each partial image derived from said decoder means into one of said window areas within one of said frame memories which is specified in accordance with the identification information extracted from a video data packet related to the partial image and a utilization status of said window areas; and

an outputting means for selectively outputting contents of said frame memories on a display screen by changing over said frame memories depending upon a display position on the display screen thereby to present a plurality of video frames at a plurality of window areas on the display screen.

5,568,185

# AUDIO COMMUNICATION BAND IMAGE TRANSCIEVER

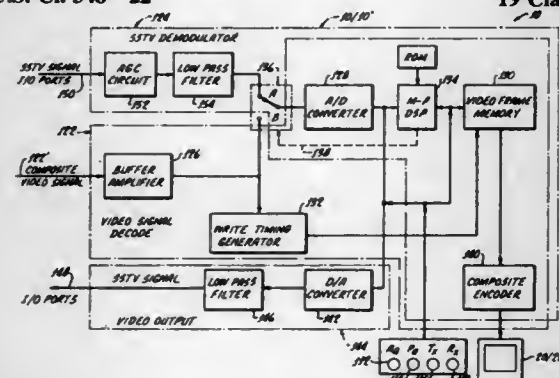
Nishimura Yoshikazu, Nagasaki, Japan, assignor to Tasco Electronics Co., Ltd., Aichi, Japan

Filed Nov. 3, 1994, Ser. No. 333,731

Claims priority, application Japan, Nov. 11, 1993, 5-304575  
Int. Cl.<sup>6</sup> H04N 7/00

U.S. Cl. 348—22

19 Claims



1. A method of converting an analog image signal of slow-scan television (SSTV) format to a digital image signal, said method comprising steps of:

providing an input level controller;

using said input level controller to receive said analog image signal of SSTV format and to responsively provide an output analog SSTV image signal within a selected range;

providing an analog-to-digital (A/D) signal converter;

using said A/D signal converter to receive said output analog SSTV image signal and to responsively provide said digital image signal;

providing a Hilbert filter; and

supplying said digital image signal to said Hilbert filter to provide a phase-shifted digital signal.

5,568,186

# FOCAL PLANE FILTERED MULTISPECTRAL MULTIDETECTOR IMAGER

Mark L. G. Althouse, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

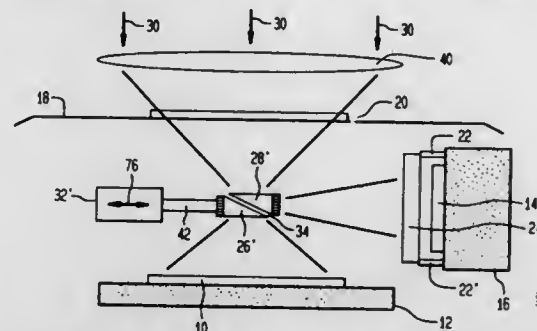
Continuation of Ser. No. 151,679, Nov. 15, 1993, abandoned.

This application Dec. 27, 1994, Ser. No. 365,374

Int. Cl.<sup>6</sup> H04N 5/33

U.S. Cl. 348—33

18 Claims



1. A filtered multispectral multidetector imager, which comprises:

(a) first prism means providing a first optical path for radiation therethrough;

(b) second prism means proximately positioned adjacent to said first prism means for providing a second optical path for radiation therethrough, said first prism means and said second prism means having an air gap therebetween;

(c) piezo electric transducer means operatively connected to said first prism means for reciprocally opening and closing said air gap intermediate said first and second prism means and thereby switching between said first optical path and said second optical path;

(d) first array detector means in alignment with said first prism means for detecting radiation passing through said first prism means;

(f) first substrate means for supporting said first array detector means;

(g) second array detector means for detecting radiation reflected by said second prism means;

(h) second substrate means for supporting said second array detector means, said second substrate means having a front and a rear surface; and

(i) spectral filter array means operatively supported on said second substrate means intermediate said second prism means and said second detector means for providing a plurality of band pass filters for generation of a single frame multispectral image.

5,568,187

# IMAGE PICKUP APPARATUS INCLUDING DISTANCE MEASUREMENT

Tadashi Okino, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 222,327, Apr. 4, 1994, which is a continuation of Ser. No. 896,893, Jun. 10, 1992, abandoned, which is a continuation of Ser. No. 240,927, Sep. 6, 1988, abandoned.

This application Mar. 7, 1995, Ser. No. 399,438

Claims priority, application Japan, Sep. 10, 1987, 62-225374; Oct. 27, 1987, 62-269329

Int. Cl.<sup>6</sup> H04N 9/73

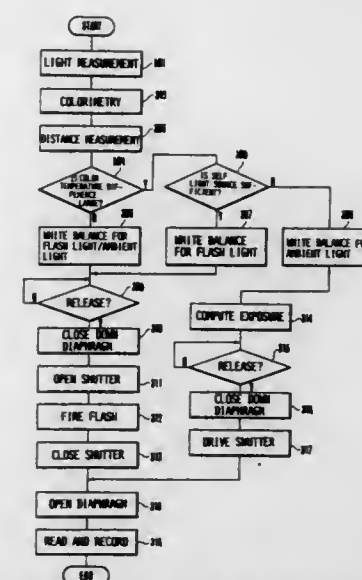
U.S. Cl. 348—224

19 Claims

1. An image pickup apparatus coupled with a flash device, comprising:

(a) image pickup means for generating a plurality of electrical color image signals from an optical image;

(b) measuring means for measuring the distance to an object to be photographed; and



(c) control means for comparing the light emission power of said flash device with the measured distance by said measuring means and for controlling color balance of said plurality of electrical color image signals in accordance with a comparison result.

5,568,188

# VIDEO ATTACHMENT TO A MICROSCOPE

Hansruedi Widmer, Niederscherli, and Jürg Stuckli, Oberdiessbach, both of Switzerland, assignors to Haag-Streit AG, Switzerland

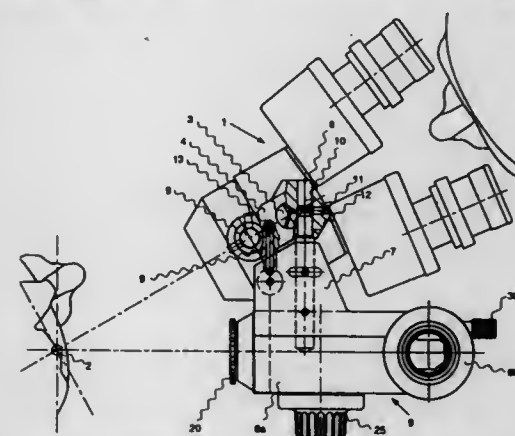
Filed Nov. 9, 1994, Ser. No. 336,869

Claims priority, application Germany, May 11, 1994, 9407854 U

Int. Cl.<sup>6</sup> H04N 7/18

U.S. Cl. 348—79

10 Claims



1. A video attachment for a microscope having an optical system, comprising:

an imaging lens system, independent of the optical system of the microscope, said imaging system having a housing,

means for coupling a video camera to the imaging lens system, and

mounting means for mechanically fixing the imaging lens system to the microscope and for a fine adjustment between the imaging lens system and the microscope for simultaneous observation of an object by the microscope and by the imaging lens system, said mounting means including:

a mounting base fixable to said microscope, the mounting base having first and second holes,

a lateral prolongation extending from the housing of said imaging lens system, the housing having third and fourth holes in alignment respectively with the first and second holes in the mounting base,

a first mounting peg in the first and third holes and a second mounting peg in the third and fourth holes, the first and second mounting pegs attaching said mounting base to said housing, the first mounting peg including two eccentric parts and two V-grooves, and being rotatably and transversely movable within the first and third holes, add

two screws corresponding to said V-grooves for fixing said first mounting peg in desired transverse and rotatable positions.

5,568,189

# AERIAL SUPPORT PLATFORM MECHANISM WITH FIVE AXES OF MOTION

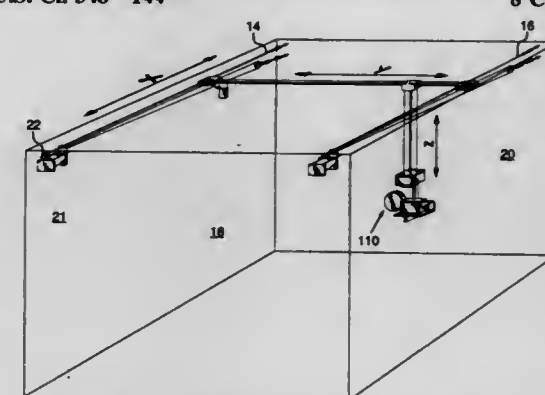
Paul J. Kneller, 66 Dunn Ave., Apt. #2, Toronto, Ontario, Canada

Filed Jun. 21, 1994, Ser. No. 264,081

Int. Cl.<sup>6</sup> H04N 5/30; F16L 3/00; G03B 39/00; 1/00

U.S. Cl. 348—144

8 Claims



1. An aerial support mechanism for providing five independently addressable degrees of axial freedom for a camera, said mechanism comprising:

a pair of spaced parallel first cables in support at both ends and supporting a pair of first carriages therefrom, first movement means for movement of each of said first carriages along said respective first cables;

a pair of transverse second cables extending between and affixed to said pair of first carriages for providing laterally-directed tension to said first pair of cables by way of said first carriages, said second cables terminating at one of said first carriages and tensionable terminating at the other first carriage;

a second carriage, said second carriage depending from said second cables and having second movement means for movement along said second cables;

a platform member, said platform member depending from a set of third cables fixed to and extending from said second carriage and terminating in third movement means disposed on said platform member, said third movement means for effecting movement of said platform member vertically with respect to said second carriage;

said platform member further comprising a rotatably mounted jointed means with a platform depending therefrom for supporting a camera, said jointed means rotatable about a horizontal axis by means of respective fourth movement means, and said jointed means including a fifth movement means to effect rotation of said platform about a vertical axis; and

control means for remotely and independently controlling the movement of each of the respective first, second, third, fourth and fifth movement means.









5,568,203

# APPARATUS FOR ESTIMATING REAL-TIME MOTION AN A METHOD THEREOF

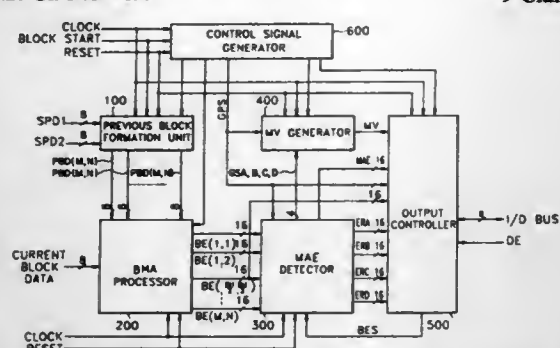
Soon-geon Lee, Suwon-city, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea  
Filed May 5, 1993, Ser. No. 56,884

Claims priority, application Rep. of Korea, Oct. 27, 1992, 92-19824

Int. Cl. H04N 7/30; 7/32

U.S. Cl. 348-699

9 Claims



1. A real time motion estimation apparatus for performing one-to-one comparison of a current pixel block having a size  $M \times N$  dots with a plurality of previous pixel blocks having said size of  $M \times N$  dots within a search window having a size of  $(2M-1) \times (2N-1)$  dots in order to obtain relative position information between said current pixel block and the previous pixel block most similar to said current pixel block, said relative position information representing motion information, said apparatus comprising:

previous block formation means simultaneously receiving first and second serial pixel data strings representing pixel data within said search window for sequentially outputting in parallel the pixel data corresponding, respectively, to each of said previous pixel blocks;

block-matching algorithm processing means, responsive to the output from said previous block formation means, for sequentially inputting said pixel data and a third serial pixel data string representing pixel data of said current pixel block and simultaneously performing the one-to-one comparison of each of said plurality of previous pixel blocks with said current pixel block in parallel, thereby outputting in parallel the respective absolute error data strings of the plurality of previous blocks with respect to the current pixel block;

minimum absolute error detecting means, responsive to the output from said block-matching algorithm processing means, for inputting and dividing said parallel absolute error data strings into a plurality of groups, obtaining respective minimum absolute error data for each group, and comparing said minimum absolute error data of said groups to one another to thereby produce a minimum absolute error data for said search window;

motion vector generating means for generating a motion vector corresponding to said minimum absolute error data produced in said search window, by being synchronized to the operation of said minimum absolute error detecting means for obtaining the minimum value; and

output controlling means for outputting said absolute error data of a motion vector (0, 0), said produced minimum absolute error data, and said generated motion vector to an I/O bus, and selectively outputting the absolute error data, among a plurality of absolute error data strings, corresponding to an external motion vector input via said I/O bus,

wherein both  $M$  and  $N$  are integers greater than 2; and

wherein said first serial data string to said previous block formation means is a previous pixel data string input in a dot-string unit defining upper  $M$  lines of said search window, and said second serial data string is a previous pixel data string input in a dot-string unit defining lower  $M-1$  lines of said search window.

5,568,204

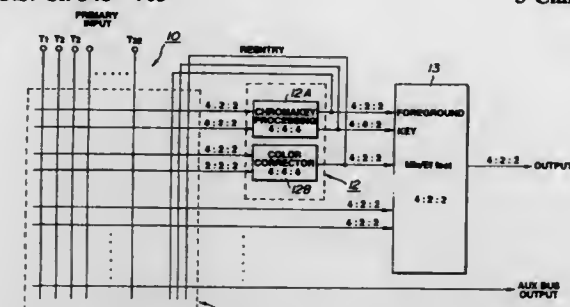
# DIGITAL VIDEO SWITCHING APPARATUS

Tsutomu Takamori, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan  
Filed Feb. 21, 1995, Ser. No. 391,018

Claims priority, application Japan, Feb. 23, 1994, 6-025262  
Int. Cl. H04N 5/262; 5/265; 5/268

U.S. Cl. 348-705

3 Claims



1. A digital video switching apparatus comprising:

a matrix switcher unit having a plurality of input buses respectively connected to a plurality of input terminals and a plurality of output buses selectively connected to respective ones of the input buses;

a first signal processing unit connected to two of said output buses selectively connected to two of said input buses supplied with a 4:2:2 digital video signal and a 0:2:2 digital video signal together making up a 4:4:4 digital video signal, said first signal processing unit performing signal processing on said 4:4:4 digital video signal at a rate of 4:4:4 for outputting a corresponding 4:2:2 digital video signal and

a second signal processing unit connected to one of the output buses selectively connected to one of the input buses supplied with the 4:2:2 digital video signal and to said first signal processing unit, said second signal processing unit performing signal processing on the 4:2:2 digital video signal supplied via said input bus and on the 4:2:2 digital video signal supplied from the first signal processing unit for outputting a corresponding 4:2:2 digital video signal.

5,568,205

# CAMERA MOUNTED WIRELESS AUDIO/VIDEO TRANSMITTER SYSTEM

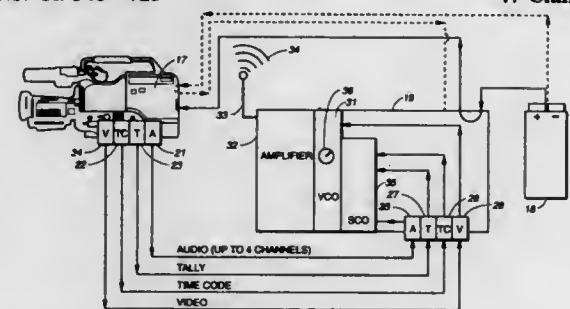
James Hurwitz, San Francisco, Calif., assignor to Telex Communications, Inc., Minneapolis, Minn.

Filed Jul. 26, 1993, Ser. No. 97,792

Int. Cl. H04N 5/38; 5/225; 5/262; 5/28

U.S. Cl. 348-723

47 Claims



1. A video production device comprising:

a transmitter, said transmitter receiving video, audio, and time code signals from a camcorder, said transmitter modulating and transmitting the video, audio, and time code signals via an omnidirectional antenna.

5,568,206

# DEVICE FOR PROCESSING MODULATED RAIL ANALOG TELEVISION SIGNAL

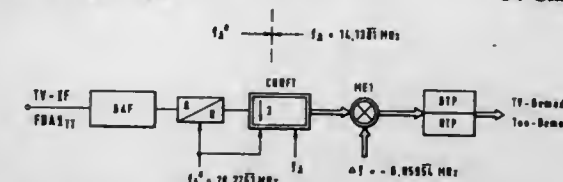
Heinz Goeckler, Backnang, Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Germany  
Filed May 11, 1995, Ser. No. 439,201

Claims priority, application Germany, May 20, 1994, 44 17 723.2

U.S. Cl. 348-726

Int. Cl. H04N 5/455

34 Claims



15. A device for processing a modulated analog television signal at intermediate frequency, comprising a sampling unit for sampling of a television signal at intermediate frequency and having an oversampling factor of at least 2 related to a useful bandwidth of the television signal at the intermediate frequency; a digital filter having coefficients for band limiting of the real television signal; a digital filter for converting the oversampled signal into a complex output signal; and digital demodulators for processing of video and audio elements of the complex output signal with using one of a joint processing and a separate processing after previous mixing.

23. A device for processing a modulated analog television signal at intermediate frequency, comprising a sampling unit for sampling of a television signal at intermediate frequency having an oversampling factor of at least 2 related to a useful bandwidth of the television signal at the intermediate frequency; a digital filter for converting the sampled signal into a complex digital signal; a digital filter for band limiting the complex digital signal to form a complex output signal, said digital filter having complex coefficients; and digital demodulators for processing of video and audio elements of the complex output signal with using one of a joint processing and a separate processing after previous mixing.

5,568,207

# AUXILIARY LENSES FOR EYEGLASSES

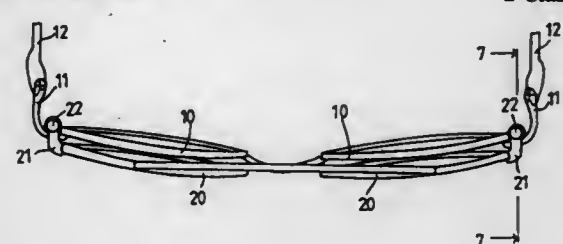
Richard Chao, No. 43-4, Yi Hsin Tsuen, Shui San Hsiang, Chia Yi Hsien, Taiwan

Filed Nov. 7, 1995, Ser. No. 554,854

Int. Cl. G02C 7/08; 9/00

U.S. Cl. 351-57

2 Claims



1. An eyeglass device comprising:

a primary spectacle frame for supporting primary lenses therein, said primary spectacle frame including two side portions each having an extension extended therefrom for pivotally coupling a leg means thereto, said primary spectacle frame including two rear and side portions each having a projection secured thereto, said primary spectacle frame including an upper side portion,

a pair of first magnetic members secured in said projections respectively,

an auxiliary spectacle frame for supporting auxiliary lenses therein, said auxiliary spectacle frame including two side portions each having an arm extended therefrom for extending over and for engaging with said upper side portion of said primary spectacle frame, and

a pair of second magnetic members secured to said arms respectively for engaging with said first magnetic members of said primary spectacle frame so as to secure said auxiliary spectacle frame to said primary spectacle frame, said arms being engaged with and supported on said upper side portion of said primary spectacle frame so as to allow said auxiliary spectacle frame to be stably supported on said primary spectacle frame and so as to prevent said auxiliary spectacle frame from moving downward relative to said primary spectacle frame and so as to prevent said auxiliary spectacle frame from being disengaged from said primary spectacle frame.

5,568,208

# MODIFIED SCANNING LASER OPHTHALMOSCOPE FOR PSYCHOPHYSICAL APPLICATIONS

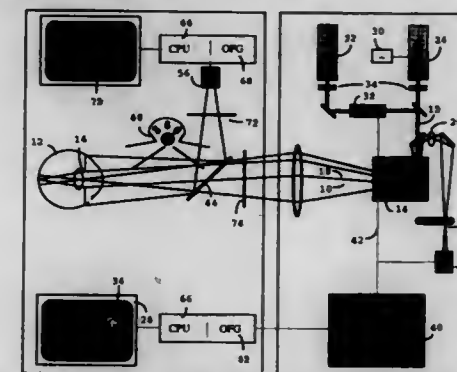
Frans J. Van de Velde, 2 Hawthorne Pl. 15-O, Boston, Mass. 02114

Filed Mar. 8, 1994, Ser. No. 207,385

Int. Cl. A61B 3/10

U.S. Cl. 351-221

6 Claims



1. A scanning laser ophthalmoscope with Maxwellian view control for imaging and psychophysics, comprising of:

(A) a scanning laser ophthalmoscope, using Maxwellian view illumination and having (1) illuminating means including at least one wavelength in the visible range and a wavelength in the infra-red range of the spectrum for visualizing the posterior segment or retina of the eye and psychophysical testing, said scanning laser ophthalmoscope also provided with (2) a modulating means for creating psychophysical stimuli in the visible laser raster of said scanning laser ophthalmoscope and (3) an electronic means for generating video and common synchronization signal;

(B) a second imaging device, using free Newtonian viewing, for visualizing the anterior segment of the eye and the reflection or backscatter of the coincident illuminating means of said scanning laser ophthalmoscope in the pupillary area and on the iris, simultaneously with the observation of the posterior segment of the eye with said scanning laser ophthalmoscope, said imaging device allowing this simultaneous viewing of both the anterior and posterior segment of the eye without affecting adversely the quality of the retinal image, and said imaging device having focusing means to document the extent and location of the Maxwellian view in the pupillary area using the anterior segment as a fiducial landmark;

(C) an imaging board with means for overlay graphics, CPU and monitor, for controlling modulating means in said scanning laser ophthalmoscope and displaying simultaneously the extent and precise location of the Maxwellian view in the pupillary area of the anterior segment together with an image of the retina and the characteristics of any psychophysical stimulus projected onto the retina using modulating means of said scanning laser ophthalmoscope;

whereby the simultaneous availability of both images of the anterior and posterior segment of the eye enable said scanning laser ophthalmoscope to freely move, maintain and adjust for focusing the Maxwellian view illumination in the pupillary

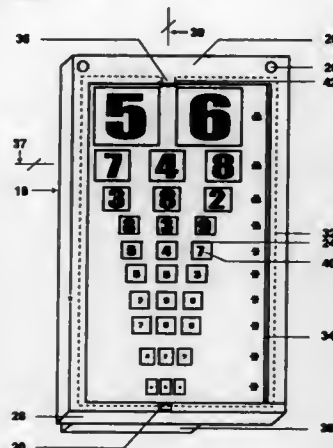


area of the eye, simultaneously document the unambiguous position of this Maxwellian view on an image of the pupillary area of the eye and simultaneously document the retinal image with the position of any stimulus of which the location can be selected independently from the selection of a location in the pupillary area for the Maxwellian view illumination, thereby allowing to measure the Stiles-Crawford effect on imaging and psychophysics for selected Maxwellian view illumination and selected retinal area.

**5,568,209**  
**AUTOMATED POCKET-SIZED NEAR VISION TESTER**  
William B. Priester, 3449 Lake Pointe, Memphis, Tenn. 38125, and Maxwell Cutler, 4991 Chickasaw, Memphis, Tenn. 38117  
Filed Apr. 17, 1995, Ser. No. 424,153  
Int. Cl.<sup>6</sup> A61B 3/02

U.S. Cl. 351-243

27 Claims



5. A near vision test apparatus for use by a healthcare examiner, comprising:

- (d) a generally rectilinear device having a front face and a generally parallel rear face, said device sized to be held by a healthcare examiner in a single hand while being operated by said single holding hand, wherein said front face is a near vision test card having a plurality of near vision test objects affixed thereon, said test objects arranged in one or more rows and one or more columns on said test card;
- (e) means for selectively retroilluminating one or more of said near vision test objects; and
- (f) means, operable by said holding hand of said examiner, for controlling said selective retroillumination of said near vision test objects.

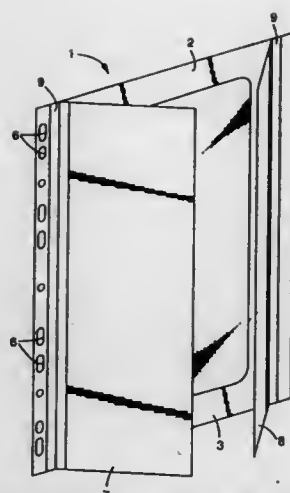
**5,568,210**  
**ENVELOPE FOR TRANSPARENCY**  
Douglas A. Kiehne, and Kenneth W. Luthy, both of Austin, Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 37,307, Mar. 26, 1993, Pat. No. 5,371,560, which is a continuation-in-part of Ser. No. 959,161, Oct. 9, 1992, abandoned, which is a continuation-in-part of Ser. No. 792,717, Nov. 15, 1991, Pat. No. 5,237,355. This application Oct. 27, 1994, Ser. No. 330,319  
Int. Cl.<sup>6</sup> G03B 21/11

U.S. Cl. 353-120

9 Claims

1. An improved envelope for transparencies for overhead projectors, said envelope comprising a substantially rectangular pocket of transparent sheet material, said pocket having two longitudinal side edges connected by shorter side edges, said pocket being open at least along one side edge for insertion of a transparency, at least one opaque flap having light scattering, light blocking or light reflecting properties such that a majority of light entering said flap

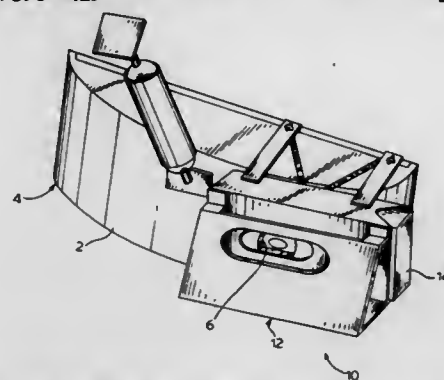


is not transmitted therethrough, said flap being attached in a foldable manner along one of said side edges by means of a flexible adhesive tape, said flap having a folded and unfolded position, said tape comprising a flexible polyester backing having a thickness of less than 15 micrometers, and attached on one surface thereof, an adhesive layer, wherein said tape has a flexibility measurement of not more than 2.5 grams, and a 180° Peel adhesion of at least 100 grams per centimeter, said flap being capable of remaining in the unfolded position on an overhead projector stage with minimal adhesive transfer to said stage at the operating temperature of the overhead projector, having a decorative portion selected from the group consisting of borders, colored transparent sheet, colored flaps, and legends.

**5,568,211**  
**IMPACT ACTIVATED TRIGGERING MECHANISM FOR A CAMERA MOUNTED IN A VEHICLE**  
Robert M. Bamford, Glendale, Calif., assignor to Terry D. Scharton, Santa Monica, Calif.  
Filed Apr. 10, 1995, Ser. No. 419,092  
Int. Cl.<sup>6</sup> G03B 17/38; 29/00

U.S. Cl. 396-429

55 Claims



1. An impact activated camera triggering apparatus used in combination with a disposable camera which has a wide angle lens and a shutter release button lever for taking a photographic picture, the apparatus removably attached inside a vehicle at a location between a back of a rear-view mirror and a front windshield, the rear-view mirror has a mirror side, the apparatus comprising:

- a. a mounting case including a generally rectangular shaped rear compartment for retaining said camera and a generally right triangular shaped front compartment;
- b. said rear compartment having a bowed shaped front panel with an elliptical shaped opening therethrough, a bowed shaped rear panel, a bottom panel, a top panel, a first end opening, and an opposite second end opening, the bowed shaped front and rear panels facing each other for securely locating said camera, the bottom panel having a longitudinal

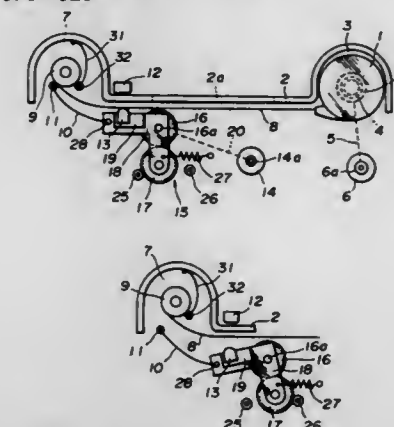
step-down section and a cut-out opening located adjacent to the second end opening for accessing said shutter release button lever and grasping said camera for insertion and removal;

- c. a longitudinal cover plate mounted within said rear compartment and covering said step-down section of said rear compartment;
- d. said front compartment having a slanted front panel, a bottom panel, a first end opening, and an opposite second end opening, the slanted front panel having a slotted top end and an elliptical shaped opening therethrough located centrally and aligned with and parallel to said opening of said front panel of said rear compartment, where both of the openings of the slanted front panel of said front compartment and said front panel of said rear compartment accommodate the field of view of said wide angle lens of said disposable camera when said disposable camera slides invertedly into a respective one of said end openings of said rear compartment, the bottom panel having a multiplicity of apertures and a detent section located between a respective two of the multiplicity of apertures, the detent section having a central cavity therethrough;
- e. a longitudinal elongated trigger spring mounted within said step-down section of said rear compartment and having a tapering distal section with a narrow distal end, a wide middle section, and a tapering proximal section with a narrow proximal end, the proximal end located relative to said cover plate such that the middle section abuts against said bottom panel of said rear compartment, and the distal end located adjacent to an end opening on said cover plate;
- f. a chamber located within said front compartment and covering said detent section, the chamber having a first end wall, a top wall with an opening and a second end wall;
- g. a spherical rolling ball retained within said chamber and being able to roll on said detent section, where the rolling ball is limited to a horizontal plane movement and responsive to inertial forces;
- h. a trigger lever arm pivotally mounted between said front panels of said front and rear compartments at a location remote from said chamber and having a distal end and a proximal end, the distal end forming a trigger lever pin extending down through said opening of said top wall of said chamber and resting on said rolling ball when said rolling ball is seating above said central cavity, the proximal end forming a reset trigger lever and resting above a respective one of said multiplicity apertures of said bottom panel of said front compartment and a transverse latching pin extending through an opening on said front panel of said rear compartment and into said rear compartment for latching said distal section of said trigger spring;
- i. said reset trigger lever of said trigger lever arm facilitating the cocking of said tapering distal section of said trigger spring by latching said transverse latching pin of said trigger lever arm over said narrow distal end of said trigger spring to prevent said tapering distal section of said trigger spring from pressing up on said shutter release button lever of said camera prematurely when said apparatus is cocked; and
- j. means for preventing said camera from sliding out from said end openings of said rear compartment, one of the means being disableable to allow insertion and retraction of said camera;
- k. whereby when said impact activated camera triggering apparatus is mounted in said vehicle, said rolling ball can be moved off said central cavity of said detent section in response to said inertial forces in the horizontal plane upon sudden impact on said vehicle from any lateral direction, which drops said trigger lever pin of said trigger lever arm off from said rolling ball, causing said latching pin of said trigger lever arm to release said tapering distal section of said trigger spring which in turn presses on said shutter release button lever of said disposable camera, to thereby automatically take said photographic picture at the moment of sudden impact.

**5,568,212**  
**CAMERA CAPABLE OF MAGNETICALLY RECORDING PHOTOGRAPH INFORMATION ON A FILM**  
Tokuo Shimizu, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan  
Filed Mar. 28, 1994, Ser. No. 218,894  
Claims priority, application Japan, Mar. 29, 1993, 5-070137; Apr. 1, 1993, 5-075822  
Int. Cl.<sup>6</sup> G03B 17/24

U.S. Cl. 396-320

9 Claims

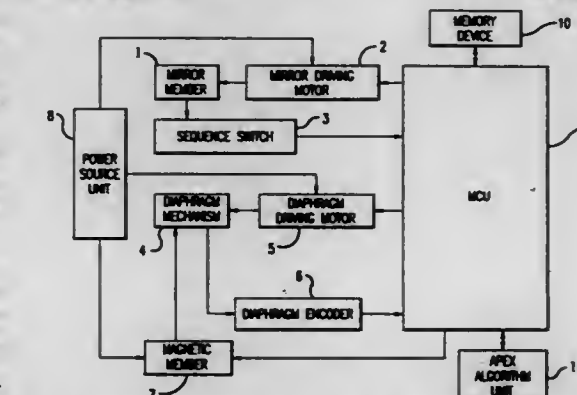


6. A camera comprising:  
information recording means for recording information on a film or reproducing the record on the film;  
film supply means for feeding the film as a need arises; and  
pressing means selectively interlocked with said film supply means and responsive only to film travel for pressing said information recording means against an information record section of the film and interlocking with said film supply means only when said film supply means is operating whereby the pressing means is displaced from said film;  
a winding spool; and  
said pressing means further comprising film guide means for pressing the film against an outer surface of said winding spool.

**5,568,213**  
**DIAPHRAGM CONTROL DEVICE FOR A CAMERA**  
Masatoshi Kanzaki, Kanagawa-ken, and Kimio Uematsu, Tokyo, both of Japan, assignors to Nikon Corporation, Tokyo, Japan  
Filed Jun. 15, 1995, Ser. No. 470,203  
Claims priority, application Japan, Sep. 6, 1994, 6-212439  
Int. Cl.<sup>6</sup> G03B 9/02; 19/12

U.S. Cl. 396-257

20 Claims



1. A diaphragm control device for a camera equipped with a mirror member and a mirror driving device to drive said mirror member to move between a first position on an optical axis of said camera and a second position off said optical axis of said camera, said diaphragm control device comprising:



a diaphragm mechanism connected to said mirror member that controls light recorded by said camera;  
a diaphragm driving device to drive said diaphragm mechanism;  
a stopping device to stop said diaphragm driving device;  
a control device to control said diaphragm driving device and said stopping device to stop said diaphragm mechanism at about a predetermined position; and  
a correction device to correct an actuation time of said stopping device based on variations in the operation of said diaphragm control device to precisely stop said diaphragm mechanism at said predetermined position.

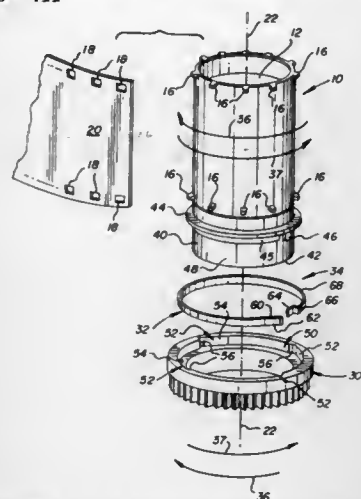
**5,568,214**  
**TAKE-UP SPOOL CLUTCH WITH DELAYED ENGAGEMENT**

Wayne E. Stiehler, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 1, 1995, Ser. No. 457,645  
Int. Cl.<sup>6</sup> G03B 1/00

U.S. Cl. 396—411

10 Claims



1. In a take-up spool drive mechanism useful for driving a take-up spool for accumulating film thereon in a photographic device, wherein the take-up spool is driven by a drive gear, the improvement comprising:

a clutch disposed between the drive gear and the take-up spool, the clutch being constructed and arranged to engage only after the drive gear has substantially completed a single rotation in a take-up direction upon transitioning to a take-up mode, in which film is accumulated on the take-up spool, from a rewind mode in which film is returned from the take-up spool to a supply spool when the supply spool rotates in a rewind direction opposite the take-up direction.

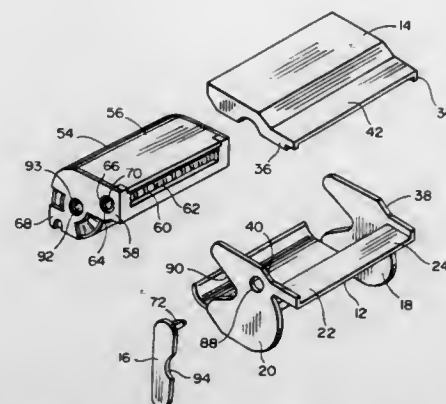
**5,568,215**  
**FILM CARTRIDGE HOLDER AND ADAPTER UNIT**  
John M. Haugen, Sr., Everett; John M. Haugen, Jr., Lake Stevens; Calvin L. Holler, Marysville, and Charles T. Higgins, Kirkland, all of Wash., assignors to Crown Photo Systems, Marysville, Wash.

Filed Sep. 13, 1995, Ser. No. 528,218  
Int. Cl.<sup>6</sup> G03B 17/26; G03D 13/08

U.S. Cl. 396—512

11 Claims

1. In combination with a first film cartridge of the type including an elongated, generally cylindrical configuration including a generally tangential film strip inlet/outlet nose and wherein the general diameter of said cartridge is smaller than the diameter of the outer circular perimeter of a standard, similarly shaped still camera 35 mm film cartridge including a generally tangential film strip inlet/outlet nose portion, a film cartridge holder including an elongated, hollow body open on one longitudinal side and defining an open



sided, partially cylindrical cavity snugly receiving said first film cartridge therein through the open side thereof and wherein the side of said holder opposite said open side includes a generally tangentially outwardly projecting, longitudinal hollow extension terminating outwardly in a slot-type outlet slit and defining a recess opening inwardly into said cavity, said nose being snugly received in said recess and including an outlet opening registered with said slit.

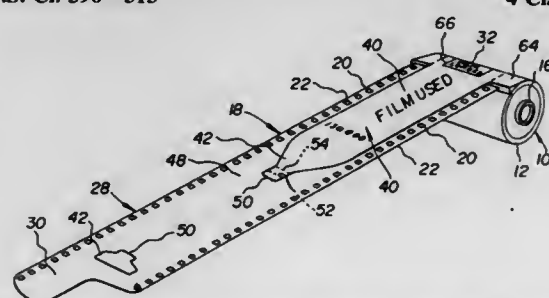
**5,568,216**  
**FILM CARTRIDGE WITH VISUAL INDICATOR FOR VERIFYING FILM LOADING IN CAMERA AND WITH PROTECTOR SHIELD FOR FILM FRAME DURING EXPOSURE IN CAMERA**

John A. Agostinelli, and Madhav Mehra, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 11, 1996, Ser. No. 584,445  
Int. Cl.<sup>6</sup> G03B 17/26; 23/02

U.S. Cl. 396—515

4 Claims



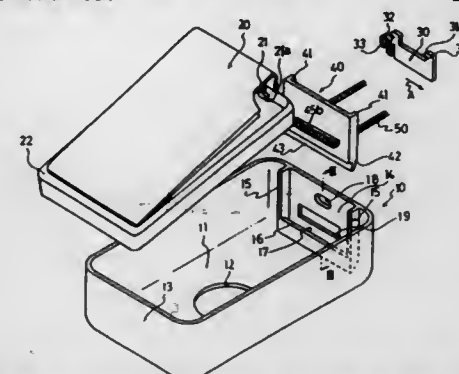
1. A film cartridge comprising a housing with a film exit slit, and a film roll support rotatable inside said housing to unwind a filmstrip beginning with a film leader to permit said film leader to be moved outwardly through said slit to accomplish film loading in a camera, is characterized by:

a protective strip with a length and a width dimensioned to permit said protective strip to completely cover a non-emulsion side of successive frames of said filmstrip when individual ones of said frames are positioned outside said housing for exposure in a camera, said protective strip having a forward end portion releasably secured to said film leader and a trailing end portion permanently secured to said housing to make the film leader first pull the protective strip onto the non-emulsion side of said filmstrip as the film leader is moved outwardly through said slit and then disconnect from the protective strip as the film leader is moved further from the housing, whereby said protective strip will remain on the non-emulsion side of said filmstrip to shield the non-emulsion side of individual ones of said frames when individual ones of the frames are positioned outside said housing for exposure in a camera.

**5,568,217**  
**BACK COVER LOCK MECHANISM OF A CAMERA**  
Akihiro Arai, and Yoshinori Ono, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan  
Filed Dec. 22, 1995, Ser. No. 577,544  
Claims priority, application Japan, Dec. 28, 1994, 6-328787  
Int. Cl.<sup>6</sup> G03B 17/02

U.S. Cl. 396—536

28 Claims



1. A back cover lock mechanism of a camera having a camera body that includes side walls, a front surface that is arranged to incorporate a photographing lens, and a back cover that is pivoted to said camera body, said back cover lock mechanism comprising:

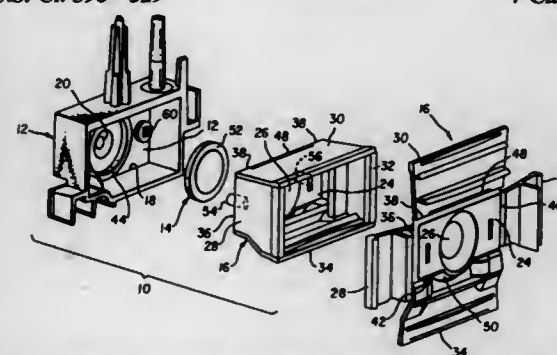
a first hook member provided at a predetermined portion of said back cover;  
a second hook member provided inside one of said side walls of said camera body, said second hook member being arranged to detachably engage said first hook member;  
a covering member for movably supporting said second hook member, said covering member being provided inside one of said side walls of said camera body; and  
a supporting member for supporting said covering member, said supporting member being provided inside said one of said side walls of said camera body so that said second hook member is placed between said covering member and one of said side walls, whereby said second hook member is movable between a locked position and an unlocked position.

**5,568,218**  
**LENS CLAMPING LIGHT-BAFFLE IN CAMERA ASSEMBLY**  
Thomas E. Dussinger, Henrietta, and David C. Smart, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 7, 1996, Ser. No. 597,751  
Int. Cl.<sup>6</sup> G03B 17/02

U.S. Cl. 396—529

7 Claims



1. A camera assembly comprising a taking lens, a body section having a chamber and a front lens opening for said taking lens which is open to said chamber, and a light-baffle including a forward wall having an exposure opening and a plurality of baffle panels pivotably connected to said forward wall for folding to fit said light-baffle into said chamber with said exposure opening behind said front lens opening, is characterized in that:

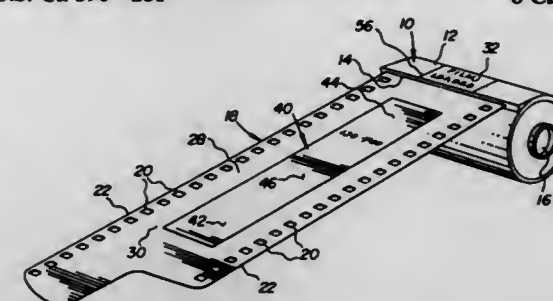
said forward wall includes means for pressing said taking lens against said body section to clamp said taking lens within said chamber between said front lens opening and said exposure opening when said light-baffle is fit into said chamber.

**5,568,219**  
**FILM CARTRIDGE WITH VISUAL INDICATOR FOR VERIFYING FILM LOADING IN CAMERA**  
Joseph A. Manico, Rochester, and Dwight J. Petruclik, Honeywell, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 11, 1996, Ser. No. 584,480  
Int. Cl.<sup>6</sup> G03B 17/30; G11B 23/28

U.S. Cl. 396—281

8 Claims



1. A film cartridge comprising a housing with a film exit slit, and a film roll support rotatable inside said housing to unwind a filmstrip beginning with a film leader having several frame lengths from said film roll support to permit said film leader to be moved outwardly through said slit to accomplish film loading in a camera, is characterized by:

a visible film-loaded indicator located to be seen through a window in a camera; and  
a flexible cover strip having a leading end portion secured to a forward end portion of said film leader, an opaque trailing end portion covering said film-loaded indicator, and an intermediate fan-folded portion extending between said leading and trailing end portions to be pulled via said leading end portion to unfold as said film leader is moved outwardly through said slit and being of suitable length to draw said trailing end portion off the film-loaded indicator to uncover the indicator only when said film leader is moved substantially completely through said slit.

**5,568,220**  
**PHOTOGRAPHIC PROCESSING APPARATUS WITH QUICK-COUPLING PROCESSING LIQUID STORAGE CONTAINER**  
François Joos, Puurs, and Patrick Van den Bergen, Berchem, both of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

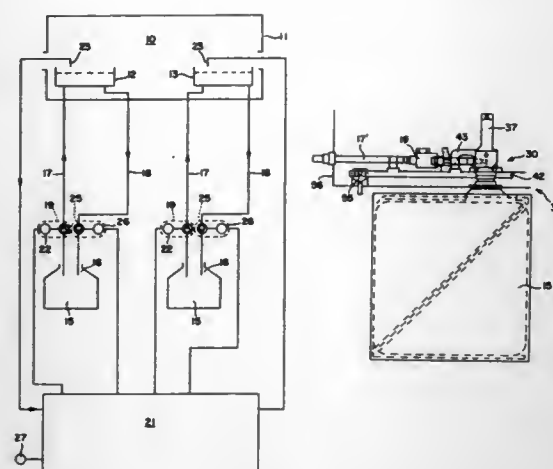
Filed Oct. 17, 1994, Ser. No. 325,953  
Claims priority, application European Pat. Off., Nov. 15, 1993, 93203182

Int. Cl.<sup>6</sup> G03D 3/02

U.S. Cl. 396—626

7 Claims

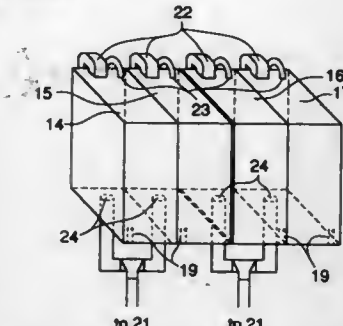
1. Apparatus for processing photographic material and which comprises at least one process vessel, each such vessel being filled with a processing liquid delivered to the vessel from a storage container, the storage container being connected to the vessel by a push-in/pull-out cap having a radially expandable and contractible resilient seal engageable with the mouth of said container and having a passageway therethrough connected by at least one conduit to the respective process vessel, said cap and each such conduit connected thereto being mounted on a support plate pivoted to a frame of the apparatus so that the cap can be raised and lowered into and out of the mouth of the container.



**5,568,221**  
**APPARATUS FOR PROCESSING SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL**  
 Takuji Hasegawa, Yasunori Wada, and Syoji Nishio, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan  
 Filed Sep. 28, 1995, Ser. No. 534,946  
 Claims priority, application Japan, Oct. 4, 1994, 6-240284  
 Int. Cl.<sup>6</sup> G03D 3/02

U.S. Cl. 396—630

11 Claims



1. An apparatus for processing a silver halide photographic light-sensitive material with a processing solution, comprising: a processing tank containing the processing solution, and replenishing means for replenishing the processing solution during processing, wherein said replenishing means comprises two replenishing tanks each connected to the processing tank; a solid processing composition and water being supplied to each of the replenishing tanks, in which the solid processing composition is dissolved to prepare a replenishing solution.

**5,568,222**  
**FOCUS DETECTING APPARATUS DETECTING FOCUS TO A PLURALITY OF AREAS**

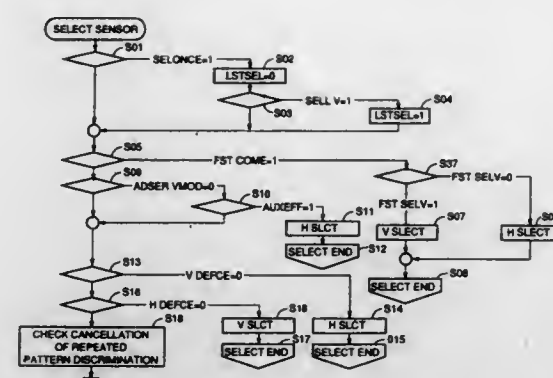
Keisuke Aoyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan  
 Continuation of Ser. No. 932,543, Aug. 20, 1992, abandoned.  
 This application Jul. 5, 1994, Ser. No. 270,313  
 Claims priority, application Japan, Aug. 21, 1991, 3-209481  
 Int. Cl.<sup>6</sup> G03B 13/36

U.S. Cl. 396—123

15 Claims

1. A focus state detecting apparatus having a plurality of sensor means, for selecting an output from one of said plurality of sensor means, and for detecting a focus state based on the selected output, comprising:

a processing circuit for evaluating a plurality of output signals, which respectively correspond to said plurality of sensor, against a plurality of predetermined judgement conditions, said processing circuit evaluating each one of said judgement

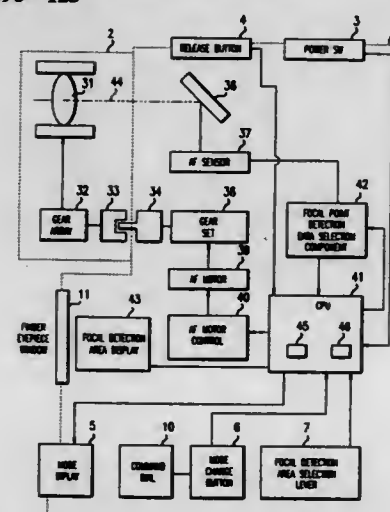


conditions against a plurality of said output signals, and determining which one output signal best fulfills each of said plurality judgement conditions; and selection means for determining, after said processing circuit has determined which one output signal best fulfills each of said plurality of judgement conditions, which one of said output signals best fulfills the most judgement conditions, and for selecting the output signal which fulfills the most judgement conditions for focus detection.

**5,568,223**  
**MULTIPLE POINT FOCUS DETECTION CAMERA**  
 Toru Takayama, Kawasaki; Tsutomu Narisawa, Saitama-ken, and Hitoshi Imanari, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan  
 Filed Dec. 2, 1994, Ser. No. 353,364  
 Claims priority, application Japan, Dec. 14, 1993, 5-313680  
 Int. Cl.<sup>6</sup> G03B 13/36

U.S. Cl. 396—123

27 Claims



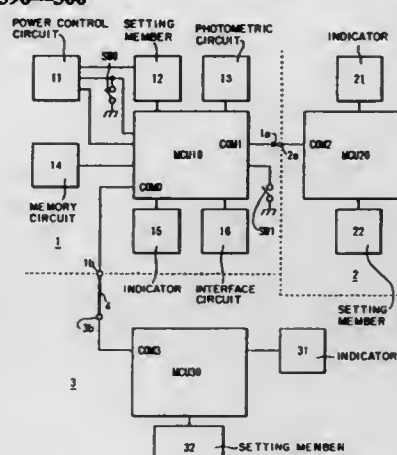
1. A multiple point focus detection camera for accomplishing focus detection from multiple focus detection areas, the camera comprising:

a movable lens system having a lens;  
 an automatic focus system coupled to said lens system for detecting a focus condition of said multiple focus detection areas and automatically selecting one of said multiple focus detection areas on the basis of said focus condition;  
 a switch for initiating the automatic focus detection system;  
 a selection lever for selecting one of said multiple focus detection areas; and  
 a controller for changing said selected one of said multiple focus detection areas that has been initiated by said switch to another of said multiple focus detection areas in accordance with said selection lever.

**5,568,224**  
**SYSTEM FOR SETTING DATA OF A CAMERA**  
 Takashi Saegusa, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan  
 Continuation of Ser. No. 104,554, Aug. 11, 1993, abandoned.  
 This application Dec. 19, 1994, Ser. No. 359,017  
 Claims priority, application Japan, Aug. 19, 1992, 4-220266  
 Int. Cl.<sup>6</sup> G03B 17/00

U.S. Cl. 396—300

13 Claims

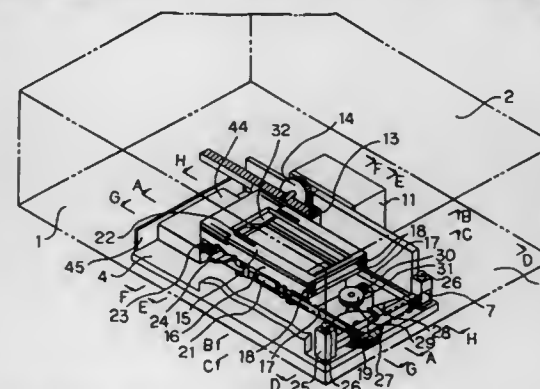


1. A system for setting data of a camera, comprising: at least two accessories individually attachable to and detachable from a camera body and capable of transferring set data for controlling said camera body to said camera body; and a transferring circuit which transfers said set data set by one of said two accessories to the other of said two accessories upon the transferring of said set data to said camera body by said one accessory, wherein said camera body executes a predetermined action on the basis of said transferred data.

**5,568,225**  
**IMAGE INPUT DEVICE**  
 Masashi Tazawa, Kawasaki; Toshiya Aikawa, Yokohama; Eisaku Maeda, Sakura, and Nobuhiko Fujinawa, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan  
 Filed Apr. 13, 1995, Ser. No. 421,449  
 Claims priority, application Japan, Nov. 11, 1994, 6-303004  
 Int. Cl.<sup>6</sup> G03B 27/62; 27/58

U.S. Cl. 355—75

15 Claims



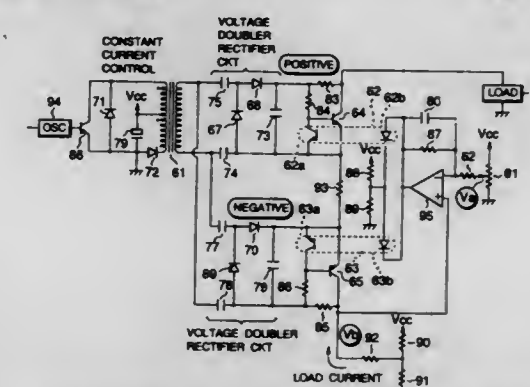
1. An image input device comprising: an illumination optical system to illuminate an original with light; a reading unit imaging light transmitted from the original; an original retaining unit retaining the original during a reciprocating motion of the original; and a reciprocating motion guide unit guiding the reciprocating motion of the original retaining unit,

wherein the original retaining unit has an aperture portion of a size not covered by the original, and wherein output adjustment of the reading unit is performed in accordance with the reading light that passes through the portion of the aperture which is not covered by the original.

**5,568,226**  
**POWER SUPPLY DEVICE HAVING CONTROL TRANSISTORS CONNECTED IN PARALLEL WITH OUTPUT VOLTAGE TERMINALS**  
 Akihisa Kusano, c/o Canon Kabushiki Kaisha, 30-2, 3-chome, Shimomaruko, Ohta-ku, Tokyo, Japan  
 Filed May 17, 1994, Ser. No. 243,931  
 Claims priority, application Japan, May 20, 1993, 5-118413  
 Int. Cl.<sup>6</sup> G03G 15/00; 21/00

U.S. Cl. 355—200

10 Claims

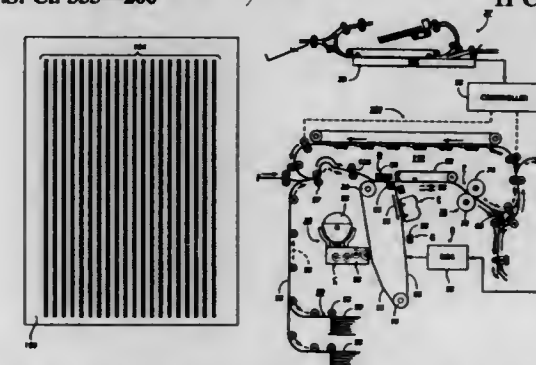


1. A power supply device for elevating an input voltage at a primary side with a transformer to provide a high output voltage at a secondary side, comprising: transistors connected in parallel between respective high-voltage output terminals of plural high-voltage output circuits of different polarities formed at the secondary side of the transformer; and base current control means for controlling base currents of said transistors, wherein said plural high-voltage outputs are connected serially.

**5,568,227**  
**METHOD AND APPARATUS FOR TRANSPORT SPEED OPTIMIZATION TO MINIMIZE IMAGE SMEAR**  
 Lam F. Wong, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.  
 Filed Dec. 5, 1994, Ser. No. 349,299  
 Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 355—200

11 Claims

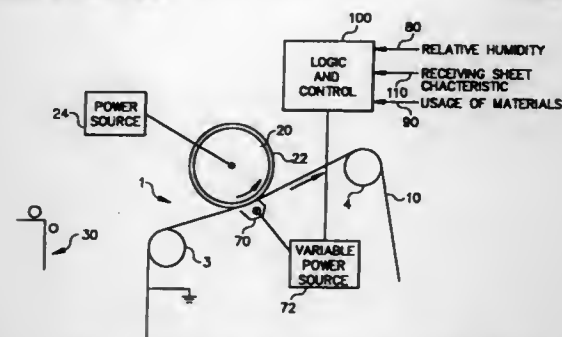


11. An apparatus for minimizing image transfer smear in a printing machine, comprising: a photoreceptive member moving at a preselected velocity;



a sheet transport adjacent said photoreceptive member for delivering a sheet to said photoreceptive member; a controller to control the velocity of said transport; and a scanner operatively associated with said controller, for scanning a plurality of sheets and generating a signal indicative of a pattern printed on the plurality of sheets, said controller responsive to the signal, generating a velocity control signal for the transport.

**5,568,228**  
**IMAGE FORMING APPARATUS WITH CONTROLLED TRANSFER**  
Thomas N. Tombs, Brockport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.  
Filed Dec. 14, 1994, Ser. No. 355,579  
Int. Cl.<sup>6</sup> G03G 21/00  
U.S. Cl. 355—208



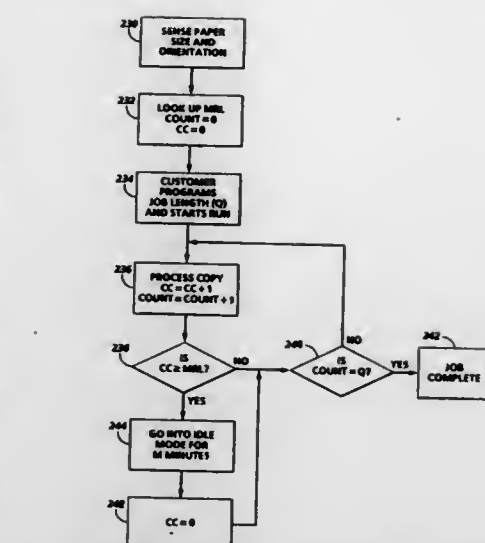
11. Image forming apparatus having an image member for carrying a toner image and a transfer member for cooperating with the image member to create an electric field for transfer of the toner image to a transfer surface, one of said image member or said transfer member having a photoconductive layer, and one of the members having an insulating layer whose resistance varies with ambient conditions, said image forming apparatus further including:

- means for creating an electric field of a direction urging transfer of a toner image from the image member to the transfer surface,
- means for determining the resistance of the insulating layer associated with one of the members,
- means for irradiating the photoconductive layer with radiation at a position at which the image member faces the transfer surface, and
- means for adjusting the radiation means in response to said determined resistance to adjust the response time of the applied electrical field for variations in such resistance.

**5,568,229**  
**FUSER TEMPERATURE CONTROL AS A FUNCTION OF COPY SHEET CHARACTERISTICS**  
Thomas F. Szlucha, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.  
Filed Jun. 21, 1995, Ser. No. 493,064  
Int. Cl.<sup>6</sup> G03G 21/00  
U.S. Cl. 355—208

10 Claims  
1. In an image processing apparatus for producing images on copy sheets, the apparatus including a fuser, a copy sheet path, a sensor for sensing copy sheet size and a controller for directing the image processing apparatus, the controller tracking the operation of the fuser according to the size of copy sheets, the controller including a table in memory for storing fuser operation data related to given copy sheet size a method of adjusting the operation of the fuser in accordance with the size of copy sheets being fused comprising the steps of:

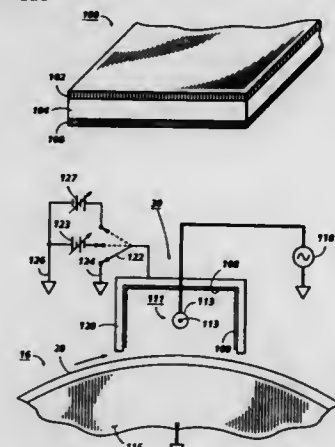
determining the size of copy sheets being delivered to the fuser;



scanning the table in memory storing the fuser operation data to locate said size, and responsive to the table in memory, identifying the fuser operation data related to said size and counting the number of copy sheets and adjusting the operation of the fuser in accordance with the operation data.

**5,568,230**  
**REPLACEABLE OZONE ABSORBING SUBSTRATES FOR A PHOTOCOPYING DEVICE**  
Karamireddy H. Reddy, Rochester, and Alan M. Litman, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.  
Filed Feb. 3, 1995, Ser. No. 383,347  
Int. Cl.<sup>6</sup> G03G 21/00  
U.S. Cl. 355—215

8 Claims

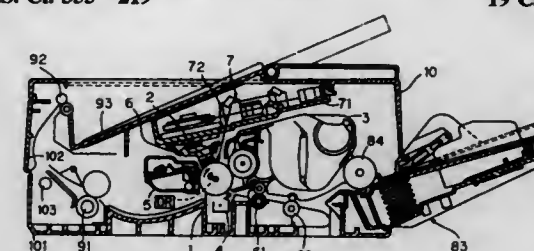


1. A cartridge replaceable unit, comprising:

- a housing;
- a photoconductive member rotatably secured to said housing; and
- a corona generator secured to said housing and located adjacent said member, said corona generator including a support structure, an electrode mounted on said support structure, a securing member easily removably secured to said support structure, a substrate having a first surface thereof secured to said securing member, and an ozone neutralizing coating secured to a second surface of said substrate, said coating continuously surrounding at least one half of the periphery of said electrode, so that said substrate including said coating may be separated from said support structure and so that a new

substrate including a new coating may be applied to said support structure, permitting the cartridge replaceable unit to be recycled.

**5,568,231**  
**CHARGING DEVICE FOR CHARGING THE SURFACE OF A PHOTORECEPTIVE MEMBER IN AN ELECTROPHOTOGRAPHIC IMAGE FORMING DEVICE**  
Masaki Asano, Amagasaki; Shuji Iino, Hirakata; Akihito Ikegawa, Sakai, and Izumi Osawa, Ikeda, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan  
Filed May 13, 1993, Ser. No. 61,166  
Claims priority, application Japan, May 15, 1992, 4-123411  
Int. Cl.<sup>6</sup> G03G 15/02  
U.S. Cl. 355—219

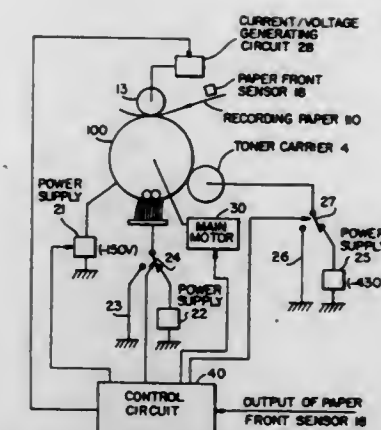


19 Claims  
1. A charging device comprising:  
charging means having a charging member including a brush hair which is made of polymer materials and is provided in contact with or minutely spaced from a surface of a photosensitive member for charging said surface of said photosensitive member to have a predetermined potential, said brush hair having an electrical resistivity of  $10^9 \Omega \text{cm}$  or less;  
means for applying a constant voltage to said charging means; and  
control means for controlling the voltage applied by said applying means when a current flowing from said charging means to said photosensitive member exceeds a predetermined value.

**5,568,232**  
**IMAGE FORMING APPARATUS CAPABLE OF REMOVING TONER FRAGMENTS AND SHAVINGS FROM A CONTACT CHARGING DEVICE BY SUPPLYING A VOLTAGE TO AN IMAGE CARRIER TO WHICH THE FRAGMENTS AND SHAVINGS ARE ATTRACTED**  
Mabumi Kashiwara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan  
Filed Mar. 20, 1995, Ser. No. 407,085  
Claims priority, application Japan, Mar. 18, 1994, 6-048204  
Int. Cl.<sup>6</sup> G03G 15/02  
U.S. Cl. 355—219

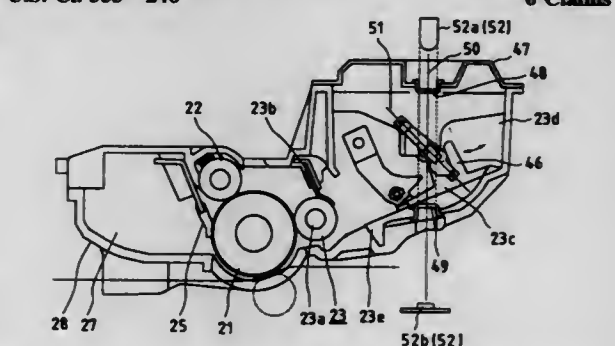
13 Claims  
1. An image forming apparatus wherein an electrostatic latent image is formed on an electrostatic latent image carrier which is charged by a contact charging device, and a region including said formed electrostatic latent image is developed by toners supplied from a toner carrier, comprising:

- first means for providing said electrostatic latent image carrier with a first voltage which has the same polarity as the charge characteristics of said electrostatic latent image carrier and said toners, said first voltage having a lower absolute value than a charging voltage for charging said electrostatic latent image carrier;
- second means for providing said charging device with a second voltage which has the same polarity as said charge characteristics and has a lower absolute value than said first voltage, during a non-imaging period during which neither formation nor development of said electrostatic latent image is performed; and



third means for providing said toner carrier with a third voltage which has the same polarity as said charge characteristics and has a lower absolute value than said first voltage, during said non-imaging period.

**5,568,233**  
**APPARATUS FOR DETECTING THE AMOUNT OF REMAINING DEVELOPER**  
Yasuo Komada, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Jan. 24, 1995, Ser. No. 377,790  
Claims priority, application Japan, Jan. 28, 1994, 6-008171  
Int. Cl.<sup>6</sup> G03G 21/00  
U.S. Cl. 355—246



6 Claims  
1. An apparatus for detecting the amount of remaining developer comprising:  
a detector for detecting a remaining amount of a developer within a developer container;  
a first memory in which a reference value for a comparison with a detection signal from said detector is prestored;  
a second memory for storing a reference value read from said first memory;  
first input means for inputting manually an instruction for modifying the reference value stored in said second memory;  
second input means for inputting manually a new reference value when an instruction is inputted by said first input means;  
modifying means for modifying the reference value stored in said second memory based on the new reference value input by said second input means; and  
determination means for determining whether developer is present by comparing the reference value stored in said second memory with the detection signal from said detector.

5,568,234

## IMAGE DENSITY CONTROL DEVICE

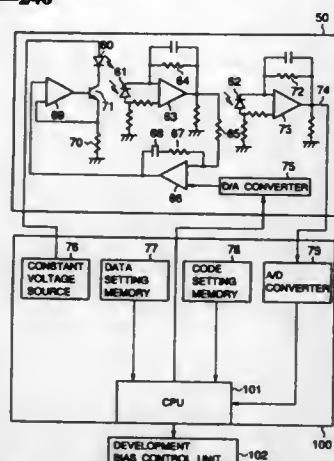
Hiroshi Shiba, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1994, Ser. No. 366,927

Claims priority, application Japan, Dec. 30, 1993, 5-354307  
Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 355—246

14 Claims



1. An image forming apparatus comprising: image forming means for forming an arbitrary image which includes a sample image having a predetermined density onto a recording medium; illuminating means for illuminating said sample image formed on said recording medium; first light receiving means for receiving reflected light from said sample image; second light receiving means for receiving light directly from said illuminating means; light amount control means for controlling said illuminating means so that an output from said first light receiving means is at a predetermined value; and control means for determining operation conditions of said image forming means which relate to a density of an image to be formed by said image forming means, based on an output of said second light receiving means when the output of said first light receiving means is equal to said predetermined value.

5,568,235

## INDUCTION HEATED INTERMEDIATE TRANSFER MEMBER

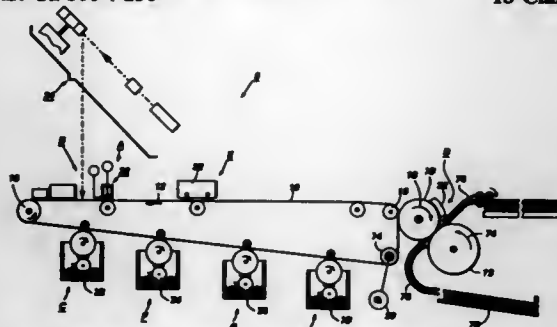
Kiri B. Amarakoon, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 22, 1995, Ser. No. 493,833

Int. Cl.<sup>6</sup> G03G 15/10; 15/16

U.S. Cl. 355—256

18 Claims



1. An intermediate transfer assembly comprising: an intermediate transfer member for receiving an image comprised of a liquid carrier and toner particles; a heat generating induction coil assembly spaced apart from said intermediate transfer member by a gap, said induction coil

assembly comprising a ferromagnetic core wrapped with a plurality of windings of a conductive element; and a conductive heating layer; wherein an alternating current passing through said plurality of windings creates alternating magnetic flux lines that induce eddy currents within said conductive heating layer which cause the conductive heating layer to heat up and to heat said image, and wherein said conductive heating layer is disposed between said gap and said plurality of windings.

5,568,236

## ONE-COMPONENT DEVELOPING DEVICE WITH SYSTEM FOR REMOVING SURPLUS ZONER

Hiroshi Toda; Akihiro Kawasaki, both of Toyokawa; Masami Eda, Itami; Shinichi Takemoto, and Tamotsu Sakuraba, both of Toyokawa, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

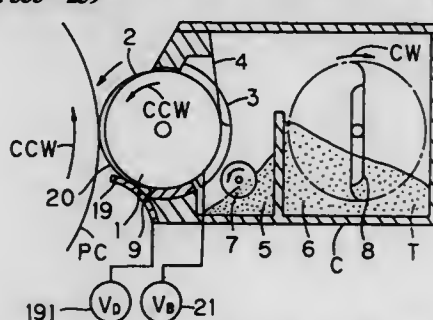
Continuation-in-part of Ser. No. 88,527, Jul. 9, 1993, abandoned. This application Sep. 8, 1994, Ser. No. 303,221

Claims priority, application Japan, Jul. 10, 1992, 4-183341; May 26, 1993, 5-123757; Dec. 27, 1993, 5-330914

Int. Cl.<sup>6</sup> G03G 15/06; 21/00

U.S. Cl. 355—259

39 Claims



39. A one-component developing device for developing an electrostatic latent image on an electrostatic latent image carrier comprising:

a toner carrying member which is opposed to said electrostatic latent image carrier and has a movable surface for holding said toner thereon;

a toner restricting member located at a position, which is upstream of a developing region, with respect to a moving direction of said surface of said toner carrying member, said toner restricting member being in contact with said surface of said toner carrying member; and

an electrically conductive member located in a region extending from a position, which is downstream from said developing region, with respect to the moving direction of said surface of said toner carrying member, to a position upstream of said toner restricting member, said electrically conductive member being in contact with said surface of said toner carrying member and being formed of material having a charge polarity near a charge polarity of said toner.

5,568,237

## TONER BOX HAVING ARIALLY SPACED AND TRAPEZOIDAL, FLEXIBLE AGITATING MEMBERS

Kazuhito Ishida, Nagoya; Hiroshi Tokuda, Anjo, and Shinji Kimura, Kan, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Division of Ser. No. 432,922, May 1, 1995, Pat. No. 5,506,665.

This application Feb. 6, 1996, Ser. No. 597,198

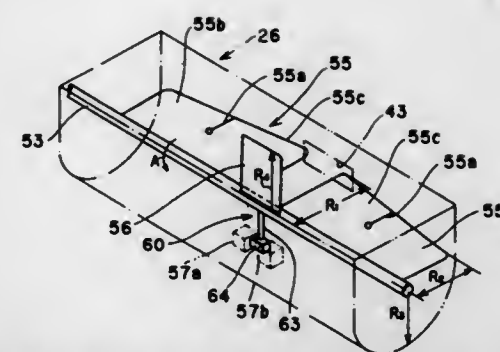
Claims priority, application Japan, May 12, 1994, 6-98476; May 12, 1994, 6-98477; May 12, 1994, 6-98478

Int. Cl.<sup>6</sup> G03G 15/08

U.S. Cl. 355—260

28 Claims

16. A toner box comprising: a toner body having a toner discharge opening;



- a shaft rotatably mounted to rotate within the toner body;
- a first agitating blade on each end of the shaft on opposite sides of the toner discharge opening, each said first agitating blade having a substantially trapezoidal shape.

5,568,238

## TRANSFER ASSIST APPARATUS HAVING A CONDUCTIVE BLADE MEMBER

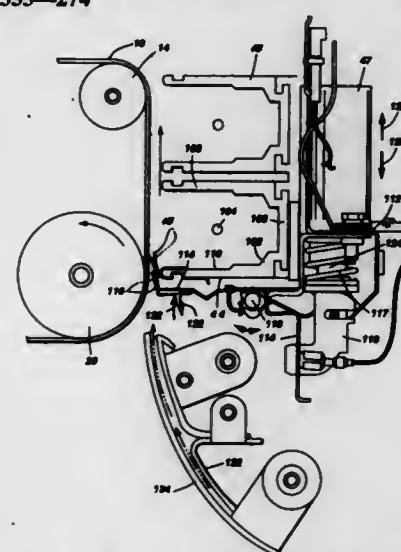
William G. Osbourne; Julio A. Sanchez-Banos, both of Webster, and Alan R. Anderson, Sodus, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 20, 1995, Ser. No. 560,156

Int. Cl.<sup>6</sup> G03G 15/16

U.S. Cl. 355—274

10 Claims



1. An apparatus for transferring a developed image from an image bearing surface to a copy sheet, including: means for electrostatically charging the copy sheet to attract the developed image from the image bearing surface to the copy sheet; and means for pressing the copy sheet into contact with at least the developed image on the image bearing surface in a region proximate to said charging means for substantially eliminating any spaces between the copy sheet and the developed image;
- said pressing means including a substantially conductive blade member including a substantially flexible sheet material adapted to be shifted between a non-operative position spaced from the image bearing surface, and an operative position in contact with the copy sheet on the image bearing surface, the sheet material including an anti-static material for reducing static generation to substantially prevent build-up of electrostatic charge thereon;
- a lever member, pivotable about a pivot point, for shifting said blade member between the non-operative position and the operative positions; and

a transport member coupled to said lever member for selectively pivoting said lever member about said pivot point to effect the shifting of said blade member between the non-operative position and the operative position.

5,568,239

## STAINPROOFING OIL FOR A HEAT FIXING ROLLER

Yutaka Furukawa; Satsaku Kumai, and Mami Yoshino, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Division of Ser. No. 296,246, Aug. 25, 1994, abandoned. This application Mar. 27, 1995, Ser. No. 412,221

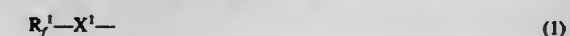
Claims priority, application Japan, Aug. 27, 1993, 5-235664; Apr. 13, 1994, 6-074973; Jul. 19, 1994, 6-166952

Int. Cl.<sup>6</sup> G03G 15/20

U.S. Cl. 355—284

8 Claims

1. A heat fixing roller coated with a stainproofing oil which consists essentially of a fluorosilicone compound having a silicon atom to which a monovalent fluorine-containing group selected from the formulae (1) to (3) is bonded:



wherein  $R_f^1$  is a monovalent polyfluorohydrocarbon group of the formula  $CF_3(CF_2)_n$ , wherein  $n$  is an integer of from 3 to 13,  $R_f^2$  is a monovalent polyfluoroalkyl group containing an ether oxygen atom  $R_f^3$  is a monovalent polyfluorohydrocarbon group and each of  $X^1$  to  $X^5$  independently is a bivalent hydrocarbon group.

5,568,240

## IMAGE HEATING APPARATUS

Yasumasa Ohtsuka, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

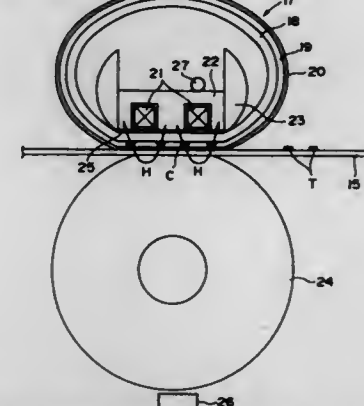
Filed Oct. 17, 1994, Ser. No. 323,789

Claims priority, application Japan, Oct. 18, 1993, 5-259972

Int. Cl.<sup>6</sup> G03G 15/20

U.S. Cl. 355—285

27 Claims



1. An image heating apparatus comprising: a movable member having an electrically conductive layer and movable with a recording material; an excitation coil for producing magnetic flux, which produces eddy current in said movable member to generate heat therein, and wherein an image on said recording material is heated by heat of said movable member; wherein said movable member has a low thermal conductivity material at a side nearer to said excitation coil than the conductive layer and said low thermal conductivity material has a thickness of not less than 10 and not more than 100  $\mu$ m.



5,568,241

# **THERMOFIXING DEVICE FOR A PRINTING OR COPYING MACHINES HAVING A LOW TEMPERATURE PREHEATING SADDLE**

Edmund Creutzmann, Markt Schwaben; Andreas Eckardt; Joachim Hoffmann, both of München; Walter Kopp, Taufkirchen, and Josef Windele, Puchheim, all of Germany, assignors to Siemens Nixdorf Informationssysteme Aktiengesellschaft, Paderborn, Germany

PCT No. PCT/EP93/02806, § 371 Date Apr. 20, 1995, § 102(e) Date Apr. 20, 1995, PCT Pub. No. WO94/09410, PCT Pub. Date Apr. 28, 1994

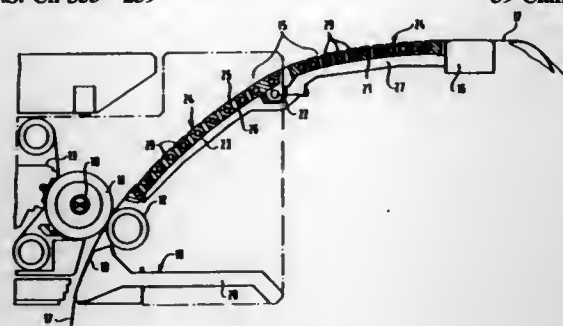
PCT Filed Oct. 12, 1993, Ser. No. 428,116

Claims priority, application Germany, Oct. 22, 1992, 921 18 107.9

Int. Cl.<sup>6</sup> G03G 15/20

U.S. Cl. 355—259

39 Claims



1. A thermofixing device for fixing toner images on a sheet recording substrate in an imaging machine, the thermofixing device comprising:

- a thermoprinting fixing device for thermoprinting fixing toner images on the recording substrate;
  - a heated preheating saddle arrangement, which is located upstream of the thermoprinting fixing device relative to a running direction of the recording substrate for preheating and guiding the recording substrate, the preheating saddle arrangement including: in
  - a plurality of heating saddles defining a gliding surface, each heating saddle extending perpendicularly across the running direction and having a plurality of heating elements, wherein the heating elements uniformly heat the gliding surface, the gliding surface, receiving the recording substrate thereon, the heating saddles having a plurality of associated temperature sensors for determining a surface temperature; a means for controlling the heating elements, the means for controlling receiving signals from the temperature sensors and analyzing:
    - a) a desired surface temperature entered via peripheral entry means;
    - b) at least one selected operating parameter; and
    - c) relationships among the desired surface temperature, the selected operating parameters and the thermal energy flow or coefficient of temperature rise, so that the means for controlling controls the surface temperature of the heating saddles so that, along the preheating saddle arrangement, an approximately constant thermal energy flow occurs from the gliding surfaces to the recording substrate;
- wherein the preheating saddle arrangement is a low temperature saddle with a minimum total length of the heated gliding surfaces at which a coefficient of temperature rise in the recording substrate dependent on the recording substrate material is not exceeded.

5,568,242

# **ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER, IMAGE FORMING APPARATUS AND PROCESS UNIT HAVING THIS ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER**

Hiroshi Sasame; Hideki Anayama, both of Yokohama, and Yoichiro Maebashi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1995, Ser. No. 394,262

Claims priority, application Japan, Feb. 28, 1994, 6-029647

Int. Cl.<sup>6</sup> G01B 7/06

U.S. Cl. 355—299

15 Claims

1. An image forming apparatus comprising an electrophotographic photosensitive member, a charging member for electrostatically charging the electrophotographic photosensitive member, an exposure means for exposing the electrophotographic photosensitive member thus charged to form an electrostatic latent image, a developing means using a toner to form a toner image from the electrostatic latent image on the electrophotographic photosensitive member, and a cleaning means for cleaning and scraping the surface of the electrophotographic photosensitive member, the electrophotographic photosensitive member comprising a support and a photosensitive layer provided thereon, which layer has a portion with a scrapability increasing in the direction from the surface toward the interior thereof and the surface of the electrophotographic photosensitive member prior to use being scrapable to a depth from 0.3  $\mu$ m to 0.9  $\mu$ m after 500 sheets of recording paper have been printed.

5,568,243

# **CLEANING MECHANISM FOR A TRANSFER DRUM OF A REPRODUCTION APPARATUS**

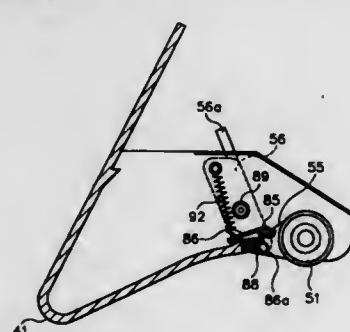
Katherine E. Durfee, Rochester; James C. Barry, Fairport; Charles J. Bennett, Hilton; Gary B. Bertram, Honeoye Falls; Mark Kristansen, Churchville; Bruce D. MacLellan, Ontario, and Anthony Sacino, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 1, 1994, Ser. No. 270,062

Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 355—299

8 Claims



1. A reproduction apparatus including a transfer drum, having an external surface, for electrostatic transfer of a toner image from an image bearing member, and a transfer drum cleaning mechanism, said transfer drum cleaning mechanism comprising:
 

- means for wiping said external surface of said transfer drum to remove residual toner and debris therefrom;
- a blade member for removing toner and debris from said wiping means; and
- means for resiliently urging said blade member into association with said wiping means under substantially uniform load, said resilient urging means includes a blade holder defining an elongated slot having spaced side walls for receiving said blade member, said elongated slot having a curved configuration, in cross-section, with sufficient space between the side walls thereof to readily receive said blade member and provide two lines of retention contact with said blade member, when urged into association with said wiping means to posi-

tively retain said blade member in said slot, and further having an axis extending in the longitudinal direction thereof, means for mounting said blade holder for pivotal movement about a pivot axis parallel to said longitudinal axis of said slot, and spring means connected to said blade holder to urge said blade holder about said pivot axis in a direction to bring said blade member into operative association with said wiping means.

5,568,244

# **IMAGE FORMING APPARATUS INCLUDING AN ENDLESS TRANSFER MEMBER**

Atsuto Hirai, Ikoma; Masahide Ueda, Takatsuki; Yoshihisa Terasaka, Suita; Eichi Sano; Masahiko Matsuura, both of Takatsuki; Hiroyuki Yamasaki, Amagasaki; Masami Yamada, Osaka, and Tomoo Izumi, Amagasaki, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

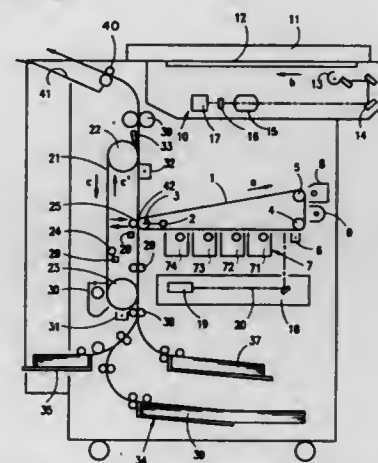
Filed Dec. 12, 1994, Ser. No. 355,289

Claims priority, application Japan, Dec. 13, 1993, 5-311660

Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 355—309

42 Claims



1. An image forming apparatus for forming an image onto a sheet, comprising:
 

- a sheet supporting member;
- a charger which is positioned in a vicinity of said sheet supporting member; and
- means for controlling the charger so that the charger charges a specific portion of said sheet supporting member corresponding to a leading edge portion of said sheet to an electrostatic potential higher than that of a remaining portion of said sheet supporting member, said electrostatic potential of said remaining portion being low enough to prevent a reduction of image quality.

5,568,245

# **TURNOVER DEVICE FOR WEB-SHAPED RECORDING MEDIA**

Otto Ferber, Germering, and Vilmar Eggerstorfer, Poing, both of Germany, assignors to Siemens Nixdorf Informationssysteme AG, Paderborn, Germany

Filed Jun. 5, 1995, Ser. No. 465,249

Claims priority, application European Pat. Off., Aug. 19, 1994, 94112973

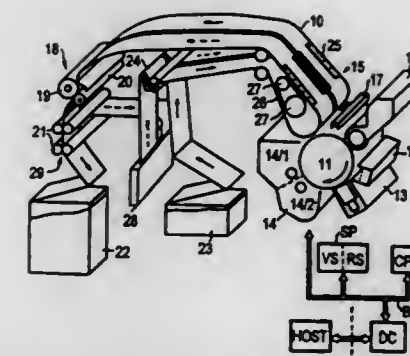
Int. Cl.<sup>6</sup> G03G 15/00

U.S. Cl. 355—309

19 Claims

1. A turnover device for turning over a web-shaped recording medium, the device comprising:
 

- an admission channel and a discharge channel arranged next to each other;



- a first oblique deflector that laterally deflects the recording medium supplied through the admission channel in a conveying direction;
- a first reverser following the first oblique deflector in the conveying direction for returning the recording medium behind the channels toward a second reverser arranged approximately parallel to the first reverser, the second reverser again reversing the recording medium;
- a second oblique deflector that follows the second reverser, the second oblique deflector deflecting the recording medium into the discharge channel; and
- a threader for the threading the recording medium through the turnover device, the threader comprising a motor-driven friction element guided around the reversers, the friction element gripping a start of the recording medium by seizing said start of the recording medium in the region of the first oblique deflector, and guiding the recording medium around the reversers and the second oblique deflector and into the region of the discharge channel.

5,568,246

# **HIGH PRODUCTIVITY DUAL ENGINE SIMPLEX AND DUPLEX PRINTING SYSTEM USING A REVERSIBLE DUPLEX PATH**

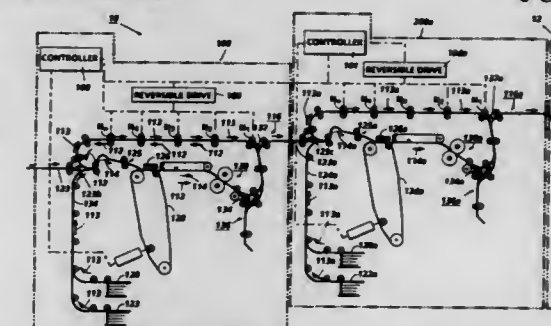
Paul D. Keller, Webster; Glenn M. Keenan, and Lloyd F. Bean, II, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 29, 1995, Ser. No. 537,054

Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 355—309

6 Claims



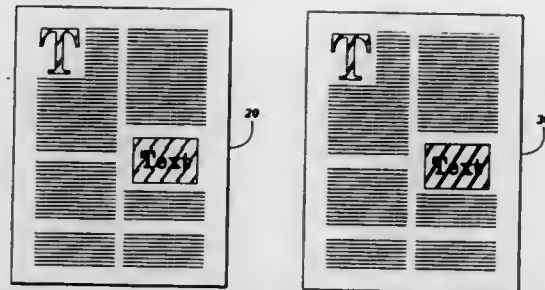
1. In a dual engine printing system for producing a multipage print job with first and second printing engines, by passing sheets to be printed through both said first and second printing engines, in that order, to a common output from said second printing engine, and wherein said first and second printing engines each have a printing path therethrough with an entrance and exit, the improvement in said dual engine printing system wherein:
 

- said second printing engine has a duplex return path bypassing said printing path of said second printing engine, said duplex return path extending substantially from one side of said second printing engine to the other side to optionally return sheets printed on one side from said printing path exit back to said printing path entrance of said second printing engine,

and wherein a higher productivity simplex print job printing mode is provided in which alternate pages of a simplex print job are substantially simultaneously printed in said first and second printing engine,

and wherein said alternate pages of the said simplex print job printed in said first printing engine in said higher productivity simplex printing mode are fed from said exit of said printing path of said first printing engine to said second printing engine duplex return path to bypass said printing path of said second printing engine,

and wherein said alternate pages from said first printing engine are automatically interleaved in said common output with said alternate pages printed in said second printing engine after said alternate pages from said first printing engine have fed through said second printing engine duplex return path.

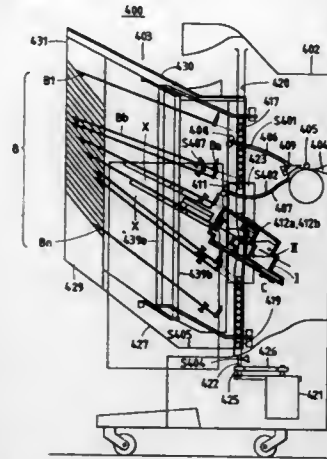


same original document sheet, which black show-through print repeating pattern is highly visible to and reproducible by said conventional black only reproduction apparatus and is not a half-tone pattern, and then copying said original document sheet on a black only reproduction apparatus to generate black print copies in which said highlight color area of said original document sheet contains on said black print copies thereof said highly visible distinguishable black print repeating pattern over said highlight color area which is visually indicative of the original color highlighting of said area.

**5,568,247**  
**IMAGE FORMING SYSTEM CAPABLE OF STAPLING SHEETS AT PLURAL POINTS**  
 Mitsushige Murata, Yokohama; Norifumi Miyake, Tokyo, and Kazuo Onodera, Ibaraki-ken, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
 Filed Dec. 27, 1994, Ser. No. 364,230  
 Claims priority, application Japan, Dec. 29, 1993, 5-354347  
 Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 355—324

10 Claims



1. A stapling apparatus comprising:  
 stapling means for selectively performing stapling at one or plural points of a plurality of sheets ejected from an image forming apparatus; and  
 control means for controlling said stapling means to perform stapling at a plurality of points of sheets ejected when said image forming apparatus is in a mode for forming images on both sides of sheet.

**5,568,248**  
**BLACK AND WHITE REPRODUCIBLE PATTERN HIGHLIGHT COLOR PRINTING**  
 John S. Wagley, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 5, 1994, Ser. No. 349,283  
 Int. Cl.<sup>6</sup> G03G 15/01

U.S. Cl. 355—328

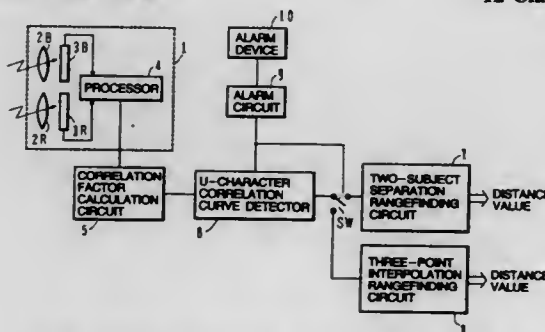
2 Claims

1. A reproduction method comprising printing a physical original document sheet with at least one highlight color area in a highlight color document printer, which highlight color area is a uniformly applied print color area of a color which does not copy well when said document sheet with said highlight color area is copied on a conventional black only reproduction apparatus, and also concurrently printing a black print show-through print repeating pattern superposed under said highlight print color area on said

**5,568,249**  
**PHASE DIFFERENCE DETECTION TYPE RANGEFINDER AND METHOD OF MEASURING SUBJECT DISTANCE**  
 Kazuo Kawamura, Jun Hasegawa, and Takashi Miida, all of Miyagi, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
 Filed Apr. 19, 1994, Ser. No. 229,818  
 Claims priority, application Japan, Apr. 19, 1993, 5-091593  
 Int. Cl.<sup>6</sup> G01C 3/08

U.S. Cl. 356—3.14

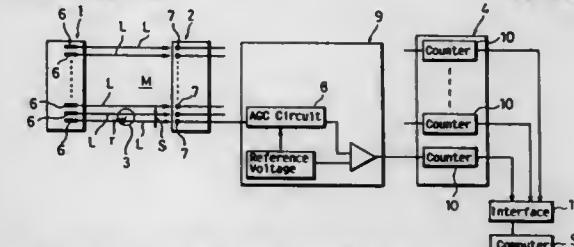
12 Claims



1. A phase difference detection type rangefinder comprising:  
 a base photosensor and a reference photosensor on which images of a subject are focussed;  
 correlation factor calculating means for calculating correlation factors between said images focussed on said base photosensor and said reference photosensor;  
 second order differential value calculating means for calculating second order differential values of said correlation factors calculated by said correlation factor calculating means;  
 second order differential value comparing means for selecting at least one maximum second order differential value from said second order differential values;  
 first three-point interpolation means for calculating at least one interpolation value by three-point interpolation in accordance with said maximum second order differential value and two second order differential values having different phases from said maximum second order differential value; and  
 first distance value calculating means for calculating a distance value by using the phase of said maximum second order differential value and said interpolation value.

**5,568,250**  
**APPARATUS AND METHOD FOR MEASURING THE VELOCITY OF A FLYING SPHERICAL OBJECT**  
 Tetsuji Nishiyama, Akashi, and Takashi Teraguchi, Kakogawa, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan  
 Filed May 26, 1994, Ser. No. 249,201  
 Claims priority, application Japan, Jun. 7, 1993, 5-164174  
 Int. Cl.<sup>6</sup> G01D 3/36; A63D 67/00; 61/00; 65/00  
 U.S. Cl. 356—28

16 Claims

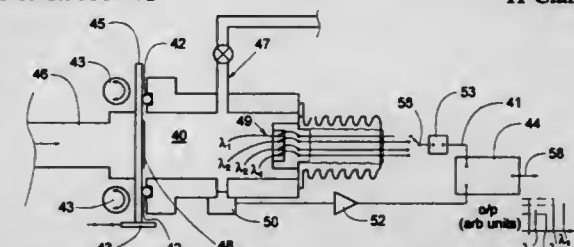


1. An apparatus for measuring the flying velocity of a spherical object in flight, comprising:  
 a ray projecting means for emitting a plurality of parallel rays of light which are located within a single plane, and in which each location is a known quantity, and the distance between every two neighboring rays of light is set such as to be less than the radius of said spherical object;  
 a ray receiving means for detecting the incidences of said rays of light and the interceptions of said rays of light;  
 an instrumentation means for measuring the time for which said rays of light are blocked off by said spherical object, upon detecting signals given by said ray receiving means;  
 and an arithmetic operation means for computing the flying velocity of said spherical object in flight on the basis of the locations of the rays of light which are blocked off, the dimensions of said spherical object and the interception time of said rays of light which is measured by using said instrumentation means.

**5,568,251**  
**AUTHENTICATING SYSTEM**  
 Michael Davies, and Jerzy A. Dobrowolski, both of Ottawa, Canada, assignors to National Research Council of Canada, Ottawa, Canada  
 Filed Mar. 23, 1994, Ser. No. 216,451  
 Int. Cl.<sup>6</sup> G07D 7/00

U.S. Cl. 356—71

11 Claims



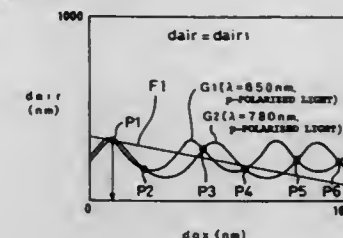
1. A system for authenticating a substrate, operable in one of a first mode, a second mode and a third mode of operation, the authenticating system in the first mode accepting a substrate coated with a thin film structure composed of layers having a combined thickness substantially within an order of magnitude of the wavelength of light to be detected, said structure being capable of reflecting light of predetermined wavelengths and substantially absorbing or transmitting light of other predetermined wavelengths incident upon a same location on the surface of the substrate, in the second mode accepting a transmissive substrate coated with a thin film structure composed of layers having combined a thickness substantially within an order of magnitude of the wavelength of light to be detected, said structure being capable of transmitting light of predetermined wavelengths and substantially absorbing or reflecting light of other predetermined wavelengths incident upon a

same location on the surface of the substrate, and the system in the third mode accepting an absorbing substrate being coated with a coating capable of absorbing light of predetermined wavelengths and substantially reflecting or transmitting light of other predetermined wavelengths incident upon a same location on the surface of the substrate, the authenticating system comprising:  
 means for irradiating the substrate with predetermined wavelengths of coherent light; and  
 detecting means operable in a spectral range covering said predetermined wavelengths of coherent light to detect the presence or absence of said wavelengths of light when reflected, transmitted or absorbed, reflectively, from or by said thin film structure.

**5,568,252**  
**METHOD AND APPARATUS FOR MEASURING INSULATION FILM THICKNESS OF SEMICONDUCTOR WAFER**  
 Tatsufumi Kusuda; Motohiro Kouno; Ikuyoshi Nakatani, and Sadao Hirae, all of Kyoto, Japan, assignors to Dainippon Screen Manufacturing Co., Ltd., Japan  
 Filed Dec. 23, 1994, Ser. No. 363,535  
 Claims priority, application Japan, Dec. 28, 1993, 5-350500  
 Int. Cl.<sup>6</sup> G01N 21/00; G01B 11/06

U.S. Cl. 356—72

12 Claims



	d air (nm)	d ox (nm)
P1:	80.0	320.0
P2:	212.3	106.6
P3:	446.0	295.6
P4:	803.2	106.2
P5:	853.3	220.0
P6:	842.7	230.7

1. A method of measuring thickness of an insulation film formed on a surface of a semiconductor wafer, said method comprising steps of:  
 providing a non-destructive measuring device comprising a light source for generating a plurality of monochromatic light beams which differ at least in wavelength and/or polarization direction, an optical waveguide having a reflecting plane for reflecting said plurality of monochromatic light beams such that geometric optical total reflection of said plurality of monochromatic light beams occurs, a photosensor for measuring intensity of each of said plurality of monochromatic light beams reflected from said reflecting plane, and a test electrode proximate to said reflecting plane adapted to be used for making C-V characteristic measurement of said semiconductor wafer;  
 holding said reflecting plane apart from said semiconductor wafer across a gap;  
 emitting said plurality of monochromatic light beams from said light source, and measuring the intensity of each of said plurality of monochromatic light beams reflected from said reflecting plane to obtain reflectance of each of said plurality of monochromatic light beams;  
 determining a plurality of characteristic curves respectively representing relationships between the thickness of said insulation film and the gap between said reflecting plane and said semiconductor wafer by utilizing said reflectance of said plurality of monochromatic light beams;  
 measuring a C-V characteristic of said semiconductor wafer to obtain a total capacity of the gap and the thickness said insulation film;

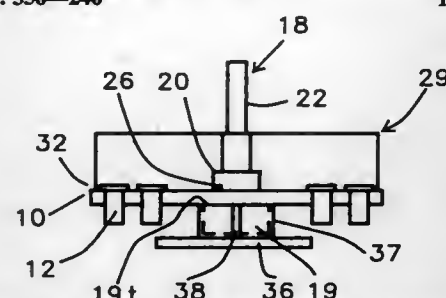


determining a characteristic line representing a relationship between the gap and the thickness of the insulation film from said total capacity; and  
finding a common intersection where said characteristic line and said plurality of characteristic curves intersect to determine values of the gap and the thickness of the insulation film.

**5,568,253**  
**SAMPLE HOLDER FOR SAMPLE TESTING APPARATUS**  
Shu F. Chan; Min H. Tsao; Kuo Y. Hsu, and Hui C. Peng, all of Hsin-chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-chu, Taiwan  
Filed Mar. 20, 1996, Ser. No. 618,892  
Int. Cl.<sup>6</sup> G01N 1/10

U.S. Cl. 356—246

13 Claims



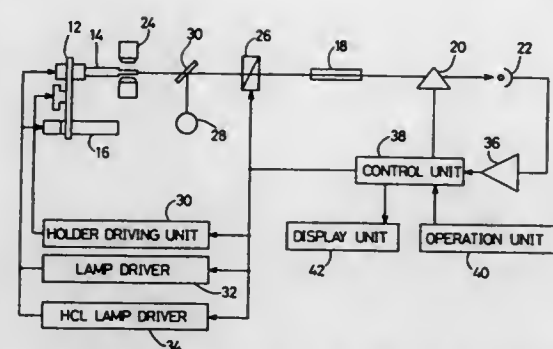
1. A holder for vials containing a liquid to be tested while the vials are held in the holder, comprising:  
a support having a bottom cylindrical section of a predetermined diameter, a middle cylindrical section of a smaller diameter than the bottom section, and a top cylindrical section of a smaller diameter than the middle section, whereby a lower annular ledge is formed between the bottom section and the middle section and an upper annular ledge is formed between the middle section and the top section,  
a disk having a center hole adapting the disk to fit over the middle section and to be supported by the lower ledge, the disk having means for holding vials, the disk being made of a polymer and being substantially free of materials that are to be detected during the test, and  
a cover made of a polymer and having an inverted cup shape and having a center hole for locating the cover on the top section of the support with the edge of the cover sealing with the upper surface of the disk at a radius beyond the vial supporting means.

**5,568,254**  
**LOW PRESSURE DISCHARGE TUBE AND ATOMIC ABSORPTION SPECTROPHOTOMETER USING THE SAME**  
Tomohiro Nakano, Kyoto, Japan, assignor to Shimadzu Corporation, Japan  
Filed Jan. 28, 1993, Ser. No. 10,328  
Claims priority, application Japan, Jan. 31, 1992, 4-046065  
Int. Cl.<sup>6</sup> G01J 3/42

U.S. Cl. 356—307

10 Claims

1. An atomic absorption spectrophotometer, comprising:  
a light source unit for generating measurement light, said light source unit comprising a plurality of lamps including at least one low pressure discharge tube lamp and at least one hollow cathode lamp which are mounted on a surface of a common lamp holder, said light source unit capable of selectively positioning one of said lamps at a light source position for emitting measuring light along an optical path during sample measurement, said light source unit including a magnetic field generating unit for operating a magnetic field on said low pressure discharge tube lamp when located at the light source position,



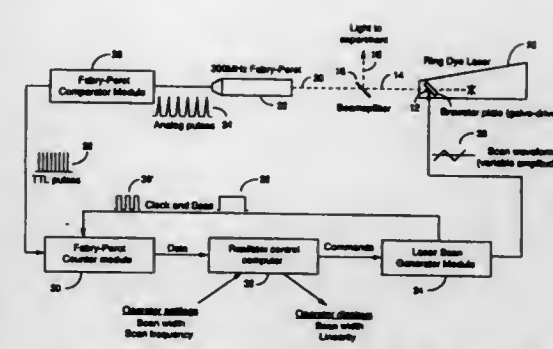
- said lamp holder being so arranged that the surface of said lamp holder is perpendicular to an optical path of the measurement light,  
said low pressure discharge tube comprising a U-shaped enclosed light permeable lamp tube having two straight portions parallel to each other and a curved portion connecting said straight portions, said lamp tube being sealed and containing a metal or metal salt in an evaporable state together with a rare gas,  
said low pressure discharge tube being so mounted on the surface of said lamp holder that the straight portions are arranged perpendicular to the surface of said lamp holder, and luminescence in a direction parallel to said straight portions and outwardly from said curved portion along the optical path of the measurement light is utilized;  
said hollow cathode lamp being so mounted on the surface of said lamp holder that luminescence is emitted along the optical path of the measurement light;  
a polarizing unit disposed on the optical path of the measurement light for changing the direction of polarization of the measurement light by 90°;  
an atomizing unit located on the optical path of the measurement light;  
a spectroscopic unit located on the optical path of the measurement light for separating the measurement light passing through said atomizing unit;  
a detector for detecting the measurement light separated by said spectroscopic unit;  
a D<sub>2</sub> lamp located off the optical path of the measurement light; and  
a half mirror located on the optical path of the measurement light, said half mirror is located between said light source unit and said atomizing unit, and positioned so that light from said D<sub>2</sub> lamp can be directed along the optical path of the measurement light.

**5,568,255**  
**APPARATUS FOR CONTROLLING THE SCAN WIDTH OF A SCANNING LASER BEAM**  
Gary W. Johnson, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.  
Filed Oct. 12, 1994, Ser. No. 321,695  
Int. Cl.<sup>6</sup> G01B 9/02

U.S. Cl. 356—352

3 Claims

1. Apparatus for scanning the frequency of a laser to provide a scanning laser beam having a scan width defined by a lower frequency and an upper frequency comprising:  
a Brewster plate disposed in the path of a laser beam, the frequency of said laser beam being varied at the output of said Brewster plate by changing the instantaneous path length of said laser beam through the Brewster plate to provide said scanning laser beam, the Brewster plate being rotatable to vary the instantaneous path length of said laser beam through the Brewster plate;  
means for rotating the Brewster plate to vary the instantaneous path length of said laser beam, thereby scanning the frequency

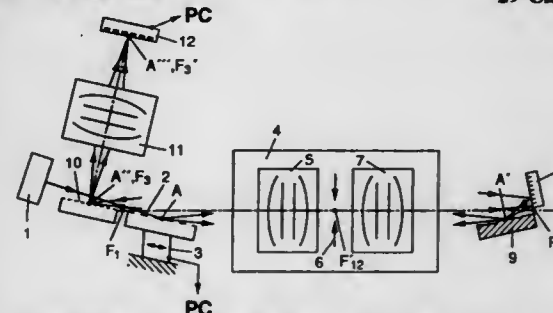


- of the laser beam between said lower frequency and said upper frequency to provide said scanning laser beam;  
an interferometer disposed to receive at least a portion of said scanning laser beam and produce an output signal each time a frequency of said scanning laser beam crosses a free-spectral resonant mode of a resonant cavity of said interferometer, the number of output signals per unit time indicating the instantaneous frequency of said scanning laser beam;  
a controller coupled to receive said output signals from said interferometer, said controller continually calculating the instantaneous frequency from said output signals per unit time received from the interferometer and thereafter continually determining the scan width from the instantaneous frequency, said controller further controlling said means for rotating the Brewster plate to vary the frequency of the scanning laser beam to provide the scanning laser beam wherein said controller further calculates a laser scan linearity of said scanned laser beam by comparing time differences between adjacent pairs of output signals and calculating the variation in those time difference for a selected number of contiguous output signals.

**5,568,256**  
**METHOD AND APPARATUS UTILIZING AN OPTICAL STAGE FOR TOPOGRAPHIC SURFACE ANALYSIS**  
Klaus Körner, Schöneiche; Fritz Holger, Berlin; Lajos Nyarsik, Berlin; Günter Spur, Berlin, and Eckart Uhlmann, Berlin, all of Germany, assignors to Fraunhofer Gesellschaft zur Förderung der angewandten Forschung e.V., Germany  
Filed Apr. 21, 1994, Ser. No. 230,772  
Claims priority, application Germany, Apr. 21, 1993, 43 13 057.7; Apr. 21, 1993, 43 13 061.5; Oct. 8, 1993, 43 34 388.0  
Int. Cl.<sup>6</sup> G01B 9/02

U.S. Cl. 356—359

29 Claims



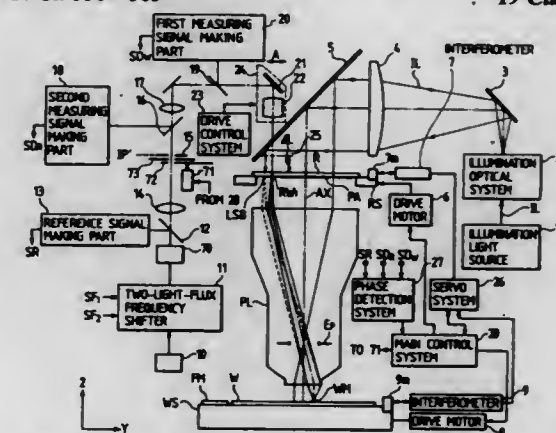
1. Apparatus for topographic analysis of a surface comprising at least one light source for radiating divergent light, a first light-distributing surface of a first diffraction grating for receiving light from the at least one light source and for reflecting a first bundle of light under normal optical conditions and a second bundle of light formed by diffraction of the first order, a first optical stage for projecting the first and second bundles from the first light-distributing surface in an optically conjugated form onto an object surface to be analyzed of a sample, light representing the object surface being sharply projected via the first optical stage onto a second light-distributing surface of a second diffraction grating,

and a detector for receiving diffracted bundles of light from the second light-distributing surface projected by a second optical stage for detecting radiation enabling topographic analysis of the object surface.

**5,568,257**  
**ADJUSTING DEVICE FOR AN ALIGNMENT APPARATUS**  
Kazuya Ota, Tokyo; Hideo Mizutani, Yokohama, and Kouichiro Komatsu, Tokyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan  
Continuation of Ser. No. 162,967, Dec. 8, 1993, abandoned, which is a continuation of Ser. No. 908,468, Jul. 6, 1992, abandoned. This application May 15, 1995, Ser. No. 441,062  
Claims priority, application Japan, Jul. 9, 1991, 3-168018  
Int. Cl.<sup>6</sup> G01B 9/02; 11/00

U.S. Cl. 356—363

19 Claims



1. An alignment apparatus which detects a diffraction grating formed on a substrate by using two beams having a predetermined difference in frequency, comprising:  
a movable stage which holds a substrate;  
a fiducial grating plate which is provided on said stage;  
a light transmission system which irradiates said fiducial grating plate with two beams at a given intersecting angle, said light transmission system including an objective optical system which emits said two beams toward said fiducial grating plate and a field diaphragm which is arranged at a plane conjugate with said fiducial grating plate with respect to said objective optical system;  
a photoelectric detector which receives interference light of diffraction rays of light that are generated substantially in one and the same direction from an intersecting area of said two beams on said fiducial grating plate, restricted by said field stop;  
a diaphragm member which is provided independent of said field diaphragm and which partially shields said intersecting area on said fiducial grating plate; and  
a measuring device which measures said intersecting angle of said two beams or a rotational error of a crossing line between said fiducial grating plate and a plane containing principal rays of said two beams with respect to a direction of grating arrangement of said fiducial grating plate, based on first and second detection signals, said first detection signal being generated from said photoelectric detector when a first area within said intersecting area is shielded by said diaphragm member, and said second detection signal being generated from said photoelectric detector when a second area within said intersecting area is shielded by said diaphragm member, said first and second areas having at least portions thereof that differ from each other.

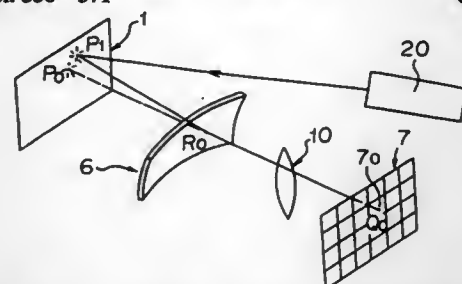


**5,568,258**  
**METHOD AND DEVICE FOR MEASURING DISTORTION OF A TRANSMITTING BEAM OR A SURFACE SHAPE OF A THREE-DIMENSIONAL OBJECT**

Ken Uemura; Yukiko Nagashima, both of Yokohama; Yasunari Saito, Funabashi; Takao Kurita, Yokohama; Tetsuo Miyake, Toyohashi, and Kazuaki Shimizu, Yokohama, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan  
 Continuation of Ser. No. 934,214, Aug. 25, 1992, abandoned.  
 This application Apr. 25, 1995, Ser. No. 428,838  
 Int. Cl.<sup>6</sup> G01B 11/24

U.S. Cl. 356—371

6 Claims



1. A method of measuring a distortion of a transmitting beam, characterized in that:

- a transmitting beam is emitted from a beam generator and projected onto a screen as a bright spot;
- said bright spot is scanned over a surface of said screen;
- a beam receiving device is provided with a beam receiving plane comprising a plurality of pixels and brightness distribution curves are generated for each of said plurality of pixels of said beam receiving device by measuring and recording a degree of brightness detected at each of said plurality of pixels during each time period when said bright spot changes position while scanning over said surface of said screen and selecting a representative point representing a degree of brightness on a brightness distribution curve corresponding to each of said plurality of pixels;
- a first location of said bright spot on said screen is determined at a first time when a measured degree of brightness at a given one of said plurality of pixels is equal to a degree of brightness represented by a representative point on a brightness distribution curve corresponding to said given one of said plurality of pixels upon transmitting through a measured body, and a second location of said bright spot on said screen is determined at a second time when a measured degree of brightness at said given one of said plurality of pixels is equal to a degree of brightness represented by a representative point on a brightness distribution curve corresponding to said given one of said plurality of pixels upon not transmitting through said measured body; and
- a distortion of said transmitting beam is measured on the basis of a distance between said first location and said second location.

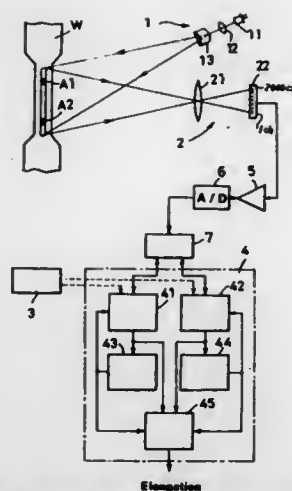
**5,568,259**  
**ELONGATION MEASURING METHOD AND LASER NONCONTACT EXTENSOMETER**  
 Masayuki Kamegawa, Nara, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Jun. 23, 1995, Ser. No. 494,219  
 Claims priority, application Japan, Jul. 27, 1994, 6-175339  
 Int. Cl.<sup>6</sup> G01B 11/14

U.S. Cl. 356—373

12 Claims

1. An elongation measuring method comprising the steps of: irradiating laser light onto the surface of a specimen over a predetermined length thereof in the direction of elongation to be measured;
- photoelectrically converting that scattering light of said laser light which has been reflected from said specimen surface, thereby to obtain speckle pattern data;



initially setting, as selected from said speckle pattern data, the data from two zones on said specimen which are separated from each other by a predetermined distance in said elongation direction, said data being set as observation point data; calculating, with the use of said observation point data, the amounts of movement of the speckle patterns from said two zones on said specimen;

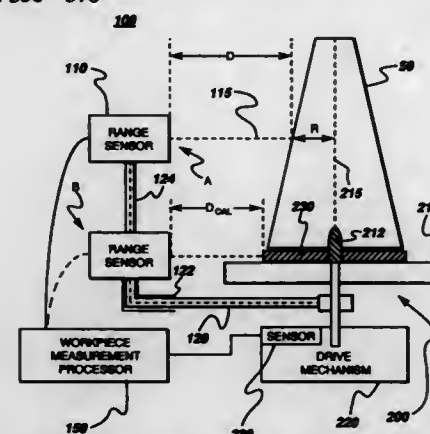
shifting, in the direction of movement of said speckle patterns, the zones serving as observation point data sources each time the calculation results of said movement amounts reach a predetermined amount; and calculating the elongation of said specimen between said initially set two zones based on (i) the shift amounts of said observation point data sources and (ii) said speckle pattern movement amounts calculated with the use of said observation point data.

**5,568,260**  
**PRECISION NON-CONTACT MEASUREMENT SYSTEM FOR CURVED WORKPIECES**  
 John L. Schaefer, Latham, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 31, 1995, Ser. No. 414,168  
 Int. Cl.<sup>6</sup> G01B 11/24

U.S. Cl. 356—376

16 Claims



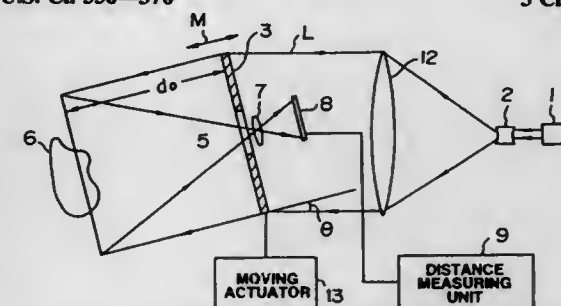
1. A precision non-contact measurement system for determining an integrated diameter measurement of a curved workpiece positioned to rotate in correspondence with a precision rotary device about the axis of rotation of said rotary device, the system comprising:
- a non-contact optical range sensor disposed along an orthogonal axial path with respect to the axis of rotation of said precision rotary device so as to illuminate said workpiece to optically determine a distance between said workpiece and said range sensor so as to determine a radius value of a portion of said workpiece disposed along said orthogonal axial path; and

a workpiece measurement processor coupled to receive respective signals from said precision rotary device and said non-contact range sensor so as to correlate the rotational position of said workpiece with corresponding respective radius values sensed by said range sensor so as to determine the diameter of said workpiece.

**5,568,261**  
**THREE-DIMENSIONAL IMAGE MEASURING DEVICE**  
 Hideyuki Wakai; Toru Suzuki; Keiji Terada; Masato Moriya, and Manabu Ando, all of Hiratsuka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan  
 Division of Ser. No. 165,418, Dec. 13, 1993, Pat. No. 5,448,360. This application Jun. 7, 1995, Ser. No. 475,312  
 Claims priority, application Japan, Dec. 18, 1992, 4-338914  
 Int. Cl.<sup>6</sup> G01B 11/24

U.S. Cl. 356—376

3 Claims



1. A three-dimensional image measuring device comprising:
- a hologram adapted for single exposure such that when reproduced, parallel light having a predetermined incident angle is irradiated, a plane light image is formed at a position located at a predetermined distance from the hologram in a depth direction;
- a light source for irradiating reproduced light on the hologram; parallel light converting means for converting the light from the light source into parallel light and irradiating the parallel light at the predetermined incident angle to the hologram;
- hologram moving and scanning means for imaging the parallel light image at a plurality of different positions extending in the moving and scanning direction by moving and scanning the hologram in a predetermined direction in such a manner that an angle between the parallel light and the hologram is kept at the predetermined incident angle;
- an object adapted to be measured being disposed in a space where the plane light image is formed;
- light receiving means including a plurality of two-dimensional-arranged light receiving elements for sequentially measuring the strength of scattered light of the plane light image imaged on a surface of the object as the hologram is moved by the hologram moving and scanning means; and
- distance measuring means for measuring the distance to the object based on an output of each light receiving element of the light receiving means.

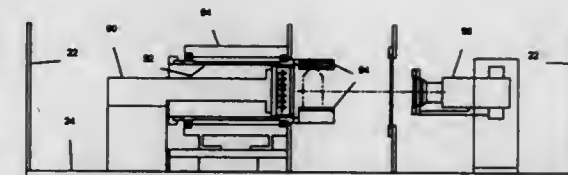
**5,568,262**  
**NON-DESTRUCTIVE FILL VOLUME MEASUREMENT SYSTEM**  
 Joseph G. LaChapelle, 32650 Joseph La., Philomath, Oreg. 97370, and Cary S. Kleist, 6139 Neisen Pl. SW., Albany, Oreg. 97321

Filed May 31, 1994, Ser. No. 251,332  
 Int. Cl.<sup>6</sup> G01B 11/00

U.S. Cl. 356—379

30 Claims

1. A non-destructive method of determining a fill volume of a first fluid in a sealed container that also contains a second fluid having a lower density than the first fluid, the container having a substantially symmetrical central region, comprising the steps of:



determining a common volume within the central region of the container intermediate an upright fluid level and an inverted fluid level, such that the first fluid fill volume equals a sum of the second fluid volume plus the common volume;

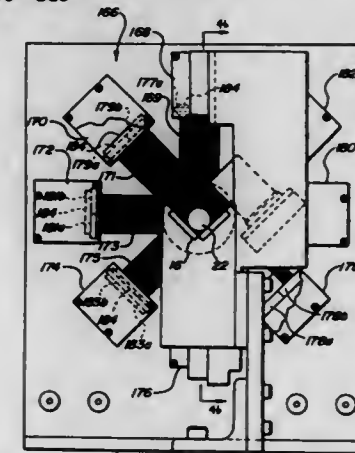
determining the second fluid volume; and

summing the second fluid volume and the common volume to determine the first fluid fill volume.

**5,568,263**  
**NON-CONTACT INSPECTION SYSTEM**  
 James L. Hanna, Ann Arbor, Mich., assignor to Mectron Engineering Company, Ann Arbor, Mich.  
 Continuation-in-part of Ser. No. 49,172, Apr. 19, 1993, Pat. No. 5,383,021. This application Jan. 6, 1995, Ser. No. 369,360  
 Int. Cl.<sup>6</sup> G01B 11/04

U.S. Cl. 356—385

18 Claims



1. An inspection system for evaluating workpieces for conformance to configuration criteria, comprising:
- track means for causing said workpieces to translate through a test section said track means including a slit in said test section,
- said test section including a light source for producing a sheet of light having a width greater than its thickness, said light source oriented with respect to said track means such that said sheet of light passes through said slit without being occluded by said track means and said workpieces pass through said sheet of light upon passing through said test section, said sheet of light oriented such that said width is perpendicular to the direction of translation of said workpieces through said test section, said test section further having a first and second photodetector constructed and arranged side-by-side which in combination receive said sheet of light wherein the portion of the sheet of light received by each of said first and second photodetectors is partially occluded and provides a first and second single channel output signal each related to the intensity of said sheet of light incident on each of said photodetectors whereby said intensity is related to the degree to which said sheet of light is occluded by said workpieces over said respective adjacent first and second photodetectors as said workpieces translate through said test section, and
- signal processing means for receiving said first and second single channel photodetector output signals and for producing a value related to the section thickness of said workpieces as measured perpendicular to the direction of said translation.

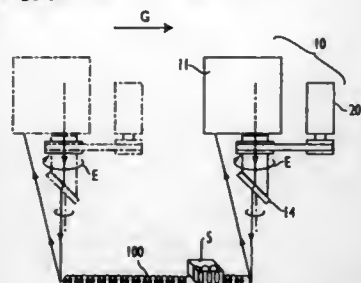


# 5,568,264 EXTERIOR VIEW INSPECTING APPARATUS FOR CIRCUIT BOARD

Shigeki Nakatsuka, Kyoto; Iwao Ichikawa, Nishinomiya; Manabu Morioka, Nara; Kenji Kato; Takayuki Fujita, both of Hirakata; Shigetoshi Negishi, Suita, and Kazuhiro Shiga, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan  
Continuation of Ser. No. 177,516, Jan. 4, 1994, abandoned.  
This application Aug. 16, 1995, Ser. No. 515,624  
Claims priority, application Japan, Jan. 7, 1993, 5-001036; Dec. 9, 1993, 5-309992

Int. Cl. G01B 11/00  
U.S. Cl. 356—394

9 Claims



1. An exterior view inspecting apparatus for circuit board comprising:

- a sensor unit for emitting a laser beam to an object to be inspected, and detecting a position of an electronic component on a circuit board by focusing a reflected light on a photoelectric transducer by using a receiving lens,
- at least one optical path converter unit comprising a flat sheet glass inclined to the optical path of the laser beam for refracting an optical path of the laser beam, the optical path of the laser beam is perpendicular to the object to be inspected after passing through said at least one optical path converter, means which rotates the flat sheet glass so that the laser beam scans an object to be inspected drawing a small circular trace,
- a sensor head unit incorporating the sensor unit and the at least one optical path converter unit,
- a control unit for moving the sensor head unit along a specified scanning route,
- a memory means for storing a correct position information of the object to be inspected,
- a correction unit for obtaining the corrected position data Z1 by correcting data H regarding the position of the object as detected by the sensor unit using the expression:

$$Z1 = H(X1 - r \cos \theta / X1)$$

wherein:

- X1 equals a distance between the laser beam and the receiving lens,
- r equals a radius of a circular trace of the laser beam,
- $\theta$  equals a rotation angle of the laser beam on the circular trace,
- a judging unit for judging the existence and position of the electronic component on the circuit board from the comparison between the corrected position data and the correct position information stored in the memory means.

5,568,265  
PIPE FITTING ALIGNMENT SYSTEMS  
David S. Matthews, 810 Salem Dr., Ballston Spa, N.Y. 12020  
Filed Apr. 5, 1995, Ser. No. 417,383  
Int. Cl. G01B 11/26; G01C 15/00  
U.S. Cl. 356—399

17 Claims



1. An alignment tool for pipe layout and installation comprising:

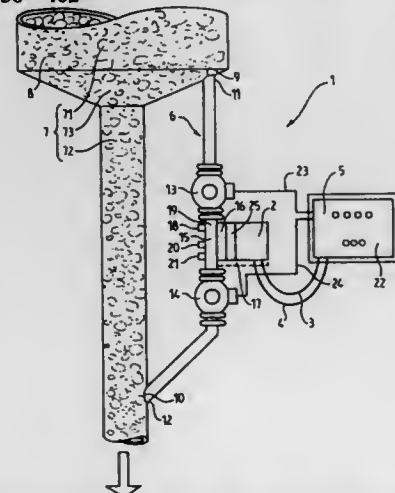
an essentially tubular means having an elongate axis and containing therein a collimated light emanation means and including a power source input means for operating said light emanation means, operating switch means, rotation means for axially twisting an independent portion of said tubular means wherein leveling means is on the independent portion so as to allow the leveling means to be placed in a position to be accurately read, and threading means disposed over and inside an end of the tubular means.

# 5,568,266 COLORIMETER AND COLORIMETRICAL CONTROL DEVICE

Jean-Charles Ciza, Triels/Seine, and Alain Moreno, Hermes, both of France, assignors to MTS Colorimetric, Osny, France

Filed Sep. 28, 1994, Ser. No. 313,775  
Int. Cl. G01J 3/50; G01N 21/85; 21/55  
U.S. Cl. 356—402

12 Claims



1. A colorimeter for on-line color analysis of a sample of a fluid substance moving along a production line, comprising:

- a measurement pipe, connected to two points along said production line, having at least one cut-off device for accumulating said sample in a measurement zone;
- said measurement zone having a window;
- a color measurement optical head disposed to receive light reflected from said sample through said window;
- a color analysis device, connected to said color measurement optical head by a fiber optical cable, further comprising:
- a level sensor disposed in said measurement zone; and
- said level sensor enabling a colorimetric measurement cycle only when a predetermined quantity of said sample is in said measurement zone.

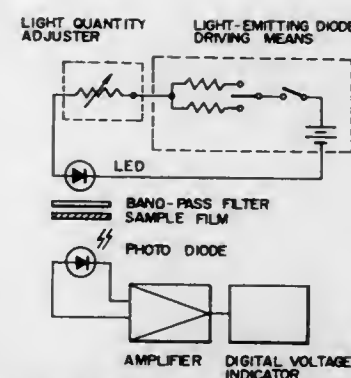
5,568,267  
SIMPLE TRANSMITTANCE-MEASURING INSTRUMENT  
Takashi Sunamori, Funabashi; Hiroshi Sato, Narashino; Masakazu Hirose, Tokyo, and Kazuo Yanauti, Funabashi, all of Japan, assignors to Taisei Chemical Industries, Ltd., Tokyo, Japan

Filed May 31, 1995, Ser. No. 455,914  
Claims priority, application Japan, Feb. 17, 1995, 7-029658  
Int. Cl. G01J 3/00

U.S. Cl. 356—416

7 Claims

1. A simple instrument for measuring the transmittance of a film impregnated with a pyridylazo-2-naphthol or dimethylphenylazo-2-naphthol dye having a continuous absorption spectrum having a plurality of absorption peaks in the wavelength range of from 350 to 800 nm, which comprises a light-emitting diode having a peak of relative emission intensity in the vicinity of a wavelength of 450



nm; a means for allowing the diode to emit a light and adjusting the quantity of the light; a band-pass filter which consists essentially of a resin film or glass plate coated with a coating composition composed essentially of at least one pigment selected from the group consisting of a Phthalocyanine Blue pigment and an organic violet pigment finely dispersed in a binder resin, and which has a peak of transmittance in the range of from 330 to 480 nm, the transmittance at the peak being 40% or more and the transmittances at 260 nm or less and 520 nm or more being 1% or less, said band-pass filter being placed in such a position that the light emitted by the above light-emitting diode passes directly through the band-pass filter; a photodiode sensitive to the wavelength of the light which has passed through the band-pass filter, said photodiode being placed so as to face the band-pass filter at such a space that a test sample can be inserted into between the band-pass filter and the photodiode and so as to receive the light which has passed through the band-pass filter and the test sample; and a means for transferring the electrical signals from the photodiode and digitally indicating them.

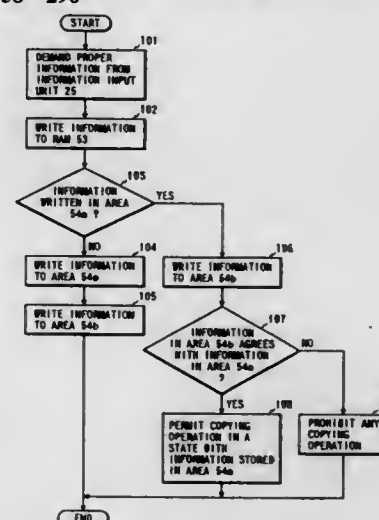
# 5,568,268 IMAGE FORMING DEVICE WITH FORGERY PREVENTION

Masato Tsuji; Katsuyuki Kouno; Hidefumi Nishigai; Hideyasu Nakamura, and Nobuyuki Kodera, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1995, Ser. No. 424,669  
Claims priority, application Japan, Jun. 15, 1994, 6-156796  
Int. Cl. G03C 21/00; H04N 1/00; 1/40

U.S. Cl. 358—296

4 Claims



1. As image forming device which processes an input signal to thereby obtain an output image signal, and forms an output image from the output image signal, said forming device comprising: information generating means for generating information for identifying said image forming device; information storing means for storing the information;

means for determining whether the stored information is the same as predetermined information; memory control means, responsive to the determining means, for controlling the storage of information by said information storing means by preventing said information storing means from storing new information after said information storing means has once stored the information generated by said information generating means; and pursuit image signal adding means for adding to the output image signal the information stored in said information storing means as a pursuit image signal that is not viewable by eye when the output message signal is developed as an image, when the stored information is the same as the predetermined information.

# 5,568,269 METHOD AND APPARATUS FOR SCANNING AND PRINTING DOCUMENTS WITH TEXT AND IMAGES

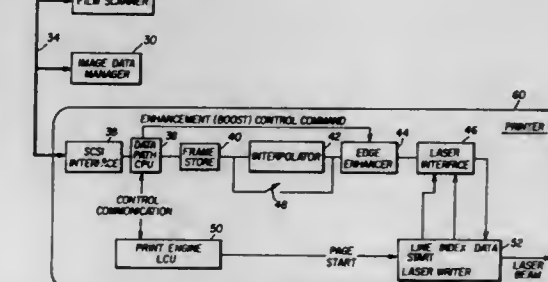
Feraydoon S. Jamzadeh, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 2, 1993, Ser. No. 116,159

Int. Cl. H04N 1/40; 1/46

U.S. Cl. 358—298

12 Claims



1. A method of reproducing both pictorial image matter and text on a sheet or surface, comprising the steps of: scanning an original image at a first resolution to derive electrical signals representative of density values of successively scanned elements for a color separation for each primary color associated with said image; scanning the original image at a second and higher resolution to derive electrical signals representative of density values of successively scanned elements for a black separation; storing data obtained from scanning each separation; interpolating the stored scanned original image data to said second resolution for each color separation; printing said interpolated original image data for each color separation at said second resolution; and printing said original image data for said black separation at said second resolution.

# 5,568,270 IMAGE READING APPARATUS WHICH VARIES READING TIME ACCORDING TO IMAGE DENSITY

Azuchi Endo, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 9, 1993, Ser. No. 163,700

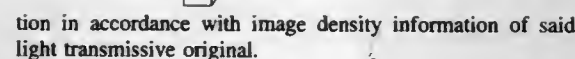
Claims priority, application Japan, Dec. 9, 1992, 4-329525

Int. Cl. H04N 1/40; 1/40

U.S. Cl. 358—298

3 Claims

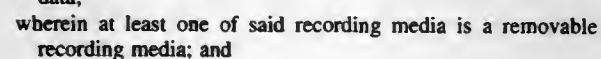
1. An image reading apparatus comprising: a light source for illuminating a light transmissive original, which carries image information, with reading light from said light source; and a photoelectric transducer means for reading said image information and for varying a reading time of said image informa-



# IMAGE INFORMATION RECORDING APPARATUS FOR RECORDING A PLURALITY OF IMAGE INFORMATION ONTO A PLURALITY OF INFORMATION RECORDING MEANS

Claims priority, application Japan, Nov. 22, 1991, 3-308027  
Int. Cl.<sup>6</sup> H04N 5/76

## 20 Claims



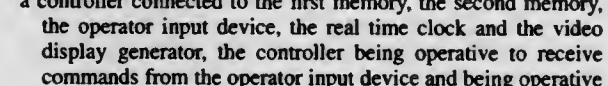
said image information recording apparatus further comprising retrieval means for retrieving said image data from a selected one of said plurality of image information recording means, and, when said image data from said selected one of said plurality of image information recording means is damaged, for reading said unique identification number for said image data in said selected one of said plurality of image information recording means to identify a specific one of said recording media for another one of said plurality of image information recording means which contains said image data, whereby said image data can be quickly retrieved.

### SCHEDULE DISPLAY SYSTEM FOR VIDEO RECORDER PROGRAMMING

Continuation of Ser. No. 527,417, Sep. 13, 1995, Pat. No. 5,508,272, which is a continuation of Ser. No. 384,442, Feb. 2, 1995, abandoned, which is a continuation of Ser. No. 149,386, Nov. 9, 1993, abandoned, which is a continuation of Ser. No. 595,393, Oct. 10, 1990, abandoned, which is a continuation of Ser. No. 484,175, Feb. 23, 1990, Pat. No. 4,963,994, which is a continuation of Ser. No. 213,162, Jun. 29, 1988, Pat. No. 4,908,713, which is a continuation of Ser. No. 634,179, Jul. 24, 1984, abandoned, which is a continuation of Ser. No. 330,111, Dec. 14, 1981, abandoned. This application Oct. 20, 1995, Ser. No. 546,335

U.S. Cl. 386—48

## 2 Claims

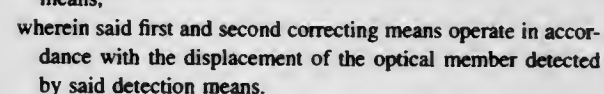


### IMAGE READING APPARATUS WITH IMAGE MAGNIFICATION AND SCANNING SPEED CHANGED TO CORRECT FOR FOCUS ADJUSTMENT

Int. Cl.<sup>6</sup> H04N 1/393; 1/047

U.S. Cl. 358—451

### 5 Claims

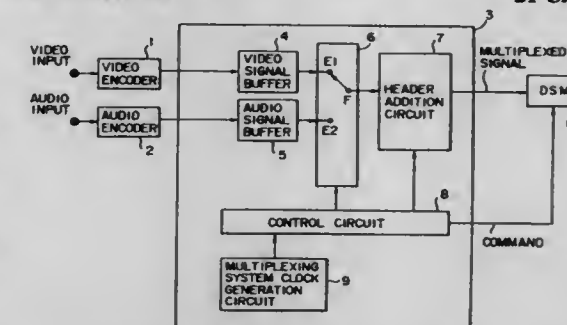


**Yasushi Fujinami, Kanagawa, and Markus H. Veltman, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan**  
Continuation of Ser. No. 125,573, Sep. 22, 1993, Pat. No. 5,455,684. This application May 19, 1995, Ser. No. 446,015  
Claims priority, application Japan, Sep. 22, 1992, 4-277956;  
Dec. 4, 1992, 4-350577

Int. CL<sup>6</sup> H04N 5/76;5/78; G11B 5/00;5/09

U.S. Cl. 386-107

## 21 Claims



machine-readable indicia formed in the recording medium to represent the compressed motion picture signal, ones of the machine-readable indicia representing the intrinsically-decodable signal portions constituting respective blocks; and additional machine-readable indicia formed adjacent each one of the blocks of the machine-readable indicia, the additional machine-readable indicia representing location information, the location information indicating a location in the recording medium of at least one other of the blocks.

# METHOD FOR VISUALLY AND AUDIBLY REPRESENTING COMPUTER INSTRUCTIONS FOR EDITING

**Continuation of Ser. No. 45,978, Apr. 9, 1993, abandoned, which is a continuation of Ser. No. 867,125, Apr. 10, 1992, abandoned. This application Jun. 26, 1995, Ser. No. 494,761**

Int. Cl.<sup>6</sup> H04N 5/76; G11B 27/02

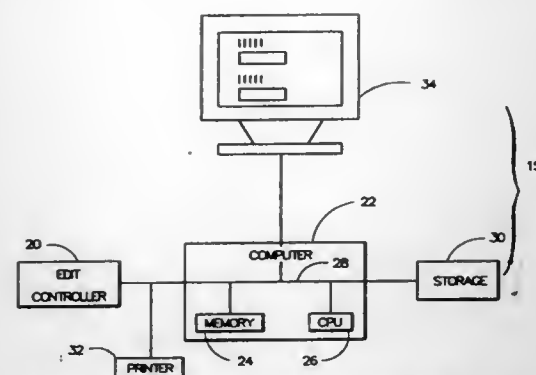
U.S. Cl. 386—52

### 31 Claims

1. A computer-implemented method for visually representing computer instructions for assembling a video program, comprising the steps of:

- a. choosing, with the aid of a computer, segments of video material to be incorporated into the video program;
- b. storing, on a computer-readable medium and in response to a choice made in the step of choosing, an identification of a source of each segment of the video program and a destination of the segment in the video program, wherein the source and the destination form a computer instruction for assembling the video program; and





c. storing, on the computer-readable medium and in response to the choice made in the step of choosing and with the computer instruction of each segment, a computer-accessible representation of the segment, distinct from the segment and which includes at least one of audio and video information.

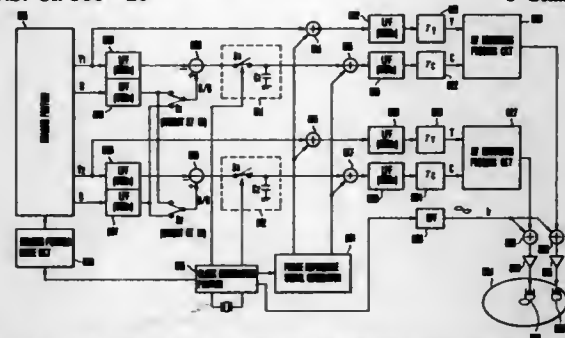
5,568,276

# IMAGE SIGNAL RECORDING AND REPRODUCING SYSTEM

Kazuhito Ohashi, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 56,611, May 3, 1993, abandoned, which is a continuation of Ser. No. 556,955, Jul. 23, 1990, abandoned. This application Nov. 21, 1994, Ser. No. 342,650  
Int. Cl.<sup>6</sup> H04N 5/95; 9/89; 5/78

U.S. Cl. 386—20

5 Claims



1. A color image signal recording apparatus for recording a color image signal including a color burst signal, horizontal and vertical synchronizing signals and having a blanking portion on a recording medium, comprising:

- (A) generating means arranged to input the image signal and to generate a sampling clock signal which is synchronized with the horizontal and vertical synchronizing signals in the color image signal, and a one pulse signal which is different from the color burst signal, the horizontal and vertical synchronizing signals included in the color image signal and which indicates a reference phase synchronized in phase with the sampling clock signal, and a pilot signal which is different from the color burst signal, the horizontal and vertical synchronizing signals and the one pulse signal and which has a single frequency;
- (B) sampling color image signal forming means arranged to input the color image signal and to effect sampling of the input color image signal in synchronism with the sampling clock signal generated by said generating means, thereby forming and outputting a sampling color image signal;
- (C) processing means for adding the one pulse signal generated by said generating means to the sampling color image signal outputted from said sampling color image signal forming means at a portion of said sampling color image signal which corresponds to the vertical blanking portion of the color image signal and continuously frequency-multiplexing the pilot signal generated by said generating means to the sam-

pling color image signal outputted from said sampling color image signal forming means; and  
(D) recording means for recording on said recording medium the sampling color image signal outputted from said processing means.

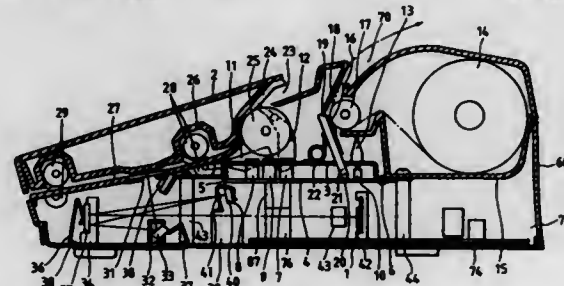
5,568,277

# FACSIMILE APPARATUS WITH IMPROVED CONTROL BOARD ARRANGEMENT

Yasuhiro Hatano, Ebina; Hajime Takayama; Yasushi Fukada, both of Yokohama; Kazuhiko Kurita, Odawara, and Kazuo Nojiri, Yokohama, all of Japan, assignors to Matsushita Graphic Communication Systems, Inc., Tokyo, Japan  
Division of Ser. No. 229,879, Apr. 19, 1994, Pat. No. 5,452,110.  
This application Jun. 6, 1995, Ser. No. 464,556  
Claims priority, application Japan, Apr. 21, 1993, 5-94426; Jul. 14, 1993, 5-174079; Jul. 30, 1993, 5-190020  
Int. Cl.<sup>6</sup> H04N 1/00; 1/04; 1/12; 1/191

U.S. Cl. 358—400

6 Claims



1. A facsimile apparatus comprising:

- a casing;
  - a handset arranged on a side of said casing;
  - a network control section disposed adjacent said handset within said casing;
  - a power supply section disposed opposite said network control section within said casing; and
  - a control board arranged above said network control section and said power supply section, said control board including an analog signal control section arranged adjacent said network control section, a driving control section, arranged adjacent said power supply section, for driving a preselected electric part, and a digital signal control section arranged between the analog signal control section and the driving control section.
2. A facsimile apparatus comprising:
- a casing;
  - a network control section disposed on a bottom plate of said casing;
  - a power supply section disposed on the bottom plate of said casing;
  - a control board arranged above said network control section and said power supply section;
  - first pair of connectors, secured on said network control section and said control board, respectively for establishing electric communication between said network control section and said control board; and
  - second pair of connectors secured on said power supply section and said control board, respectively for establishing electric communication between said power supply section and said control board.
3. A facsimile apparatus comprising:
- a casing;
  - a metallic bottom plate;
  - a metallic base plate above said bottom plate at a preselected interval therebetween;
  - transmit document feeding means arranged above said base plate for feeding a transmit document along a document feeding path;
  - a control unit arranged between said base plate and said bottom plate for controlling an operation of the facsimile apparatus; and

a power supply section disposed on said metallic bottom plate away from said metallic plate and adjacent said control unit.

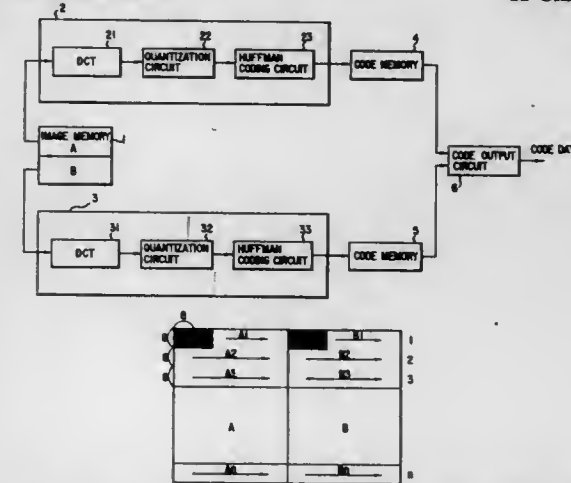
5,568,278

# IMAGE DATA CODING AND DECODING METHOD AND APPARATUS WITH A PLURALITY OF DCT'S, QUANTIZERS, AND VLC'S

Keichi Nakano, and Hidetoshi Yamada, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan  
Continuation-in-part of Ser. No. 842,055, Feb. 26, 1992, abandoned. This application Dec. 20, 1993, Ser. No. 170,676  
Claims priority, application Japan, Mar. 19, 1991, 3-054936  
Int. Cl.<sup>6</sup> H04N 1/41

U.S. Cl. 358—427

11 Claims



5. An image data coding apparatus for coding image data, comprising:

- a plurality of code amount deriving means each for deriving an amount of code by quantizing with a provisional quantization width and coding the image data;
- quantization width predicting means for predicting an optimum quantization width based on the code amount derived by said plurality of code amount deriving means;
- image data storing means having a plurality of storage areas for storing image data, said image data being divided into a plurality of image data items in a predetermined direction, and each of said image data items being stored in a corresponding one of said plurality of storage areas;
- a plurality of simultaneously operable orthogonal transform means provided in one-to-one correspondence with said plurality of storage areas, each of said plurality of orthogonal transform means including means for reading out a corresponding one of the image data items stored in said plurality of storage areas, with each image data item being divided into a plurality of timewise sequentially occurring blocks, and means for simultaneously subjecting respective blocks of the corresponding image data item to orthogonal transformation;
- a plurality of simultaneously operable quantization means provided in one-to-one correspondence with said plurality of storage areas, each of said plurality of quantization means including means for simultaneously quantizing, for each frequency component of a given block, a corresponding one of orthogonal transform outputs supplied from said plurality of orthogonal transform means;
- a plurality of simultaneously operable variable length coding means provided in one-to-one correspondence with said plurality of storage areas, each of said plurality of variable length coding means including means for calculating a difference between one of the frequency components of said given block and a corresponding frequency component of a timewise preceding block and for simultaneously subjecting a corresponding one of quantized outputs from said plurality of quantization means to variable length coding processing;

5,568,279

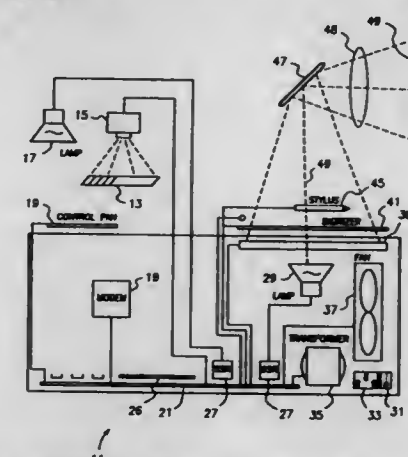
# REMOTE INTERACTIVE PROJECTOR

Brian L. Hinman, Los Gatos, and Jeffrey C. Rodman, San Francisco, both of Calif., assignors to Polycom, Inc., San Jose, Calif.

Continuation of Ser. No. 16,431, Feb. 11, 1993, abandoned.  
This application Jun. 5, 1995, Ser. No. 461,175  
Int. Cl.<sup>6</sup> H04N 1/00; 1/387

U.S. Cl. 358—452

20 Claims



1. A remote interactive projector comprising:
- a CCD camera adapted for recording an image of a document;
- illumination means for illumination of said document to obtain a sufficiently bright image recorded by the camera;
- a motherboard having a memory, said motherboard being connected to the CCD camera for receiving the recorded image and storing the image in the memory;
- an image plate connected to the camera motherboard for receiving the recorded image from the memory and displaying the recorded image;
- a digitizer coupled to the image plate enabling annotation of the recorded image; and
- projection means coupled to the image plate for projecting the recorded image onto a projection screen.

14. A method for interactively displaying and annotating a stored digital image of a document between a local projector and a remote projector, said digital image being stored in the memory of a motherboard in the local projector wherein the method comprises the steps of:

- establishing a communication link between the remote and local projectors;
- transmitting the stored digital image from the local projector to the remote projector;
- receiving and storing the digital image by the remote projector which was transmitted by the local projector;
- annotating the stored digital image by the remote projector;
- displaying the annotated image by the remote projector while simultaneously transmitting the annotations back to the local projector for annotation of the stored digital image in the local projector; and
- displaying the annotated stored digital image in the local projector.

20. A method for interactively displaying and annotating a stored digital image of a document between a local projector and a remote projector, said digital image being stored in the memory of a motherboard in the local projector, wherein the method comprises the steps:

- establishing a communication link between the remote and local projectors;
- transmitting the stored digital image from the local projector to the remote projector;
- receiving and storing the digital image by the remote projector which was transmitted by the local projector;
- annotating the stored digital image by the local projector;
- displaying the annotated image by the local projector while simultaneously transmitting the annotations back to the remote projector for annotation of the stored digital image in the remote projector; and
- displaying the annotated stored digital image in the local projector.

5,568,280

#### FACSIMILE ACCESS CONTROLLER FOR CALCULATING A COMMUNICATION CHARGE

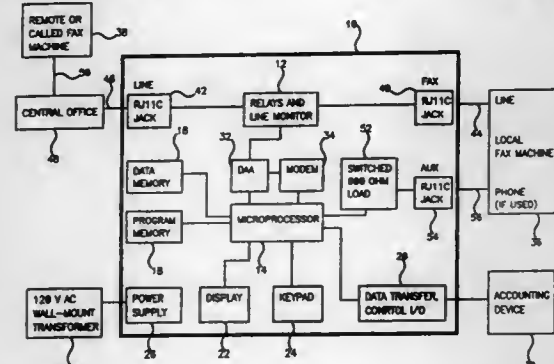
James Wells, Lansing; David B. Johnson, Freeville; Edward A. Tennant, Newfield, all of N.Y., and Walid Elsoufi, Princeton, N.J., assignors to Jamex, Lansing, N.Y.

Filed Aug. 8, 1994, Ser. No. 287,170

Int. Cl.<sup>6</sup> H04N 1/32; 1/00; H04M 11/00

U.S. Cl. 358—468

18 Claims



1. A method for logging or identifying each page of a facsimile transmitted or received by a facsimile machine, the method comprising the steps of:

- monitoring the transmission or reception of data from or to the facsimile machine for a resolution signal and end-of-line signals in the data;
- determining the number of lines which will be on a page based upon the resolution signal;
- counting the number of end-of-line signals monitored in a row;
- detecting an end-of-page signal; and
- logging or identifying the transmission or reception of a page when the total count of the end-of-line signals indicates that a page had been transmitted or received or the end-of-page signal is detected.

5,568,281

#### AUTOMATIC DOCUMENT PRESENCE, SKEW AND WIDTH DETECTION METHOD AND APPARATUS FOR A DOCUMENT SCANNER

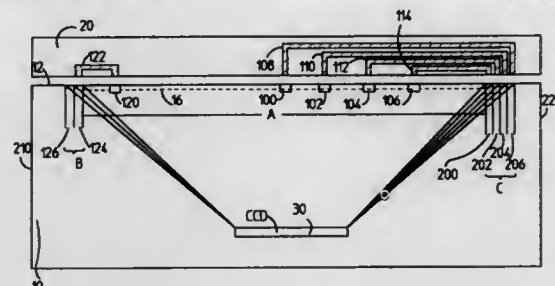
Richard L. Kochis, and Jacklyn M. Dowdy, both of Fort Collins, Colo., assignors to Hewlett-Packard Co., Palo Alto, Calif.

Filed Jul. 31, 1995, Ser. No. 509,398

Int. Cl.<sup>6</sup> H04N 1/04

U.S. Cl. 358—475

6 Claims



1. A document scanner including a document scan area and having an automatic document presence detection system, said automatic document presence detection system comprising:

- a light source having individual pixels extending across one side of said document scan area, said light source directing a strip of light toward said document scan area;
- a light sense means having individual pixels extending across an area corresponding to said light source, said light sense means detecting light emitted from said light source, said light sense means extending outside the strip of light of said light source, such that said light sense means comprises extra pixels relative to said light source;

an automatic document feeder, said automatic document feeder extending across a second side of said document scan area opposing said light source, such that light from said light source directed toward said document scan area passes through said document scan area and toward said automatic document feeder when a document is not present;

a light pipe positioned in said automatic document feeder with a first end at a predetermined position adjacent said document scan area and a second end at a predetermined position outside of said strip of light of said document scan area, said light pipe being so positioned that light directed from said light source toward said document scan area impinges said first end of said light pipe, passes through said light pipe, exits said second end of said light pipe and is directed toward a predetermined number of said extra pixels in said light sense means when a document is not present in said document scan area, and when a document is present in said document scan area light does not pass through said document scan area to said light pipe and said extra pixels in said light sense means; and

a controller for turning on individual pixels of said light source that correspond to the position of said first end of said light pipe at predetermined intervals, said controller being responsive to said extra pixels of said light sense means, whereby if light is detected by said extra pixels of said light sense means the controller continues turning on said light source and monitoring said light sense means at predetermined intervals and if light is not detected by said extra pixels of said light sense means the controller instructs said automatic document feeder to begin feeding a document and the controller initiates the scanning process.

5,568,282

#### ROTARY DRUM SCANNER

Graham A. Thomson, London; Peter J. Neilson, and Paul C. Cook, both of Gloucestershire, all of United Kingdom, assignors to Itek Colour Graphics, LTD., Gloucestershire, United Kingdom

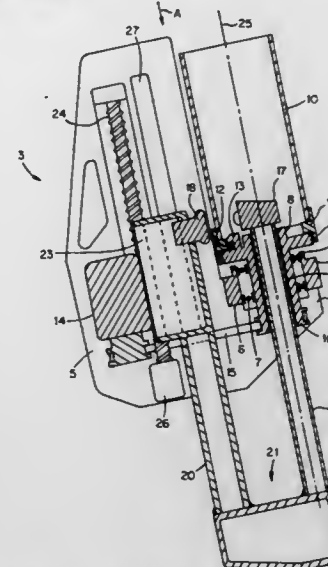
Filed Aug. 5, 1994, Ser. No. 286,202

Claims priority, application United Kingdom, Aug. 6, 1993, 9316354

Int. Cl.<sup>6</sup> H04N 1/08

U.S. Cl. 358—489

7 Claims



1. A rotary drum color separation scanner for scanning an image from a transparency comprising:

- a transparent cylindrical drum to which the transparency is mountable;
- means for rotatably mounting the drum about its longitudinal axis, wherein said axis is arranged to be vertical or close to vertical;
- means for rotating the drum about said axis;
- a carriage;
- a light source and
- a reading head wherein the light source and reading head are mounted on the carriage, and a part of said carriage, carrying either the light source or the reading head, is movable into and out of said drum.

5,568,283

#### OPTICAL MODULATION DEVICE AND DISPLAY APPARATUS WITH THREE BIREFRINGENT FILMS EACH ACTING AS A HALF WAVEPLATE

Hideaki Mitsutake, Tokyo, and Kazuo Yoshinaga, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 266,320, Jun. 27, 1994, Pat. No. 5,392,142, which is a continuation of Ser. No. 673,070, Mar. 21, 1991, abandoned. This application Nov. 21, 1994, Ser. No. 346,282

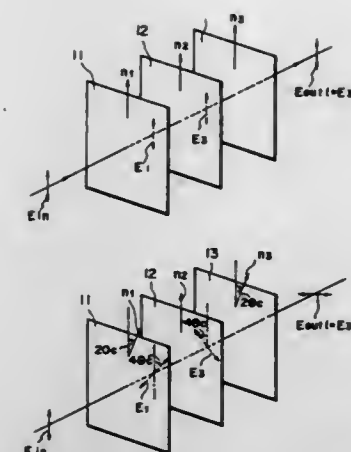
Claims priority, application Japan, Mar. 23, 1990, 2-074654

Int. Cl.<sup>6</sup> G02F 1/1347

U.S. Cl. 359—053

7 Claims

- 1. An optical modulation device, comprising:
- a polarizer for polarizing input light;
- a first and a third film having a birefringent property and forming a first state and a second state depending on an electric field applied thereto, said first state rotating a polarization plane of said polarized light and said second state not rotating said polarization plane, said first and said third film each having a thickness which functions as a halfwave plate in said first state; and



an analyzer, said optical modulation device further comprising: a second film interposed between said first film and said third film and having a birefringent property of a single state which does not rotate the polarization plane of polarized light that passed through said second state of said first film but which rotates the polarization plane of polarized light that passed through said first state of said first film, said second film having a thickness which functions as a halfwave plate when said first film is set in said first state, wherein polarized light that passed through said second film without having its polarization plane rotated passes through said second state of said third film, and polarized light having a polarization plane that rotates while passing through said second film passes through said first state of said third film before passing through said analyzer.

5,568,284

#### IMAGE RECORDING APPARATUS

Seiichi Oku; Masahiro Kubo, and Setsuji Tatsumi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

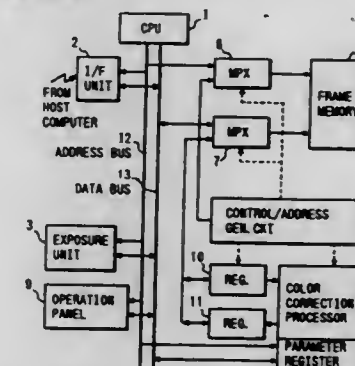
Continuation of Ser. No. 856,735, Mar. 24, 1992, Pat. No. 5,489,996. This application Aug. 5, 1994, Ser. No. 286,232

Claims priority, application Japan, Mar. 27, 1991, 3-87814

Int. Cl.<sup>6</sup> G03F 3/08

U.S. Cl. 358—518

2 Claims



1. A method employed by an image recording apparatus, which receives image signals representing colors, for compressing a color reproduction region of the image recording apparatus in a uniform color space, comprising the step of compressing said colors outside the color reproduction region onto a surface of the color reproduction region at respective points, which represent the minimum color difference between said colors before and after compression, without changing the color tint of said colors, said compressing step further comprising the steps of:



plotting those of said colors whose color shape appears to be of the same hue on a plane of  $a^*$  and  $b^*$  in a color space of  $L^*$ ,  $a^*$  and  $b^*$ , so that the resultant loci are curve-approximated by functions; and  
moving, according to the curve-approximated loci, an intended color to project the colors onto their respective points of the minimum color difference between the colors before and after compression without varying the color tint.

5,568,285

# IMAGE PROCESSING SYSTEM INCLUDING PLURAL COLOR PROCESSING SECTIONS

Yoshinori Ikeda, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

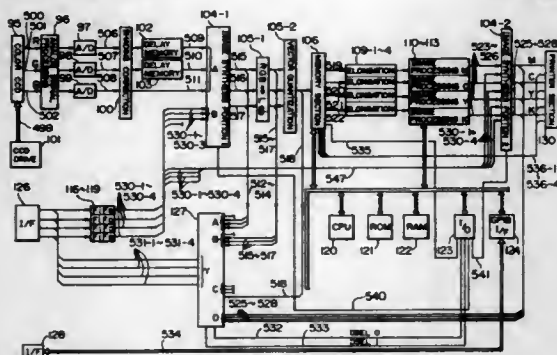
Continuation of Ser. No. 873,030, Apr. 24, 1992, abandoned.  
This application Mar. 28, 1995, Ser. No. 411,403

Claims priority, application Japan, Apr. 26, 1991, 3-097241;  
Apr. 27, 1992, 4-107676

Int. Cl.<sup>6</sup> H04N 1/54; 1/56; 1/60

U.S. Cl. 358—518

24 Claims



1. An image processing system comprising:  
first input means for inputting first image data;  
second input means different from said first input means for inputting second image data of a plurality of types into said image processing system from external equipment; and  
a plurality of color processing sections for sequentially processing the first image data input by said first input means, wherein when the second image data input by said second input means is of a predetermined type, at least one, but not all, of said plurality of color processing sections processes the second image data and all remaining color processing sections perform no processing of the second image data.

5,568,286

# FAST LIQUID CRYSTAL SWITCHING UNIT

Nabeel A. Riza, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 4, 1993, Ser. No. 130,819

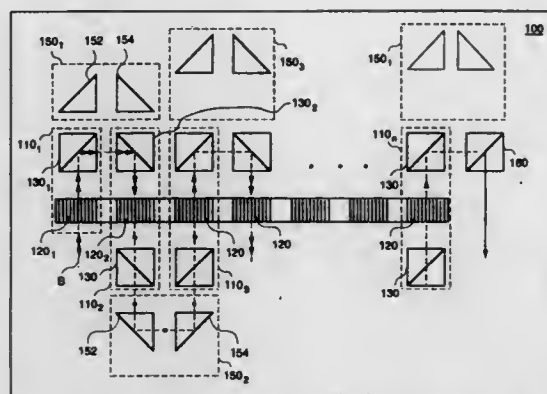
Int. Cl.<sup>6</sup> G02F 1/13; 1/135; 1/1347; H01Q 3/22

U.S. Cl. 359—53

18 Claims

1. A fast-speed optical switching unit for directing incident light beams to a selected path comprising:

a polarization rotation unit optically coupled to receive said incident light beams, said polarization rotation unit comprising an effective plurality of "n" parallel-rub birefringent nematic liquid crystal cells optically coupled in series in an integral cascade structure such that each of said incident light beams pass sequentially through each of said n liquid crystal cells so that a respective selected polarization orientation is imparted to each respective light beam, said polarization rotation unit having a switching speed corresponding to the value of  $1/n^2$ ; and  
beam-directing optics optically coupled to receive light beams from said polarization rotation unit and disposed to direct



respective light beams along respective selected paths dependent on the polarization orientation of each respective light beam.

5,568,287

# LIQUID CRYSTAL DEVICE WITH OPTICAL MEANS OF HIGH REFRACTIVE INDEX AT PIXELS AND LOW REFRACTIVE INDEX BETWEEN PIXELS

Junko Shingaki, Atsugi; Shuzo Kaneko, Yokohama; Katsumi Kurematsu, Kawasaki, and Hideaki Mitsutake, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

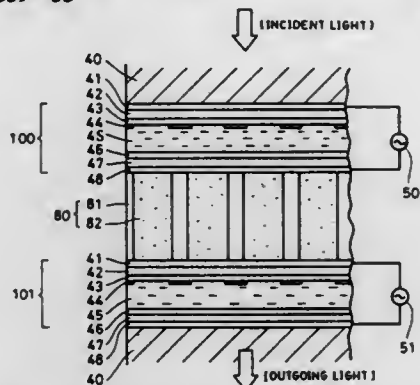
Division of Ser. No. 284,267, Aug. 2, 1994, Pat. No. 5,495,351, which is a continuation of Ser. No. 788,260, Nov. 5, 1991, abandoned. This application Nov. 24, 1995, Ser. No. 562,381

Claims priority, application Japan, Nov. 9, 1990, 2-302476;  
Nov. 22, 1990, 2-315850; Nov. 30, 1990, 2-330134; Oct. 3, 1991, 3-256550

Int. Cl.<sup>6</sup> G02F 1/1347; 1/1333

U.S. Cl. 359—53

8 Claims



3. A liquid crystal device comprising:

a) liquid crystal cells of two types including a plurality of pixels aligned on a plurality of lines and rows, each of said pixels composed of a pair of electrodes and liquid crystals provided between said pair of electrodes;  
b) an optical means positioned between said cells of two types, and including high-refractive portions positioned corresponding to said pixels and low-refractive portions positioned next to said high-refractive portions, said high-refractive and low-refractive portions having the refractive indexes the ratio between which satisfies the condition for total reflection of incident light.

5,568,288

# METHOD FOR FORMING THIN FILM TRANSISTORS WITH ANODIC OXIDE ON SIDES OF GATE LINE

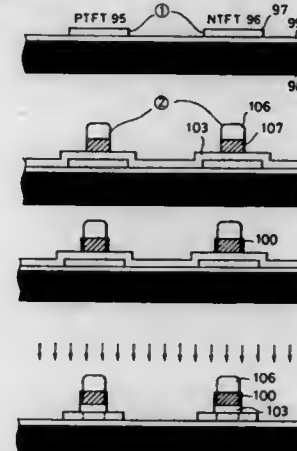
Shunpei Yamazaki, Tokyo; Akira Mase, Aichi, and Masaaki Hiroki, Kanagawa, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Division of Ser. No. 857,597, Mar. 25, 1992, Pat. No. 5,287,205. This application Nov. 16, 1993, Ser. No. 153,080

Claims priority, application Japan, Mar. 26, 1991, 3-087780  
Int. Cl.<sup>6</sup> G02F 1/1343; C25D 5/02; H05K 3/00

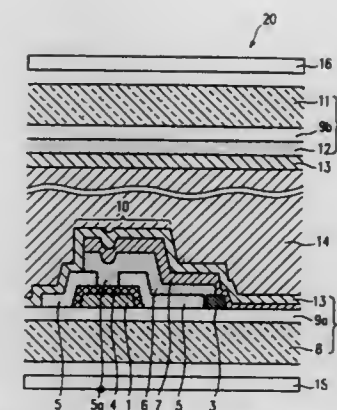
U.S. Cl. 359—59

9 Claims



7. A method for forming an electro-optical device having a plurality of thin film transistors including at least one n-type of thin film transistor and at least one p-type of thin film transistor comprising:

forming a plurality of semiconductor islands on an insulating surface, each semiconductor island including a channel region;  
forming a gate insulating layer on each semiconductor island;  
forming a gate electrode having a side surface and a top surface on each gate insulating layer;  
forming an insulating film on the top surface of each gate electrode;  
oxidizing only the side surface of said gate electrode by anodic oxidation;  
wherein said insulating film prevents said top surface from being oxidized by said anodic oxidation,  
introducing dopant species into each semiconductor island with said gate electrode and oxidized side surface portion as a mask in order to form source and drain regions.



wherein the plurality of two-terminal nonlinear devices each include:

a lower electrode which is a part of the corresponding signal wire;  
a first insulator layer located on the lower electrode provided as a result of anodic oxidation of a part of the lower electrode and having a thickness of no greater than 1,000 angstroms;  
a second insulator layer covering the first insulator layer and having at least one opening, the second insulator layer being formed of a different material from the first insulator layer; and  
an upper electrode located on the second insulator layer and connected to the first insulator layer through the opening, and wherein the plurality of signal wires each have a top surface and a pair of side surfaces, and the upper electrode has an end extending diagonally with respect to a direction in which the corresponding signal wire extends on at least one of the side surfaces of the corresponding signal wire.

5,568,290

# ELLIPTICALLY POLARIZING PLATE COMPRISING DISCOTIC LIQUID CRYSTAL AND IN WHICH $30 \leq [(N_x + N_y)/2 - N_z] \times d \leq 150$

Taku Nakamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Ashigara, Japan

Filed Nov. 21, 1994, Ser. No. 345,688

Claims priority, application Japan, Nov. 22, 1993, 5-291846;  
Jul. 6, 1994, 6-154774

Int. Cl.<sup>6</sup> G02F 1/1335

U.S. Cl. 359—63

9 Claims



1. An elliptically polarizing plate comprising a polarizing film and an optical compensatory sheet provided thereon, wherein said sheet has an optically negative monoaxial property and a direction of a minimum retardation inclined at 5 to 50 degrees from the normal of the sheet, the sheet comprising a transparent film and an oriented layer of a discotic liquid crystal provided thereon, said transparent film having a light transmittance of not less than 80%, showing optical isotropy on the plane of the transparent film, and satisfying the condition of:

$$30 \leq [(n_x + n_y)/2 - n_z] \times d \leq 150$$

in which  $n_x$  and  $n_y$  are main refractive indices on the plane of the transparent film,  $n_z$  is a main refractive index in the thickness direction of the transparent film, and  $d$  is the thickness of the transparent film, wherein the unit for  $d$  is nm.

5,568,289

# LIQUID CRYSTAL DISPLAY DEVICE

Masahiro Kishida, Nabari; Toshiyuki Yoshimizu, Soraku-gun, and Takeshi Seike, Kitakatsuragi-gun, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 14, 1995, Ser. No. 404,067

Claims priority, application Japan, Mar. 18, 1994, 6-049333  
Int. Cl.<sup>6</sup> G09G 3/36; G02F 1/133

U.S. Cl. 359—58

7 Claims

1. A liquid crystal display device, comprising:

a first substrate including a plurality of pixel electrodes arranged in a matrix, a plurality of signal wires formed of metal for supplying the plurality of pixel electrodes with an electric charge, and a plurality of two-terminal nonlinear devices for switching connection between the plurality of pixel electrodes and the plurality of signal wires into one of a conductive state and a non-conductive state;  
a second substrate located opposite to the first substrate and including a plurality of scanning electrodes arranged parallel to each other and crossing the plurality of signal wires; and  
a liquid crystal layer sandwiched between the first substrate and the second substrate,

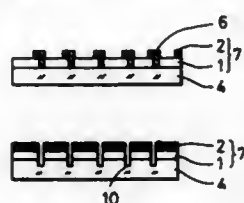
5,568,291

# ELECTRODE SUBSTRATE WITH LIGHT SHIELDING FILM HAVING UPPER SURFACE COPLANAR WITH UPPER SURFACE OF LAMINATE ELECTRODES

Tatsuo Murata, Hiratsuka; Kazuya Ishiwata, Yokosuka, and Toshifumi Yoshioka, Hiratsuka, all of Japan, assignors to Cannon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 991,404, Dec. 16, 1992, abandoned, which is a division of Ser. No. 660,861, Feb. 26, 1991, Pat. No. 5,348,828. This application Aug. 29, 1994, Ser. No. 296,180  
Claims priority, application Japan, Feb. 26, 1990, 2-042613

Int. Cl.<sup>6</sup> G02F 1/1333; 1/1343  
U.S. Cl. 359—67

6 Claims



1. A chiral smectic liquid crystal device comprising: an electrode substrate including: a substrate portion having an upper substrate surface; a plurality of laminate films on said substrate surface spaced to define a plurality of respective spaces on said substrate surface therebetween, each said laminate film including a first layer of a transparent conductive film having a first surface area and a second layer of a non-transparent metal film on and along an edge portion of said first surface area to leave a remaining portion of said first surface area exposed, each said remaining portion defining a pixel area and each said metal film having an upper metal surface; and a respective light shielding film filling each of said spaces and extending upwards from said substrate surface to have an upper film surface continuous with and coplanar with the upper metal surface of the metal film of the respective laminate film, a thickness of each said light shielding film being less than 1 μm as measured from said substrate surface to the respective upper metal surface, such that all surface areas of said electrode substrate between said pixel areas are substantially shielded from light by said metal films and said light shielding films.

5,568,292

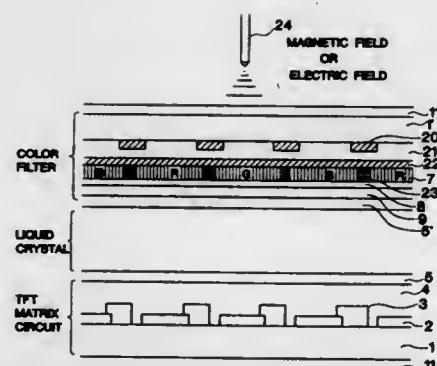
# POSITION-SENSITIVE LIQUID CRYSTAL DISPLAY AND PROCESS FOR PRODUCING THE SAME

Jeong J. Kim, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea  
Continuation of Ser. No. 118,175, Sep. 9, 1993, abandoned.  
This application Nov. 6, 1995, Ser. No. 554,106  
Claims priority, application Rep. of Korea, Sep. 9, 1992, 16578

Int. Cl.<sup>6</sup> G02F 1/1335; 1/1333  
U.S. Cl. 359—67

7 Claims

1. A position-sensitive liquid crystal display comprising: a lower glass substrate; an upper glass substrate; a plurality of transparent pixel electrodes formed on said lower glass substrate; a plurality of thin film transistors associated with said transparent pixel electrodes formed on said lower glass substrate; a position-sensitive layer formed on said upper glass substrate as a black matrix wherein said position-sensitive layer includes a plurality of X-directional grid wires, a plurality of Y-directional grid wires and an insulating layer therebetween;



- a color filter formed directly on said X-directional grid wires of said position-sensitive layer; and
- a liquid crystal material interposed between said lower glass substrate and said upper glass substrate.

5,568,293

# LIQUID CRYSTAL DISPLAY HAVING TRAPEZOIDAL COLOR FILTERS FORMED FROM A LOW-TEMPERATURE CURING POLYAMINO RESIN HAVING A PHOTSENSITIVE GROUP

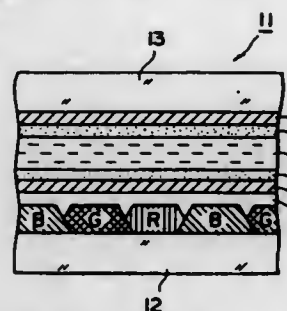
Hideaki Takao, Sagami-hara; Tatsuo Murata, Atsugi; Junichiro Kanbe; Miki Tamura, both of Yokohama; Masaru Kamio, Atsugi; Nobuyuki Sekimura, Kawasaki, and Yoshiki Kikuchi, Sagami-hara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 352,756, Dec. 5, 1994, which is a division of Ser. No. 238,345, May 5, 1994, Pat. No. 5,398,126, which is a continuation of Ser. No. 806,099, Dec. 11, 1991, abandoned, which is a division of Ser. No. 416,034, Oct. 2, 1989, Pat. No. 5,101,289, which is a division of Ser. No. 90,703, Aug. 28, 1987, Pat. No. 4,917,471. This application Apr. 28, 1995, Ser. No. 430,422

Claims priority, application Japan, Aug. 30, 1986, 61-202746; Aug. 30, 1986, 61-202747; Aug. 30, 1986, 61-202748; Aug. 30, 1986, 61-202749; Nov. 20, 1986, 61-275352; Jan. 23, 1987, 62-014923

Int. Cl.<sup>6</sup> G02F 1/1335; 1/13  
U.S. Cl. 356—68

10 Claims



1. A liquid crystal device comprising: (a) plural transparent electrodes having a plurality of confronting portions formed therebetween; (b) a pair of substrates supporting said transparent electrodes; (c) a group of plural color filters arranged on the inner side of at least one of the above pair of substrates and arranged at positions corresponding to each of said plurality of confronting portions, said color filters being formed in trapezoidal shapes, provided that the relationships of  $0^\circ < \theta < 90^\circ$  and  $0 < W \leq d/\tan \theta$  are satisfied where  $d$  (μm) is the thickness of said color filters,  $\theta$  (degrees) is the sectional taper angle between the lower bottoms of the color filters and the diagonal sides thereof and  $W$  (μm) is the overlapping width between adjacent color filters, said color filters comprising a colorant material dispersed in a low-temperature-curing polyamino resin having a photosensitive group in the molecule; and

- (d) a chiral smectic liquid crystal arranged between said pair of substrates.

5,568,294

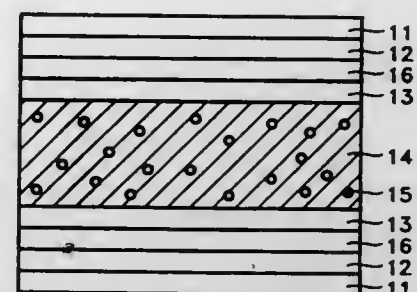
# LIQUID CRYSTAL DISPLAY DEVICE HAVING A POLYMER FUNCTIONING AS AN ORIENTATION LAYER AND A RETARDER

Jong-chun Lee, Suwon, Rep. of Korea, assignor to Samsung Display Devices Co., Ltd., Kyungki-do, Rep. of Korea  
Filed Aug. 31, 1994, Ser. No. 297,531

Claims priority, application Rep. of Korea, Aug. 31, 1993, 93-17139

Int. Cl.<sup>6</sup> G02F 1/1335; 1/1337; C09K 19/00  
U.S. Cl. 359—73

17 Claims



1. A liquid crystal display comprising a pair of substrates, transparent electrodes respectively formed thereon in facing relationship, and a liquid crystal material layer inserted between the electrodes, wherein a liquid crystalline polymer orientation layer, in which the product of the double refractive index of said liquid crystalline polymer orientation layer and the thickness of said layer ranges from 0.01 μm to 1.5 μm, is formed on at least one surface of said liquid crystal material layers, and said liquid crystalline polymer orientation layer functions simultaneously as a liquid crystal orientation layer and as an optical phase retardation film.

5,568,295

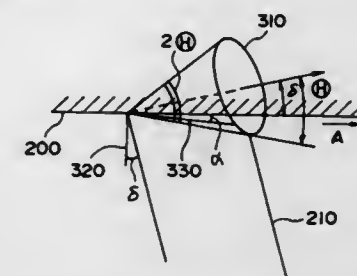
# CHIRAL SMETIC LCD WITH SMALL PRETILT ANGLE, SUBSTRATE RUBBED IN TWO OPPOSING DIRECTIONS, AND NO CHOLESTERIC PHASE OR TILT ANGLE > THE PRETILT PLUS INCLINATION ANGLES

Katsutoshi Nakamura, Hiratsuka; Shuzo Kaneko, Chigasaki; Etsuro Kishi, Sagami-hara; Hirokatsu Miyata, Yokohama, and Masaaki Shibata, Kanagawa-ken, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Oct. 5, 1994, Ser. No. 318,432

Claims priority, application Japan, Oct. 8, 1993, 5-253053; Apr. 27, 1994, 6-089943

Int. Cl.<sup>6</sup> G02F 1/1337; 1/13  
U.S. Cl. 359—75

27 Claims

C2 ALIGNMENT  $\theta > \delta$ 

1. A liquid crystal device, comprising: a pair of substrates, and a chiral smectic liquid crystal disposed between the two substrates, said liquid crystal assuming at least two stable states including two stable states under no

voltage application, at least one of the substrates having been subjected to a uniaxial aligning treatment in two directions including a normal direction and a reverse direction substantially opposite to the normal direction, wherein the liquid crystal is placed in an alignment state such that the liquid crystal provides an apparent tilt angle  $\theta_a$  which is half of an angle between said two stable states under no voltage application, a tilt angle  $\theta$  and an average pretilt angle  $\alpha$  of at most  $2^\circ$  with respect to a substrate surface, and forms smectic layers forming an inclination angle  $\delta$  from a normal to the substrate surfaces satisfying:  $\theta/2 < \theta_a \leq \theta$  and  $\theta > \alpha + \delta$ .

5,568,296

# RUBBING APPARATUS WITH AN EVEN NUMBER OF RUBBING ROLLERS WITH PILE YARN ON HALF INCLINING IN THE OPPOSITE DIRECTION TO THAT OF THE OTHER HALF

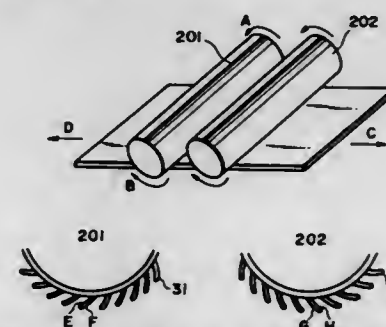
Yasuto Kadera, Fujisawa; Kenji Onuma, Ischura, and Masaaki Suzuki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 58,359, May 10, 1993, Pat. No. 5,422,750.  
This application Mar. 7, 1995, Ser. No. 399,533

Claims priority, application Japan, May 13, 1992, 146870/1992

Int. Cl.<sup>6</sup> G02F 1/1337  
U.S. Cl. 359—76

5 Claims



1. A rubbing apparatus for imparting an alignment control power to an alignment control film of a substrate for a liquid crystal device, comprising an even number of at least two cylindrical rubbing rollers rotating in an identical direction, wherein each rubbing roller comprises a rubbing cloth wound thereabout and planted with pile yarn standing against the cloth, a first half of the rubbing rollers having an inclination of the pile yarn in a direction following the rotation direction of the rubbing rollers, and a second half of the even number of rubbing rollers having an inclination direction of the pile yarn opposite to that of the first half of the even number of rubbing rollers.

5,568,297

# METHOD OF MAKING A LIQUID CRYSTAL DISPLAY DEVICE BY MEASURING THE LIQUID CRYSTAL LAYER THICKNESS AND ADJUSTING

Koujiro Tsubota, Nara; Kazuyoshi Fujioka, Higashiosaka; Yohji Yoshimura, Nara; Hiroyuki Ohgami, Teiri; Yutaka Takafuji, Nara, all of Japan, and Hirokazu Kamei, Kashi-hara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 67,466, May 25, 1993, Pat. No. 5,499,127.  
This application May 22, 1995, Ser. No. 446,499

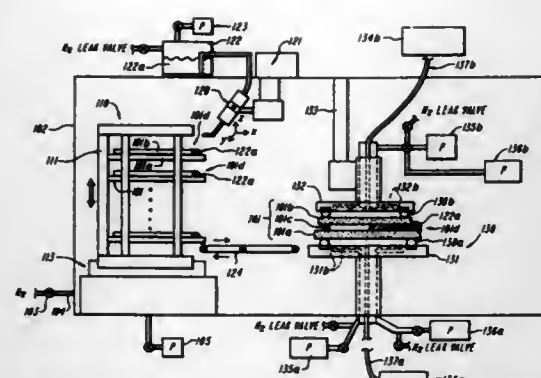
Claims priority, application Japan, May 25, 1992, 4-132870; Jul. 3, 1992, 4-177155

Int. Cl.<sup>6</sup> G02F 1/1339; B65B 31/00; C09K 19/00; H01J 9/26  
U.S. Cl. 359—80

2 Claims

1. A method for producing a liquid crystal display device, comprising the steps of:





providing two substrates opposed to each other with a sealing member along a perimeter thereof except for an injection opening;  
supplying the injection opening with a liquid crystal in a larger amount than a specified amount to be injected;  
partially injecting the liquid crystal into a gap between the two substrates by a difference between a pressure inside the two substrates and a pressure outside the two substrates, thereby forming a liquid crystal layer;  
measuring a thickness of a central portion of the liquid crystal layer;  
mechanically adjusting the thickness of the central portion based on a result obtained by the measurement, using a process selected from the group consisting of allowing the liquid crystal to be injected into the gap and allowing the liquid crystal to be discharged from the gap; and  
sealing the injection opening.

5,568,298

# FERROELECTRIC LIQUID CRYSTAL BLUE COLOR SHUTTER WITH COLOR CORRECTION FILTER

Akira Mase, Aichi-ken, and Michio Shimizu, Kanagawa-ken, both of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

Continuation of Ser. No. 811,064, Dec. 20, 1991, abandoned.

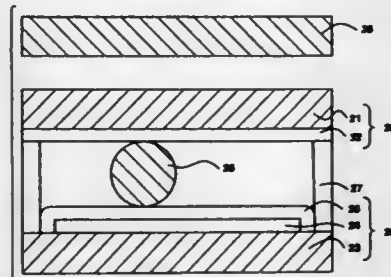
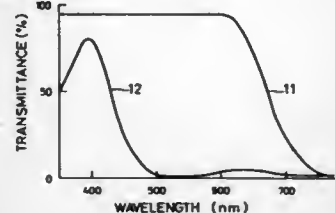
This application Dec. 8, 1993, Ser. No. 162,978

Claims priority, application Japan, Dec. 27, 1990, 2-418871

Int. Cl. G02F 1/14; 1/1335

U.S. Cl. 359-100

8 Claims



1. An electro-optical blue color shutter comprising:  
a pair of substrates provided with electrodes thereon;  
an orientation control surface provided on an inside surface of only one of said substrates;  
a ferroelectric liquid crystal material disposed between said substrates wherein the product ( $\Delta n$ ) of the optical anisotropy ( $\Delta n$ ) of said ferroelectric liquid crystal material and the thick-

ness (d) of said ferroelectric liquid crystal material in a direction perpendicular to said inside surface is 500 nm to 650 nm; and  
a filter which cuts only the light of long wavelengths.

5,568,299

# FERROELECTRIC LIQUID CRYSTAL WITH PITCH 1-2 TIMES LAYER THICKNESS AND GRADATION BY BISTABLE MONOSTABLE RATIO

Toshiaki Yoshihara; Akihiro Mochizuki; Hironori Shiroto, and Tetsuya Makino, all of Kawasaki, Japan, assignors to Fujitsu Limited, Japan

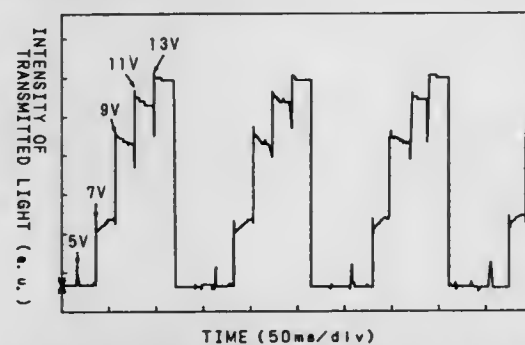
Filed Jul. 14, 1995, Ser. No. 502,542

Claims priority, application Japan, Mar. 10, 1995, 7-051539

Int. Cl. G02F 1/141

U.S. Cl. 359-100

7 Claims



5. A ferroelectric liquid crystal display element comprising:

a pair of substrates;

a ferroelectric liquid crystal layer interposed between said substrates;

electrodes disposed on surfaces facing each other of said substrates to control the direction of spontaneous polarization of said ferroelectric liquid crystal layer,

wherein a dimensional ratio of a helical pitch to a thickness of the layer is set so as to hold a mingling state of two areas to appear an intermediate optical characteristic where, after the direction of the polarization is once completely inverted from an original direction, with the application of a predetermined voltage over the threshold voltage, after removing of the voltage the polarization direction in one area remains as inverted, whereas in the other area the polarization direction is again inverted back to the original.

5,568,300

# FIBER INTERFACE SHELF FOR INTERFACING ATM SWITCH MODULE AND SUBSCRIBER LINE OR TOLL SWITCH

Ryoichi Ishibashi, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Jul. 21, 1995, Ser. No. 505,604

Claims priority, application Japan, Oct. 4, 1994, 6-240050

Int. Cl. H04J 14/08

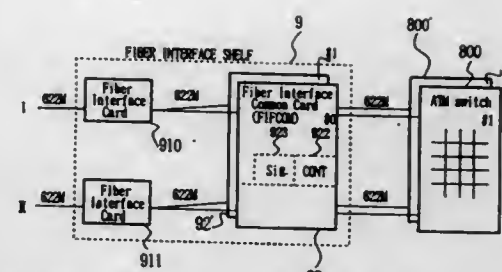
U.S. Cl. 359-137

16 Claims

1. A fiber interface shelf connected to a plurality of transmission lines on one side and to an ATM switch module on the other side for interfacing between the transmission lines and the ATM switch module, the fiber interface shelf comprising:

a plurality of fiber interface cards, each of which is connected to a corresponding transmission line for terminating the corresponding transmission line; and

a fiber interface common card for interfacing between the transmission lines and the ATM switch module to transfer signals therebetween, the fiber interface common card having,



a plurality of selection gates, each being inputted a pair of outputs of the fiber interface cards and outputting one of the pair of outputs, and  
a control circuit for controlling each of the selection gates to select and output the one of the pair of outputs.

5,568,301

# OPTICAL COMMUNICATION SYSTEM WITH SECURE KEY TRANSFER

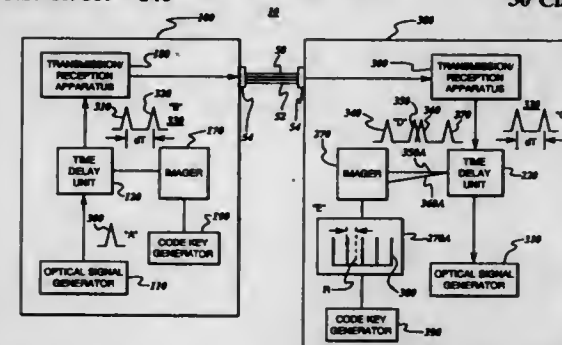
Jerome J. Tiemann, Schenectady; John E. Hershey, Ballston Lake, both of N.Y., and Amer A. Hassan, Cary, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 3, 1995, Ser. No. 415,877

Int. Cl. H04J 14/08

U.S. Cl. 359-140

30 Claims



1. An optical communications system adapted for secure key exchange between stations having respective optical communications assemblies, the communications system comprising:

a first and a second optical communications assembly, said assemblies being optically coupled together via an optical coupling medium, each of said optical communications assemblies comprising:

a respective time delay unit;

an optical pattern imager optically coupled to said respective time delay unit;

a respective transmission-reception apparatus optically coupled to said time delay unit and disposed so as to couple said first optical communications assembly via said optical coupling medium; and

a respective optical signal generator coupled to said respective time delay unit for passing an optical signal through said time delay unit, said optical signal comprising a pulse of coherent light.

# 5,568,302 METHOD OF TRANSMITTING DATA VIA AN OPTICAL DATA LINK

Kenneth A. Puzey, Essex Junction, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

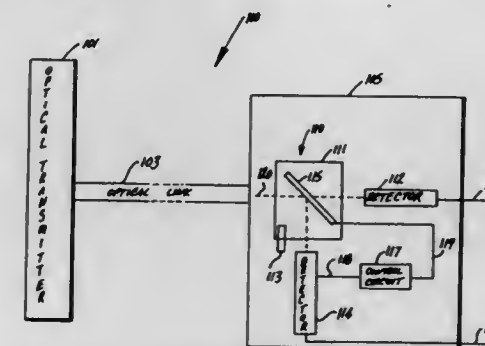
Division of Ser. No. 208,468, Mar. 9, 1994. This application

Jun. 1, 1995, Ser. No. 457,653

Int. Cl. H01L 39/00; H04B 10/00

U.S. Cl. 359-157

13 Claims



1. A method of transmitting data in a data transmission system comprising an optical data link and a plurality of optical detectors responsive to optical pulses to generate corresponding electrical output signals, the method comprising the steps of:

generating an optical data stream comprising a serial stream of pulses represented by the presence and absence of light at one end of the data link;

directing successive pulses of the serial data stream from the other end of the optical data link to the plurality of optical detectors in a predefined sequence; and

combining electrical output signals generated by the optical detectors in a sequence corresponding to the predefined sequence;

the step of directing successive pulses to the plurality of detectors comprising placing a wafer of superconductive material in alignment with the optical data stream and at a predefined angle to the data stream, and the step of changing the superconductive wafer between a superconducting state in which light incident on the wafer is reflected to one of the detectors and a non-superconducting state in which light incident on the wafer is passed through the wafer to another of the detectors.

5,568,303

# UNIT FOR GENERATING SIGNAL PULSES, TRANSMITTER COMPRISING SUCH A UNIT, AND MULTIPLEX TRANSMISSION SYSTEM COMPRISING SUCH A TRANSMITTER

Coen T. H. F. Liedenbaum, and John J. E. Reid, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

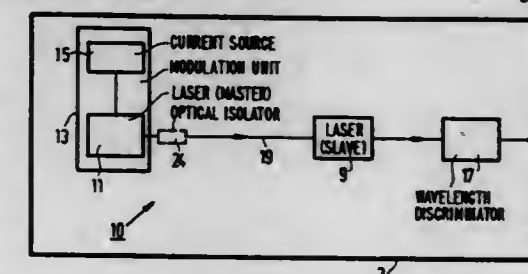
Filed Jun. 28, 1995, Ser. No. 494,529

Claims priority, application European Pat. Off., Jun. 30, 1994, 94201891; Sep. 16, 1994, 94202665

Int. Cl. H04B 10/04

U.S. Cl. 359-184

5 Claims



1. A unit for generating signal pulses, comprising:

a first, pulsed laser for supplying a pulse series having a pulse period  $T$  and a wavelength  $\lambda_1$ ; and  
 a modulation unit for modulating said first laser in accordance with a data signal, wherein said modulation unit comprises a second laser having a wavelength band which is different from  $\lambda_1$  and wherein the second laser is modulated in accordance with a data signal to be transported at a modulation period which is equal to  $T$  and whose radiation is injected into said first laser at instances for which it holds that  $E(P_m) > E(LP)$ , in which  $E(P_m)$  is the radiation energy of the second laser injected into said first laser at the relevant instant and  $E(LP)$  is the radiation energy built up in said first laser at the relevant instant; and wherein said unit further comprises a wavelength discriminator for selecting the wavelength  $\lambda_1$  from the radiation transmitted by said first laser after injection.

5,568,304

## OPTICAL RECEIVER FOR MODULATED LIGHT

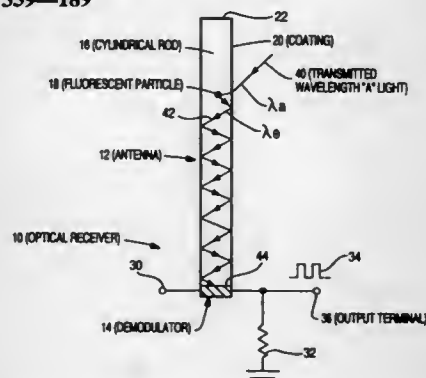
Peter F. Baur, Angsburg, Germany, assignor to AT&T Global Information Solutions Company, Dayton, Ohio  
 Filed Jun. 6, 1995, Ser. No. 468,599

Claims priority, application United Kingdom, Dec. 5, 1994, 9424523

Int. Cl.<sup>6</sup> H04B 10/06

U.S. Cl. 359—189

12 Claims



1. An optical receiver for modulated light, comprising:  
 an optical antenna for collecting transmitted modulated light and having a fluorescent material dispersed therein, said optical antenna being formed of a low-pass filter material which is transparent to wavelengths equal to or longer than a predetermined wavelength and absorptive to wavelengths shorter than said predetermined wavelength, said optical antenna being provided with a coating of high-pass filter material which is transparent to wavelengths equal to or shorter than said predetermined wavelength, and is reflective to wavelengths longer than said predetermined wavelength, said fluorescent material responding to light of said predetermined wavelength by emitting light of a different wavelength; and  
 an optoelectrical demodulator located in operative relationship to said optical antenna and adapted to convert light emitted by said fluorescent material to electrical signals.

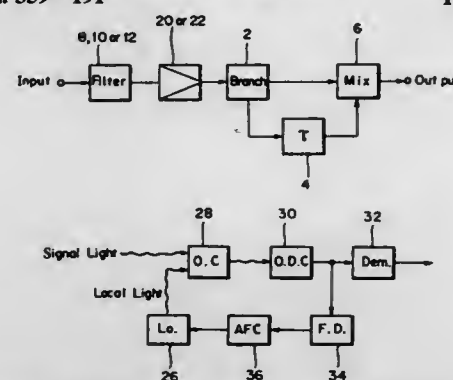
5,568,305

## HETERODYNE RECEIVER PROVIDED WITH A FREQUENCY DISCRIMINATOR FOR COHERENT LIGHTWAVE COMMUNICATIONS

Takao Naito, Terumi Chikama, and Hiroshi Onaka, all of Kawasaki, Japan, assignors to Fujitsu Limited, Japan  
 Continuation of Ser. No. 355,339, Dec. 12, 1994, abandoned, which is a continuation of Ser. No. 900,493, Jun. 18, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 462,565  
 Claims priority, application Japan, Jun. 20, 1991, 3-148823  
 Int. Cl.<sup>6</sup> H04B 10/06

U.S. Cl. 359—191

14 Claims



1. A heterodyne receiver for coherent light wave communications comprising:

- an optical coupler having a first input terminal to receive a signal light transmitted over an optical transmission line, a second input terminal, and a coupler output terminal;
  - a local light source having a frequency control input terminal, and having an output terminal to supply a local light having a local frequency to said second input terminal of said optical coupler;
  - an optical detection circuit having an input terminal optically connected with said coupler output terminal of said optical coupler to receive an outputted mixed light beam including said received signal light and said supplied local light from said optical coupler, and having an IF output terminal to generate an intermediate-frequency signal based on said received mixed light beam, said intermediate-frequency signal having a frequency corresponding to a difference between a frequency of said signal light and a frequency of said local light;
  - a demodulator having an input terminal operatively connected with said IF output terminal of said optical detection circuit, to receive said intermediate-frequency signal and to reproduce transmitted data from said intermediate-frequency signal generated by said optical detection circuit;
  - a frequency discriminator having an input terminal operatively connected with said IF output terminal of said optical detection circuit to receive said intermediate-frequency signal, and having an FD output terminal to generate an FD signal having a level which varies in accordance with a frequency of said received intermediate-frequency signal; and
  - an automatic frequency control circuit having an input terminal operatively connected with said FD output terminal of said frequency discriminator to receive said generated FD signal, and having an output terminal operatively connected with said frequency control input terminal of said local light source to control said local frequency of said local light such that the level of said FD signal generated by said frequency discriminator is kept constant;
- said frequency discriminator comprising:
- a filter supplied with said received intermediate-frequency signal from said optical detection circuit, to limit a pass band of said intermediate-frequency signal using a cutoff frequency determined based on a delay time  $\tau$ , thereby to generate a limited intermediate-frequency signal, said filter having an output terminal to output said limited intermediate-frequency signal;

a branch circuit having an input terminal operatively connected with said output terminal of said filter to receive said limited intermediate-frequency signal, and having a first and a second output terminal each to output a divided said limited intermediate-frequency signal;  
 a delay circuit having an input terminal operatively connected with said first output terminal of said branch circuit to receive said limited intermediate-frequency signal, and having a delay output terminal to generate a delayed said received limited intermediate-frequency signal which is delayed by said delay time  $\tau$ ; and  
 a mixer having a first input terminal operatively connected with said delay output terminal of said delay circuit to receive said generated delayed limited intermediate-frequency signal, having a second input terminal operatively connected with said second output terminal of said branch circuit to receive said limited intermediate-frequency signal, and having a mixer output terminal to output said generated FD signal by mixing said received delayed limited intermediate-frequency signal and said limited intermediate-frequency signal.

5,568,306

## LASER BEAM CONTROL AND IMAGING SYSTEM

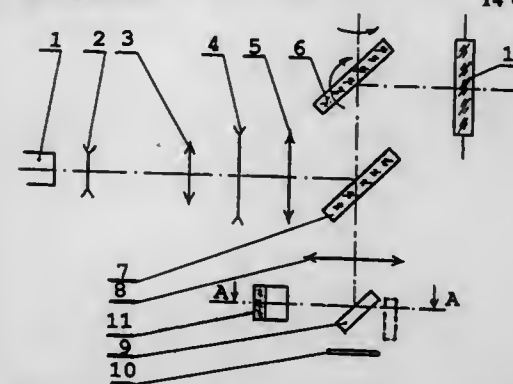
Victor Mandel, Huntington Beach, Calif., assignor to Leonard Tachner, Newport Beach, Calif.

Filed Oct. 17, 1994, Ser. No. 323,667

Int. Cl.<sup>6</sup> G02B 26/08

U.S. Cl. 359—223

14 Claims



1. An improved laser beam control and imaging apparatus of the type used for varying the focal point and direction of a laser beam and for aiming the laser beam on an object by providing an image of the point of impingement of the beam on the object; the apparatus comprising:

- a laser beam source;
  - a first lens system for controlling the shape of the laser beam;
  - a second lens system for controlling the focal point of the laser beam;
  - a first mirror for reflecting the laser beam but for transmitting light from the object;
  - a second mirror for reflecting the laser beam and light from the object, said second mirror being moveable for altering the direction of said reflected laser beam;
  - said first and second lens systems and said first and second mirrors directing the laser beam toward a selected location on said object to impinge said laser beam on said location over a selected size impingement point; and
  - an imaging system positioned relative to said first and second mirrors for receiving said light from said object which indicates the precise position of the laser beam on the object;
- said first and second lens systems being positioned between said laser beam source and said first mirror.

5,568,307

## APPARATUS FOR CONTROLLING THE REFLECTANCE OF AN OBJECT SURFACE

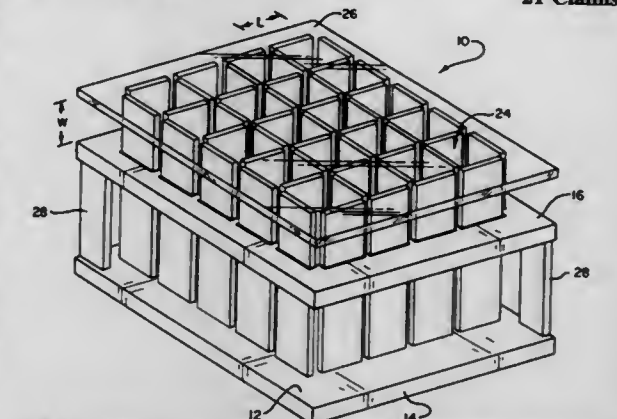
Eric R. Williams, Murrieta, Calif., assignor to McDonnell Douglas Corporation, Huntington Beach, Calif.

Filed Feb. 7, 1995, Ser. No. 384,022

Int. Cl.<sup>6</sup> G02B 26/00

U.S. Cl. 359—295

21 Claims



10. Apparatus for selectively controlling the amount of radiation absorbed by the surface of an object, comprising:

- a plurality of means mounted in spaced apart relation on said object surface, said means being electrically energized to have an outer end surface thereof experience a modified dimensional extension with respect to the object surface;
- a modulator plate affixed to outer end surfaces of the means for being moved with respect to the object surface, said modulator plate including a plurality of spaced apart slotlike openings enclosing a number of imperforate wall portions;
- an identical plurality of side walls slidably received within respective slotlike openings of the modulator plate and each side wall having an edge surface contacting the object surface, said side walls coacting to form cavities facing outwardly away from the modulator plate toward incoming radiation, said modulator plate wall portions respectively forming cavity bottoms; and
- an electrical power source for energizing said plurality of means.

5,568,308

## FABRICATION OF FERROELECTRIC DOMAIN REVERSALS

Akinori Harada, Kanagawa-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

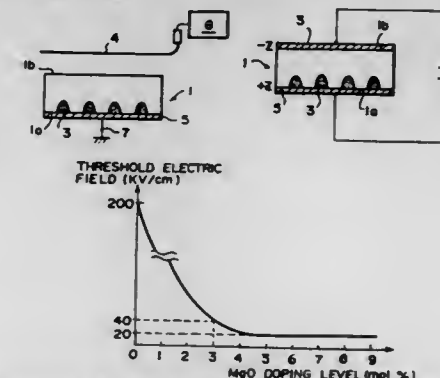
Filed Feb. 17, 1994, Ser. No. 197,708

Claims priority, application Japan, Feb. 18, 1993, 5-029206

Int. Cl.<sup>6</sup> G02F 1/37

U.S. Cl. 359—326

12 Claims



1. A method for fabricating localized ferroelectric domain reversals, comprising the steps of:  
 providing a MgO-LiNbO<sub>3</sub> or a MgO-LiTaO<sub>3</sub> substrate having a doping level of MgO within a range from 3 mol. % to 9 mol.



% as a unipolarized ferroelectric substance possessing a non-linear optical effect; and  
applying an electric field to the unipolarized ferroelectric substance.

5,568,309

# SYSTEM AND METHOD FOR AMPLIFICATION AND WAVEFRONT COMPENSATION OF DEPOLARIZED OPTICAL BEAMS

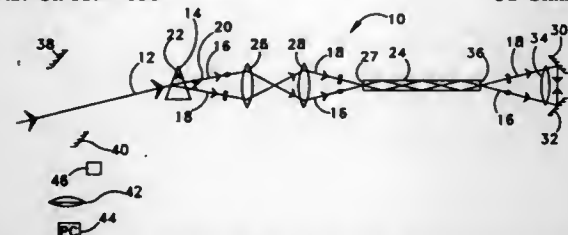
David A. Rockwell, Santa Monica, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 24, 1994, Ser. No. 427,517

Int. Cl.<sup>6</sup> H01S 3/00

U.S. Cl. 359—338

31 Claims



1. A system for amplifying and wavefront compensating a depolarized optical seed beam, comprising:

a polarizing beamsplitter for splitting said depolarized optical seed beam into two orthogonally polarized beams,  
at least one optical amplifier for amplifying said orthogonally polarized beams,

at least one beam director for directing and redirecting said beams back into said at least one amplifier so that they perform a first set of multiple passes through said amplifier, and

a phase conjugation unit for phase conjugating said beams after said first set of multiple passes so that the phase conjugated beams counter-propagate back to said at least one amplifier, perform a second set of multiple passes through said amplifier, and are recombined into a single return beam by said polarizing beamsplitter,

said phase conjugation unit altering the wavefronts of said orthogonally polarized beams so that wavefront and polarization of said return beam substantially matches the wavefront and polarization of said seed beam.

5,568,310

# OPTICAL TRANSMISSION LINE RELAYED WITH MULTISTAGE OPTICAL AMPLIFIERS

Takao Naito, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

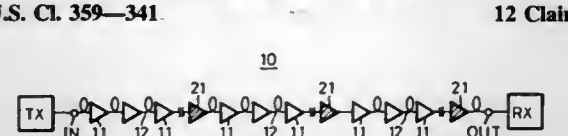
Continuation of Ser. No. 34,384, Mar. 18, 1993, Pat. No. 5,422,754. This application May 4, 1995, Ser. No. 434,723

Claims priority, application Japan, Mar. 19, 1992, 4-62872

Int. Cl.<sup>6</sup> H04B 10/00; G02B 6/26

U.S. Cl. 359—341

12 Claims



1. An optical transmission system for transmitting a signal, the signal has a center frequency and the optical transmission system comprising:

an optical transmission line having an input terminal which receives the signal, and an output terminal; and

a plurality of optical amplifying units concatenated into the optical transmission line, the signal being received by the input terminal of the optical transmission line, transmitted through the optical transmission line by passing through each

of the optical amplifying units and output from the output terminal of the optical transmission line, wherein each optical amplifying unit includes an optical amplifier and at least two optical amplifying units include an optical filter to provide optical filters concatenated into the optical transmission line, and

the concatenated optical filters include a first-type optical filter which passes the center frequency of the signal and has a bandwidth which passes the signal received at the input terminal of the optical transmission line, and a second-type optical filter which passes the center frequency of the signal and has a bandwidth which is narrower than the bandwidth of the first-type optical filter, optical amplifying units being arranged in the optical transmission line to form a concatenated mixture of a first-type optical filter and a second-type optical filter.

5,568,311

# WAVELENGTH TUNABLE SEMICONDUCTOR LASER DEVICE

Keisuke Matsumoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

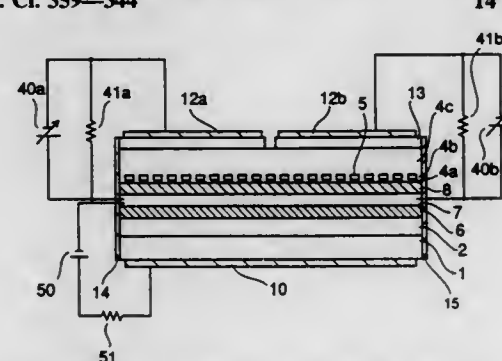
Filed May 26, 1995, Ser. No. 452,158

Claims priority, application Japan, May 30, 1994, 6-116556

Int. Cl.<sup>6</sup> H01S 3/19

U.S. Cl. 359—344

14 Claims



1. A wavelength tunable semiconductor laser device comprising:

a semiconductor substrate of a first conductivity type;  
a semiconductor active layer located opposite the semiconductor substrate and producing light in response to current injected into the active layer, the light having a wavelength;

a semiconductor tuning layer located opposite the semiconductor substrate and having a refractive index that varies in response to an electric field applied to the tuning layer, a tuning layer tuning the wavelength of the light produced by the laser in response to the refractive index controlled by the electric field applied to the tuning layer;

a semiconductor spacer layer of a second conductivity type, opposite the first conductivity type, interposed between the active layer and the tuning layer;

front and rear resonator facets located at opposite ends of the semiconductor active layer and of the semiconductor tuning layer and having different reflectivities from each other;

a first electrode in electrical contact with the tuning layer for applying an electric field to the semiconductor tuning layer, the first electrode being divided into a plurality of portions in a resonator length direction of the semiconductor, laser;

a second electrode disposed on the semiconductor substrate for injecting current into the semiconductor active layer; and

a third electrode commonly used with the first and second electrodes, the third electrode being in electrical contact with the semiconductor spacer layer.

5,568,312

# RELAY LENS SYSTEM FOR ENDOSCOPE

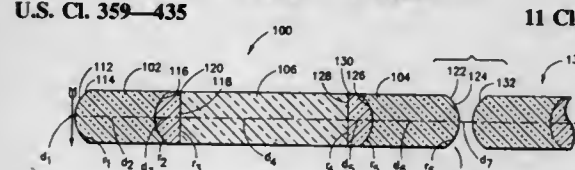
Richard F. Horton, Los Lunas, N.M., assignor to Symbiosis Corporation, Miami, Fla.

Continuation-in-part of Ser. No. 330,188, Oct. 27, 1994, and Ser. No. 330,369, Oct. 27, 1994. This application Nov. 22, 1994, Ser. No. 343,669

Int. Cl.<sup>6</sup> G02B 23/24; A61B 1/04

U.S. Cl. 359—435

11 Claims



1. A relay lens system for transmitting an image formed by an objective lens at the distal end of an endoscope to an eyepiece at the proximal end of the endoscope, the relay lens system comprising:

at least one relay lens pair having axially aligned first and second substantially cylindrical rod lenses, each of said first and second rod lenses having

a) a convexo-concave polymeric lens element having a convex surface and a concave surface, wherein said convex surface of said convexo-concave polymeric lens element forms an outside end for each of said first and second rod lenses,

b) a concavo-convex polymeric lens element having a concave surface and a convex surface, wherein said convex surface of said concavo-convex polymeric lens element forms an inside end for each of said first and second rod lenses,

c) a glass rod element having first and second flat ends,

d) a convexo-plano optical cement lens element formed between and affixing said concave surface of said convexo-concave polymeric lens element and said first flat end of said glass rod, and,

e) a plano-convex optical cement lens element formed between and affixing said concave surface of said concavo-convex polymeric lens and said second flat end of said glass rod.

5,568,313

# APPARATUS FOR PROVIDING AUTOSTEREOSCOPIC AND DYNAMIC IMAGES AND METHOD OF MANUFACTURING SAME

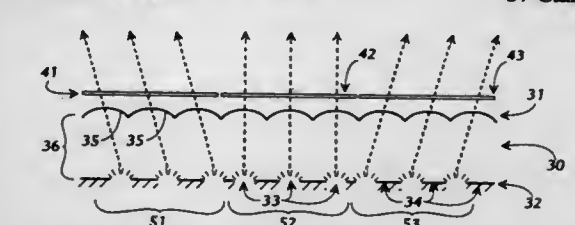
Richard A. Steenblik, Atlanta, and Mark J. Hurt, Alpharetta, both of Ga., assignors to Applied Physics Research, L.P., Roswell, Ga.

Continuation-in-part of Ser. No. 931,871, Aug. 18, 1992, Pat. No. 5,359,454. This application Mar. 2, 1994, Ser. No. 205,047

Int. Cl.<sup>6</sup> G02B 27/22; 27/12

U.S. Cl. 359—463

37 Claims



1. A light control material comprising:

a transparent substrate having at least a top surface and a bottom surface;

a layer of emulsion disposed on said top surface of said transparent substrate, said layer of emulsion having interleaved photographic images formed therein;

light control optics having bright zones and dark zones formed therein, said light control optics bonded to, or formed in said bottom surface of said transparent substrate, said transparent

substrate spacing said light control optics and said layer of emulsion a predetermined distance apart, said light control optics controlling the illumination of said interleaved photographic images such that an autostereoscopic or dynamic image is displayed.

5,568,314

# IMAGE DISPLAY APPARATUS

Shigeru Omori, Nakai-machi; Tomohiko Hattori, Nagayo, and Jun Suzuki, Nakai-machi, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

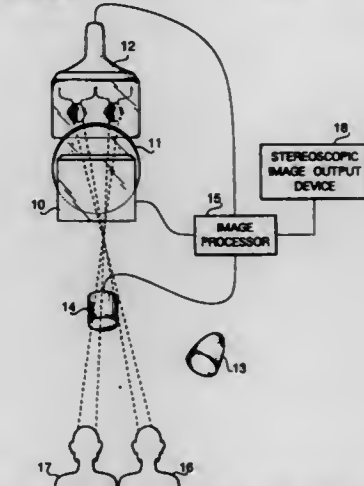
Filed Nov. 30, 1994, Ser. No. 352,052

Claims priority, application Japan, Dec. 3, 1993, 5-304380

Int. Cl.<sup>6</sup> G02B 27/22; H04N 13/04

U.S. Cl. 359—464

26 Claims



1. An image display apparatus for allowing an observer to observe an image with his or her right eye and an image different from said image with his or her left eye, said apparatus comprising:

a spatial modulation device having light transmission characteristics;

an imaging device for obtaining an image of a surface of the observer;

a display device for displaying the image of the observer obtained by said imaging device to illuminate said spatial modulation device from behind; and

an optical device for giving directivity to a light from said display device,

wherein said display device displays the image of the surface of the observer obtained by said imaging device and an image obtained by negative-positive reversing said image of the surface of the observer as figures for illuminating said spatial modulation device.

5,568,315

# OPTICAL BEAMSPLITTER

Curtis A. Shuman, Colorado Springs, Colo., assignor to Disco- vision Associates, Irvine, Calif.

Division of Ser. No. 705,780, May 28, 1991, abandoned. This application May 22, 1995, Ser. No. 446,364

Int. Cl.<sup>6</sup> G02B 5/30; 27/14; 27/28; G11B 7/00

U.S. Cl. 359—487

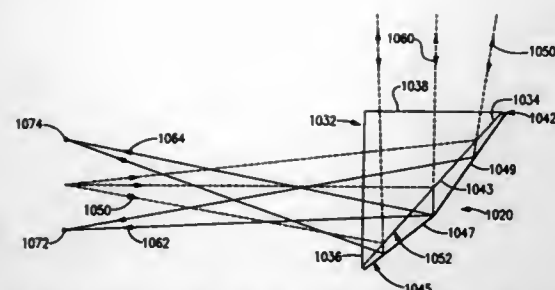
8 Claims

1. An optical beam splitting assembly for use in an optical system, said assembly comprising:

a light source producing an incident light beam;

a reflective medium for receiving said incident light beam and reflecting a corresponding reflected light beam;

a right angle prism including a first leg having a first length and a second leg having a second length, said first and second legs being joined by a hypotenuse, said first length and said second length being approximately equal to each other;



a thin faceted optical element positioned adjacent said hypotenuse, said optical element having a front surface and a rear surface, said thin faceted optical element having a maximum thickness which is less than said first and second lengths of said first and second legs of said prism, said rear surface formed by a first portion and a second portion, said first and second portions being non-planar relative to each other; an optically selective coating positioned intermediate said hypotenuse and said front surface of said thin faceted optical element to form a beam splitting interface; and a light detector which receives said reflected light beam wherein said incident light beam passes from said light source through said first leg, reflecting off said beam splitting interface to pass through said second leg as directed toward said reflective medium thereby producing said corresponding reflected light beam, said corresponding reflected light beam returning through said second leg and through said optically selective coating and reflecting off said first portion and a second portion of said rear surface thereby forming a first converging return beam and a second converging return beam each passing through said first leg.

5,568,316

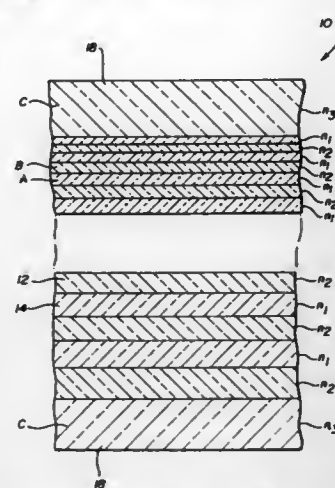
**FORMABLE REFLECTIVE MULTILAYER BODY**

Walter J. Schrenk; Charles B. Arends; Conrad F. Balazs; Ray A. Lewis, and John A. Wheatley, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.  
Division of Ser. No. 242,713, May 13, 1994, Pat. No. 5,448,404, which is a continuation of Ser. No. 969,710, Oct. 29, 1992, abandoned. This application Apr. 13, 1995, Ser. No. 421,170

Int. Cl.<sup>6</sup> G02B 1/10

U.S. Cl. 359—584

9 Claims



8. A formable polymeric multilayer reflective body having a substantially uniform reflective appearance over substantially the entire range of the visible spectrum comprising:

at least first and second diverse polymeric materials, the body comprising a sufficient number of alternating layers of said first and second polymeric materials such that at least 40% of visible light incident on said body is reflected, a substantial

majority of the individual layers of said body having optical thicknesses in the range where the sum of the optical thicknesses in a repeating unit of said polymeric materials is between about 190 nm and 1700 nm, wherein said first and second polymeric materials differ from each other in refractive index by at least about 0.03, wherein said layers have a gradient of optical layer repeat unit thicknesses through the thickness of said body such that said gradient of optical layer repeat unit thicknesses provide continuous wavelength coverage over substantially the entire range of the visible spectrum for said body to maintain a substantially uniform reflective appearance when drawn, and wherein said gradient of optical layer repeat unit thicknesses is a quartic function.

5,568,317

**BEAM SPLITTER/COMBINER WITH PATH LENGTH COMPENSATOR AND METHOD FOR MAKING THE SAME**

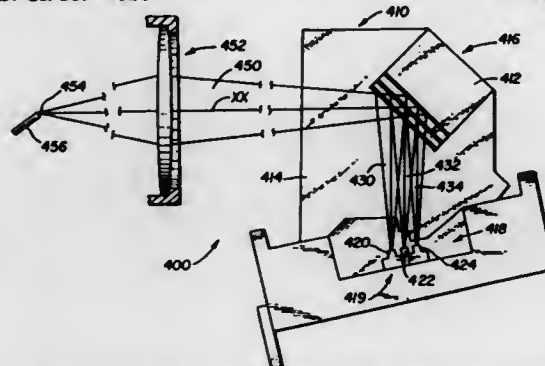
David D. Bohn, Fort Collins, and Jesse M. Gerrard, Loveland, both of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 108,359, Aug. 18, 1993, Pat. No. 5,459,611. This application Jun. 26, 1995, Ser. No. 495,059

Int. Cl.<sup>6</sup> G02B 27/10

U.S. Cl. 359—618

2 Claims



1. A method for producing a beam splitter/path length compensator assembly for use in a color imaging assembly for forming spatially separated, color component images of an object on a unitary image plane, comprising:

a) providing a beam splitter means having a plurality of parallel color component beam reflecting layers disposed obliquely in the path of a polychromatic imaging light beam for splitting said polychromatic imaging light beam into a plurality of parallel, spatially and spectrally separated, color component beams having optical axes positioned perpendicular to said unitary image plane;

b) providing a mold means for producing a unitary path length compensator device comprising:

i) beam splitter housing means for securely holding said beam splitter means and for spatially separating said beam splitter means from said unitary image plane; and  
ii) path length compensator means disposed between said beam splitter means and said unitary image plane for refractively compensating for differences in optical path lengths of said plurality of color component beams, whereby each of said color component beams provides a focused color component image of said object on said unitary image plane;

c) placing said beam splitter means within said mold means;  
d) injecting a molten plastic material into said mold means; and  
e) allowing said plastic material to cure to a solid state, said plastic material being transparent upon curing.

5,568,318

**METHOD AND APPARATUS FOR EFFICIENT CONCENTRATION OF LIGHT FROM LASER DIODE ARRAYS**

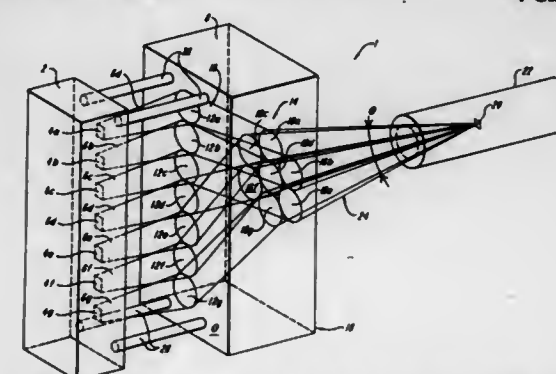
James R. Leger, Groton, and William C. Goltso, Burlington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 809,850, Dec. 18, 1991, Pat. No. 5,333,077, which is a continuation of Ser. No. 429,417, Oct. 31, 1989, abandoned. This application Nov. 15, 1993, Ser. No. 152,585

Int. Cl.<sup>6</sup> G02B 27/10

U.S. Cl. 359—618

4 Claims



1. A method for directing light into an optical fiber using a light beam having a spatial cross-sectional distribution which is extended predominantly in one direction, the method comprising: receiving the light beam; redirecting different portions of the received light beam to different locations on an imaginary plane wherein at least two portions of the light beam are directed along two nonparallel paths so as to generate a two-dimensional pattern of light on the imaginary plane; and redirecting portions of said two-dimensional pattern of light to a point along an axis of the optical fiber.

5,568,319

**ASPHERICAL EYEPIECE**

Masanobu Kaneko, Yokohama, and Yasunori Ueno, Kawasaki, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 5,119, Jan. 15, 1993, abandoned.

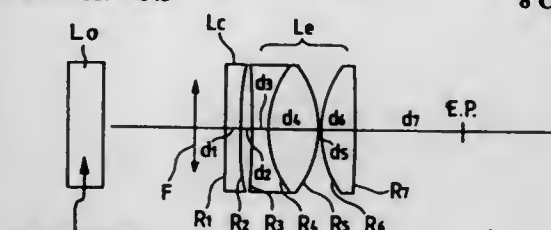
This application May 15, 1995, Ser. No. 441,061

Claims priority, application Japan, Jan. 31, 1992, 4-045981

Int. Cl.<sup>6</sup> G02B 25/00

U.S. Cl. 359—643

8 Claims



OBJECTIVE LENS FORMING REAL IMAGE

1. An aspherical eyepiece for enlarging and observing a real image formed by an objective lens having positive refractive power, said eyepiece having positive refractive power as a whole and including from an eye side toward said objective lens:

a positive lens group; and  
a correction plate for correcting pupil aberration of the positive lens group, the correction plate being disposed between the positive lens group and a front side focal plane of the positive lens group, and having an aspherically shaped surface.

5,568,320

**MULTIPLE ROW LENS ARRAY ALIGNABLE WITH MULTIPLE ROW IMAGE BAR**

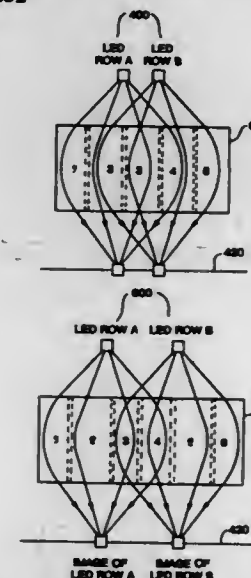
James D. Rees, Pittsford, and Walter F. Leising, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 30, 1994, Ser. No. 351,101

Int. Cl.<sup>6</sup> G02B 3/00

U.S. Cl. 359—652

4 Claims



1. An optical system comprising: an image bar including a plurality of pixels arranged along a plurality of substantially parallel rows; and a lens array for imaging light from the image bar, the lens array including a plurality of lenses arranged along a plurality of substantially parallel rows in a direction orthogonal to center axes of the lenses,

wherein the lenses in each lens row images light emitted from the pixels in pixel rows located within a field of view of the lens row, each pixel row being symmetrically arranged with respect to lens rows having fields of view encompassing the pixel row,

wherein the image bar includes at least two rows of pixels and the lens array comprises at least five rows of lenses, and wherein a first pixel row is within the fields of view of first, second, third, and fourth lens rows and beyond the field of view of a fifth lens row, and wherein a second pixel row is within the fields of view of the second, third, fourth, and fifth lens rows and beyond the field of view of the first lens row.

5,568,321

**ZOOM LENS**

Hideki Ogawa, Chofu; Tsunefumi Tanaka, and Takeshi Koyama, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 792,157, Nov. 14, 1991, abandoned.

This application Aug. 12, 1993, Ser. No. 104,943

Claims priority, application Japan, Nov. 16, 1990, 2-310678; Nov. 16, 1990, 2-310679

Int. Cl.<sup>6</sup> G02B 15/14

U.S. Cl. 359—676

10 Claims

1. A zoom lens comprising, in succession from an object side, a first lens unit of positive refractive power, a second lens unit of negative refractive power, a third lens unit of positive refractive power and a fourth lens unit of positive refractive power, said fourth lens unit having, in succession from the object side, a first positive lens having its convex surface of sharp curvature facing an image plane side, and a cemented lens comprising a meniscus positive lens having its concave surface facing the object side and a negative lens having its concave surface of sharp curvature facing the object side, said meniscus positive lens and said nega-

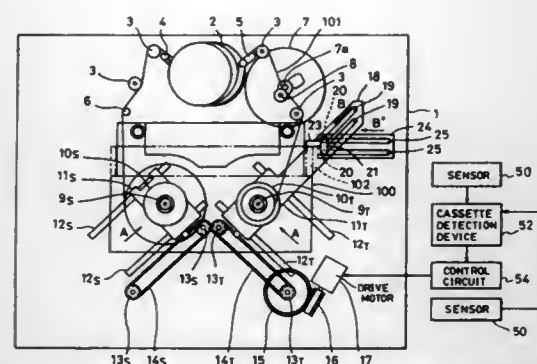












- (d) a lid opening member for opening a lid of the cassette to be loaded;
- (e) a second movement mechanism for moving said lid opening member to a predetermined position so that said lid opening member is engageable with the cassette which has been loaded;
- (f) an interlocking mechanism for interlocking said second movement mechanism with said first movement mechanism, said interlocking mechanism having an interconnecting member interconnected to one of said pair of reel bases, said lid opening member engaging with said interconnecting member; and
- (g) a tape pulling-out member for pulling out a tape from said cassette so as to bring said tape into contact with said head after said lid opening member opens said lid.

5,568,340

## CASSETTE LOADING AND UNLOADING DEVICE

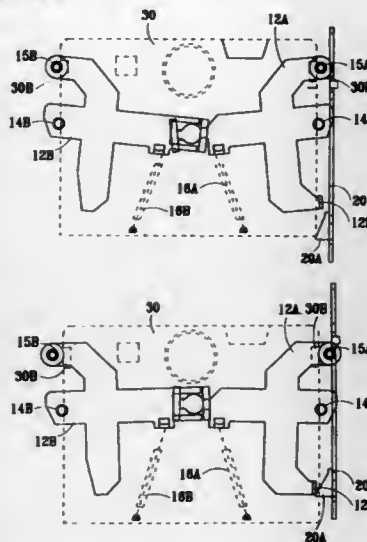
Yee-Haur Chiou, Hsinchu, and Jyh-Jong Ju, Tauryuan, both of Taiwan, assignors to Industrial Technology Research Institute, Hsin Chu, Taiwan

Filed Dec. 28, 1994, Ser. No. 365,137

Int. Cl.<sup>6</sup> G11B 5/008

U.S. Cl. 360—96.5

4 Claims



1. A cassette loading and unloading device comprising:
- a base plate provided with a plurality of spaced connecting holes;
- a pair of laterally spaced cassette guide seats secured to said base plate at selected ones of said connecting holes, each of said guide seats defining a generally U-shaped guide slot;
- a sliding plate upon which a cassette is adapted to be positioned, said sliding plate including opposing lateral portions respectively slidably received in said guide seats, a rear portion including at least one upstanding member adapted to abut a cassette placed on said sliding plate and a front portion;

- a spring interconnected between said base plate and the front portion of said sliding plate, said spring tending to bias said sliding plate forward relative to said base plate;
- a pair of cassette clamping arms pivotally mounted, at laterally spaced positions, to said base plate, each of said clamping arms including a rear portion;
- a pair of coned rollers each of which is rotatably mounted to the rear portion of a respective one of said clamping arms through a respective axle and adapted to engage and retain a cassette placed in said device;
- a button sliding plate positioned on one of said pair of guide seats, said button sliding plate including a bent portion at a front end thereof adapted to engage and pivot one of said clamping arms, said button sliding plate further having a rear portion formed with an oval-shaped hole and a central portion formed with a slot;
- means for interconnecting lateral inward portions of said pair of clamping arms such that pivoting of one of said clamping arms also causes the other of said clamping arms to pivot in unison;
- a shaft attached to said one of said pair of guide seats and extending through the oval-shaped hole of said button sliding plate;
- a button sliding agraffe including first, second and third arms extending from a central portion thereof, said central portion being provided with a hole that receives said shaft such that said button sliding agraffe is rotatable relative to said button sliding plate between a first, unloaded position and a second, loaded position, said first arm being adapted to be engaged by said sliding plate to rotate said button sliding agraffe to said second position when a cassette is loaded in said device, said third arm extending forwardly and including a portion adapted to extend within the slot formed in the central portion of said button sliding plate when said button sliding agraffe is rotated to said first position upon unloading a cassette from said device to limit forward movement of said button sliding plate; and
- a return spring interconnected between the second arm of said button sliding agraffe and said one of said pair of guide seats to bias said button sliding agraffe into said first position.

5,568,341

## MAGNETIC DISK DRIVE SEALING STRUCTURE HAVING A SOFT ELASTIC MEMBER BONDED TO A CORE MEMBER

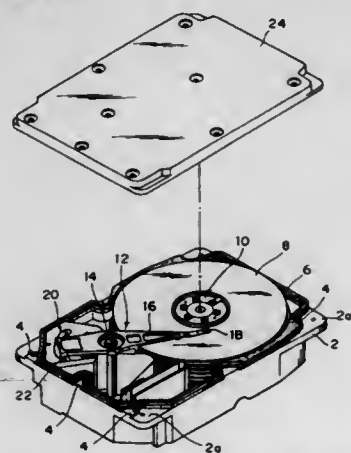
Kazunori Shikano, Higashine, Japan, assignor to Fujitsu Limited, Japan

Filed Oct. 31, 1994, Ser. No. 333,235

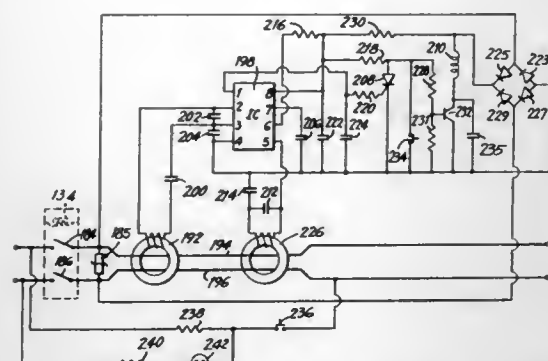
Claims priority, application Japan, Jan. 20, 1994, 6-004332  
Int. Cl.<sup>6</sup> G11B 33/14

U.S. Cl. 360—97.02

12 Claims



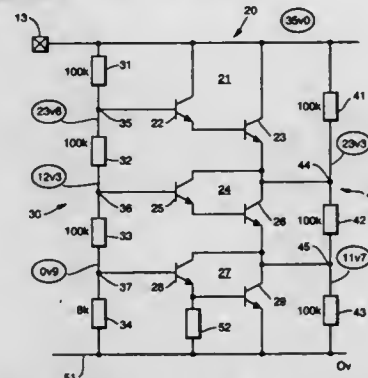




- g) a printed circuit board having a front side and a rear side mounted adjacent said inner surface of said first housing portion using said component mounting means;
- h) at least one fixed contact arm mounted upon said rear side of said printed circuit board;
- i) at least one fixed contact, one for each of said at least one fixed contact arm, coupled to its associated one of said at least one fixed contact arm;
- j) at least one movable contact arm mounted upon said front side of said printed circuit board;
- k) at least one movable contact, one for each of said at least one movable contact arm, coupled to its associated one of said at least one movable contact arm;
- l) a selectively positionable operating means mounted upon said rear side of said printed circuit board and having a first position where said at least one movable contact on said at least one movable contact arm engages said at least one fixed contact on its associated at least one fixed contact arm and a second position where said at least one movable contact on said at least one movable contact arm is separated from said at least one fixed contact on its associated at least one fixed contact arm;
- m) control means coupled to said selectively positionable operating means to apply a signal to said selectively positionable operating means to cause said selectively positionable operating means to assume said first position and apply no signal to said selectively positionable operating means to cause said selectively positionable operating means to assume said second position;
- n) means for detecting a ground fault mounted on said rear side of said printed circuit board, said means for detecting a ground fault positioned adjacent phase and neutral supply line conductors from a source of electrical power and phase and neutral load conductors to an electrical load, said means for detecting a ground fault coupled to said control means to cause a signal to be applied to said selectively positionable operating means when no fault is detected and removing said signal when a fault is detected; and
- o) fastening means to engage said first and second housing portions and selectively form a unitary housing therefrom; said first and third semi-circular electrical cord entrances forming a complete circular electrical cord entrance to receive one of said supply line conductors and load conductors; said second and fourth semi-circular electrical cord entrances forming a complete circular electrical cord entrance to receive the other one of said supply line conductors and load conductors; said component support means engaging said selectively positionable operating means to help maintain its desired position within said unitary housing; one of said phase and neutral supply line conductors coupled to said at least one movable contact arm and the equivalent one of said phase and neutral load conductors coupled to the associated one of said at least one fixed contact arm whereby said one of said phase and neutral supply line conductors is continuous with said equivalent one of said phase and neutral load conductors in the absence of a fault.

**5,568,345**  
**OVERVOLTAGE PROTECTION CIRCUIT**  
 Mark S. J. Mudd, Swindon, Great Britain, and Ross Addinall, Gloucestershire, United Kingdom, assignors to Plessey Semiconductors Limited, United Kingdom  
 Filed Oct. 18, 1994, Ser. No. 324,914  
 Claims priority, application United Kingdom, Nov. 3, 1993, 9322697

U.S. Cl. 361—56 Int. Cl.<sup>6</sup> H02H 9/04 6 Claims

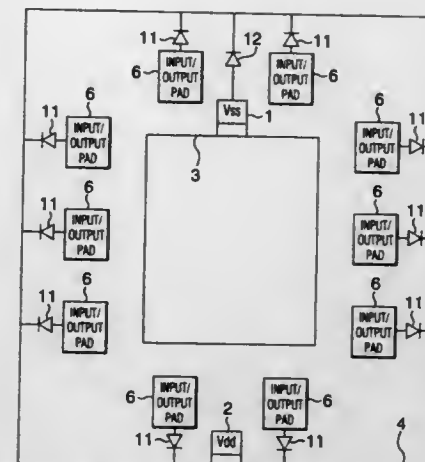


1. An overvoltage protection circuit for connection between a first, reference node and a second node which is to be protected against overvoltage with respect to the first node, the protection circuit comprising: a first plurality of controllable switching elements each having a control terminal and first and second main terminals, said first plurality of switching elements being connected in series between said first and second nodes by way of a second plurality of junctions between respective first and second main terminals of adjacent ones of said first plurality of switching elements, the second plurality being equal to the first plurality minus one; biasing means connected to said first plurality of switching elements and including first and second potential divider chains each connected between said first and second nodes, the first potential divider chain having a third plurality of tapping points, the second potential divider chain having a fourth plurality of tapping points, the fourth plurality being equal to the third plurality minus one, the tapping points of the first potential divider chain being connected to corresponding control terminals of the first plurality of switching elements, the tapping points of the second potential divider chain being connected to corresponding ones of said junctions between said respective main terminals of said switching elements; and said biasing means being arranged, in the absence of an overvoltage, for biasing the first plurality of switching elements into a substantially non-conducting state, and for establishing voltages between the first and second main terminals of the respective switching elements which are within a rated value for said switching elements.

**5,568,346**  
**ESD PROTECTION CIRCUIT**  
 Jonathan H. Webb-Orchard, Kanata, Canada, assignor to Mitel Corporation, Kanata, Canada  
 Filed Feb. 8, 1995, Ser. No. 385,706  
 Claims priority, application Canada, Feb. 8, 1994, 2115230  
 Int. Cl.<sup>6</sup> H02H 9/04

U.S. Cl. 361—58 4 Claims

1. A protection circuit for providing ESD protection to an integrated circuit, comprising a substrate; first and second supply pads; first and second power rails connected to said first and second respective supply pads, said first power rail being connected to said substrate; a plurality of signal pads that are not electrically connected to said second power rail; first diode means sufficient to carry ESD current, said first diode means being directly connected between said second supply pad and said first power rail; a plurality of second diode means respectively directly connected between each said signal pad and said first power rail, whereby discharge between any of said signal pads occurs sequen-

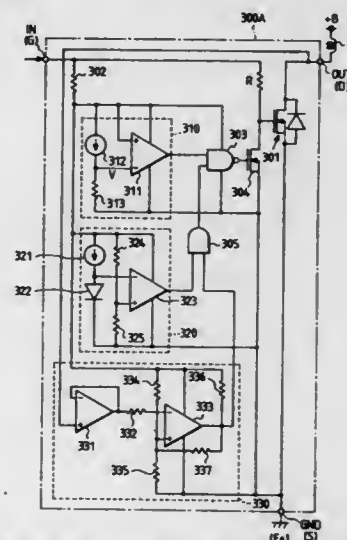


tially through one said second diode means, said substrate, and another said second diode means, said one and said another second diode means being in a back-to-back relationship, discharge between said supply pads occurs through said first diode means connected to said second said supply pad and said substrate, and discharge between a said signal pad and said second supply pad occurs through a said second diode means, said substrate and said first diode means.

**5,568,347**  
**LOAD DRIVING CIRCUIT WITH PROTECTIVE CIRCUIT**  
 Katsuhiko Shirai, Okazaki; Kazunori Kurokawa, Nagoya, and Takashi Harada, Hekinan, all of Japan, assignors to Nippon-denso Co., Ltd., Kariya, Japan  
 Filed Sep. 15, 1994, Ser. No. 305,292  
 Claims priority, application Japan, Sep. 16, 1993, 5-230418  
 Int. Cl.<sup>6</sup> H02H 9/02

U.S. Cl. 361—98

12 Claims



1. A driving circuit for driving a load based on a load control signal comprising:  
 a switching element responsive to the load control signal inputted to the driving circuit, said switching element being turned on for activating the load;  
 protective circuit means for monitoring a malfunction of said switching element and for restricting an operation of said switching element in response to the malfunction, said protective circuit means being arranged to be activated by the load control signal; and  
 a switching element activation control circuit arranged to prohibit said switching element from being turned on until the load control signal reaches a preselected level required for

stable operation of said protective circuit means to correctly monitor the malfunction of said switching element.

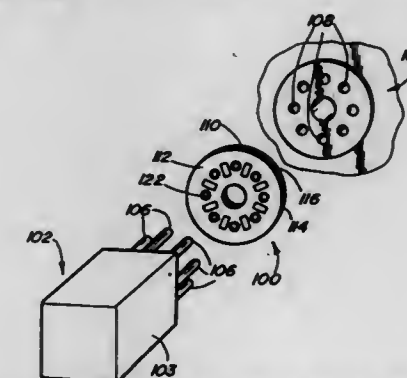
**5,568,348**  
**INSERT DEVICE FOR ELECTRICAL RELAYS, SOLENOIDS, MOTORS, CONTROLLERS, AND THE LIKE**

Kevin G. Foreman, Sandia Park; Willie C. Kiser, Rio Rancho, and Paul J. Miller, Albuquerque, all of N.M., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 87,638, Jul. 1, 1993, Pat. No. 5,455,734, which is a continuation-in-part of Ser. No. 938,111, Aug. 31, 1992, Pat. No. 5,290,191, which is a continuation-in-part of Ser. No. 895,148, Jun. 5, 1992, Pat. No. 5,181,859, which is a continuation of Ser. No. 694,262, Apr. 29, 1991, abandoned. This application Aug. 29, 1995, Ser. No. 520,497  
 Int. Cl.<sup>6</sup> H02H 9/00

U.S. Cl. 361—118

5 Claims



1. A device for making electrical connection to at least one pin of a plurality of pins in a male connector which mates with sockets in a female connector, comprising:

a structure being sufficiently thin so as to fit between said male connector and said female connector while permitting mating engagement therebetween, said structure having holes therein substantially aligned with said pins of said male connector, said structure being insertable over said pins such that said pins extend through the holes;  
 electrical component means disposed within said structure; and  
 contact means for contacting at least one of said pins when said pins extend through the holes in said structure and said electrical component means, whereby said device is inserted onto the male connector for performing a preselected function on at least one signal carried by the pins thereof mated with the female receptacle.

**5,568,349**  
**APPARATUS AND METHOD FOR CONTROLLING A RELAY DEVICE**

Rolf E. Kowalewski, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

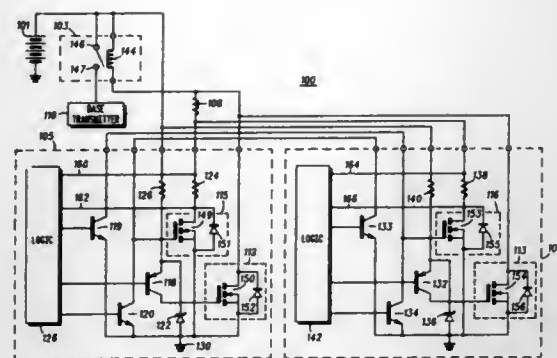
Filed Apr. 4, 1995, Ser. No. 416,253

Int. Cl.<sup>6</sup> H01H 47/04

U.S. Cl. 361—154

4 Claims

1. A redundant relay driver circuit for controlling a relay device having a coil and a set of contacts, the coil having a first terminal coupled to a power supply, the redundant relay driver circuit comprising:  
 first holding means, coupled to a second terminal of the coil, for establishing a first, current through the coil;  
 second holding means, coupled to the second terminal of the coil, for establishing a second current through the coil;  
 closing means, coupled to the second terminal of the coil, for establishing a third current through the coil, the first current, the second current, and the third current together being suffi-



cient to at least close the set of contacts, and the first current and the second current together being sufficient to maintain closure of the set of contacts; and  
control means, coupled to the closing means, the first holding means, and the second holding means, for disabling the closing means when the set of contacts are closed, for testing operability of the first holding means and the second holding means, and for disabling either holding means when either holding means is inoperable.

5,568,350

## OVER TEMPERATURE MEMORY CIRCUIT

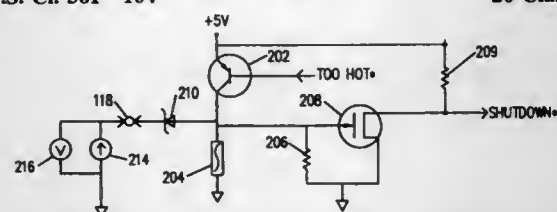
Alan E. Brown, Georgetown, Tex., assignor to Dell USA, L.P., Austin, Tex.

Filed Jan. 11, 1995, Ser. No. 371,235

Int. Cl.<sup>6</sup> H02H 5/04

U.S. Cl. 361—104

20 Claims



1. A memory circuit for documenting an over temperature condition in a power supply, the power supply including a temperature sensor circuit asserting a signal indicative of an over temperature condition, said memory circuit comprising:

- a switch receiving the over temperature condition signal and switching in response thereto for switching a power voltage; and
  - a fuse coupled to said switch for receiving said power voltage wherein said fuse open-circuits in response to said power voltage being applied across it;
- wherein the power supply includes an external pin, and:  
means coupled to said fuse and for coupling to the external pin for facilitating detection of the status of said fuse; and  
said status detection means comprises a Zener diode having a predetermined nominal voltage.

5,568,351

## ADJUSTABLE ANTISTATIC BRACELET WITH SNAP-ASSEMBLED PERMANENT CAP

Robert J. West, Alta Loma, and Mark E. Hempel, Chino Hills, both of Calif., assignors to Desco Industries, Inc., Walnut, Calif.

Filed Jun. 8, 1995, Ser. No. 486,002

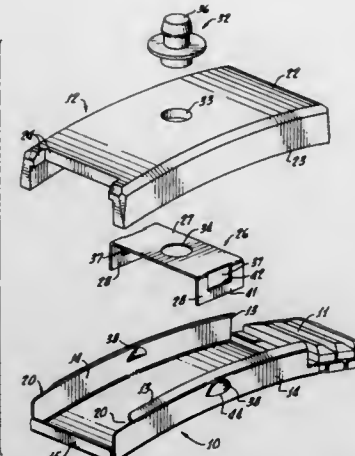
Int. Cl.<sup>6</sup> H05F 3/02

U.S. Cl. 361—220

11 Claims

1. A metal-link expandable antistatic bracelet having no removable parts, which comprises:

- (a) a metal backplate shaped generally as a channel,



- said backplate having a web adapted to contact the wrist of the wearer,
- said backplate having side flanges extending upwardly from said web,
- (b) an electrically insulating cap shaped generally as a channel, said cap having a web shaped and sized to fit over said backplate, said cap having side flanges adapted to nest over said backplate flanges,
- (c) an expandable and contractible metal-link wristband,
- (d) means to connect one end portion of said wristband to one end of said backplate,
- (e) means to adjustably connect the other end portion of said wristband to the other end of said backplate, in such manner that the diameter of said wristband may be varied,
- (f) electrical connector means on the upper side of said cap web to make electrical connection to an electrical grounding cord, and
- (g) means on said cap to make both a snap-action permanent nonremovable mechanical connection between said cap and said backplate when said cap is mounted over said backplate, and to make permanent, nonremovable electrical connection between said electrical connector means and said backplate when said cap is mounted over said backplate.

5,568,352

## CAPACITOR AND MANUFACTURING METHOD THEREOF

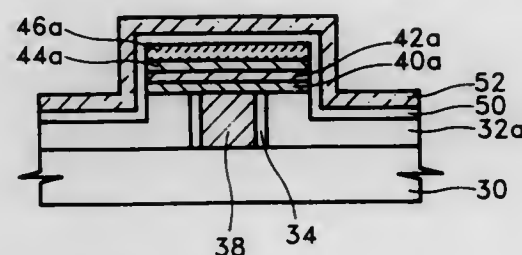
Cheol-seong Hwang, Seongnam, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea  
Filed Nov. 16, 1995, Ser. No. 558,399

Claims priority, application Rep. of Korea, Jan. 26, 1995, 95-1414

Int. Cl.<sup>6</sup> H01G 4/06; 4/008; 4/20; 7/00

U.S. Cl. 361—321.4

20 Claims



1. A capacitor comprising:  
a first insulating film formed on a semiconductor;  
a contact hole formed in the first insulating film;  
a spacer formed on an inner wall of the contact hole;  
a first conductive layer filling the contact hole;

- a triple film formed over the first insulating film, the triple film including three layers, at least one of the three layers being formed of a nonoxidizing material;
- a second conductive layer formed on the triple film;
- a second insulating film formed on the overall surface of the resultant structure; and
- a third conductive layer formed on the overall surface of the second insulating film, wherein a layer of the triple film formed of a nonoxidizing material is placed between the second conducting layer and any of the layers in the triple film formed of an oxidizing material.

5,568,353

## ELECTROCHEMICAL CAPACITOR AND METHOD OF MAKING SAME

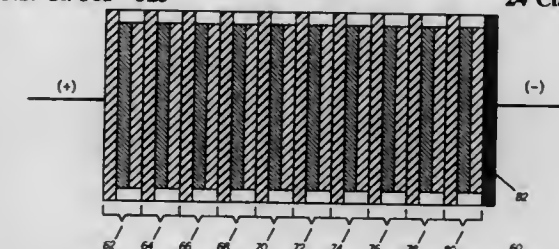
Lijun Bai, Vernon Hills; Joseph G. Kincs, Arlington Heights, and Marc Chason, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 3, 1995, Ser. No. 415,976

Int. Cl.<sup>6</sup> H01G 9/00

U.S. Cl. 361—523

24 Claims



1. An electrochemical capacitor device, comprising:  
a substrate having at least a first and a second major surface, said substrate being fabricated of a material which is electrically conducting and ionically insulating, the second major surface thereof providing a layer of electrochemically active cathode material;
- a layer of electrochemically active anode material disposed on said first major surface;
  - a layer of a separator material which is ionically conducting and electrically insulating disposed on at least one of the anode layer or cathode layer.

5,568,354

## CHIP TYPE SOLID ELECTROLYTE CAPACITOR

Hiromichi Taniguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 190,482, Feb. 2, 1994, abandoned.

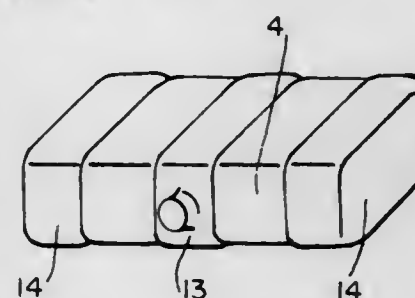
This application Jul. 24, 1995, Ser. No. 505,997

Claims priority, application Japan, Feb. 2, 1993, 5-015114

Int. Cl.<sup>6</sup> H01G 9/012

U.S. Cl. 361—540

7 Claims



1. A capacitor comprising:  
a body having a first pair of opposed faces, a second pair of opposed faces, and a third pair of opposed faces, said second pair of faces being in contact with said first pair and said third pair of faces, said first pair of faces having an area which is

- greater than the other pairs, said third pair of faces having an area which lesser than the other pairs, and said second pair of faces having an intermediate area with respect to the other pairs;
- an anode lead embedded in the body at one of said second pair of opposed faces;
- a resin layer formed on said first and second pairs of faces;
- an anode terminal electrode connected to said anode lead and formed on the resin layer; so as to extend onto each of said first and second pairs of faces;
- two cathode terminal electrodes being formed on said third pair of faces, each of said cathode terminal electrodes extending onto the resin layer on said first and second pairs of faces; wherein each of said first pair of faces serves alternatively as an installing face.

5,568,355

## PCB HOUSING WITH TWO-PART TERMINAL-ACCESS COVER

Markus Verding, Dorsten, and Thomas Ehm, Dortmund, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 24, 1995, Ser. No. 393,826

Claims priority, application Germany, Feb. 25, 1994, 9403210.6 U

Int. Cl.<sup>6</sup> H05K 7/20; 1/14

U.S. Cl. 361—676

8 Claims



1. A housing comprising:  
a base housing part for receiving a plurality of printed circuit boards, the printed circuit boards respectively having proximally located terminals at a terminal region;
- a first cover part covering the base housing part except the terminal region; a second cover part covering the terminal region, the second cover part being removable from the first cover part to provide access to the terminal region, wherein the second cover part is releasably secured to the first cover part by a snap-in connection;
  - an overlapping region between the second cover part and the first cover part;
  - a catch nose on the second cover part; and
  - an opening in the first cover part to receive said catch nose to provide the snap-in connection generally at the overlapping region;
- wherein the second cover part is tapered in shape, having steps with ventilation slots being provided between the steps.



**5,568,356**  
**ELECTRONICS SUPPORT AND SIGNAL**  
**INTERCONNECTION SYSTEM AND METHOD STACKED**  
**MODULE ASSEMBLY INCLUDING ELECTRICALLY**  
**INTERCONNECTED SWITCHING MODULE AND**  
**PLURAL ELECTRIC MODULES**

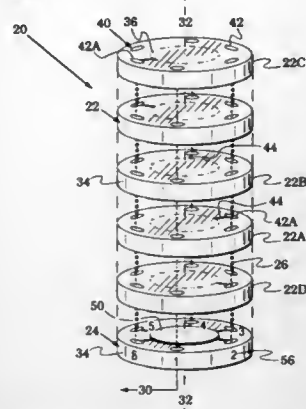
David A. Schwartz, Moorpark, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 18, 1995, Ser. No. 423,423

Int. Cl.<sup>6</sup> H05K 7/00; H01H 9/00

U.S. Cl. 361—679

18 Claims



1. An interconnection system for multiple electronic circuits, comprising:

- a plurality of modules, each configured about a module axis with at least one of said modules adapted to carry an electronic circuit;
  - one or more connectors carried on each of said modules, each of said connectors positioned at a different one of a set of  $n$  connector locations wherein said set has the same spatial relationship on each of said modules and is spatially invariant as its respective module is rotated in steps of  $360/n$  degrees about its axis;
  - each of said connectors configured to engage any other of said connectors when they are axially aligned and in an adjoining relationship; and
  - one of said modules comprising a switching module that carries a switch configured to selectively connect combinations of the switching module's connectors;
- wherein said modules are arranged in a coaxial relationship and adjacent modules are axially and rotationally positioned to engage their respective connectors.

**5,568,357**  
**DISPLAY SUPPORT HAVING CRADLED DAMPING CAPS**  
**FOR FLOATING CORE SHOCK ABSORPTION**

Gary Kochis, Union Town; Neil C. Delaplane, Copley; William R. Rebh, Medina; James M. Cisar, Wadsworth, and Yung-Fu Chang, Medina, all of Ohio, assignors to Metanetics Corporation, Fort Myers, Fla.

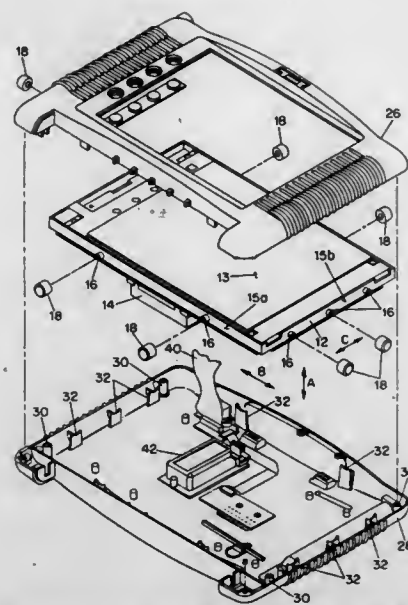
Filed Jun. 15, 1994, Ser. No. 260,102

Int. Cl.<sup>6</sup> G06F 1/16; H05K 7/02

U.S. Cl. 361—681

7 Claims

- 1. A shock resistant portable electronic unit, comprising:
- a three-dimensional enclosure of shock resistant material, including at least two separable sections;
- a frame unit having peripheral dimensions proportioned to fit within said enclosure without physical contact therewith and adapted to support at least one electronic component, said frame unit including a plurality of projections extending outward from said peripheral portions, each said projection having an end and a cross-sectional geometry; and
- shock absorbing means comprising resilient damping material located along peripheral portions of said frame unit and positioned between contact areas of two separable sections of said enclosure and arranged to



support said frame unit within said enclosure so as to prevent dislocation of said frame unit by drop shock forces incident upon said enclosure from any direction, and provide three-dimensional cushioning between said frame unit and said enclosure effective to dampen transmittal to said frame unit of drop shock forces incident upon said enclosure from any direction,

said shock absorbing means comprising a plurality of damping caps each having an end, a cross-sectional geometry and an opening extending partially through said damping cap and configured to accept insertion of one of said projections; and wherein said enclosure comprises cooperating first and second sections, said first section including a plurality of first cradle supports each having a contact area corresponding to a first portion of the cross-sectional geometry of one of said mounting caps, said second section including a plurality of second cradle supports each having a contact area corresponding to a second portion of the cross-sectional geometry of one of said mounting caps, and said second section also including a plurality of lateral supports each positionable adjacent to an end of one of said mounting caps.

**5,568,358**  
**MULTI-ATTITUDE DISPLAY LID POSITIONING**  
**ARRANGEMENT FOR CRAFTSPERSON'S PORTABLE**  
**SIGNAL PROCESSING AND COMMUNICATIONS UNIT**

John R. Nelson, Leawood, Kans., and David T. Wathen, Woodland Hills, Calif., assignors to Harris Corporation, Melbourne, Fla.

Filed Nov. 14, 1994, Ser. No. 343,697

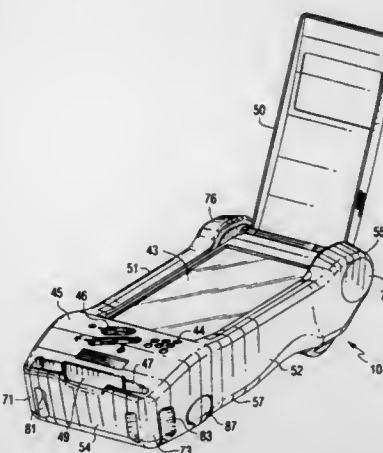
Int. Cl.<sup>6</sup> H05K 5/00; E05D 3/06

U.S. Cl. 361—681

22 Claims

1. A display panel lid arrangement for a craftsman's signal processing and communications craft unit, said craft unit being operative to enable a craftsman, who may be dispatched to a service site that is remotely located with respect to a telephone facility serving a subscriber line, to communicate with said telephone facility and with a test head that is connectable to said subscriber line, said craft unit having an input/output device, including a visual display panel, through which information input by said craftsman is converted into prescribed signals and transmitted to a test system and through which information associated with the operation of said test system is presented to said craftsman, said display panel lid arrangement comprising:

- a display panel lid which is sized to cover said visual display panel; and
- a pivot attachment mounted to said craft unit, said pivot attachment being engageable with said lid and being configured to



enable the lid to be pivoted between a closed position which covers said display panel, and an open position which allows said craftsman to view said display panel, and to be pivoted beyond said open position to an extended position, and stably positioned at said extended position beneath said craft unit as a craft unit support member; and wherein said pivot attachment includes left side and right side hinge assemblies at respective left and right sides of said craft unit, a lid pin support element mounted adjacent to one end of said lid, and lid pin elements coupling opposite ends said lid pin support element with said left and right side hinge assemblies, respectively.

**5,568,359**  
**PORTABLE COMPUTER DESKTOP DOCKING SYSTEM**

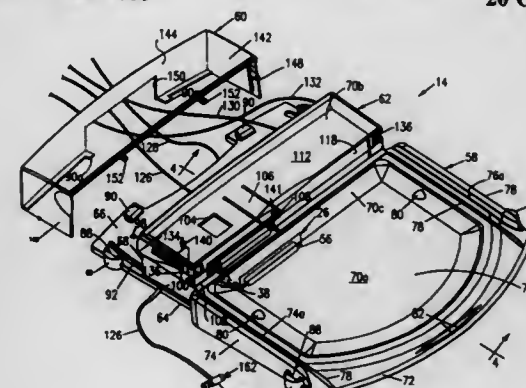
Christopher Cavallo; Steven Gluskoter, and Damon Broder, all of Austin, Tex., assignors to Dell USA, L.P., Austin, Tex.

Filed May 24, 1995, Ser. No. 453,131

Int. Cl.<sup>6</sup> G06F 1/16; H05K 7/10

U.S. Cl. 361—686

20 Claims



1. Docking apparatus for use with a portable computer having a bottom side, opposite front and rear sides, opposite left and right sides, and a first docking connector structure carried on said rear side, said docking apparatus comprising:

- a support base structure having:
- a generally flat bottom side positionable on a horizontal support surface such as a desktop,
- a top side portion having front and rear sections and a front end, said front section being operative to support the bottom computer side for sliding movement of the computer thereon rear side first toward said rear section of said top side portion,
- opposite left and right side edge portions,
- a pair of vertical walls extending in front-to-rear directions along said left and right side edge portions and having side edge sections projecting upwardly beyond said top side portion and being operative to slidably engage the left and

**5,568,360**  
**HEAT PIPE DEVICE AND METHOD FOR ATTACHING**  
**SAME TO A COMPUTER KEYBOARD**

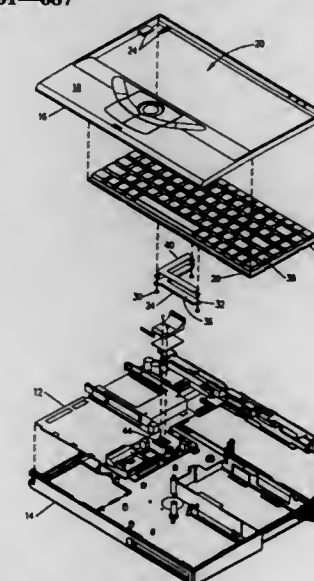
Mark B. Penniman, Austin; Carmen M. Schlesener, Pflugerville, and Jim J. Kizer, Austin, all of Tex., assignors to Dell USA, L.P., Austin, Tex.

Filed Mar. 29, 1995, Ser. No. 412,373

Int. Cl.<sup>6</sup> H05K 7/20; F28D 15/02

U.S. Cl. 361—687

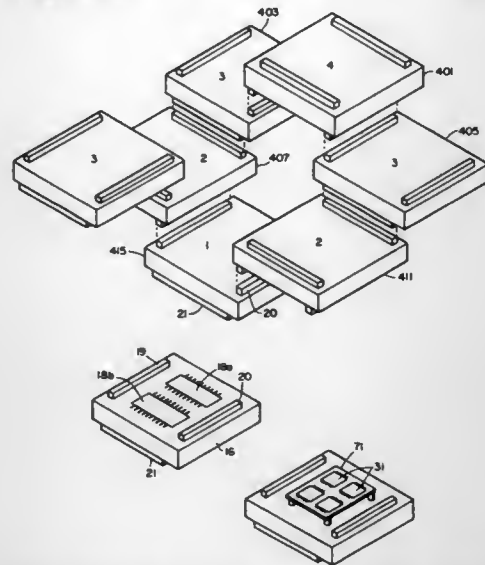
20 Claims



11. A system for cooling a portable computer, comprising:

- a portable computer having a keyboard coupled upon said computer, said keyboard includes a plurality of keys arranged on one surface of said keyboard and a metal plate arranged on the opposing surface of said keyboard; and
- a heat pipe having a substantially flat outer surface which is adapted for removable, thermal coupling to said metal plate.

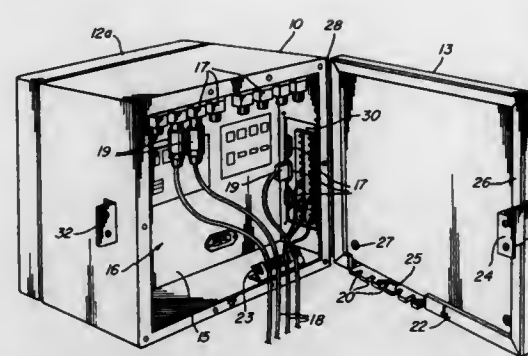
**5,568,361**  
**THREE-DIMENSIONAL ELECTRONIC CIRCUIT OF INTERCONNECTED MODULES**  
 Stephen A. Ward, Chestnut Hill; Gill A. Pratt, Wellesley; John N. Nguyen, and John S. Pezaris, both of Cambridge, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.  
 Continuation of Ser. No. 852,603, Mar. 17, 1992, abandoned.  
 This application Jul. 25, 1994, Ser. No. 279,693  
 Int. Cl.<sup>6</sup> H05K 7/00; 7/02; H01R 23/68; 23/72  
 U.S. Cl. 361—735 31 Claims



1. A three-dimensional electronic circuit assembly comprising:  
 a plurality of data processing modules comprising respective integrated electronic circuits for performing data processing operations and controlling communications between modules, each module having at least three sets of connectors along fewer than six surfaces thereof for joining the circuits on the modules to adjacent modules to enable communications between modules via the sets of connectors, each one of the sets of connectors supporting multiple electrical connections to other modules, adjacent modules being oriented relative to each other such that adjacent modules interconnect in a three-dimensional array having levels; and  
 a common clock signal that is supplied to the modules of the array.

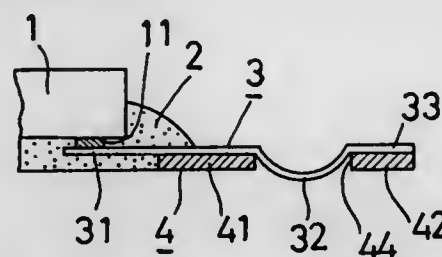
**5,568,362**  
**CABINET FOR HOUSING ELECTRONIC EQUIPMENT CONNECTABLE TO MACHINES OR POWER TOOLS FOR PERFORMING OPERATIONS**  
 Gunnar C. Hansson, Stockholm, Sweden, assignor to Atlas Copco Tools AB, Nacka, Sweden  
 Filed Sep. 21, 1993, Ser. No. 124,970  
 Claims priority, application Sweden, Sep. 25, 1992, 9202768  
 Int. Cl.<sup>6</sup> H02B 1/10 3 Claims

1. A cabinet housing electronic equipment for process control and/or monitoring of machines or power tools for performing operations, and which machines or power tools are connectable to the electronic equipment in the cabinet by means of at least one cable (18) provided with at least one multi-contact connector plug (19), the cabinet comprising:  
 a casing (10) having a display and control panel (12b);  
 a first openable door (12a) connected to said casing (10) and having a transparent window covering said display and control panel (12b); a second openable door (13) connected to said casing (10);  
 at least one multi-contact jack (17) which receives said at least one multi-contact connector plug (19) of said cables;



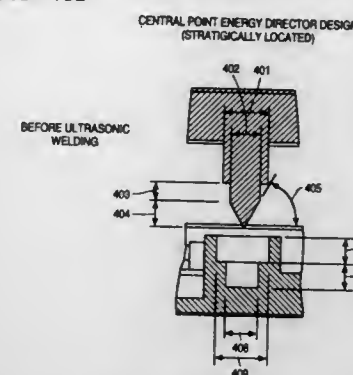
an electronic equipment chamber in said casing (10);  
 a connector chamber (16) at least partly defined by said second door (13) and enclosing said at least one jack (17) and said at least one plug (19);  
 a partition wall (15) in said casing (10) and separating said connector chamber (16) from said electronic equipment, said partition wall (15) comprising at least one circuit board (30) on which said at least one jack (17) is mounted; and  
 at least one opening (20) provided at an edge of said door (13) and through which said at least one cable (18) passes.

**5,568,363**  
**SURFACE MOUNT COMPONENTS AND SEMIFINISHED PRODUCTS THEREOF**  
 Akira Kitahara, 585-4, Kamojima, Kamojimacho, Oe-gun; Tokushima, Japan  
 Division of Ser. No. 59,547, May 12, 1993, Pat. No. 5,440,452.  
 This application Apr. 10, 1995, Ser. No. 419,388  
 Claims priority, application Japan, May 12, 1992, 4-118727; Jun. 24, 1992, 4-165634; Dec. 11, 1992, 4-331579  
 Int. Cl.<sup>6</sup> H01R 9/00 9 Claims



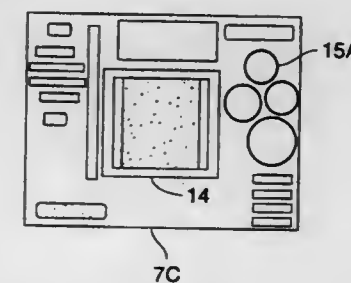
8. A surface mount component comprising a chip body having an integrated circuit incorporated therein, and a plurality of leads extending outward from the chip body, the surface mount component being comprising the chip body is disposed on a sheet of insulating film centrally thereof and integrally joined to the insulating film with a sealing resin, the plurality of leads being bonded to one surface of the insulating film and extending on the film surface in four directions, each of the leads having an outer end projecting outward beyond the insulating film and being fixedly joined at the projecting end to one of insulating frames arranged around the chip body, the insulating frames being fixedly joined to the insulating film directly, each of the leads being formed at a region thereof from the insulating film to the insulating frame with an electrical connector portion to be joined to a wiring board, the electrical connector portion of each lead being bondable to the wiring board by an electroconductive bonding layer without separating off the insulating frame when the component is mounted on a surface of the wiring board.

**5,568,364**  
**SONICALLY-BONDED OUTER SUPPORT STRUCTURE FOR AN INTEGRATED CIRCUIT CARD**  
 Henry R. Madden, Modesto, Calif., assignor to Wireless Access Inc., Santa Clara, Calif.  
 Continuation-in-part of Ser. No. 114,656, Aug. 31, 1993, abandoned. This application Dec. 8, 1994, Ser. No. 352,384  
 Int. Cl.<sup>6</sup> H05K 5/00 24 Claims U.S. Cl. 361—752



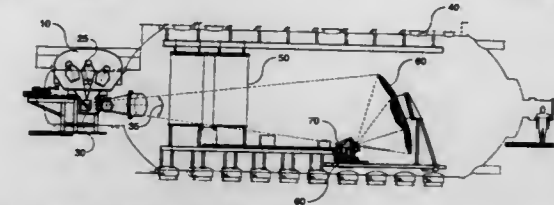
1. A card architecture comprising:  
 a board assembly having a plurality of electronic devices, wherein the board assembly includes an interface to transfer signals to and from plurality of electronic devices;  
 a first rigid cover having a first integrated portion of a frame and at least one energy director having a width; and  
 a second rigid cover having a second integrated portion of the frame and at least one mating hole to receive said at least one energy director, wherein the mating hole has a width slightly greater than that of said at least one energy director, such that a rigidized frame forms around the board assembly when the first rigid cover and the second rigid cover are sonically bonded together.

**5,568,365**  
**HIGH OUTPUT, COMPACT POWER SUPPLY**  
 Stan S. Hahn, Moraga, and Sung Kee Baek, Martinez, both of Calif., assignors to Asian Micro Sources, Inc., Moraga, Calif.  
 Filed May 11, 1994, Ser. No. 241,111  
 Int. Cl.<sup>6</sup> H05K 7/00 14 Claims U.S. Cl. 361—837



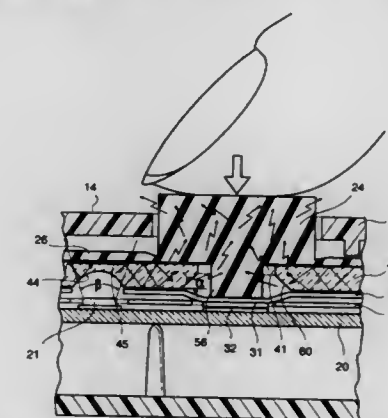
1. A compact power supply comprising  
 a package with an included volume of less than about 250 cubic centimeters,  
 a switching power supply contained in said package for providing more than about 5 watts of power, said power supply comprising a plurality of circuit boards positioned relative to one another to form a substantially "U" shape in said package, means to connect to and supply input power to said switching power supply, and  
 means to connect to output power from said switching power supply.

**5,568,366**  
**COMPACT SOLAR SIMULATOR WITH A SMALL SUBTENSE ANGLE AND CONTROLLED MAGNIFICATION OPTICS**  
 Kent S. Jefferies, Fairview Park, Ohio, assignor to U.S. of America as represented by the Administrator National Aeronautics & Space Administration, Washington, D.C.  
 Filed Oct. 11, 1994, Ser. No. 322,862  
 Int. Cl.<sup>6</sup> F21V 7/00 11 Claims



1. A solar dynamic facility comprising:  
 a solar simulator including a plurality of lamp modules, wherein each of said lamp modules contains a collector and a lens positioned such that each of said lamp modules generates a light beam to a focal point,  
 a segmented turning mirror including a plurality of segments with each segment positioned at the focal point of at least one of said light beams, for reflecting and turning each of said plurality of light beams, and  
 a vacuum chamber including a concentrator for receiving each of said plurality of light beams thereby simulating a pseudo sun on said concentrator.

**5,568,367**  
**REMOTE CONTROL WITH KEY LIGHTING**  
 Young M. Park, Seoul, Rep. of Korea, assignor to Universal Electronics Inc., Twinsburg, Ohio  
 Filed Dec. 20, 1994, Ser. No. 359,472  
 Claims priority, application Rep. of Korea, Jun. 8, 1994, 13251 Int. Cl.<sup>6</sup> F21V 33/00 16 Claims U.S. Cl. 362—109



4. A hand held, battery operated remote control for controlling an appliance from a remote location, said remote control comprising: a housing having openings through an upper wall thereof; a plurality of transparent or translucent push-buttons each extending upwardly through one of said openings; one of said push-buttons being a light actuation button; a plurality of switch means each associated with one of said push-buttons; and a light emitting circuit located inside said housing and including at least one light emitting element positioned in said housing at a location not under a push button, light dispersing means for illuminating one or more of said push-buttons with light from said at least one light emitting element, and circuit means for maintaining said light emitting circuit activated for a short period of time after said one of said switch means is closed by depression of said light actuation button.

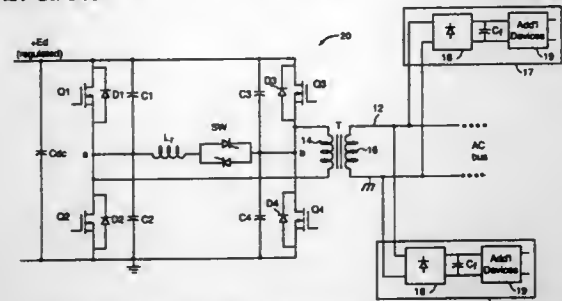


# 5,568,368 SQUARE-WAVE CONVERTERS WITH SOFT VOLTAGE TRANSITIONS FOR AC POWER DISTRIBUTION SYSTEMS

Robert L. Steigerwald, Burnt Hills, and Gerald W. Ludwig, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.  
Continuation of Ser. No. 55,600, May 3, 1993, abandoned.  
This application Feb. 5, 1996, Ser. No. 595,453  
Int. Cl.<sup>6</sup> H02M 3/335

U.S. Cl. 363—17

17 Claims



1. A power converter for converting a dc voltage to a square-wave voltage for supplying a plurality of loads via an ac distribution bus in an ac power distribution system, comprising:  
first and second power switching devices coupled in a half-bridge configuration between a first dc bus voltage and a second dc bus voltage, said first and second power switching devices each having a diode coupled in antiparallel therewith;  
an input capacitance coupled between said first dc bus voltage and said second dc bus voltage, said input capacitance being sufficiently high to present a relatively low impedance to said ac power distribution bus;  
a slow-rate limiting capacitor coupled in parallel with each of said power switching devices for shunting current there-through during turn-off of each of said switching devices  
an auxiliary circuit comprising a resonant inductor coupled to the junction between said first and second power switching devices and switch means coupled to said resonant inductor, for periodically driving current to zero in said inductor said slow-rate limiting capacitors limiting the rate of change of voltage on said ac distribution bus such that the rate of change of voltage on said ac distribution bus is determined by the values of said slow-rate limiting capacitors and said resonant inductor and is substantially independent of said loads, said resonant inductor resonating with said slow-rate limiting capacitors such that said ac power distribution bus voltage resonates between positive and negative rail voltages during a time substantially determined by the values of said slow-rate limiting capacitors and said resonant inductor.

5,568,369  
METHOD FOR OPERATING A VOLTAGE CONVERTER,  
AND A VOLTAGE CONVERTER AND ITS APPLICATION.  
Franz Ohms, Oberrot, and Martin Geiler, Elzach, both of Germany, assignors to Ant Nachrichtentechnik GmbH, Backnang, Germany  
PCT No. PCT/DE93/00928, § 371 Date Apr. 17, 1995, § 102(e)  
Date Apr. 17, 1995, PCT Pub. No. WO94/09556, PCT Pub.  
Date Apr. 28, 1994

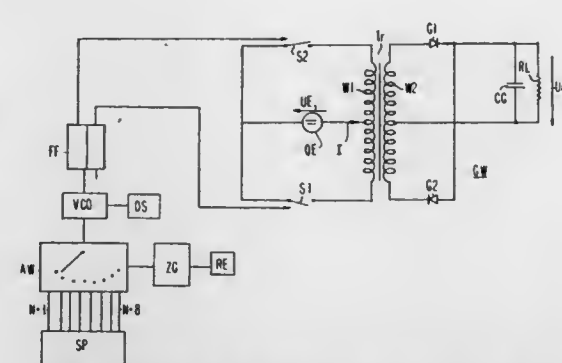
PCT Filed Oct. 4, 1993, Ser. No. 424,342  
Claims priority, application Germany, Oct. 15, 1992, 43 34  
772.6

U.S. Cl. 363—26

7 Claims

1. Method for operating a DC/DC converter for switching mode, in particular during a starting operation, having the following steps:

subdividing into a plurality of subphases a time phase during which the output voltage of the voltage converter increases as a consequence of at least one parameter selected from the

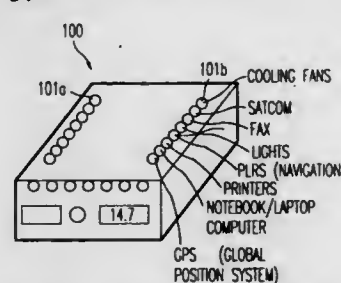


group consisting of an inherent inductance of the voltage converter and an inductance connected to the voltage converter,  
the starting and stopping times are respectively selected to be constant within each subphase in which the electronic switch or switches of the DC/DC voltage converter are repeatedly switched on and off,  
dimensioning the switching-on times of the voltage converter from subphase with different values as a function of the effective inductance, specifically in such a way that the mean value of the energy-consuming current of the voltage converter in the subphases does not exceed a prescribed value.

5,568,370  
TACTICAL POWER ADAPTER  
Leonard Goldstein, Clifton, and Mohammad Baz, Fairfax Station, both of Va., assignors to VSE Corporation, Alexandria, Va.

Filed Jun. 9, 1995, Ser. No. 489,275  
Int. Cl.<sup>6</sup> H02J 3/00; 7/00  
U.S. Cl. 363—34

20 Claims



1. A portable tactical power adaptor comprising:  
a power source input for providing a supply of input power;  
a converter for converting the input power to a bus voltage;  
power switching modules for receiving the bus voltage and for switching the bus voltage to a manually set voltage;  
connectors, each corresponding to one of said power switching modules, for outputting the manually set voltage switched by a corresponding power switching module; and  
voltage varying means for varying the manually set voltage of said power switching modules.

5,568,371  
ACTIVE HARMONIC POWER FILTER APPARATUS AND  
METHOD  
Ira J. Pitel, Morristown, N.J., and Prasad Enjeti, College Station, Tex., assignors to Texas A&M University System, College Station, Tex.

Filed Sep. 29, 1994, Ser. No. 314,880  
Int. Cl.<sup>6</sup> H02J 1/02; H02M 1/12  
U.S. Cl. 363—39

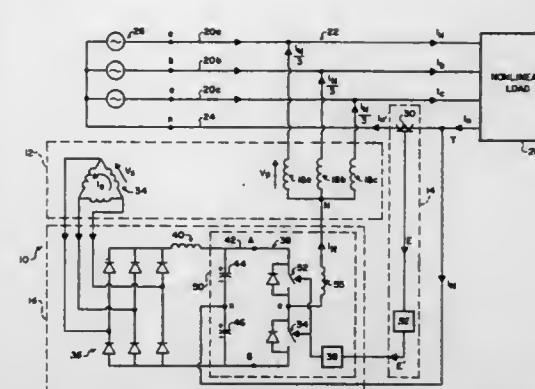
15 Claims

1. An apparatus for cancelling harmonic currents in a neutral wire associated with a multiple phase electrical power distribution system, the apparatus comprising:

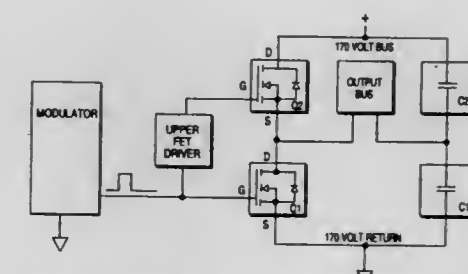
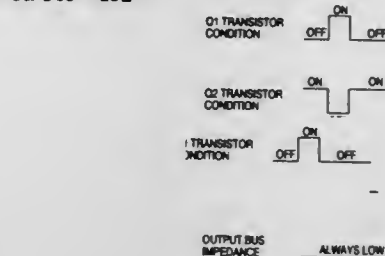
5,568,373  
TOLERANT POWER CONVERTER  
Kenneth T. Small, 17595 Montebello Rd., Cupertino, Calif.  
95014

Filed Jul. 28, 1994, Ser. No. 281,754  
Int. Cl.<sup>6</sup> H02M 7/5387  
U.S. Cl. 363—132

20 Claims



(a) a multi-phase transformer having primary windings electrically connected to phase wires of the electrical power distribution system and having a neutral voltage point between at least two of the phases;  
(b) neutral current monitoring means for monitoring a harmonic current in the neutral wire and for producing a neutral current error signal that indicates the harmonic current in the neutral wire on the source side of a neutral wire tap point; and  
(c) harmonic current injection means responsive to the neutral current error signal for removing a corrective harmonic current from the neutral wire at the neutral wire tap point and injecting the corrective harmonic current into the phase wires of the electrical power distribution system through the neutral voltage point of the multi-phase transformer to substantially cancel the harmonic current in the neutral wire on the source side of the neutral wire tap point.

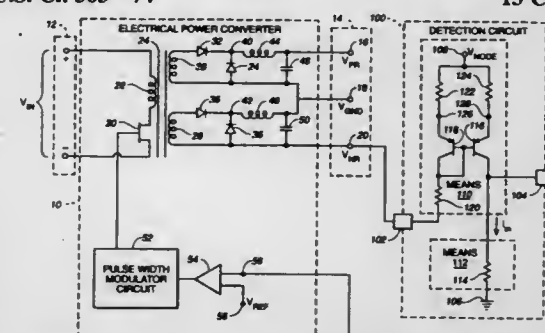


1. A power converter for transferring power from an input bus having a first lead and a second lead to an output bus having a first lead and a second lead, said power converter comprising:  
a first transistor having a first lead coupled to said first lead of said input bus;  
a first capacitor having a first lead coupled to said first lead of said input bus;  
a second transistor having a first lead coupled to said second lead of said input bus;  
a second capacitor having a first lead coupled to said second lead of said input bus;  
said first lead of said output bus coupled to a second lead of said first transistor and to a second lead of said second transistor;  
said second lead of said output bus coupled to a second lead of said first capacitor and to a second lead of said second capacitor;  
a first fixed-frequency pulsing means for controlling a first on duty percentage of said first transistor;  
second pulsing means for controlling a second on duty percentage of said second transistor, wherein first and second on duty percentage total approximately 100 percent;  
control means to decrease said on duty percentage of said first transistor while increasing said on duty percentage of said second transistor.

5,568,372  
CIRCUIT FOR DETECTING NEGATIVE OUTPUT RAILS  
David A. Smith, Kowloon, Hong Kong, assignor to Astec International, Ltd., Hong Kong, Hong Kong  
Filed Jul. 12, 1993, Ser. No. 90,406  
Int. Cl.<sup>6</sup> H02M 3/335

U.S. Cl. 363—74

13 Claims



1. In an electrical power converter having at least one negative output rail, a detection circuit for detecting the voltage of the negative output rail and for converting said voltage to a positive output voltage comprising:  
an input port for receiving the negative output rail voltage;  
an output port;  
a ground reference potential;  
a node having a voltage that is positive with respect to said ground reference potential;  
means for generating a measurement current from said node to said ground reference potential, said measurement current having a value that is a function of the negative output rail voltage received at said input port; and  
means for generating an output voltage at said output port that is positive with respect to said ground reference potential, said output voltage having a value that is a function of said measurement current.

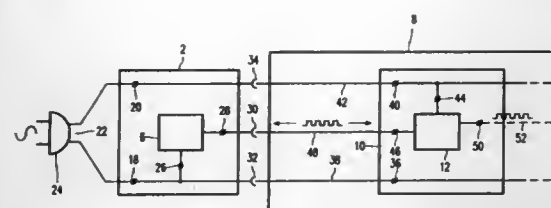
5,568,374  
VACUUM CLEANER WITH THREE-WIRE POWER-SUPPLY AND COMMUNICATION CONNECTION BETWEEN FUNCTIONAL UNITS TO BE COUPLED  
Wieger Lindeboom, Jan Tiesinga, and Peter S. Viet, all of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1994, Ser. No. 338,934  
Claims priority, application Belgium, Nov. 10, 1993,  
09301244

U.S. Cl. 364—131

12 Claims

1. A vacuum cleaner comprising: a first functional unit (2) for providing suction power, and a second functional unit (10) for vacuuming by using the suction power and for coupling electrically to the first functional unit (2);



which first functional unit (2) comprises a first mains voltage terminal (18) and a second mains voltage terminal (20) for receiving an alternating mains voltage, and a first data processing unit (6) having a first reference terminal (26) and a first communication terminal (28);

which second functional unit (10) comprises a first mains voltage terminal (36) and a second mains voltage terminal (40) for receiving the alternating mains voltage, and a second data processing unit (12) having a second reference terminal (44) and a second communication terminal (46);

which first mains voltage terminal (18) of the first functional unit (2) is coupled to the first mains terminal (36) of the second functional unit (10) via a first mains voltage wire (38) and a first mains voltage contact (32);

which second mains voltage terminal (20) of the first functional unit (2) is coupled to the second mains voltage terminal (40) of the second functional unit (10) via a second mains voltage wire (42) and a second mains voltage contact (34); and

which first communication terminal (28) is coupled to the second communication terminal (46) via a communication wire (48) and a communication contact (30) wherein the first reference terminal (26) is connected to the first mains voltage terminal (18) of the first functional unit (2) and the second reference terminal (44) is connected to the second mains voltage terminal (40) of the second functional unit (10).

5,568,375

# METHOD FOR PREVENTING AN OVERLOAD WHEN STARTING A MULTICOMPUTER SYSTEM AND MULTICOMPUTER SYSTEM FOR CARRYING OUT SAID METHOD

Dieter Rausch, Karlsruhe, Germany, assignor to Alcatel N.V., Rijswijk, Netherlands

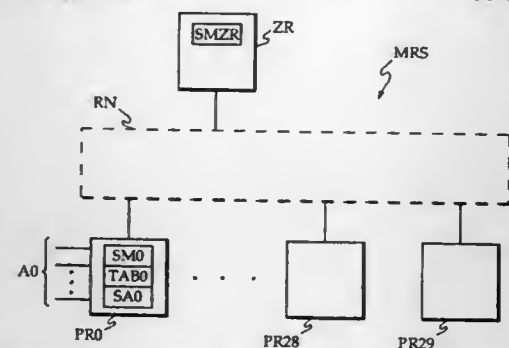
Filed Jun. 7, 1995, Ser. No. 486,076

Claims priority, application Germany, Jul. 22, 1994, 44 26 001.6

Int. Cl.<sup>6</sup> G05B 15/00; 19/18

U.S. Cl. 364—131

10 Claims



1. Method for preventing an overload when starting a multicomputer system (MRS) that comprises n peripheral computers (PR0, ..., PR29) and a central computer (ZR), with the n peripheral computers (PR0, ..., PR29) and the central computer (ZR) connected to a computer communication network (RN), wherein the n peripheral computers (PR0, ..., PR29) respectively signal their availability to the central computer (ZR) by means of availability signals via the computer communication network (RN) after an instruction to start the system (5) and after a peripheral-computer-dependent signal delay ( $V_{PR}$ ), and wherein the availability signals which are transmitted from the n peripheral computers

(PR0, ..., PR29) to the central Computer (ZR) are completed after a predetermined time interval (T).

5,568,376

# IRRIGATION CONTROLLER

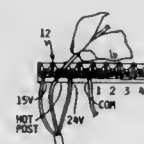
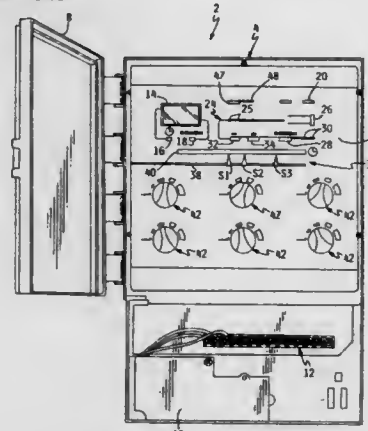
Alberto D. Benmergui, Alto Loma, and Kurt Maloney, Pomona, both of Calif., assignors to The Toro Company, Minneapolis, Minn.

Division of Ser. No. 91,079, Jul. 13, 1993, Pat. No. 5,363,290, which is a continuation of Ser. No. 554,686, Jul. 18, 1990, abandoned. This application Jan. 4, 1994, Ser. No. 177,298

Int. Cl.<sup>6</sup> G06F 15/46

U.S. Cl. 364—145

5 Claims



1. An improved irrigation controller for individually and automatically controlling water flow to a plurality of individual watering stations in accordance with a programmed watering schedule over a period of days, each watering station having an electrically operated control device that will open an irrigation valve to that station when the control device is actuated, the controller including:

- a plurality of separate station terminals each of which is connected by a station wire to the control device of a single one of the watering stations;
- a common terminal which is connected by a common wire to the control devices of all the watering stations for applying power thereto;
- output switches connected to the station terminals for completing the electrical circuit to the control device of the corresponding station by connecting the station wire to ground when the output switch is closed;
- logic and control means for executing the programmed watering schedule in accordance with the passage of time by closing the appropriate output switches at the appropriate times and for the appropriate durations stored in the schedule; and
- further including a hot post terminal connected to ground for allowing the user to determine station assignment by touching the station wires normally connected to the station terminals to the hot post terminal as power is applied to the control devices through the common terminal.

5,568,377

# FAST AUTOMATIC TUNING OF A FEEDBACK CONTROLLER

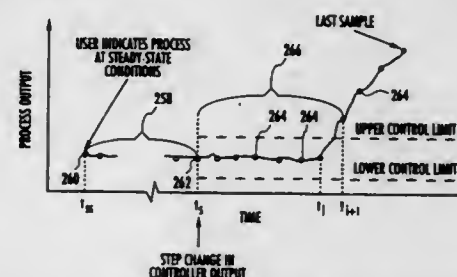
John E. Seem, Shorewood, and Gaylon M. Decious, Milwaukee, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 291,283, Aug. 16, 1994, which is a continuation-in-part of Ser. No. 908,583, Oct. 29, 1992, Pat. No. 5,355,305. This application Nov. 29, 1994, Ser. No. 346,570

Int. Cl.<sup>6</sup> G05B 13/02

U.S. Cl. 364—157

36 Claims



1. A method of automatically adjusting the control parameters of a feedback controller disposed to control a process in a system, comprising the steps of:

- specifying at least one parameter for a step test;
- determining if the process has reached an initial steady-state;
- determining at least one control limit after the system is in the initial steady-state;
- estimating a process time delay value for the process, said step of estimating a process time delay value including basing the process time delay value on the at least one control limit;
- estimating a plurality of characteristic areas, a process time constant and a process gain value;
- stopping the step test; and
- determining at least one control parameter for the feedback controller.

5,568,378

# VARIABLE HORIZON PREDICTOR FOR CONTROLLING DEAD TIME DOMINANT PROCESSES, MULTIVARIABLE INTERACTIVE PROCESSES, AND PROCESSES WITH TIME VARIANT DYNAMICS

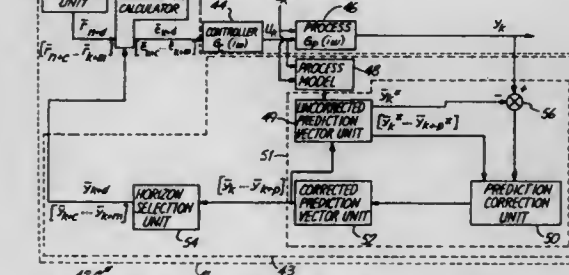
Wilhelm K. Wojsznis, Round Rock, Tex., assignor to Fisher-Rosemount Systems, Inc., Austin, Tex.

Filed Oct. 24, 1994, Ser. No. 328,323

Int. Cl.<sup>6</sup> G05B 13/02; 13/04

U.S. Cl. 364—164

28 Claims



1. A variable horizon predictor (41) for use in a control loop (42) having a process under control (46) and a controller (44), wherein the controller (44) has a controller output for providing a control signal and a controller input for receiving an error signal, and the process (46) has a process input for controlling a process variable, with the process input coupled to the controller output to receive the control signal, and a process output for providing a process output signal representative of the process variable, the variable horizon predictor comprising:

a process model (48) having a model input coupled to the controller output to receive the control signal and a model response output for providing a model response signal based on the control signal;

a prediction vector unit (51) having a prediction vector output for providing a prediction vector and a model response input coupled to the model response output of the process model (48) to receive the model response signal, wherein the prediction vector comprises predicted future values of the process output signal;

a horizon selection unit (54) having a prediction subvector output for providing a selected subvector of the prediction vector and prediction vector input coupled to the prediction vector output of the prediction vector unit to receive the prediction vector, wherein the horizon selection unit selects a prediction subvector from the prediction vector; and

an error scalar/vector calculator (58) having an error signal output coupled to the controller input and a subvector input coupled to the subvector output of the horizon selection unit to receive the subvector, wherein the error vector calculator produces an error signal based on a set point signal and the prediction subvector.

5,568,379

# METHOD FOR CONTROLLING DYNAMIC NTH-ORDER SYSTEMS

Rainer Palm, München, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

PCT No. PCT/DE92/00804, § 371 Date May 23, 1994, § 102(e) Date May 23, 1994, PCT Pub. No. WO93/11473, PCT Pub. Date Jun. 10, 1993

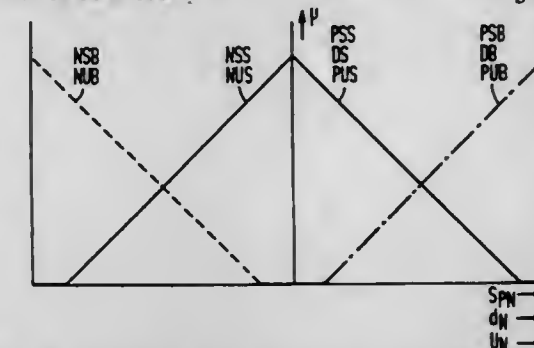
PCT Filed Sep. 18, 1992, Ser. No. 244,405

Claims priority, application Germany, Nov. 25, 1991, 41 38 662

Int. Cl.<sup>6</sup> G05B 13/00

U.S. Cl. 364—176

3 Claims



1. In a computer system, a method for controlling dynamic nth-order systems, comprising the steps of: producing a manipulated variable u as a sum of a linear compensation term C and a product term P, the compensation term C being a linear combination of a contouring error e and its time derivatives  $e^{(n-k)}$ , and the product term being formed by multiplying a fuzzy control term  $K_{Fuzzy}$  by a saturation term, sat; and using the manipulated variable u for controlling at least a system component of a dynamic nth-order system;

the linear compensation term being given by

$$C = -\sum_{k=1}^{n-1} \left( \frac{n-1}{k} \right) \lambda^k e^{(n-k)}$$

e denoting the contouring error,  
 $e^{(n-k)}$  denoting the time derivatives of e,  
 $\lambda$  denoting a reciprocal time constant, and  
n denoting the order of the dynamic system;  
the saturation term, sat, depending on time derivatives of the contouring error and a boundary layer constant  $\phi > 0$  in accordance with the formula



$$\text{sat}(s/\Phi) = \begin{cases} s/\Phi & \text{for } |s/\Phi| < 1 \\ \text{sgn}(s/\Phi) & \text{for } |s/\Phi| \geq 1 \end{cases}$$

the fuzzy control term  $K_{Fuzzy}$  being selected such that

$$K_{Fuzzy} = F + D + V + \eta$$

when

$F(x,t) = |f(x,t)|$ ,  $D(x,t) = |d(t)|$  and  $v(t) = |x_d^{(n)}(t)|$ , and  $x(t)$  denoting a state vector of the system,  $d(t)$  denoting disturbances of the system dynamics,  $f(x,t)$  denoting nonlinear system components,  $t$  denoting time, and  $\eta$  denoting a non-negative constant.

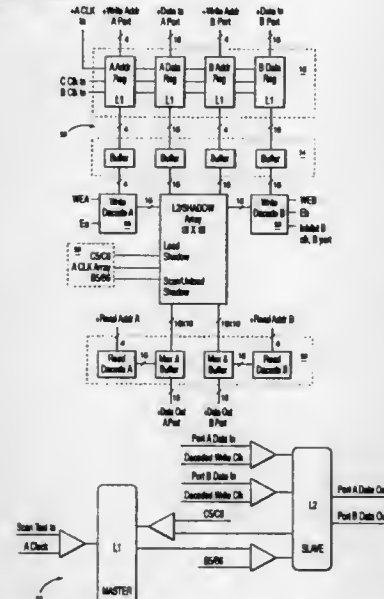
### 5,568,380 SHADOW REGISTER FILE FOR INSTRUCTION ROLLBACK

Timothy B. Brodnax, Austin, Tex.; John S. Bialas, Jr., Bealeton; Steven A. King, Herndon, both of Va.; Johnny J. LeBlanc, Austin, Tex.; Dale A. Rickard, Manassas, Va.; Clark J. Spencer, Praha, Czechoslovakia, and Daniel L. Stanley, Manassas, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1993, Ser. No. 114,267  
Int. Cl. G05B 9/02

U.S. Cl. 364-184

7 Claims



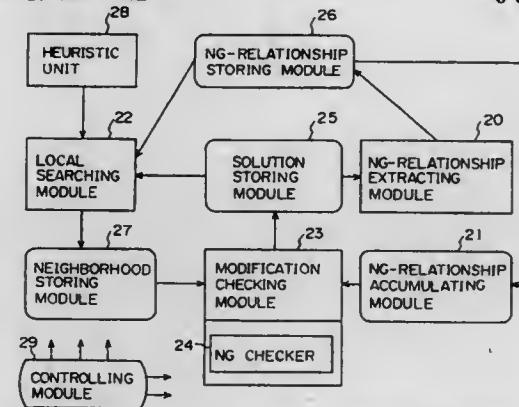
1. In a data processing system having an instruction memory containing a sequence of executable instructions and an arithmetic logic unit which operates in response to said instructions for carrying out arithmetic and logic operations, apparatus comprising: a plurality of general purpose register files comprising a plurality of L2 latches of level sensitive scan design ("LSSD") latches for storing information; corresponding shadow register files comprising a plurality of L1 latches of said LSSD latches coupled to said general purpose register files for storing the contents of said L2 latches within one clock cycle; and said shadow register files having respective outputs coupled to corresponding inputs of said general purpose register files for transferring the contents of said L1 latches to said L2 latches within one clock cycle in response to a specific event in the arithmetic logic unit.

### 5,568,381 COMBINATORIAL OPTIMIZATION SYSTEM THAT EXTRACTS AN UNDERSIRABLE RELATIONSHIP FROM A PRESENT SOLUTION

Hirota Hara; Nobuhiro Yugami, and Kazuhiro Ohishi, all of Kawasaki, Japan, assignors to Fujitsu Limited, Japan  
Continuation of Ser. No. 884,403, May 18, 1992, abandoned.  
This application Sep. 26, 1994, Ser. No. 311,040  
Claims priority, application Japan, May 18, 1991, 3-113579  
Int. Cl. G06F 17/00; 17/60

U.S. Cl. 364-402

6 Claims



1. A computerized combinatorial optimization apparatus for optimizing a combination of a plurality of operations for at least one machine in a present solution, comprising:

undesirable relationship extracting digital processing means for extracting an undesirable relationship between said combination of operations in said present solution based on an objective function for said optimization, said objective function having no possible improvement without modifying said undesirable relationship;

undesirable relationship accumulative storing digital processing means for cumulatively storing said undesirable relationship extracted by said undesirable relationship extracting means; local searching digital processing means for modifying said undesirable relationship in the present solution and for generating another solution as a neighborhood of the present solution based on the modified undesirable relationship;

generated solution checking digital processing means for checking whether or not said another solution generated by said local searching means includes the undesirable relationship cumulatively stored in said undesirable relationship accumulative storing means; and for substituting said another solution for said present solution as a new solution when a result of a check by said generated solution checking means is that said another solution does not include the undesirable relationship stored in said undesirable relationship accumulative storing means;

controlling digital processing means for searching for an optimum solution by providing said new solution substituted by said generated solution checking means to said undesirable relationship extracting means and repeating the functions performed by said undesirable relationship extracting digital processing means, said undesirable relationship accumulative storing digital processing means, said local searching digital processing means, and said generated solution checking digital processing means until conditions for terminating a search for an optimum solution are satisfied; and optimizing means for using said optimum solution to optimize said combination of said plurality of operations for said at least one machine.

5,568,382

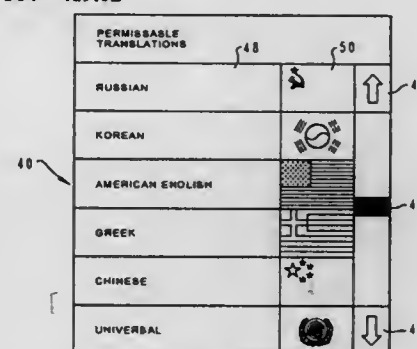
Patent Not Issued For This Number

### 5,568,383 NATURAL LANGUAGE TRANSLATION SYSTEM AND DOCUMENT TRANSMISSION NETWORK WITH TRANSLATION LOSS INFORMATION AND RESTRICTIONS

William J. Johnson, Flower Mound; Michael D. Smith, Euless, and Marvin L. Williams, Lewisville, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.  
Continuation of Ser. No. 983,018, Nov. 30, 1992, abandoned.  
This application Nov. 23, 1994, Ser. No. 344,295  
Int. Cl. G06F 17/28

U.S. Cl. 364-419.02

13 Claims



1. A computer implemented method of transmitting a document in a data processing system having a plurality of workstations from an originator to a recipient, comprising:

creating said document in a first workstation of said originator in a first language;

translating said document from said first language into a second language at said first workstation and generating information loss for said document accessible by said originator;

specifying loss criteria restricting a particular one of a plurality of translations by said originator based on said information loss and combining said loss criteria with said document in said first language; and

transmitting said document in said first language with said loss criteria to said recipient at a second workstation in said data processing system for translation into said second language selected by said recipient based on said loss criteria when said second language is not the particular one of said plurality of translations restricted by said originator.

### 5,568,384 BIOMEDICAL IMAGING AND ANALYSIS Richard A. Robb, Rochester, and Hong-Jian Jiang, Everett, both of Minn., assignors to Mayo Foundation for Medical Education and Research, Rochester, Minn.

Filed Oct. 13, 1992, Ser. No. 960,128  
Int. Cl. G06F 159/00

U.S. Cl. 364-419.13

3 Claims

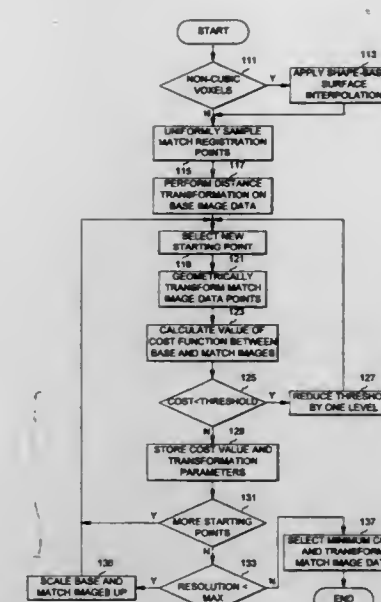
1. A method for synthesizing a base image data set and a match image data set into a single fused composite image data set with accurate registration and congruence using a programmable data processing system, comprising data input means, display means, and data storage means, the method comprising the steps of:

(a) using the data input means to provide the programmable data processing system with the base image data set and the match image data set, the base image data set and the match image data set each comprising a biomedical image generated by a biomedical image generation means;

(b) storing the base image data set and the match image data set in the data storage means; and

(c) using the programmable data processing system to perform the steps of:

(1) if the voxels of the base image data set are non-cubic, applying shape-based surface interpolation to interpolate intermediate contours between every consecutive pair of



actual contours of the base image data set to obtain a smoothly varying surface;

(2) uniformly sampling a plurality of registration points from the surface of the match image data set;

(3) creating a distance image data set by performing a distance transformation to convert the surface of the base image data set into a grey-level image in which all voxels have a value corresponding to the distance to the nearest surface voxel;

(4) transforming geometrically the registration points on the surface of the match image data set to become more closely aligned in orientation with corresponding points on the surface of the distance image data set;

(5) calculating the value of a cost function between registration points on the surface of the match image data set and the corresponding points on the surface of the distance image data set;

(6) if the value of the cost function is below a predetermined multi-level threshold value, reducing the threshold by at least one level and returning to step (4);

(7) storing the value of the cost function with the corresponding values for the geometric transformation parameters for later comparison;

(8) repeating steps (4) through (7) for each of a plurality of predetermined uniformly distributed starting points within the match image data set in order to generate a plurality of cost function values and corresponding geometric transformation parameters;

(9) if the resolution of the base image data set and the match image data set is below a predetermined multi-level maximum resolution level, scaling the base image data set and the match image data set upward at least one level and returning to step (4);

(10) selecting the minimum of the plurality of stored cost function values and using the corresponding stored geometric transformation parameters to map the match image data set onto the base image data set to create a single fused composite multi-valued image with two or more values associated with each 3-D spatial (x,y,z) coordinate uniquely representing and corresponding to the 3-D distribution of values of the base image data set and the match image data set; and

(11) displaying, on the display means, the composite image values associated with each 3-D spatial (x,y,z) coordinate.

5,568,385

## SOFTWARE SYSTEM FOR COLLECTING AND DISPLAYING WEATHER INFORMATION

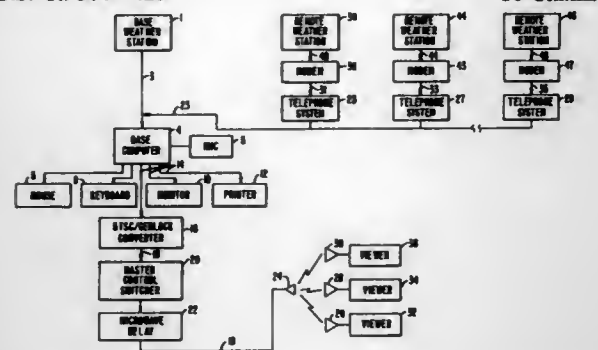
William A. Shelton, 3069 Myles Dr., Sparks, Nev. 89434

Filed Jun. 1, 1994, Ser. No. 251,983

Int. Cl.<sup>6</sup> G06F 169/00

U.S. Cl. 364-420

10 Claims



1. A computer based weather detection and reporting system for collecting and formatting real time weather data to be used in live weather presentation, comprising

- a microprocessor based computer programmed to
  - (1) receive digital signals encoding real-time weather data collected at a plurality of weather stations;
  - (2) store and retrieve said digital signals to and from data storage;
  - (3) store and retrieve predetermined default screen configuration buffers for generating data screens displaying alphanumeric and graphic displays of real-time weather data encoded in said digital signals;
  - (4) send said digital signals to said screen buffers when said signals are received by said computer, so that said screen buffers are prepared to display the most current weather data received by the computer;
  - (5) in response to an input device, select a plurality of said screen buffers to send to a means for displaying them;
  - (6) provide a first plurality of option screens allowing a user to modify real-time weather data input and output options including appearance of said predetermined default screen configuration buffers and placement of screen buffers when displayed;
  - (7) provide a second plurality of option screens allowing a user to assign an input device action to a particular selection of said screen buffers;
  - (8) provide a third plurality of option screens allowing a user to modify received real-time weather data displayed in said screen buffers;
- multiple weather stations, each comprised of
  - (1) one or more weather instruments, each capable of sensing a particular weather parameter, and converting said sensed weather parameter into an analog electrical signal;
  - (2) means for converting the analog signal from each said instrument into a series of digital electrical signals corresponding to the values of the sensed weather parameter over time;
- means for communicating said digital electrical signals from said weather stations to said computer; and
- means for transmitting said data screens incorporating current weather data received by the computer to multiple end users on a real time basis.

5,568,386

## AUTOMATED CORRECTION CONTROL SYSTEM AND METHOD FOR CHARACTERISTICS OF THROTTLE POSITION SENSOR

Masayuki Sugiura, Anjo; Masahiro Kawaguchi, Kariya; Shinichi Matsui, Nagaya, and Kenji Suzuki, Okazaki, all of Japan, assignors to Aisin AW Co., Ltd., Japan

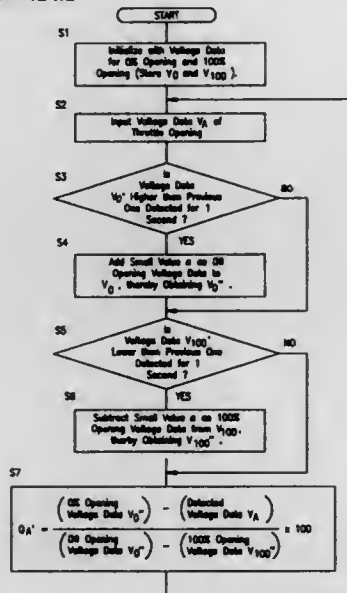
Filed Nov. 4, 1994, Ser. No. 336,123

Claims priority, application Japan, Nov. 5, 1993, 5-277109

Int. Cl.<sup>6</sup> G06G 7/70

U.S. Cl. 364-424.1

12 Claims



1. A system for automated correction of preset characteristics of a throttle position sensor, said system being suited for use with an automatic transmission having shifting solenoids controlled by an electronic controller in accordance with a vehicle speed signal and a throttle position signal, comprising:

- a throttle position sensor for producing a throttle position voltage corresponding to a throttle position;
- memory means containing 0% and 100% throttle position set points stored therein;
- comparator means for comparing the throttle position voltage detected by said throttle position sensor with both the 0% and 100% throttle position set points stored in said memory means;
- correction means for adding a small value to a greater one of the 0% and 100% throttle position set points stored in said memory means when said comparator means indicates that the throttle position voltage is greater than the greater one or for subtracting a small value from a smaller one of the 0% and 100% throttle position set points stored in said memory means when said comparator means indicates that the throttle position voltage is smaller than the smaller one to produce a corresponding corrected 0% or 100% throttle position set point wherein the small value is substantially less than the difference between the throttle position voltage and the corresponding 0% or 100% throttle position set point, and then storing the corrected 0% or 100% throttle position set point in said memory means; and
- means for determining the throttle position signal from the throttle position voltage based on the stored 0% and 100% throttle position set points as substituted by any stored corrected 0% and 100% throttle position set points.

5,568,387

## METHOD AND ARRANGEMENT FOR ADAPTIVE SWITCHING OFF OF THE EXHAUST BRAKE IN CONNECTION WITH UPSHIFT

Roger Andersson, Södertälje, Sweden, assignor to Scania CV Aktiebolag, Sweden

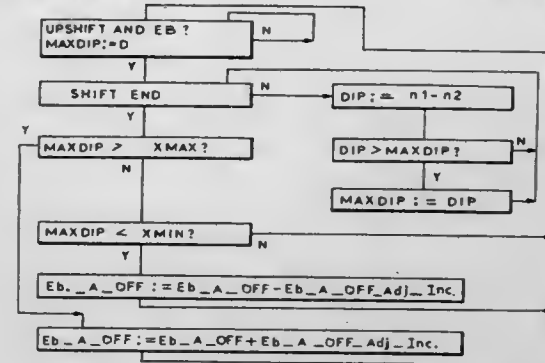
Filed Dec. 29, 1994, Ser. No. 365,969

Claims priority, application Sweden, Dec. 30, 1993, 9304366

Int. Cl.<sup>6</sup> G06G 7/70; B60K 41/04

U.S. Cl. 364-424.1

12 Claims



1. A computer assisted method for controlling an upshift from a lower gear to a higher gear in a motor vehicle having an exhaust brake which is activated to lower an engine speed to a speed which is synchronized with the higher gear, which method comprises the steps of:

- shifting from a lower gear to a higher gear;
- activating the exhaust brake during step (a);
- deactivating the exhaust brake during step (a) at a predetermined time after step (b);
- determining the engine speed after step (c);
- comparing the engine speed determined in step (d) with the synchronized speed required for the higher gear;
- determining in accordance with predetermined criteria whether the predetermined time for deactivation of the exhaust brake for the next shift to a higher gear should be changed; and
- if step (f) indicates that the predetermined time should be changed, changing the predetermined time so that during the next shift to a higher gear the exhaust brake is deactivated at a new predetermined time.

5,568,388

## METHOD AND SYSTEM FOR AUTOMATICALLY CALIBRATING CONTROL LOGIC OF A VEHICLE CONTROL SYSTEM

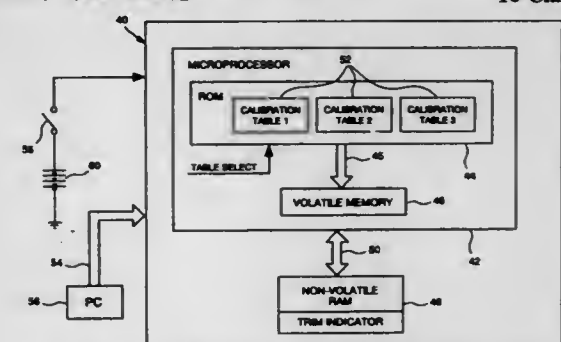
Peter W. Schnerer, Dearborn Heights; Timothy J. Schnobel, Saline, and Brian C. Tuck, Ann Arbor, all of Mich., assignors to Kelsey-Hayes Company, Livonia, Mich.

Filed Feb. 27, 1995, Ser. No. 394,753

Int. Cl.<sup>6</sup> G06F 19/00

U.S. Cl. 364-424.01

16 Claims



1. A method for automatically calibrating control logic of a vehicle control system including a vehicle-mounted,

microprocessor-based control unit having a first memory, an addressable second memory, and a working third memory, the method comprising the steps of:

- loading a selectable indicator into the first memory;
- loading a plurality of calibration tables into the second memory wherein each calibration table has a unique address and contains calibration data for a specific group of vehicles;
- addressing one of the calibration tables based on the selectable indicator; and
- loading the one of the calibration tables into the working third memory for automatically calibrating the control logic according to the vehicle in which it is mounted.

5,568,389

## METHOD AND APPARATUS FOR CONTROLLING AN ELECTRIC ASSIST STEERING SYSTEM

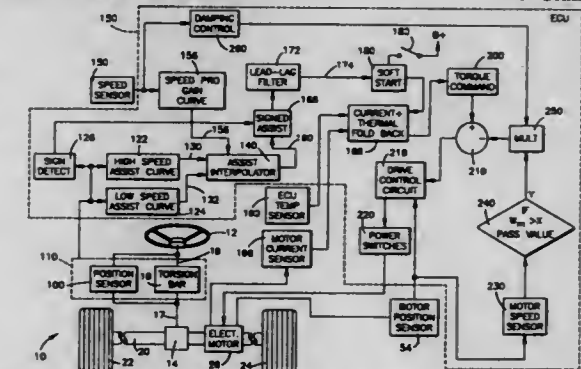
Kevin M. McLaughlin, Troy, and Joseph D. Miller, Farmington Hills, both of Mich., assignors to TRW Inc., Lyndhurst, Ohio

Filed Mar. 11, 1994, Ser. No. 212,112

Int. Cl.<sup>6</sup> B62D 5/04

U.S. Cl. 364-424.05

9 Claims



5. An apparatus for controlling a steering assist system, said steering assist system providing steering assist in response to a steering control signal, said apparatus comprising:

- vehicle speed sensing means for sensing vehicle speed and for providing a speed signal having a value indicative of the sensed vehicle speed;
- torque sensing means operatively connected to a vehicle hand wheel for sensing applied steering torque and providing a torque signal indicative of applied steering torque; and
- control means operatively connected to said vehicle speed sensing means and to said torque sensing means and including a first set of torque-in vs. torque-out assist values associated with a first vehicle speed wherein said first vehicle speed is a relatively low vehicle speed and said torque-in vs. torque-out assist values associated with said first vehicle speed increases in accordance with a first monotonically increasing function after a first predetermined torque-in value is exceeded, said control means further including a second set of torque-in vs. torque-out assist values associated with a second vehicle speed different than said first vehicle speed wherein said second vehicle speed is a relatively high vehicle speed and wherein said torque-in vs. torque-out assist values associated with said second vehicle speed increases in accordance with a second monotonically increasing function after a second predetermined torque-in value is exceeded, said control means providing said steering control signal in response to said applied steering torque and having a value functionally related to (i) said speed signal and (ii) both said first set and second set of assist values wherein said steering control signal is functionally related to a requested torque assist value  $T_{ASSIST}$  value determined according to

$$T_{ASSIST} = (K_{SP} \times T_{LOW}) + ((K_{SPMAX} - K_{SP}) \times T_{HIGH})$$

where  $T_{LOW}$  is the torque-out value in accordance with the first set of assist values,  $T_{HIGH}$  is the torque-out value in accordance with the second set of assist values,  $K_{SP}$  is a speed proportion value that



decreases as vehicle speed increases, and  $K_{SPMAX}$  is the maximum speed proportional value at low vehicle speed.

# 5,568,390 NAVIGATION SYSTEM TO BE MOUNTED ON VEHICLES

Masaharu Hirota, Susono; Toru Ito, Nagoya; Norikazu Endo, Susono; Akihiko Nojima, Toyota, and Yoshitaka Kato, Anjo, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 288,211, Aug. 9, 1994, abandoned.

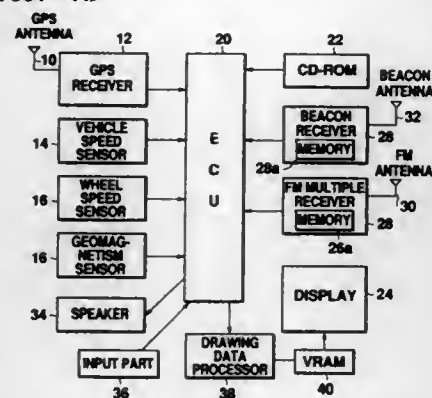
This application Dec. 29, 1995, Ser. No. 580,491

Claims priority, application Japan, Aug. 10, 1993, 5-198333

Int. Cl.<sup>6</sup> G06F 165/00

U.S. Cl. 364-449

22 Claims



18. A navigation system to be mounted on a vehicle for carrying out a search of reachable destinations on a basis of map information, said navigation system comprising:

- input means for inputting a final destination;
- reachable final destination estimating means for estimating different reachable destinations other than said inputted final destination from a present position of said vehicle, said different reachable final destinations being estimated to be reachable under a predetermined condition;
- reachable final destination expanding information receiving means for receiving reachable final destination expanding information for expanding said estimated different reachable final destinations based on said reachable final destination expanding information; and
- display means for displaying said estimated different reachable final destinations and said received reachable final destination expanding information.

5,568,391

# AUTOMATED TILE MOSAIC CREATION SYSTEM

Lance D. McKee, 10 Circuit Ave., Worcester, Mass. 01603

Continuation of Ser. No. 529,447, May 29, 1990, abandoned.

This application Jul. 22, 1993, Ser. No. 95,258

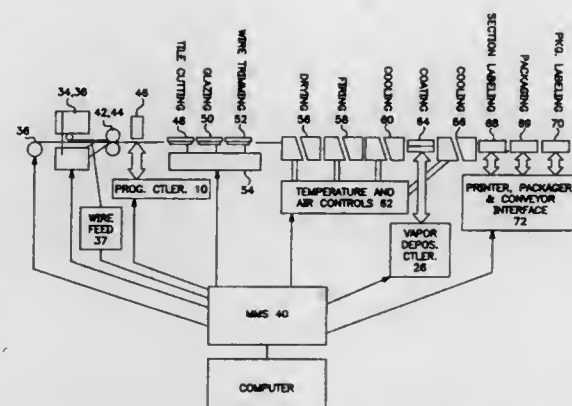
Int. Cl.<sup>6</sup> G06F 19/00

U.S. Cl. 364-469.01

31 Claims

1. Apparatus for designing and manufacturing tile mosaics, comprising, in combination:

- (a) means for patterning a plan area with tile pattern comprising special program means to facilitate mosaic design and provide a digital vector pattern to guide the automated manufacture of actual custom tiles of any size or shape,
- (b) means for dividing the resulting whole design pattern into smaller patterns for separate, sections, each containing multiple tiles, and such that there are no rectilinear seam or grid lines visibly separating the sections after installation, and such that sections may be labeled after manufacturing with a description of their place in the whole design, and
- (c) means for keeping the tiles of a section in place relative to each other within a said section and from section-to-section,



said means comprising a uniform sheet precursor of the tile which has embedded wires or other embedded matting material therein maintained through all steps of manufacturing and installation, so that gap widths appear even and regular in the finished product without any handling of individual tiles.

5,568,392

# DOCUMENT EDGE MARKING APPARATUS

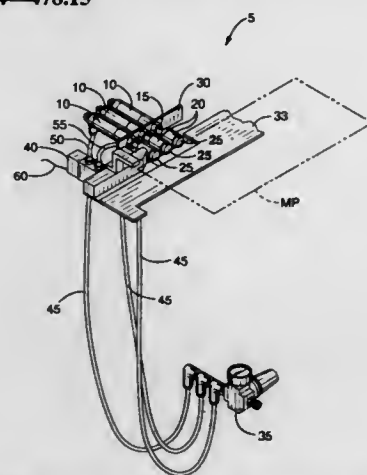
Brett J. Flickner, 259 Wellfleet Cir., Folsom, Calif. 95630; Charles E. Preston, 9445 Central Ave., Orangevale, Calif. 95662; Daniel M. Saldana, 11082 Erla Ct., Rancho Cordova, Calif. 95670; Jonathan D. Emigh, 7050 Mt. Aukum Rd., Somerset, Calif. 95684; Marc J. Fagan, 2786 Brentwood Pl., Davis, Calif. 95616; Steven L. Mulkey, 2687 Hillcrest Dr., Cameron Park, Calif. 95682; Cindy M. Spear, 15288 Medella Cir., Rancho Murieta, Calif. 95683; Lino E. Carnesecca, 465 Homestead Ct., Lincoln, Calif. 95648, and David P. Pensa, Jr., 3831 Ziana Rd., Cameron Park, Calif. 95682

Filed Oct. 6, 1994, Ser. No. 319,428

Int. Cl.<sup>6</sup> G06F 17/00

U.S. Cl. 364-478.15

3 Claims



1. A system for marking a perimeter edge of a mailing piece, comprising:

- a) computer means for determining if the perimeter edge of the mailing piece is to be marked and for directing the marking of the perimeter edge of the mailing piece and
- b) means for marking the perimeter edge of the mailing piece, wherein said marking means comprises a plurality of indicia imprinting means, wherein each indicia imprinting means within said plurality of indicia imprinting means comprises a solenoid linked to a marking pad, wherein when said solenoid is activated said solenoid forces said marking pad against the mailing piece's perimeter edge thereby marking the perimeter edge of the mailing piece, thereby permitting identification of the marked mailing piece when the marked mailing piece is stacked with other mailing pieces.

5,568,393

# AUTOMATED WAREHOUSE INLOADING/OUTLOADING STORAGE CONTROLLER

Yukito Ando; Akira Okura, both of Toyota, and Mikio Ito, Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 33,349, Mar. 18, 1993, abandoned.

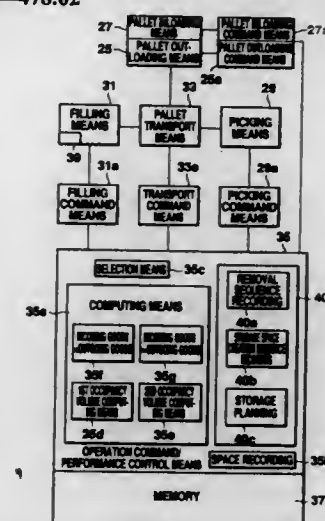
This application Jan. 10, 1995, Ser. No. 370,819

Claims priority, application Japan, Mar. 25, 1992, 4-066547

Int. Cl.<sup>6</sup> G06F 17/00; B65G 69/00

U.S. Cl. 364-478.02

8 Claims



1. An automated warehouse comprising: a storehouse for storing pallets, said pallets storing a plurality of types of goods; storage means for storing pallets in said storehouse; recording means for recording the types and quantities of pallets stored in the storehouse, and the types, quantities and volumes of goods filling the pallets for each of the pallets as inventory data; outloading means for outloading pallets from said storehouse; picking means for picking outloaded goods from outloaded pallets, wherein said outloading means is positioned between said picking means and said storehouse; filling means for filling incoming goods each having a predetermined volume in said outloaded pallets, said filling means including buffer means for temporarily storing outloaded pallets until an occupancy volume of incoming goods is matched with the available storage space on an outloaded pallet; transporting means for transporting pallets from which outloaded goods have been picked by said picking means and pallets from said buffer means to said filling means; and an inloading/outloading controller for controlling each of the aforesaid means wherein said inloading/outloading controller includes computing means for computing the occupancy volume of incoming goods based on data of the incoming goods and for computing the amount of available storage space created in a pallet for each of the pallets when outloaded goods have been picked from the pallet based on data of the goods which have been picked by said picking means, space recording means for recording the amount of available storage space in a pallet for each of the pallets computed by the computing means, and selection means for selectively specifying incoming goods having an occupancy volume that is approximately equal to or smaller than the amount of available storage space created in an outloaded pallet such that said filling means fills incoming goods in the available storage space on the outloaded pallets, wherein when a pallet suitable for accommodating incoming goods is not in the buffer means, the inloading/outloading controller searches for a suitable pallet from the pallets in the storehouse and carries the pallet to the filling means for accommodating the incoming goods.

5,568,394

# INTERFEROMETRY WITH MULTIPATH NULLING

Kapriel V. Krikorian, Agoura, and Robert A. Rosen, Agoura Hills, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

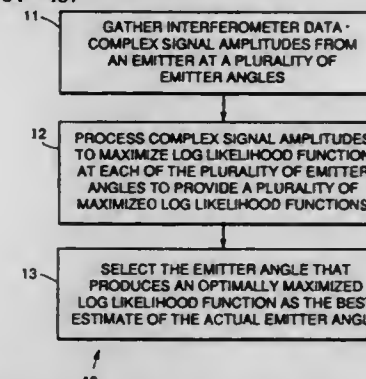
Continuation of Ser. No. 140,953, Oct. 25, 1993, abandoned.

This application Feb. 15, 1995, Ser. No. 388,947

Int. Cl.<sup>6</sup> G06F 17/10

U.S. Cl. 364-487

4 Claims



1. A method of processing interferometric signals derived from an interferometer to eliminate multipath signals and provide an improved estimate of relative angle between an unknown emitter and the interferometer, said method comprising the steps of: measuring complex signals using the interferometer that are derived from a known emitter at a plurality of emitter angles relative to the interferometer; processing the measured complex signals from the plurality of emitter angles to generate corresponding multipath contributions to each of the complex signals by subtracting the signal corresponding to a direct path to the known emitter at each of the plurality of emitter angles from each of the complex signals; measuring complex signals from the unknown emitter using the interferometer; processing the measured complex signals from the unknown emitter to maximize a predetermined log likelihood function at the plurality of emitter angles that incorporates statistics of the multipath signals and noise for the unknown emitter; and selecting as the estimate of relative angle between the unknown emitter and the interferometer an emitter angle corresponding to the direct path of one of the plurality of emitter angles that maximizes the log likelihood function for the unknown emitter.

5,568,395

# MODELING AND ESTIMATING CROSSTALK NOISE AND DETECTING FALSE LOGIC

Tammy Huang, Fremont, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Jun. 29, 1994, Ser. No. 268,920

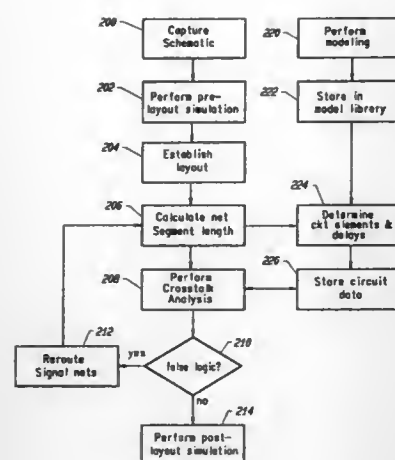
Int. Cl.<sup>6</sup> G06F 17/50

U.S. Cl. 364-489

18 Claims

1. A computer aided design (CAD) system for modeling and estimating crosstalk noise and detecting false logic, said system comprising:

- a user interface for entering circuit schematic information into the CAD system, said circuit schematic information defining circuit elements and a plurality of circuit nets, said plurality of circuit nets including a victim signal net and a culprit signal net;
- a memory, coupled to said user interface for storing said circuit schematic information and a computer program; and
- a processor directed by said computer program, coupled to said memory, for calculating peak crosstalk noise ( $\phi_{XTM}$ ) on said victim signal net generated by said culprit signal net, wherein said peak crosstalk noise is defined as:



$$V_{XTM} = (V_{dd}) \frac{\tau_c}{\tau_T} \cdot \left( \frac{\tau_T}{\tau_i} \right)^{\frac{\tau_i}{\tau_T - \tau_i}}$$

when  $\tau_i - \tau_T$  is not equal to zero, and

$$V_{XTM} = (V_{dd}) \frac{\tau_c}{\tau_T} \cdot e^{-1}$$

when  $\tau_i - \tau_T$  is equal to zero, where  $\tau_c = R_c C_{cm}$ ,  $\tau_T = R_c (C_i + C_{CT})$  and where  $\tau_i$  represents a time constant of said culprit signal net,  $C_i$  represents an effective loading capacitance of said culprit signal net,  $R_c$  represents an effective resistance of said victim signal net,  $C_v$  represents an effective loading capacitance of said victim signal net,  $C_c$  represents coupling capacitance between said victim signal net and said culprit signal net,  $C_{CT}$  represents a sum of all coupling capacitance related to said victim signal net,  $V_{dd}$  represents a power supply voltage; and

wherein said processor compares said peak crosstalk noise with a previously-defined peak-voltage threshold value and detects false logic when said peak crosstalk noise exceeds said threshold value.

5,568,396

### IDENTIFYING OVERCONSTRAINTS USING PORT ABSTRACTION GRAPHS

Cyrus Bamji, and Ravi Varadarajan, both of Fremont, Calif., assignors to Cadence Design Systems, Inc., San Jose, Calif.

Filed Jan. 21, 1994, Ser. No. 184,868

Int. Cl. G06F 17/50

U.S. Cl. 364-491

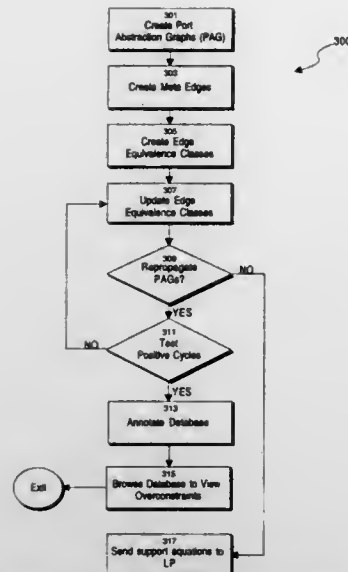
15 Claims

1. In a computer automated design system for designing a structure including a plurality of interconnected cells, in which each cell includes either another cell or at least one structural element, and each structural element in a cell is related to at least one structural element in the cell by a constraint with a value, and at least one structural element in each cell is interconnected to a structural element in another cell, a computer implemented method for identifying overconstraints in the structure prior to completing the structure, comprising the steps of:

creating a plurality of constraint sets, each constraint set consisting of constraints that will have a same value in the completed structure by:

generating a graph of each cell including only structural elements, in which a structural element of a cell is represented as a vertex, and a constraint between two structural elements is represented by an edge coupling a pair of vertices representing the structural elements, the edge having a length equal to the value of the constraint;

adding a pair of meta-edges between pairs of corresponding vertices in at least two graphs, where a first vertex and a



second vertex in a first graph corresponds to a third vertex and a fourth vertex in a second graph where:

a first structural element in a first cell represented by the first vertex is interconnected with a third structural element in a second cell represented by the third vertex;

a second structural element in the first cell represented by the second vertex is interconnected with a fourth structural element in the second cell;

there is a first constraint between the first and second structural elements, and a second constraint between the third and fourth structural elements, the first constraint represented by a first edge in the first graph, and the second constraint represented by a second edge in the second graph; and,

generating at least one edge equivalence class each edge equivalence class containing all edges of the graphs whose vertices are coupled by pairs of meta-edges;

updating each of the plurality of constraint sets so that each constraint in a constraint set has the value of the constraint in the set having a greatest value; and,

identifying in a cell a set of interconnected structural elements having constraints with a net positive value for all constraints in the set, the positive cycle identifying an overconstraint on the interconnected structural elements.

5,568,397

### LOGIC CIRCUIT DIAGRAM EDITOR SYSTEM

Keiichirou Yamashita, Yokohama, and Akihiro Uchida, Kawasaki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 7, 1994, Ser. No. 271,649

Claims priority, application Japan, Jul. 8, 1993, 5-169304

Int. Cl. G06F 17/50

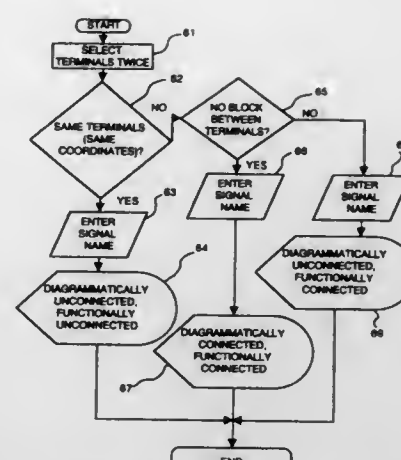
U.S. Cl. 364-491

13 Claims

1. A logic circuit diagram editor system having a data processing unit and a display unit for displaying a logic circuit diagram, comprising:

a memory unit for storing logic connection information about a logic circuit diagram including terminal indicating data and signal name data for indicating logical connections between terminals of logic circuits within said logic circuit diagram; input means for selecting said terminals displayed on said display unit to be connected in said logic circuit diagram and for entering signal names indicating a logical connection between terminals of said logic circuits; and

said data processing unit having logical connection determination means for determining whether each of said selected terminals is the same and for automatically displaying a signal name entered by said input means in a vicinity of each of said



selected terminals if said terminals are not the same, wherein said logical connection determination means further sets a logical connection relationship between said terminals without displaying a diagrammatic connection between said terminals.

5,568,398

### ELECTRONIC OPERATIONS COUNTER FOR A VOLTAGE REGULATOR CONTROLLER

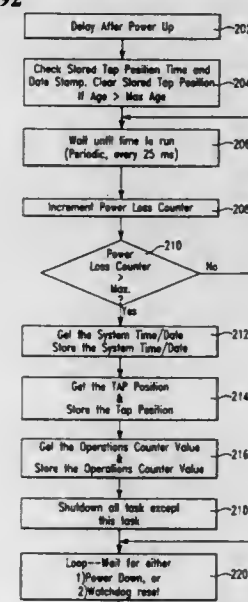
John J. Trainor, Wake Forest, N.C., assignor to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Dec. 10, 1993, Ser. No. 165,147

Int. Cl. G06G 7/63; G05F 1/14

U.S. Cl. 364-492

12 Claims



10. A method of maintaining an operations count in voltage regulation system having a step-type voltage regulator transformer and a tap changer of a type which can be operated by an automated controller having a direct current power supply, comprising the steps of:

continuously monitoring an alternating current input to the direct current power supply for zero crossings;

periodically incrementing a counter;

clearing the counter each time one of the zero-crossings occurs; and,

when the counter exceeds a threshold value, storing the operations count in a non-volatile memory.

5,568,399

### METHOD AND APPARATUS FOR POWER OUTAGE DETERMINATION USING DISTRIBUTION SYSTEM INFORMATION

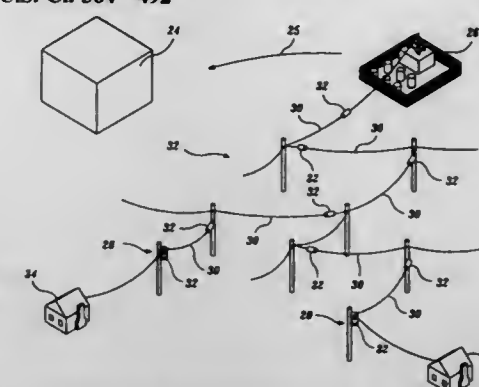
Zarko Sumic, Kirkland, Wash., assignor to Puget Consultants Inc., Bellevue, Wash.

Filed Jan. 31, 1995, Ser. No. 381,182

Int. Cl. G06F 17/00

U.S. Cl. 364-492

20 Claims



1. A method for determining the location of the protective device immediately upstream of the probable location of a fault causing a power outage in a power distribution system having a power distribution grid with a power source connected to a plurality of terminal nodes by grid branches and corresponding protective devices whose operation minimizes the deleterious effects of power outages, and a control station, comprising:

- determining distribution system information based on the power distribution grid;
- determining power outage information describing the terminal node to which the power outage information is related;
- identifying a set of possibly operated protective devices by upstream tracing from the terminal node, about which the power outage information was determined, to the power source;
- calculating a possibility that each protective device operated;
- calculating a cumulative possibility that each protective device operated as a function of the power outage information;
- comparing the cumulative possibility that each protective device operated to a predetermined confidence threshold; and
- if the cumulative possibility that a given protective device operated is greater than the confidence threshold, concluding that the protective device operated.

5,568,400

### MULTIPLICATIVE SIGNAL CORRECTION METHOD AND APPARATUS

Edward W. Stark, Suite 3M - 160 W. End Ave., New York, N.Y. 10023, and Harald Martens, Gamle Vegen 13, N-1430, Aas, Norway

Continuation-in-part of Ser. No. 402,038, Sep. 1, 1989, abandoned. This application Aug. 28, 1990, Ser. No. 572,534

Int. Cl. G06F 17/00; 159/00

U.S. Cl. 364-498

49 Claims



1. A method for correcting signals representing input spectral data ( $X_{ki}$ ) derived from a sensor during a measurement, at least as to multiplicative errors, said method comprising the steps of: providing a first and primary reference spectrum signal ( $P_{ko}$ ) representing a predetermined standard for such data; providing at least one second reference spectrum signal ( $P_{kj}$  or  $P_{kj}$ );



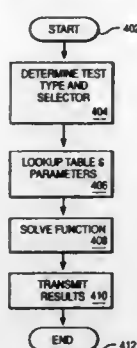
estimating coefficients for a selected appropriate model to be applied to said input data based on said first and second reference spectra signals; and  
correcting said signals representing said spectral data based on said estimated coefficients at least as to multiplicative errors for producing signals representing a linear additive structure for use in calibration, validation and determination by linear multivariate analysis.

5,568,401

**SYSTEM AND METHOD FOR TRANSFORMING PROGRAM CODE FOR EFFICIENT PIXEL PROCESSING**  
Chandrasekhar Narayanaswami, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed Sep. 20, 1993, Ser. No. 124,115  
Int. Cl.<sup>6</sup> G06K 9/62

U.S. Cl. 364—514 A

3 Claims



1. A system for transforming graphics pixel data in a graphics processing system having a processor and storage means, the system comprising:

- means for receiving a pixel processing test request;
- selector means for determining a test function as one of a plurality of test functions and a test selector for said pixel processing request to be performed on said pixel data;
- table lookup means for transmitting to said processor coefficient data for a selected one of said plurality of tests, said coefficient data selected in response to said test selector;
- pixel transformation means for transforming said pixel data based upon said coefficient data and said test function.

5,568,402

**COMMUNICATION SERVER FOR COMMUNICATING WITH A REMOTE DEVICE**

Dale A. Gray, Lutherville; Michael Chmielewski, Taneytown; Edward A. Bubnis, Jr., Catonsville; Michael G. Burch, Baltimore; Charles W. Heaps, Eldersburg, all of Md.; Robert M. Galante, New Freedom, Pa., and Keith A. Wancowicz, Perry Hall, Md., assignors to GSE Process Solutions, Inc., Hunt Valley, Md.

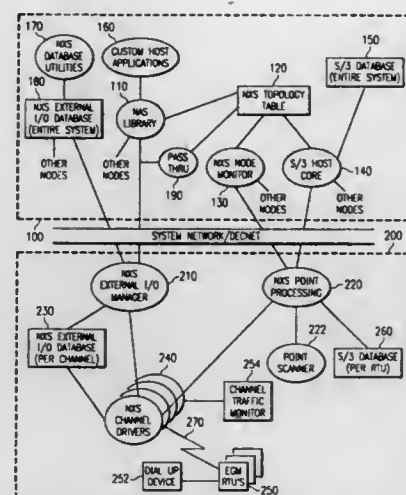
Filed Apr. 11, 1994, Ser. No. 226,130

Int. Cl.<sup>6</sup> H04B 1/00

U.S. Cl. 364—514 C

5 Claims

1. A status change data gathering apparatus comprising:
- a status change detector for detecting and transmitting data representing changes in a process or apparatus;
  - a first processor connected to said status change detector through a communication channel for receiving and collecting said detected data representing said changes in said process or said apparatus;
  - a second processor connected to said first processor, said second processor communicating to said status change detector through said first processor independently of said communication channel.



5,568,403

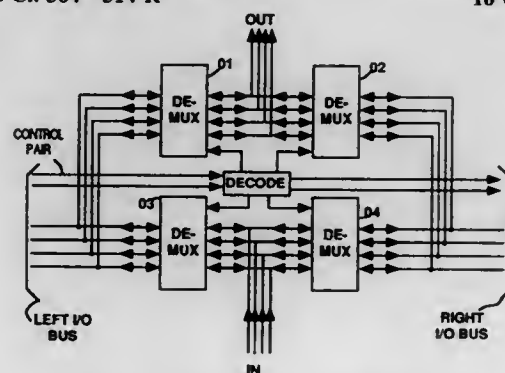
**AUDIO/VIDEO/DATA COMPONENT SYSTEM BUS**  
Michael S. Deiss, and Charles B. Neal, both of Zionsville, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Aug. 19, 1994, Ser. No. 292,908

Int. Cl.<sup>6</sup> H04L 12/00

U.S. Cl. 364—514 R

16 Claims



1. A method for communicating compressed signal between components of an audio video system wherein the compressed signal is sourced in MPEG-like transport packets, and the component receiving the sourced transport packets includes a system clock, said method comprising:

- counting pulses of said system clock modulo M, M an integer, to generate count values;
- capturing a current count value at a predetermined instance associated with an occurrence of a sourced transport packet;
- forming a bit serial superpacket containing the captured count value and corresponding transport packet in mutually exclusive portions of said superpacket;
- conveying the superpacket to said components on a bus.

5,568,404

**METHOD AND SYSTEM FOR PREDICTING SOUND PRESSURE LEVELS WITHIN A VEHICLE DUE TO WIND NOISE**

Gary S. Strumolo, Beverly Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

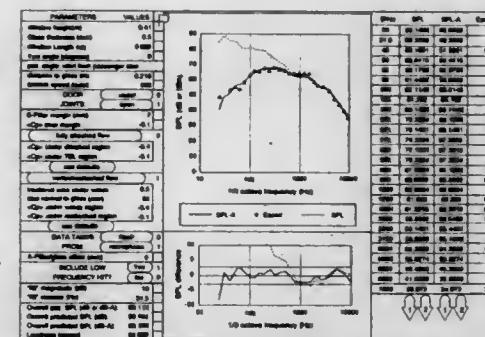
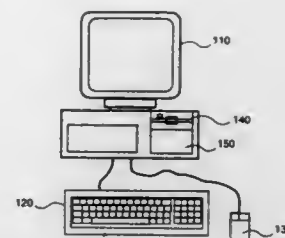
Filed Oct. 24, 1994, Ser. No. 328,308

Int. Cl.<sup>6</sup> G06G 7/48

U.S. Cl. 364—558

18 Claims

10. A computer based system for predicting sound pressure levels (SPLs) within a vehicle due to wind noise, the system comprising:



means for generating a first set of data representing at least one part of the vehicle capable of vibrating by the wind and vehicle speed;

means for generating a second set of data representing pressure spectra for vortex, reattached and turbulent boundary layer flows;

memory means for storing the first and second sets of data;

programmed data processor means coupled to the memory means for computing a third set of data representing the SPLs within the vehicle due to sound radiated by the at least one part into the vehicle based on the first and second sets of data; and

display means coupled to said processor means for displaying a first set of visual indicia representing the SPLs.

5,568,405

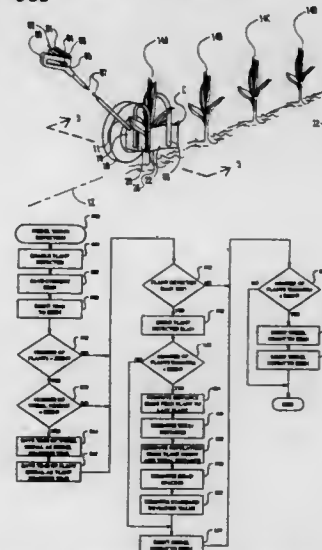
**DEVICE TO MEASURE AND PROVIDE DATA FOR PLANT POPULATION AND SPACING VARIABILITY**  
Dan T. Easton, Bagley, and David J. Easton, Cedar Falls, both of Iowa, assignors to Easton Goers, Inc., Bagley, Iowa

Filed Nov. 23, 1994, Ser. No. 344,077

Int. Cl.<sup>6</sup> G01B 5/16

U.S. Cl. 364—561

18 Claims



1. An apparatus for determining plant population, plant spacing, plant spacing variability, and other information regarding row-planted crops in a field, comprising:

a frame;

a first sensor mounted on the frame to sense the presence of plants along a crop row and to produce a plant location signal;

a second sensor mounted to the frame to measure the distance between successive plants in the crop row and to produce a distance signal; and

a processor electrically connected to the first and second sensors having first and second inputs for the plant location and distance signals, a calculation component to compute and record the spacing between successive plants for a given one or more portions of one or more crop rows, and to determine plant distribution for a given portion of a row of the fields.

5,568,406

**STOLEN CAR DETECTION SYSTEM AND METHOD**

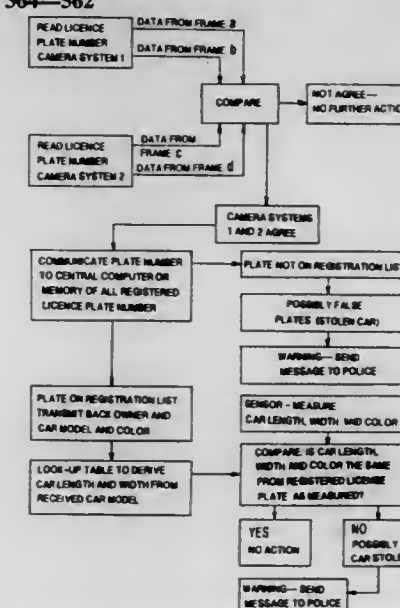
Eliot S. Gerber, 9 Frog Rock Rd., Armonk, N.Y. 10504

Filed Dec. 1, 1995, Ser. No. 566,145

Int. Cl.<sup>6</sup> G08G 1/01

U.S. Cl. 364—562

29 Claims



1. The method of detecting vehicles displaying incorrect license plates, including the steps of:

- (a) using a camera to form an image of a license plate of a target vehicle which is within area of the camera;
- (b) converting the image into digital data representing the number of the license plate;
- (c) measuring a physical characteristic of the target vehicle;
- (d) deriving from a data base of license plate numbers a physical characteristic based on the license plate number read from the target vehicle;
- (e) comparing the measured physical characteristic with the physical characteristic derived from the data base and in the event of a mismatch generating a warning signal.





5,568,412

# ROUNDING-OFF METHOD AND APPARATUS FOR FLOATING POINT ARITHMETIC APPARATUS FOR ADDITION/SUBTRACTION

Tack D. Han; Shi W. Lee, and Woo C. Park, all of Seoul, Rep. of Korea, assignors to Goldstar Company, Limited, Seoul, Rep. of Korea

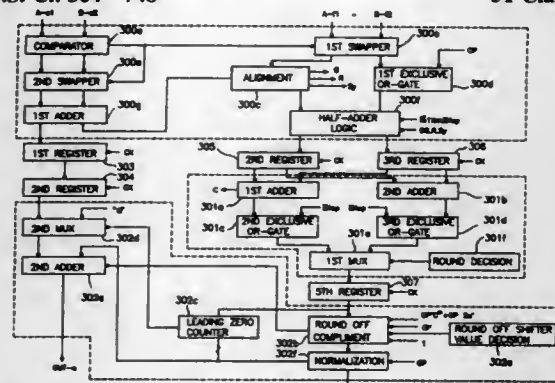
Filed Nov. 29, 1994, Ser. No. 350,981

Claims priority, application Rep. of Korea, Apr. 29, 1994, 9331/1994

Int. Cl.<sup>6</sup> G06F 7/38; 7/50

U.S. Cl. 364-748

51 Claims



6. An apparatus for arithmetic addition/subtraction of first and second floating point operands, each having a fraction portion and an exponent, comprising:

data alignment means for aligning the fraction portions of the first and second operands based on a difference of their exponents obtained by comparing the respective exponents of the first and second operands;

addition/subtraction-and-rounding-off means for performing at least two addition/subtraction operations between the aligned fraction portions of the first and second operands, and for selectively outputting a result value of one of the addition/subtraction operations as a rounded-off result value in response to a rounding-off control signal so that said rounded-off result value is a rounded-off value of addition/subtraction of the fraction portions of the first and second operands; and normalization means for normalizing the rounded-off result value to output a final result.

5,568,413

# ANALOG CIRCUIT IMPLEMENTING FUZZY RULES WITH POLYNOMIAL OUTPUT COEFFICIENTS

Oliver Landolt, Neuchâtel, Switzerland, assignor to CSEM-Centre Suisse D'Electronique Et De Microtechnique Sa Recherche Et Developpement, Neuchâtel, Switzerland

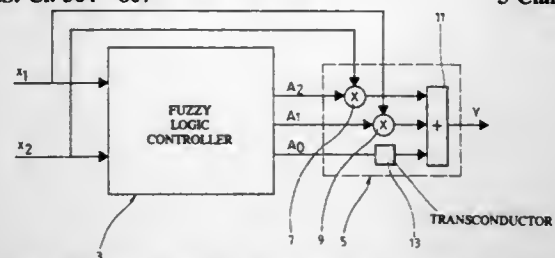
Filed Nov. 30, 1994, Ser. No. 352,082

Claims priority, application France, Dec. 2, 1993, 93 14455

Int. Cl.<sup>6</sup> G06G 7/00

U.S. Cl. 364-807

3 Claims



1. An analog fuzzy logic controller implementing a set of fuzzy rules with which are respectively associated output values expressed as many polynomials, the coefficients of said polynomials having predetermined values specific to the different rules, and each of said rules including at least one condition consisting of a fuzzy relationship between one of said input variables and a

reference value, said controller comprising first means for determining the weight of each of the fuzzy rules, said weight being determined by combining results of comparison of the values of the input variables with the reference values in the different conditions of said rule; wherein said controller further comprises:

second means for estimating a global value for each of said coefficients, said global value being determined by starting from the different values of said coefficient in the different rules and taking into account said respective weights of said rules, and

third means for delivering, as output of said controller, the value of a polynomial in said set of input variables, the coefficients of said polynomial being said global values delivered by said second means.

5,568,414

# NONLINEAR OPERATION UNIT AND DATA PROCESSING APPARATUS USING THE NONLINEAR OPERATION UNIT

Kazumasa Murai, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

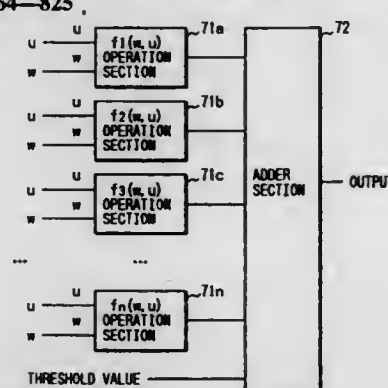
Filed Mar. 21, 1994, Ser. No. 216,017

Claims priority, application Japan, Mar. 22, 1993, 5-085157

Int. Cl.<sup>6</sup> G06G 7/02

U.S. Cl. 364-825

9 Claims



1. A nonlinear operation unit, comprising: nonlinear function operation means for performing the computing operation of a function, which produces the results of operations equivalent to the results of the process carried out by computing at least one input signal by using a nonlinear function, and multiplying the results of the computing operations by weight values; and

adder means for adding together the results of the computing operations by said nonlinear function operation means and adding a threshold value to the sum of these results;

wherein said nonlinear function operation means includes differential amplifier circuits, each said differential amplifier circuit consisting of a pair of amplifier elements each having at least three terminals, said paired amplifier elements being coupled with each other at the first terminals,

a voltage difference proportional to the input signal is applied to between the second terminals of said paired amplifier elements each having at least three terminals, a current proportional to the weight is fed to the first terminals, whereby the output signal is produced as a current difference at the third terminals of the amplifier elements each having at least three terminals and constituting differential amplifier circuits.

5,568,415

# CONTENT ADDRESSABLE MEMORY HAVING A PAIR OF MEMORY CELLS STORING DON'T CARE STATES FOR ADDRESS TRANSLATION

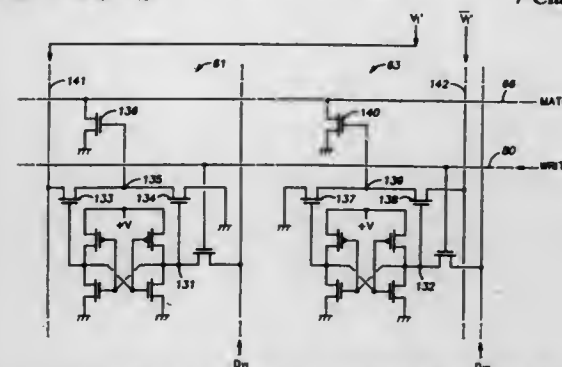
Edward J. McLellan, Milford, and Bruce A. Gleseke, Ashland, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 19, 1993, Ser. No. 21,510

Int. Cl.<sup>6</sup> G11C 15/04; G06F 12/10

U.S. Cl. 365-49

7 Claims

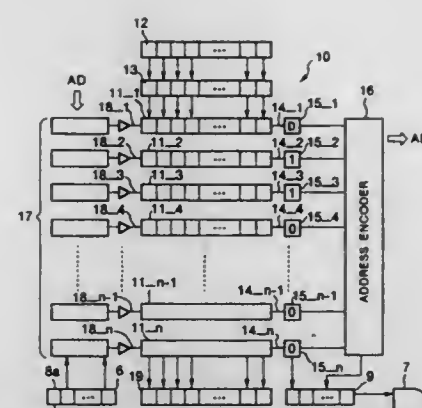


1. A content addressable memory for storing information including a "don't care" state, comparing the stored information to address signals asserted on a pair of address lines, and asserting a match signal on a match line when the stored information matches address information asserted on said address lines, said content addressable memory comprising:

a pair of memory cells, each of said memory cells storing a respective bit of said stored information, each of said memory cells including

a pair of transistors, one of said transistors connecting a common node to a respective one of said address lines, another of said transistors connecting said common node to a potential of a predefined logic level, each of said transistors having a gate receiving a logic level or inverted logic level of the bit of information stored in a respective one of said memory cells so that one of said transistors is conductive in response to the logic level of the bit of information stored in the respective one of said memory cells when the other of said transistors is not conductive in response to the logic level of the bit of information stored in the respective one of said memory cells; and

a transistor connected to said match line and having a gate connected to said common node.



memory device and of a portion of the at least one associative memory device connected to an upstream side of each of the at least one associative memory device;

identification means for identifying that each of the at least one associative memory device is a last stage associative memory device of the associative memory, the identification means generating an identifying signal when each of the at least one associative memory device is the last stage associative memory device; and

an output control circuit coupled to the identification means and the retrieval result register, the output control circuit outputting to the external devices the retrieval result data in the retrieval result register when the identification means generates the identifying signal.

5,568,417

# FLUORESCENT METHOD, FLUORESCENT DEVICE, FLUORESCENT RECORDING METHOD, FLUORESCENT RECORDING MEDIA, FLUORESCENT RECORD READING METHOD, FLUORESCENT RECORD READING DEVICE AND FLUORESCENT RECORD DELETING DEVICE

Makoto Furuki, and Lyong Sun Pu, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1994, Ser. No. 302,505

Claims priority, application Japan, Sep. 10, 1993, 5-248577

Int. Cl.<sup>6</sup> G11C 13/00

U.S. Cl. 365-106

11 Claims



1. A fluorescent device comprising an organic dye thin film, a pair of electrodes disposed to apply voltage to the organic dye thin film and a light source generating fluorescence by exciting the organic dye thin film, wherein efficiency of the fluorescence is increased and decreased depending on the change of a charge amount in the organic dye thin film by the voltage applied between the electrodes.

5,568,416

# ASSOCIATIVE MEMORY

Keiichi Kawana; Masato Yoneda, and Masahiro Konishi, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Mar. 22, 1995, Ser. No. 408,718

Claims priority, application Japan, Mar. 24, 1994, 6-054139; Sep. 14, 1994, 6-220307

Int. Cl.<sup>6</sup> G11C 15/00

U.S. Cl. 365-49

20 Claims

1. An associative memory comprising: at least one associative memory device, the at least one associative memory device being cascade-connected, external devices coupled to the associative memory storing data in the at least one associative memory device and retrieving the data from the at least one associative memory device by providing reference data to the at least one associative memory device, each of the at least one associative memory device comprising:

a retrieval result register, the retrieval result register storing retrieval result data of each of the at least one associative

5,568,418

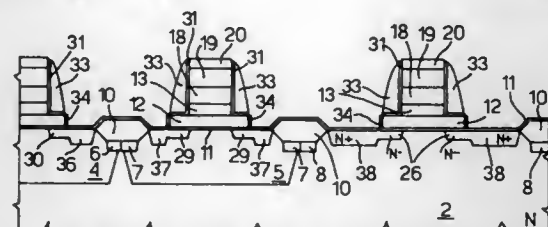
## NON-VOLATILE MEMORY IN AN INTEGRATED CIRCUIT

Giuseppe Crisenza, Trezzo sull'Adda, and Cesare Clementi, Busto Arsizio, both of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy  
Division of Ser. No. 129,776, Sep. 30, 1994, abandoned. This application May 23, 1995, Ser. No. 447,772  
Claims priority, application European Pat. Off., Sep. 30, 1992, 92830541

Int. Cl.<sup>6</sup> G11C 11/34

U.S. Cl. 365—185.01

18 Claims



1. A non-volatile memory having integrated devices in a substrate of semiconductor material, the memory comprising:
  - a first polycrystalline silicon gate region of a first length in a first direction;
  - a layer of insulating material overlapping said first gate region;
  - a second polycrystalline silicon gate region overlapping said layer of insulating material, said second gate region having a second length in said first direction, said second length being less than said first length;
  - first substrate regions embedded in said substrate aligned with said first gate regions, said first substrate regions having a first doping level; and
  - second substrate regions embedded in said substrate aligned with said first substrate regions and beneath said first gate regions, said second substrate regions having a second doping level lower than said first doping level.

5,568,419

## NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE AND DATA ERASING METHOD THEREFOR

Shigeru Atsumi, Tokyo; Masao Kuriyama; Hironori Banba, both of Kawasaki; Akira Umezawa, Yokohama, all of Japan, and Nobuaki Otsuka, Menlo Park, Calif., assignors to Kabushiki Kaisha Toshiba, Japan

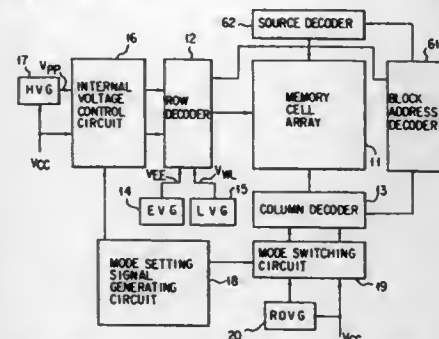
Filed Jul. 27, 1995, Ser. No. 507,968

Claims priority, application Japan, Jul. 28, 1994, 6-176726

Int. Cl.<sup>6</sup> G11C 11/34

U.S. Cl. 365—185.3

24 Claims



1. A non-volatile semiconductor device comprising:
  - a memory cell array having a plurality of memory cells into which data is electrically written and from which data is erased, said memory cells being arranged in a matrix form and each memory cell being connected to a corresponding one of row lines and a corresponding one of column lines;
  - an erasing circuit for flash-erasing data stored in said plurality of memory cells;

a selection circuit for selecting one of said memory cells, said selection circuit setting a selected row line to a positive potential and setting non-selected row lines to negative potentials in an overerase verification mode for detecting an overerased memory cell and a weak program mode for weak programming said overerased memory cell;

a detection circuit connected to the column lines, for detecting a voltage read out from the memory cell selected by said selection circuit, said detection circuit comparing a voltage read out from the memory cell with a first reference voltage in an erasing verification mode and comparing a voltage read out from the memory cell with a second reference voltage in said overerase verification mode; and

a weak program circuit for supplying a voltage lower than a normal writing voltage to the overerased memory cell to raise a threshold voltage thereof by a small amount when the overerased memory cell is detected by said detection circuit.

5,568,420

## NONVOLATILE SEMICONDUCTOR MEMORY DEVICE

Young-Ho Lim, and Kang-Deog Suh, both of Kyungki-do, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

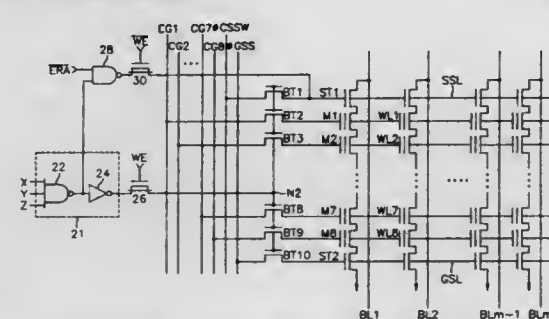
Filed Nov. 30, 1994, Ser. No. 350,162

Claims priority, application Rep. of Korea, Nov. 30, 1993, 25961/1993

Int. Cl.<sup>6</sup> G11C 11/34

U.S. Cl. 365—185.17

7 Claims



1. An electrically erasable and programmable nonvolatile semiconductor memory device (EEPROM) comprising:

two or more memory blocks each having two or more NAND cell strings connected between a bit line and a ground voltage via string selection means and ground selection means, respectively,

each of said two or more NAND cell strings including a predetermined number of memory cells having their channels serially connected to one another and their gate terminals controlled by word lines commonly connecting said two or more NAND cell strings, wherein each of said memory cells includes a control gate and a floating gate, and wherein said word lines, control gate, and floating gate each receive control gate driving signals via channels of corresponding transfer transistors,

block selection logic for generating a block selection signal which selects between said two or more memory blocks, and control gate driving logic for generating control gate driving signals and applying the control gate driving signals to the two or more memory blocks, characterized in that:

gates of said transfer transistors are connected to a common control node, and said block selection signal is applied to said common control node.

5,568,421

## SEMICONDUCTOR MEMORY DEVICE ON WHICH SELECTIVE TRANSISTORS ARE CONNECTED TO A PLURALITY OF RESPECTIVE MEMORY CELL UNITS

Seichi Aritome, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

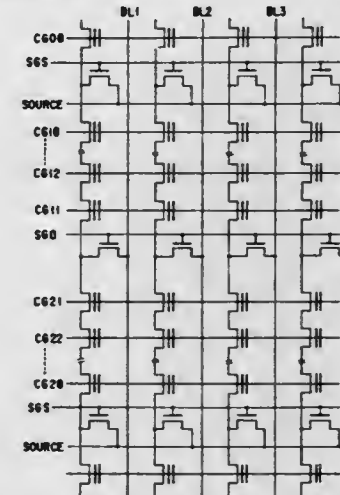
Filed Mar. 10, 1995, Ser. No. 402,822

Claims priority, application Japan, Mar. 14, 1994, 6-042363

Int. Cl.<sup>6</sup> G11C 16/02; H01L 29/788

U.S. Cl. 365—185.17

18 Claims



1. A semiconductor memory device comprising:
    - a semiconductor substrate;
    - a word line arranged in a predetermined direction;
    - a plurality of memory cell units each having a plurality of memory cells each of which has a charge storage layer and a control gate stacked on said semiconductor substrate and in which the write and erase operations are effected by transferring charges between said charge storage layer and said semiconductor substrate as one unit;
    - a plurality of data lines arranged in a direction crossing said word line and for transferring data with respect to said plurality of memory cell units; and
    - a plurality of selective transistors arranged between said plurality of memory cell units and said plurality of data lines and each having a first end connected to a corresponding one of said plurality of memory cell units and a second end connected to a corresponding one of said plurality of data lines, and wherein
- said first end of each of said plurality of selective transistors are shared by adjacent memory cell units in a data line direction.

5,568,422

## FLASH MEMORY HAVING A SIDE WALL IMMEDIATELY ADJACENT THE SIDE OF A GATE ELECTRODE AS A MASK TO EFFECT THE ETCHING OF A SUBSTRATE

Masakazu Fujiwara, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 32,247, Mar. 17, 1993, abandoned.

This application Apr. 18, 1995, Ser. No. 423,817

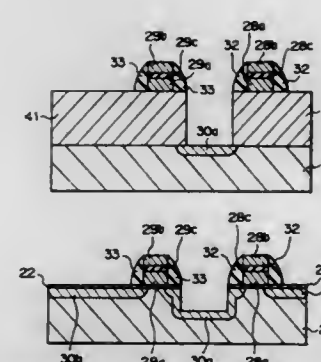
Claims priority, application Japan, Mar. 18, 1992, 4-061791

Int. Cl.<sup>6</sup> G11C 11/34

U.S. Cl. 365—185.33

15 Claims

1. A flash memory of NOR-type comprises at least a pair of stacked gate portions consisting essentially of a first gate electrode being formed over a surface of a semiconductor substrate through a gate insulating film and being formed on field insulating film and extending therealong, side walls of an insulation material being formed on respective side faces of the stacked gates, an inter-gate insulation film on the first gate electrode, and a second gate electrode on the inter-gate insulation film, and source and drain electrodes used to charge electrons for data storage to the first gate



electrode and discharge the same therefrom, wherein a side wall of an insulation material is provided adjacent to the side of the stacked gate portion and on the gate and field insulation films, the field insulation film is removed between the edges of the side walls adjacent to the respective gate portions so that said substrate is exposed, and a trench being formed between the stacked gates and along the edges of the side walls adjacent to the respective gate portions; and in an area corresponding to said gate insulating film, the trench being a trench (A) formed in the semiconductor substrate, and in an area corresponding to said field insulating film, the trench being a trench (B) formed in the field insulating film so as to expose the semiconductor substrate present under the field insulating film, and an impurity diffused layer being formed in the surface of the semiconductor substrate exposed at the bottoms of said trenches (A) and (B).

5,568,423

## FLASH MEMORY WEAR LEVELING SYSTEM PROVIDING IMMEDIATE DIRECT ACCESS TO MICROPROCESSOR

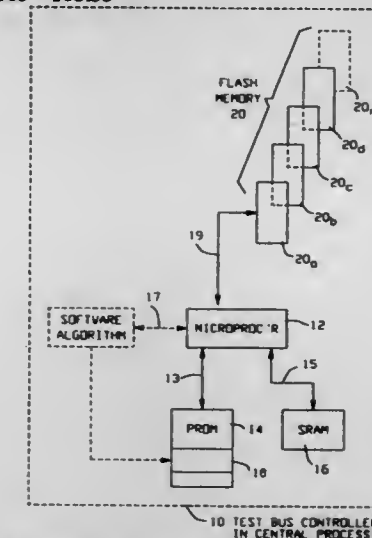
Edwin Jou, Irvine, and James H. Jeppesen, III, Lake Forest, both of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Apr. 14, 1995, Ser. No. 422,119

Int. Cl.<sup>6</sup> G11C 16/02

U.S. Cl. 365—185.33

4 Claims



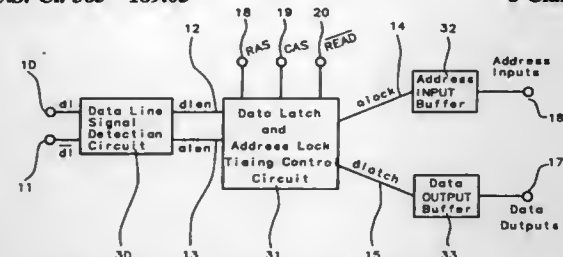
1. In a digital network using a central processor and memory modules including a flash memory, a method for equitable utilization of each block of memory in said flash memory comprising the steps of:

- (a) connecting said processor directly to said flash memory for immediate access;
- (b) assigning a header area in each block of flash memory which registers the number of times that the block has been utilized and erased, said header also specifically identifying each individual block of said flash memory;





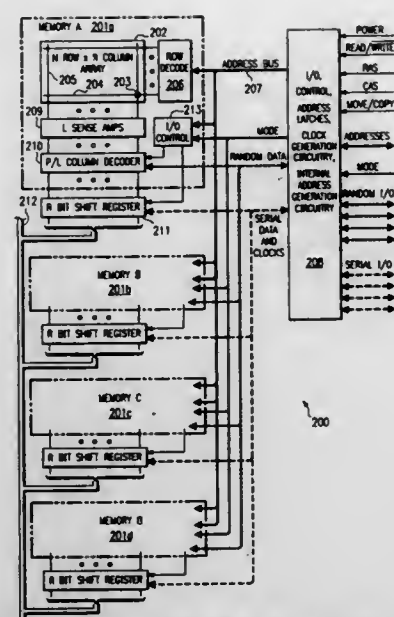
**5,568,430**  
**SELF TIMED ADDRESS LOCKING AND DATA LATCHING CIRCUIT**  
 Tah-Kang J. Ting, Hsinchu, Taiwan, assignor to Etron Technology, Inc., Hsin-chu, Taiwan  
 Filed Dec. 4, 1995, Ser. No. 567,016  
 Int. Cl.<sup>6</sup> G11C 7/00:8/00  
 U.S. Cl. 365—189.05 8 Claims



1. A data and address control circuit, comprising:
  - a row address strobe line;
  - a column address strobe line;
  - an inverse read line;
  - a data latch enable line;
  - an address lock enable line;
  - a timing control circuit having a first input, a second input, a third input and an output wherein said first input of said timing control circuit is connected to said column address strobe line, said second input of said timing control circuit is connected to said row address strobe line, said third input of said timing control circuit is connected to said inverse read line, said output of said timing control circuit is at a logical zero level when said row address strobe line is at a logical zero level or said column address strobe line is at a logical one level, and said output of said timing control circuit is at a logical one level when said row address strobe line is at a logical one level, said inverse read line is at a logical zero level, and said column address strobe line has switched from a logical one level to a logical zero level;
  - an address lock circuit having a first input, a second input, and an output wherein said first input of said address lock circuit is connected to said column address strobe line, said second input of said address lock circuit is connected to said address lock enable line, said output of said address lock circuit is at a logical one level if said column address strobe line is at a logical one level, said output of said address lock circuit is at a logical one level if said address lock enable line is at a logical one level and said output of said timing control circuit is at a logical one level; and
  - a data latch circuit having a first input, a second input, and an output wherein said first input is connected to said data latch enable line, said second input is connected to said output of said timing control circuit and to said output of said address lock circuit, said output of said data latch circuit is at a logical one level if said output of said timing control circuit is at a logical one level and said data latch enable line is at a logical one level, and said output of said data latch circuit is at a logical one level if said output of said timing control circuit is at a logical one level and said output of said address lock circuit is at a logical one level; and

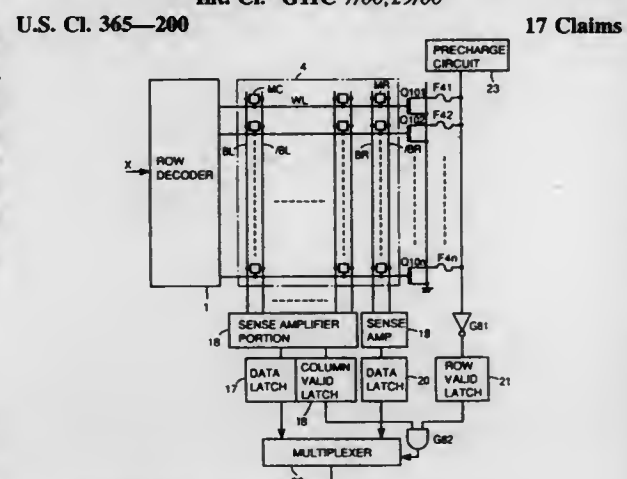
**5,568,431**  
**MEMORY ARCHITECTURE AND DEVICES, SYSTEMS AND METHODS UTILIZING THE SAME**  
 G. R. Mohan Rao, Dallas, Tex., assignor to Cirrus Logic, Inc., Fremont, Calif.  
 Continuation of Ser. No. 304,508, Sep. 12, 1994, Pat. No. 5,473,566. This application Sep. 21, 1995, Ser. No. 531,755  
 Int. Cl.<sup>6</sup> G11C 7/00 20 Claims

9. A memory subsystem comprising:
  - a plurality of arrays of memory cells each arranged in rows and columns;



- for each said array, a row decoder and a column decoder for accessing selected ones of said cells of said array;
- for each said array, an associated register having a first parallel port coupled to said column decoder;
- a common bus coupled to a second parallel port of each said register; and
- circuitry for coupling data from accessed ones of said cells of a first selected one of said arrays to accessed ones of said cells of a second selected one of said arrays via said parallel ports of said associated registers and said bus.

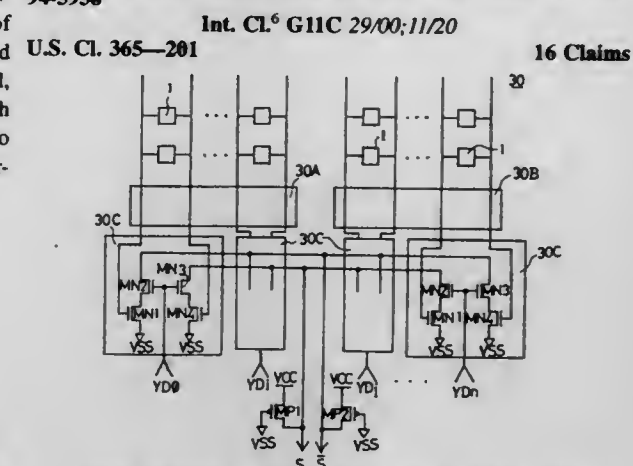
**5,568,432**  
**SEMICONDUCTOR MEMORY DEVICE INCLUDING REDUNDANCY MEMORY CELL REMEDYING DEFECTIVE MEMORY CELL**  
 Tomohisa Wada, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
 Filed Nov. 25, 1994, Ser. No. 348,098  
 Claims priority, application Japan, Dec. 24, 1993, 5-327706  
 Int. Cl.<sup>6</sup> G11C 7/00:29/00 17 Claims



7. A semiconductor memory device, comprising:
  - a memory cell array including a plurality of memory cells arranged in a matrix manner;
  - a redundancy memory cell array including a redundancy memory cell used when a defect occurs in said memory cells;
  - first reading means comprising a plurality of reading means for reading out data from said memory cell array;

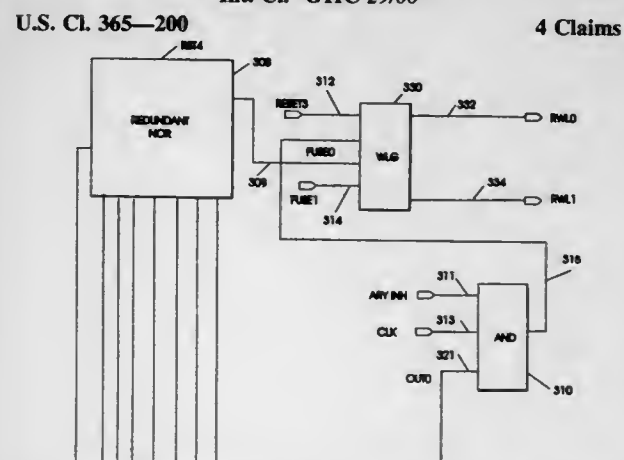
- second reading means for reading out data from said redundancy memory cell array;
- defect information signal output means for providing a defect information signal indicating whether or not data provided from said first reading means is data corresponding to a defective memory cell in said memory cell array; and
- selecting means for selecting predetermined data among a plurality of data provided from said plurality of reading means of said first reading means and data provided from said second reading means for, when a defect occurs in said memory cell, replacing data provided from said first reading means with data provided from said second reading means in response to said defect information signal, and for selecting predetermined data between said data for sequential output.

**5,568,434**  
**MULTI-BIT TESTING CIRCUIT FOR SEMICONDUCTOR MEMORY DEVICE**  
 Yong-Weon Jeon, Seoul, Rep. of Korea, assignor to LG Semiconductor Co., Ltd., Chungcheongbuk-do, Rep. of Korea  
 Filed Jan. 25, 1995, Ser. No. 377,729  
 Claims priority, application Rep. of Korea, Mar. 24, 1994, 94-5938  
 Int. Cl.<sup>6</sup> G11C 29/00:11/20 16 Claims



1. A multi-bit testing circuit for testing a semiconductor memory device having a plurality of memory cells, comprising:
  - a first amplifying means coupled to a first group of memory cells for sensing at least one pair of bit line signals having values complementary to one another, each pair being associated with a respective one of the memory cells of the first group and for providing each of said sensed pair of bit line signals to a respective one of first and second output lines of a common signal path when said first sense amplifying means is activated;
  - a second amplifying means coupled to a second group of memory cells for sensing at least one pair of bit line signals having values complementary to one another, each pair being associated with a respective one of the memory cells of the second group and for providing each of said sensed pair of bit line signals to a respective one of the first and second output lines of said common signal path when said second sense amplifying means is activated; and
  - a third amplifying means coupled to said first and second output lines of said common signal path for producing an output signal in response to said sensed pair of bit line signals provided on the first and second output lines by said first amplifying means and said second amplifying means when activated.

**5,568,433**  
**MEMORY ARRAY HAVING REDUNDANT WORD LINE**  
 Manoj Kumar, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.  
 Filed Jun. 19, 1995, Ser. No. 491,661  
 Int. Cl.<sup>6</sup> G11C 29/00 4 Claims

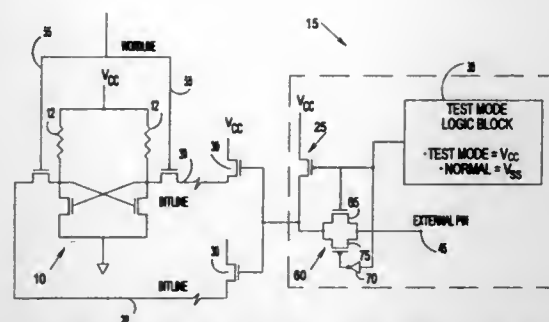


1. A memory for storing data in a data processing system, comprising:
  - a primary array of storage cells;
  - a secondary array of storage cells; and
  - a storage cell selection circuit for selecting a plurality of storage cells from one of said arrays of storage cells, said selection circuit comprising:
    - a first plurality of circuits for selecting between a true and a complement value of a plurality of address lines;
    - a logic circuit having a plurality of inputs, each of said inputs connected to an output of one of said first plurality of circuits, said logic circuit generating an active output if one or more of said first plurality of circuits generates an active output; and
    - an address gating circuit, having a plurality of inputs, each of said inputs to said address gating circuit connected to one of said plurality of address lines, said address gating circuit producing an output when a last of said input lines to become active has become active, the output of said address gating circuit being connected to a gating circuit to enable selection of storage cells when said output of said address gating circuit becomes active.

**5,568,435**  
**CIRCUIT FOR SRAM TEST MODE ISOLATED BITLINE MODULATION**  
 Kenneth W. Marr, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.  
 Filed Apr. 12, 1995, Ser. No. 421,506  
 Int. Cl.<sup>6</sup> G11C 7/00 20 Claims

1. A circuit for isolating a first voltage signal from a second voltage signal in a test mode of a memory device, the memory device having gates associated with bitline load devices and the memory device further having peripheral circuitry, the circuit connected to the memory device and responsive to a control signal, the circuit comprising:
  - (a) means for disabling the first voltage signal to the gates of the bitline load devices, and for enabling the second voltage signal to the gates of the bitline load devices, and wherein the first voltage signal remains selectively enabled to the peripheral circuitry and is isolated from the second voltage signal as the second voltage signal is enabled to the gates of the bitline load devices; and,





(b) means for disabling the second voltage signal to the gates of the bitline load devices and for enabling the first voltage signal to the gates of the bitline load devices, and wherein the first voltage signal remains selectively enabled to the peripheral circuitry.

5,568,436

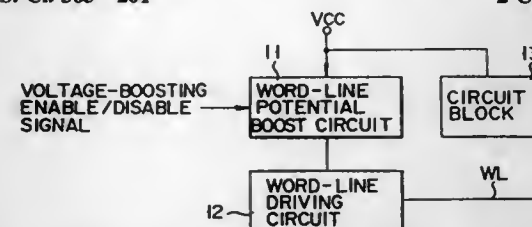
### SEMICONDUCTOR DEVICE AND METHOD OF SCREENING THE SAME

Tohru Furuyama, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 325,636, Oct. 19, 1994, Pat. No. 5,428,576, which is a continuation of Ser. No. 696,226, May 6, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 480,926 Claims priority, application Japan, May 11, 1990, 2-119948 Int. Cl.<sup>6</sup> G11C 7/00; 8/00

U.S. Cl. 365—201

2 Claims



1. A method of screening a semiconductor device which comprises a plurality of circuit blocks to which various potentials, including at least one potential either raised or lowered, are assigned, and means for selectively and reversibly changing the potentials assigned to said circuit blocks, said method comprising the step of:

selectively and reversibly changing the potentials assigned to the circuit blocks, thereby to apply a specific voltage to at least one of the circuit blocks, said specific voltage being not higher than the voltages applied to the other circuit blocks.

5,568,437

### BUILT-IN SELF TEST FOR INTEGRATED CIRCUITS HAVING READ/WRITE MEMORY

Kamran Jamal, Sunnyvale, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

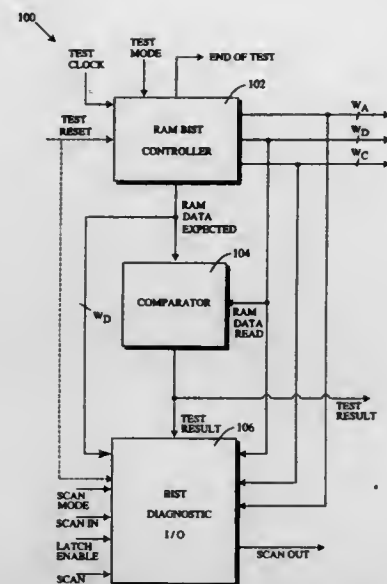
Filed Jun. 20, 1995, Ser. No. 493,204

Int. Cl.<sup>6</sup> G11C 7/00

U.S. Cl. 365—201

22 Claims

1. An integrated circuit with read/write memory and read/write memory self testing capability comprising:  
read/write memory having a plurality of data storage locations, each location having a unique address;  
a controller responsive to a test enable signal and operative to generate and store test data at various locations in said read/write memory;  
a comparator responsive to said test data provided by said controller and to retrieved data read from said read/write memory, said comparator comparing said test data and said retrieved data for corresponding locations in said read/write



memory and producing error signals indicating that said retrieved data does not correspond correctly to said test data; and

input/output circuitry including at least one register capable of storing an address of a read/write memory location where an error has been detected as indicated by said error signals, and capable of outputting said address of a read/write memory location to provide an indication where said error occurred in said read/write memory.

5,568,438

### SENSE AMPLIFIER WITH OFFSET AUTONULLING

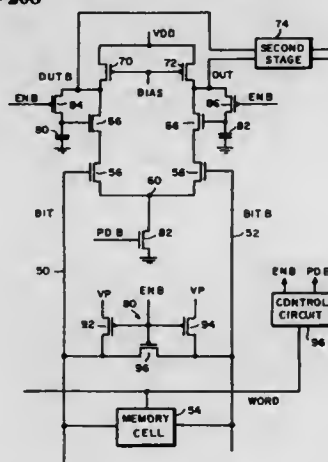
Robert A. Penschuk, Wrentham, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Jul. 18, 1995, Ser. No. 503,529

Int. Cl.<sup>6</sup> G11C 7/00

U.S. Cl. 365—208

17 Claims



1. A sense amplifier for determining the state of a memory cell of a random access memory, said memory cell having Bit and Bit B lines connected thereto, comprising:

first and second transistors connected in a differential amplifier configuration, said first and second transistors having control electrodes coupled to the Bit and Bit B lines, respectively, for sensing the state of the memory cell;

third and fourth transistors connected in said differential amplifier configuration, said third and fourth transistors each having a control electrode, said differential amplifier configuration having an offset error and providing differential outputs for indicating the state of the memory cell during a read phase;

first and second capacitors respectively coupled between the control electrodes of said third and fourth transistors and a reference potential;

a feedback circuit for coupling voltages representative of the offset error to said first and second capacitors during a nulling phase in which the Bit and Bit B lines are not being read; and  
a bias circuit for biasing said first, second, third and fourth transistors for operation during the read phase and the nulling phase.

5,568,439

### FLASH EEPROM SYSTEM WHICH MAINTAINS INDIVIDUAL MEMORY BLOCK CYCLE COUNTS

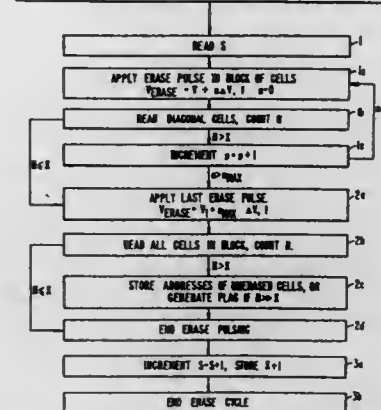
Eliyahu Harari, 104 Auzeais Ct., Los Gatos, Calif. 95030  
Continuation of Ser. No. 116,867, Sep. 3, 1993, Pat. No. 5,434,825, which is a division of Ser. No. 563,287, Aug. 6, 1990, Pat. No. 5,268,870, which is a division of Ser. No. 380,854, Jul. 17, 1989, Pat. No. 5,043,940, which is a division of Ser. No. 204,175, Jun. 8, 1988, Pat. No. 5,095,344. This application Jun. 6, 1995, Ser. No. 468,061

Int. Cl.<sup>6</sup> G11C 16/06; G06F 11/20

U.S. Cl. 365—218

8 Claims

SET V<sub>1</sub> = VOLTAGE OF FIRST ERASE PULSE.  
SET V<sub>2</sub> = VOLTAGE INCREMENT AT EACH SUBSEQUENT ERASE PULSE.  
SET T<sub>1</sub> = TIME DURATION OF EACH ERASE PULSE.  
SET T<sub>2</sub> = CELL CONDUCTANCE IN FULLY ERASED STATE.  
SET N<sub>1</sub> = MAXIMUM NUMBER OF ERASE PULSES PER CYCLE.  
SET N<sub>2</sub> = NUMBER OF BITS NOT FULLY ERASED.  
SET S = MAXIMUM NUMBER OF BITS NOT FULLY ERASED WHICH IS ACCEPTABLE TO SYSTEM.  
S = NUMBER OF FULL ERASE CYCLES EXPERIENCED BY THE BLOCK.



1. A method of erasing an array of a plurality of electrically erasable and programmable read only memory (EEPROM) cells, the individual cells including a field effect transistor with a threshold voltage that is alterable by controlling a level of charge on a floating gate thereof and which has an erase electrode, said method comprising:

operating the memory array with the cells thereof being partitioned into individual distinct blocks of cells to be simultaneously erasable upon an erase voltage being applied to the erase electrodes thereof;

designating a plurality of cells within the individual blocks of cells for storing an indication of a number of erase cycles which the individual blocks have experienced;

reading, from the designated cells of a selected block to be erased, the experience number indicative of the number of erase cycles which the selected block has experienced, temporarily storing outside of the selected block the experience number read from the selected block,

thereafter subjecting the selected block to an erase cycle by simultaneously applying an erase voltage to the erase electrodes of the memory cells therein,

verifying whether the cells within the selected block have been successfully erased,

terminating the erase cycle when the cells within the selected block have been successfully erased,

updating the experience number read from the selected block to reflect the occurrence of another erase cycle, and

after termination of the erase cycle, writing the updated experience number into said designated cells of the selected block.

5,568,440

### SEMICONDUCTOR MEMORY DEVICE HAVING SELF-REFRESHING FUNCTION

Masaki Tsukude, and Kazutami Arimoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

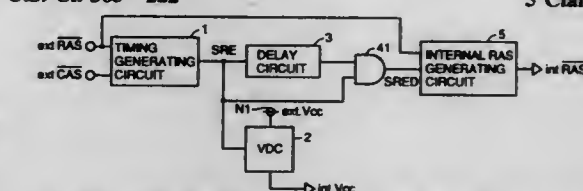
Filed Feb. 2, 1995, Ser. No. 382,557

Claims priority, application Japan, Feb. 3, 1994, 6-011900; Mar. 15, 1994, 6-044369

Int. Cl.<sup>6</sup> G11C 7/00

U.S. Cl. 365—222

5 Claims



2. A semiconductor memory device carrying out a normal operation and a self-refreshing operation based on a voltage swing having a swing width defined by an internal power supply voltage, comprising:

self-refresh period defining means for generating a self-refresh period definition signal defining a period in which said self-refreshing operation is carried out; and

internal power supply voltage generating means responsive to said self-refresh period definition signal for generating said internal power supply voltage so that said internal power supply voltage is lower in the period defined by the signal than in said normal operation.

5,568,441

IC CARD

Yoshikado Sanemitsu, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

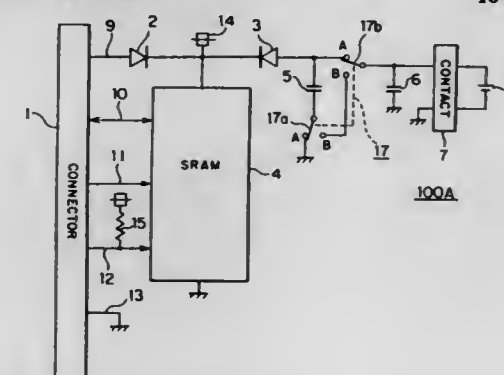
Filed Aug. 23, 1995, Ser. No. 518,458

Claims priority, application Japan, Sep. 27, 1994, 6-231675

Int. Cl.<sup>6</sup> G11C 5/14

U.S. Cl. 365—229

16 Claims



1. An IC card comprising:

a connector;

a volatile memory connected to said connector for storing data;

a primary cell for supplying power to said memory for data retention;

a first current limiting element for preventing overflow of current from said primary cell via said connector;

a second current limiting element for protecting said primary cell from being charged via said connector

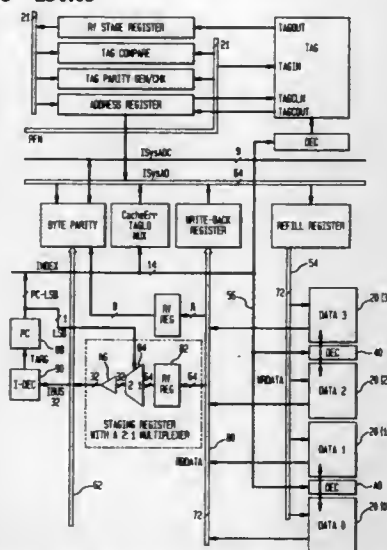
a plurality of charge accumulation devices for accumulating charge supplied from said primary cell; and

line drivers when a select signal is asserted on the unique segment select line coupled to the row decoder;

a staging register for receiving a group of K data words, said group having a length of Y/N bits, from said segment when a select signal is asserted on said unique segment select line associated with said segment; and

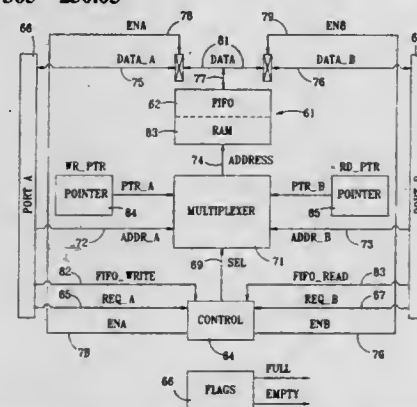
a K:1 multiplexer for receiving a third portion of said unique index field and decoding said third portion to select one of said K data words.

## 2 Claims



a plurality of N row decoders, with each row decoder coupled to the X word line drivers of a unique cache segment, with each row decoder receiving a second portion of said unique index field and having a select input coupled to a unique one of said segment select lines, each row decoder activated for decoding said second portion to activate a unique one of said X word

## 20 Claims



a first region of said memory array that operates as a random access memory (RAM) device; and  
a second region of said memory array that operates as a plurality of independent first-in-first-out (FIFO) buffer memories;

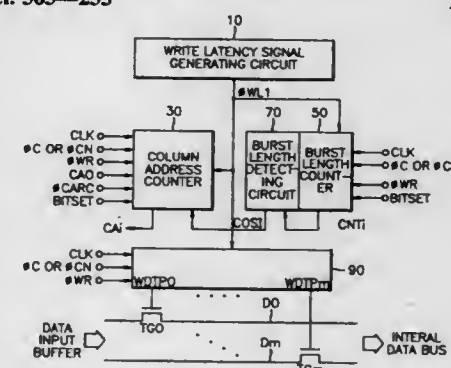
means for writing data to said first region and reading data from said first region independently of said second region; and  
means for writing data to said second region and reading data from said second region independently of said first region.

## 23 Claims



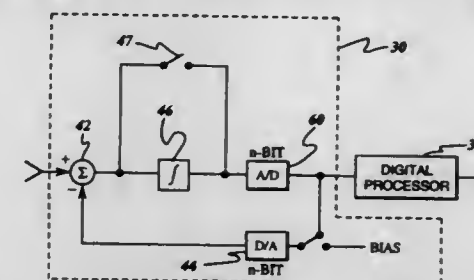
**12. A semiconductor memory device comprising:**  
a first select output terminal;

## 17 Claims



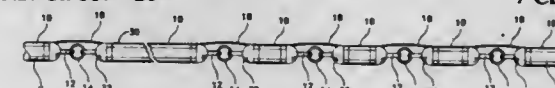
1. A semiconductor memory device including a column address counter, a burst length counter and a data transfer switching circuit for processing data in synchronization with an external system clock, said semiconductor memory device comprising:  
means for setting a prescribed write latency value; and  
means for inhibiting internal operations of said column address counter, burst length counter and data transfer switching circuit for a prescribed holding time corresponding to said write latency value.

### 13 Claims



- a digital to analog (D/A) converter for converting said digital signals into analog feedback signals;
- an analog summer for receiving said analog electrical signals and combining the analog electrical signals with said analog feedback signals;
- an integrator selectively coupled to receive an output signal from the analog summer and for generating an integrated analog signal; and
- an A/D converter for selectively receiving, and converting to an equivalent digital signal, one of the integrated analog signal and an output signal of the analog summer.

## 7 Claims



a plurality of bodies interconnected in series by flexible tethers, a proximal one of said bodies being adapted for connection to the tow cable, and a distal one of said bodies being adapted for connection to the array;

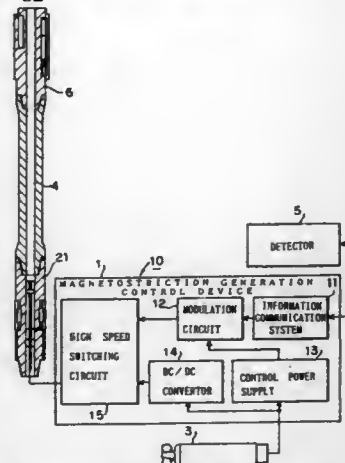
an external coaxial cable assembly extending between each two of said bodies and in communication with each other by way of internal coaxial cables within said bodies.



**5,568,448**  
**SYSTEM FOR TRANSMITTING A SIGNAL**  
 Ryosuke Taniguchi, Shinichi Hattori, and Takahiro Sakamoto,  
 all of Nagasaki, Japan, assignors to Mitsubishi Denki  
 Kabushiki Kaisha, Tokyo, Japan  
 Filed Aug. 29, 1994, Ser. No. 296,884  
 Claims priority, application Japan, Apr. 25, 1991, 6-086941  
 Int. Cl.<sup>6</sup> H04H 9/00

U.S. Cl. 367—82

25 Claims



1. A system for transmitting a signal, comprising:
  - a magnetostrictive element having magnetostrictive material for producing magnetostriction and an excitation winding around the magnetostrictive material;
  - a magnetostriction generation control device for driving said magnetostrictive element, said magnetostriction generation control device including a power supply for supplying a voltage, a high-frequency switching circuit for selectively transmitting the voltage, a transformer for transforming the selectively transmitted voltage from an initial value to a higher value, a second rectifier for rectifying the higher value voltage, a waveform-smoothing capacitor for storing the rectified higher value voltage, a constant voltage control circuit for controlling a voltage level of the rectified higher value voltage, a switching means for selectively transmitting the stored voltage to the magnetostrictive element as an exciting current, and a switching control circuit for controlling a switching time of the switching means;
  - a rodlike body for transmitting a signal wave generated by said magnetostrictive element; and
  - an acoustic wave receiver disposed in a predetermined position of said rodlike body, for receiving said signal wave propagated through said rodlike body, converting the received signal wave into a converted signal and outputting the converted signal.

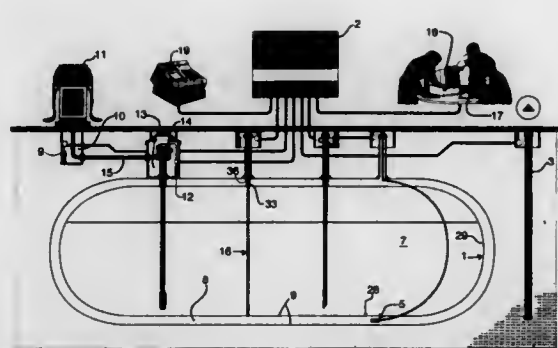
**5,568,449**  
**METHODS AND APPARATUS FOR USE IN ULTRASONIC RANGING**

Steven P. Rountree, and Samir W. Berjaoui, both of Lafayette, La., assignors to U.S. Test, Inc., Lafayette, La.  
 Filed Sep. 2, 1994, Ser. No. 307,292  
 Int. Cl.<sup>6</sup> G01S 15/42

U.S. Cl. 367—99

22 Claims

1. In an ultrasonic probe for use in an ultrasonic ranging system measuring the fluid level of a fluid in a cavity of a container, wherein said probe having an elongated member having a top end and a lower end, said elongated member vertically fixable to said container to position said lower end within said container cavity below said fluid level, at least one calibration reflector fixedly attached to said elongated member below said fluid level, a transducer assembly positioned a known distance from a bottom surface of said container forming said cavity, and between said lower end and all of said calibration reflectors for transmitting a packet of ultrasonic sound waves and for detecting primary and secondary

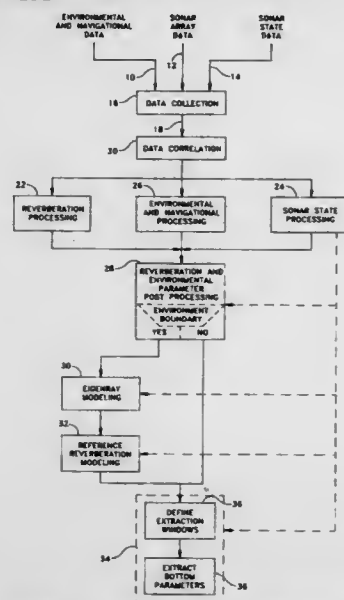


echo packets reflected from each of said calibration reflectors and from said fluid level, the improvement to which comprises: each of said calibration reflectors positioned to cause its secondary echo packet to be imbedded in the trailing edge of a primary echo packet of another calibration reflector prior to a time when said transducer has detected a primary echo packet associated with said fluid level.

**5,568,450**  
**SYSTEM AND PROCESSOR FOR REAL-TIME EXTRACTION OF OCEAN BOTTOM PROPERTIES**  
 David W. Grande, North Stonington, Conn.; Michael T. Sundvik, Narragansett, R.I.; Judith L. Bishop, Waterford, and Bernard F. Cole, New London, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.  
 Filed Oct. 18, 1994, Ser. No. 330,143  
 Int. Cl.<sup>6</sup> H04B 11/00; G01S 15/00

U.S. Cl. 367—131

8 Claims



1. A processor for characterizing ocean bottom parameters in real-time comprising:
  - signal processing means for receiving navigational, environmental, and sonar data and processing said data into a reverberation energy envelope, said reverberation energy envelope being generated from an acoustic return from a sonar ping, and into blocks of time correlated data;
  - data monitoring means, coupled to said signal processing means, for monitoring said navigational, environmental, and sonar state data and said reverberation energy envelope for changes; and
  - model processing means, responsive to said data monitoring means, for building a set of acoustic model eigenrays, building a reference reverberation model, said reference reverberation model comprising reference reverberation as a function

of time, and extracting bottom parameters by comparing said reverberation energy envelope with said reference reverberation model.

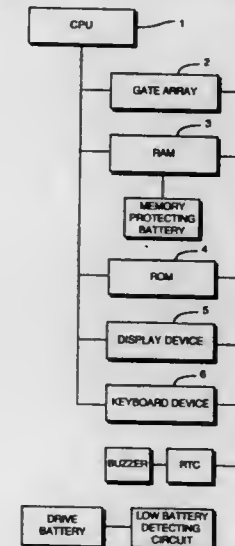
**5,568,451**  
**COMPACT ELECTRONIC APPARATUS**  
 Hiroshi Fukutomi, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Filed Jun. 22, 1993, Ser. No. 79,818  
 Claims priority, application Japan, Jun. 24, 1992, 4-166423;  
 Jun. 30, 1992, 4-173338

Int. Cl.<sup>6</sup> G04B 47/00; 19/24; G06F 3/14; 15/00

U.S. Cl. 368—10

20 Claims



1. A compact electronic apparatus, comprising:
  - a storage means for storing a piece of plan data for each plan;
  - a display means for displaying the piece of plan data for each plan;
  - an input device operable to indicate that a plan has been transacted; and
  - a data changing means responsive to operation of the input device for causing a mark to be included in the displayed piece of plan data so as to indicate that the plan has been transacted, and for causing time data which corresponds to a time when the plan is actually transacted to be included in the displayed piece of plan data.

**5,568,452**  
**ALARM CLOCK**  
 Harry Kronenberg, 1474 Van Dyke Rd., San Marino, Calif. 91108

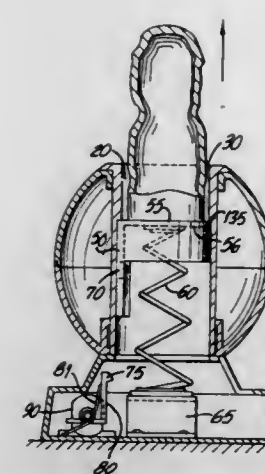
Filed Nov. 1, 1991, Ser. No. 786,125

Int. Cl.<sup>6</sup> G04B 23/02

U.S. Cl. 368—262

24 Claims

1. An alarm clock for emitting a characteristic sound signal and a moving display signal at a predetermined time, comprising:
  - a housing having an interior chamber and a surface defining an opening in said housing;
  - an actionable member including a carrier portion located within said interior chamber and having an aperture, said actionable member being sized to fit through said housing opening;
  - release means at least partially extended in said aperture for moving said actionable member from a first position in said interior chamber to a second position;
  - an electronic clock mechanism mounted within said housing, said clock mechanism including alarm means for setting a pre-selected alarm signal generated by said clock mechanism;
  - electronic sound generating means for generating a characteristic sound signal in response to said alarm signal; and

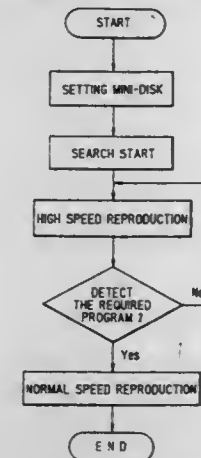


electronic actuation means for operating said release means and for operating said sound generating means in response to said alarm signal wherein said actionable member is manually displaceable to said first position thereby terminating said characteristic sound signal and thereby resetting said alarm signal and said sound generating means.

**5,568,453**  
**RADIO HAVING A RECORDING AND REPRODUCING UNIT RESPONSIVE TO A RADIO WAVE OF A PREDETERMINED FREQUENCY**  
 Setsuo Okada, Hokkaido, Japan, assignor to Hudson Soft Co., Ltd., Hokkaido, Japan  
 Continuation of Ser. No. 151,644, Nov. 15, 1993, Pat. No. 5,448,534. This application Mar. 27, 1995, Ser. No. 411,188  
 Claims priority, application Japan, Sep. 20, 1993, 5-256513  
 Int. Cl.<sup>6</sup> H04H 9/00

U.S. Cl. 369—7

8 Claims



1. A radio with recording and reproducing functions comprising:
  - a receiving unit including a tuning amplifier, said amplifier generating at least an indicating signal in response to a radio wave of a predetermined frequency;
  - a recording and reproducing unit including an optometric head unit and a disk driver;
  - a mini-disk for loading into said optometric head unit, said mini-disk being rotated within said head unit by said disk driver;
  - an input device for generating instruction signals for said recording and reproducing unit;
  - a controller responsive to said instruction signals and said indicating signal for controlling said recording and reproducing unit, said controller overriding the instruction signals of said input device to said recording and reproducing unit in the presence of said indicating signal, wherein

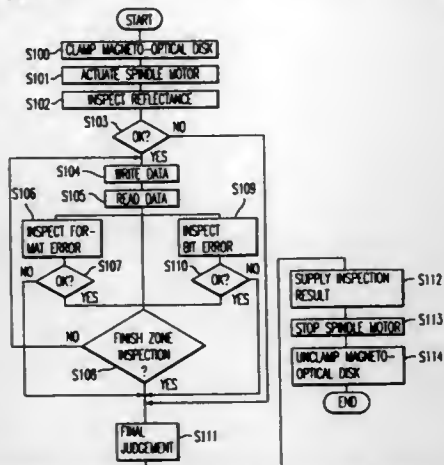
said controller controls the receiving unit so that radio waves of a predetermined frequency for a predetermined radio program are monitored at a predetermined interval in a predetermined area, and the predetermined radio program is recorded in preference to a currently broadcasted program by the recording and reproduction unit when the radio waves of the predetermined frequency are detected.

**5,568,454**  
**APPARATUS AND METHOD FOR DETECTING A DEFECT ON A MAGNETO-OPTICAL DISK**  
 Yasuji Shima, Yokohama, and Tetsuji Iwashita, Ayase, both of Japan, assignors to Tosoh Corporation, Shinnanyo, Japan  
 Continuation of Ser. No. 92,495, Jul. 16, 1993, abandoned, which is a division of Ser. No. 869,831, Apr. 16, 1992, Pat. No. 5,270,879, and a continuation of Ser. No. 490,291, Mar. 8, 1990, abandoned. This application Feb. 28, 1995, Ser. No. 396,091

Claims priority, application Japan, Mar. 9, 1989, 1-56898  
 Int. Cl.<sup>6</sup> G11B 11/00; 3/90

U.S. Cl. 369—13

5 Claims



1. A magneto-optical disk writing and reading method for writing on and reading from a magneto-optical disk for determining whether polarization defects exist in the disk, comprising the steps of:

- rotating the disk;
- concurrently writing data from a plurality of write heads onto each one of a plurality of concentric annular zones of the disk, wherein each write head writes data onto a corresponding one of the plurality of concentric annular zones;
- concurrently reading data with a plurality of read heads from, respectively, each of the plurality of concentric annular zones, wherein each read head reads data from a corresponding one of the plurality of concentric annular zones by
  - generating a laser beam with a laser beam source
  - collimating the laser beam with a collimator lens
  - shaping the laser beam with a shaping prism
  - linearly polarizing the laser beam by passing it through a linear polarizer
  - passing the linearly polarized laser beam that passed through the linear polarizer through a polarizing beam splitter
  - focusing the linearly polarized laser beam that passed through the polarizing beam splitter at a point on said corresponding one of the plurality of concentric annular zones, whereat the linearly polarized laser beam which has passed through the polarizing beam splitter is reflected to form a polarized reflected beam
  - passing the polarized reflected beam through the objective lens
  - splitting the polarized reflected beam that is passed through the objective lens with the polarizing beam splitter into a first reflected portion and a second transmitted portion

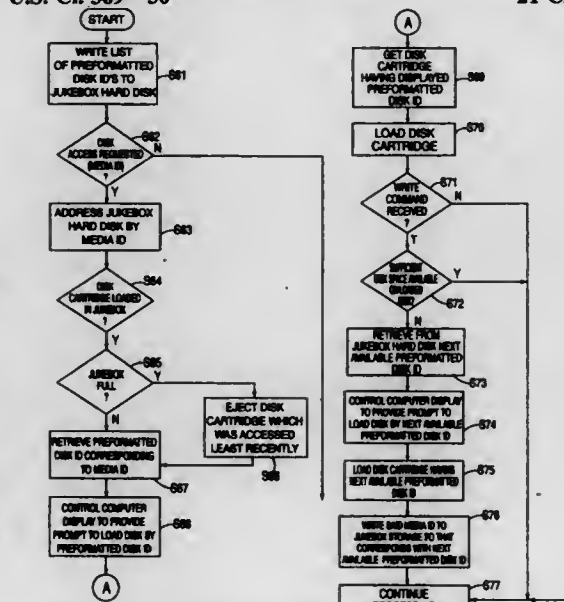
- passing part of the first reflected portion through an analyzer and
- detecting the intensity of light from the part of the first reflected portion that passed through the analyzer, wherein said intensity of light that passed through the analyzer corresponds to a direction of magnetization of said disk in said corresponding one of the plurality of concentric annular zones;

independently moving each write head and each read head diametrically with respect to the disk;  
 determining whether or not the optical disk was written on with a write signal, by comparing a read signal read from the optical disk by a selected read head with a write signal supplied to that portion of the optical disk which was read by the selected read head; and  
 wherein when said step of determining determines that the optical disk was not written on, a polarization defect exists at said portion of the optical disk which was read by said selected read head.

**5,568,455**  
**SYSTEM AND METHOD FOR THE STORAGE AND RETRIEVAL OF OFF-LINE PERFORMATTED OPTICAL MEDIA**  
 James Balsom, Poway, Calif., assignor to Sony Corporation, Tokyo, Japan, and Sony Electronics, Park Ridge, N.J.  
 Filed May 18, 1995, Ser. No. 444,323  
 Int. Cl.<sup>6</sup> G11B 17/22

U.S. Cl. 369—30

21 Claims



1. A method for the storage and retrieval of off-line optical disk media, comprising the steps of:

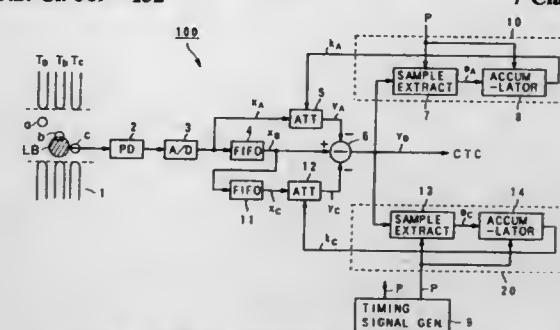
- storing into first data storage means in an optical disk cartridge storage and retrieval device, a list of preformatted disk ID's, wherein each of said preformatted disk ID's is unique to one of a plurality of optical disk cartridges, and wherein said optical disk cartridges are located in said optical disk cartridge storage and retrieval device or off-line;
- sending an inquiry, from a computer connected to said optical disk cartridge storage and retrieval device, said inquiry comprising a request to access a selected one of said plurality of optical disk cartridges, wherein said request to access said selected optical disk cartridge is by a media ID associated with said selected optical disk cartridge;
- addressing said first data storage means through said computer according to said media ID, wherein said media ID corresponds to at least one of said unique preformatted disk ID's;

determining through controller means whether said selected optical disk cartridge is located in said optical disk cartridge storage and retrieval device; and,  
 controlling said computer display through said controller means to provide a prompt to load said selected optical disk cartridge into said optical disk cartridge storage and retrieval device when said selected optical disk cartridge is not stored in said optical disk cartridge storage and retrieval device, said prompt including said unique preformatted disk ID corresponding to said selected optical disk encased by said optical disk cartridge.

**5,568,456**  
**CROSSTALK CANCELER**  
 Hideki Hayashi, and Yukiyoichi Haraguchi, both of Tsurugashima, Japan, assignors to Pioneer Electronic Corporation, Tokyo-to, Japan  
 Filed May 19, 1995, Ser. No. 446,063  
 Claims priority, application Japan, May 23, 1994, 6-108444  
 Int. Cl.<sup>6</sup> G11B 17/22; 7/00

U.S. Cl. 369—132

7 Claims



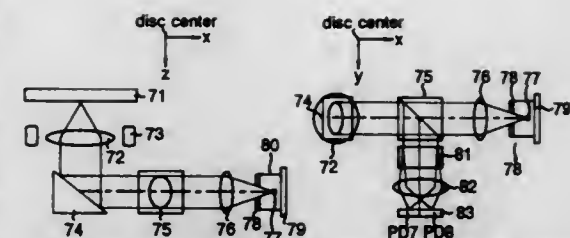
1. A crosstalk canceler comprising:  
 means for obtaining signals of a target track and at least one track neighboring to the target track formed on an optical disc on which crosstalk detection signals are recorded;  
 means for generating timing signal indicating periods of the crosstalk detection signals;  
 means for multiplying the signal of the neighboring track by a coefficient to produce a multiplied signal;  
 means for subtracting the multiplied signal from the signal of the target track to output an output signal;  
 means for detecting levels of the output signal at the periods of the crosstalk detection signals in accordance with the timing signal; and  
 means for accumulating the levels and outputting the accumulated levels as the coefficient.

**5,568,457**  
**OPTICAL PICKUP SYSTEM FOR READING OR WRITING INFORMATION ON DISK USING HOLOGRAM DEVICE AND WOLLASTON PRISM**  
 Keun Y. Yang, Kyungki-do, and Sung W. Noh, Seoul, both of Rep. of Korea, assignors to LG Electronics Inc., Seoul, Rep. of Korea  
 Filed Feb. 24, 1995, Ser. No. 393,838  
 Claims priority, application Rep. of Korea, Feb. 26, 1994, 3608/1994  
 Int. Cl.<sup>6</sup> G11B 7/095

U.S. Cl. 369—44.23

11 Claims

1. An optical pickup system capable of reading out information from a disc or writing information on said disc comprising:  
 a semiconductor laser used as a light source;  
 a polarizing beam splitter for fully reflecting all S-polarized beam component, reflecting some of P-polarized beam component and transmitting the other P-polarized beam component with respect to a laser beam from said semiconductor laser, and fully reflecting all S-polarized beam component,



- reflecting some of P-polarized beam component and transmitting the other P-polarized beam component with respect to a beam reflected by said disc;  
 a collimator lens placed between said semiconductor laser and polarizing beam splitter for changing said laser beam from said semiconductor laser to be a parallel beam to allow said parallel beam to be incident to said polarizing beam splitter, and focusing the P-polarized beam component transmitted through said beam splitter after being reflected by said disc;  
 a reflection mirror placed between said polarizing beam splitter and disc for reflecting the beam transmitted through said polarizing beam splitter toward said disc; and reflecting the beam reflected by said disc toward said polarizing beam splitter;  
 an objective lens placed between said reflection mirror and disc for focusing the beam reflected by said reflection mirror onto said disc, and forming the beam reflected by said disc to a parallel beam to allow said parallel beam to be incident to said reflection mirror;  
 a photodetector divided-by-six for detecting a tracking error and a focus error in accordance with the intensity of beams respectively focusing onto six sections thereof;  
 a hologram device placed between said semiconductor laser and collimator lens for diffracting to allow said laser beam from said semiconductor laser to be incident to said collimator lens, and diffracting to focus beams from said P-polarized beam component transmitted through said polarizing beam splitter onto said photodetector divided-by-six;  
 a bisectonal photodetector for detecting said information written on said disc in accordance with the intensity of beams respectively focusing onto two sections thereof;  
 a Wollaston prism placed between said polarizing beam splitter and bisectonal photodetector for separating beams of P-wave component and S-wave component from a mixed beam having P-wave and S-wave components from said polarizing beam splitter; and  
 a focusing lens for focusing the P-wave and S-wave component beams separated by means of said Wollaston prism onto two sections of said bisectonal photodetector.

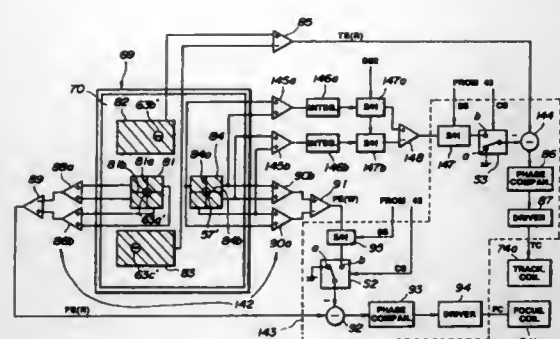
**5,568,458**  
**OPTICAL INFORMATION RECORDING AND REPRODUCING APPARATUS IN WHICH REPRODUCING LIGHT IS USED TO PERFORM SERVO CONTROL HAVING NO OFFSET AT RECORDING MODE**  
 Naoki Tani, Takumi Sugaya, both of Hachioji; Takao Rokutan, Higashimurayama; Mitsuo Oshiba, Hachioji, and Takafumi Sakurada, Akishima, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan  
 Filed Aug. 2, 1993, Ser. No. 100,160  
 Claims priority, application Japan, Aug. 10, 1992, 4-212968  
 Int. Cl.<sup>6</sup> G11B 7/09

U.S. Cl. 369—44.35

4 Claims

1. An optical information recording and reproducing apparatus comprising:  
 recording-light generating means for generating recording light which is used to record information onto an optical recording medium having a plurality of tracks;  
 reproducing-light generating means for generating reproducing light which is used to reproduce the information recorded onto said optical recording medium;  
 an objective optical system for condensing and irradiating said recording light generated by said recording-light generating





means and said reproducing light generated by said reproducing-light generating means, to positions on the optical medium different from each other;

optical detecting means for receiving returned light of said recording light and returned light of said reproducing light condensed and irradiated to said optical recording medium, at positions different from each other;

light-intensity control means for performing such control that a light intensity of said recording light generated by said recording-light generating means during a period of time other than the time of recording which records the information onto said optical recording medium is set to a low light intensity in which a pit is not formed on said optical recording medium;

focus control means for controlling said reproducing light such that the size of an optical spot formed on said optical recording medium by said reproducing light is minimized;

focus detecting means for detecting a focus error signal which expresses a quantity of displacement from a focus condition in which the size of the optical spot formed on said optical recording medium by said recording light is minimized, and focus-error-signal hold means for holding a value of a focus error signal due to said recording light, said focus-error signal hold means being under control of said focus control means according to focus control of said reproducing light.

5,568,459

# OPTICAL DISK APPARATUS AND OPTICAL DISK HAVING A HARD ADDRESS MARK AREA

Hiroki Takamori, and Masahiro Honjo, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 198,619, Feb. 18, 1994, abandoned.

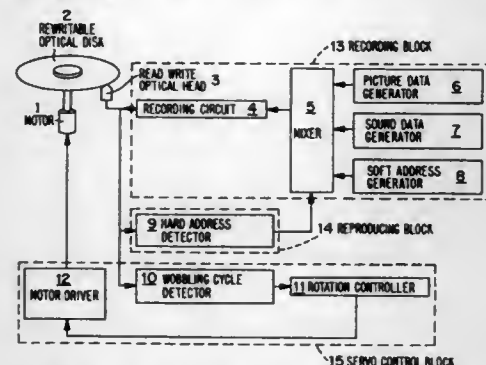
This application Jan. 11, 1996, Ser. No. 587,827

Claims priority, application Japan, Feb. 18, 1993, 5-028745

Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369—50

23 Claims



1. An optical disk apparatus comprising:  
a rewritable optical disk having a spiral groove which is used as a track for reproducing and recording digital information, said track including:  
(a) hard address mark areas positioned exclusively at every intersection of said track and a single virtual straight line passing through the center of said rewritable optical disk, said hard address mark areas are pre-formed when pressing said

rewritable optical disk and said hard address mark areas have hard address mark information,

(b) a periodic radial wobble groove containing frequency information at a specified period, said periodic radial wobble groove is pre-formed when pressing said rewritable optical disk, and

(c) data areas formed by partitioning said track with said hard address mark areas;

read and write optical head means for reproducing information on said track and for recording a signal to be recorded on said track;

servo control means for controlling rotation of said rewritable optical disk at a constant linear velocity in response to said frequency information from said periodic radial wobble groove;

hard address detecting means for detecting said hard address mark information and position information of said hard address mark areas, and producing an output signal;

soft address generating means for generating a soft address mark area signal which divides said data areas into a plurality of sectors, each sector having a predetermined equal length, wherein all of said data areas have one hard address mark area and two or more soft address mark areas;

mixing means for (a) processing an information signal to be recorded and said soft address mark area signal from said soft address generating means into signals having a length which can be recorded in one of said plurality of sectors in response to said output signal from said hard address detecting means, (b) positioning an area having a length less than said predetermined sector length in the proximity of said hard address mark area as a dummy area, and (c) producing a mixing signal which contains said processed information signal; and

recording means for converting said mixing means into a write signal for said read and write optical head means.

5,568,460

# OPTICAL RECORDING AND/OR REPRODUCING APPARATUS AND METHOD UTILIZING STIMULATED PHOTON ECHO

Seishiro Saikan, Osaka; Kiyoshi Uchikawa, Tokyo, and Hisao Ohsawa, Yachiyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 155,537, Nov. 22, 1993, abandoned, which is a continuation of Ser. No. 600,717, Oct. 22, 1990, abandoned, which is a continuation-in-part of Ser. No. 477,446, Feb. 9, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 480,387

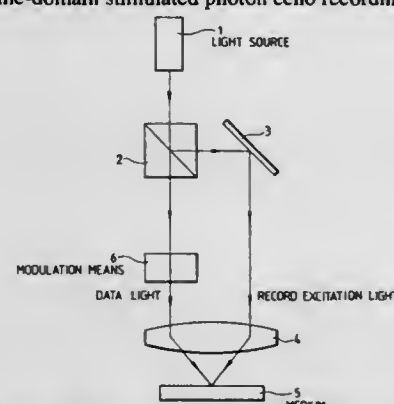
Claims priority, application Japan, Mar. 27, 1989, 1-74197; Oct. 24, 1989, 1-276395; Oct. 26, 1989, 1-279559; Dec. 11, 1989, 1-318905

Int. Cl.<sup>6</sup> G11C 13/04; G11B 7/00

U.S. Cl. 369—100

19 Claims

12. A time-domain stimulated photon echo recording method for



recording information on a recording medium capable of persistent Spectral Hole Burning, said method comprising the steps of:  
irradiating the same location of said medium with two incoherent luminous fluxes emitted from a single light source; and

delaying, based upon information to be recorded, the incident time of one of said two incoherent luminous fluxes on said recording medium with respect to the other, and thereby persistently recording on said location information corresponding to an amount of said delaying.

5,568,461

# OPTICAL INFORMATION RECORDING AND REPRODUCING APPARATUS

Kenichi Nishiuchi, Moriguchi; Noyasu Miyagawa, Suita; Eiji Ohno, Hirakata, and Nobuo Akahira, Yawata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

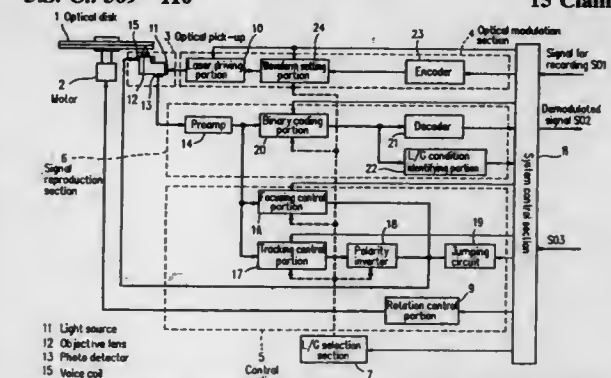
Filed Apr. 20, 1995, Ser. No. 425,902

Claims priority, application Japan, Apr. 20, 1994, 6-81533

Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369—110

15 Claims



1. An optical information recording and reproducing apparatus for recording and reproducing an information signal on/from both concave portions and convex portions of guide grooves formed on a recording medium, the recording medium having: a substrate on which the guide grooves consisting of the concave portions and the convex portions are formed; and a recording thin film, formed on the guide grooves, on which variations to be detected optically are generated by irradiation of light,

the optical information recording and reproducing apparatus comprising:

an optical means, having a light source, for focusing a light beam emitted from the light source on the recording medium using an objective lens;

a focusing control means for controlling so as to make a focal point of the light beam correspond to a position of the recording thin film;

a tracking control means for controlling a position of the light beam in a direction substantially vertical to the guide grooves so that the light beam tracks the guide grooves;

a selection means for selecting which of the concave portions and the convex portions of the guide grooves are used for recording the information signal thereon or reproducing a recorded information signal therefrom;

a polarity inverting means for inverting a polarity of an output signal from the tracking control means depending on a result selected by the selection means;

a waveform setting means for setting a modulation pattern for the light beam to be irradiated on the recording medium in accordance with the information signal; and

a signal reproduction means for demodulating the information signal from a light reflected or transmitted by recorded marks recorded on the recording medium;

wherein at least one of the focusing control means, the tracking control means, the waveform setting means and the signal reproduction means has at least two kinds of operating conditions for recording and reproducing the information signal on/from the concave portions and the convex portions of the guide grooves,

and wherein the operating conditions are selected depending on the result selected by the selection means.

5,568,462

# KNIFE EDGE METHOD FOR USE IN DETECTING A FOCUSING ERROR IN AN OPTICAL PICKUP SYSTEM

Chan-Kyu Park, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

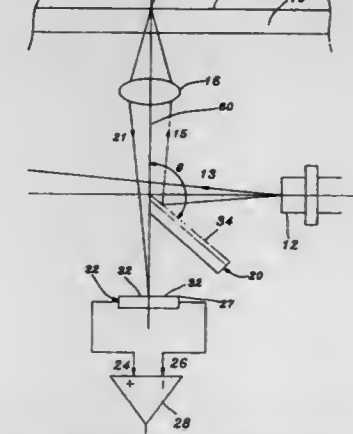
Filed Nov. 15, 1994, Ser. No. 339,620

Claims priority, application Rep. of Korea, Nov. 16, 1993, 1993-24391

Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369—112

2 Claims



1. An optical pickup system for determining a focussing error comprising:

a light source for generating a light beam;

an optical detector, including a reception surface being equally divided to provide a first and a second photoelectric cells, each of the photoelectric cells generating an output in the form of a light intensity measurement, wherein a center of the reception surface of the optical detector and a convergence point located on an optical disk form an optical axis;

a knife edge, provided with a reflection surface and disposed between the optical disk and the optical detector, for reflecting the light beam from the light source to the recording surface of the optical disk, utilizing the reflection surface thereof, wherein the knife edge is arranged in such a way that it is inclined at a predetermined angle  $\theta$  with respect to the optical axis;

an objective lens, disposed between the knife edge and the optical disk, for converging the light beam reflected by the knife edge onto the recording surface and for converging the reflected light beam from the recording surface onto the knife edge and the optical detector; and

a differential amplifier, connected to the first and the second photoelectric cells, for generating a focussing error signal by comparing the outputs from the first and second photoelectric cells of the optical detector.

5,568,463

# SEMICONDUCTOR LASER DEVICE TO DETECT A DIVIDED REFLECTED LIGHT BEAM

Kenji Sahara; Hironobu Narui; Masato Doi, and Osamu Matsuda, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 7, 1995, Ser. No. 399,642

Claims priority, application Japan, Mar. 8, 1994, 6-037255

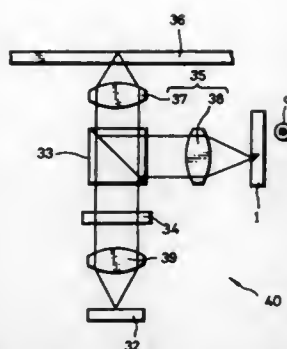
Int. Cl.<sup>6</sup> G11B 7/13

U.S. Cl. 369—112

3 Claims

1. An optical device for detecting a magneto-optical signal comprising:

an optical element having a common substrate, a light-emitting portion and a light receiving portion, said light-emitting portion and said light receiving portion being closely disposed on said common substrate and said light receiving portion receiv-



ing and detecting reflected-back light in a single beam obtained from a magneto-optical medium after light emitted from said light-emitting portion was reflected on said magneto-optical medium; and another light receiving element, wherein said single beam of reflected-back light from said magneto-optical medium is divided into two beams, one reflected-back light beam is received and detected by said light receiving portion of said optical element and the other reflected-back light beam is received and detected by said another light receiving element.

5,568,464

# SEMICONDUCTOR LASER DRIVING APPARATUS UTILIZING THREE CURRENT SOURCES TO CONTROL READ AND WRITE LIGHT POWER

Yuji Horie, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

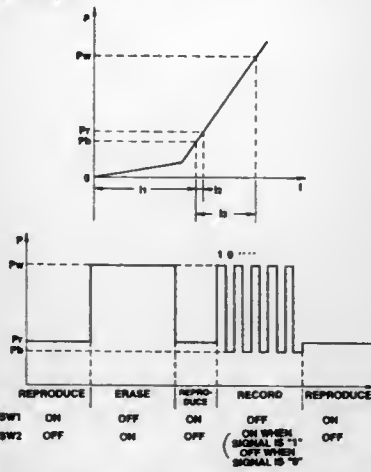
Filed Nov. 17, 1994, Ser. No. 343,852

Claims priority, application Japan, Nov. 18, 1993, 5-289348

Int. Cl.<sup>6</sup> G11B 7/00; H01S 3/13

U.S. Cl. 369—116

13 Claims



1. A semiconductor laser driving apparatus for use in an information recording/reproducing apparatus that records and reproduces information by illuminating a recording medium with a laser beam, said semiconductor laser driving apparatus comprising:

- a semiconductor laser for generating said laser beam;
- a photo detector for detecting the output of said semiconductor laser;
- a first current source for generating a base optical power of the output of said semiconductor laser wherein said base optical power is used in recording information;
- a second current source for adjusting a reproducing optical power of the output of said semiconductor laser wherein said reproducing optical power is used to reproduce information;
- a third current source for adjusting a recording optical power of the output of said semiconductor laser wherein said recording optical power is used to record information; and
- optical power control means for controlling the optical output power of said semiconductor laser, wherein the reproducing

optical power used to reproduce information is generated by the sum of a first current provided by the first current source and a second current provided by the second current source, wherein the recording optical power used to record information is generated by the sum of the first current provided by the first current source and a third current provided by the third current source, and wherein the base optical power used in recording information is generated by the first current provided by the first current source.

5,568,465

# READING FROM RECORD MEDIUM IN EITHER AN INVERTED OR NON-INVERTED SIGNAL-PROCESSING MODE

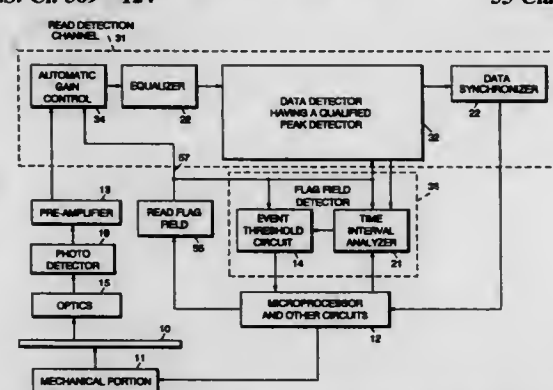
Robert A. Hutchins, and Glen A. Jaquette, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 318,957, Oct. 6, 1994, abandoned. This application Apr. 7, 1995, Ser. No. 416,399

Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369—124

53 Claims



1. A method of signal processing a stream of pulse signals, including steps of:

- selecting a source of said pulse signals that supplies interleaved groups of said pulse signals in said stream respectively having first ones of said groups having first ones of said pulse signals, said first ones of said pulse signals having variable repetitive pulse signal rate such that said variable repetitive pulse signal rate includes a pulse signal rate less than a predetermined maximum repetitive pulse signal rate, and second ones of said groups having second ones of said pulse signals having a given repetitive pulse signal rate not greater than said predetermined maximum repetitive pulse signal rate, data being carried in said pulse signals as amplitude peaks in said pulse signals;

first, receiving from said source for processing said first group of said variable rate pulse signals;

in said processing, first inverting signal polarity of said received first group pulse signals;

in said processing, detecting negative peaks of said inverted and received first group of pulse signals for indicating said data carried by said received first group of pulse signals;

second, indicating that said second group of said pulse signals are to be received and processed; and

receiving and processing said second group of said pulse signals including detecting the positive peaks of said received second group of said pulse signals for indicating data in said received second group of said pulse signals.

5,568,466

# MAGNETO-OPTICAL DISC

Tsuyoshi Komaki; Hiroyuki Endo; Hideki Hirata, and Isamu Kuribayashi, all of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

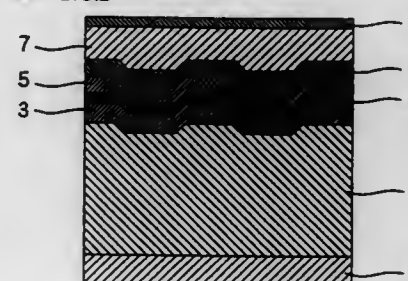
Filed Jul. 17, 1995, Ser. No. 503,084

Claims priority, application Japan, Aug. 10, 1994, 6-209270; Nov. 21, 1994, 6-311229

Int. Cl.<sup>6</sup> G11B 11/00; 3/70

U.S. Cl. 369—275.2

11 Claims



1. In a magneto-optical disc comprising on a substrate a recording layer and a protective film of radiation-cured resin, wherein information is written in the recording layer with the aid of a magnetic head in sliding contact with the protective film,

the improvement wherein in a micro-vibration scratch test made on the protective film by setting the disc in a thin film scratch tester equipped with a diamond indenter having a radius of curvature R (μm) of up to 50 μm, the protective film satisfies the relationship:  $0.8 \leq L/R^2 \leq 2.7$  wherein L is the critical load (N.m) under which the thin film is scratched.

5,568,467

# INFORMATION RECORDING FORMAT HAVING A PLURALITY OF BANDS WITH INDEPENDENT READ AND WRITE CONTROL DATA

Masahiro Inagaki; Yoshihisa Fukushima, both of Osaka; Haruo Yamashita, Ibaragi; Yasushi Azumatsuni, Takatsuki, and Hiroshi Hamasaka, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

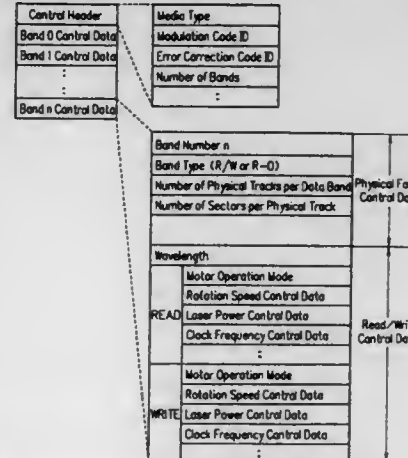
Filed Apr. 28, 1994, Ser. No. 234,565

Claims priority, application Japan, Apr. 28, 1993, 5-102377

Int. Cl.<sup>6</sup> G11B 7/24

U.S. Cl. 369—275.3

10 Claims



1. A data recording medium comprising:
  - a data zone having a plurality of bands composed of at least one track, in which user data are written; and
  - a control zone in which a plurality of band control data are written, each of the band control data corresponding to a respective one of the plurality of bands;

wherein the band control data are independent from each other, and the band control data include read control data for a READ operation and write control data for a WRITE operation which are independent from each other.

5,568,468

# USAGE PARAMETER CONTROL APPARATUS FOR PERFORMING A PLURALITY OF CONFORMANCE CHECKING OPERATIONS AT HIGH SPEED

Nobuo Ogasawara, Yokohama; Noboru Endo, Kodaira; Kazuo Miki, Koganei, and Akihiko Takase, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

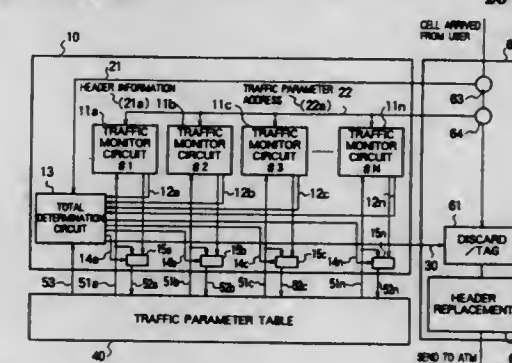
Filed Nov. 30, 1994, Ser. No. 351,148

Claims priority, application Japan, Dec. 6, 1993, 5-304943

Int. Cl.<sup>6</sup> H04J 3/14; H04L 12/26

U.S. Cl. 370—13

26 Claims



1. A policing circuit in an asynchronous transfer mode network comprising:

- monitor means having a plurality of monitor circuits for independently monitoring traffic of an input cell for each of a plurality of monitoring items; and
- determination means including a plurality of determination circuits corresponding to said monitor circuits, each determination circuit receives the output of a corresponding monitor circuit and cell identification information contained in the input cell to determine whether the input cell of the asynchronous transfer mode network is to be tagged, discarded or permitted for input in accordance with a cell processing rule determined for communication service to be provided by the asynchronous transfer mode network.

5,568,469

# METHOD AND APPARATUS FOR CONTROLLING LATENCY AND JITTER IN A LOCAL AREA NETWORK WHICH USES A CSMA/CD PROTOCOL

William P. Sherer, Sunnyvale; Lai-Chin Lo, Campbell, both of Calif., and John F. Hickey, Killenau, Ireland, assignors to 3COM Corporation, Santa Clara, Calif.

Filed Sep. 27, 1994, Ser. No. 313,674

Int. Cl.<sup>6</sup> H04J 3/02

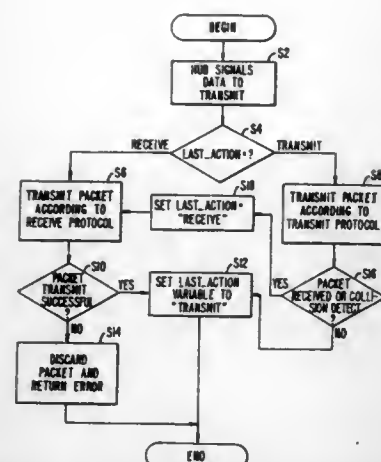
U.S. Cl. 370—17

14 Claims

1. In a carrier-sense/collision-detect network, a method for transferring data over a communication channel between a first node and a second node whereby said first node ensures fairness of access and low bounded maximum access latency, comprising the steps of:

- forming the data into packets;
- at said first node, detecting the state of a last action state variable;
- if the last action variable indicates the last action performed by said first node was a receive action, transmitting a packet from said first node to said second node according to a last-action-equals-receive protocol such that said packet from said first node is given priority over a packet originating at said second node;





if the last action variable indicates the last action performed by said first node was a transmit action, transmitting a subsequently available packet from said first node to said second node according to a last-action-equals-transmit protocol such that transmissions from said first node are deferred if a packet from said second node is detected on said communication channel thereby giving priority to a packet originating at said second node; and setting said last action state variable to conform to the last action performed by said first node on said channel.

5,568,470

# METHOD FOR CONTROLLED-LATENCY TRANSFER OF TRANSMIT ATM TRAFFIC AND SYNCHRONOUS FEEDBACK OVER A PHYSICAL INTERFACE

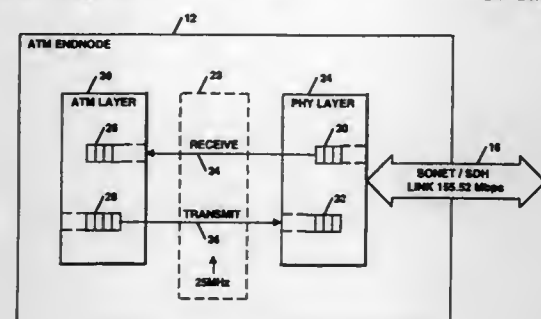
Michael Ben-Nun, Jerusalem, Israel; Winthrop J. Wu, Marlborough, and Niamh Darcy, Acton, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 28, 1995, Ser. No. 430,945

Int. Cl. 6 H04L 12/54

U.S. Cl. 370-17

14 Claims



EXEMPLARY ATM END NODE

1. A method for a controlled-latency transfer of transmit asynchronous transfer mode (ATM) traffic in an ATM endnode comprising the steps of:
  - providing the endnode with an ATM layer, the ATM layer having a first-in-first-out (FIFO) queue for transmitting transmit ATM traffic;
  - providing the endnode with a PHY layer, the PHY layer having a FIFO queue for receiving the transmit ATM traffic from the ATM layer;
  - providing an interface between the FIFO queue of the ATM layer and the FIFO queue of the PHY layer for the flow of the transmit ATM traffic;
  - providing a signal in the ATM endnode;

providing a state machine in the ATM endnode, the state machine monitoring the signal in the ATM endnode; stalling the transfer of the transmit ATM traffic from the FIFO of the ATM layer to the FIFO of the PHY layer over the interface when the signal and the state machine indicate that the FIFO of the PHY layer is full or nearly full; and transmitting the transmit ATM traffic from the FIFO of the ATM layer to the FIFO of the PHY layer over the interface.

5,568,471

# SYSTEM AND METHOD FOR A WORKSTATION MONITORING AND CONTROL OF MULTIPLE NETWORKS HAVING DIFFERENT PROTOCOLS

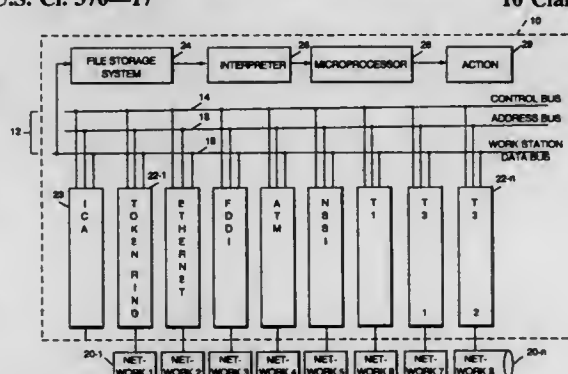
Paul C. Hershey, Manassas, Va., and John G. Wacławsky, Frederick, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 6, 1995, Ser. No. 524,029

Int. Cl. 6 H04J 3/14; H04L 12/26; 12/46

U.S. Cl. 370-17

10 Claims



1. A workstation for monitoring and controlling multiple communication networks using different protocols comprising:
  - a common bus coupling the workstation to a plurality of network adapters, the bus including data, address and control lines; each adapter connected to a different network using a protocol;
  - a programmable digital filter coupled across the bus for collecting data, address and control information indicative of traffic events occurring on the common bus for each network, the filter identifying the protocols on the bus to count traffic events for each network;
  - means for receiving and storing in files information indicative of traffic events occurring on the address, data, and control lines for the networks;
  - an interpreter accessing the stored files for analyzing the performance of each network and generating (i) a graphical display of conditions existing in the networks and (ii) commands for correcting traffic problems and/or balancing communication loading among the networks as identified from the traffic events occurring in the networks; and
  - a processor for implementing the commands in the networks to overcome such traffic conditions and balance communication loading among the networks.

5,568,472

# CODE DIVISION MULTIPLE ACCESS MOBILE COMMUNICATION SYSTEM

Narumi Umeda, Yokohama; Tadashi Matsumoto, and Youichi Douzono, both of Yokosuka, all of Japan, assignors to NTT Mobile Communications Network Inc., Tokyo, Japan  
PCT No. PCT/JP93/01592, § 371 Date Jun. 29, 1994, § 102(e)  
Date Jun. 29, 1994, PCT Pub. No. WO94/10766, PCT Pub. Date May 11, 1994

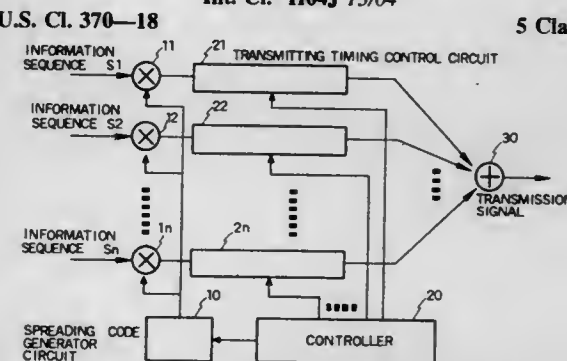
PCT Filed Nov. 4, 1993, Ser. No. 256,230

Claims priority, application Japan, Nov. 4, 1992, 4-295340; Nov. 20, 1992, 4-312280; Dec. 24, 1992, 4-344740; Dec. 24, 1992, 4-344741

Int. Cl. 6 H04J 13/04

U.S. Cl. 370-18

5 Claims



1. A code division multiple access mobile communication system which uses code division multiple access for communications between a plurality of mobile stations and a base station in each of a plurality of cells wherein a plurality of different sets each of a plurality of different spreading codes are each allotted to said cells, respectively, and a same one of sets of said plurality of different spreading codes is allotted to at least two of the plurality of cells spatially far apart from each other;

the base station in each of said plurality of cells comprising a plurality of transmitting devices each of which spreads a plurality of information sequences with the same one of said spreading codes allotted to the cell to produce a plurality of spread information sequences, delays the plurality of spread information sequences by corresponding delay times, respectively, and then transmits said plurality of delayed spread information sequences, respectively, to said plurality of mobile stations; and

each of said mobile stations in each cell having a receiving device which receives a signal from said base station in said cell, despreads the received signal with one of said spreading codes of one set allotted to the cell to produce a despread signal, and extracts information from said despread signal at one of said transmitting timings corresponding to the respective delay times to reproduce an information sequence.

5,568,473

# METHOD AND APPARATUS FOR SIMPLE AND EFFICIENT INTERFERENCE CANCELLATION FOR CHIP SYNCHRONIZED CDMA

Farhad Hemmati, Rockville, Md., assignor to Comsat Corporation, Bethesda, Md.

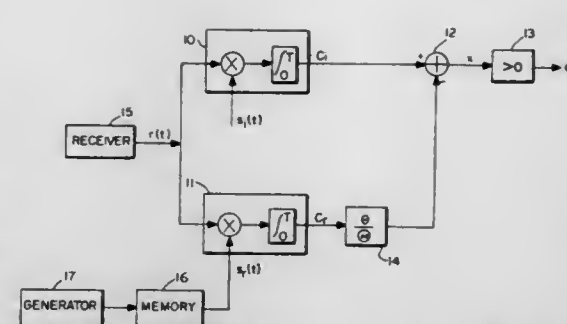
Filed Dec. 8, 1994, Ser. No. 354,758

Int. Cl. 6 H04B 7/216; H04J 13/04

U.S. Cl. 370-18

10 Claims

1. In a Code Division Multiple Access (CDMA) spread spectrum receiver, apparatus for cancelling interference from other CDMA spread spectrum transmitters, said apparatus comprising:
  - first correlating means for receiving a composite signal of plural, overlapping spread-coded signals, and applying a first spreading sequence to said composite signal to produce a first output, said first output comprising an intended signal and first interference components;



second correlating means for receiving and decoding said composite signal with a reference sequence whose cross correlation with code sequences of said other CDMA spread spectrum transmitters is substantially a constant and producing a second output with second interference components, said second interference components being substantially equivalent to said first interference components; and combining means for combining said first and second outputs such that said first and second interference components substantially cancel each other and produce a third output representing said intended signal.

5,568,474

# PING-PONG COMMUNICATION METHOD AND APPARATUS

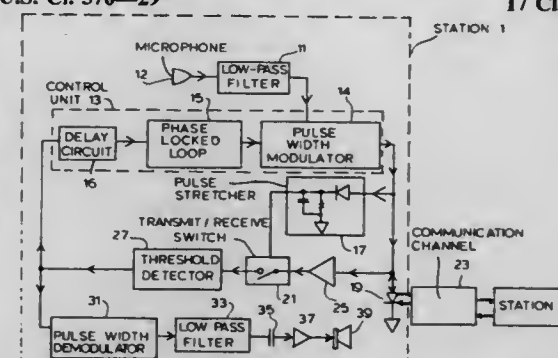
Charles H. Wissman, Oceanside, Calif., assignor to Tempo Research Corporation, Vista, Calif.

Filed Jan. 30, 1995, Ser. No. 380,603

Int. Cl. 6 H04L 7/04

U.S. Cl. 370-29

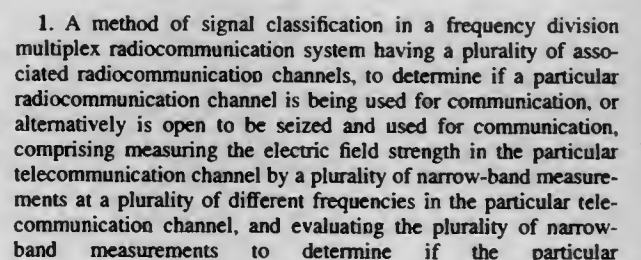
17 Claims



7. A transceiver for transmitting and receiving information comprising:
  - a) a receive circuit for receiving a series of incoming voltage pulses;
  - b) a transmit circuit for transmitting a series of outgoing voltage pulses, the transmit circuit including a frequency control mechanism operatively coupled to the receive circuit to receive the incoming series of voltage pulses and in response to receipt thereof, to adjust the frequency of the series of outgoing voltage pulses such that the incoming and outgoing series of voltage pulses are transmitted at a single frequency, and such that the transmit circuit is not transmitting an outgoing voltage pulse at the same time the receive circuit is receiving an incoming voltage pulse.

## 17 Claims

## 20 Claims











means for selectively disabling the use of said subset of operational elements, as identified by said retrieving means, by said customer system, comprising:

means for isolating said subset of operational elements by disabling any said interconnection paths connected to said subset of operational elements,

means for listing at least one fence mode operational on said subset of operational element in said portion of said data in said retrieving means to identify a mode in which said subset of operational elements is disabled,

means, responsive to said apparatus requesting application of a fence mode to one of said subset of operational elements for comparing said requested fence process with said at least one fence mode listed with said portion of said data,

means, responsive to said comparing means matching said requested fence mode with one of said listed modes, for accepting application of said requested fence to said mode requested operational element.

5,568,492

# CIRCUIT AND METHOD OF JTAG TESTING MULTICHIP MODULES

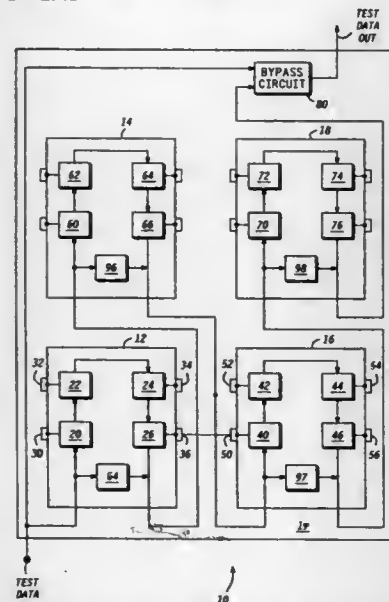
Andrew Flint, Chandler; James R. Trent, Mesa, and Jerome A. Grula, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 6, 1994, Ser. No. 254,846

Int. Cl.<sup>6</sup> H04B 17/00

U.S. Cl. 371—22.1

19 Claims



10. A multichip module compatible with JTAG testing, comprising:

- an IC die disposed on a substrate with a plurality of serially coupled registers where a first register receives a test data input signal to the multichip module and a last register provides a first test data output signal;
  - a delay register having an input coupled for receiving said test data input signal; and
  - a first multiplexer having first and second data inputs, a control input and an output, said first data input being coupled to said output of said delay register, said second data input being coupled for receiving said first test data output signal, said control input receiving a control signal that selects between said test data input signal and said first test data output signal as a second test data output signal of the multichip module.
19. A method of JTAG testing a multichip module, comprising the steps of:
- monitoring a test data input signal for a predetermined sequence of logic states;

enabling a path for said test data input signal through serially coupled by registers within a plurality of IC die disposed on a substrate of the multichip module upon detecting other than said predetermined sequence of logic states of said test data input signal; and

bypassing said test data input signal around said serially coupled by registers within said plurality of IC die disposed on said substrate of the multichip module upon detecting said predetermined sequence of logic states of said test data input signal while delaying said test data input signal by one clock cycle.

5,568,493

# SCAN BASED TESTING FOR ANALOG MODULE WITHIN A MIXED ANALOG AND DIGITAL CIRCUIT

John O. Morris, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

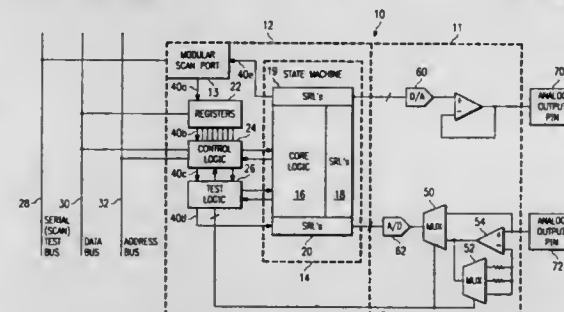
Continuation of Ser. No. 961,743, Oct. 16, 1992, abandoned.

This application Mar. 17, 1995, Ser. No. 405,740

Int. Cl.<sup>6</sup> G01R 31/27

U.S. Cl. 371—22.3

19 Claims



1. An integrated circuit, comprising: analog operation circuitry having a plurality of nodes for input and output of signals during normal operation, a plurality of scan cells connected to certain of said nodes for containing signals to be utilized in performing selected tests, a test port for controlling test operations connected to said plurality of scan cells, said test port being for sending digitally encoded analog test signals concurrently with digital signals to said scan cells, and other circuitry for configuring a portion of said analog circuitry for performing one of said selected tests responsive to a preselected test output signal.

5,568,494

# ENCODING OR DECODING DEVICE COMPRISING A PAGED MEMORY

Bernardus A. M. Zwaans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

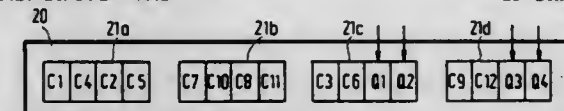
Filed Dec. 12, 1994, Ser. No. 353,837

Claims priority, application European Pat. Off., Dec. 16, 1993, 93203545

Int. Cl.<sup>6</sup> G11C 29/00

U.S. Cl. 371—40.1

13 Claims



1. An encoding device, comprising a first encoder for forming respective first blocks in a first error protection code, a memory for the storage of data units of the first blocks, the memory being page oriented where successive accessing of different locations in a same page require only a single page addressing operation, read means for reading a sub-set of the data units, comprising one data unit from each first block, from the memory, and

a second encoder for forming a second block in a second error protection code by encoding the sub-set, and the encoding device being arranged for writing data units of a particular first block in the memory distributed among several pages, with at least two data units of the particular first block being written on one and the same page at different addresses within the same page on the basis of a first, single page addressing operation, and writing further data units of further first blocks also distributed among the several pages, and the read means being arranged for reading the data units of the sub-set successively from different pages, at least two data units then being read on the basis of a second, single page addressing operation.

5,568,495

# MODULAR AUDIO DATA PROCESSING ARCHITECTURE

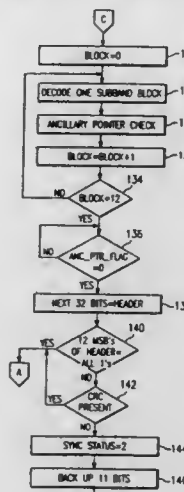
Frank L. Laczo, Sr., Allen, and Karen L. Walker, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 100,591, Jul. 30, 1993. This application Jun. 7, 1995, Ser. No. 484,418

Int. Cl.<sup>6</sup> G06F 11/10

U.S. Cl. 371—471

6 Claims



1. A method of processing a data stream, comprising the steps of: receiving the data stream in an input buffer; detecting a loss of synchronization with the data stream; providing a predetermined set of data corresponding to muted output to an execution controller responsive to said step of detecting; providing a signal to the execution controller instructing the execution controller to continue operating on the predetermined set of data until synchronization is recovered; and recovering synchronization within the data stream.

5,568,496

# LASER OPTICS PROTECTIVE DEVICE

Brian L. Justus; Alan L. Huston; Anthony J. Campillo, all of Springfield, and Charles D. Merritt, Burke, all of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

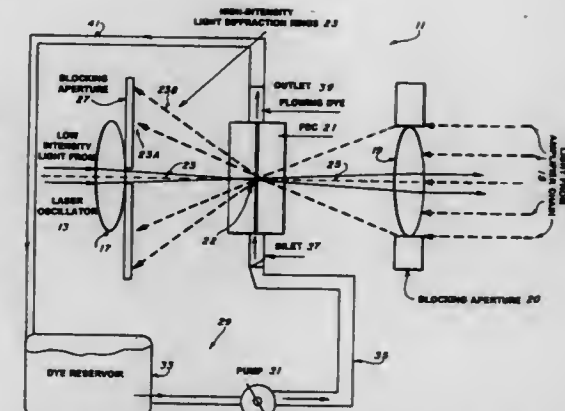
Filed Nov. 30, 1994, Ser. No. 351,070

Int. Cl.<sup>6</sup> H01S 3/10

U.S. Cl. 372—11

17 Claims

1. A passive, broadband, thermal optical limiter disposed between a laser oscillator and a laser amplifier system for providing protection for optical components in the laser oscillator from



damage due to amplified optical feedback from the laser amplifier system, said broadband thermal optical limiter comprising:

- first optical means for focusing the amplified optical feedback to a focal point;
- a flowing dye cell disposed near the focal point, said flowing dye cell being responsive to the focused amplified optical feedback for defocusing and highly aberrating said focused amplified optical feedback into a plurality of rings about an optical axis;
- second optical means for passing only a small portion of the aberrated optical feedback optical means; and
- a blocking aperture disposed around said second optical means for substantially blocking all of the aberrated optical feedback deflected by said flowing dye cell and for passing there-through into said second optical means only a small portion of the aberrated optical feedback from said flowing dye cell.

5,568,497

# CHALCOGENIDE OPTICAL PUMPING SYSTEM HAVING BROAD EMISSION BAND

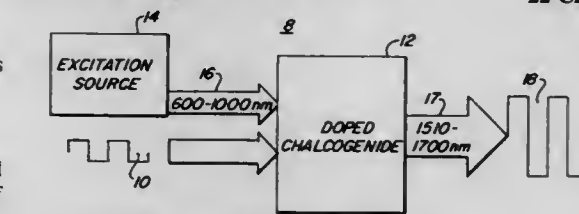
Stephen G. Bishop, Champaign; Shiqun Gu, and Douglas A. Turnbull, both of Urbana, all of Ill., assignors to The Board of Trustees of the University of Illinois, Ill.

Filed Jun. 7, 1995, Ser. No. 487,180

Int. Cl.<sup>6</sup> H01S 3/10

U.S. Cl. 372—40

22 Claims



1. An optical emission system comprising: a chalcogenide glass; a rare earth dopant within the chalcogenide glass; an excitation source for inducing a broad range of optical emissions from the chalcogenide glass, said broad range exceeding approximately 30 nm in width.

5,568,498

# LASER DEVICE WITH LASER STRUCTURES CONNECTED IN SERIES IN AN OPTICAL CAVITY

Olle Nilsson, Fjärås, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Sep. 9, 1994, Ser. No. 303,624

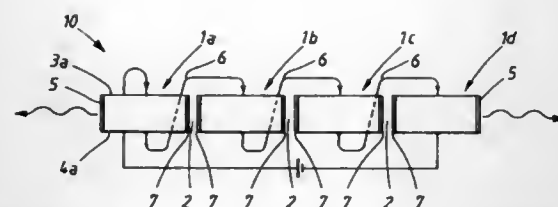
Claims priority, application Sweden, Sep. 10, 1993, 9302951

Int. Cl.<sup>6</sup> H01S 3/18;3/25

U.S. Cl. 372—43

16 Claims

1. An edge emitting laser device with at least two in the same optical cavity arranged laser structures, wherein the laser structures



are substantially aligned in an optical direction of propagation; each laser structure comprises an active region; the active regions are separately formed and electrically connected in series; and outer surfaces of the device comprise cleaved reflecting surfaces, and those surfaces of each laser structure which form a border to another laser structure are antireflective.

5,568,499

# OPTICAL DEVICE WITH LOW ELECTRICAL AND THERMAL RESISTANCE BRAGG REFLECTORS

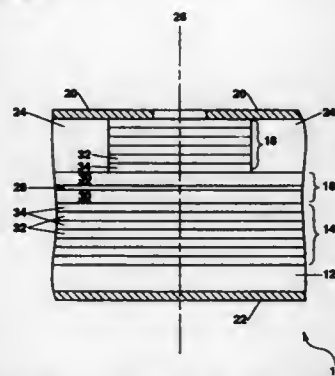
Kevin L. Lear, Albuquerque, N.M., assignor to Sandia Corporation, Albuquerque, N.M.

Filed Apr. 7, 1995, Ser. No. 418,730

Int. Cl.<sup>6</sup> H01S 3/19

U.S. Cl. 372-45

34 Claims



1. An optical device comprising at least one distributed Bragg reflector mirror having at least one pair of semiconductor layers epitaxially grown one upon another, one layer in each pair having an index of refraction which is different from the index of refraction of the other layer in each pair, any two adjacent semiconductor layers of the distributed Bragg reflector mirror forming a heterojunction, a first layer of the two adjacent layers having a first composition and a first bandgap and a second layer of the two adjacent layers having a second composition and a second bandgap, the second bandgap being greater than the first bandgap,

characterized in that a first region of each heterojunction adjacent to the first layer is composition graded from the first composition to a third composition intermediate between the first and second compositions, and a second region of each heterojunction adjacent to the second layer is composition graded from the third composition to the second composition, the second region having a smaller variation in composition with distance in the growth direction than the first region.

5,568,500

# SEMICONDUCTOR LASER

Akira Furuya, Chikashi Anayama, and Makoto Kondo, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 15, 1994, Ser. No. 212,790

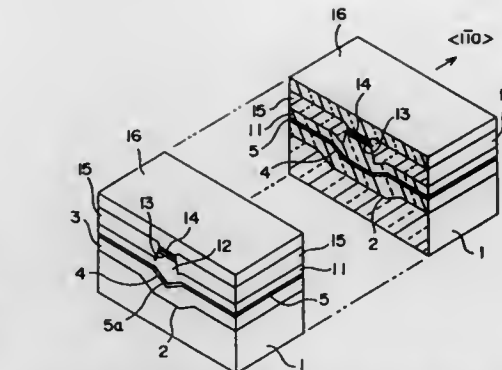
Claims priority, application Japan, Apr. 15, 1993, 5-088582

Int. Cl.<sup>6</sup> H01S 3/18

U.S. Cl. 372-46

11 Claims

1. A semiconductor laser comprising:



electrodes for supplying an electric current, which drives said semiconductor laser;

a substrate having a groove;

a first cladding layer formed on the substrate;

an active layer formed on the first cladding layer, wherein active layer at one edge for outputting light is formed into a V-shape and the active layer at the other edge is formed in a concave shape with a flat bottom;

a second cladding layer formed on the active layer; and

a contact layer coupled to the second cladding layer.

5,568,501

# SEMICONDUCTOR LASER AND METHOD FOR PRODUCING THE SAME

Nobuyuki Otsuka, Kawanishi; Masahiro Kitoh, Toyonaka; Masato Ishino, Shijonawate, and Yasushi Matsui, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

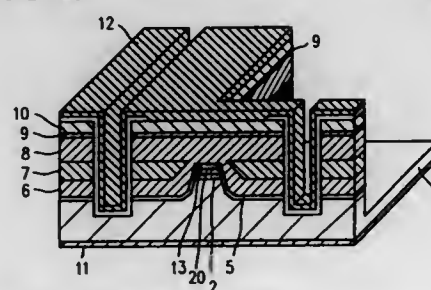
Filed Oct. 31, 1994, Ser. No. 331,939

Claims priority, application Japan, Nov. 1, 1993, 5-273441; May 30, 1994, 6-116616

Int. Cl.<sup>6</sup> H01S 3/19

U.S. Cl. 372-46

19 Claims



1. A semiconductor laser comprising:

a semiconductor substrate of a first conductivity type;

a stripe-shaped multilayer structure, formed on the semiconductor substrate, the stripe-shaped multilayer structure including an active layer; and

a current blocking portion formed on the semiconductor substrate on both sides of the stripe-shaped multilayer structure, wherein the current blocking portion has a first current blocking layer of a second conductivity type, and a second current blocking layer of the first conductivity type formed on the first current blocking layer,

the first current blocking layer includes a low-concentration region having a relatively low concentration of an impurity of the second conductivity type, and a high-concentration region having an impurity concentration which is higher than that of the low-concentration region, and

the low-concentration region is provided at a position closer to the stripe-shaped multilayer structure than the high-concentration region.

5,568,502

# SEMICONDUCTOR LASER DEVICE

Misao Hironaka, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

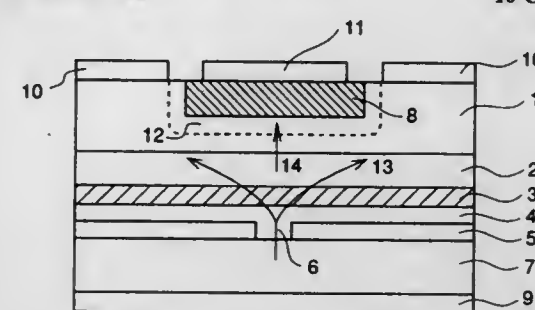
Filed Aug. 10, 1995, Ser. No. 513,390

Claims priority, application Japan, Aug. 22, 1994, 6-196754; Jun. 15, 1995, 7-148732

Int. Cl.<sup>6</sup> H01S 3/19

U.S. Cl. 372-50

10 Claims



1. A semiconductor laser device comprising:

opposite resonator facets formed by cleaving;

a semiconductor region of a first conductivity type;

a semiconductor multilayer structure disposed on the first conductivity type semiconductor region and comprising at least an active layer and upper and lower cladding layers sandwiching the active layer, the semiconductor multilayer structure functioning as a laser;

first and second electrodes for supplying current to the semiconductor multilayer structure to generate light in the structure;

a semiconductor region of a second conductivity type, opposite the first conductivity type, contacting the semiconductor region of the first conductivity type to produce a pn junction and disposed relative to the semiconductor multilayer structure so that the light generated in the semiconductor multilayer structure is directly applied to the semiconductor region of the second conductivity type; and

a third electrode electrically contacting the semiconductor region of the second conductivity type for outputting signals when a voltage is applied between the third electrode and either the first electrode or the second electrode.

5,568,503

# SOLID-STATE LASER DEVICE WITH OPTICAL FIBER CABLE CONNECTION

Shigeru Omori, Kanagawa-ken, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 318,388, Oct. 5, 1994, abandoned.

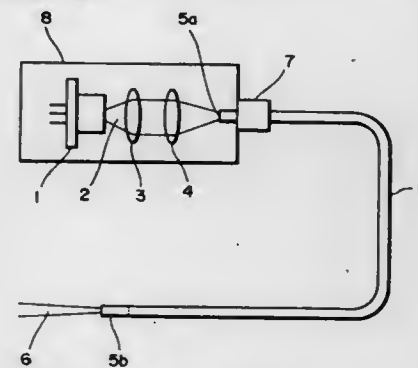
This application Jan. 19, 1996, Ser. No. 588,838

Claims priority, application Japan, Oct. 8, 1993, 5-253017

Int. Cl.<sup>6</sup> H01S 3/08

U.S. Cl. 372-70

13 Claims



1. A solid-state laser device comprising:

a solid-state laser device main body incorporating a semiconductor laser and a first optical system for shaping a first laser beam emitted from said semiconductor laser;

an optical fiber cable connected to said solid-state laser device main body and accommodating an optical fiber for guiding the first laser beam shaped by said first optical system; and

a solid-state laser medium which is incorporated in a distal end portion, at a light exit side, of said optical fiber cable, and generates a second laser beam by pumping the first laser beam, wherein said first laser beam has a wavelength which easily passes through said optical fiber, and said second laser beam has an infrared wavelength which can hardly pass through said optical fiber.

5,568,504

# SURFACE-EMITTING LASER DIODE

Anton Köck, and Erich Gornik, both of München, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

PCT No. PCT/EP93/03301, § 371 Date Jun. 5, 1995, § 102(e) Date Jun. 5, 1995, PCT Pub. No. WO94/13044, PCT Pub. Date Jun. 9, 1994

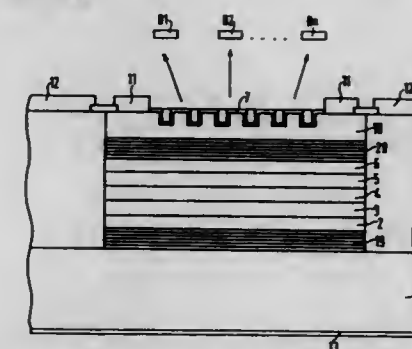
PCT Filed Nov. 24, 1993, Ser. No. 448,428

Claims priority, application European Pat. Off., Dec. 3, 1992, 92120671

Int. Cl.<sup>6</sup> H01S 3/18; 3/805; 3/103; 3/101

U.S. Cl. 372-96

3 Claims



1. A tunable surface-emitting laser diode, comprising:

a central layer;

two layers separated by said central layer, said two layers being arranged parallel, and with reference to planes of said two layers, transverse to one another and being made from semiconductor materials having different energy band gaps, and of which one is provided as an active layer and one as a tuning layer;

contacts connected in an electrically conductive fashion to said two layers in such a way that a separate current injection into the active layer and into the tuning layer can be performed;

a semiconductor layer on said two layers and having a surface defining a spatial periodic structure which is present in a region, arranged with reference to the planes of said two layers in a fashion transverse to a region provided for generating radiation in the active layer;

a metallic film at least partially covering said spatial periodic structure;

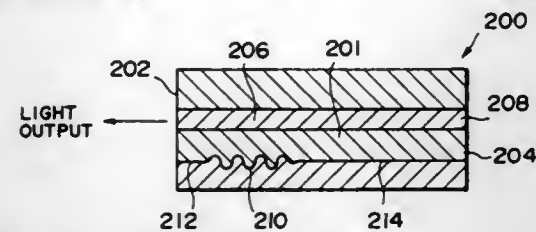
said spatial periodic structure being of a height and a length of each period of said spatial periodic structure, a minimum distance of said metallic film from the active layer, and a thickness of said metallic film being dimensioned such that during operation of the laser diode surface modes are excited by photons generated in the active layer on a surface of said metallic film averted from the active layer, and

means for achieving laser resonance during operation of said laser diode, said means for achieving a laser resonance comprising at least one reflective coating arranged parallel and with reference to the planes of said two layers transverse to the active layer.



**5,568,505**  
**LASER DIODE ELEMENT WITH EXCELLENT INTERMODULATION DISTORTION CHARACTERISTIC**  
 Tetsuro Okuda, Hirohito Yamada, and Toshitaka Torikai, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan  
 Division of Ser. No. 178,859, Jan. 7, 1994, Pat. No. 5,469,459.  
 This application Jun. 6, 1995, Ser. No. 463,635  
 Claims priority, application Japan, Jan. 8, 1993, 5-1501; Apr. 21, 1993, 5-93460

Int. Cl.<sup>6</sup> H01S 3/08  
 U.S. Cl. 372-96 4 Claims

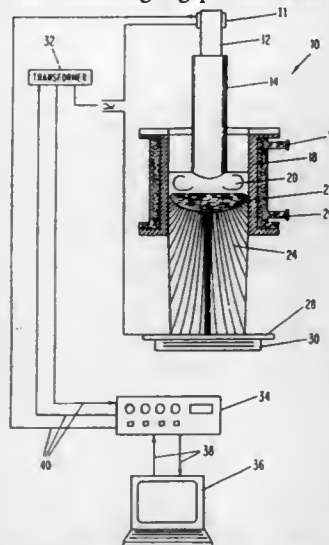


1. A laser diode element comprising: a semiconductor block having: a first end surface; a second end surface opposite to said first end surface; a laser cavity which is formed between said first and said second end surfaces and which has a predetermined length L; and an active layer and a partial grating which are formed in the direction of said laser cavity and which are coupled to each other at a predetermined coupling constant K; said partial grating being nearer to one of said first and said second end surfaces than to the other of said first and said second end surfaces and being remote from said one of said first and said second end surfaces to divide the direction of the laser cavity into a short length side and a long length side with said partial grating interposed between said short and said long length sides, said predetermined coupling constant K being larger in said short length side than in said long length side.

**5,568,506**  
**CONSTANT VOLTAGE ELECTRO-SLAG REMELTING CONTROL**  
 Max E. Schlienger, Albuquerque, N.M., assignor to Sandia Corporation, Albuquerque, N.M.  
 Filed May 16, 1995, Ser. No. 442,545  
 Int. Cl.<sup>6</sup> H05B 3/60

U.S. Cl. 373-50 14 Claims

1. A method for controlling a gap between an electrode and a



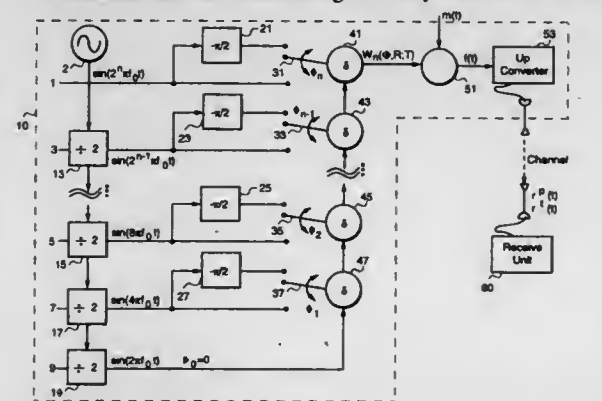
molten metal pool within a slag pool of an electro-slag remelting furnace, the method comprising the steps of:

immersing the electrode in the slag pool; applying substantially constant voltage across an electrical circuit including in series, the electrode, the gap and the molten metal pool, whereby current through the circuit heats the slag pool which thereby melts the electrode; and moving the electrode towards the slag pool at a constant feed rate, a change in gap distance causing a directly proportional change in impedance through the slag which causes an inversely proportional change in current through the constant voltage circuit, this current change causing a change in the rate of melt of the electrode, thereby stabilizing the gap distance.

**5,568,507**  
**GEOMETRIC HARMONIC MODULATION (GHM) - ANALOG IMPLEMENTATION**  
 John E. Hershey, Ballston Lake, Gary J. Saulnier, Rexford, both of N.Y., and Amer A. Hassan, Cary, N.C., assignors to General Electric Company, Schenectady, N.Y.  
 Filed Mar. 20, 1995, Ser. No. 407,088  
 Int. Cl.<sup>6</sup> H04B 1/69; 7/12

U.S. Cl. 375-200 9 Claims

2. A transmit unit for transmitting a binary stream  $b^{(k)}$  to a

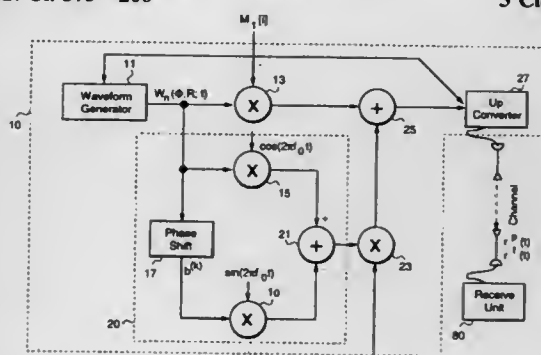


- a master oscillator for providing a sinusoidal signal of a predetermined frequency;
- a first branch for receiving the sinusoidal signal from the master oscillator having a phase shifting means for shifting the phase of the received sinusoidal signal by a selected amount to result in an offset tone;
- a plurality of successive branches each comprising:
  1. a frequency divider for receiving an adjusted sinusoidal signal from a previous branch, the first of which receives the sinusoidal signal from the master oscillator, and reducing the frequency by a factor of two to result in an adjusted sinusoidal tone at an output;
  2. a phase shifting means coupled to the frequency divider for receiving the adjusted sinusoidal tone for shifting the phase of this tone by a selected amount to result in an offset tone at an output;
- a final branch having a frequency divider for receiving the adjusted sinusoidal signal from the last of the plurality of branches and reducing the frequency by a factor of two to result in a fundamental tone with no phase shift at an output;
- a combining device coupled to the output of each of the branches, for receiving the offset tones and the fundamental tone, the combining device operating in two modes: a preamble mode and a traffic mode, the combining device summing the received tones to create a preamble waveform when operating in the preamble mode, and the combining device multiplying the received tones to create a traffic waveform  $W_n(\Phi, R; t)$  when operating in a traffic mode;
- a multiplier for multiplying when combining device is operating in traffic mode, traffic waveform  $W_n(\Phi, R; t)$  by a -1 to invert traffic waveform  $W_n(\Phi, R; t)$  for one logical value, and leave traffic waveform  $W_n(\Phi, R; t)$  unchanged for a second

logical value to encode binary stream  $b^{(k)}$  to result in an encoded traffic waveform; and  
 g) up converter for transmitting the preamble waveform, and the encoded traffic waveform, when the combining device is operating in the preamble mode, and traffic mode, respectively.

**5,568,508**  
**INTERLACED GEOMETRIC HARMONIC MODULATION**  
 John E. Hershey, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.  
 Filed Mar. 20, 1995, Ser. No. 407,551  
 Int. Cl.<sup>6</sup> H04B 1/69; 7/12

U.S. Cl. 375-200 3 Claims



1. A method of direct spread spectrum communication of two simultaneous message signals  $m_1[i]$ ,  $m_2[i]$  from a transmit unit to a receive unit comprising the steps of:

- a) producing a first traffic waveform described by:

$$W_n(\Phi, R; t) = \sum_{i=0}^n \sin(2^i \cdot 2\pi R t + \phi_i);$$

where

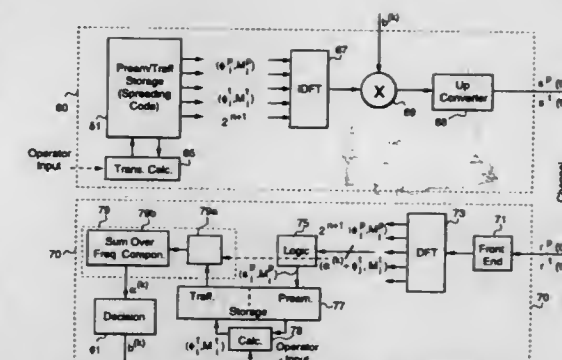
$n$  is an "order" of the function,  $\Phi = (\phi_0, \phi_1, \dots, \phi_n)$  is a tone phase set used as a spreading and despreading code,  $t$  is time, and  $R$  is a rate at which said binary message is to be transmitted;

- b) encoding said first message signal  $m_1[i]$  in first traffic waveform to result in a first encoded waveform;
- c) shifting the frequency of each component of the first waveform to result in of a second traffic waveform having components with frequencies which are between those of the first traffic waveform;
- d) encoding said second message signal  $m_2[i]$  in second traffic waveform to result in a second encoded waveform;
- e) summing the first and second encoded waveforms to result in a traffic signal;
- f) transmitting the traffic signal to said receive unit;
- g) receiving the traffic signal at said receive unit;
- h) decoding the traffic signal into said first and second message signal  $m_1[i]$ ,  $m_2[i]$ .

**5,568,509**  
**DYNAMIC CODE DIVISION MULTIPLE ACCESS COMMUNICATION SYSTEM**  
 John E. Hershey, Ballston Lake, N.Y.; Amer A. Hassan, Cary, N.C., and Gary J. Saulnier, Rexford, N.Y., assignors to General Electric Company, Schenectady, N.Y.  
 Filed Mar. 20, 1995, Ser. No. 407,552  
 Int. Cl.<sup>6</sup> H04B 1/69; 7/12

U.S. Cl. 375-200 3 Claims

3. A method of dynamic direct spread spectrum communication of a binary message signal from a transmit unit to a receive unit comprising the steps of:



- a) producing a traffic carrier waveform described by:

$$W_n(\Phi, R; t) = \sum_{i=0}^n \sin(2^i \cdot 2\pi R t + \phi_i);$$

where

$n$  is an "order" of the function,  $\Phi = (\phi_0, \phi_1, \dots, \phi_n)$  is a tone phase set next in a predetermined sequence of tone phase sets known to both said transmit and receive units,

$t$  is time,

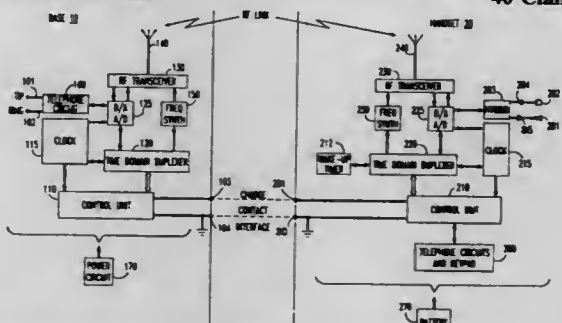
and  $R$  is a rate at which said binary message is to be transmitted;

- b) encoding a data block of said message signal  $m(t)$  in traffic carrier waveform to result in an encoded carrier waveform;
- c) transmitting the encoded carrier waveform to said receive unit;
- d) receiving the encoded carrier waveform at said receive unit;
- e) synthesizing a reference carrier waveform  $W_n(\Phi, R; t)$  at said receive unit from the predetermined tone phase set  $\Phi$ ;
- f) correlating the synthesized waveform  $W_n(\Phi, R; t)$  with the received encoded carrier waveform to result in message signal  $m(t)$ ; and
- g) repeating steps "a"-"f" for a plurality of tone phase sets  $\Phi$  according to the predetermined sequence to result in a plurality of transmitted data blocks.

**5,568,510**  
**APPARATUS AND METHOD FOR OBTAINING SYNCHRONISM BETWEEN A BASE STATION AND A PORTABLE UNIT ARRANGED FOR OPERATION IN A FREQUENCY HOPPING SYSTEM**  
 Herbert W. Tam, Edison, N.J., assignor to AT&T IPM Corp., Coral Gables, Fla.

Filed Sep. 27, 1994, Ser. No. 312,595  
 Int. Cl.<sup>6</sup> H04B 15/00; H04K 1/00

U.S. Cl. 375-202 40 Claims



1. A cordless telephone system comprising: a base unit and a handset unit arranged for communicating over any one of a plurality of communication channels in a frequency hopping system; means for configuring said base unit and said handset unit on a selected one of the communication channels for beginning a

synchronous frequency hopping cycle among the plurality of communication channels;  
 means in the base unit for transmitting contiguously a first series of data messages indicative of a start hopping message and a second series of data messages indicative of an acknowledge hopping message to the handset unit for synchronizing both the base unit and handset unit for said synchronous frequency hopping cycle; and  
 means in the handset unit for transmitting a third series of data messages acknowledging receipt of each one of the first series of data messages from the handset unit, each message in the second series of data messages being given an assigned value and the data messages in the second series of data messages linearly decreasing in assigned value with time to a predetermined value after which both the base unit and handset unit begin the frequency hopping cycle.

5,568,511

# SYSTEM AND METHOD FOR RADIO DISCONNECT AND CHANNEL ACCESS FOR DIGITIZED SPEECH TRUNKED RADIO SYSTEMS

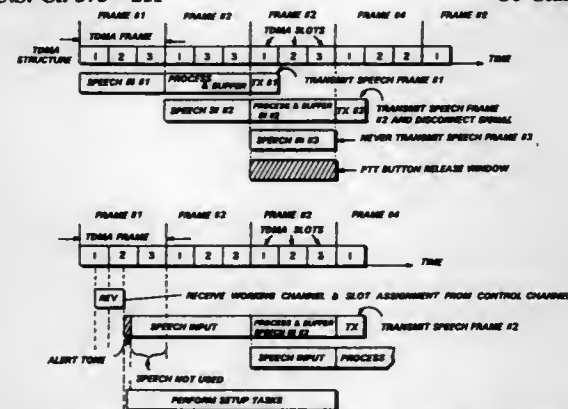
Ross W. Lampe, Raleigh, N.C., assignor to Ericsson GE Mobile Communications Inc., Research Triangle Park, N.C.

Filed Aug. 26, 1992, Ser. No. 935,440

Int. Cl.<sup>6</sup> H04B 3/36

U.S. Cl. 375-211

30 Claims



1. A digital communications system including a plurality of portable/mobile transceivers, where a controller assigns an available one of a plurality of working communications channels to a transceiver requesting a working channel over a control channel, each transceiver comprising:

- an encoder for digitally encoding speech signals input to one of said transceivers;
- a transmitter for transmitting digitally encoded speech signals;
- a receiver for receiving digitized speech signals;
- a decoder for decoding the received speech signals; a data processor connected to the encoder, transmitter, decoder, and receiver for minimizing time delays occurring between a time when an operator of the transceiver ends a transmission over a current working channel and a time when the current working channel is disconnected.

5,568,512

# COMMUNICATION SYSTEM HAVING TRANSMITTER FREQUENCY CONTROL

Robert R. Rotzoll, Meridian, Id., assignor to Micron Communications, Inc., Boise, Id.

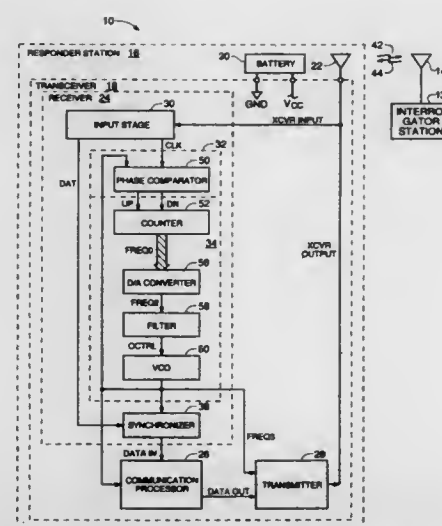
Filed Jul. 27, 1994, Ser. No. 281,384

Int. Cl.<sup>6</sup> H04B 1/38; H04L 5/16

U.S. Cl. 375-221

13 Claims

1. A communication system comprising:  
 A) a first transceiver for transmitting a command signal conveying a frequency value; and



B) a second transceiver for receiving the command signal and for transmitting a reply signal, wherein the second transceiver comprises

- 1) a receiver comprising a tracking oscillator for detecting said frequency value and for providing a control signal responsive to the command signal, said control signal conveying said frequency value; and
  - 2) a transmitter coupled to the receiver and responsive to the control signal, for providing the reply signal having a frequency accuracy responsive to said frequency value;
- C) wherein:
- 1) the command signal is characterized by a first phase;
  - 2) the tracking oscillator provides a reference signal characterized by a second phase and characterized by a reference frequency, the control signal being provided responsive to the reference signal; and
  - 3) the tracking oscillator further comprises
    - a) a phase comparator for selectively providing a resultant signal from the set of signals consisting of a first signal, a second signal, and a third signal, the selection responsive to comparing the first phase with the second phase, and
    - b) a variable frequency oscillator for providing the reference signal, the variable frequency oscillator responsive to the first signal, the second signal, and the third signal for respectively increasing, decreasing, and maintaining the reference frequency.

5,568,513

# STANDBY POWER SAVINGS WITH CUMULATIVE PARITY CHECK IN MOBILE PHONES

Thomas M. Croft, Cary, N.C.; Paul W. Dent, Stehag, Sweden; Lawrence J. Harte, Cary, N.C., and Torbjorn Solve, Lund, Sweden, assignors to Ericsson Inc., Research Triangle Park, N.C.

Filed May 11, 1993, Ser. No. 59,932

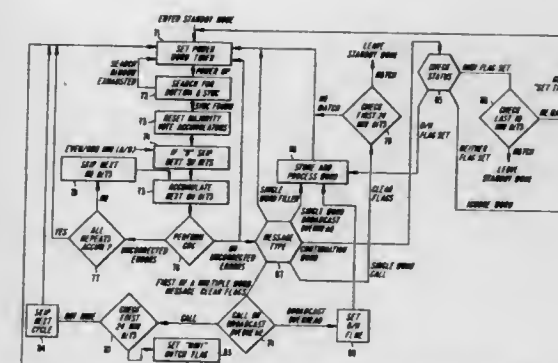
Int. Cl.<sup>6</sup> H04B 3/46; 1/16; 7/00; G08B 5/22

U.S. Cl. 375-224

20 Claims

19. In a radio communications system having at least one base station serving one or more portable stations, a method to reduce standby power consumption of said portable stations comprising the steps of:

- transmitting messages from a base station, each message including a number of words and each word being repeated a number of times, at least one word including a number of data bits representing at least part of an identification number of any of said portable stations and including a number of check bits that depend on said data bits;
- resetting in a portable station a number of accumulators corresponding to said number of data bits and check bits;



receiving first of said repeated words at said portable station and adding the values of each bit to a corresponding one of said accumulators;

processing the values of said accumulator contents to determine if values corresponding to said data bits are consistent with values corresponding to said check bits and generating a check or no-check indication;

if said no-check indication is generated, receiving another repeat of said word and adding its bit values to corresponding accumulators;

repeating said processing step until all word-repeats have been accumulated or until said check indication is generated;

upon a substantially error-free check indication being generated, powering down parts of said portable station for the remainder of said repeats of said word and then further processing said accumulator values to determine if part of said word matches a corresponding part of the said portable station's identification number and generating a match or no-match indication; and

upon said no-match indication being generated, holding parts of said portable station powered down for a duration of transmission of the rest of the words in the same message.

5,568,514

# SIGNAL QUANTIZER WITH REDUCED OUTPUT FLUCTUATION

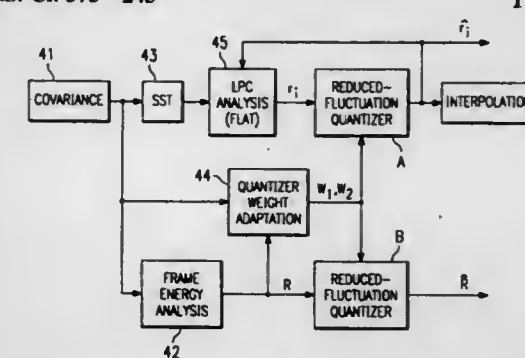
Alan V. McCree, Dallas, and Visbu R. Viswanathan, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 245,090, May 17, 1994. This application Jun. 7, 1995, Ser. No. 474,215

Int. Cl.<sup>6</sup> H04B 14/06

U.S. Cl. 375-245

1 Claim



1. In a VSELP speech encoder that is responsive to digital input speech signals  $s(n)$  to provide a compressed digital output signal including quantized frame energy signal  $\hat{R}$  and quantized reflection coefficient signal  $\hat{r}_i$ , an improved quantizer including:

- covariance means for generating a covariance matrix signal including means for calculating a signal covariance matrix according to

$$ac(i,j) = \sum_{n=0}^{n-1} s(n-i)s(n-j) \text{ for } i=0; g=0, 10,$$

frame energy generator means coupled to said covariance means for generating a frame energy signal  $R$  including means for calculating the frame energy according to

$$\frac{\sqrt{ac(0,0) + ac(0,0)}}{2(n)}$$

where  $n$  is length of summation; means for calculating weights  $w_1, w_2$  for reduced fluctuation by calculating

$$T=1.25(T-0.2)$$

$$S = \frac{P - 1.4P_{noise}}{2.6P_{noise}}$$

$$T' = \max \left[ \frac{IP - P_{prev}}{\max(P, P_{prev})} \cdot IK1 - K1_{prev} \right]$$

$$K1 = \frac{ac(0,1)}{ac(0,0)}$$

$$W_1=0.75(1-T)(1-S)$$

$$W_2=T$$

first quantizing means responsive to said frame energy signal for quantizing said frame energy signal  $R$  with a first reduced fluctuation quantizer (B) to provide quantized frame energy signal  $\hat{R}$ ;

spectral Smoothing means for spectral smoothing said signal covariance matrix signal to provide a spectral smoothed signal;

means coupled to said spectral smoothing means for generating a reflection coefficient signal  $r_i$  including means for calculating reflection coefficients for  $i=1$  to 10; and

means responsive to said reflection coefficient signal  $r_i$  for quantizing signal  $r_i$  using second reduced fluctuation quantizer (A) to provide quantized reflection coefficient signal  $\hat{r}_i$ .

5,568,515

# REVERSIBLE AUI PORT FOR ETHERNET

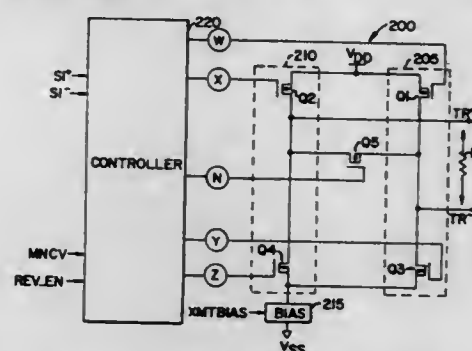
John M. Winc, Cupertino, Calif., assignor to Advanced Micro Devices Inc., Sunnyvale, Calif.

Continuation of Ser. No. 391,912, Feb. 21, 1995. This application May 16, 1995, Ser. No. 441,831

Int. Cl.<sup>6</sup> H04B 3/00

U.S. Cl. 375-257

5 Claims



5. A reversible Control In line driver, comprising:  
 a first and a second MOS driver, each MOS driver comprising a PMOS transistor and an NMOS transistor, a drain of said PMOS transistor coupled to a drain of said NMOS transistor, a source of said NMOS transistor coupled to a first reference



voltage, and a source of said PMOS transistor coupled to a second reference voltage;  
 a first output coupled to said drain of said NMOS transistor of said first MOS driver;  
 a second output coupled to said drain of said NMOS transistor of said second MOS driver; and  
 a driver controller, coupled to a gate of each transistor of said MOS drivers and responsive to an input differential signal, a transmit signal, and a REV\_EN signal, for:  
 driving an output differential signal from said outputs responsive to said input differential signal when said transmit signal is asserted and said REV\_EN signal is deasserted, otherwise activating each transistor of said MOS drivers when said transmit signal and said REV\_EN signal are deasserted; and otherwise deactivating each transistor of said MOS drivers when said REV\_EN signal is asserted.

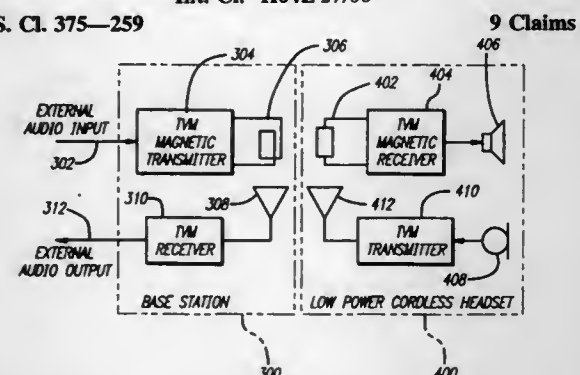
5,568,516

## VERY LOW POWER CORDLESS HEADSET SYSTEM

Gene M. Strohallen, Sebastopol, and Robert F. Young, Santa Cruz, both of Calif., assignors to Phonic Ear Incorporated, Petaluma, Calif.

Continuation-in-part of Ser. No. 86,823, Jul. 2, 1993. This application Oct. 3, 1994, Ser. No. 316,920  
 Int. Cl.<sup>6</sup> H04L 27/00

U.S. Cl. 375-259



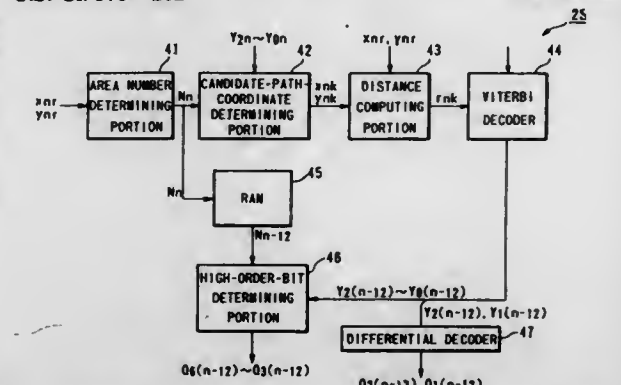
1. A two-way wireless communication system for transmitting audio signals between a first location and a second location, the system comprising:

- first transmission means, disposed at said first location, for receiving a first audio signal, said first transmission means including a time variant modulation clock generator for generating a time variant modulation clock signal, modulation means, responsive to the time variant modulation clock signal for time variant modulating said first audio signal to produce a time variant modulated first audio signal, and a magnetic transmission element for transmitting said time variant modulated first audio signal;
- first receiver means, disposed at said second location and including a magnetic receiving element magnetically coupled to said magnetic transmission element, for receiving and demodulating said time variant modulated first audio signal;
- second transmission means, disposed at said second location, for receiving and transmitting a second audio signal, said transmission means including at least one of a RF transmitter and an infrared transmitter for transmitting said second audio signal; and
- second receiver means, disposed at said first location and including at least one of a RF receiver and an infrared receiver, for receiving said second audio signal, wherein at least one of said first and second locations comprises a portable communication device.

5,568,517  
 DECODING DEVICE FOR PERFORMING AMPLITUDE-PHASE DEMODULATION AND VITERBI DECODING  
 Akira Sogo, and Ryo Kamiya, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan  
 Division of Ser. No. 175,266, Dec. 29, 1993, Pat. No. 5,436,932. This application May 4, 1995, Ser. No. 433,137  
 Claims priority, application Japan, Jan. 5, 1993, 5-015968  
 Int. Cl.<sup>6</sup> H04L 5/12; 23/02

U.S. Cl. 375-262

16 Claims



1. A decoding system, which decodes data encoded in a viterbi manner in which changes a state of encoded data in accordance with a predetermined state transition rule, the system comprising: encoding means for encoding data to be transmitted thereto; transmitting means for transmitting the encoded data; receiving means for receiving the encoded data as received data indicative of a present point and for generating an X coordinate and a Y coordinate; area determining means for determining an area code indicative of a quadrant area and a sub-quadrant area, to which the encoded data received by the receiving means belongs, based on the X and Y coordinates, each quadrant and sub-quadrant includes a plurality of signal points on a signal space diagram, and the quadrant and sub-quadrant areas being defined by using predetermined lines which pass through signal points indicative of the encoded data, and wherein the sub-quadrant area has a pitch representing a distance on the signal space diagram that is smaller than the pitch between two of the plurality of signal points; path determining means for determining paths for the receiving data, the paths leading from the present point indicated by the received data to one of a plurality of candidate signal points disposed adjacent to an area defined by the received data, based on the area code; and decoding means for decoding the received data using viterbi decoding.

5,568,518

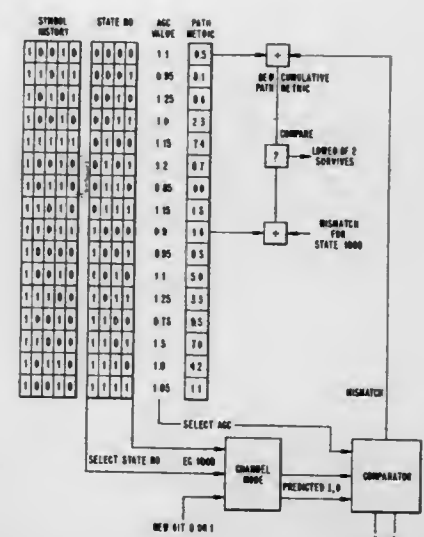
## FAST AUTOMATIC GAIN CONTROL

Paul W. Dent, Stehags, Sweden, assignor to Ericsson GE Mobile Communications Inc., Research Triangle Park, N.C.  
 Filed Sep. 14, 1994, Ser. No. 305,651  
 Int. Cl.<sup>6</sup> H04L 27/06

U.S. Cl. 375-340

20 Claims

1. A method for demodulating or decoding received digital modulated signals, comprising the steps of: obtaining numerical signal samples from said received signals; comparing said numerical signal samples with sample values expected for each of a number of possible symbol sequences using a scaling factor associated with each of said symbol sequences in order to determine a mismatch value for each sequence; accumulating said mismatch values for all consecutive symbol sequences that are logically self-consistent; choosing the lowest cumulative mismatch value from among all foregoing sequences that can logically precede a new sequence to be accumulated with the mismatch value from



said new sequence, wherein said chosen mismatch value identifies a best predecessor sequence; and choosing the scaling factor associated with said best predecessor sequence and updating the scaling factor to obtain the scaling factor to be associated with said new sequence.

5,568,519

## METHOD AND APPARATUS FOR SEPARATING A SIGNAL MIX

Paul-Walter Baier; Tobias Felhauer, both of Kaiserslautern; Thomas Zimmermann, Muenchen-Laim, and Anja Klein, Niederkirchen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

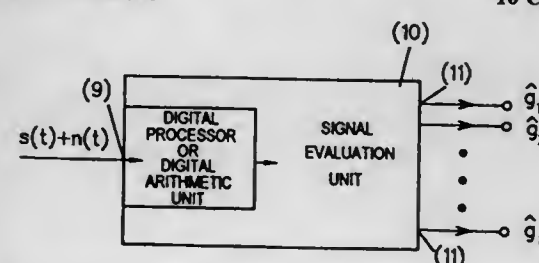
Filed Jun. 26, 1992, Ser. No. 904,823

Claims priority, application Germany, Jun. 28, 1991, 41 21 356.4

Int. Cl.<sup>6</sup> H04L 27/06; H04B 1/10

U.S. Cl. 375-343

16 Claims



6. An apparatus for separating a signal mix

$$s(t) = \sum_{\mu=1}^M g_{\mu} \cdot f_{\mu}(t),$$

that is composed of M known real or complex functions  $f_{\mu}(t)$ ,  $\mu=1, 2, \dots, M$ , dependent on time t that are weighted with M unknown weighting factors  $g_{\mu}$ ,  $\mu=1, 2, \dots, M$ , at least some of the functions  $f_{\mu}(t)$  being not disjunctive in the time domain and/or in the frequency domain, and an additional potential noise signal  $n(t)$  that is correlated with  $s(t)$  or non-correlated being superimposed on the signal mix  $s(t)$ , comprising:

- a signal processing unit having an input and a plurality of outputs, the signal mix  $s(t)$  being supplied to the input of the signal processing unit;
- in the signal processing unit modified signal-matched filters or correlators, whose pulse responses are linear combinations of pulse responses of signal-matched filters that are signal-matched to the functions  $f_{\mu}(t)$ , receiving the inputted signal mix  $s(t)$ ; and

in the signal processing unit a linear combiner connected to said filters or correlators for forming linear combinations of correlation products of the inputted signal mix  $s(t)$  and of the functions  $f_{\mu}(t)$  at the outputs of the signal processing unit, said linear combinations being true-to-expectation estimated values of the unknown weighting factors  $g_{\mu}$  for separating the signal mix  $s(t)$ ;

wherein correlation products  $w=(w_1, w_2, \dots, w_M)$  are formed from the input signal  $s(t)+n(t)$  and from functions  $f_{\mu}(t)$ , which result from the functions  $f_{\mu}(t)$  through linear or non-linear filtering or are identical with the functions  $f_{\mu}(t)$ , and wherein linear combinations are formed according to a relation  $w \cdot C^{-1}$  from the correlation products  $w$   $32 (w_1, w_2, \dots, w_M)$  with a covariance matrix C of the functions  $f_{\mu}(t)$  and  $f_{\mu}(t)$ .

5,568,520

## SLOPE DRIFT AND OFFSET COMPENSATION IN ZERO-IF RECEIVERS

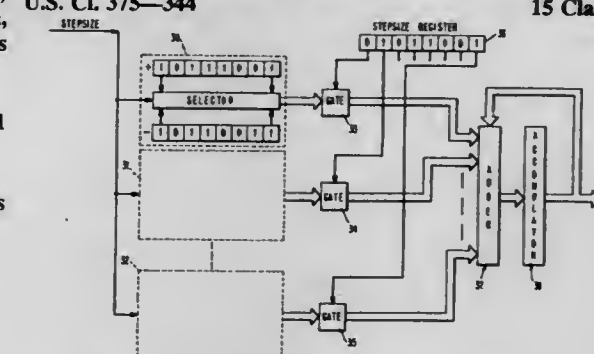
Björn Lindquist, Bjärred, and Paul W. Dent, Stehag, both of Sweden, assignors to Ericsson Inc., Research Triangle Park, N.C.

Filed Mar. 9, 1995, Ser. No. 401,127

Int. Cl.<sup>6</sup> H04L 27/06

U.S. Cl. 375-344

15 Claims



1. An improved radio receiving apparatus for direct conversion of signals to a baseband for processing, comprising:

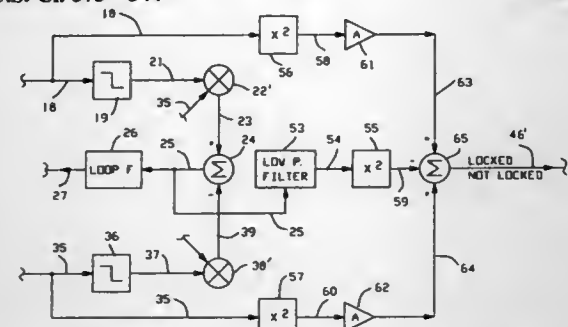
- direct conversion means for converting a radio input signal to a complex baseband signal having a real waveform and an imaginary waveform; and
- slope and offset compensation means for estimating offsets and systematic drifts in said real and imaginary waveforms and compensating for said drifts and offsets such that decoding of information modulated on said radio input signal is substantially unimpaired, said shape and offset compensation means comprising:
  - integrating capacitors which are driven to follow the input real and imaginary waveforms by a charge or discharge current pulse from charge pumps;
  - comparator means for comparing the real and imaginary waveforms with a voltage on said integrating capacitors to generate a positive/negative indication;
  - processing means for determining correction values for said real and imaginary waveforms wherein said correction values are used to select current magnitudes to be applied to said charge pumps, said current magnitudes being stored in register pairs which are independent for positive and negative stepsign.

5,568,521  
PHASE LOCK INDICATOR CIRCUIT FOR A HIGH  
FREQUENCY RECOVERY LOOP

**Bruce H. Williams, Sandy; Glenn A. Arbanas, and Roy E. Greff, both of Salt Lake City, all of Utah, assignors to Unisys Corporation, Blue Bell, Pa.**

Filed Sep. 16, 1993, Ser. No. 137,244

U.S. Cl. 375-344      Int. Cl.<sup>6</sup> H03D 3/24      9 Claims



1. A phase locked indication circuit for a high frequency carrier recovery loop circuit, comprising:

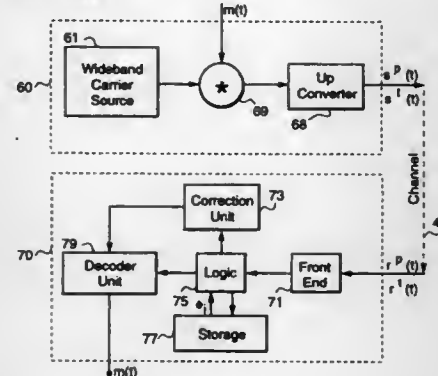
- a Costas QPSK carrier recovery loop circuit having a real channel, an imaginary channel and a phase error channel, a three input summing circuit having an output indicative of a locked or a not locked condition, two positive inputs and a negative input, a pair of high frequency diode multipliers, said real channel and said imaginary channel each being coupled through one of said high frequency diode multipliers to one of said two positive inputs of said three input summing circuit, said phase error channel being coupled to said negative input of said three input summing circuit through a diode multiplier having a low band pass characteristic for effectively separating the locked and the not locked conditions, each said diode multiplier providing a direct current output signal, a low pass filter connected in series between said phase error channel and the diode multiplier for reducing high frequency signals which cause false locked and not locked signals, whereby said locked and not locked signals have substantial voltage separation sufficient to avoid said false locked and not locked condition.

5,568,522  
CORRECTION OF MULTIPATH DISTORTION IN  
WIDEBAND CARRIER SIGNALS

**John E. Hershey, Ballston Lake, and Gary J. Saulnier, Rexford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Mar. 20, 1995, Ser. No. 407,559**

U.S. Cl. 375—346 6 Claims



1. A method of correcting phase distortion introduced in a carrier waveform having a plurality of tones, each tone having predefined frequency  $\omega_i$ , phase  $\phi_i$ , and magnitude  $m_i$  for a symbol period, as the waveform is transmitted through a channel, comprising the steps of:

- receiving the transmitted waveform;
- extracting a phase  $\phi_i'$  and magnitude  $m_i'$  from each of a plurality of tones having frequencies  $\omega_i'$  in the transmitted waveform;
- comparing the extracted phases/magnitudes ( $\phi_i', m_i'$ ) to said predefined phases/magnitudes ( $\phi_i, m_i$ ) of the same frequency  $\omega_i = \omega_i'$  to determine a phase distortion  $\xi_i$  for each tone;
- determining channel distortion relation  $dC/d\omega$  being change in phase  $\phi$  per change in frequency  $\omega$  due to said channel from the phase distortions  $\xi_i$  determined for each corresponding tone;
- employing the channel distortion relation  $dC/d\omega$  to correct a message waveform comprised of a plurality of message tones transmitted through said channel.

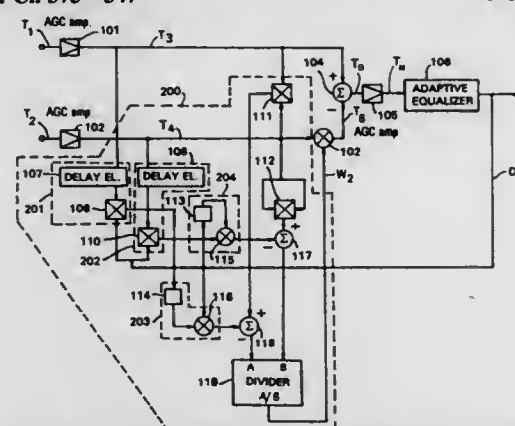
5,568,523  
METHOD AND APPARATUS FOR ADAPTIVELY  
CANCELING INTERFERENCE SIGNALS

**Ichiro Tsujimoto, Tokyo, Japan, assignor to NEC Corporation,  
Japan**

**Filed May 12, 1994, Ser. No. 241,629**

Claims priority, application Japan, Jun. 29, 1993, 5-210813  
Int. Cl.<sup>6</sup> H04B 7/10

U.S. Cl. 375-347 8 Claims



1. A method of adaptively canceling an interference signal for a two-branch space-diversity signal-receiving system having an array of first and second receiver means assigned to a first diversity branch and a second diversity branch, respectively, comprising the steps of:

- amplifying a first arrival signal and a second arrival signal to a normalized power level by means of automatic gain control to produce a first branch signal and a second branch signal, respectively, the first arrival signal and the second arrival signal referring to the signals arriving at the first and second receiver means, respectively, represented in a complex expression,
- producing a first product and a second product, the first product being a product of amplitudes of a first interference signal and a second interference signal multiplied by a phase factor expressed in a complex expression, the second product being a square of the amplitude of the second interference signal, the first and second interference signals being interference signals included in the first and second branch signals, respectively, and the phase factor being  $\exp[i(\phi_1 - \phi_2)]$  with  $\phi_1$  and  $\phi_2$  denoting phase angles of the first and second interference signals, respectively,
- producing a complex weight  $w$  so that the weight  $w$  is equal to the ratio of the first product to the second product, multiplying the second branch signal by the complex weight  $w$  to produce a weighted second branch signal,

performing subtraction of one of the first branch signal and the weighted second branch signal from the other in order to compensate the first and second interference signals, and adaptively equalizing a result of the subtraction to produce a decision data signal.

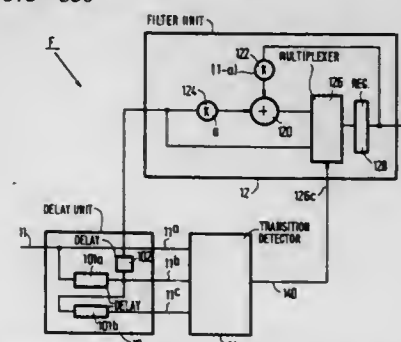
5,568,524  
**FILTER DEVICE COMPRISING A RECURSIVE FILTER  
UNIT, METHOD OF FILTERING, AND TRANSMISSION  
SYSTEM COMPRISING SUCH A FILTER DEVICE**

Johannes A. C. Bernsen, Eindhoven, Netherlands, and Seiji Kashloka, Beverly Hills, Calif., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 19, 1994, Ser. No. 358,441

Claims priority, application European Pat. Off., Dec. 17, 1993, 93203568

U.S. Cl. 375—350      Int. Cl.<sup>6</sup> H04B 1/10      9 Claims



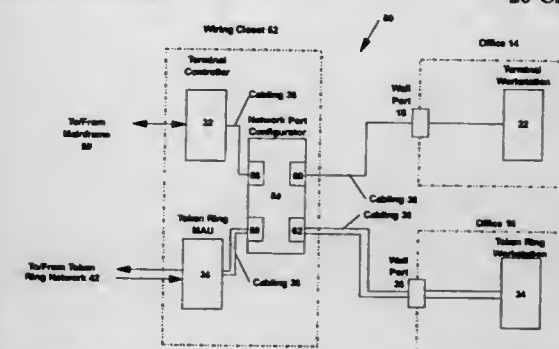
1. A filter device, comprising a recursive filter unit, a transition detector for detecting a transition in an input signal of the filter unit, and adaptation means for adapting the operation of the filter unit in response to detection of the transition, characterized in that the transition detector detects a boundary between a first region and a subsequent second region in the input signal, and the adaptation means replaces one or more processed signal values, stored in the filter unit for recursive use and derived from signal values from the first region, by one or more signal values from the second region, or by filtered signal values derived from the signal values from the second region before filtering any signal value from the second region.

5,568,525  
SYSTEM AND METHOD FOR CONNECTION OF  
MULTIPLE PROTOCOL TERMINALS

**Richard H. Johan de Nijs; Charles L. Haymes, and Dale T. Ulmer, all of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.**

Filed Aug. 19, 1993, Ser. No. 109,185

U.S. Cl. 375—356 20 Claims



1. For use with a plurality of network workstations and a plurality of network equipment, each workstation and each net-

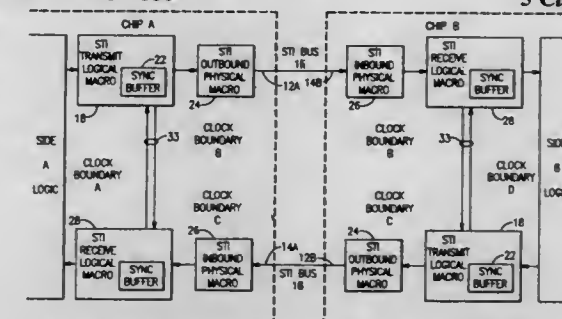
**5,568,526**  
**SELF TIMED INTERFACE**

Frank D. Ferraiolo, New Windsor; Robert S. Capowski, Verbank; Daniel F. Casper, Poughkeepsie; Richard C. Jordan, Lake Katrine, all of N.Y., and William C. Laviola, Round Rock, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 261,515, Jun. 17, 1994. This application  
May 26, 1995, Ser. No. 452,445

Int. Cl.<sup>6</sup> H04B 1/10

U.S. Cl. 375—356 5 Claims



1. A self-timed communications interface for transmitting digital data between a first node and a second node over a plurality of parallel digital data lines and a clock signal line, comprising in combination:

- said first node including:  
a digital data buffer;  
means for generating a communications clock signal;  
means responsive to said communications clock signal for  
coupling parallel digital data from said digital data buffer  
simultaneously to said plurality of parallel digital data lines  
synchronously with said communications clock signal; and  
and means to couple said communications clock signal to said  
clock signal line;
- said second node including:  
means for receiving said digital data signal coupled to said  
plurality of parallel digital data lines;  
means for receiving said communications clock signal  
coupled to said communications clock signal line;  
comparing means coupled to said means for receiving said  
digital data signal and said means for receiving said com-  
munications clock signal;  
said comparing means comparing a phase of said communi-  
cations clock signal with a phase of said digital data signal

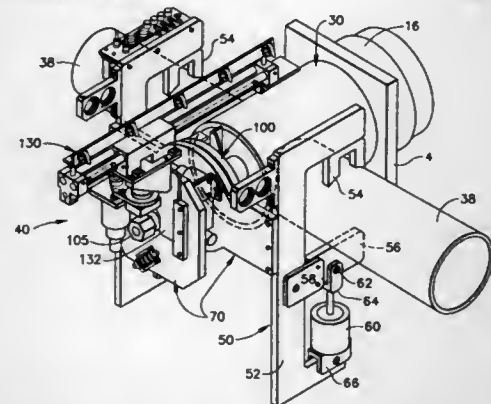


coupled respectively to each of said plurality of parallel digital data lines, and means coupled to said comparing means to independently adjust the phase of said digital data signal coupled respectively to each of said plurality of parallel digital data lines relative to said communications clock signal in order to individually phase align said digital data signal coupled to each of said plurality of data lines and said communications clock signal received by said means for receiving said communications clock signal.

**5,568,527**  
**METHOD AND APPARATUS FOR REMOTE ULTRASONIC INSPECTION OF CORE SPRAY T-BOX WELDS**  
 David L. Richardson, Los Gatos; James C. S. Tung, Santa Clara, and David C. Berg, San Jose, all of Calif., assignors to General Electric Company, San Jose, Calif.  
 Filed Feb. 14, 1995, Ser. No. 388,339  
 Int. Cl. G21C 17/00

U.S. Cl. 376-245

16 Claims



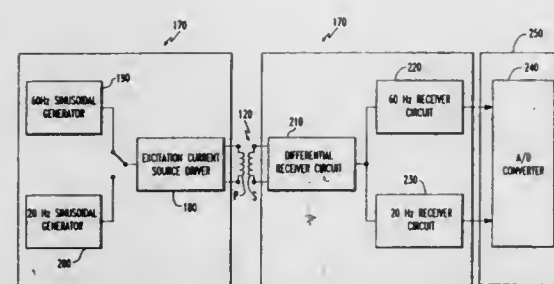
1. An apparatus for remotely inspecting a crevice weld in a T-box assembly which connects an inlet pipe to two outlet pipes, the two outlet pipes extending from opposite sides of the T-box, the inlet pipe extending perpendicular to the two outlet pipes, and the crevice weld lying along a circle which is concentric with and perpendicular to a centerline axis of the inlet pipe, comprising:  
 a stationary support frame;  
 first and second pairs of clamping jaws attached to said stationary support frame, each of said first and second pairs of clamping jaws having jaws which can be moved toward each other to clamp onto a respective outlet pipe;  
 remotely controlled drive means for moving said respective jaws of said first and second pairs of clamping jaws toward each other;  
 a first rotating frame rotatably mounted on said stationary support frame, said first rotating frame being rotatable about an axis of rotation; and  
 first transducer means supported by said first rotating frame, whereby said stationary support frame can be clamped onto the outlet pipes such that said axis of rotation is coaxial with said centerline axis.

**5,568,528**  
**METHOD AND SYSTEM FOR COMPENSATING A ROD POSITION INDICATION SYSTEM FOR NON-LINEARITY**  
 Louis W. Gauss, Jr., Penn Township, and Arun P. Sahasrabudhe, West Milford, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.  
 Filed Nov. 21, 1994, Ser. No. 342,474  
 Int. Cl. G21C 17/00

U.S. Cl. 376-258

8 Claims

1. A method for compensating for the non-linearity of an LVDT-type sensor utilized to determine the position of each control rod of



a control rod cluster assembly during selective step movement of each control rod into and out of a nuclear reactor core, comprising the steps of:

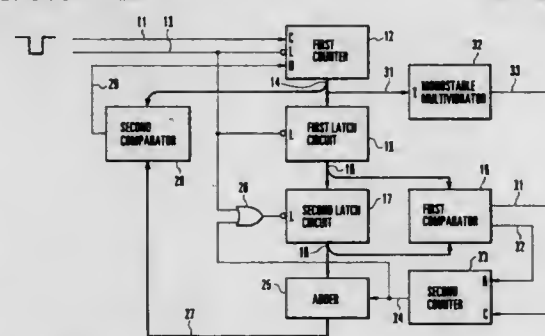
- applying an excitation current of a first preselected frequency to a primary of said LVDT-type sensor for inducing at a secondary of said sensor a secondary voltage representative of the position of each control rod of said control rod cluster assembly relative to a fully inserted position within said reactor core so long as the relationship between said secondary voltage and the position of each control rod is a linear relationship; and
- switching the frequency of said excitation current to a second preselected frequency when the relationship between said secondary voltage and the position of each control rod becomes non-linear to restore said linear relationship.

**5,568,529**  
**SIGNAL DISCONNECTION MONITOR APPARATUS AND SIGNAL PERIOD DETECTION APPARATUS THEREFOR**  
 Hitoshi Masuda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 28, 1995, Ser. No. 506,966  
 Claims priority, application Japan, Jul. 29, 1994, 6-178732  
 Int. Cl. G07C 3/02

U.S. Cl. 377-16

10 Claims



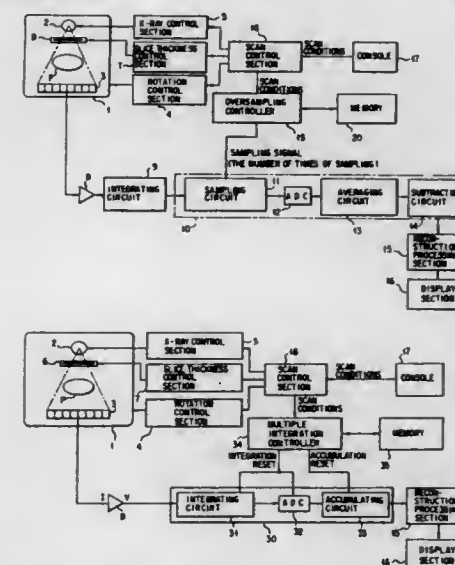
1. A signal disconnection detection apparatus comprising:  
 first count means, reset by a pulse signal received every predetermined period of a clock signal, for counting a clock signal transmitted together with data;  
 first comparison means for comparing a count value of said first count means with a set value larger than the number of clock signals included in one period of the pulse signal, and stopping an operation of said first count means when the count value of said first count means exceeds the set value; and  
 detection means for detecting that the count value of said first count means does not continuously change within a predetermined period of time to output a signal disconnection detection signal of at least one of the clock signal and the pulse signal.

**5,568,530**  
**X-RAY COMPUTED TOMOGRAPHY APPARATUS**  
 Yasuo Saito, Tochigi-ken, and Tsuyoshi Hatano, Otawara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 6, 1995, Ser. No. 417,785  
 Claims priority, application Japan, Apr. 8, 1994, 6-070561  
 Int. Cl. A61B 6/03

U.S. Cl. 378-4

28 Claims

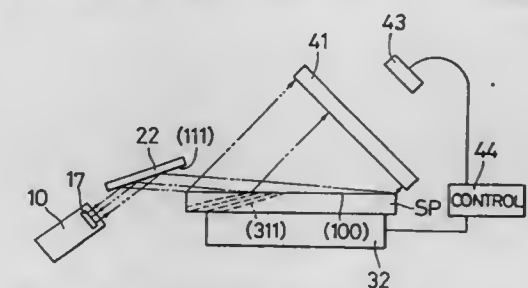


1. An X-ray computed tomography apparatus comprising:  
 X-ray emission means for emitting an X-ray in accordance with a scan condition;  
 detection means for detecting an X-ray transmitted through an object to be examined;  
 integrating means for repeatedly integrating a detection signal from said detection means at predetermined intervals;  
 oversampling means for sampling an integral signal from said integrating means a plurality of number of times in an initial period of the interval and averaging the sampled signals to obtain an initial average value, sampling the integral signal from said integrating means a plurality of number of times in a final period of the interval and averaging the sampled signals to obtain a final average value, and subtracting the initial average value from the final average value to create projection data;  
 reconstruction means for reconstructing a tomographic image on the basis of a plurality of projection data with different projection angles; and  
 oversampling control means for determining the number of times of sampling on the basis of the scan condition, and controlling said oversampling means to realize the determined number of times of sampling.
15. An X-ray computed tomography apparatus comprising:  
 X-ray emission means for emitting an X-ray in accordance with a scan condition;  
 detection means for detecting an X-ray transmitted through an object to be examined;  
 multiple integrating means for repeatedly integrating a detection signal from said detection means at predetermined intervals, and accumulating repeatedly obtained integral values, thereby creating projection data;  
 reconstruction means for reconstructing a tomographic image on the basis of a plurality of projection data with different projection angles; and  
 multiple integration control means for determining the number of times of integration on the basis of the scan condition, and controlling said multiple integrating means to realize the determined number of times of integration.

**5,568,531**  
**SURFACE DEFECT EVALUATING APPARATUS**  
 Kazuo Nishihagi, Hirakata, and Atsushi Kawabata, Kyoto, both of Japan, assignors to Technos Co., Ltd., Osaka, Japan  
 Filed Apr. 25, 1995, Ser. No. 428,566  
 Claims priority, application Japan, Sep. 27, 1994, 6-231781  
 Int. Cl. G01N 23/70

U.S. Cl. 378-71

4 Claims

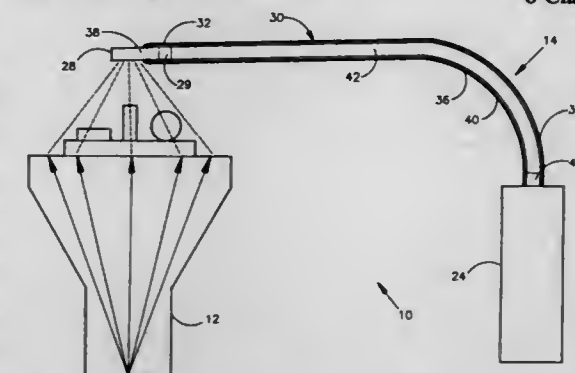


1. A surface defect evaluating apparatus comprising:  
 an X-ray generator for generating an X-ray flux,  
 a diffraction crystal for diffracting the X-ray flux from the X-ray generator on a predetermined crystal plane, and  
 an X-ray imager device for detecting the intensity distribution of the X-ray flux diffracted by a predetermined crystal plane in a sample after the X-ray flux diffracted by the diffraction crystal obliquely irradiates a surface of the sample,  
 wherein the X-ray generator includes an anode and a non-winding type cathode, an electron beam focus is formed in linear shape on the anode, a slit form X-ray flux is generated along a direction substantially perpendicular to the longitudinal direction of the beam focus, and the longitudinal direction of the X-ray flux is set nearly parallel to a plane including incident X-rays and diffracted X-rays in relation to the sample.

**5,568,532**  
**EXAMINATION SYSTEM UTILIZING IONIZING RADIATION AND A FLEXIBLE, MINIATURE RADIATION DETECTOR PROBE**  
 Stanislaw Majewski, Grafton; Brian J. Kross; Carl J. Zorn, both of Yorktown, and Lukasz A. Majewski, Grafton, all of Va., assignors to Southeastern Universities Research Association, Inc., Newport News, Va.  
 Filed Aug. 12, 1994, Ser. No. 289,918  
 Int. Cl. H05G 1/64

U.S. Cl. 378-98.3

8 Claims

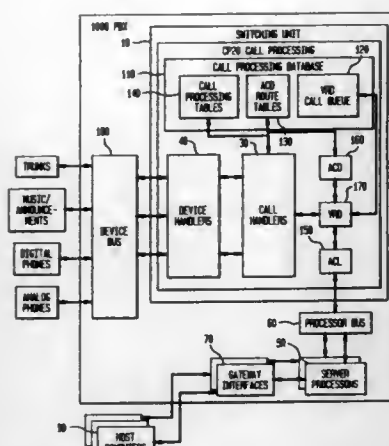


1. An x-ray examination system, comprising:  
 a radiation source which is a large raster scanning x-ray tube anode;  
 at least one flexible, elongated miniature radiation probe including a flexible light guide with said flexible light guide having a liquid light guide core within a plastic tube, with the index of refraction of said plastic tube being significantly lower than the index of refraction of said liquid;









receiving an incoming call;  
receiving an internal route request from a call processing module of the PBX in response to receiving the incoming call;  
receiving an external route request for the incoming call from an alternate source outside of the PBX; and  
rejecting the internal or the external route request on the basis of a priority scheme.

5,568,545

### CENTRALIZED COMMAND SYSTEM FOR A TELECOMMUNICATIONS NETWORK

Timo Vesterinen, Espoo, Finland, assignor to Nokia Telecommunications OY, Espoo, Finland

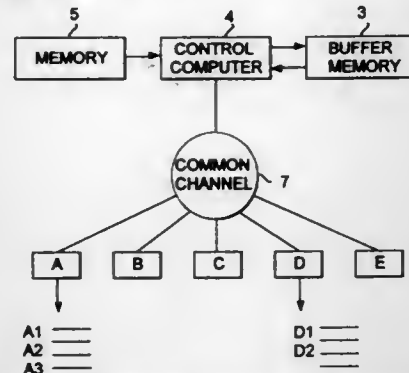
PCT No. PCT/Fin93/00316, § 371 Date Apr. 12, 1995, § 102(e) Date Apr. 12, 1995, PCT Pub. No. WO94/05123, PCT Pub. Date Mar. 3, 1994

PCT Filed Aug. 12, 1993, Ser. No. 387,708

Claims priority, application Finland, Aug. 14, 1992, 923670 Int. Cl.<sup>6</sup> H04M 7/00; 3/00

U.S. Cl. 379—333

7 Claims



1. A centralized command system for a telecommunications network, comprising:

a central exchange of a telecommunications network;  
network elements under control of said central exchange constituting an entity which is controllable in a centralized manner from the central exchange by means of user interfaces of individual concentrators;

a program-based command structure in which the command sequences required by each task and directed to the central exchange and/or one or more of said network elements are combined so as to form a single logical task entity, or macro, having a respective target system, on the basis of which said command system automatically initiates embedded terminal sessions with said network elements and executes commands necessary for performing the respective task;

said program-based command structure being configured to open a respective terminal session with each respective target system of each said logical task entity or macro, before

starting the respective logical task entity or macro, and to maintain all resulting connections in parallel during execution of the whole of the respective logical task or macro.

5,568,546

### METHOD AND APPARATUS FOR DYNAMIC ABBREVIATED DIALING ASSIGNMENT

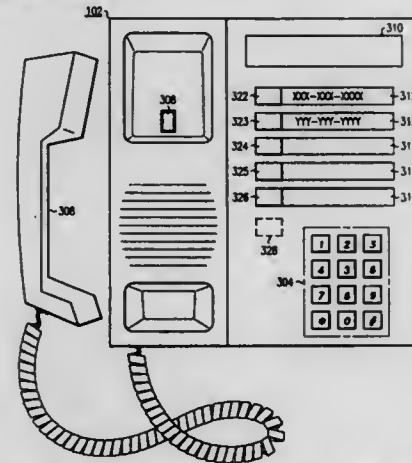
David J. Marutiak, Oakland, Calif., assignor to Lucent Technologies, Inc., Murray Hill, N.J.

Filed Oct. 31, 1994, Ser. No. 331,829

Int. Cl.<sup>6</sup> H04M 1/27

U.S. Cl. 379—355

4 Claims



1. A method for dynamically determining a list of abbreviated dialing numbers for making a telephone call, comprising the steps of:

- detecting a handset going off-hook;
- after the handset is off-hook, reading a list of abbreviated dialing numbers from a memory;
- displaying the topmost entries of the list of abbreviated dialing numbers;
- determining if an abbreviated dialing selection is used to initiate the telephone call and if an abbreviated dialing selection was used, skipping ahead to step k, otherwise continuing to step e;
- collecting a manually dialed number;
- determining if the manually dialed number to the numbers is on the list of abbreviated dialing numbers and if it is on the list skipping to step 1, otherwise continuing to step g;
- adding the manually dialed number to the list;
- determining if a number of entries of the list with the added manual dialed number exceeds a maximum number thereof and if the maximum number is not exceeded the method is completed, otherwise continuing to step i;
- deleting an entry having the lowest usage other than the most recent manually dialed call and if there is a tie between entries for the lowest usage, deleting the lowest usage entry that is the least recent to be used from the list;
- skipping ahead to step p;
- updating a usage count value and a last used date for the dialed number, and skipping to step p;
- updating usage count value and last used date for the dialed number;
- determining if the usage count has exceeded a threshold as a possible displayed entry, and if the usage count has not exceeded the threshold then skipping to step p, otherwise continuing to step n;
- requesting a label for this entry;
- sorting the list from the entry having the most usage of its dialed number to the entry having the least usage; and
- storing the sorted list in said memory for use upon a next telephone call.

5,568,547

### SUBSCRIBER CIRCUIT PROVIDED WITH A CIRCUIT FOR MONITORING A SUBSCRIBER INSTRUMENT

Kouichi Nishimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

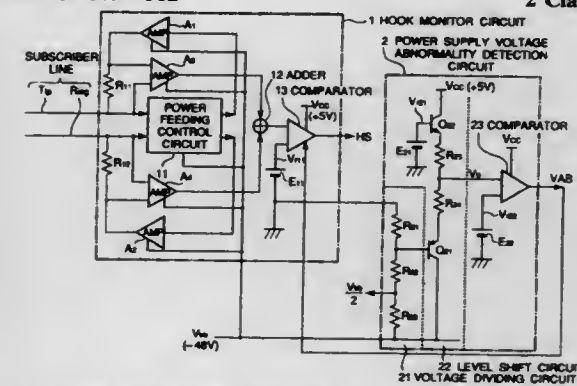
Filed Jun. 15, 1994, Ser. No. 261,281

Claims priority, application Japan, Jun. 15, 1993, 5-142474

Int. Cl.<sup>6</sup> H04M 3/22

U.S. Cl. 379—382

2 Claims



1. A subscriber circuit comprising:

a hook monitor circuit for connection to a pair of subscriber lines for operating with a power supply voltage supplied to a subscriber instrument, said hook monitor circuit detecting a current flowing through said pair of subscriber lines in the form of a voltage and comparing said voltage with a first reference voltage, such that if said voltage is higher than said first reference voltage, said hook monitor circuit generates a monitor signal;

a power supply voltage abnormality detecting circuit for receiving said power supply voltage supplied to said subscriber instrument and for generating an active abnormality detection signal; and

means for responding to said active abnormality detection signal for inhibiting said hook monitor circuit from outputting said monitor signal;

wherein said power supply voltage abnormality detecting circuit includes a voltage dividing circuit receiving said power supply voltage supplied to said subscriber instrument and outputting a voltage-divided voltage, a level shift circuit receiving said voltage-divided voltage and outputting a level-shifted voltage, and a comparator comparing said level-shifted voltage with a second reference voltage and generating said active abnormality detection signal when said level-shifted voltage is higher than said second reference voltage

wherein said voltage dividing circuit includes first, second and third resistors series-connected to each other in the named order, the series connection of said first, second, and third resistors being connected between a ground level and said power supply voltage supplied to said subscriber instrument, in the named order from said ground level, so that said voltage-divided voltage is produced from a connection node between said first and second resistors, and a voltage of one half of said power supply voltage is produced at a connection node between said second and third resistors, and

wherein said level shift circuit includes a first transistor with a base connected to the connection node between said first and second resistors and with a collector connected to said power supply voltage, a second transistor with a base connected to a third reference voltage and with a collector connected to a second power supply voltage, and voltage dividing circuitry connected between emitters of said first and second transistors for dividing a voltage between said emitters of said first and second transistors to supply a divided voltage as said level-shifted voltage.

5,568,548

### HANG-UP CUP ASSEMBLY

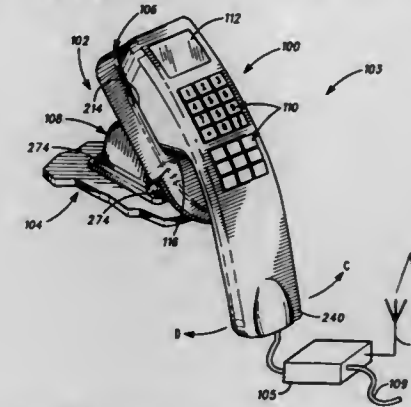
Daniel J. Repplinger, Hawthorn Woods, and Jennifer M. Hislop, Barrington, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 19, 1995, Ser. No. 492,265

Int. Cl.<sup>6</sup> H04M 1/00; A47F 7/14; A47B 91/00; F16M 11/04

U.S. Cl. 379—446

17 Claims



1. A hang-up cup assembly comprising:

a hang-up cup having a surface including a first engagement member extending in a first direction and a second engagement member extending in a second direction, the first and second directions being different;

a pedestal having a complementary engagement member to engage the first and second engagement members, the first engagement member to mate with the complementary engagement member in the first direction such that the hang-up cup engages the complementary engagement member when rotated to different orientations relative to the pedestal in a first plane, and the complementary engagement member to mate with the second engagement member in the second direction such that the hang-up cup engages the complementary engagement member when rotated to different orientations relative to the pedestal in a second plane, whereby the first engagement member is positioned on the complementary engagement member to permit rotation in the first plane and the second engagement member is positioned on the complementary engagement member to permit rotation in the second plane; and

a fastener for securing a position of the hang-up cup on the pedestal.

5,568,549

### MOBILE TELEPHONE HOLDER

Chin-Yang Wang, No. 167, Lane 131, Sec. 2, Ture Hsing Rd., Panchiao City, Taipei Hsien, Taiwan

Filed Sep. 6, 1995, Ser. No. 523,872

Int. Cl.<sup>6</sup> H04M 1/00

U.S. Cl. 379—446

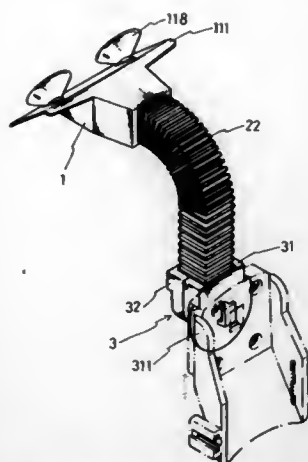
1 Claim

1. A mobile telephone holder comprising:

a mounting base, said mounting base comprising a casing and a cover covered on said casing, said casing comprising a flat bottom wall having two key holes near two opposite sides, two vacuum mounts respectively fixed to said key holes for fastening said mounting base to a flat surface, two upright walls raised from said flat bottom wall between said key holes, a transverse wall connected between said upright walls, two parallel rails respectively raised from said upright walls above said transverse wall, a post disposed above said transverse wall, and two female screws bilaterally disposed between said transverse wall and said rails within said upright walls, said cover being a flat plate having two mounting tubes respectively fastened to the female screws of said mounting base by a respective screw;

a holder frame fixedly secured to said supporting arm remote from said mounting base for holding a mobile telephone, said





holder frame comprising a left shell and a right shell, said left shell comprising a downward flange defining a seat for holding a mobile telephone, a back chamber, a plurality of female screws and a post disposed in the back chamber of said left shell, said right shell comprising a back chamber matched with the back chamber of said left shell, and a plurality of mounting holes respectively fastened to the female screws of said left shell by a respective screw; and a supporting arm connected to said mounting base, said supporting arm comprised of a deformable metal plate and a bellows tube sleeved onto said deformable metal plate, said bellows tube having a first outward flange around the periphery at one end, said first flange being engaged with the rails of said mounting base, and a second outward flange around the periphery at an opposite end, said second flange being fastened inside the back chambers of said left shell and said right shell, said deformable metal plate having a first mounting hole at one end fixed to the post of said mounting base by a screw and a second mounting hole at an opposite end fixed to the post of said left shell.

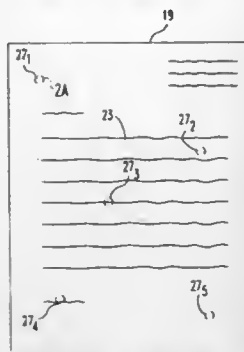
#### 5,568,550 METHOD AND SYSTEM FOR IDENTIFYING DOCUMENTS GENERATED BY AN UNAUTHORIZED SOFTWARE COPY

Shmuel Ur, 11 Ravina Street, Tel Aviv 69395, Israel, assignor to Shmuel Ur, Israel; Leon H. Charney, New York, N.Y., and Shay H. Bushinsky, Israel

Filed Oct. 5, 1994, Ser. No. 318,218  
Int. Cl.<sup>6</sup> H04L 9/00

U.S. Cl. 380—3

18 Claims



1. A method of identifying a software copy used to generate documents comprising the steps of:  
embedding in said software a unique identifying code pattern to be printed in addition to matter selected for printing by said software;  
generating a printed document containing said unique identifying code pattern and said matter selected for printing by said software, said unique identifying code pattern comprising a

plurality of non-contiguous marks, each having a size no greater than about 300 dpi; and  
scanning said document to extract and identify said unique identifying code pattern.

#### 5,568,551 DATA MANAGEMENT METHOD AND SYSTEM THEREOF

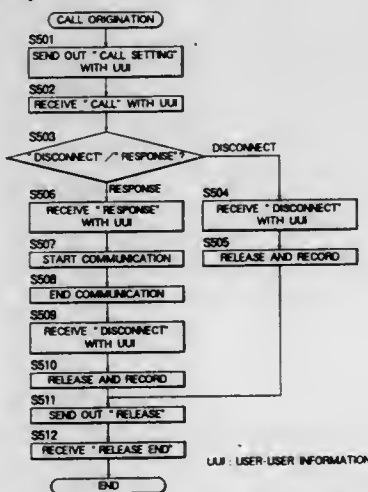
Isao Kawashima, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 4, 1994, Ser. No. 285,847

Claims priority, application Japan, Aug. 6, 1993, 5-196161  
Int. Cl.<sup>6</sup> H04L 9/00

U.S. Cl. 380—4

22 Claims



1. A data management system in a data communication system comprising a control means which, when performing data communication between a first communication means and a second communication means, establishes a signal channel before establishing a data channel and transfers control data for data management between said first communication means and said second communication means through said signal channel before using said data channel to transfer managed data.

#### 5,568,552 METHOD FOR PROVIDING A ROVING SOFTWARE LICENSE FROM ONE NODE TO ANOTHER NODE

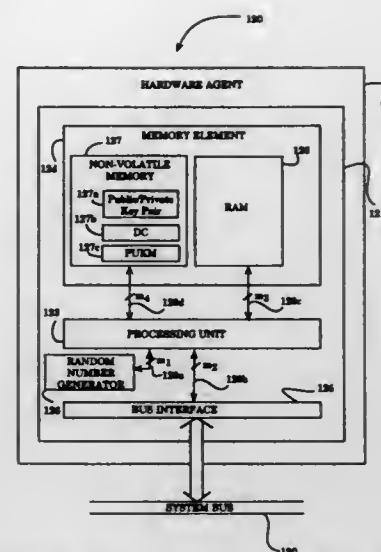
Derek L. Davis, Phoenix, Ariz., assignor to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 303,084, Sep. 7, 1994. This application  
Jun. 7, 1995, Ser. No. 472,951  
Int. Cl.<sup>6</sup> H04K 1/00

U.S. Cl. 380—4

16 Claims

1. A method for transferring a valid license token between a first and second nodes which allows execution of a licensed software program after the valid license token had been initially provided by a software supplier, the method comprising the steps of:  
establishing a communication link between a first cryptographic device of the first node and a second cryptographic device of the second node;  
authenticating said first and second cryptographic devices prior to transferring the valid license token there between;  
transmitting a query message from said first cryptographic device to said second cryptographic device in order to determine whether said second cryptographic device possesses said valid license token;  
generating a transfer request message from said first cryptographic device to said second cryptographic device if said second cryptographic device possesses said valid license token;



transferring said valid license token from said second cryptographic device to said first cryptographic device;  
generating a token received message from said first cryptographic device to said second cryptographic device after receipt of said valid license token; and  
terminating said communication link.

#### 5,568,553 CORDLESS PHONE SYSTEM CAPABLE OF SCRAMBLING COMMUNICATION SIGNALS

Yuji Takahashi, and Hideo Fukasawa, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

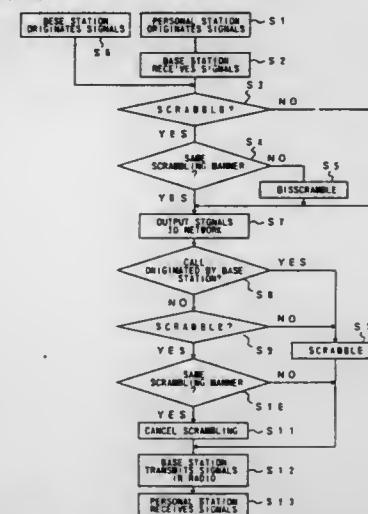
Division of Ser. No. 968,982, Oct. 30, 1992, Pat. No. 5,392,354.

This application Aug. 16, 1994, Ser. No. 291,153

Claims priority, application Japan, Oct. 30, 1991, 3-283379  
Int. Cl.<sup>6</sup> H04L 9/00

U.S. Cl. 380—9

8 Claims



1. A base station of a cordless phone, for communicating with a personal station of the cordless phone by radio and being connected to a network, said base station comprising:  
receiving means for receiving a scrambled signal transmitted by radio from said personal station; and  
output means for outputting the scrambled signal received by said receiving means to said network without descrambling when a scrambling manner of the scrambled signal transmitted by radio from said personal station is the same as a scrambling manner of communication signals in another phone communicated with said cordless phone via said network.

#### 5,568,554 METHOD FOR IMPROVING THE PROCESSING AND STORAGE PERFORMANCE OF DIGITAL SIGNATURE SCHEMES

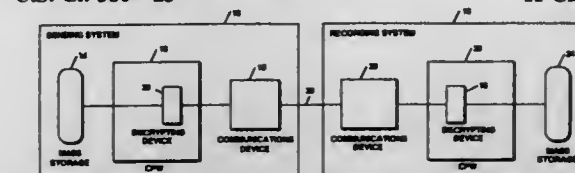
Donald E. Eastlake, 3rd, Carlisle, Mass., assignor to Digital Equipment Corporation, Maynard, Md.

Filed Jan. 31, 1995, Ser. No. 381,244

Int. Cl.<sup>6</sup> H04L 9/00; 9/30

U.S. Cl. 380—25

11 Claims



11. A method of transferring data to insure data authenticity comprising the steps of:

providing a first computer system, said first computer system having a mass storage device, a central processing unit having an encrypting/decrypting device, and a communication device;  
providing a second computer system, said second computer system having a mass storage device, a central processing unit having an encrypting/decrypting device, and a communication device;  
linking said first computer system to said second computer system via a network communications link;  
providing a database on said mass storage device of said first computer system, said database containing a plurality of records;  
selecting a subset of said plurality of records;  
converting said subset into a signet, the step of converting including the substeps of providing a first constant, concatenating each of said records in said subset a first transfer string, concatenating said first constant into said first transfer string, encrypting said first transfer string using a first key, and concatenating said encrypted first transfer string to said first constant;  
transferring said signet to said second computer system over said network communications link;  
transferring said subset to said second computer system over said network communications link;  
decrypting said signet in said second computer system; and  
verifying said decrypted signet.

#### 5,568,555 MULTI-COLOR INFORMATION ENCODING SYSTEM

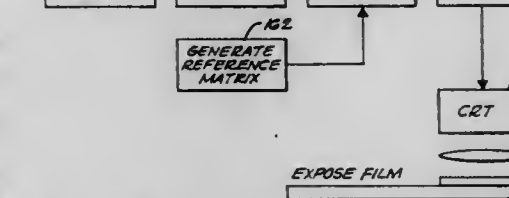
Harry A. Shamir, Waltham, Mass., assignor to ColorCode Unlimited, Inc., Cambridge, Mass.

Continuation of Ser. No. 834,666, Feb. 12, 1992, Pat. No. 5,369,261. This application Nov. 23, 1994, Ser. No. 344,118

Int. Cl.<sup>6</sup> G09C 3/08

U.S. Cl. 380—51

35 Claims



1. A method for decoding a data region, on a medium, and converting the data region into at least a portion of a human-ascertainable informational element, the data region being encoded with at least one of n different colors, wherein each color of the plurality of n different colors has a wavelength in a range of

first and second bias resistors connected in series between the first and second differential input terminals; third and fourth resistors connected in series between the first and second differential output terminals; and a feedback circuit that dc couples a ground terminal to a node between the first and second bias resistors to provide the input terminals of gain-stage amplifier with a dc current path to the ground terminal sufficient to accommodate a bias current and that ac couples the node between the first and second bias resistors to a node between the third and fourth resistors to maintain, at the input terminals of the gain-stage amplifier, a high input impedance to ac signals above a predetermined frequency, such that the input impedance of the line receiver is larger for ac signals above the predetermined frequency than for dc signals and such that, above the predetermined frequency, the line receiver receives the differential-mode input signal and substantially rejects any common-mode signals on the differential lines along with the differential-mode input signal.



# 5,568,562

## RELEASABLY MOUNTED COMPOUND LOUDSPEAKERS

Chia-Po Huang, Taoyuan Hsien, Taiwan, assignor to Vocal Co., Ltd., Taiwan

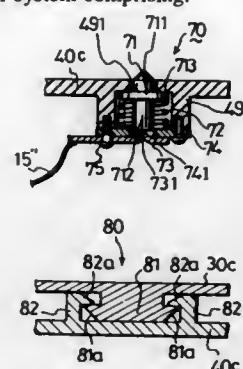
Filed Nov. 28, 1994, Ser. No. 345,002

Int. Cl.<sup>6</sup> H04R 25/00

U.S. Cl. 381—186

2 Claims

1. A loudspeaker system comprising:



- a first loudspeaker driver including a voice coil mounted thereon;
- a carrier having a bearing plate and a leg member which is mounted to said first loudspeaker driver for supporting and spacing said bearing plate apart from said first loudspeaker driver, said bearing plate having a flat bearing surface;
- a second loudspeaker driver including a voice coil mounted thereon;
- a support plate for supporting said second loudspeaker driver, said support plate having a flat base surface disposed on said bearing surface of said bearing plate;
- means for retaining releasably said support plate on said bearing plate, wherein said retaining means includes a retaining member mounted securely on said bearing surface of said bearing plate, and an engagement member mounted securely on said base surface of said support plate, said engagement member being engageable with said retaining member for retaining releasably said support plate on said bearing plate, and wherein said retaining member includes two parallel spaced hook plates extending from said bearing surface toward said base surface and having inwardly bent barb-like end portions, said engagement member having an insert piece which extends from said base surface toward said bearing surface between said hook plates, and which has two outwardly bent barb-like flanges that are engageable with said barb-like end portions of said hook plates, respectively;
- first and second contact members mounted respectively to said bearing and base surfaces of said bearing and support plates; and
- means for connecting electrically said first and second contact members to said voice coils of said first and second loudspeaker drivers, respectively, said first and second contact members making electrical contact with each other when said support plate is disposed on said bearing plate.

5,568,563

# METHOD AND APPARATUS OF PATTERN RECOGNITION

Ken-ichi Tanaka, and Masako Shimizu, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

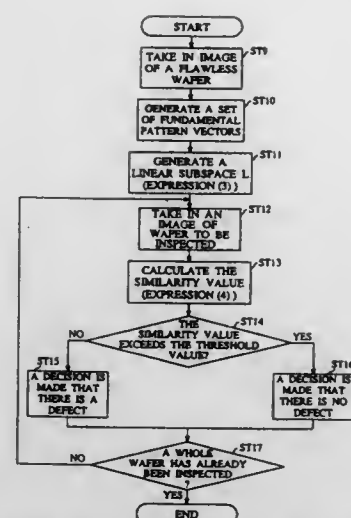
Filed May 3, 1994, Ser. No. 237,138

Claims priority, application Japan, May 17, 1993, 5-114807 Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382—144

16 Claims

1. A pattern recognition method for comparing a first image including a fundamental pattern, to a second image including a test pattern, to detect a match between the test pattern and the fundamental pattern, the method comprising the steps of:



producing a first signal representative of said first image; producing a second signal representative of said second image; generating a set of data structures that defines a set of vectors based upon said first signal, said set of vectors including a first vector indicative of the fundamental pattern of the first image disposed in a first position and a plurality of second vectors indicative of the fundamental pattern of the first image disposed in a plurality of respective different positions from the first position; generating a linear subspace data structure that defines a linear subspace spanned by the first vector and the plurality of second vectors; generating a test pattern data structure that defines a test pattern vector based upon said second signal, said test pattern data structure being indicative of the second image; projecting the test pattern vector to the generated linear subspace to produce a third vector which belongs to a complementary subspace of the linear subspace; generating a norm signal based upon the third vector which belongs to the complementary subspace; and determining if the fundamental pattern of the first image matches the test pattern of the second image based on the norm signal.

5,568,564

# IMAGE PROCESSING APPARATUS AND METHOD FOR INSPECTING DEFECTS OF ENCLOSURES OF SEMICONDUCTOR DEVICES

Takayuki Ozaki, Hyogo-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

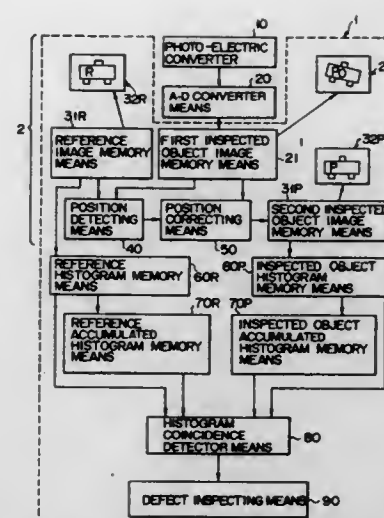
Continuation of Ser. No. 841,209, Feb. 27, 1992, abandoned, which is a continuation of Ser. No. 613,457, Nov. 14, 1990, abandoned, which is a continuation of Ser. No. 346,664, May 3, 1989, abandoned. This application Aug. 21, 1992, Ser. No. 931,517

Claims priority, application Japan, May 10, 1988, 63-113355 Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382—149

25 Claims

1. An image processing apparatus for inspecting enclosures of semiconductor devices for defects, comprising: first means for storing electric signals each representative of a relative density degree of a first image signal as a reference signal;
- second means for storing electric signals each representative of a relative density degree of a second image signal of one of said enclosures to be inspected;
- third means for storing an electric signal representative of an accumulated value of the relative degree supplied from said first storing means as a first histogram R;
- fourth means for storing an electric signal representative of an accumulated value of the relative degree supplied from said second storing means as a second histogram P;



means for detecting the coincidence degree H between the first histogram R and the second histogram P by electronically performing calculation based on the following formulas:

$$H = \frac{A - \frac{1}{m \times n} B \cdot C}{\sqrt{D - \frac{1}{m \times n} B^2} \cdot \sqrt{E - \frac{1}{m \times n} C^2}}$$

$$A = \sum_{i=1}^m \sum_{j=1}^n \{P(X_p + i - 1, Y_p + j - 1) \cdot R(X_r + i - 1, Y_r + j - 1)\}$$

$$B = \sum_{i=1}^m \sum_{j=1}^n \{P(X_p + i - 1, Y_p + j - 1)\}$$

$$C = \sum_{i=1}^m \sum_{j=1}^n \{R(X_r + i - 1, Y_r + j - 1)\}$$

$$D = \sum_{i=1}^m \sum_{j=1}^n \{P(X_p + i - 1, Y_p + j - 1)\}^2$$

$$E = \sum_{i=1}^m \sum_{j=1}^n \{R(X_r + i - 1, Y_r + j - 1)\}^2$$

where  $P(X_p, Y_p)$  and  $R(X_r, Y_r)$  indicate pixel density data at coordinates  $(X_p, Y_p)$  and  $(X_r, Y_r)$ , respectively, m is the number of pixels included in one horizontal pixel array of a window, and n is the number of pixels included in one vertical pixel array of the window, the window defining a range of the first and second histograms R and P at the time of calculation; and means for judging whether or not the inspected enclosure has defects by electronically comparing the calculated value of the H with a predetermined value, and rejecting the inspected enclosure as defective when the compared values have an impermissible deviation from one another.

5,568,565

# HANDWRITING INPUT METHOD AND APPARATUS

Hiroshi Minakata, Tokyo, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

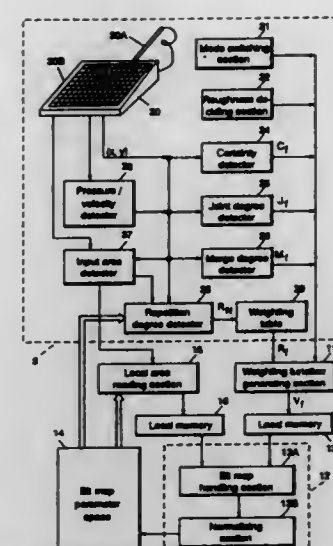
Filed Apr. 29, 1993, Ser. No. 55,436

Claims priority, application Japan, Mar. 5, 1992, 4-048287 Int. Cl.<sup>6</sup> G06K 9/00; 9/46

U.S. Cl. 382—187

8 Claims

1. A method for receiving strokes handwritten on an input/output screen and displaying a line segment on said screen, said method comprising the steps of: receiving a stroke input by writing by hand with a pen on a first area of an input/output screen; associating with each point of said stroke a plurality of parameters by



detecting the pen-stroke pressure P of said stroke; detecting the pen velocity V of said stroke; detecting the number of times N previous strokes have been input in said local area; converting P, V and N to a plurality of parameters wherein the following parameters are calculated: certainty factor Cf as a parameter showing whether the user is writing a line segment, Cf being a function of at least P and V; merge factor Mf as a parameter showing the strength with which the user writes a line segment, Mf being a function of at least P; joint factor Jf as a parameter showing density of the user input, Jf being a function of at least V; and repetition factor Rf as a parameter showing whether the user has intention of repeatedly writing a line segment, Rf being a function of the number of previous strokes input into said local area; weighting said plurality of parameters to generate a three-dimensional weighting function, said weighting function associated with said input stroke; reading from a memory means a stored weighting function associated with a previously input stroke, said previous stroke input in a local area on said input/output screen, said local area being an area substantially close to said first area; adding said weighting function associated with said input stroke and said stored weighting function, said result of said addition being a generated weighting function; storing said generated weighting function in said memory means; detecting the edge of said weighting function to extract a line segment; and displaying said line segment on said input/output screen.

5,568,566

# DRAWING PROCESSING APPARATUS

Osamu Hori, Yokohama; Shigeyoshi Shimotsuji, Tokyo, and Mieko Asano, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 797,354, Nov. 25, 1991, abandoned.

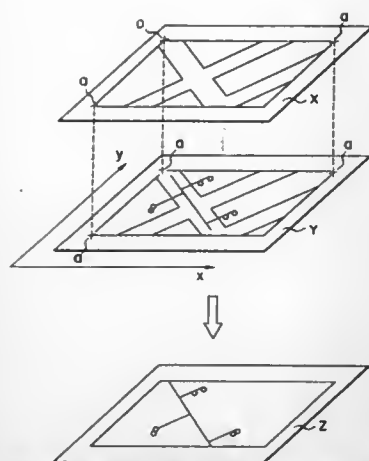
This application Dec. 28, 1993, Ser. No. 173,932

Int. Cl.<sup>6</sup> G06K 9/48

U.S. Cl. 382—197

6 Claims

1. A drawing processing apparatus for extracting desired figures from a drawing as numerical data, comprising: drawing input means for inputting a background drawing and a to-be-processed drawing and dividing figures drawn on said background drawing and said to-be-processed drawing into a plurality of segments to convert each of the segments to



vector data, said to-be-processed drawing including figures drawn on the same figures as said background drawing;  
 storing means for storing said vector data corresponding to said background drawing and said vector data corresponding to said to-be-processed drawing;  
 registration means for registering said background drawing and said to-be-processed drawing with each other using said vector data read out from said storing means;  
 candidate vector extracting means for setting a predetermined circumscribed rectangle for each of said vectors obtained from said background drawing and extracting said vector data obtained from said to-be-processed drawing included in said circumscribed rectangle;  
 calculating means for calculating a degree of overlap between said vector data and said candidate vector data and determining said candidate vector data as a corresponding vector extracted from said background drawing when the degree of overlap is equal to or lower than a predetermined threshold value; and  
 classifying means for classifying vectors, which correspond to the vectors formed from the figure on said background drawing, from the vectors formed from the figure on said to-be-processed drawing.

5,568,567

# TWO-DIMENSIONAL IMAGE PROCESSING METHOD AND APPARATUS FOR APPROXIMATING CIRCULAR ARC CONFIGURATION OF AN OBJECT

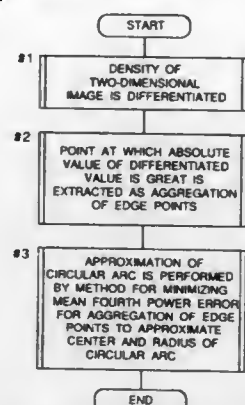
Haruhiko Yokoyama, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Jan. 22, 1992, Ser. No. 824,173

Claims priority, application Japan, Jan. 22, 1991, 3-005437  
 Int. Cl.<sup>6</sup> G06K 9/46

U.S. Cl. 382-204

13 Claims



1. A data processor implemented method for processing two-dimensional image data of an object to inspect a circular arc configuration of the object, the two-dimensional image data repre-

sentative of a two-dimensional image containing an image of the circular arc configuration of the object, said method comprising:  
 subjecting the two-dimensional image data to a data extraction process to extract edge point image data from the two-dimensional image data, the edge point image data indicative of an aggregation of image edge points of the image of the circular arc configuration of the object; and,  
 subjecting the edge point image data to a data approximation process to approximate the circular arc configuration of the object, said data approximation process including  
 a first data processing step of determining the square of a distance between a center of a given circle having a given radius and each image edge point of the edge point image data,  
 a second data processing step of determining the square of the radius of the given circle,  
 a third data processing step of determining, for each image edge point of the edge point image data, the square of a difference between the square of the distance determined in said first data processing step and the square of the radius determined in said second data processing step,  
 a fourth data processing step of determining a mean of the squares of the differences determined in said third data processing step, the mean of the squares of the differences corresponding to a mean fourth power error of the given circle relative to the aggregation of image edge points of the edge point image data, and  
 a fifth data processing step of defining a circle to be applied as the given circle in said first through third data processing steps which minimizes the mean of the squares of the differences determined in said fourth data processing step, the thus defined circle approximating the circular arc configuration of the object.

5,568,568

# PATTERN RECOGNITION APPARATUS

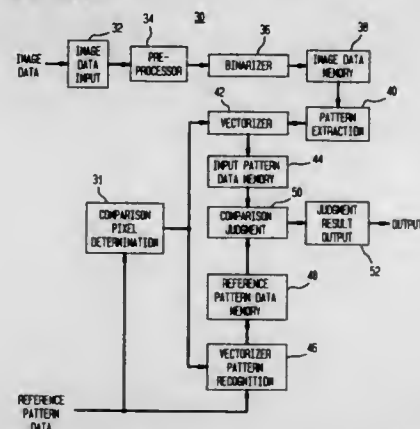
Yoshinori Takizawa, Tokyo, and Naoka Yoshida, Kanagawa, both of Japan, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 23, 1992, Ser. No. 824,277

Claims priority, application Japan, Apr. 12, 1991, 3-080243  
 Int. Cl.<sup>6</sup> G06K 9/62

U.S. Cl. 382-220

6 Claims



1. A pattern recognition apparatus for comparing an input pattern with a plurality of different registered reference patterns comprising:  
 probability calculation circuit means for calculating a probability of the existence of a pixel of any one of the plurality of different registered reference patterns at each pixel within a prescribed frame of MxN pixels separately forming each one of the reference patterns;  
 entropy calculation circuit means responsive to the probability values obtained from the probability calculation means for calculating pixel information content entropy values for each of the pixels within the prescribed frame, and using said

entropy values as a basis for selecting a number of pixel points in the prescribed frame which is less than M times N to be used for comparison with corresponding pixel points of the input pattern, wherein the entropy calculation means comprises means responsive to the probability values obtained from the probability calculation means for calculating information entropy values means responsive to a distribution of the calculated information entropy values within a frame for producing a predetermined plurality of centroid pixel points with a predetermined number of adjacent surrounding pixels at certain locations within the frame of the reference patterns using a K-mean technique and selecting means responsive to the location of the plurality of centroid pixel points and the adjacent surrounding pixels for selecting the pixels within the frame of the reference patterns to be compared with corresponding pixels of the input pattern;  
 first vectorizing means responsive to data regarding pixels of the input pattern for converting positions of the pixels in the input pattern, corresponding to the pixels selected by the selecting means, into first evaluation vectors;  
 second vectorizing means responsive to data regarding pixels of each reference pattern for converting positions of the pixels in the plurality of reference patterns, corresponding to the pixels selected by the selecting means, into second evaluation vectors; and  
 comparator circuit means for comparing the first and second evaluation vectors and generating an output signal indicating which of the plurality of reference patterns has a highest probability of being the input pattern.

5,568,569

# METHOD AND APPARATUS FOR ANALYZING DIGITAL VIDEO IMAGES BY MERGING DISPLACEMENT VECTORS

Stuart J. Golin, East Windsor, N.J., assignor to Intel Corporation, Santa Clara, Calif.

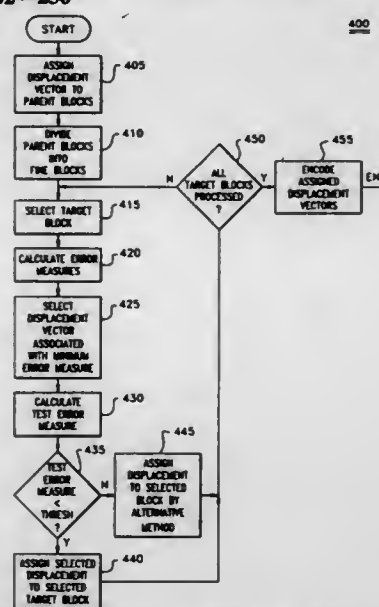
Continuation of Ser. No. 999,148, Dec. 31, 1992, abandoned.

This application Jun. 10, 1994, Ser. No. 258,613

Int. Cl.<sup>6</sup> G06K 9/36; 9/46

U.S. Cl. 382-236

23 Claims



1. A computer implemented method for forming an encoded digital video signal from a target digital video signal representative of a target digital video image within a sequence of one or more digital motion video images using motion analysis, said target digital video image being represented by an array of pixels, comprising the steps of:

(A) assigning displacement vectors to a plurality of blocks of pixels in said target digital video image by block matching a

pixel block in a previous image with each of said plurality of pixel blocks in said target digital video image;  
 (B) selecting first and second pixel block groups from said plurality of blocks of pixels, said first and second pixel block groups being adjacent and having corresponding first and second displacement vectors assigned thereto, said first and second displacement vectors being different;  
 (C) determining a first error measure associated with predicting said second pixel block group from said previous image using said second displacement vector;  
 (D) determining a second error measure associated with predicting said second pixel block group from said previous image using said first displacement vector;  
 (E) determining an error change from the results of steps (C) and (D);  
 (F) determining a variance value in accordance with the magnitudes of the pixels in said second pixel block group;  
 (G) calculating a merge-factor in accordance with said error change, said variance, and the number of pixels in said second pixel block group;  
 (H) reassigning said first displacement vector to said second pixel block group and thereby forming a reassigned displacement vector if said merge-factor is less than a merge-threshold; and  
 (I) forming said encoded digital video signal from said target digital video signal in accordance with said reassigned displacement vector.

5,568,570

# METHOD AND APPARATUS FOR REDUCING QUANTIZATION ARTIFACTS IN A HIERARCHICAL IMAGE STORAGE AND RETRIEVAL SYSTEM

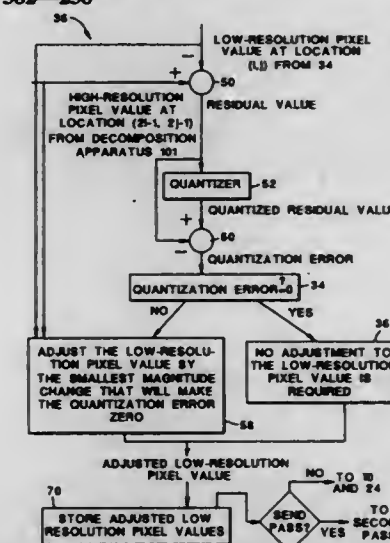
Majid Rabbani, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 30, 1994, Ser. No. 315,781

Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382-238

14 Claims



1. A method for reducing quantization artifacts in a hierarchical image system of the type that decomposes a high resolution image into low resolution image components, including low resolution image pixel values, and residual image pixel values comprising the steps of:

a) forming a predicted higher resolution image by interpolating the pixel values of the low resolution image components;  
 b) determining the difference values between the pixel values in the low resolution image and the corresponding pixel values in the higher resolution image;  
 c) comparing each of the difference values against quantizer conversion values to determine if an error would exist for an executed conversion;



- d) adjusting the image pixel values within the low resolution image component if an error would exist, to a value that eliminates the error to form an adjusted low resolution image;
- e) using the unadjusted image pixel value as part of the adjusted low resolution image component if an error does not exist; and
- f) forming a predicted higher resolution image by interpolating the pixel values of the adjusted low resolution image components of steps d) and e);
- g) determining the difference values between the interpolated pixel values in the predicted higher resolution image and the corresponding pixel values in the higher resolution image;
- h) comparing each of the difference values against quantizer conversion values to determine if an error would exist for an executed conversion;
- i) adjusting further the image pixel values within the adjusted low resolution image component if an error would exist, to a value that eliminates the error to form an adjusted low resolution image; and
- j) using the unadjusted image pixel value as part of the adjusted low resolution image component if an error does not exist.

5,568,571

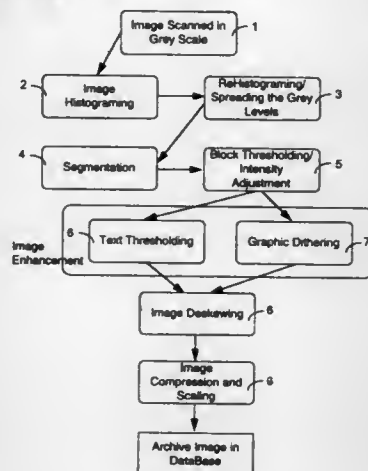
## IMAGE ENHANCEMENT SYSTEM

Donald F. Willis, Saline; John E. Brooks, Ypsilanti, both of Mich.; Hosni Adra, Toledo, Ohio, and Hsieh S. Hou, Rancho Palos Verdes, Calif., assignors to University Microfilms, Inc., Ann Arbor, Mich.

Filed Dec. 14, 1992, Ser. No. 989,820  
Int. Cl. G06K 9/38

U.S. Cl. 382—254

26 Claims



Algorithm Flow

1. A digital image processing apparatus comprising in combination;

- A. means for receiving a scalar image file of scaled pixel values;
- B. means for segmentation of the scaled pixel values into graphics blocks and non-graphics blocks, the segmentation means including:

1. means for determining at least a first edge threshold from the scaled pixel values wherein the edge threshold is determined according to the following formula:

$$TV = a \times ((LNG - DNG) / b + DNG);$$

where:

- a and b are numerical coefficients;
- TV=edge threshold;
- LNG=lightest non-white scalar pixel value; and
- DNG=darkest non-black scalar pixel value; and
- 2. means for applying at least one edge detection filter to each scalar pixel value and tagging as an edge the scalar pixel values satisfying the conditions of the edge detection filter;

- C. means for developing a binary image file derived from the scalar image file, the developing means including:

1. means for applying a text threshold to the non-graphics blocks in the scalar image file to convert each scaled pixel non-graphic value into a first binary value representing text or alternatively a second binary value representing background for the text; and
2. means for applying a graphics threshold to graphics blocks in the scalar image file to convert each scaled pixel graphic value into a first binary value representing one color or alternatively a second binary value representing another color; and

- D. means for compressing the binary image file to yield a compressed image file for subsequent decompression and digital processing of the compressed image file.

5,568,572

## METHOD AND APPARATUS FOR TONAL CORRECTION IN BINARY PRINTING DEVICES BY PREDISTORTION OF IMAGE DATA

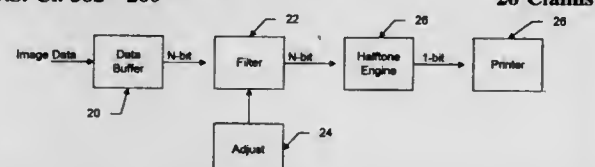
Joseph S. Shu, San Jose, Calif., assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Jul. 1, 1994, Ser. No. 269,601

Int. Cl. G06K 9/40

U.S. Cl. 382—260

26 Claims



1. A method of printing comprising:
- a. obtaining data representative of density levels associated with a source image;
- b. filtering the data in accordance with a filter function;
- c. processing the filtered data into a half-tone pattern; and
- d. printing in accordance with the half-tone pattern onto a recording medium,

wherein the filter function is defined such when the half-tone pattern is printed, the printed pattern exhibits a density pattern lighter than that of the source image in highlight and upper midtone regions and darker than that of the source image in shadow and lower midtone regions.

5,568,573

## APPARATUS FOR SIMULTANEOUSLY READING IMAGE DATA PRINTED ON BOTH SIDES OF A DOCUMENT

Minoru Wada, and Norio Kanemitsu, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 4, 1994, Ser. No. 285,746

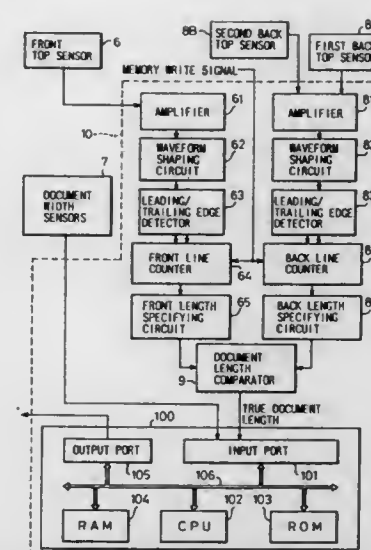
Claims priority, application Japan, Aug. 6, 1993, 5-195676  
Int. Cl. G06K 7/015

U.S. Cl. 382—317

6 Claims

1. A reading apparatus serving as an input means for simultaneously reading printed image information from the front and back of a document, converting the read image information into digital data, and storing the digital data on a data recording medium, comprising:

- document carrier means for carrying documents, inserted into a slot, through said apparatus and for ejecting said documents through an outlet;
- a front reading means/or reading a printed image from said front of a document;
- a back reading means for reading a printed image from said back of a document;
- a front size determining means lying in a document carrier path and detecting the size of said front of a document by detecting a leading and trailing edge of said document;



- a back size determining means lying in said document carrier path and detecting the size of said back of a document;
- a document size comparing means for comparing between the sizes determined by said front size determining means and back size determining means, and outputting a larger one of determined sizes as a document size; and
- a reading control means allowing said front reading means and back reading means to read printed image information from said document according to said document size provided by said document size comparing means.

5,568,574

## MODULATOR-BASED PHOTONIC CHIP-TO-CHIP INTERCONNECTIONS FOR DENSE THREE-DIMENSIONAL MULTICHIP MODULE INTEGRATION

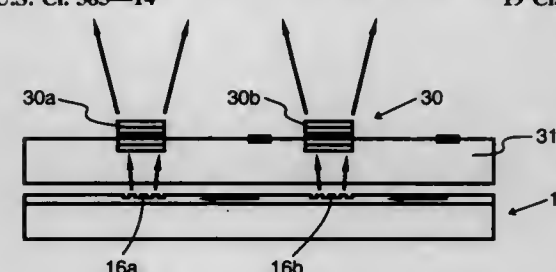
Armand R. Tanguay, Jr., Fullerton, and B. Keith Jenkins, Long Beach, both of Calif., assignors to University of Southern California, Los Angeles, Calif.

Filed Jun. 12, 1995, Ser. No. 489,983

Int. Cl. G02B 6/12; G03H 1/00

U.S. Cl. 385—14

19 Claims



1. A modulator array with compact parallel optical readout, comprising:

- (a) a first array of optical modulators;
- (b) a first optical power bus means for optical readout of said first array of optical modulators, located in close physical proximity to said first array of optical modulators, said first optical power bus means comprising:
  - (i) a first at least one optical waveguide on a surface of a first substrate, said surface of said first substrate defining a first plane; and
  - (ii) a first means for coupling light out of said first at least one optical waveguide into a first at least one outcoupled beam, said first at least one outcoupled beam propagating at a first nonzero angle with respect to said first plane defined by said surface of said first substrate; and
- (c) a first optics means for directing said first at least one outcoupled beam towards at least one optical modulator of

said first array of optical modulators, generating a set of modulator readout beams.

5,568,575

## OPTICAL ARRAY MODULE AND THE CONTROL METHOD OF THE SAME

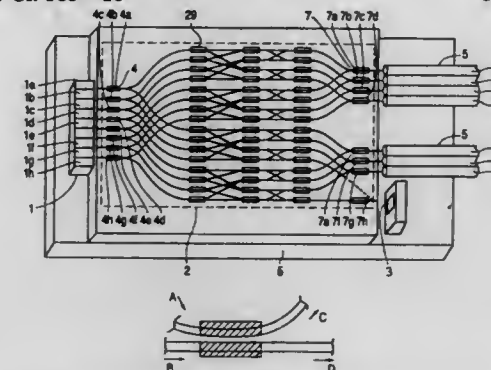
Kazuyoshi Sato, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 28, 1994, Ser. No. 348,149

Claims priority, application Japan, Nov. 26, 1993, 5-295843  
Int. Cl. G02B 6/35

U.S. Cl. 385—16

8 Claims



1. A light emitting array module comprising:
- a plurality of light emitting elements for converting electrical signals transmitted by a plurality of channels into optical signals;
- an optical switch for switching optical paths for light emitted from said light emitting elements;
- a plurality of optical fibers coupled optically to said light passing through said optical switch;
- at least one light receiving element for receiving said light passing through said optical switch and for checking whether said light emitting elements are functioning properly;
- a timing extract circuit for extracting timing of said electrical signals and for determining a stop state of each electrical signal;
- a switching control circuit for controlling said optical switch to connect said light emitting elements under said stop state to said light receiving element; and
- a switching circuit for selecting light emitting elements which are functioning properly for connection to said channels.

5,568,576

## OPTICAL PARALLEL TRANSMISSION DEVICE

Atsushi Takai, and Hajime Abe, both of Kokubunji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

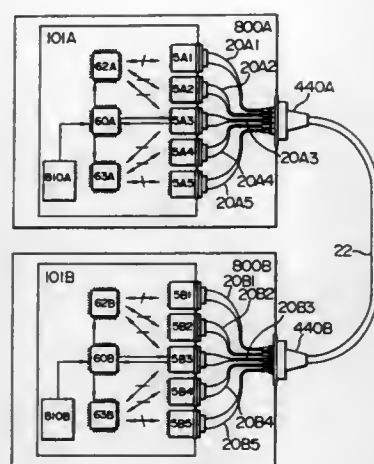
Continuation of Ser. No. 49,714, Apr. 20, 1993, Pat. No. 5,448,661. This application Jul. 27, 1995, Ser. No. 508,140

Claims priority, application Japan, Apr. 23, 1992, 4-104278  
Int. Cl. G02B 6/28

U.S. Cl. 385—24

7 Claims

1. A parallel optical transmission device comprising:
  - a transmitter section having a plurality of transmitter modules converting a plurality of input electrical signals into optical signals;
  - a section consisting of bundles of optical waveguides 20i, j transmitting said optical signals, one end of said bundles being connected with said transmitter section; and
  - a receiver section having a plurality of receiver modules reproducing the electrical signals from said optical signals thus transmitted to output them, said receiver section being connected with the other end of said bundles;
- wherein all propagation delay times from said input electrical signals to the output electrical signals are set in predetermined regions.



5,568,577

# METHOD AND APPARATUS FOR CONCENTRATING THE ENERGY OF LASER DIODE BEAMS

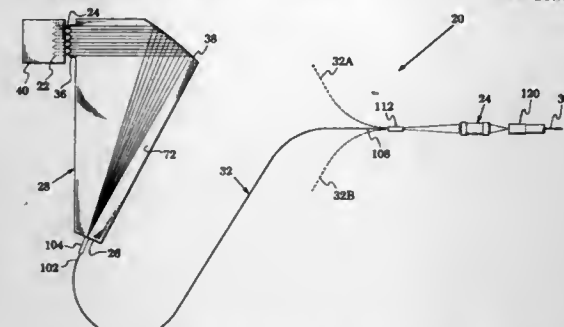
Arthur H. Hardy, Jr., Santa Barbara, and Leland V. Gardner, Buellton, both of Calif., assignors to Hughes Electronics, Los Angeles, Calif.

Filed Dec. 13, 1994, Ser. No. 355,878

Int. Cl.<sup>6</sup> G02B 6/32

U.S. Cl. 385—33

44 Claims



1. A method of concentrating the energy of a plurality of electromagnetic beams that each defines a first numerical aperture and a lesser second numerical aperture respectively along first and second axial beam planes, comprising the steps of:

- reducing said first numerical aperture of each of said beams along its first axial beam plane;
- reflecting said beams with a concave surface to form a superimposed image at a focus of said concave surface with a combined numerical aperture along their first beam planes;
- selecting the focal length of said concave surface to cause said combined numerical aperture to be less than said first numerical aperture; and
- reflectively guiding each of said beams along its second axial beam plane to retain its second numerical aperture at said focus.

5,568,578

# GRADIENT INDEX ROD COLLIMATION LENS DEVICES FOR ENHANCING OPTICAL FIBER LINE PERFORMANCE WHERE THE BEAM THEREOF CROSSES A GAP IN THE LINE

Gregory H. Ames, Gales Ferry, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

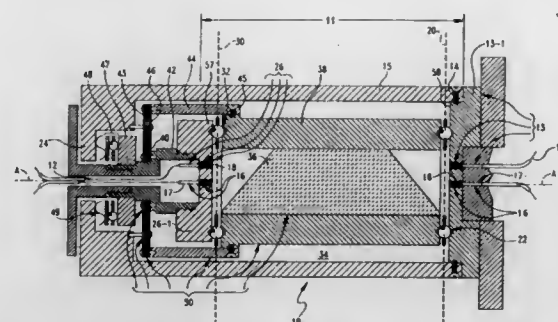
Filed Dec. 14, 1994, Ser. No. 359,119

Int. Cl.<sup>6</sup> G02B 6/00; 6/36; 6/32; 6/26

U.S. Cl. 385—34

9 Claims

1. A fiber optic beam collimator for interposition in a utilization optical fiber line having a gap, said collimator serving to provide



intercoupling between a beam propagating within the optical fiber line and the one-in-the-same beam propagating in the gap in the form of a generally collimated beam, said collimator comprising: a span of said optical fiber line ending at one side of said gap and adapted to form a reinforced terminal end section; a gradient index glass, rod-type collimation lens having a length which exceeds one-quarter pitch by a predetermined increment, said predetermined increment being chosen to substantially maximize transmission of beam power through the utilization optical fiber line in which the collimator is interposed; and

said reinforced terminal end section being disposed with its longitudinal axis parallel aligned with the central axis of the rod-type, collimation lens with the end of the optical fiber in an abutting relationship to a first of the opposite end faces of the rod-type, collimation lens, and further being disposed with its longitudinal axis in a predetermined lateral spatial relationship to said central axis of the lens, which relationship is chosen to provide optical train alignment and beam registry between the beam in the optical fiber and the one-in-the-same-beam in generally collimated form at the second side of the rod-type collimation lens propagating in a direction parallel to said central axis of the lens.

5,568,579

# WAVEGUIDE COUPLING DEVICE INCLUDING TAPERED WAVEGUIDE WITH A PARTICULAR TAPERED ANGLE TO REDUCE COUPLING LOSS

Kaoru Okaniwa, Kawagoe, Japan, assignor to Hoechst Aktiengesellschaft, Germany

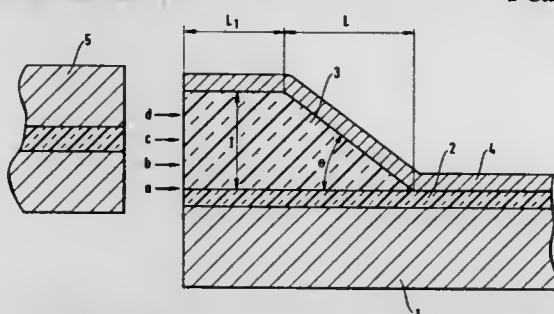
Filed Aug. 2, 1995, Ser. No. 510,390

Claims priority, application Japan, Aug. 4, 1994, 6-183513

Int. Cl.<sup>6</sup> G02B 6/26

U.S. Cl. 385—43

1 Claim



1. A waveguide device comprising a cladding layer having a refractive index  $n_{cl}$ , a first waveguide having a refractive index  $n_g$  ( $n_g > n_{cl}$ ) formed on said cladding layer, and a second waveguide having a refractive index  $n_{cp}$  ( $n_{cp} > n_g$ ) formed on said first waveguide, wherein the sectional shape of said second waveguide has a tapered structure in which a layer thickness of said second waveguide reduces as the distance from the end face of the second waveguide increases, and a tapering angle  $\Theta$  in said tapered structure satisfies the following conditions:

$$\Theta_g = \{90^\circ - \arcsin(n_{cl}/n_g)\}/2 \quad (1)$$

$$\Theta < 2.0 \Theta_g \quad (2)$$

wherein  $n_{eff}$  represents an effective refractive index of said first waveguide.

5,568,580

# OPTICAL STAR-COUPLER

Tetsuya Saitoh, and Hideo Shimizu, both of Tokyo, Japan, assignors to Fuji Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 276,708, Jul. 18, 1994. This application

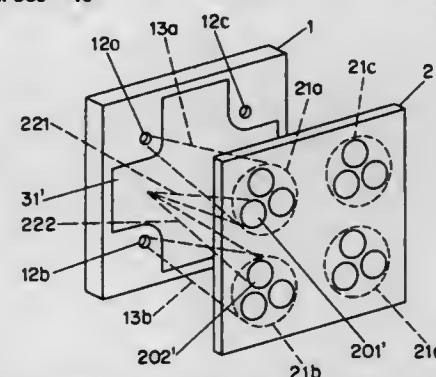
Jun. 7, 1995, Ser. No. 478,961

Claims priority, application Japan, Jul. 19, 1993, 5-118074

Int. Cl.<sup>6</sup> G02B 6/26

U.S. Cl. 385—46

14 Claims







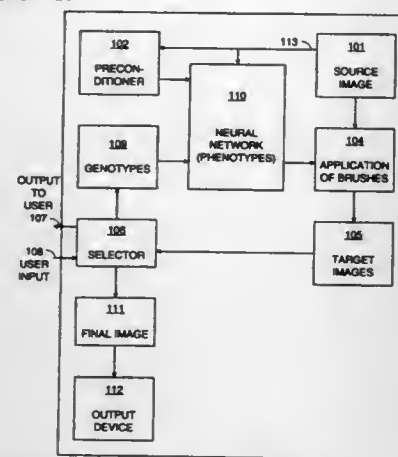
said first or second signal and said third signal using a second number of fuzzy values that is smaller than said first number of fuzzy values.

# **5,568,590** **IMAGE PROCESSING USING GENETIC MUTATION OF NEURAL NETWORK PARAMETERS** Michael Tolson, Mill Valley, Calif., assignor to Xaos Tools, San Francisco, Calif.

Filed Dec. 17, 1993, Ser. No. 168,948  
 Int. Cl.<sup>6</sup> G06T 5/00; G06F 15/18

U.S. Cl. 395—13

32 Claims



6. An image processing system, comprising:  
 an image input device for providing a source image;  
 a neural network having inputs coupled to the image input device and having outputs, for receiving the source image and for controlling the image processing elements;  
 means for providing a plurality of genotypes, each genotype defining a configuration of the neural network;  
 a plurality of image processing elements, each for selectively transforming a portion of the source image to produce a plurality of target images corresponding to the genotypes;  
 a storage device for storing the target images; and  
 an output device, coupled to the storage device, for outputting the target images.

# **5,568,591** **METHOD AND DEVICE USING A NEURAL NETWORK FOR CLASSIFYING DATA** Joël Minot, Charenton, and Philippe Gentric, Paris, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

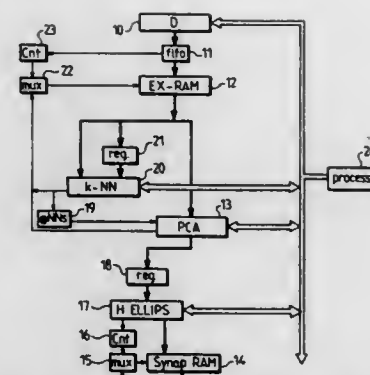
Division of Ser. No. 904,734, Jun. 25, 1992, Pat. No. 5,455,892. This application May 22, 1995, Ser. No. 446,275  
 Claims priority, application France, Jun. 28, 1991, 91 08066  
 Int. Cl.<sup>6</sup> G06E 1/00; 3/00; G06F 15/18

U.S. Cl. 395—22

11 Claims

1. A device for classifying data presented in the form of data vectors, which device provides a value representing an estimated probability that a data vector belongs to a class from one or several classes which have been learned based on specimens and which comprises a neural network with several layers for processing a data vector, characterized in that the device comprises a number of neurons and synaptic weights which have been determined by the following method:

- selecting at least one feature from each of a plurality of known signals having at least one feature;
- determining a difference between the selected at least one feature for every different pair of known signals wherein the differences are represented by a plurality of difference-vectors;



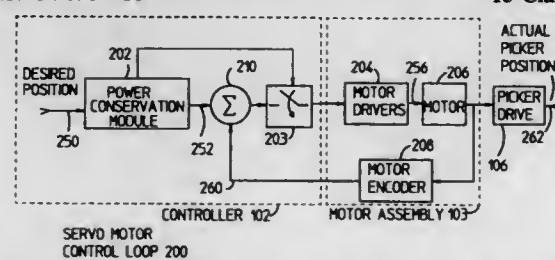
- selecting a first one of the difference-vectors as a current difference-vector and determining the k nearest difference-vectors from said current difference vector wherein a decision domain is created including a group of k+1 difference vectors;
  - calculating a distribution probability for the group of difference-vector in the decision domain;
  - introducing a neuron corresponding to the decision domain an internal layer of neurons of the neural network;
  - calculating a weight represented by  $a_i$  and a weight represented by  $b_j$  for each difference-vector connection between an input layer of neurons and the internal layer based upon the distribution probability of the decision domain;
  - selecting a next one of the difference-vectors as a new current difference-vector and repeating steps (c) through (g) until the last difference-vector is processed; and
  - inputting a plurality of unknown signal difference-vectors into an input layer of the network and calculating a probability based upon the weighting coefficients  $a_i$  and  $b_j$  that the unknown signal difference-vectors lie within one of the decision domains,
- whereby the neural network is trained to classify the differences between the unknown signal and the known signals, thus indicating the degree of correspondence between the unknown signal and the known signals.

# **5,568,592** **SYSTEM AND METHOD FOR CONSERVING POWER IN AN OPTICAL AUTOCHANGER** Kelly J. Reasoner, Ft. Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 13, 1994, Ser. No. 322,821  
 Int. Cl.<sup>6</sup> G05B 15/00; 19/00

U.S. Cl. 395—80

15 Claims

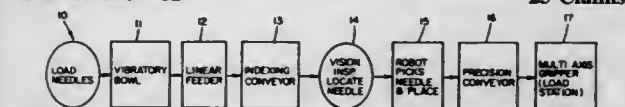


- A system for conserving power in a robotic arm device responsive to a motion command and controlled by a servo loop having a motor, a motor driver, and a motor encoder, comprising:
- (a) timer means for monitoring an idle time since a last motion command;
- (b) means for determining whether said idle time exceeds a predetermined time;
- (c) means for positioning the robotic arm to a stow position when said idle time exceeds said predetermined time; and
- (d) means for opening the servo loop to disable the motor after the robotic arm has reached said stow position to conserve power while the robotic arm is in said stow position.

# **5,568,593** **ROBOTIC CONTROL SYSTEM FOR A NEEDLE SORTING AND FEEDING APPARATUS** David Demarest, Parsippany, N.J., and Dennis P. Yost, Wayne, Pa., assignors to Ethicon, Inc., Somerville, N.J. Filed Jan. 13, 1994, Ser. No. 181,624 Int. Cl.<sup>6</sup> B05B 19/04; G25J 11/00; 9/00

U.S. Cl. 395—82

23 Claims



1. A control system for a needle infeed device for automatically transferring needles randomly positioned on a conveyor means to a precision engagement device at a further processing location, said needle infeed device comprising one or more robots each having a gripper means for picking and placing said needles, said control system comprising:

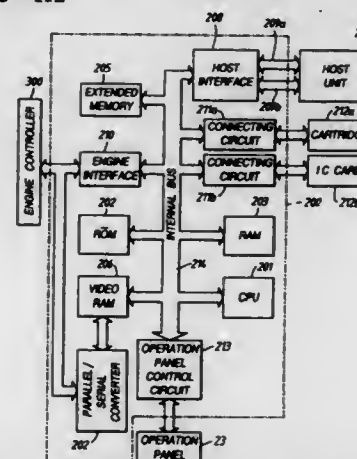
- control means for pausing said conveyor means to create a dwell cycle for said infeed device;
- at least one vision tracking means for each infeed device, each vision tracking means in communication with said control means for creating an image of said needles during each dwell cycle at one or more predetermined locations on said conveyor means and for calculating positional and orientation data for each needle from the image obtained at said predetermined location during said dwell cycle;
- memory means for temporarily storing said positional and orientation data received from said vision tracking means; and
- robot control means for accessing said stored positional and orientation data to select one of said imaged needles, the positional and orientation data stored in said memory means, and enabling said one of said robots to pick up one of said imaged needles in accordance with its respective positional and orientation data and to place said needle in said precision engagement device.

# **5,568,594** **IMAGE FORMING APPARATUS WITH IMPROVED ABILITY TO EMULATE OTHER IMAGE FORMING APPARATUSES**

Kazuhisa Suzuki, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-Ken, Japan  
 Continuation of Ser. No. 854,174, Mar. 25, 1992, abandoned.  
 This application Aug. 28, 1994, Ser. No. 287,113  
 Claims priority, application Japan, Apr. 8, 1991, 3-103139  
 Int. Cl.<sup>6</sup> G06K 15/00

U.S. Cl. 395—112

2 Claims



1. A printing apparatus having an image bearing member and connected to a host unit for printing an image on the image bearing member according to image data supplied from the host unit, the printing apparatus having selectable printer emulations to thereby emulate other printers, the printing apparatus comprising:

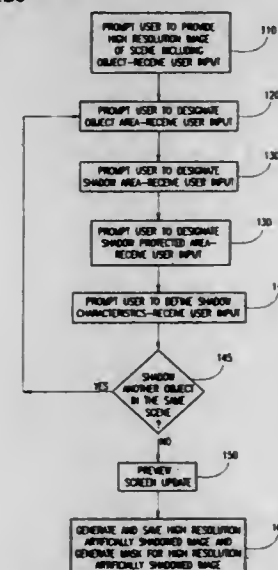
storing means for temporarily storing the image data supplied from the host unit;  
 first key means for selecting an alternate printer emulation;  
 second key means for selecting a hold of the image data stored in the storing means when the printer emulation is changed;  
 third key means for selecting an erasure of the image data stored in the storing means when the printer emulation is changed;  
 connecting means for receiving a cartridge having a program thereon defining one or more alternate printer emulations;  
 display means for displaying a message regarding holding the image data stored in the storing means in response to the first key means;  
 changing means for changing the printer emulation in response to the first key means and the connecting means;  
 means for holding the image data stored in the storing means in response to the second key means when the printer emulation is changed by the changing means; and  
 means for erasing the image data stored in the storing means in response to the third key means when the printer emulation is changed by the changing means.

# **5,568,595** **METHOD FOR GENERATING ARTIFICIAL SHADOW** Hanan Yosefi, Rishon Lezion, and Shimon R. Armoni, Netanya, both of Israel, assignors to Scitex Corporation Ltd., Herzliya, Israel

Continuation of Ser. No. 56,077, Apr. 30, 1993, abandoned.  
 This application Oct. 5, 1995, Ser. No. 538,767  
 Int. Cl.<sup>6</sup> G09B 9/08

U.S. Cl. 395—126

8 Claims



1. A method for producing a two dimensional color image with an artificial shadow, said image having elements stored in at least a first two dimensional format and in a second two dimensional format, the method comprising:

- receiving a user input comprising at least an area in said two dimensional image in which the object to be shadowed resides, an area in said two dimensional image in which the shadow is to be generated and at least one shadow characteristic;
- generating in accordance with said user input a two dimensional artificial shadow;
- manipulating elements stored in said first two dimensional format in accordance with said artificial shadow, said user input and said second format;
- manipulating elements stored in said second two dimensional format in accordance with said user input; and
- defining a relationship between said manipulated elements in said first two dimensional format and the manipulated elements in said second two dimensional format.



ments in said second two dimensional format, and generating said two dimensional image with the artificial shadow, based on said relationship.

# 5,568,596 IMAGE PROCESSING SYSTEM WITH IMPROVED COLOR COMPENSATION WHEN TRANSFERRING BETWEEN COLOR FORMATS

Robin A. Cawley, Newbury, England, assignor to Quantel Limited, Newbury, England

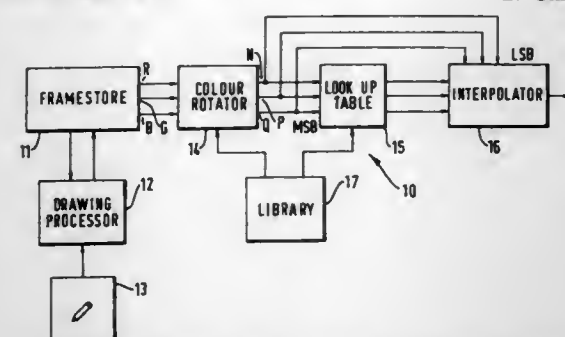
Filed Feb. 25, 1994, Ser. No. 201,804

Claims priority, application United Kingdom, Feb. 25, 1994, 9303834

Int. Cl. G06K 1/40

U.S. Cl. 395—131

27 Claims



1. A digital image processing system for converting image data representing a color value in a first plural-color format into data representing a separation value of one or more respective color separations, the data defining a multiplicity of pixels which together form an image, the system comprising:

first transforming means for transforming pixel-by-pixel said image data in said first plural-color format to produce data in a second plural-color format different than said first plural-color format and selected such that one or more of the colors of the second plural-color format respectively corresponds substantially with one or more colors of the one or more color separations; and

second transforming means for determining for each pixel from most significant parts of the data in said second plural-color format range data defining a range of values, and for calculating from the range data using least significant parts of the data in the second plural-color format, separation data, thereby producing on a pixel-by-pixel basis a separation value for the one or more color separations.

# 5,568,597 ADAPTING IMAGE DATA RESOLUTION TO MATCH RESOLUTION OF AN OUTPUT DEVICE

Tadayoshi Nakayama, Tokyo; Yoshitake Nagashima, Chigasaki, and Takashi Saito, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1994, Ser. No. 246,506

Claims priority, application Japan, May 24, 1993, 5-121204

Int. Cl. G06T 15/50

U.S. Cl. 395—132

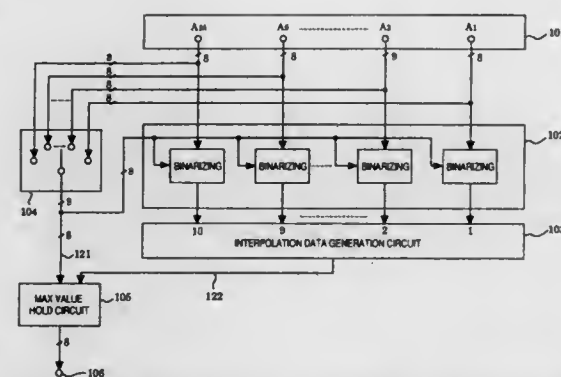
15 Claims

10. An image processing method which obtains interpolated pixel data of multivalued image data based on a plurality of reference pixel data in the vicinity of the interpolated pixel, comprising:

a step for generating a threshold value;

a step for converting each of the plurality of the reference pixel data to binary reference pixel data by comparing with the threshold value;

a step for generating binary interpolation data in the position of the interpolated pixel from a plurality of binary reference pixel data; and



a multivalued interpolation step for obtaining multivalued interpolation data expressing the interpolating pixel based on the threshold value and the binary interpolation data.

# 5,568,598 DISPLAYING IMAGES USING PROGRESSIVE FADE-IN

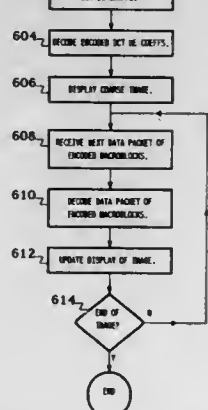
Walter Mack, Chandler, and J. C. Korta, Mesa, both of Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Filed Sep. 9, 1994, Ser. No. 303,948

Int. Cl. G06T 5/50

U.S. Cl. 395—133

25 Claims



1. A computer-implemented process for displaying images, comprising the steps of:

(a) displaying a first display image on a monitor, wherein the first display image is a first image comprising first-image signals;

(b) receiving a first set of second-image signals corresponding to a second image;

(c) generating a second display image, comprising second-display-image signals, by applying a first function to the first-image signals and the first set of second-image signals, wherein the first function is based on a first weighting scheme;

(d) displaying the second display image;

(e) receiving a second set of second-image signals corresponding to the second image;

(f) generating a third display image, comprising third-display-image signals, by applying a second function to the first-image signals and the first and second sets of second-image signals, wherein:

the second function is based on a second weighting scheme; and  
the first weighting scheme weights the first-image signals more than the second weighting scheme weights the first-image signals; and

(g) displaying the third display image.

5,568,599

# ELECTRONIC MONTAGE CREATION DEVICE

Hiroyuki Yoshino, Hiagashiyamoto, and Takashi Kojo, Ome, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 212,114, Mar. 11, 1994. This application Jan. 11, 1996, Ser. No. 587,829

Claims priority, application Japan, Mar. 18, 1993, 5-085519

Int. Cl. G06F 15/72

U.S. Cl. 395—135

23 Claims

CHARACTER	NO.	1	2	3
OPTIMISTIC				
PESSIMISTIC				
AGGRESSIVE				

1. An electronic montage image creation device for creating a montage image of a person, the apparatus comprising:

pattern storage means for storing a plurality of patterns of each of a plurality of parts which constitute a human face; character designating means for designating a personality character such as any of prudent, optimistic, pessimistic, punctual, clean, sloven, aggressive, speculative, passive, serious, frivolous, capricious, and the like, of the person whose montage image is to be created;

pattern designating means for selectively designating a pattern of each of the plurality of parts from among the patterns of the parts stored in said pattern storage means, on the basis of the personality character designated by said character designating means; and

combining means for combining the respective patterns of the parts designated by the pattern designating means to create a montage image of the person having the designated personality character, and for displaying the created montage image of the person.

5,568,600

# METHOD AND APPARATUS FOR ROTATING AND SCALING IMAGES

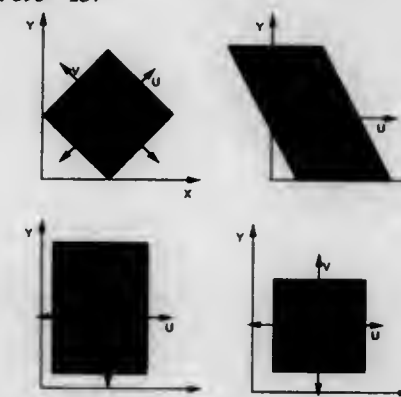
James T. C. Kaba, Jackson, N.J., assignor to David Sarnoff Research Ctr., Princeton, N.J.

Filed Apr. 15, 1994, Ser. No. 228,539

Int. Cl. G06T 3/00

U.S. Cl. 395—137

21 Claims



16. A method for scaling and rotating an input image to produce an output image, comprising the steps of:

producing said input image containing a plurality of pixel values arranged in predefined locations defined by input pixel coordinates within an input image coordinate system; shearing an output pixel location along a first axis to produce a first pixel location; shearing and scaling said first pixel location along a second axis to produce a second pixel location; scaling said second pixel location along the first axis to produce a third pixel location that is rotated and scaled relative to said output pixel location; determining a pixel value for said third pixel location; and displaying said pixel value determined for said third pixel location at said output pixel location as an output pixel value.

5,568,601

# SAMPLING POINT GENERATING APPARATUS

Toshiya Yamauchi, Yoshikazu Yutani, and Rika Toyoda, all of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

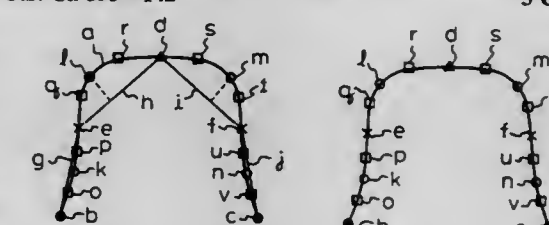
Filed Jul. 12, 1994, Ser. No. 273,852

Claims priority, application Japan, Oct. 6, 1993, 5-250518

Int. Cl. G06F 15/00

U.S. Cl. 395—142

3 Claims



1. A sampling point generating apparatus comprising: means for drawing a straight line between the start and end points of an original curve; means for calculating errors between the coordinates of the original curve and the coordinates of the straight line; means for detecting at least one extremal error value point where increase or decrease in the errors is reversed; and means for generating an auxiliary point between each pair of neighboring points of the at least one extremal error value point and between the start and end points, wherein the start and end points, the at least one extremal error value point and the auxiliary points serve as sampling points to provide a cubic curve that approximates the original curve.

5,568,602

# METHOD AND APPARATUS FOR GAME DEVELOPMENT USING CORRELATION OF TIME SEQUENCES AND DIGITAL VIDEO DATA

Sean M. Callahan, Cupertino; Edward Harp, San Jose, and Bruce Leak, Palo Alto, all of Calif., assignors to Rocket Science Games, Inc., San Francisco, Calif.

Filed Oct. 28, 1994, Ser. No. 330,912

Int. Cl. G06T 13/00

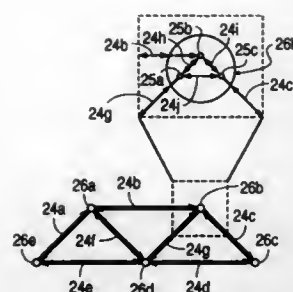
U.S. Cl. 395—154

20 Claims

5. A method for developing a game using digital video data stored in a data store, implemented by a computer having access to the data store, comprising the steps of:

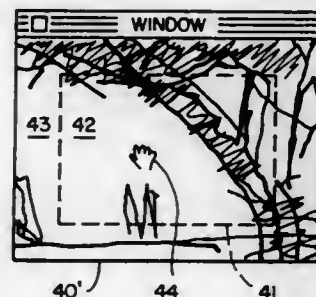
developing a graphic depiction of a branched time line structure on a first display, said branched time line structure including a first time line portion, a node, a second time line portion and a third time line portion, wherein said first, second and third time line portions are connected to said node;

storing said branched time line structure in said data store; generating a series of video images on a second display responsive to said digital video data;



selecting a portion of said series of video images so that the corresponding digital video data can be correlated with one of said time line portions;  
correlating said corresponding digital video data with one of said time line portions to generate a data block which can be stored in said data store; storing said data block in the data store;  
displaying said branched time line structure on said first display wherein a position on said branched time line structure is marked by an indicator coordinated with said branched time line structure;  
at a particular position on said branched time line structure which corresponds to a particular time, ceasing to move said indicator along said branched time line structure in a manner which causes said video images on said second display to cease to be advanced; and  
causing said indicator to jump from said position on said branched time line structure to a different position on said branched time line structure in a manner which causes the video image on said second display to be displayed out of sequence.

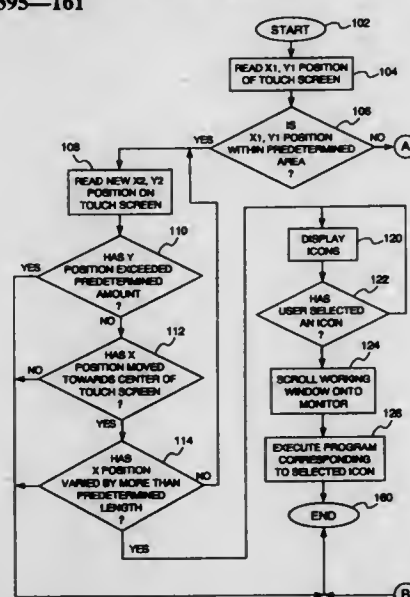
**5,568,603**  
**METHOD AND SYSTEM FOR TRANSPARENT MODE SWITCHING BETWEEN TWO DIFFERENT INTERFACES**  
Michael Chen, Palo Alto; Richard I. Mander, Menlo Park, and Ian S. Small, Cupertino, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.  
Filed Aug. 11, 1994, Ser. No. 289,274  
Int. Cl. G06F 3/14  
U.S. Cl. 395—155  
36 Claims



1. In a computer system including a screen for displaying data, an I/O interface for interacting with said data on said display screen when said I/O interface is activated, and a movement indicator displayed on said screen for showing the movement of said I/O interface, a system for switching between at least two data manipulation modes on said screen comprising:  
a means for defining a bounding area in which a portion of said data is displayed;  
said means also for defining a boundary defined within said bounding area;  
a means for providing said at least two data manipulation modes;  
a means for switching between said at least two data manipulation modes in response to the location of said movement indicator in relation to said bounding area and said boundary, wherein said switching means switches between said at least

two data manipulation modes independent of whether said I/O interface is activated or deactivated.

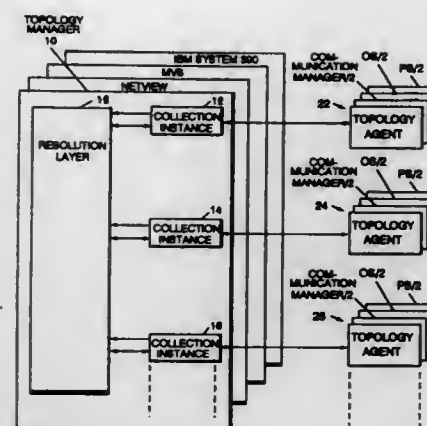
**5,568,604**  
**METHOD AND SYSTEM FOR GENERATING A WORKING WINDOW IN A COMPUTER SYSTEM**  
Benjamin E. Hansen, Westminster, Colo., assignor to U S West Technologies, Inc., Boulder, Colo.  
Continuation-in-part of Ser. No. 999,489, Dec. 31, 1992, abandoned. This application Aug. 23, 1994, Ser. No. 294,268  
Int. Cl. G06F 3/14  
U.S. Cl. 395—161  
13 Claims



1. For use in a computer system that includes memory and a monitor having a touch-sensitive screen for providing user input thereon, a method for displaying a working window on the touch-sensitive screen, the method comprising:  
providing a touch-sensitive screen for displaying none, one, or more windows and/or icons;  
defining in the memory an input stroke, said input stroke corresponding to the touching of the touch-sensitive screen at a first location and continuing in a first direction to a second location, wherein said input stroke is not related to a displayed window and/or icon;  
defining in the memory a plurality of icons each icon representing a working window;  
providing a first user input stroke;  
comparing the first user input stroke with the input stroke defined in memory;  
displaying the plurality of icons on the touch-sensitive screen in response to the comparing step;  
selecting a displayed icon;  
displaying a working window corresponding to the selected icon wherein the working window is scrolled onto the touch-sensitive screen in the first direction.

**5,568,605**  
**RESOLVING CONFLICTING TOPOLOGY INFORMATION**  
Robert D. Clouston, Cary; John S. Graham, Jr., Raleigh, and John H. Zeiger, Cary, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.  
Filed Jan. 13, 1994, Ser. No. 180,725  
Int. Cl. G06F 11/00  
U.S. Cl. 395—182.02  
7 Claims

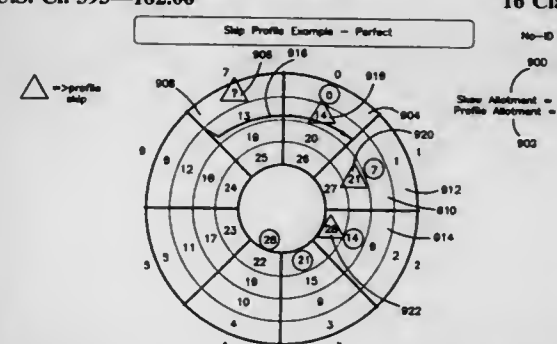
4. In a communication network having a plurality of network resources as nodes or transmission groups between, a method for



managing the topology of the network using agents in at least some of the nodes to monitor the topology of the network, said method comprising the steps of:

collecting network topology information from each agent by identifying each network resource and the connectivity of each resource in the network as viewed from the agent's node; analyzing the connectivity of each network resource in the network from the topology information provided by each agent and providing reachability status, the reachability status indicating whether the resource is reachable from the agent's node through the connectivity of the network;  
based on the resource reachability status resolving conflicts in reachability about the same network resource as viewed from different agents;  
said resolving step comprises the steps of:  
creating an entry in a resolution database for each new resource identified by said collecting step;  
adding an entry in a reach list for each new resource; and  
updating the reach list based on the reachability status, the reach list indicating the reachability of each network resource as viewed by each agent node; and  
said updating step identifying a best reach entry on the reach list for each network resource reachable from the agent nodes, the best reach entry being the entry on the reach list with the most reliable information.

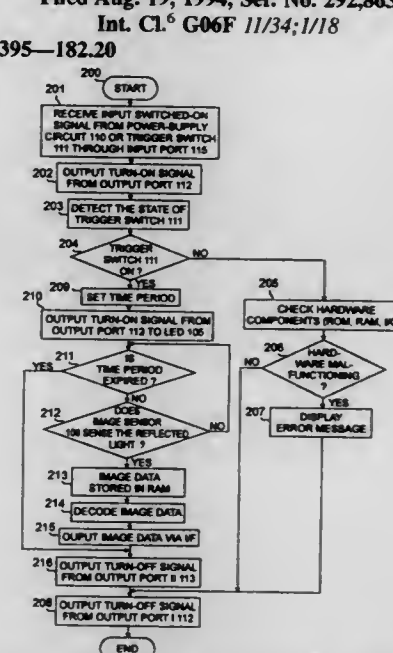
**5,568,606**  
**METHOD AND APPARATUS FOR MAXIMIZING EFFECTIVE DISK CAPACITY USING ADAPTIVE SKEWING**  
Jeffrey J. Dobbek, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed Oct. 11, 1994, Ser. No. 321,142  
Int. Cl. G06F 9/00  
U.S. Cl. 395—182.06  
16 Claims



16. An adaptive skewing method for synchronizing storage disk disposed in a disk drive array storage device, comprising the steps of:

storing data on tracks on disks in a multiple disk drive array storage device according to an adaptive synchronization skew into synchronization zones;  
utilizing the adaptive synchronization skew to control sector locations of logical customer data sectors;  
maintaining a fixed uniform distribution of skips across the entire surface of the disk drive, the skips representing excess unused storage capacity;  
spreading the unused capacity across the file at rates consistent with a desired profile at the ends of the synchronization zones according to the adaptive synchronization skew, the adaptive synchronization skew containing an excess transition time period used for buffering; and  
using the excess time period and skips located periodically across the disk drive to shift sector locations when defects are present to synchronize the spindle having sector defects with other spindles.

**5,568,607**  
**APPARATUS, SYSTEMS AND METHODS FOR CONTROLLING POWER CONSUMPTION IN A SELECTIVELY ENABLED PROCESSING SYSTEM**  
Mamoru Ishikawa, Tokyo, Japan, and Christen V. Nielsen, Dunedin, Fla., assignors to International Data Matrix, Inc., Nashua, N.H., and Tokyo Electric Company, Ltd., Tokyo, Japan  
Filed Aug. 19, 1994, Ser. No. 292,863  
Int. Cl. G06F 11/34; 11/18  
U.S. Cl. 395—182.20  
41 Claims



1. A method for operating a triggerable, selectively enabled microprocessing system having at least one high-power consumption microprocessor, an on-off switch and a trigger switch, said high-power consumption microprocessor not including a low-power consumption mode, said method comprising the steps of:  
switching an on-off switch in an OFF state to an ON state, said switch coupling a power-supply to said selectively enabled microprocessing system using said on-off switch, said OFF state for disconnecting said power-supply from said selectively enabled microprocessing system and said ON state for connecting said power-supply to said selectively enabled microprocessing system, said ON state having an ON active-state in which said selectively enabled microprocessing system consumes energy from said power-supply and an ON standby-state in which said selectively enabled microprocessing system substantially does not consume energy from said power-supply;  
placing said selectively enabled microprocessing system in said ON active-state in response to said switch changing from said



OFF state to said ON state thereby enabling said high power consumption microprocessor to consume power and perform a diagnostic function on at least a portion of said selectively enabled microprocessing system in response thereto; changing said selectively enabled microprocessing system from said ON-active state to said ON-standby state following said diagnostic function; detecting a first input signal indicating a triggering event; returning said selectively enabled microprocessing system from said ON standby-state to said ON active-state for a set time period thereby enabling the high power consumption microprocessor to perform a function other than said diagnostic function; and restoring said enabled selectively microprocessing system from said ON active-state to said ON standby-state at the end of said time period.

5,568,608

# METHOD FOR PROTECTING DATA IN MEDIA RECORDING PERIPHERAL DEVICES

Charles P. Shannon, Garland, Tex., assignor to E-Systems, Inc., Dallas, Tex.

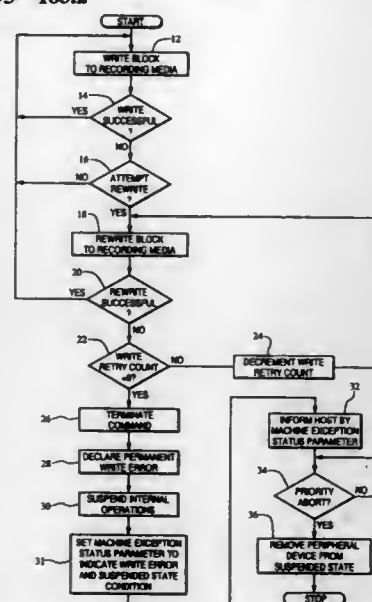
Continuation of Ser. No. 990,271, Dec. 14, 1992, abandoned.

This application May 3, 1995, Ser. No. 434,031

Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 395—183.2

16 Claims



1. A method for suspending the operation of a media recording peripheral device to minimize the loss of data stored in a data buffer of the peripheral device upon detection of an error condition at the peripheral device, comprising the steps of:

- detecting at the peripheral device an error condition;
- terminating by the peripheral device execution of a present command within a command queue of the peripheral device;
- suspending execution by the peripheral device of commands within the command queue of the peripheral device to preserve data presently stored within the data buffer of the peripheral device;
- transmitting a notification from the peripheral device to a host computer of suspension of the execution of commands by the peripheral device within the command queue of the peripheral device;
- transmitting an abort command from the host computer to the peripheral device in response to said notification;
- in response to said abort command from said host computer, deleting all queued commands within the command queue; and
- actuating the execution by the peripheral device of commands in the command queue in response to commands received by the

peripheral device from the host computer subsequent to deletion of all queued commands.

5,568,609

# DATA PROCESSING SYSTEM WITH PATH DISCONNECTION AND MEMORY ACCESS FAILURE RECOGNITION

Hitoshi Sugiyama, Fujieda; Toshinori Hiraishi, Mishima, and Tuiyoshi Kumano, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

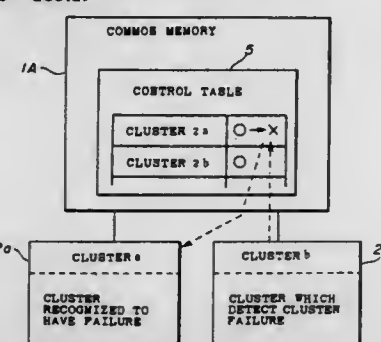
Division of Ser. No. 249,046, May 24, 1994, which is a continuation of Ser. No. 701,883, May 17, 1991, abandoned. This application Apr. 28, 1995, Ser. No. 430,315

Claims priority, application Japan, May 18, 1990, 2-128324; Jun. 29, 1990, 2-171068

Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 395—183.19

8 Claims



1. A data processing system, comprising:

- at least one common memory;
- clusters, each accessing said common memory;
- input/output paths connecting said common memory and said clusters; and
- input/output path disconnecting means for physically disconnecting said input/output paths from said common memory, each of said clusters comprising:
- input/output path disconnection processing means for controlling said input/output path disconnecting means to physically disconnect, when a failure has occurred in one of said clusters, all input/output paths connected to said one of the clusters; and
- cluster failure recognition processing means for stopping operation of said one of the clusters when said one of the clusters in which said failure has occurred recognizes that said failure has occurred in said one of the clusters responsive to detection of the physical disconnection via an attempted access of said common memory.

5,568,610

# METHOD AND APPARATUS FOR DETECTING THE INSERTION OR REMOVAL OF EXPANSION CARDS USING CAPACITIVE SENSING

Alan E. Brown, Georgetown, Tex., assignor to Dell USA, L.P., Austin, Tex.

Filed May 15, 1995, Ser. No. 441,485

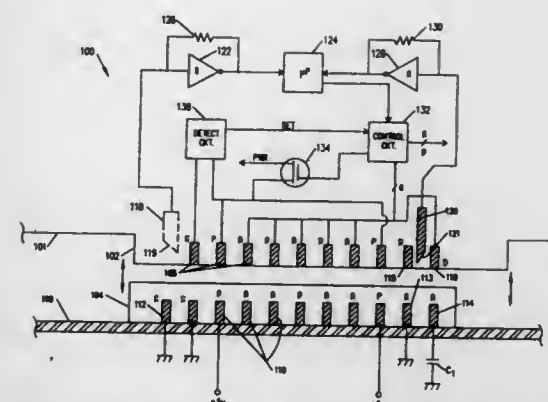
Int. Cl.<sup>6</sup> G06F 11/34

U.S. Cl. 395—185.01

28 Claims

1. A detection system for detecting the insertion and removal of an expansion card relative to an I/O connector of a computer system, the expansion card including a connector having a plurality of conductive pins for interfacing corresponding pins of the I/O connector, said detection system comprising:

- a conductive plate for mounting to the expansion card to capacitively interface a corresponding pin on the I/O connector, wherein capacitive coupling develops between said plate and said corresponding pin which changes as the expansion card is moved relative to the I/O connector;



an oscillator coupled to said capacitive coupling between said plate and said corresponding pin, wherein said oscillator has a frequency which varies with changes of said capacitive coupling; and

a processor coupled to said oscillator for detecting movement of the expansion card through changes of said frequency.

5,568,611

# UNAUTHORIZED ACCESS MONITOR

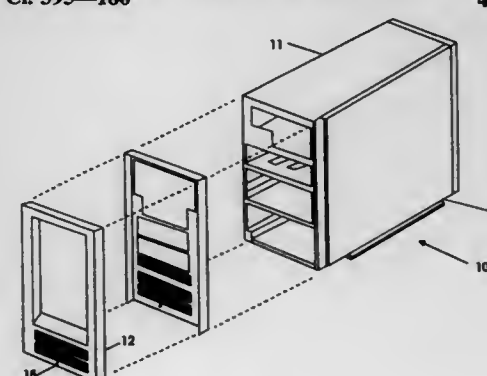
Bharat Khatri, Boca Raton; Fred Marx, Coconut Creek, both of Fla.; Dan Ellis Mayer, Austin, Tex.; Cynthia M. Merkin, Lake Worth, and Ileana Vila, Boca Raton, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 29, 1994, Ser. No. 282,348

Int. Cl.<sup>6</sup> G06F 13/00; H04L 9/00

U.S. Cl. 395—186

4 Claims



1. A computer system comprising:

- an information processing apparatus for processing information;
- a housing for enclosing the information processing apparatus, the housing including an opening for providing access to the information processing system;
- a cover attached to the housing, the cover providing an open position and a closed position for the information processing apparatus;
- a key-operated lock for locking the cover in the closed position; and
- means for stopping information processing by the information processing system responsive to an unauthorized physical access to the information processing apparatus.

# METHOD AND APPARATUS FOR ADVERTISING SERVICES OF TWO NETWORK SERVERS FROM A SINGLE NETWORK NODE

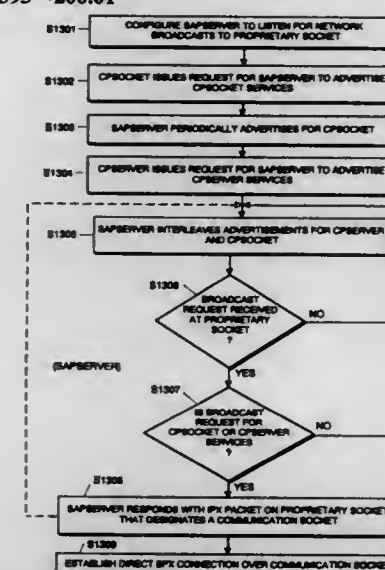
Lorraine F. Barrett, Yorba Linda; William C. Russell, Laguna Hills; Robert D. Wadsworth, Costa Mesa; Andrew J. Kraslavsky, Rancho Santa Margarita, and George A. Kalwitz, Costa Mesa, all of Calif., assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1992, Ser. No. 978,499

Int. Cl.<sup>6</sup> H04L 12/18

U.S. Cl. 395—200.01

18 Claims



17. An apparatus for advertising first and second network servers resident on a single network node from the single network node in a local area network (LAN) communication system which supports advertising only a single network server from each node, said apparatus comprising:

- configuring means for configuring a surrogate server, resident of the single network node, to listen for network broadcasts from the LAN communication system to a proprietary socket;
- advertising means for advertising at periodic intervals, from the surrogate server by broadcast over the LAN, the services of both the first and second network servers, wherein advertising for the first and second network servers is interleaved;
- receiving means for receiving a request addressed to the proprietary socket, the request requesting network services;
- responding means for responding, from one of the first and second network servers, to the request received by the receiving means if the request is directed to one of the first and second network servers, wherein said advertising means continues to interleavedly advertise, from the surrogate server and by broadcast over the LAN, for the first and second network servers.

5,568,613

# DATAFRAME BRIDGE FILTER WITH COMMUNICATION NODE RECORDKEEPING

William T. Futral, Hillsboro, Oreg., assignor to Ungermann-Bass, Inc., Santa Clara, Calif.

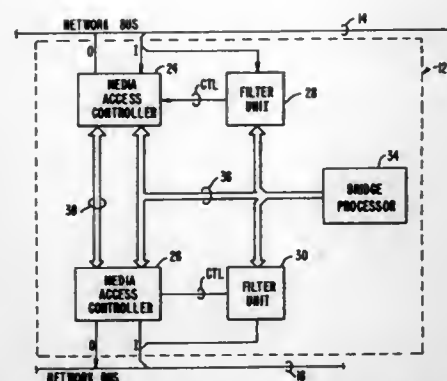
Filed Sep. 3, 1992, Ser. No. 939,777

Int. Cl.<sup>6</sup> G06F 13/00; 13/14; 12/06

U.S. Cl. 395—200.02

10 Claims

1. In a communications bridge system of a type operating to receive and communicate selected ones of dataframes from source data nodes on a first data communication network destination data nodes on a second data communication network, each of the dataframes including source address data indicative of the source data node and a destination address data indicative of the destination data node, a filter apparatus for identifying those dataframes



that are communicated on the first data communication network bound for the second network, the filter apparatus comprising:

memory means for storing a plurality of multi-bit data records, each data record relating to a corresponding one of the source data nodes, and each including at least partial address data indicative of the corresponding source data node and age information indicative of a time period when the data record was last accessed;

first means responsive to a received dataframe for developing from the destination address a memory address indicative of a selected number of the records stored in the memory means;

second means responsive to the received dataframe and the memory address to access the selected number of the data records from the memory means;

third means, coupled to receive each data record accessed from the memory means for comparing the partial address data of such data record with the destination address of the received dataframe to provide a comparison signal indicative of the destination being on the first data network;

means for writing to the memory means, for each data record accessed, a present age value as the age information of such data record;

means for comparing the source address data of the dataframe to the content of the memory means and updating the age information each time the partial address contained in a record corresponds to the source address data; and

means for periodically accessing each data record to inspect the associated age information, and rewriting back to the memory means only those data records whose age information is within a predetermined age range;

whereby the communications bridge system bridge is adapted to be responsive to the comparison signal to discard the received dataframe.

5,568,614

#### DATA STREAMING BETWEEN PEER SUBSYSTEMS OF A COMPUTER SYSTEM

Richard N. Mendelson, Highland Beach, and Ralph M. Pipitone, Boynton Beach, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

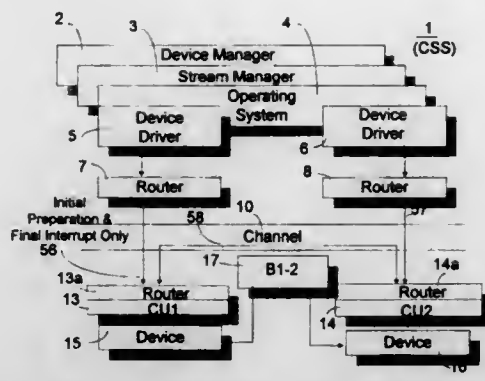
Filed Jul. 29, 1994, Ser. No. 282,993

Int. Cl. G06F 15/16

U.S. Cl. 395—200.08

21 Claims

1. For a computer system—that contains a processor subsystem, a memory subsystem, peripheral devices, device control units controlling said peripheral devices in response to commands received from said processor subsystem, and a channel linking said device control units to said processor and memory subsystems, said channel having a peer communication feature enabling said control units to communicate directly with each other without intervention of said processor subsystem and without intermediate buffer storage in said memory subsystem of information being communicated between said control units—a mechanism for enabling one of said control units to direct processing of a data stream of arbitrary length, by a device controlled by said one control unit, in cooperation with first and second other said control



units respectively controlling first and second other devices, said mechanism comprising:

means in said one control unit for receiving setup command information defining: (1) input and output buffer storage spaces in said memory subsystem that are to be managed by said one control unit in cooperation respectively with said first and second other control units; (2) a notification protocol, defining signals to be directly transferred between said one control unit and said first and second other control units via said peer communication feature of said channel, said signals to be used by said control units for managing use of said input and output buffer storage spaces; and (3) a process to be conducted, on a said data stream of arbitrary length in said input buffer storage space, by said device controlled by said one control unit, said data to be written to said input buffer storage space by said first other device, said process to produce result data to be written to said output buffer storage space for further handling by said second other device, and said process to be conducted to completion without interruption of said processor subsystem; said input and output buffer storage spaces being characterized in that each has insufficient storage capacity to simultaneously store all of the data potentially contained in said data stream;

means in said one control unit responsive to said setup command information for preparing said one control unit and said device controlled by said one control unit to: (1) perform said process defined by said command information on a said data stream to be conveyed through said input buffer storage space; (2) forward data resulting from performance of said process to said second other device via said output buffer storage space; and (3) manage usage of said input and output buffer storage space, in cooperation respectively with said first and second other control units, via said notification protocol and said peer communication feature of said channel; and

means in said one control unit, responsive to an initiating signal from said processor subsystem and to conditions established by said preparing means, for directing a streaming operation in which: (1) said process is performed on data of said data stream forwarded through said input buffer storage space; (2) data resulting from performance of said process is forwarded to said second other device via said output buffer storage space; (3) transport of said data stream through said input buffer storage space, and transport of said resulting data through said output buffer storage space, are jointly managed by said one control unit and said first and second other control units using said notification protocol and said peer communication feature of said channel; and (4) all of the foregoing functions are carried out to completion, i.e., until all of the data in the data stream has been processed and forwarded, without interruption of said processor subsystem.

5,568,615

#### STEALTH INTERFACE FOR PROCESS CONTROL COMPUTERS

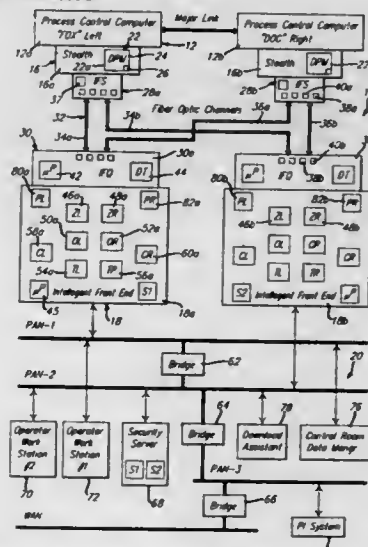
Edward R. Sederlund, Saginaw, Mich.; Nadene T. Thomas, Lake Jackson, Tex.; Robert J. Lindesmith, Midland, Mich., and Russell W. Cowles, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 897,905, Jun. 12, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 487,193

Int. Cl. G06F 15/167

U.S. Cl. 395—200.08

12 Claims



1. A method of providing transparent data transfers between an actively redundant process control computer and at least one front end computer which is capable of communicating with a computer network, comprising the steps of:

providing a multi-ported memory having at least one internal port for communicating with said process control computer and at least one external port for communicating with said front end computer;

providing a variable section in said multi-ported memory for periodically storing data collected by said process control computer in said variable section of said multi-ported memory;

providing a mailbox section in said multi-ported memory for storing messages sent from said front end computer to said process control computer; and

enabling said multi-ported memory to be addressed from said external port only during a predetermined portion of an operative clock cycle for said process control computer, so that either at least one data word stored in said variable section of said multi-ported memory may be transferred to a memory associated with said front end computer or at least one message word may be transferred from said front end computer to said mailbox section of said multi-ported memory without any interference with the operation of said process control computer.

5,568,616

#### SYSTEM AND METHOD FOR DYNAMIC SCHEDULING OF 3D GRAPHICS RENDERING USING VIRTUAL PACKET LENGTH REDUCTION

Chandrasekhar Narayanaswami, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

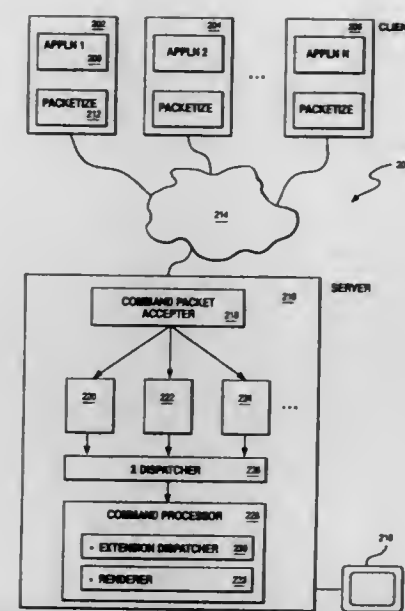
Filed Sep. 14, 1993, Ser. No. 121,137

Int. Cl. G06F 13/00

U.S. Cl. 395—200.13

7 Claims

1. A method for virtually reducing interprocess communication packet size in a client/server system having a server process receiving interprocess communication packets of a first size, the interprocess communication packets containing a sequential plural-



ity of subcommands for processing by the server process, the server having a means for storing a plurality of interprocess communication packets for processing and a means for dispatching one of said interprocess communication packets for processing, the method comprising the steps of:

dispatching a next sequential one of said plurality of subcommands in said dispatched interprocess communication packet for processing;

accumulating an indicia of resources committed to said processing;

testing said accumulated indicia against a threshold; and repeating said dispatching, accumulating and testing steps for a next sequential command if said indicia is less than said threshold, or signalling said server to redispach said dispatched interprocess communication packet and terminating processing of said dispatched interprocess communication packet if said indicia exceed the threshold.

5,568,617

#### PROCESSOR ELEMENT HAVING A PLURALITY OF PROCESSORS WHICH COMMUNICATE WITH EACH OTHER AND SELECTIVELY USE A COMMON BUS

Masatsugu Kametani, Ibaraki-ken, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 636,562, Jan. 7, 1991, Pat. No. 5,297,260, which is a continuation of Ser. No. 471,801, Dec. 15, 1989, abandoned, which is a continuation of Ser. No. 13,548, Feb. 11, 1987, abandoned. This application Jan. 13, 1994, Ser. No. 182,695

Claims priority, application Japan, Mar. 12, 1986, 61-52448; Oct. 20, 1986, 61-247436

Int. Cl. G06F 13/364; 15/12

U.S. Cl. 395—280

8 Claims

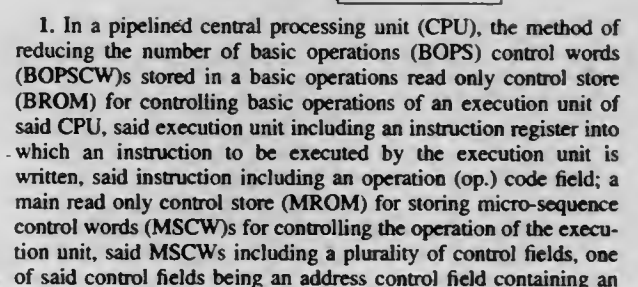
1. A processor element for use in a system having a plurality of said processor elements and a system bus, each processor element being selectively connected to a common bus, said processor element comprising:

a first CPU which processes information supplied through said common bus;

a second CPU which process information supplied through said common bus, said second CPU being directly connected to said system bus;

a storage connected between said first CPU and said second CPU, said storage stores information from either of said first and second CPU's and permits the other of said first and second CPU's to retrieve said stored information; and





address of a BOPSCW in the BROM, an MSCW register into which a MSCW read out of the MROM is written, a BOPSCW register into which a BOPSCW read out of the BROM is written; an instruction written into the instruction register, an MSCW written into the MSCW register, and a BOPSCW written into the BOPSCW register each being a potential source of a control field required to execute a basic operation; a register file including a plurality of addressable registers, each of said addressable registers having an address and into which an operand can be written under the control of a write address control field applied to the register file and from each of said addressable registers an operand can be read and applied to an arithmetic and logic unit (ALU) in response to a read address control field being applied to the register file; the ALU executing arithmetic and logic functions on operands applied to the ALU from addressable registers of the register file to produce a result operand, and said result operand being written into a result register in response to a function control field (Func.) being applied to the ALU; the register file and the ALU being active elements of the unit; staging register means for transmitting control fields applied to the staging register means to the active elements of the unit and for applying said control fields to an active element of the unit when required to execute a basic instruction; and a clock distribution circuit which produces and distributes a two phase clock signal, with each phase of a clock signal defining a time slot (TS), the execution of a basic instruction consisting of "n" control fields where "n" is a positive integer greater than two and requires "p" time slots, TS, where "p" is integer greater than one; comprising said CPU executing the steps of:

1. obtaining at least one of said "n" control fields from one of said potential sources of a control field; and
2. transmitting the control field obtained in step 1 through staging register means and applying said control field to an active element of the unit during a time slot when required to execute said instruction.

5,568,623

#### METHOD FOR REARRANGING INSTRUCTION SEQUENCE IN RISC ARCHITECTURE

Yuji Ogawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 836,653, Feb. 18, 1992, abandoned.

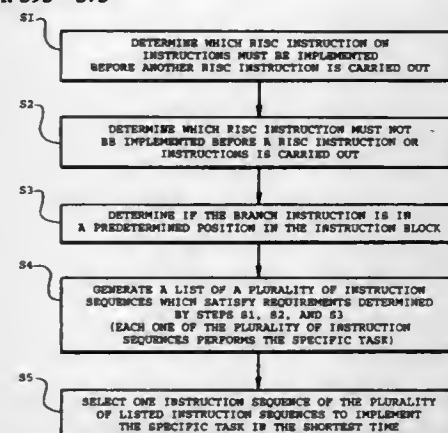
This application Feb. 13, 1995, Ser. No. 387,393

Claims priority, application Japan, Feb. 18, 1991, 3-043987

Int. Cl. G06F 9/45

U.S. Cl. 395—375

4 Claims



1. A method of rearranging RISC (reduced instruction set computer) program instructions which together perform a specific task and which include a branch instruction and which constitute an instruction block, comprising the following steps implemented in a computer:

- (a) determining, in said computer, which RISC instruction or instructions must be implemented before another RISC instruction is carried out;

- (b) determining, in said computer, which RISC instruction must not be implemented before a RISC instruction or instructions is carried out;
- (c) determining, in said computer, if said branch instruction is in a predetermined position in said instruction block;
- (d) listing, in said computer, a plurality of instruction sequences which satisfy requirements determined by steps (a), (b) and (c), each one of said plurality of instruction sequences performing said specific task; and
- (e) selecting, in said computer, one instruction sequence of a plurality of listed instruction sequences to implement said specific task in a shortest time.

5,568,624

#### BYTE-COMPARISON OPERATION FOR HIGH-PERFORMANCE PROCESSOR

Richard L. Sites, Boylston, and Richard T. Witek, Littleton, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

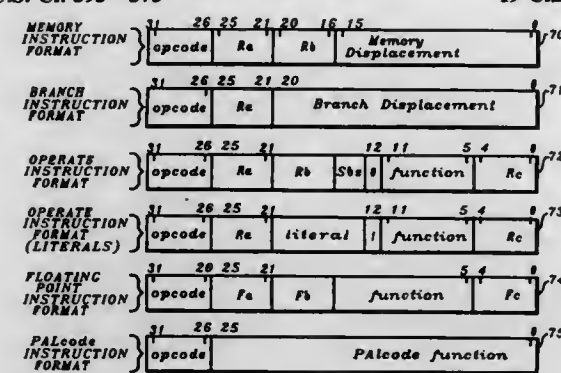
Continuation of Ser. No. 547,992, Jun. 29, 1990, abandoned.

This application Aug. 13, 1993, Ser. No. 106,316

Int. Cl. G06F 7/02; 9/00

U.S. Cl. 395—375

19 Claims



4. A method of operating a single-chip processor of the type having an on-chip register set having a plurality of registers, said method comprising the steps of:

- by executing a first instruction, loading to a first register of said register set a first eight-byte value; said first register being identified in said register set by a field of said first instruction;
- by executing a second instruction, loading to a second register of said register set a second eight-byte value; said second register being identified in said register set by a field of said second instruction;

by executing a third instruction, comparing the contents of said first and second registers to produce a one-byte value in a third register of said register set; said first, second, and third registers being identified in said register set by first, second and third fields, respectively, of said third instruction; said one-byte value consisting of a result of a byte-by-byte comparison of each of the bytes in said first eight-byte value and in said second eight-byte value, said one-byte value containing eight bits with each one of said eight bits representing a result of comparing one byte of said first eight-byte value and one byte of said second eight-byte value;

wherein said first, second and third registers are interchangeable registers of said register set, said interchangeable registers being general purpose registers accessible by instructions executed by said processor; and

wherein said one-byte value in said third register is loaded in a low-order byte of said third register and zero-extended; and wherein each bit of said low-order byte is set to 1 if the corresponding byte of the value in said first register is greater than or equal to the corresponding byte of the value in said second register.

5,568,625

#### TIME CONVERSION METHOD OF MINI DISCS USING MULTIPLE TIME TABLES

Dong-Jin Lee, Kwangmyeong, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

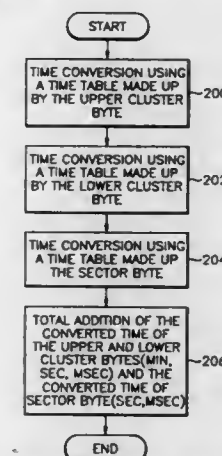
Filed Oct. 31, 1994, Ser. No. 331,740

Claims priority, application Rep. of Korea, Oct. 29, 1993, 22748/1993

U.S. Cl. 395—404

Int. Cl. G11B 7/00

8 Claims



1. A method for converting position data into time data for use in a mini disc drive system having a pick-up means for detecting the position data of the mini disc and having a plurality of time tables based on a cluster unit and a sector unit of the mini disc, said time tables each having a plurality of time data in sequence corresponding to the position data, said method comprising the steps of: dividing said cluster unit into an upper portion and a lower portion, respectively;

creating a first time table corresponding to said upper portion, a second time table corresponding to said lower portion and a third time table corresponding to said sector unit, wherein each of said time tables has a plurality of data entries; converting the position data detected by the pick-up means into first, second and third data by using said first, second, and third time tables, respectively; and adding said first, second, and third time data to produce the time data.

5,568,626

#### METHOD AND SYSTEM FOR REWRITING DATA IN A NON-VOLATILE MEMORY A PREDETERMINED LARGE NUMBER OF TIMES

Hiroshi Takizawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 661,164, Feb. 27, 1991, abandoned.

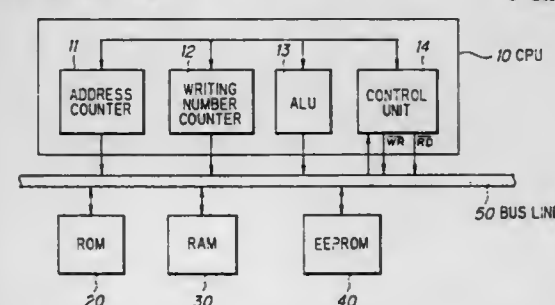
This application Feb. 3, 1994, Ser. No. 193,913

Claims priority, application Japan, Feb. 27, 1990, 2-48273

Int. Cl. G06F 12/06

U.S. Cl. 395—430

8 Claims



1. A method for storing data in a non-volatile memory, comprising the steps of:

writing data into a plurality of memory regions of said non-volatile memory to which data is able to be written a limited number of times, said plurality of memory regions including an initial memory region and a final memory region, each of the memory regions being assigned a serial address, the initial memory region being assigned the first address among the serial addresses, the final memory region the last address among said serial addresses, and the final address being followed by the initial address to permit circular access of said non-volatile memory, said plurality of memory regions being equal or greater in number than a value determined by dividing the number of times data is to be written into said non-volatile memory by said limited number of times, and each of said plurality of memory regions having a writing count number storing region for storing a writing count number and a data storing region for storing data; searching said plurality of memory regions to locate an effective memory region defined as that memory region which has the last serial address among a group of said memory regions storing a writing count number equal to that stored in said initial memory region;

writing a writing count number and data into a writing count number storing region and a data storing region, respectively, of a memory region which has an address next following that of amid effective memory region, said writing being performed without erasing data from said effective memory region, said writing count number having a value which is one greater than said writing count number stored in said initial memory region if said effective memory region is said final memory region, and writing a writing count number which is the same as that stored in said writing count number storing region of said initial memory region if said effective memory region is not said final memory region; and reading data from said effective memory region.

5,568,627

#### HEADER VERIFICATION IN A DISK DRIVE USING SECTOR HISTORIES FOR IMPROVED FORMAT EFFICIENCY

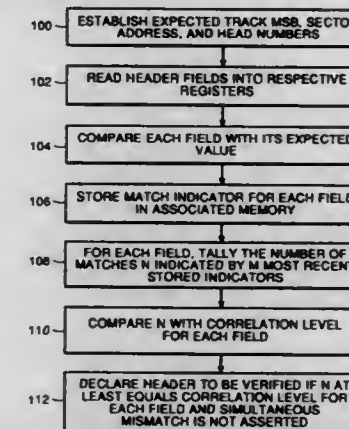
Bruce Leshay, West Boylston, and Bruce Buch, Westboro, both of Mass., assignors to Quantum Corporation, Milpitas, Calif.

Filed Apr. 5, 1994, Ser. No. 223,415

Int. Cl. G06F 12/00

U.S. Cl. 395—439

8 Claims



7. In a disk drive having a read transducer and a storage disk, a method of identifying a target one of a series of distinct pre-recorded headers stored on the disk in preparation for an associated desired data transfer, said method comprising the steps of:

establishing an expected high-order track address, an expected sector address, and an expected head number, each representing an expected value of a corresponding field in one of said headers preceding said target header; reading said one header from said disk with the transducer; comparing each of said expected values with the corresponding field from said one header to generate a set of present indica-



tors whose respective values indicate whether there is presently a match between corresponding ones of said fields and said expected values;

storing said set of present indicators, the stored indicators being subsequently referred to as historical indicators;

continually repeating said steps of establishing, reading, comparing, and storing for subsequent headers until said target header is expected to be encountered next, said storing step being carried out during each repetition such that a predetermined number of the most recent sets of said historical indicators are retained;

reading a next encountered header with the transducer;

comparing said target header with said next encountered header to generate the set of present indicators;

selecting, for each of said fields, another predetermined number of the most recent corresponding retained historical indicators;

tallying, for each of said fields, the number of matches indicated by the corresponding present indicator and the corresponding selected indicators;

comparing, for each of said fields, the corresponding tallied number of matches with a corresponding predetermined threshold value;

enabling said data transfer if each tallied number is at least the corresponding predetermined threshold value; and

inhibiting said data transfer otherwise.

5,568,628

# STORAGE CONTROL METHOD AND APPARATUS FOR HIGHLY RELIABLE STORAGE CONTROLLER WITH MULTIPLE CACHE MEMORIES

Takao Satoh, Sagami-hara; Hiroshi Ichinomiya, Kawasaki; Hisaharu Takeuchi, Odawara, and Akira Yamamoto, Sagami-hara, all of Japan, assignors to Hitachi, Ltd., and Hitachi Microcomputer System, Ltd., both of Tokyo, Japan

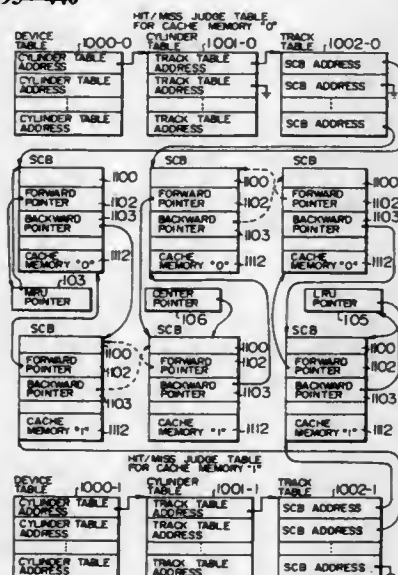
Filed Dec. 14, 1993, Ser. No. 165,989

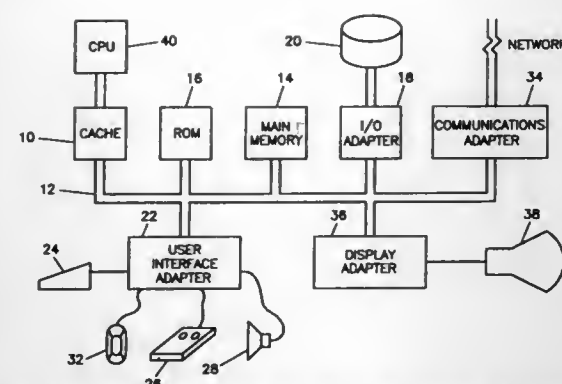
Claims priority, application Japan, Dec. 14, 1992, 4-353648

Int. Cl.<sup>6</sup> G06F 12/08

U.S. Cl. 395—440

24 Claims





(c) a circuit for determining the one of the plurality of columns of cache memory to which the particular one of the plurality of indices is assigned.

5,568,633

### PROCESS FOR MANAGING A HIERARCHY OF MEMORIES

Alain Boudou, Vert; Anne Kasynski, Mainguierin, and Sylvie Lesmanne, Les Clayes Sous Bois, all of France, assignors to Bull S.A., Louveciennes, France

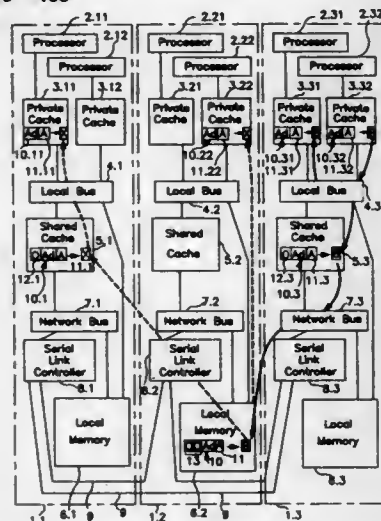
Filed Jul. 15, 1994, Ser. No. 275,383

Claims priority, application France, Jul. 15, 1993, 9308711

Int. Cl. G06F 13/00

U.S. Cl. 395-468

18 Claims



1. A process for coherent management of exchanges between the levels in a hierarchy of memories comprising at least one intermediate level in the hierarchy, linked to a higher level in the hierarchy and to a lower level in the hierarchy, with each level in the hierarchy being divided into memories (3, 5, 6) which are in turn divided into blocks (10) containing pieces of information (11) associated with addresses (Ad), with the blocks of the memories on a higher level and at the intermediate level in the hierarchy containing copies of the information held in the blocks at the corresponding addresses on a lower level in the hierarchy, the process comprising, during a modification of a piece of information in a block (10.32) of a memory on a higher level in the hierarchy, invalidating at least some of the information with corresponding addresses of other memories on the higher level in the hierarchy, and managing either an update or an invalidation of the information at the corresponding addresses on the intermediate level and on the lower level in the hierarchy, in accordance with the usefulness of the update.

### 5,568,634 METHOD OF WRITING IN A NON-VOLATILE MEMORY, NOTABLY IN A MEMORY CARD EMPLOYING MEMORY ALLOCATION STRATEGIES ON SIZE AND OCCUPANCY BASIS

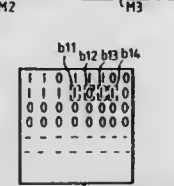
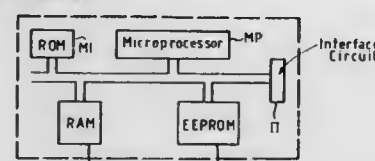
Edouard M. Gordons, Aubagne, France, assignor to Gemplus Card International, Gemenos, France

Filed Apr. 21, 1994, Ser. No. 231,019

Int. Cl. G06F 12/00

U.S. Cl. 395-497.01

15 Claims



5. A method of storing information elements in a non-volatile memory of a chip card, the non-volatile memory comprising memory blocks including a plurality of occupied memory blocks and a plurality of unoccupied memory blocks, the method comprising:

a first storing step, the first storing step including the steps of ascertaining which memory blocks are occupied and which memory blocks are unoccupied, the ascertaining step further comprising the step of accessing a file allocation table, backing up the information elements in the non-volatile memory, the backing up occurring at a first location which is determined based on the ascertaining step, and storing a locking information element in the non-volatile memory, the storage of the locking information element indicating that the first storing step has been completed, and the locking information element being stored at a second location which is determined based on the ascertaining step; and

a second storing step, the second storing step including the steps of storing the information elements in the non-volatile memory, and erasing the locking information element stored at the second location of the non-volatile memory; wherein the locking information element comprises bits of the file allocation table that designate the first location.

5,568,635

### PHYSICAL MEMORY ALLOCATION SYSTEM, PROGRAM EXECUTION SCHEDULING SYSTEM, AND INFORMATION PROCESSOR

Ryuichi Yamaguchi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 23, 1994, Ser. No. 200,489

Claims priority, application Japan, Feb. 24, 1993, 5-033853

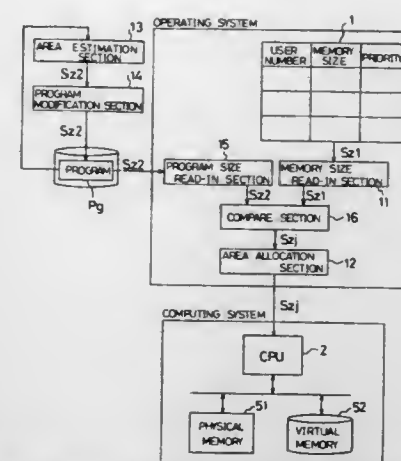
Int. Cl. G06F 12/02

U.S. Cl. 395-497.02

5 Claims

5. An information processor having a physical memory and a virtual memory wherein said physical memory is organized in such a way that data stored in said virtual memory are copied to said physical memory, and plural programs receiving execution requests are handled according to commands issued by command means, said information processor comprising:

(a) a user priority read-in section which fetches a priority allocated to a respective user who runs a program, said priority being a user priority,



- (b) an area estimation section which runs said each program for a fixed period of time so as to measure a storage area size referred to by said each program, said storage area size being a program size;
- (c) a priority-in section which, taking a priority referred to by each user to the execution of said each program as a program priority, makes a comparison in size between said program size of one program and said program size of the other program thereby lowering said program priority of a program found to have a smaller size;
- (d) a priority modification section which, upon receipt of an output of said priority-in section, writes said program priority to said each program;
- (e) a program priority read-in section which inputs said program priority from said each program at program execution time, and
- (f) a priority compare section which receives outputs of said user priority read-in section and said program priority read-in section for comparison in priority ranking between said user priority and said program priority thereby outputting one of these two priorities that is found to have a lower rank than the other as an at-execution-time priority, wherein said command means issues, upon receipt of an output of said priority compare section, a command so as to select between said plural programs according to said at-execution-time priority.

5,568,636

### METHOD AND SYSTEM FOR IMPROVING A PLACEMENT OF CELLS USING ENERGETIC PLACEMENT WITH ALTERNATING CONTRACTION AND EXPANSION OPERATIONS

James S. Koford, San Jose, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Sep. 13, 1994, Ser. No. 306,385

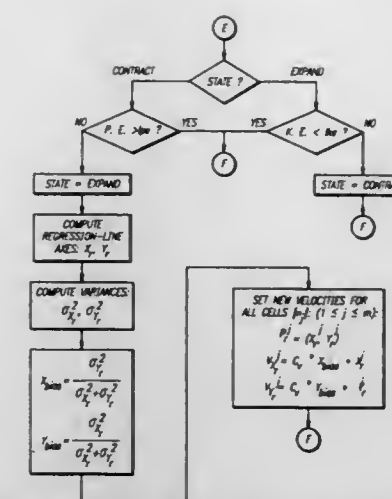
Int. Cl. G06F 3/00; 15/00

U.S. Cl. 395-500

31 Claims

26. A physical design automation system for generating an optimized placement of cells for an integrated circuit chip, comprising:

- initial placement generating means for generating an initial placement of said cells;
- placement representation means for representing said cells as masses, and representing interconnect nets of said cells as springs such that each spring is connected between two of said masses;
- contraction means for performing a contraction operation by which said masses are moved toward a minimum energy configuration by forces of said springs; and
- expansion means for performing an expansion operation by which said masses are moved away from said minimum energy configuration;
- in which the expansion means comprises:



determination means for determining current positions of a plurality of said masses respectively, and determining current velocities of said plurality of said masses respectively; computing means for computing net forces exerted by said springs on said plurality of said masses respectively, computing new velocities of said plurality of said masses resulting from said net forces being applied thereto over a predetermined period of time, and computing new positions of said plurality of said masses in accordance with movement thereof from said current positions at said new velocities over said predetermined length of time.

5,568,637

### ELECTRONIC DEVICE HAVING PSEUDO-SRAM AND CPU OPERATING IN AN ACTIVE MODE AND IN AN IDLE MODE

Kouji Moriya, Higashiyamato, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

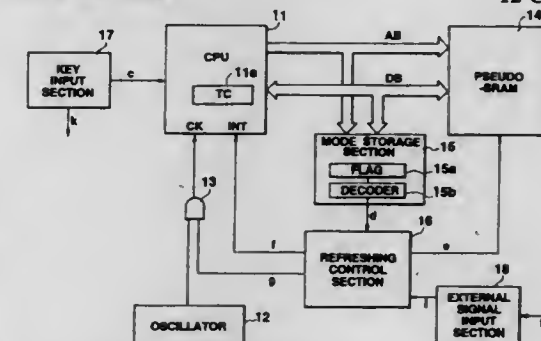
Filed Jun. 20, 1994, Ser. No. 262,594

Claims priority, application Japan, Jun. 28, 1993, 5-157009

Int. Cl. G06F 1/06

U.S. Cl. 395-550

12 Claims



1. An electronic device comprising:
- a CPU which controls an operation of said electronic device, said CPU functioning in an active mode in which said CPU operates and in an idle mode in which said CPU does not operate;
- a pseudo-SRAM connected to said CPU and having a self-refreshing function;
- storage means for storing data denoting the active mode in which said CPU operates and the idle mode in which said CPU does not operate;
- refresh signal supplying means for supplying a first refresh timing signal of a predetermined period to cause said pseudo-SRAM to perform an automatic refreshing operation when said CPU is in the active mode, for stopping supply of the first refresh timing signal when said CPU is in the idle mode, and for supplying, when the idle mode of said CPU is switched to



the active mode of said CPU, a second refresh timing signal having a period shorter than that of the first refresh timing signal for a predetermined interval of time.

5,568,638

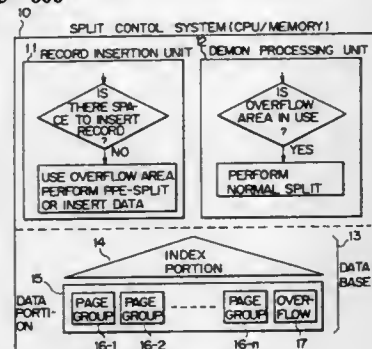
**SPLIT CONTROL SYSTEM FOR A PAGE/PAGE GROUP IN A DATA PROCESSING SYSTEM A PRE-SPLIT PROCESS USING A TEMPORARY OVERFLOW AREA**  
Katzumi Hayashi; Masaaki Mitani, and Shinzi Kitao, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 18, 1993, Ser. No. 19,566

Claims priority, application Japan, Feb. 18, 1992, 4-030818  
Int. Cl.<sup>6</sup> G06F 17/30

U.S. Cl. 395—600

4 Claims



1. A split control system for a page/page group in a data processing system which manages records of the page/page group based on a storage structure employing a non-dense B-tree cluster structure, comprising:

a data base including an index portion and a data portion, the index portion formed by layers consisting of the B-tree structure having at least one upper page group index, a plurality of page group indexes each operatively connected to the upper page group index, and a plurality of page indexes each operatively connected to a corresponding page group index for managing key values of the records, and the data portion formed by a plurality of upper page groups each operatively connected to a corresponding page group index and having an overflow area;

record insertion means operatively connected to the data base for inserting records into the page/page group by using the overflow area in a transaction process, and performing a pre-split process for the page/page group into further page/page groups by also using the overflow area when there are sufficient vacant pages for insertion into the page/page group; and

demon processing means operatively connected to the data base and operated asynchronously with the transaction process for retrieving a state of the use of the overflow area, performing a normal split process for the page/page group when the overflow area is in use, and a moving split page/page group from the overflow area to the page/page group.

wherein a timing of a normal split process in the B-tree structure is temporarily delayed by using the overflow area so that it is possible to effectively balance an overhead time of the split process and to improve a response time returned by pre-split process to the transaction process.

5,568,639  
**METHOD AND APPARATUS FOR PROVIDING AN OBJECT-ORIENTED FILE STRUCTURING SYSTEM ON A COMPUTER**

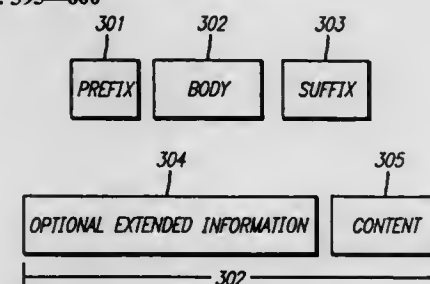
Jonathan J. Wilcox, Woodside; Thomas A. Henderson, Palo Alto, and Jon A. Wilcox, Menlo Park, all of Calif., assignors to Menai Corporation, Menlo Park, Calif.

Filed Nov. 24, 1993, Ser. No. 158,591

Int. Cl.<sup>6</sup> G06F 7/00; 9/00

U.S. Cl. 395—600

19 Claims



1. An article of manufacture comprising:

a computer usable medium having computer readable program code means embodied thereon for causing a computer to provide a file structuring system for storing a file on a computer system, the computer readable program code means in said article of manufacture comprising:

computer readable program code configured to cause said computer to provide a file to be stored in said computer system comprising a plurality of objects, each object having an object length and an object type;

said object comprising a prefix, a suffix, and contents, said prefix and said suffix each having a bracket length, said prefix and said suffix each defining said object length, said prefix defining the position of said suffix and comprising a keybyte and a prefix remainder,

said suffix defining the position of said prefix and comprising a suffix remainder and said keybyte, wherein said suffix remainder and said prefix remainder contain the same information;

computer readable program code configured to cause said computer to create a focus list of focus entries of said file when said file is open;

computer readable program code configured to cause said computer to access said objects while said objects are in focus.

5,568,640  
**DOCUMENT RETRIEVING METHOD IN A DOCUMENT MANAGING SYSTEM**

Tatsuya Nishiyama, Hirakata; Satoshi Wakayama, Sakai; Yoshiaki Matsuda, Kawasaki; Tetsuya Hashimoto, Yokohama; Keiji Kojima, Sagami, and Kiyoshi Yamamoto, Osaka, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Seibu Software Co., Ltd., Osaka, both of Japan

Filed Sep. 20, 1994, Ser. No. 309,416

Claims priority, application Japan, Sep. 20, 1993, 5-232852  
Int. Cl.<sup>6</sup> G06F 17/30

U.S. Cl. 395—600

4 Claims

1. A document retrieving method in a document management system which manages documents, using a computer, comprising the steps of:

- managing classifications of documents in accordance with a plurality of node trees having nodes linked in a hierarchical structure;
- obtaining target nodes inputted by an operator;
- when a particular one of the plurality of node trees is designated, OR-merging documents related to all the nodes ranging from documents linked to the target node to documents linked to lower nodes in the node tree which are linked to the target node directly or indirectly to create a collection of documents;

5,568,642  
**COMPUTER SYSTEM WITH EASY PROGRAMMING ARCHITECTURE AND PROGRAMMING METHOD THEREOF**

Fumio Negoro, Yokohama; Tetsuri Murata, Tokyo; Kozo Sawamura, Kawasaki; Junichi Yuki, Sakura; Hiroshi Murai, Tokyo; Masayasu Onuki; Norihito Ito, both of Kawasaki; Wieguo Jiang, Tokyo, and Masako Yonemura, Yokohama, all of Japan, assignors to Institute of Software Scientific Constructions, Tokyo, Japan

Continuation of Ser. No. 319,062, Oct. 6, 1994, abandoned.

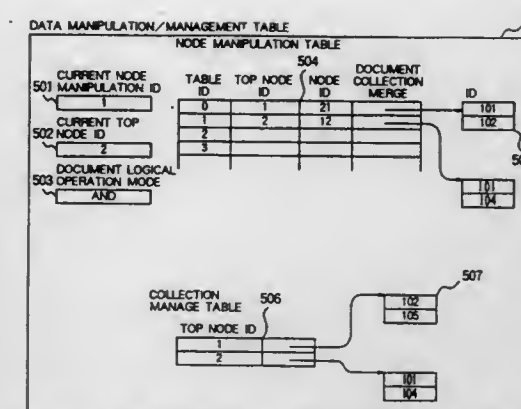
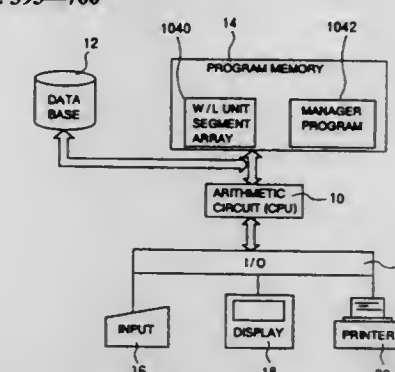
This application Feb. 28, 1996, Ser. No. 608,213

Claims priority, application Japan, Dec. 26, 1991, 3-345563;  
Jul. 30, 1992, 4-203983

Int. Cl.<sup>6</sup> G06F 9/44

U.S. Cl. 395—700

8 Claims



(d) when a new different node tree is designated, OR-merging documents related to all the nodes ranging from documents linked to the target node to documents linked to lower nodes in the new node tree which are linked to the target node directly and indirectly to create another collection of documents; and

(e) repeating the steps (b) and (d) and performing an AND-merge operation on the created collections to create and output a final collection of documents.

5,568,641

**POWERFAIL DURABLE FLASH EEPROM UPGRADE**

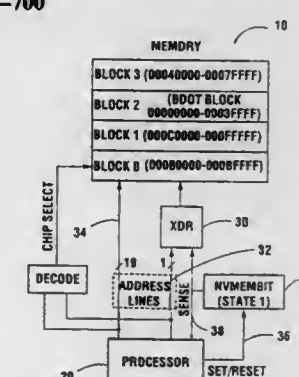
Marvin D. Nelson; Barry J. Oldfield, and Mark D. Petersen, all of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 18, 1995, Ser. No. 375,095

Int. Cl.<sup>6</sup> G06F 9/00

U.S. Cl. 395—700

16 Claims



1. A method for providing powerfail durable memory upgrades for a first memory device having system boot data and separately erasable/writable blocks addressable by a microprocessor, the method comprising the steps of:

- copying the boot data from a primary boot block associated with a primary address space in the first memory device to an alternate boot block associated with an alternate address space;
- setting a second non-volatile memory to cause the alternate boot block to appear in the primary address space from the microprocessor's perspective, and the primary boot block to appear in the alternate address space, and whereby in case of a disruptive event the data remains boot addressable in the alternate boot block by the microprocessor;
- writing new boot data to the primary boot block; and
- resetting the second memory to cause the primary boot block to appear back in the primary address space, and the alternate boot block to appear back in the alternate address space.

5,568,643  
**EFFICIENT INTERRUPT CONTROL APPARATUS WITH A COMMON INTERRUPT CONTROL PROGRAM AND CONTROL METHOD THEREOF**

Toshiyuki Tanaka, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP94/01690, § 371 Date Jun. 12, 1995, § 102(e)  
Date Jun. 12, 1995, PCT Pub. No. WO95/10806, PCT Pub. Date Apr. 20, 1995

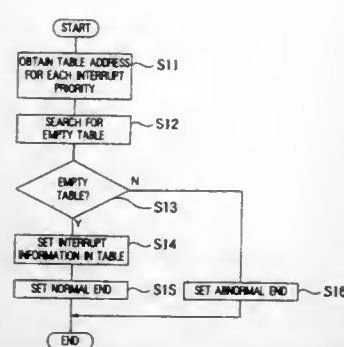
PCT Filed Oct. 11, 1994, Ser. No. 454,240

Claims priority, application Japan, Oct. 12, 1993, 5-254133  
Int. Cl.<sup>6</sup> G06F 9/46

U.S. Cl. 395—739

7 Claims

7. An interrupt control method for a microprocessor lacking interrupt processing circuit, comprising the steps of:



storing a common interrupt control program, interrupt processing programs operating as one of plural application programs, and an interrupt table;

registering plural types of interrupt processing conditions in said interrupt table, said interrupt table containing identification data representing a stored interrupt processing program which corresponds to a registered interrupt processing condition; detecting signal generated by an interrupt generating circuit; activating said common interrupt control program in response to the generated interrupt signal for specifying identification data of the interrupt processing program corresponding to said detected interrupt signal; and activating a stored interrupt processing program matching the specified identification data.

5,568,644

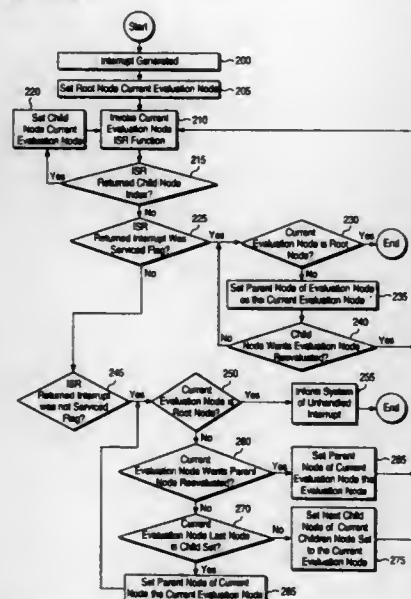
**METHOD AND APPARATUS USING A TREE  
STRUCTURE FOR THE DISPATCHING OF INTERRUPTS**

Matthew R. Nelson, Sunnyvale, and Thomas E. Saulpaugh,  
San Jose, both of Calif., assignors to Apple Computer, Inc.,  
Cupertino, Calif.

Filed May 5, 1995, Ser. No. 435,967  
Int. Cl.<sup>6</sup> G06F 3/04:9/18

U.S. Cl. 395—741

## 28 Claims



1. In a computer system comprising a processor and a plurality of devices coupled to a bus, an interrupt dispatching apparatus for determining an interrupt source from the plurality of devices that issued an interrupt request to the processor, said interrupt dispatching apparatus comprising:

an interrupt source tree (IST) comprising a plurality of hierarchically arranged nodes, said nodes comprising a root node and a plurality of leaf nodes connected to higher level nodes in the hierarchy through branches, said root node providing a

branch direction to at least one leaf node, at least one of said leaf nodes comprising an identification of an interrupt source; an interrupt dispatcher, responsive to an interrupt from an interrupt source, traversing said IST by invoking a routine pointed to by said root node to determine a branch direction to one of said plurality of leaf nodes, said one of said plurality of leaf nodes identifying said interrupt source.

5,568,645

**VERSATILE RF DATA CAPTURE SYSTEM**

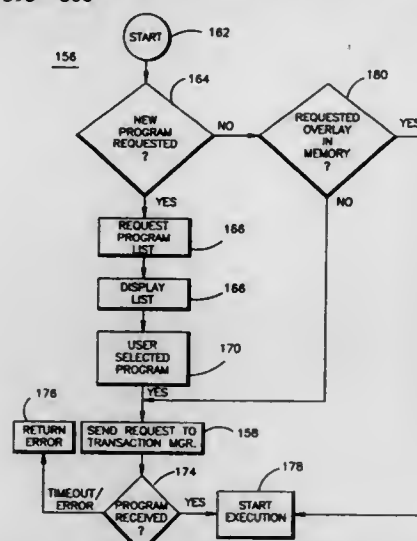
**Michael D. Morris, and Lyle L. Zumbach, both of Cedar Rapids, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa**

Continuation of Ser. No. 748,150, Aug. 21, 1991, Pat. No. 5,349,678. This application Jul. 5, 1994, Ser. No. 267,758

Int. Cl.<sup>5</sup> G06F 17/60

U.S. Cl. 395—800

## 8 Claims



1. A system for collecting data from at least one remote site and transmitting the collected data to a main information center and having information distributed throughout said data collecting system, the information being partitioned into a first information portion and a second information portion, said data collection system comprising:

a) at least one terminal for collecting data at the remote site, said terminal comprising means for collecting data, a first memory for storing the first information portion, information requesting means responsive to the need for information by said terminal to generate an information call identifying the needed information, and first memory searching means responsive to the information call for searching said first memory for the presence or absence of that needed information, said first memory searching means responsive to the presence of that needed information for accessing said first memory and supplying that accessed, needed information for use by said terminal;

b) a server for said terminal; and  
c) communication means for interconnecting said terminal and said server, said first memory searching means responsive to the absence of that needed information within said second memory for transmitting the information call via said communication means from said terminal to said server.

d) said server disposed at the main information center and comprising a second memory for storing the second information portion, and second memory searching means responsive to the information call transmitted via said communication means from said terminal for accessing the requested information from said second memory means and transmitting the accessed information via said communication means from said server to said terminal.

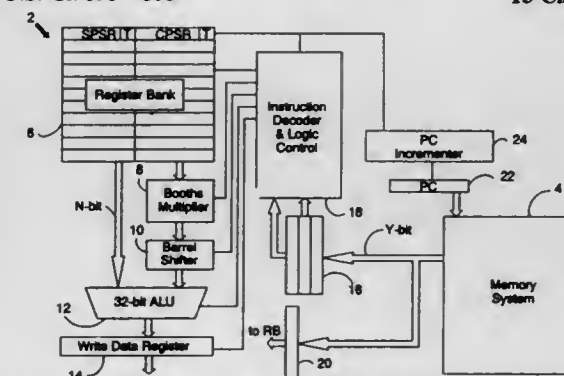
5,568,646  
**MULTIPLE INSTRUCTION SET MAPPING**  
 David V. Jaggard, Cambridge, United Kingdom, assignor to  
 Advanced Risc Machines Limited, Cambridge, United Kingdom

Filed Sep. 19, 1994, Ser. No. 308,838  
Claims priority, application United Kingdom, May 3, 1994,  
9408873

U.S. Cl. 395—800

Int. Cl.<sup>6</sup> G06F 9/00

### 13 Claims



- (i) Apparatus for processing data, said apparatus comprising:
  - (i) a processor core responsive to a plurality of core control signals;
  - (ii) decoding means for decoding P bits of an X-bit program instruction word of a first instruction set to generate said core control signals;
  - (iii) an instruction pipeline through which instruction program words are passed to said decoding means; and
  - (iv) first mapping means responsive to a Y-bit program instruction word of a second instruction set passing along said instruction pipeline for mapping Q bits of said Y-bit program instruction word to said P bits of a corresponding X-bit program instruction word for decoding by said decoding means, wherein
- (v) Y is less than X, P is less than X and said second instruction set is a subset of said first instruction set; and
- (vi) instruction program words pass through said instruction pipeline over a plurality of processing cycles, one of said processing cycles being a decode cycle, said decoding means being operative to produce said core control signals by the end of said decode cycle and said first mapping means being operative to produce said P bits of said corresponding X-bit program instruction word during a first portion of said decode cycle to enable said decoding means still to produce said core control signals by the end of said decode cycle.

**5,568,647**  
**SERIAL CONTROL APPARATUS WITH A SINGLE CHIP**  
**SELECT SIGNAL**

**Yuji Kobayashi, Kanagawa, Japan, assignor to Sony Corpora-  
tion, Tokyo, Japan**

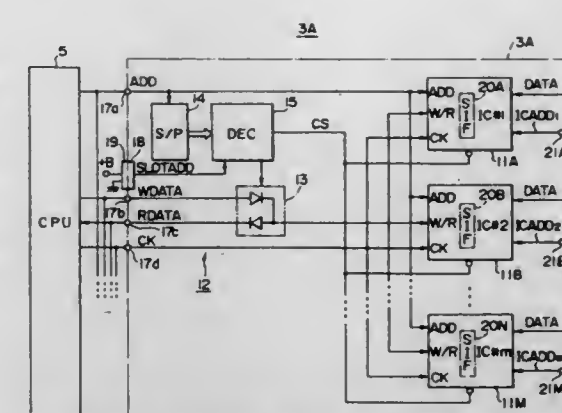
Filed Feb. 24, 1993, Ser. No. 21,676

Claims priority, application Japan, Feb. 28, 1992, 4-043649  
Int. Cl.<sup>6</sup> G06F 13/00; 13/20

U.S. Cl. 395—823

## 21 Claims

1. A serial control apparatus comprising:  
a plurality of printed circuit boards, each printed circuit board having a plurality of integrated circuits, each printed circuit board having a corresponding board identifier, and each integrated circuit having a corresponding IC identifier;  
printed circuit board identifying means mounted on each of said plurality of respective printed circuit boards for setting the board identifier of the printed circuit board;  
integrated circuit identifying means for identifying each of said plurality of respective integrated circuits, said integrated circuit identifying means including respective IC identifier setting means.



ting means for adjustably setting the respective IC identifier of said plurality of respective integrated circuits;

PC board IC selecting means mounted on each of said plurality of respective printed circuit boards for comparing a board identification to the board identifier of the corresponding one of said plurality of printed circuit boards, and sending a single chip select signal to all of said plurality of integrated circuits to enable transfer Of data to and from the respective integrated circuits on the printed circuit board if the board identification matches the board identifier of the corresponding one of said plurality of printed circuit boards; and

a central processing unit for controlling said plurality of printed circuit boards and said plurality of integrated circuits, said central processing unit being connected to send serial identification signals for specifying a particular printed circuit board and a particular integrated circuit to be selected to said PC board IC selecting means and said integrated circuit identifying means, and thereby selecting a particular one of said plurality of integrated circuits on a particular one of said plurality of printed circuit boards for communication directly with said central processing unit.

**5,568,648**  
**INDIRECT ADDRESSING OF CHANNELS VIA LOGICAL  
CHANNEL GROUPS**

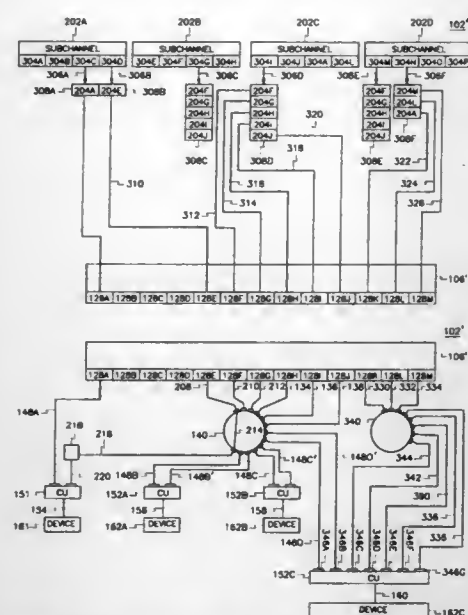
Anthony Coscarella, Woodstock, N.Y.; Martin W. Sachs, Westport, Conn., and Joseph Temple, Hurley, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.  
Continuation of Ser. No. 711,474, Jun. 5, 1991. This application Jun. 6, 1995, Ser. No. 471,475  
Int. Cl.<sup>6</sup> G06F 3/00; 13/00

U.S. Cl. 395—862

### 18 Claims

17. A computer system, comprising:  
an active data unit;  
a plurality of peripheral devices; and  
an IO subsystem to transfer information between said peripheral devices and said active data unit, said IO subsystem comprising:  
multiple channels electrically coupled to said active data unit;  
one or more switches each electrically coupled to one or more of said channels and one or more of said peripheral devices, for routing information between said channels and said peripheral devices;  
a plurality of channel path identifiers each identifying one of said channels;  
a computer memory having a finite storage capacity;  
a plurality of logical channel groups comprising lists that store channel path identifiers, said lists stored in said computer memory, said lists storing varying numbers of channel path identifiers, said lists having a storage capacity that is limited only by said finite storage capacity of said computer memory, channel path identifiers in any one of said logical channel groups identifying channels which are electrically coupled to a particular one of said peripheral devices via a particular one of said switches;





a plurality of subchannels each exclusively assigned to one of said peripheral devices, each of said subchannels maintaining one or more pointers each addressing one of said logical channel groups; and  
means for establishing a physical communication path between said active data unit and one of said peripheral devices by selecting a channel path identifier in a logical channel group addressed by a pointer maintained by a subchannel assigned to said peripheral device, wherein said physical communication path includes a channel identified by said selected channel path identifier.

5,568,649

# INTERRUPT CASCADING AND PRIORITY CONFIGURATION FOR A SYMMETRICAL MULTIPROCESSING SYSTEM

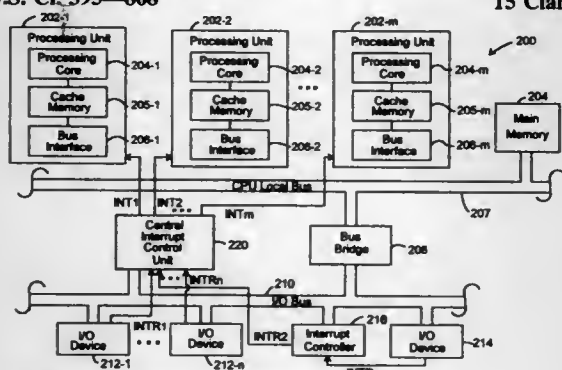
James MacDonald, Buda, and Rupaka Mahalingaiah, Austin, both of Tex., assignors to Advanced Micro Devices, Sunnyvale, Calif.

Filed May 31, 1994, Ser. No. 251,799

Int. Cl. G06F 13/24

U.S. Cl. 395-868

15 Claims



1. A multiprocessor system comprising:

- a plurality of processing units;
- a plurality of peripheral devices;
- a remote interrupt handler coupled to said plurality of peripheral devices, wherein said remote interrupt handler is configured to detect an assertion of an interrupt signal associated with any of said plurality of peripheral devices, and wherein said remote interrupt handler is configured to generate a serial signal indicative of which of said plurality of peripheral devices said interrupt signal corresponds, and wherein said remote interrupt handler includes:

an interrupt detect unit coupled to each of said plurality of peripheral devices and configured to detect said assertion of said interrupt signal of any of said plurality of peripheral devices; and  
a data encoder coupled to said interrupt detect unit and configured to generate a first parallel encoded signal indicative of which of said peripheral devices said interrupt signal corresponds;  
wherein said serial signal is derived from said first parallel encoded signal; and  
a central interrupt control unit coupled to said plurality of processing units and coupled to receive said serial signal from said remote interrupt handler, wherein said central interrupt control unit is configured to decode said serial signal to determine to which of said peripheral devices said interrupt signal corresponds, and wherein said central interrupt control unit is configured to provide a processor interrupt signal to one of said processing units which is designated to process said interrupt signal; and wherein said central interrupt control unit includes a shifter control unit coupled to receive said serial signal and configured to convert said serial signal to a second parallel signal prior to decoding said serial signal.

5,568,650

# CONTROL UNIT FOR CONTROLLING READING AND WRITING OF A MAGNETIC TAPE UNIT

Yoshiaki Mori, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

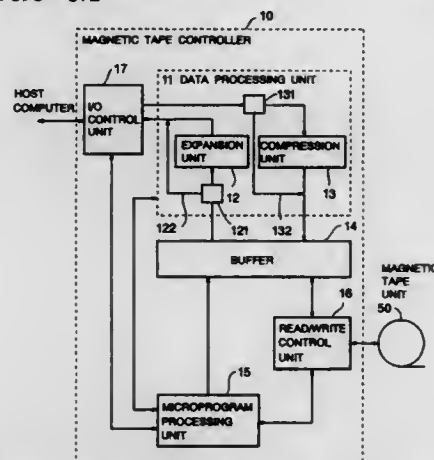
Filed Jun. 5, 1992, Ser. No. 894,775

Claims priority, application Japan, Jun. 6, 1991, 3-163842

Int. Cl. G06F 3/06

U.S. Cl. 395-872

16 Claims



1. A control unit for a magnetic tape unit comprising:  
data processing means for transforming non-compressed write data into compressed write data via compression, and for transforming compressed read data from said magnetic tape unit into decompressed read data via expansion;  
storage means for storing the compressed write data received from said data processing means and for storing compressed read data received from the magnetic tape unit, said compressed write data in said storage means becoming compressed recovered data based on an instruction from a host computer to recover the compressed write data which are held unwritten to said magnetic tape unit;  
I/O control means for transmitting the non-compressed write data, the decompressed read data, and the compressed recovered data to and from the host computer; and  
microprogram processing means for performing storing and reading control to the storage means and for controlling the data processing means according to the instruction from the host computer, including:  
means for reading the compressed recovered data stored in said storage means and held unwritten to said magnetic tape unit without expansion by the data processing means according to

a memory capacity of said host computer and a size of said compressed data, and transferring the compressed recovered data read from said storage means to said host computer based on an instruction from the host computer, and  
means for rewriting the compressed recovered data in said storage means from said host computer without compression by said data processing means based on an instruction from said host computer.

5,568,651

# METHOD FOR DETECTION OF CONFIGURATION TYPES AND ADDRESSING MODES OF A DYNAMIC RAM

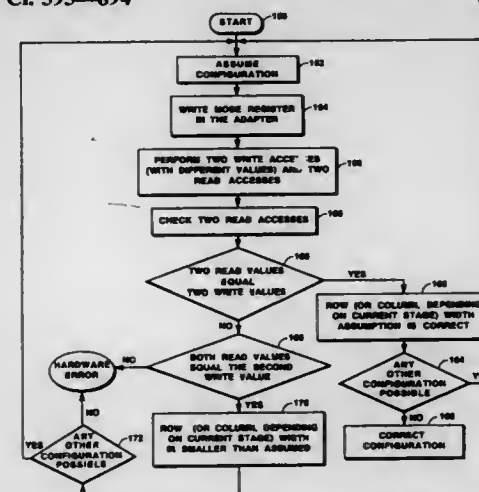
Eitan Medina, Jerusalem; Simoni Ben-Michael, Givat Ze'ev; Yifat Ben-Shahar, Jerusalem, all of Israel, and Niamh Darcy, Acton, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Nov. 3, 1994, Ser. No. 333,809

Int. Cl. G06F 13/00; H04L 12/28

U.S. Cl. 395-894

4 Claims



1. A method for determining a configuration type of a plurality of dynamic random access memory (DRAM) devices comprising the steps of:  
providing an adapter, the adapter having an adapter memory;  
providing a first DRAM device, the first DRAM device having an actual DRAM configuration;  
providing an interface for communicating between the first DRAM device and the adapter; and  
determining, in the adapter memory, the DRAM configuration, the step of determining comprising the steps of:  
assuming a first DRAM configuration of one of a plurality of DRAM configurations for the first DRAM device;  
determining whether the first DRAM configuration matches the actual DRAM configuration, said step of determining comprising the substeps of  
loading the first DRAM configuration into a mode register in the adapter;  
performing a first write access, a second write access, a first read access, and a second read access;  
comparing the first write access and the second write access to the first read access and the second read access;  
assuming a second DRAM configuration if the first write access and the second write access equal the first read access and the second read access; and  
assuming a third DRAM configuration if the first read access and the second read access equals the second write access; and  
repeating the steps of assuming and determining if the first DRAM configuration does not equal the actual DRAM configuration.

5,568,652

# RAPID SETTING COMPOSITIONS AND METHOD OF MAKING AND USING SAME

Shy-Hsien Wu, Horseheads, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Nov. 25, 1994, Ser. No. 344,969

Int. Cl. B22F 3/10

U.S. Cl. 419-2

21 Claims

1. A method of making a homogeneous formable mixture comprising:  
simultaneously mixing under shear, a water-insoluble wax, organic binder comprising components selected from the group consisting of methylcellulose, ethylhydroxy ethylcellulose, hydroxybutylcellulose, hydroxybutyl methylcellulose, hydroxyethylcellulose, hydroxymethylcellulose, hydroxypropylcellulose, hydroxypropyl methylcellulose, hydroxyethyl methylcellulose, sodium carboxy methylcellulose, and combinations thereof, powder material capable of being formed into a body when combined with the organic binder, and vehicle of which at least about 90 wt % is water, at a temperature which is at least high enough to soften the wax.

5,568,653

# METHOD OF PRODUCING A SINTERED CARBONITRIDE ALLOY FOR SEMIFINISHING MACHINING

Gerold Weinl, Älvsjö, and Rolf Oskarsson, Rönninge, both of Sweden, assignors to Sandvik AB, Sandviken, Sweden

Continuation of Ser. No. 78,238, Jun. 21, 1993, abandoned.

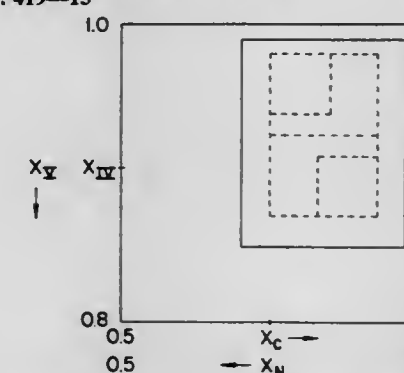
This application May 11, 1995, Ser. No. 438,992

Claims priority, application Sweden, Dec. 21, 1990, 9004117

Int. Cl. B22F 3/12

U.S. Cl. 419-13

14 Claims



1. A method of producing a sintered titanium-based carbonitride alloy with 3-25 weight percent binder phase, comprising steps of:  
milling a complex carbonitride raw material and said binder phase to form a mixed powder composite, said complex carbonitride raw material comprising  $(A_xB_{1-x})(C_yN_{1-y})$  where A is one or more elements from Group IV and B is one or more elements from Group V, with  
 $0.85 \leq x \leq 0.99$  and  
 $0.58 \leq y \leq 0.69$ ; and  
sintering the powder composite to produce said sintered titanium-based carbonitride alloy, all of the Group IV and V elements in the alloy being added via the complex raw material.

5,568,654

**MOBILE RADIO TELECOMMUNICATIONS SYSTEM**

Yasuro Fukawa, Hiratuka, Japan, assignor to Any Co., Ltd., Hiratuka, Japan

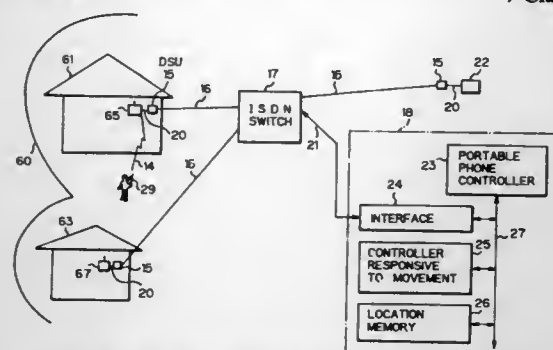
Filed Apr. 8, 1994, Ser. No. 224,771

Claims priority, application Japan, Oct. 7, 1993, 5-251812

Int. Cl.<sup>6</sup> H04Q 7/00

U.S. Cl. 455—33.1

7 Claims



1. A mobile radio telecommunications system comprising:  
a switching unit;

a control station connected to said switching unit;  
a plurality of base stations connected to said switching unit; and  
a plurality of mobile stations connectable to said plurality of base stations by radio channels;

said plurality of base stations being respectively situated at private property, and each comprising first control means for determining a direction in which any one of said plurality of mobile stations is moving;

said first control means receiving via said control station and said switching unit information representative of received levels at which said plurality of base stations have received a radio wave from any one of said plurality of mobile stations, comparing said received levels, determining, based on a result of comparison, one of said plurality of base stations having the highest received level to be a current base station currently covering the mobile station, and determining a direction in which said mobile station is moving on the basis of a transition of said highest received level;

wherein a plurality of radio zones are arranged each covering, among said plurality of base stations, a predetermined number of nearby base stations as a single group, said base stations of each group defining respective microzones which are combined to form a single zone, at least one location identification code and at least one base station code being respectively assigned to said single zone and each of said base stations, each group of base stations sharing same radio channels, different groups of base stations each using particular radio channels;

said first control means receiving at least the information representative of the received levels at which the base stations belonging to the same group as the base station including said first control means have received the radio wave from the mobile station, comparing said received levels in said group, determining, based on a result of comparison, one of said base stations having the highest received level to be a current base station currently covering said mobile station, and determin-

ing a direction in which said mobile station is moving in said group on the basis of a transition of said highest received level;

said base stations each further comprising first memory means for storing the base station code assigned thereto, the location identification code assigned to the group to which the base station belongs, and the base station code assigned to the base station having the highest received level which is determined by said first control means and changes due to a movement of the mobile station;

said control station comprising second control means for receiving the information representative of the received levels from said base stations via said switching unit, sending said information to each of said base stations via said switching unit, comparing one group currently covering the mobile station and the other groups surrounding said one group with respect to a total received level of said base stations belonging to the same group, determining that said mobile station is present in the group having the highest total received level, and determining a direction in which said mobile station is moving over the groups on the basis of a transition of said highest total received level; and

second memory means for storing the location identification code assigned to the group having the highest total received level which is determined by said second control means and changes due to a movement of the mobile station.

5,568,655

**DETECTION OF PAGER SIGNAL IN FM RADIO TRANSMISSION**

Jouko Heinonen, Salo; Henrik Sunell, Marttila, and Matti Koskinen, Pernio, all of Finland, assignors to Nokia Mobile Phones Ltd., Salo, Finland

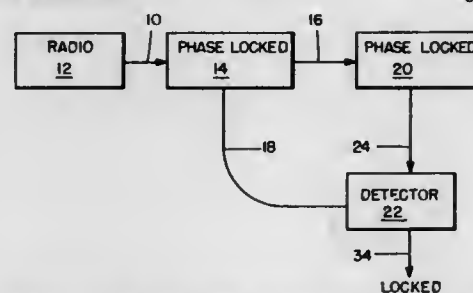
Filed Nov. 14, 1994, Ser. No. 338,034

Claims priority, application United Kingdom, Nov. 13, 1993, 9323461

Int. Cl.<sup>6</sup> H04B 1/00

U.S. Cl. 455—38.1

6 Claims



1. Apparatus for detecting the presence of a pager signal at a predetermined frequency in a frequency modulated transmission, comprising a phase locked loop circuit tuned to the predetermined frequency and operative to produce an output signal consisting of a stream of pulses at a pulse repetition frequency representative of the presence or absence of the pager signal, and detector means responsive to the output signal of said phase locked loop circuit for detecting the presence of the pager signal wherein the detector means is operative to detect the number of pulses produced in a predetermined time.

**DESIGNS**

OCTOBER 22, 1996

374,753

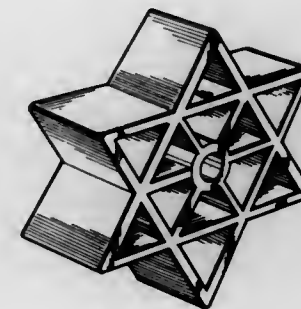
PASTA

Douglas S. Tittle, Middletown, N.J., assignor to FunFoods Incorporated, Hoboken, N.J.

Filed Jul. 10, 1995, Ser. No. 41,221

Term of patent 14 years

U.S. Cl. D1—106



374,755

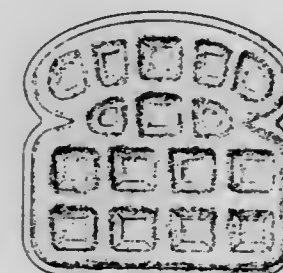
WAFFLE

Harold Gobble, Richland; Michael Bauman; Gerry Johnson, both of Battle Creek, and Douglas R. Zimmermann, Richland, all of Mich., assignors to Kellogg Company, Battle Creek, Mich.

Filed Sep. 20, 1995, Ser. No. 44,213

Term of patent 14 years

U.S. Cl. D1—125



374,756

INFUSION PACKAGE

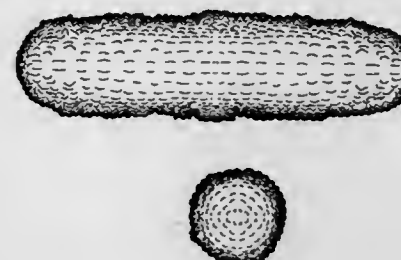
John F. T. Stevenson, Uppingham, United Kingdom, assignor to Lyons Tetley Limited, Greenford, United Kingdom

Filed Mar. 27, 1995, Ser. No. 36,760

Claims priority, application United Kingdom, Sep. 29, 1994, 2042280

Term of patent 14 years

U.S. Cl. D1—199





374,757  
DRESS TIE

Bryant D. Nevitt, 4451 Acorn Ct., Yorba Linda, Calif. 92688  
Filed Jul. 15, 1994, Ser. No. 25,914  
Term of patent 14 years  
U.S. Cl. D2—605



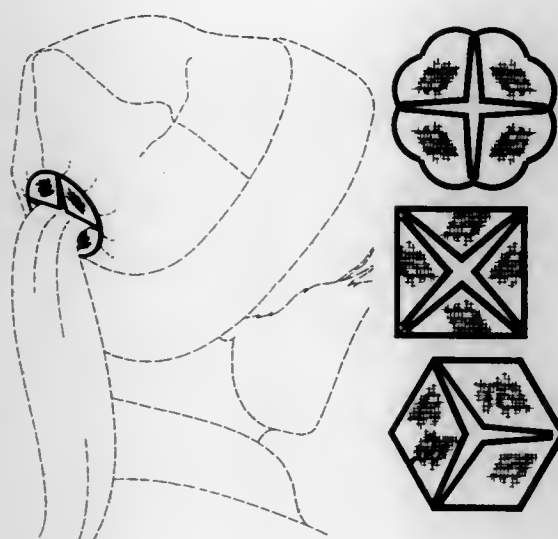
374,759  
SPORTS SHOE

Peter Edauw, Camalo'di Povegliano, and Francesco Caeran, Montebelluna, both of Italy, assignors to Nordica S.p.A., Italy, and Rollerblade, Inc., Minnetonka, Minn.  
Filed Sep. 25, 1995, Ser. No. 44,455  
Claims priority, application WIPO, Mar. 28, 1995, DM032626  
Term of patent 14 years  
U.S. Cl. D2—902



374,758  
HEADGEAR ACCESSORY

Vincent Armenta; Louis J. Cruz, and Henry S. Alvarez, all of P.O. Box 62, Santa Maria, Calif. 93456  
Filed Mar. 31, 1995, Ser. No. 37,651  
Term of patent 14 years  
U.S. Cl. D2—851



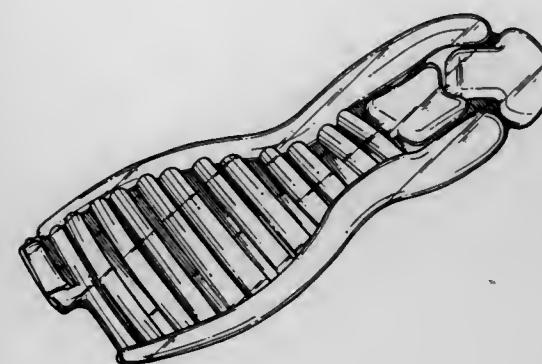
374,760  
SPORTS SHOE

Peter Edauw, Camalo' di Povegliano, and Francesco Caeran, Montebelluna, both of Italy, assignors to Nordica S.p.A., Italy, and Rollerblade, Inc., Minnetonka, Minn.  
Filed Sep. 25, 1995, Ser. No. 44,470  
Claims priority, application European Pat. Off., Mar. 28, 1995, DM/032 626  
Term of patent 14 years  
U.S. Cl. D2—902



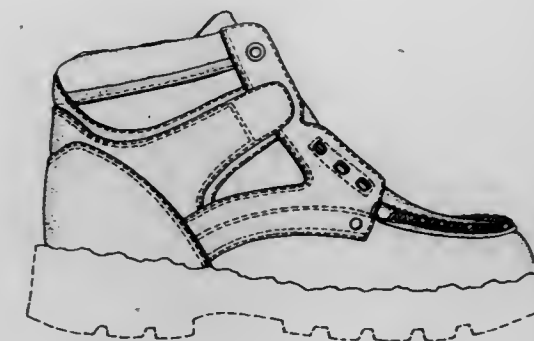
374,761  
BLADDER FOR A SHOE SOLE

James C. Sell, Jr., Battleground, Wash., assignor to Nike, Inc., Beaverton, Oreg.  
Filed Aug. 25, 1995, Ser. No. 43,083  
Term of patent 14 years  
U.S. Cl. D2—961



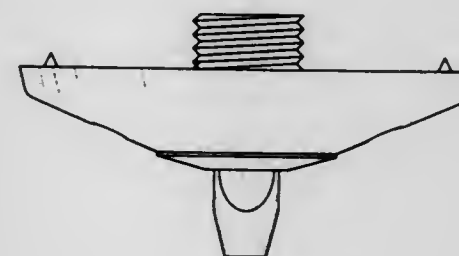
374,763  
SHOE UPPER

Peter Von Conta, Newton, Mass., assignor to The Rockport Company, Inc., Marlboro, Mass.  
Filed Oct. 17, 1995, Ser. No. 45,332  
Term of patent 14 years  
U.S. Cl. D2—970



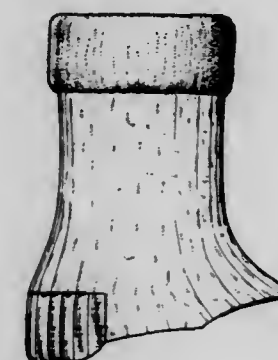
374,762  
GOLF SPIKE

David F. Grant, Suite 1, 215 1st Ave. NE., Calgary, Alberta, Canada  
Filed Aug. 28, 1995, Ser. No. 43,160  
Term of patent 14 years  
U.S. Cl. D2—962



374,764  
SOCK DICKIE

Deborah M. Penn, 1107 Amber, Wichita Falls, Tex. 76305  
Filed Dec. 13, 1994, Ser. No. 32,262  
Term of patent 14 years  
U.S. Cl. D2—980



374,765

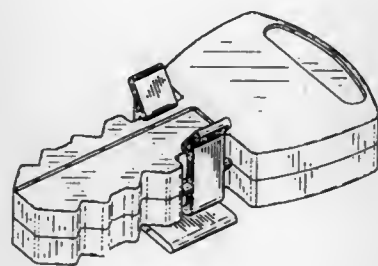
## KEY HOLDER

Stephen W. Jones, Emporia, Kans., assignor to Jasco, Inc.,  
Emporia, Kans.

Filed Aug. 11, 1995, Ser. No. 42,489

Term of patent 14 years

U.S. Cl. D3—212



374,767

## REMOTE CONTROL HOLDER

Otis M. Leach, 719 Gasberry La., Webster, N.Y. 14580  
Filed Feb. 3, 1995, Ser. No. 34,388

Term of patent 14 years

U.S. Cl. D3—218



374,766

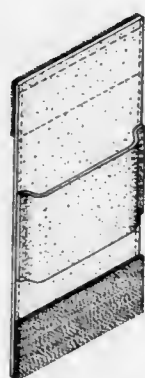
## BELT ATTACHMENT FOR ARTICLES HAVING A BELT CLIP

Craig Raus, P.O. Box 670047, Houston, Tex. 77267

Filed Dec. 27, 1994, Ser. No. 32,748

Term of patent 14 years

U.S. Cl. D3—215



374,768

## HOLSTER FOR CARRYING TELECOMMUNICATION EQUIPMENT

Edgar Lundie, Jr., 1135 Johnson Cir., Lilburn, Ga. 30247

Filed Jun. 22, 1995, Ser. No. 40,775

Term of patent 14 years

U.S. Cl. D3—218



374,769

## FLASHLIGHT AND BATTERY CARRIER

Richard N. Case, Boulder, Colo., assignor to RCP Enterprises,  
Inc., Boulder, Colo.

Filed Dec. 30, 1994, Ser. No. 32,858

Term of patent 14 years

U.S. Cl. D3—229



374,771

## BRIEFCASE CONTAINER FOR TOYS

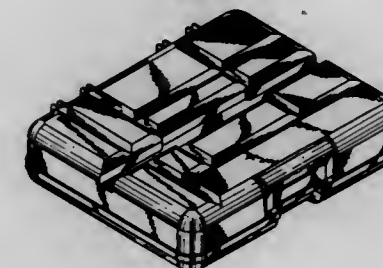
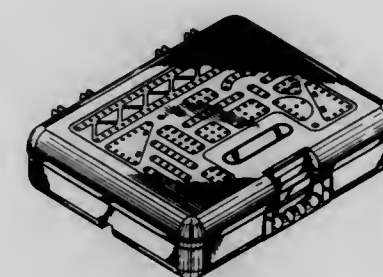
Jacques Guegan, L'Hay les Roses; Francis Lecocq, Hames-  
Boueres, and Jean-Pierre Moussaud, Les Attacques, all of  
France, assignors to MECCANO, S.A., Calais, France

Filed Jul. 6, 1994, Ser. No. 25,819

Claims priority, application Canada, Apr. 28, 1994,  
1994.0861

Term of patent 14 years

U.S. Cl. D3—276



374,772

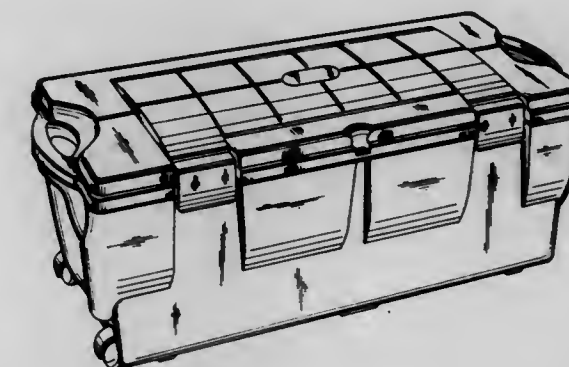
## FOOT LOCKER

Bryan Hotaling, Arlington, and Jon Rossman, Chelmsford,  
both of Mass., assignors to Tucker Housewares, Leominster,  
Mass.

Filed Aug. 11, 1995, Ser. No. 42,555

Term of patent 14 years

U.S. Cl. D3—276



374,770

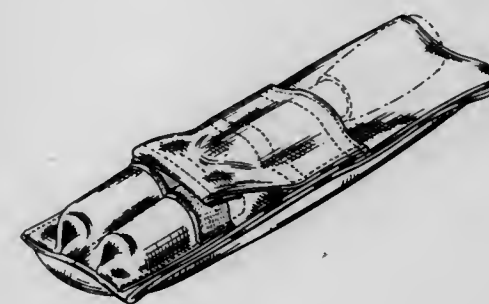
## FLASHLIGHT AND BATTERY HOLSTER

Richard N. Case, Boulder, Colo., assignor to RCP Enterprises,  
Inc., Boulder, Colo.

Filed Dec. 30, 1994, Ser. No. 32,859

Term of patent 14 years

U.S. Cl. D3—229





374,773

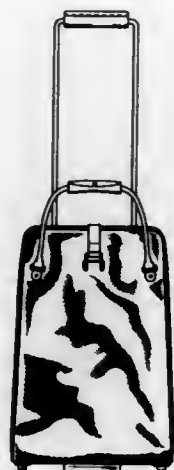
## WHEELED LUGGAGE CASE

Agnes C. Domotor, Providence, R.I., assignor to Samsonite Corporation, Denver, Colo.

Filed Aug. 30, 1995, Ser. No. 43,264

Term of patent 14 years

U.S. Cl. D3—279



374,775

## BRISTLED HEAD FOR A TOOTHBRUSH

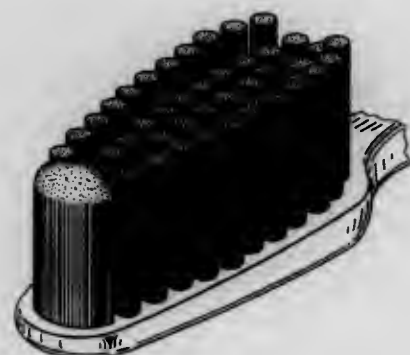
Kevin G. Yost, Short Hills, and Alan G. Trojanowski, Monmouth Junction, both of N.J., assignors to Johnson & Johnson Consumer Products, Inc., Skillman, N.J.

Filed Mar. 22, 1995, Ser. No. 36,560

The portion of the term of this patent subsequent to Apr. 16, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D4—104



374,774

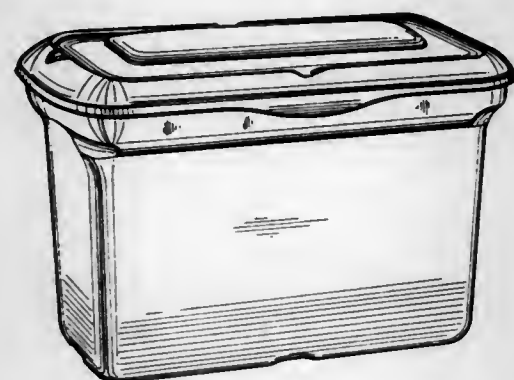
## TOTE WITH HINGED COVER

Timothy S. Cassel, Arlington, Mass., assignor to Tucker Housewares, Leominster, Mass.

Filed Aug. 30, 1995, Ser. No. 43,266

Term of patent 14 years

U.S. Cl. D3—294



374,776

## SPHERICAL HAIRBRUSH

Sabrina S. Denebeim, 260 Avila St., San Francisco, Calif. 94123

Filed Apr. 4, 1994, Ser. No. 20,836

Term of patent 14 years

U.S. Cl. D4—128



374,777

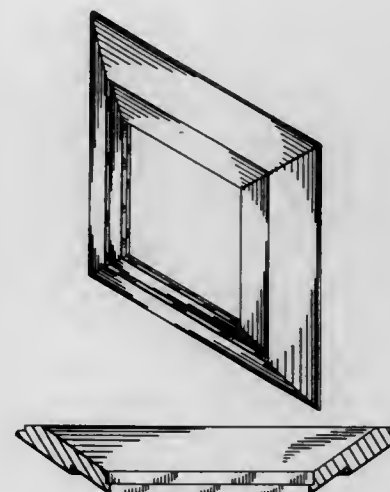
## PICTURE FRAME

Yaacov Agam, 26 Rue Boulard, Paris, France

Filed Jun. 7, 1995, Ser. No. 39,974

Term of patent 14 years

U.S. Cl. D6—300



374,779

## CHAIR

Saul Feldberg, Don Mills, Canada, assignor to Global Upholstery Company, Downsview, Canada

Filed Jan. 4, 1996, Ser. No. 48,573

Term of patent 14 years

U.S. Cl. D6—366



374,778

## CHAIR

Romeo Tedesco, Weston, and Jocelyn Beaulieu, Newmarket, both of Canada, assignors to Global Upholstery Company, Downsview, Canada

Filed Jun. 30, 1995, Ser. No. 40,996

Term of patent 14 years

U.S. Cl. D6—366



374,780

## LAWN CHAIR

Chun-Chu Tseng, No. 3, Ting-Shi-Hsin, Lu-Man Vill., Chu-Chi Hsiang, Chia-I Hsien, Taiwan

Filed Nov. 21, 1995, Ser. No. 46,920

Term of patent 14 years

U.S. Cl. D6—375



374,781

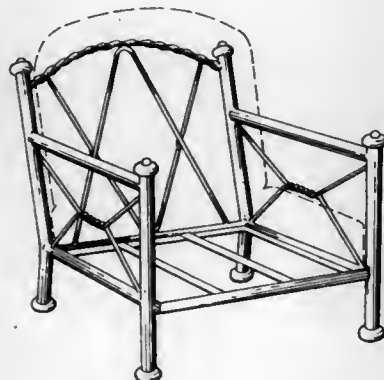
## LOUNGE CHAIR

Leo Martin, Coconut Grove, Fla., assignor to Miami Metal Products, Inc., Miami, Fla.

Filed Jan. 16, 1996, Ser. No. 48,884

Term of patent 14 years

U.S. Cl. D6—379



374,783

## TRIPLE DRESSER WITH MIRROR

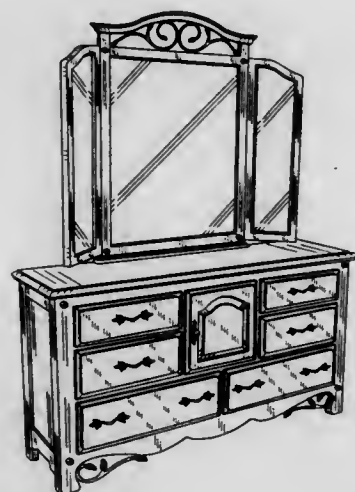
H. Thomas Keller, and Scott Risdon, both of High Point, N.C., assignors to Vaughan Furniture Company, Inc., Galax, Va.

Division of Ser. No. 30,024, Oct. 20, 1994. This application

Oct. 3, 1995, Ser. No. 44,923

Term of patent 14 years

U.S. Cl. D6—444



374,782

## CHEST

Michael J. Paus, High Point, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.

Filed Feb. 23, 1995, Ser. No. 35,280

Term of patent 14 years

U.S. Cl. D6—444



374,784

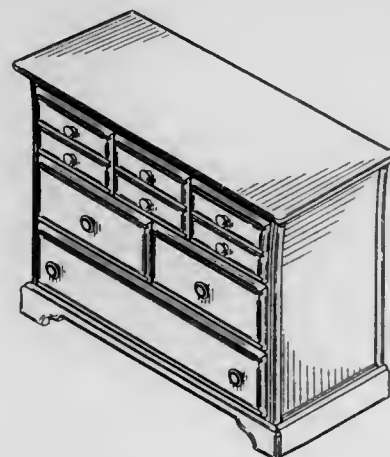
## DRESSER

Merlin A. Brunner, Appleton, and Harvey J. Draheim, Weyauwega, both of Wis., assignors to Simmons Juvenile Products Company, Inc., New London, Wis.

Filed May 12, 1995, Ser. No. 38,800

Term of patent 14 years

U.S. Cl. D6—445



374,785

## NIGHT STAND

H. Thomas Keller, and Scott Risdon, both of High Point, N.C., assignors to Vaughan Furniture Company, Inc., Galax, Va.

Division of Ser. No. 30,024, Oct. 20, 1994. This application

Jun. 5, 1995, Ser. No. 39,875

Term of patent 14 years

U.S. Cl. D6—446



374,787

## TABLE

John P. Stoddard, London, United Kingdom; David F. Lyons, Grosse Pointe Farms, Mich., and Roberto G. Fraquelli, London, United Kingdom, assignors to Haworth, Inc., Holland, Mich.

Filed Jun. 9, 1995, Ser. No. 40,074

Term of patent 14 years

U.S. Cl. D6—484



374,788

## SHELF

Winfred Scholl, Dusseldorf, Germany, assignor to HEWI Heinrich Wilke GmbH, Arolsen, Germany

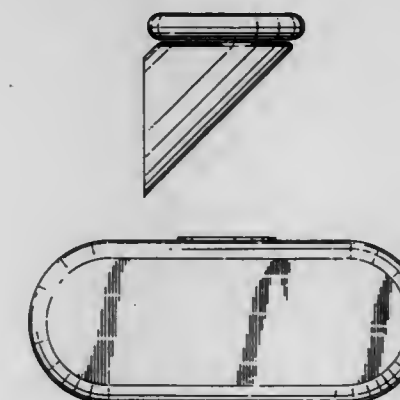
Division of Ser. No. 662,806, Feb. 27, 1991, Pat. No. Des.

358,732. This application Jan. 24, 1995, Ser. No. 31,993

Claims priority, application Germany, Aug. 27, 1990, M9005636.1

Term of patent 14 years

U.S. Cl. D6—574



374,786

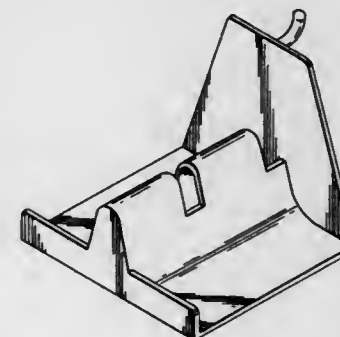
## EYEGGLASS DISPLAY SUPPORT

Steven B. Liebers, 2554 Industry La., Norristown, Pa. 19403

Filed Apr. 4, 1995, Ser. No. 37,131

Term of patent 14 years

U.S. Cl. D6—468





374,789

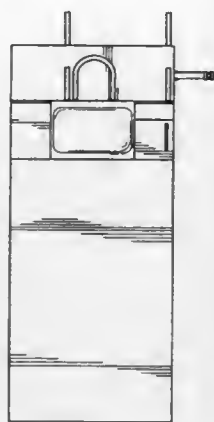
## MULTI-PURPOSE BEACH TOWEL

Tammy Kalista; Julia Cranston, and Lynn Avery, all of 19 Pine Ct., NE., Medicine Hat, AB, Canada

Filed Mar. 27, 1995, Ser. No. 36,730

Term of patent 14 years

U.S. Cl. D6—596



374,791

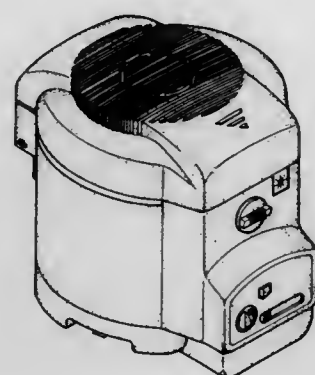
## FRYER FOR FOOD

Ping-Huang Wu, No.3 Lane 772, Ho-Ping Road, Patech City, Taoyuan Hsien, Taiwan

Filed Oct. 27, 1995, Ser. No. 45,714

Term of patent 14 years

U.S. Cl. D7—354



374,790

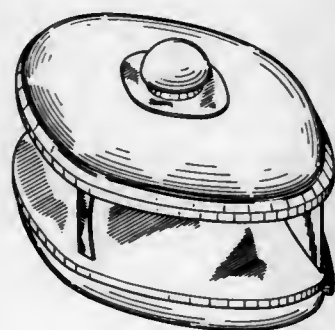
## ELECTRIC ROASTER

Tony Hsu, Yung Kang, Taiwan, assignor to Lundar Electric Inc. Co., Ltd., Tainan Hsien, Taiwan

Filed Dec. 14, 1995, Ser. No. 47,889

Term of patent 14 years

U.S. Cl. D7—352



374,792

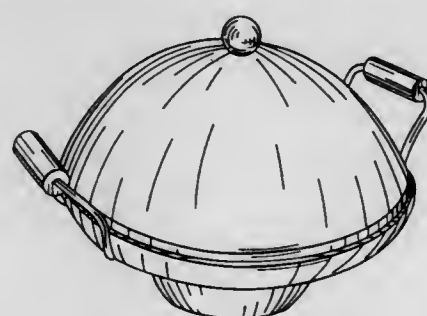
## COOKING UTENSIL

DuWayne M. Dzibinski, 11407 Rawson Ave., Franklin, Wis. 53132

Filed Sep. 13, 1995, Ser. No. 43,817

Term of patent 14 years

U.S. Cl. D7—360



374,793

## GLASS LID FOR COOKING UTENSILS

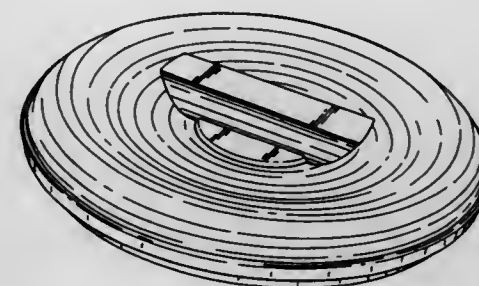
Richard Eickel, Arnsberg, Germany, assignor to Heinrich Berndes Produktionsgesellschaft mbH, Germany

Filed Aug. 21, 1995, Ser. No. 42,922

Claims priority, application Germany, Mar. 17, 1995, M 95 02 506.5

Term of patent 14 years

U.S. Cl. D7—391



374,795

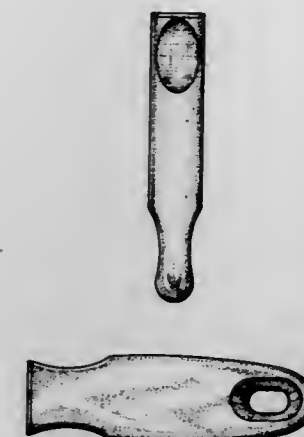
## NON-SLIP, RESILIENT HANDLE

Gunnar Lie, 9309 Olympic View Dr., Edmonds, Wash. 98020

Filed Dec. 18, 1995, Ser. No. 48,019

Term of patent 14 years

U.S. Cl. D7—395



374,794

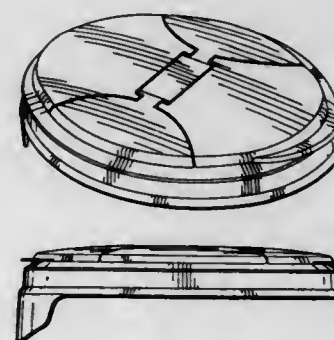
## LID FOR PASTA KEEPER

Richard B. Ahern, Jr., Akron, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Nov. 1, 1995, Ser. No. 45,892

Term of patent 14 years

U.S. Cl. D7—392.1



374,796

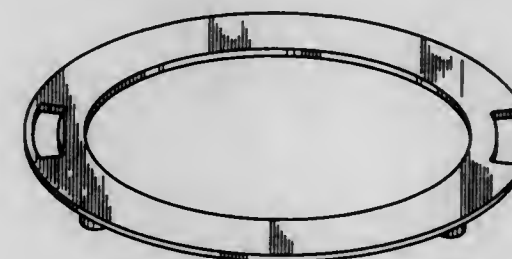
## BARBEQUE GRILL RING SHELF

Kathy L. Bradley, Mt. Washington; Richard H. Bird; Olden A. Dockery, both of Louisville, all of Ky.; Randy A. Smitley, Corydon; Calvin F. Sprinkle, Borden, both of Ind., and Donald T. Payne, Louisville, Ky., assignors to Porcelain Metals Corporation, Louisville, Ky.

Filed Aug. 11, 1995, Ser. No. 42,483

Term of patent 14 years

U.S. Cl. D7—406



374,797

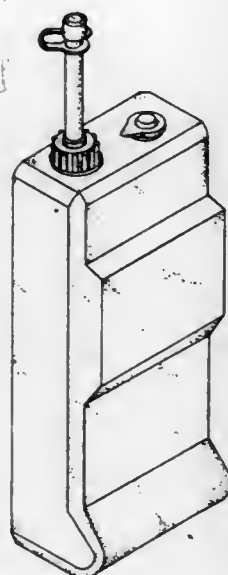
## FLUIDS CONTAINER

Warner Squire, West Palm Beach, Fla., and Oliver C. Clerc, Jr., St. Louis, Mo., assignors to Mirax Chemical Products Corporation, St. Louis, Mo.

Filed Feb. 27, 1995, Ser. No. 35,413

Term of patent 14 years

U.S. Cl. D7—515



374,799

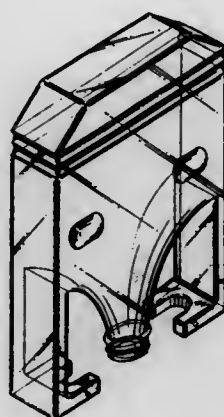
## CONDIMENT DISPENSER

Gloria C. Simon, and Frank M. Simon, both of 876 Pinnacle Cir., Lewisville, Tex. 75067

Filed Dec. 21, 1995, Ser. No. 48,152

Term of patent 14 years

U.S. Cl. D7—590



374,798

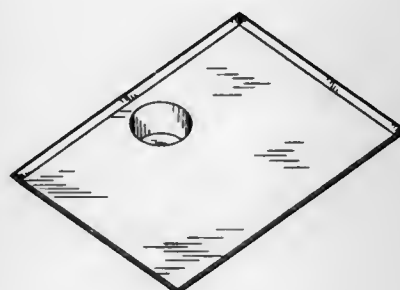
## TRAVEL TRAY

John W. Pippins, Jr., 608 Roger Rd., Scott, La. 70583

Filed Jun. 30, 1995, Ser. No. 40,940

Term of patent 14 years

U.S. Cl. D7—553



374,800

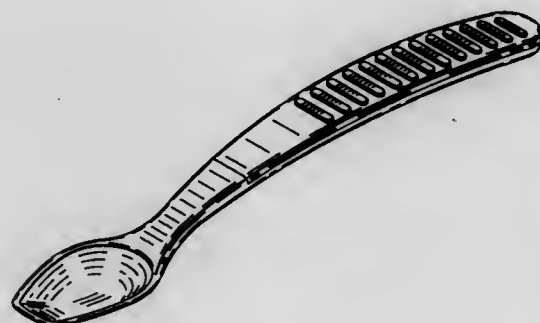
## SPOON

Brenda O. Llistro, Westport, Conn., and Aidan J. Petrie, Providence, R.I., assignors to Playtex Products, Inc., Westport, Conn.

Filed Aug. 21, 1995, Ser. No. 42,917

Term of patent 14 years

U.S. Cl. D7—653



374,801

## CORKSCREW OPENER

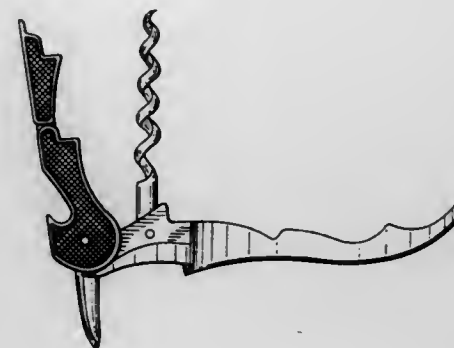
Ramón B. Puig, and Marta B. Linares, both of Gustavo Becquer, 105, 08206 Sabadell, Barcelona, Spain

Filed Jun. 7, 1994, Ser. No. 24,052

Claims priority, application Spain, Jan. 20, 1994, 131750

Term of patent 14 years

U.S. Cl. D8—42



374,803

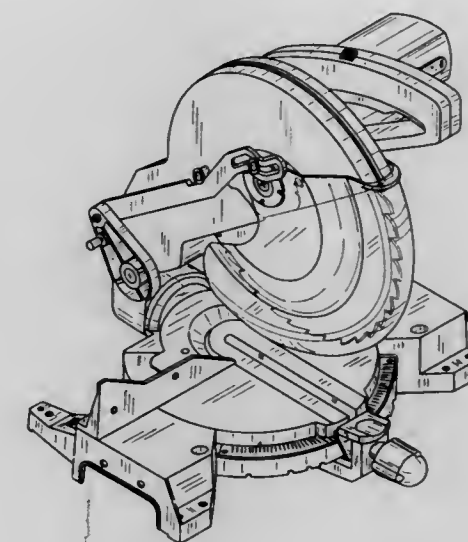
## COMPOUND MITER SAW

Daniel A. Terpstra, Kirkwood; David E. Beth, St. Charles, both of Mo.; James B. Watson, Conyers, Ga.; J. Douglas Alsup, Conyers, Ga., and William J. Saunders, Lithonia, Ga., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 9, 1995, Ser. No. 40,101

Term of patent 14 years

U.S. Cl. D8—66



374,802

## NAIL PUNCH

Steven E. Spier, 100B Oak St., Norwood, N.J. 07648, and John A. Schneider, 431 Ridgewood Rd., Westwood, N.J. 07675

Filed May 25, 1995, Ser. No. 39,337

Term of patent 14 years

U.S. Cl. D8—51



374,804

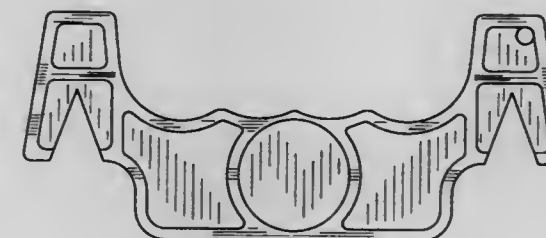
## KNIFE SHARPENER

Jeffrey T. Hughes, Winston-Salem, N.C., assignor to Hughes Products Co., Inc., Thomasville, N.C.

Filed Feb. 21, 1995, Ser. No. 35,100

Term of patent 14 years

U.S. Cl. D8—93





374,805

## CRIMPER HANDLE

W. Keith Moffatt, Freeport, Ill., and Paul Hurley, Holland, Mich., assignors to Greenlee Textron, Inc., Rockford, Ill.  
Filed Jul. 12, 1995, Ser. No. 41,350  
Term of patent 14 years

U.S. Cl. D8—107



374,807

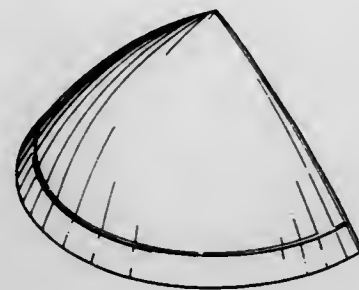
## COVER HEAD FOR BATHROOM RECEPTACLE SUPPORT

Shin-wang Wu, 19Fl.-2, No. 508, Sec. 5, Chungslao E. Rd., Taipei, Taiwan

Filed Aug. 22, 1995, Ser. No. 42,976

Term of patent 14 years

U.S. Cl. D8—349



374,806

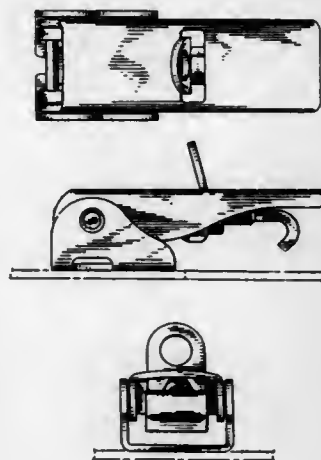
## DRAW LATCH

James J. Ford, Niskayuna, N.Y.; Lynn B. Ziemer, Ridley Park, and Edward A. McCormack, Media, both of Pa., assignors to Southco, Inc., Concordville, Pa.

Division of Ser. No. 27,634, Aug. 25, 1994, Pat. No. Des. 367,218, which is a continuation-in-part of Ser. No. 19,345, Feb. 28, 1994, abandoned. This application May 25, 1995, Ser. No. 43,105

Term of patent 14 years

U.S. Cl. D8—331



374,808

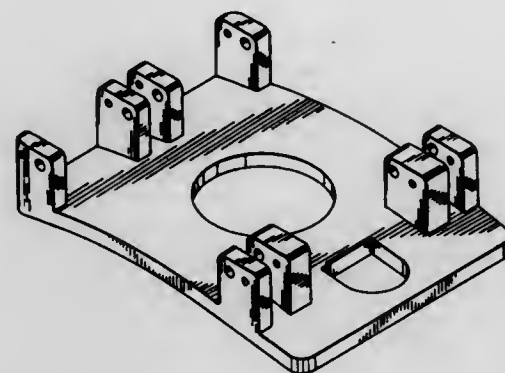
## DIVING COMPUTER RETAINER

William D. Ungar, Lake Forest, Calif., assignor to U.S. Divers Co., Inc., Santa Ana, Calif.

Filed Oct. 31, 1995, Ser. No. 46,738

Term of patent 14 years

U.S. Cl. D8—349



374,809

## FACEPLATE

Craig Scherer, Wilmette, and Michael Thuma, Des Plaines, both of Ill., assignors to Panduit Corp., Tinley Park, Ill.  
Filed Dec. 14, 1994, Ser. No. 32,195  
Term of patent 14 years

U.S. Cl. D8—353



374,811

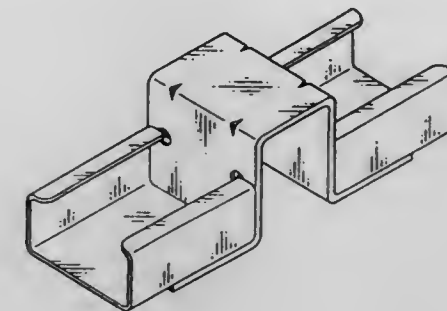
## JOINT FOR A RACK FRAME

Muneharu Miyashita, Shizuoka, Japan, assignor to Yazaki Industrial Chemical Co., Ltd., Shizuoka, Japan  
Filed Aug. 22, 1994, Ser. No. 27,442

Claims priority, application Japan, Jun. 7, 1994, 6-16577

Term of patent 14 years

U.S. Cl. D8—382



374,810

## FRAME FOR MOUNTING ELECTRONIC EQUIPMENT

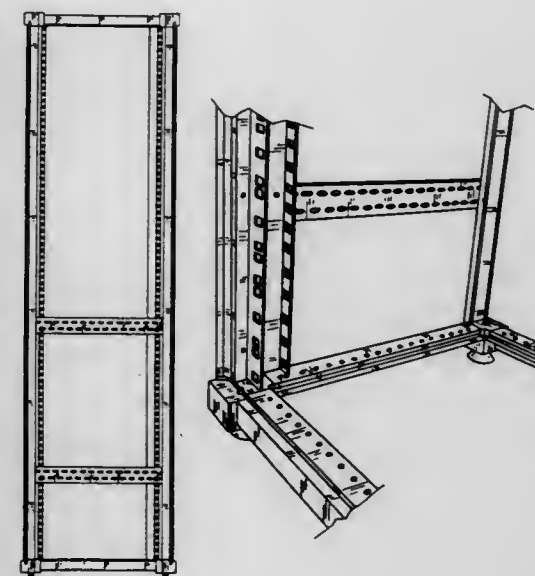
Johannes W. M. Keijser, Helmond, and Jacobus J. Crebolder meergenaamd Krijbolder, Erp, both of Netherlands, assignors to Minkels Products B.V., Netherlands

Filed Jun. 20, 1995, Ser. No. 40,514

Claims priority, application Hague Agreement, Dec. 20, 1994, DM/031583

Term of patent 14 years

U.S. Cl. D8—354



374,812

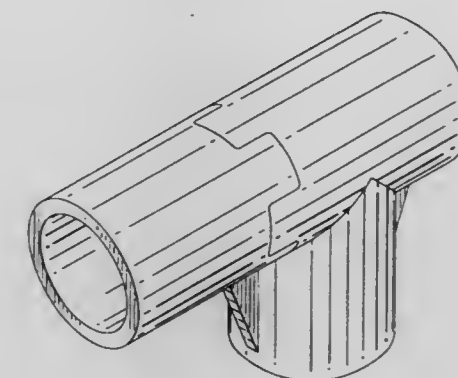
## CLAW COUPLING

Seiji Hirano, and Masamichi Morioka, both of Shizuoka-ken, Japan, assignors to Yazaki Industrial Chemical Co., Ltd., Shizuoka-ken, Japan

Filed Mar. 24, 1995, Ser. No. 36,707

Term of patent 14 years

U.S. Cl. D8—382



374,813

## MALE MEMBER OF SURFACE FASTENER

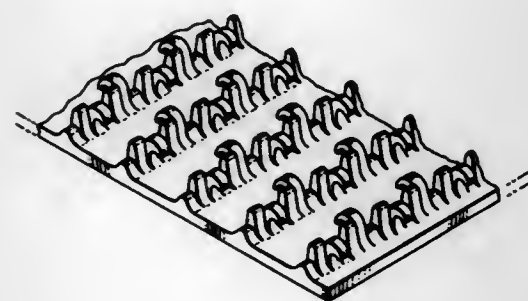
Mitsuru Akeno, Toyama, Japan, assignor to YKK Corporation, Tokyo, Japan

Filed May 22, 1995, Ser. No. 39,301

Claims priority, application Japan, Nov. 22, 1994, 6-35640

Term of patent 14 years

U.S. Cl. D8—382



374,815

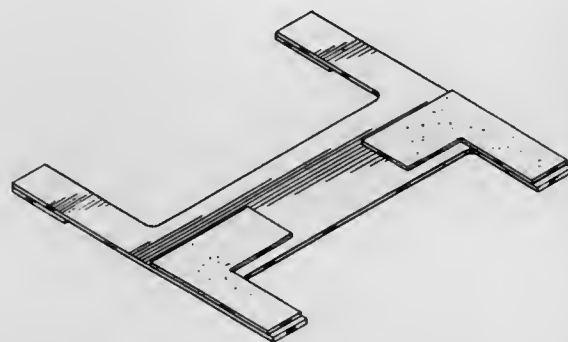
## EXTENSION CORD RETAINER

Russell P. Snow, 27 Penacook St., Concord, N.H. 03301

Filed Jun. 20, 1995, Ser. No. 40,478

Term of patent 14 years

U.S. Cl. D8—394



374,814

## DOUBLE-NUT HEADED CERAMIC BOLT

Toshihiko Saito, 12-6 Shimouma 6-Chome, Setagaya-ku, Tokyo 154, Japan

Filed Oct. 17, 1995, Ser. No. 45,338

Term of patent 14 years

U.S. Cl. D8—387



374,816

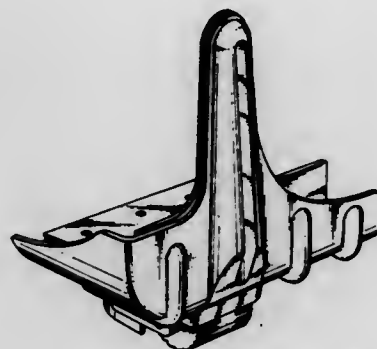
## CASTER SEAT OF A CART

Cheng-Hsien Tsai, No. 103, Da-Ming 1st Rd., Tien-Tzu Hsiang, Taichung Hsien, Taiwan

Filed Sep. 14, 1995, Ser. No. 43,971

Term of patent 14 years

U.S. Cl. D8—375



374,817

## COSMETIC DISPENSER

Peter Bertolini, Shelton; William Valls, Harwinton, both of Conn., and Wayne Marcus, Warwick, R.I., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Oct. 26, 1994, Ser. No. 30,324

Term of patent 14 years

U.S. Cl. D9—338



374,819

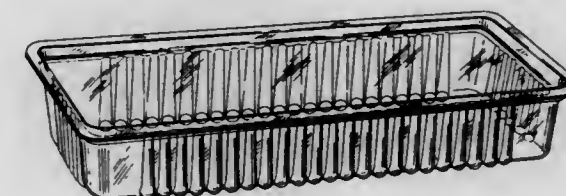
## PACKAGE FOR SLICED MEAT STACKS

Cindie M. Wells, Cambridge, Wis., assignor to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Mar. 31, 1994, Ser. No. 20,706

Term of patent 14 years

U.S. Cl. D9—425



374,818

## COSMETIC DISPENSER

Norman D. Poisson, Andover, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Feb. 15, 1995, Ser. No. 34,873

Term of patent 14 years

U.S. Cl. D9—338



374,820

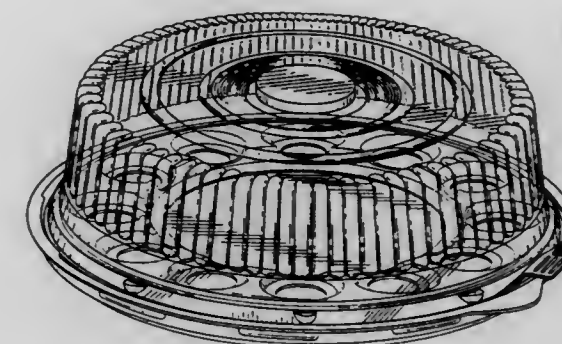
## CAKE CONTAINER

Robert Knoss, Anoka, and Calvin S. Krupa, Hamel, both of Minn., assignors to Ultra Pac, Inc., Rogers, Minn.

Filed Jan. 4, 1996, Ser. No. 48,590

Term of patent 14 years

U.S. Cl. D9—429





374,821

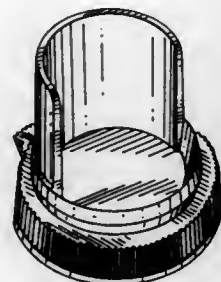
## CONTAINER CLOSURE

Gustav E. Johnson, Westfield, N.J., assignor to Lermer Packaging Corp., Garwood, N.J.

Filed Jan. 13, 1995, Ser. No. 33,500

Term of patent 14 years

U.S. Cl. D9—447



374,823

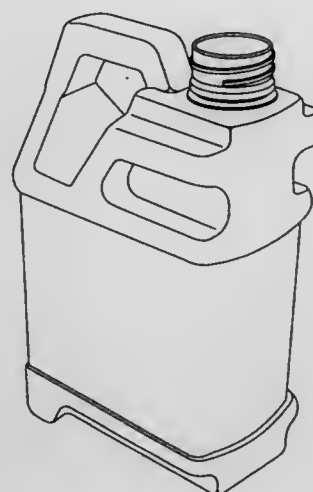
## LIQUID DETERGENT BOTTLE

James D. Decker; James L. Copeland, both of Apple Valley, Minn., and Scott R. Olson, Eagan, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Filed Dec. 20, 1995, Ser. No. 48,094

Term of patent 14 years

U.S. Cl. D9—520



374,822

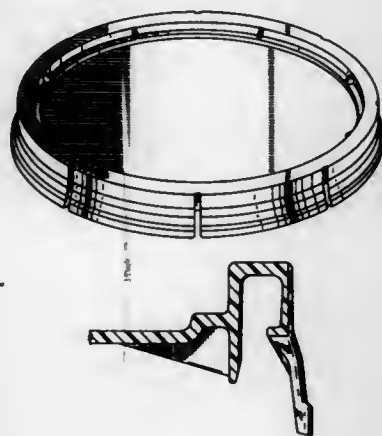
## CONTAINER CLOSURE

Terry M. Philips, Willoughby, Ohio, assignor to Bennett Industries, Inc., Peotone, Ill.

Filed Mar. 7, 1995, Ser. No. 35,797

Term of patent 14 years

U.S. Cl. D9—453



374,824

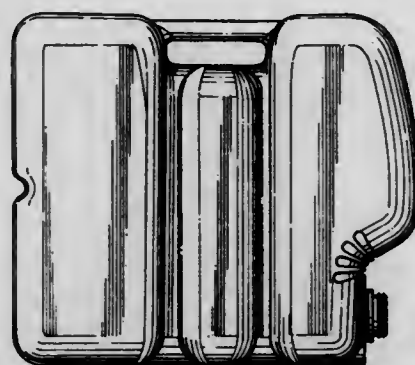
## BOTTLE

B. Joseph Rokus; Ted Reusch, and Richard Rendon, all of Arcadia, Calif., assignors to Reid Plastics, Inc., Arcadia, Calif.

Filed Oct. 20, 1995, Ser. No. 45,456

Term of patent 14 years

U.S. Cl. D9—527



374,825

## COMBINED BOTTLE AND CAP

Steven M. Rowe, 9030 W. Sahara Ave., Suite. 888, Las Vegas, Nev. 89117

Filed Oct. 27, 1995, Ser. No. 45,723

Term of patent 14 years

U.S. Cl. D9—529



374,827

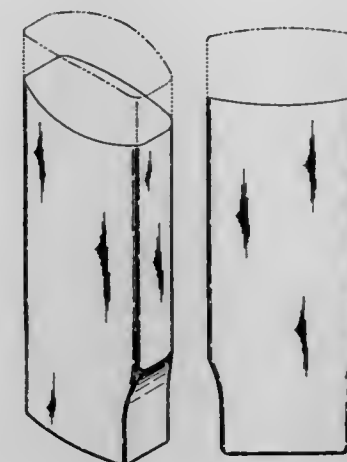
## BOTTLE

William Valls, Harwinton, Conn., assignor to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed May 5, 1995, Ser. No. 38,518

Term of patent 14 years

U.S. Cl. D9—571



374,826

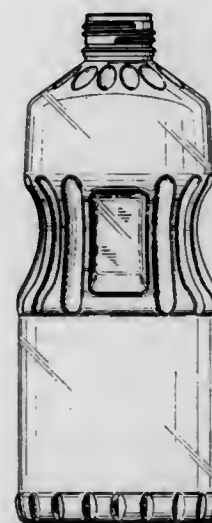
## BOTTLE

Peter J. Mackinson, Wyckoff; William J. Doskoczynski, Stewartsville, and Michael A. Sirico, North Haledon, all of N.J., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed May 16, 1995, Ser. No. 38,913.

Term of patent 14 years

U.S. Cl. D9—542



374,828

## POCKET WATCH CASE

John J. DeMatteo, Jr., Rte. 2 Box 273, Scottsville, Va. 24590

Filed Jul. 23, 1993, Ser. No. 10,945

Term of patent 14 years

U.S. Cl. D10—37



374,829

**METAL DETECTOR**

Gilbert Y. Yue, Kowloon, Hong Kong, assignor to Alert Enterprises, Inc., San Diego, Calif.

Filed Aug. 31, 1995, Ser. No. 43,870  
Term of patent 14 years

U.S. Cl. D10—47



374,831

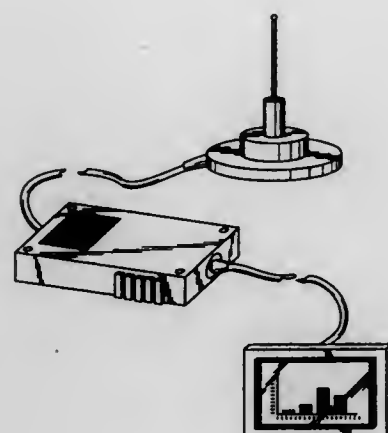
**COMBINED CONTROL PANEL, DISPLAY UNIT AND ANTENNA FOR AN EMERGENCY VEHICLE SENSOR SYSTEM**

Thomas Hoyt, 5820 E. 36th St., Tucson, Ariz. 85711

Filed Jul. 24, 1995, Ser. No. 41,766

Term of patent 14 years

U.S. Cl. D10—104



374,830

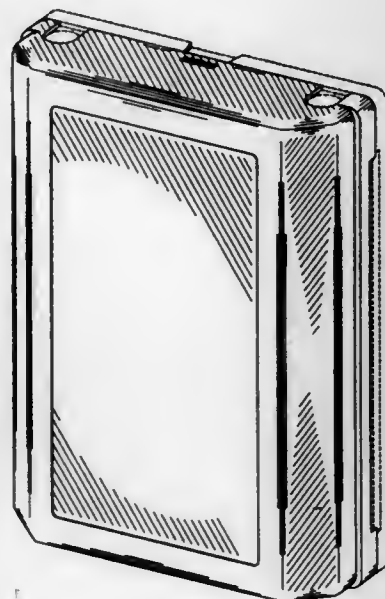
**THERMOSTAT REMOTE SUBBASE HOUSING COVER**

Andrea E. Dexter, Renton, Wash.; James E. Erickson, Eagan, and Guy M. Shoultz, Delano, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 20, 1995, Ser. No. 41,631

Term of patent 14 years

U.S. Cl. D10—50



374,832

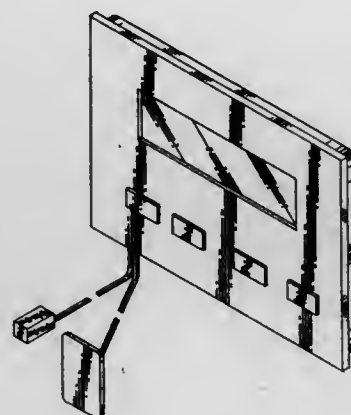
**AUTOMOBILE FUEL CALCULATOR**

Miguel A. Ramos, 38520 Pond Ave., Palmdale, Calif. 93552

Filed Sep. 25, 1995, Ser. No. 44,493

Term of patent 14 years

U.S. Cl. D10—104



374,833

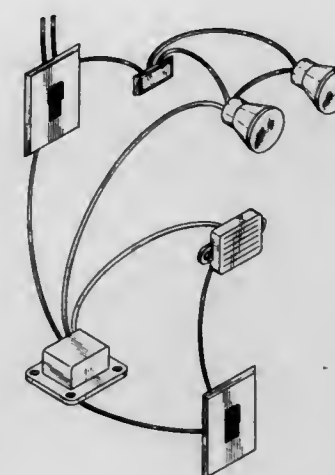
**MOTION DETECTING ALARM SYSTEM**

Oscar J. Shines, Sr.; Catherine D. Shines, both of 3424 E. Euclid Ave., Spokane, Wash. 99207, and Franklin P. Shines, Sr., 21415 92nd Ave. W., Edmonds, Wash. 98020

Filed Jul. 31, 1995, Ser. No. 42,046

Term of patent 14 years

U.S. Cl. D10—106



374,835

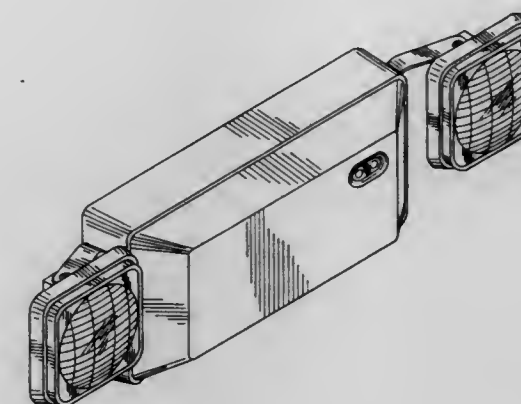
**EMERGENCY LIGHT**

Peter F. Wachter, Northfield, Ill., assignor to Juno Lighting, Inc., Des Plaines, Ill.

Filed Oct. 12, 1995, Ser. No. 45,186

Term of patent 14 years

U.S. Cl. D10—114



374,834

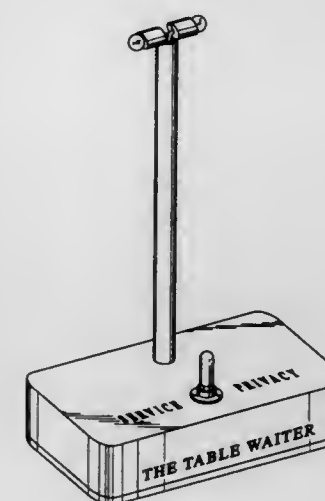
**TABLE SERVICE INDICATOR**

Marcella B. Rusch, 206 N. Dr., Bargetown, Ky. 40004

Filed Jul. 13, 1995, Ser. No. 41,415

Term of patent 14 years

U.S. Cl. D10—114



374,836

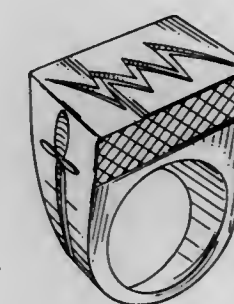
**RING COMMEMORATING FOUR WAGNER OPERAS**

Paul Weiss, 15 E. Camille Dr., Flagstaff, Ariz. 86001

Filed May 26, 1995, Ser. No. 39,481

Term of patent 14 years

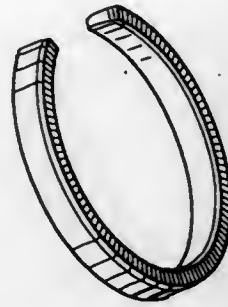
U.S. Cl. D11—26





374,837  
EARRING

Clyde A. Austin, 60 Paul Ave., Mountain View, Calif. 94041  
Filed Aug. 16, 1994, Ser. No. 27,229  
Term of patent 14 years  
U.S. Cl. D11—40



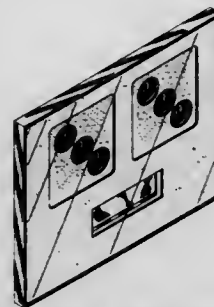
374,839  
GIRL ANGEL FIGURE

Vivian A. S. Scott, Westbriar Apartment No. 201, 3710 N. Rosser St., Alexandria, Va. 22311, and Raymond J. Goldstein, Box 11045, Arlington, Va. 22210  
Filed Nov. 1, 1994, Ser. No. 30,160  
Term of patent 14 years  
U.S. Cl. D11—131



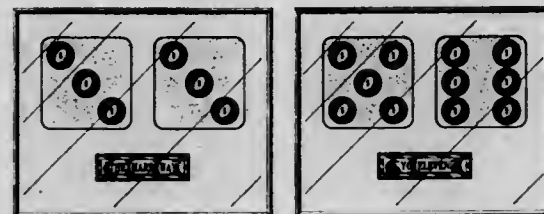
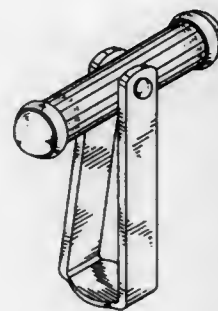
374,840  
PLAQUE

Adam H. Levy, 2825 Oak Park Cir., Davie, Fla. 33328, and Jared A. Lerner, 800 Parkview Dr., Apt. No. 411, Hallandale, Fla. 33009  
Filed Dec. 7, 1995, Ser. No. 47,574  
Term of patent 14 years  
U.S. Cl. D11—132



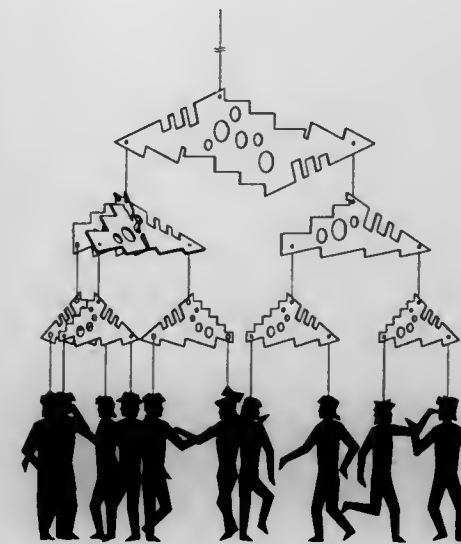
374,838  
CUFF LINK ACTION

Frederick N. Levinger, Providence, R.I., assignor to Colibri Corporation, Providence, R.I.  
Filed Aug. 31, 1995, Ser. No. 43,328  
Term of patent 14 years  
U.S. Cl. D11—86



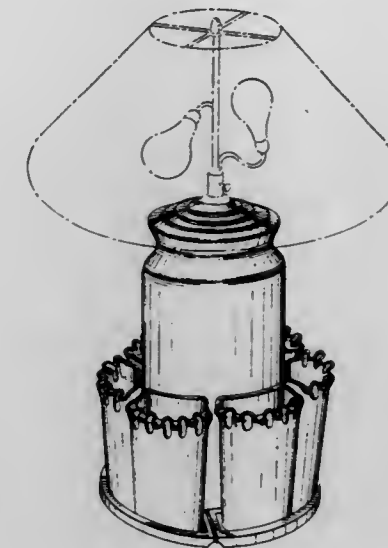
374,841  
MOBILE

Peter W. Lonsky, 2748 Ross Rd., Palo Alto, Calif. 94303  
Filed Nov. 3, 1995, Ser. No. 45,976  
Term of patent 14 years  
U.S. Cl. D11—141



374,843  
COMBINED PLANTER AND LAMP BASE

Lee Attanasio, P.O. Box 1114, New York, N.Y. 10023  
Filed Jul. 14, 1995, Ser. No. 41,450  
Term of patent 14 years  
U.S. Cl. D11—144

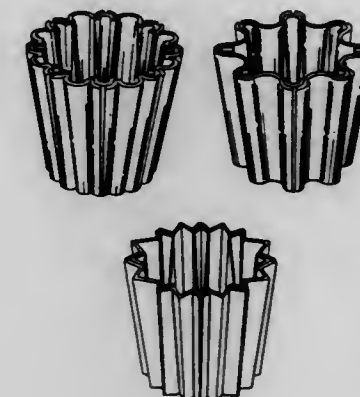
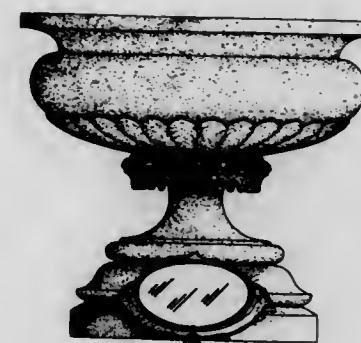


374,844  
FLOWER POT COVER

Donald E. Weder, and Joseph G. Stracter, both of Highland, Ill., assignors to The Family Trust U/T/A, and Southpac Trust International, Inc., both of Highland, Ill.  
Division of Ser. No. 807,904, Dec. 16, 1991, Pat. No. Des. 366,227, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, Pat. No. Des. 365,302, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, and a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, and a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, abandoned, and a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989, abandoned. This application Jul. 10, 1995, Ser. No. 41,202  
Term of patent 14 years  
U.S. Cl. D11—164

374,842  
URN

Jeffrey S. Poor, and Mark Rabinowitz, both of Brooklyn, N.Y., assignors to Central Park Conservancy Inc., New York, N.Y.  
Filed Jun. 1, 1994, Ser. No. 23,807  
Term of patent 14 years  
U.S. Cl. D11—143



374,845

**PULL TAB OF SLIDE FASTENER**

Chikako Ikehara, Toyama-ken, Japan, assignor to YKK Corporation, Tokyo, Japan

Filed May 11, 1995, Ser. No. 38,763

Claims priority, application Japan, Nov. 30, 1994, 6-36587

Term of patent 14 years

U.S. Cl. D11—221



374,847

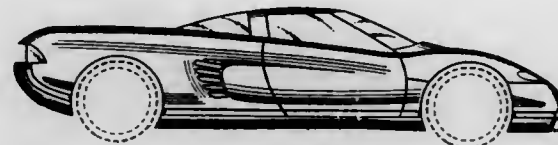
**AUTOMOBILE BODY**

Daryl Gisser, 87 Southgate Dr., New Hempstead, N.Y. 10977

Filed Dec. 6, 1993, Ser. No. 16,631

Term of patent 14 years

U.S. Cl. D12—92



374,846

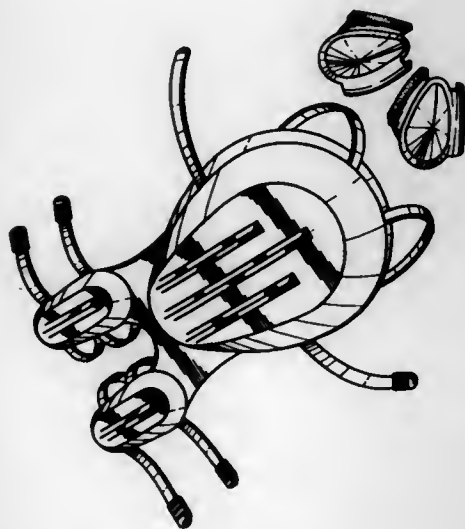
**BODY SNOW SLED WITH FOREARM BLADES**

Jeffery J. Dickhaut, and Donald Dickhaut, both of 2745 Carnation Way, Thornton, Colo. 80229

Filed Dec. 12, 1995, Ser. No. 47,752

Term of patent 14 years

U.S. Cl. D12—11



374,848

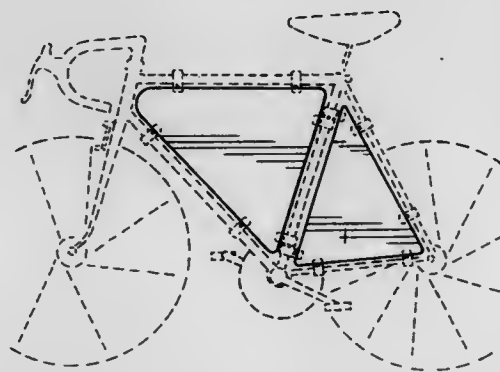
**BICYCLE ARMOR**

Michael B. Liles, 14832 Emberdale Dr., Woodbridge, Va. 22193, and Patrick Pierce, 219 Tlano St., Fairmont, W. Va. 26554

Filed Oct. 20, 1995, Ser. No. 45,470

Term of patent 14 years

U.S. Cl. D12—114



374,849

**BICYCLE RACK**

Robert G. Chipman, Austin, Tex., assignor to Landscape Forms, Inc., Kalamazoo, Mich.

Filed May 8, 1995, Ser. No. 38,539

Term of patent 14 years

U.S. Cl. D12—115



374,851

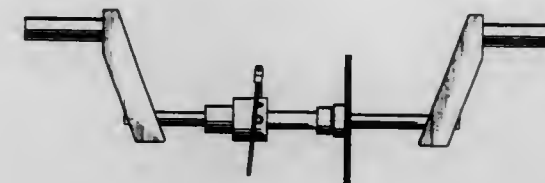
**HANDLEBAR WITH AN INTEGRAL LOCKING COLLAR FOR ITS CRANK**

Robert P. Loehr, 2 Sarian Dr., Neptune, N.J. 07753, and Frank Treglia, 789 Francis Dr., Toms River town, N.J. 08753

Filed Jul. 14, 1995, Ser. No. 41,448

Term of patent 14 years

U.S. Cl. D12—178



374,850

**TIRE**

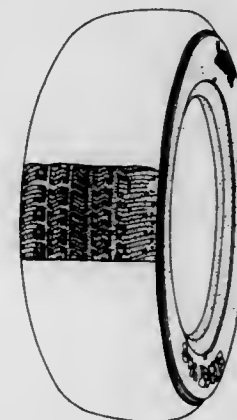
Raimund Wohlfahrt, Enzesfeld, Austria, assignor to Sava Kranj, Kranj, Slovenia

Filed Feb. 4, 1994, Ser. No. 18,346

Claims priority, application Slovenia, Aug. 5, 1993, M-93 50 114

Term of patent 14 years

U.S. Cl. D12—147



374,852

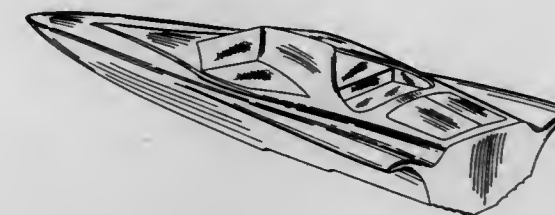
**BOAT**

Göran Mannerfelt, Danderydsvägen 69, S-182 62 Djursholm, Sweden

Filed Jun. 27, 1995, Ser. No. 40,794

Term of patent 14 years

U.S. Cl. D12—314





374,853

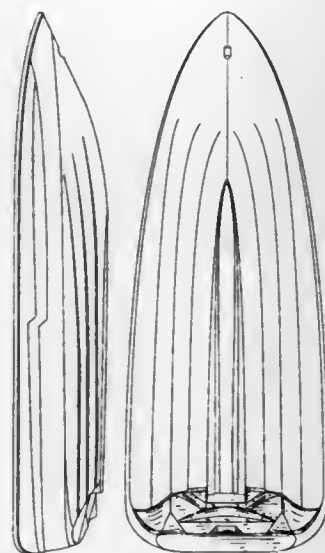
## BOAT HULL

Richard D. Pierce, Mountain Home, Ark., assignor to Challenger, Inc., Mountain Home, Ark.

Filed Nov. 16, 1995, Ser. No. 46,495

Term of patent 14 years

U.S. Cl. D12—314



374,855

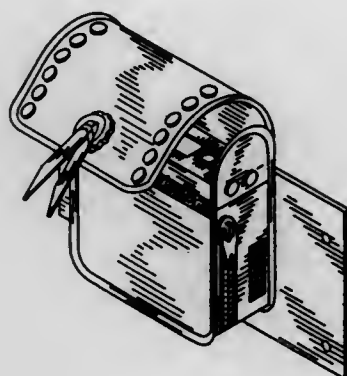
## WINDSHIELD MOUNTED RADIO HOUSING WITH DECORATION

John J. Lazzeroni, and Melinda K. Carevich, both of 1415 S. Cherry, Tucson, Ariz. 85713-1997

Filed Dec. 11, 1995, Ser. No. 47,714

Term of patent 14 years

U.S. Cl. D12—415



374,856

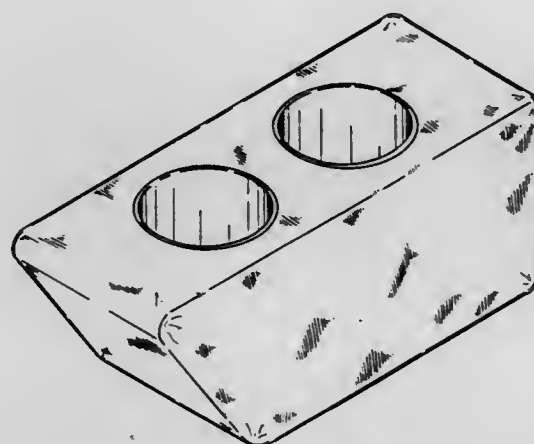
## COMBINED CUPHOLDER AND ARMREST FOR VEHICLES

Randy Q. Berninger, 4275 Old Berwick Rd., Bloomsburg, Pa. 17815

Filed Jun. 22, 1995, Ser. No. 40,604

Term of patent 14 years

U.S. Cl. D12—419



374,854

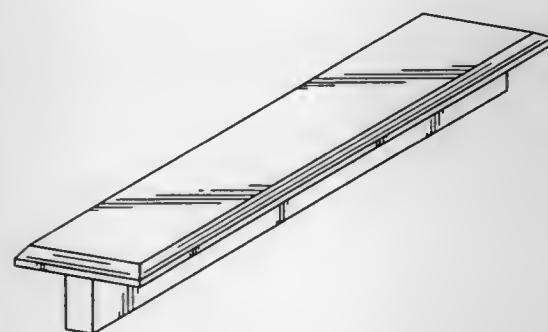
## TAILGATE GAP COVER

James E. Little, and Narcisa T. Little, both of 15816 8 Ave. NE., Seattle, Wash. 98155

Filed Sep. 11, 1995, Ser. No. 43,692

Term of patent 14 years

U.S. Cl. D12—400



374,857

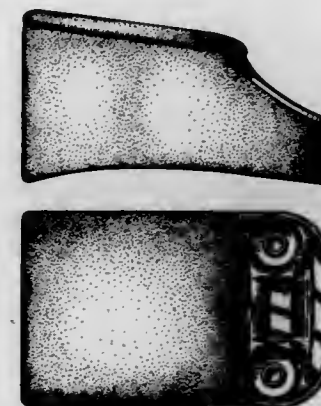
## BENCH SEAT CONSOLE

D. W. Diem, Newport Beach, Calif., assignor to Performance Marketing, Inc., Santa Ana, Calif.

Filed Oct. 13, 1995, Ser. No. 45,228

Term of patent 14 years

U.S. Cl. D12—419



374,859

## PORTABLE POWER SUPPLY

Etienne Guay, and André Côté, both of Montreal, Canada, assignors to Booster PAC International Corporation, St-Jean-sur-Richelieu, Canada

Filed Feb. 15, 1994, Ser. No. 18,788

Term of patent 14 years

U.S. Cl. D13—110



374,860

## BATTERY FOR PORTABLE COMMUNICATION DEVICE

Willard F. Amaro, Jr., Flowery Branch, Ga.; Eugene R. Fay, Delray Beach, and Charles R. McMurray, Boynton Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 8, 1995, Ser. No. 38,692

Term of patent 14 years

U.S. Cl. D13—103



374,858

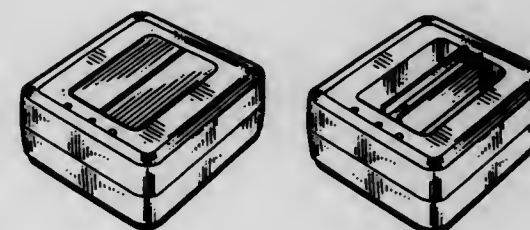
## BATTERY CHARGER FOR A NOTEBOOK PERSONAL COMPUTER

Chi-Tsong Chu, 5th Floor, No. 40, Alley 29, Lane 136, Kang-Lord Street, Nei-Hoou District, Taipei, Taiwan

Filed Aug. 22, 1995, Ser. No. 43,132

Term of patent 14 years

U.S. Cl. D13—108



374,861

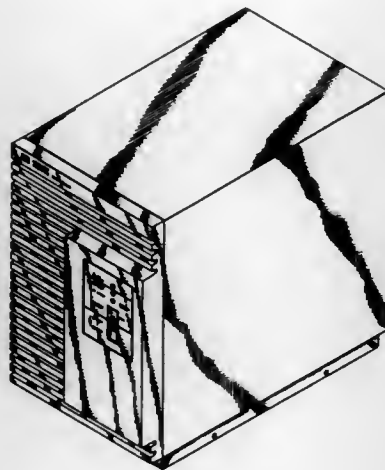
**600 VA UNINTERRUPTIBLE POWER SUPPLY**

Badir M. Mousa, Auburn, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 18, 1995, Ser. No. 39,000

Term of patent 14 years

U.S. Cl. D13—110



374,863

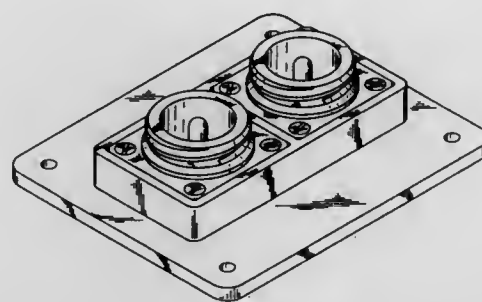
**GANGED JACK COVER**

Frank Grande, Highland Beach, Fla., assignor to Hse-McCann Telephone, Co., Inc., Deerfield Beach, Fla.

Filed Oct. 12, 1994, Ser. No. 29,638

Term of patent 14 years

U.S. Cl. D13—146



374,862

**CABLE CONNECTOR**

Noel Lee, Daly City, Calif., assignor to Monster Cable International, Ltd., Bermuda

Filed Jun. 27, 1995, Ser. No. 40,810

The portion of the term of this patent subsequent to Feb. 6, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D13—133



374,864

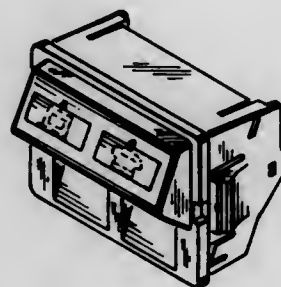
**CONNECTOR MODULE**

John A. Siemon, Woodbury, and Randall J. Below, Cheshire, both of Conn., assignors to The Siemon Company, Watertown, Conn.

Continuation of Ser. No. 993,480, Dec. 18, 1992, Pat. No. 5,295,869. This application Oct. 28, 1993, Ser. No. 14,696

Term of patent 14 years

U.S. Cl. D13—154



374,865

**CABLING UNIT**

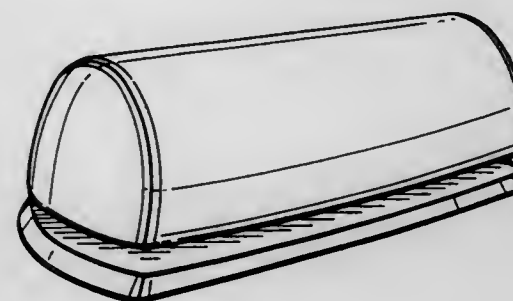
Ian Drinkwater, Bury St. Edmonds, United Kingdom, assignor to President Office Furniture Ltd., United Kingdom

Filed Apr. 20, 1995, Ser. No. 37,770

Claims priority, application United Kingdom, Oct. 20, 1994, 2042729

Term of patent 14 years

U.S. Cl. D13—154



374,867

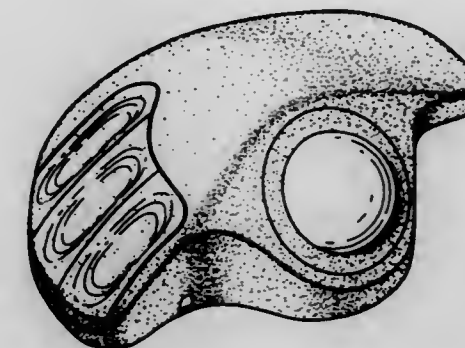
**ERGONOMIC TRACKBALL**

Eugene Canavan, Dublin, Ireland, assignor to Logitech, Inc., Fremont, Calif.

Filed Jun. 9, 1995, Ser. No. 40,132

Term of patent 14 years

U.S. Cl. D14—114



374,868

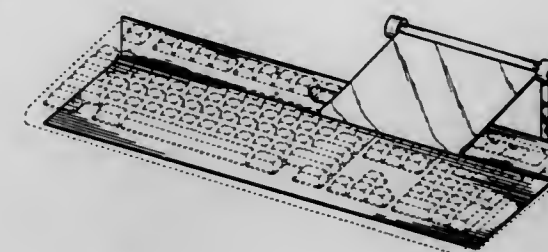
**COMPUTER MOUSE RACK**

Nancy L. Craft, 10190 Pleasant Lake Blvd., Apartment G-35, Parma, Ohio 44130

Filed Jun. 16, 1995, Ser. No. 40,401

Term of patent 14 years

U.S. Cl. D14—114



374,866

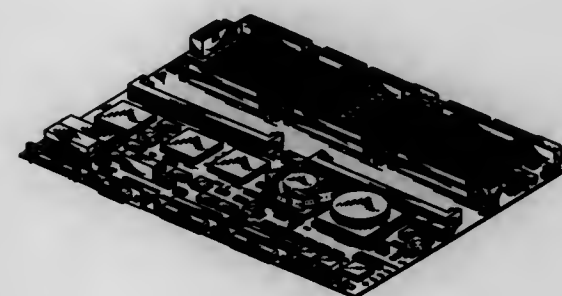
**SCALABLE PROCESSING ARCHITECTURE (SPARC) COMPUTER MOTHERBOARD**

Mark L. Johnston, Los Altos, Calif., assignor to Cycle Computer Corp., Cupertino, Calif.

Filed Apr. 27, 1995, Ser. No. 38,145

Term of patent 14 years

U.S. Cl. D13—182





374,869

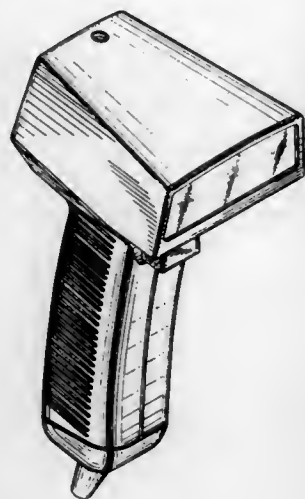
**HAND-HELD SCANNER FOR READING OPTICAL INDICIA**

James H. Karlin, Monroe County, N.Y., assignor to PSC Inc., Webster, N.Y.

Filed Oct. 30, 1995, Ser. No. 45,811

Term of patent 14 years

U.S. Cl. D14—116



374,871

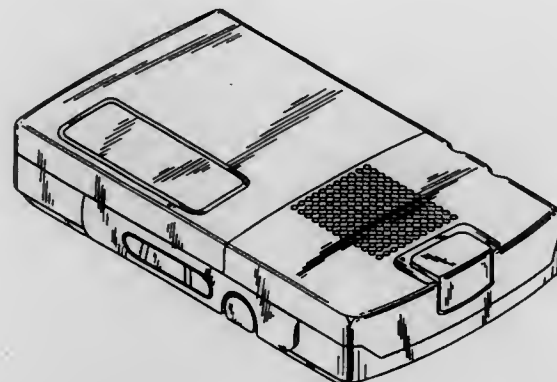
**MAGNET OPTICAL DISK RECORDER**

Shuhei Taniguchi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 10, 1995, Ser. No. 34,707

Term of patent 14 years

U.S. Cl. D14—136



374,872

**PORTABLE TELEPHONE HOUSING**

Anthony Scianna, Sr., Morton Grove; David G. Teteak, Crystal Lake; Paul Bethke, Grayslake, and Daniel L. Williams, Vernon Hills, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 13, 1996, Ser. No. 50,279

Term of patent 14 years

U.S. Cl. D14—138



374,870

**SMART CARD WITH TWO EXTERNAL CONTACT REGIONS**

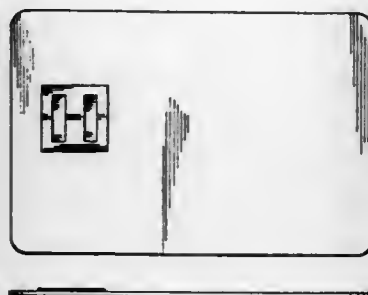
Michel Gaumet, Saint Denis en Val, France, assignor to Solaic (societe anonyme), France

Filed May 30, 1995, Ser. No. 39,508

Claims priority, application France, Nov. 30, 1994, 94 6522

Term of patent 14 years

U.S. Cl. D14—117



374,873

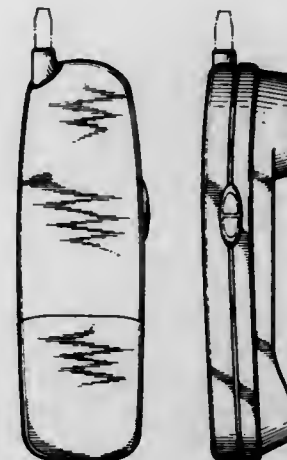
**CORDLESS TELEPHONE HANDSET HOUSING**

Pang C. Kong; Ho C. Wah, and Wong F. Shan, all of Tsuen Wan, Hong Kong, assignors to Vtech Communications, Ltd., Hong Kong

Filed Jan. 5, 1995, Ser. No. 33,161

Term of patent 14 years

U.S. Cl. D14—147



374,875

**HOUSING FOR A PORTABLE TELEPHONE CAPABLE OF HANGING FROM A REMOTE OBJECT**

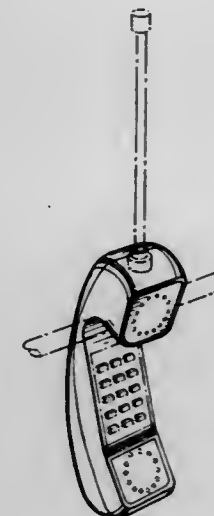
James D. Graves, 3205 S. Mt. Baker Blvd., Seattle, Wash. 98144

Continuation of Ser. No. 227,600, Apr. 4, 1994, abandoned.

This application Aug. 22, 1995, Ser. No. 42,969

Term of patent 14 years

U.S. Cl. D14—248



374,876

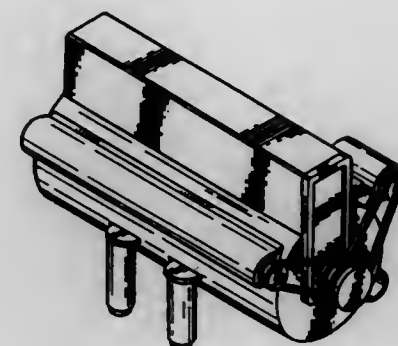
**ROTARY ENGINE**

Mark Zimmerman, 1215 S. County Rd. #13, Tiffin, Ohio 44883

Filed Jun. 8, 1995, Ser. No. 39,995

Term of patent 14 years

U.S. Cl. D15—1



374,874

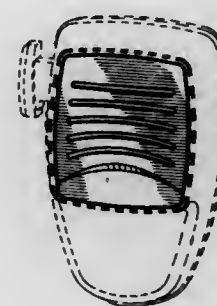
**MICROPHONE GRILLE**

Phillip E. Lindeman, Gurnee, and Marc H. Pullman, Bartlett, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 30, 1995, Ser. No. 39,546

Term of patent 14 years

U.S. Cl. D14—225



374,877

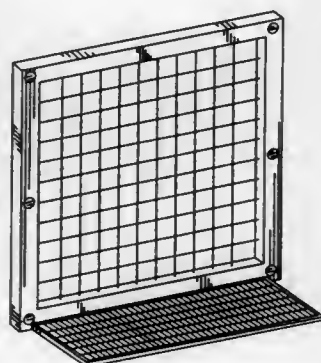
## SAFETY NET FOR FREEZER

Jeffrey D. Thomas, R.R. #4, Box 551 A, Tunkhannock, Pa. 18657

Filed Oct. 3, 1994, Ser. No. 29,314

Term of patent 14 years

U.S. Cl. D15—89



374,879

## PERISCOPE

Su-Min Kung, 8F, No. 276-2, Sec. 1, Ta-Tung Road,, Hsi Chi Town Taipei Hsien, Taiwan

Filed Dec. 28, 1995, Ser. No. 48,853

Term of patent 14 years

U.S. Cl. D16—132



374,878

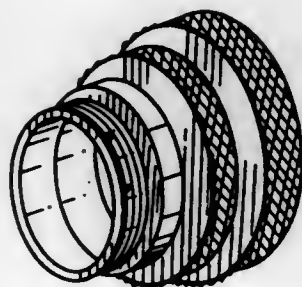
## MODULAR ADAPTOR RING ASSEMBLY FOR A NIGHT VISION DEVICE

Gary L. Palmer, Bellevue, Wash., assignor to ITT Corporation, New York, N.Y.

Filed Mar. 8, 1994, Ser. No. 19,716

Term of patent 14 years

U.S. Cl. D16—130



374,880

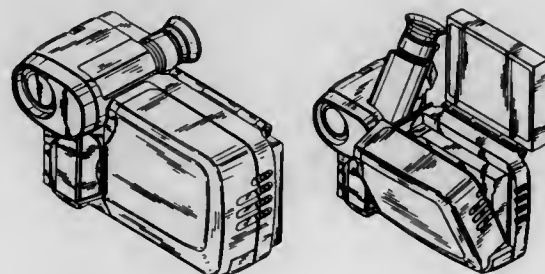
## COMBINED VIDEO TAPE RECORDER AND CAMERA

Tetsu Kataoka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 24, 1995, Ser. No. 36,697

Term of patent 14 years

U.S. Cl. D16—202



374,881

## FLASH CAMERA WITH COVER LABEL

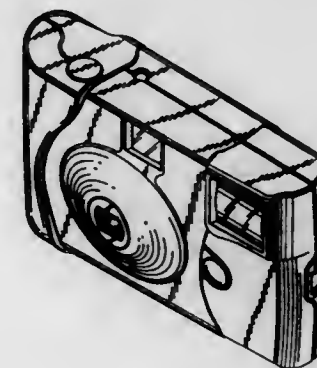
Steven S. Chapman, Corfu; Daniel C. Jackson; John K. McBride, both of Rochester; James G. Rydelek, Henrietta, and Joseph E. Yokajty, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 27,928, Sep. 1, 1994, abandoned.

This application Oct. 17, 1995, Ser. No. 46,798

Term of patent 14 years

U.S. Cl. D16—218



374,883

## EYEGLASSES

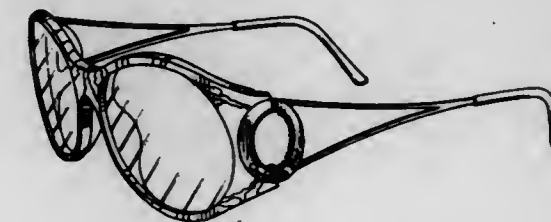
Adolf Lüzlbauer, Vienna, Austria, assignor to Carrera Eyewear Corporation, Norwood, N.J.

Filed Nov. 20, 1992, Ser. No. 3,321

Claims priority, application Germany, May 22, 1992, M 92 03 824.7

Term of patent 14 years

U.S. Cl. D16—321



374,882

## COMBINED SUNGLASSES AND VISOR

Wen-Te Wang, No. 246-1, Kang-Kou, Kang-Kou Tsun, An-Ting Hsiang, Tainan Hsien, Taiwan

Filed Mar. 14, 1995, Ser. No. 36,181

Term of patent 14 years

U.S. Cl. D16—310



374,884

## EAR STEMS

James H. Jannard, San Juan Capistrano, Calif., assignor to Oakley, Inc., Irvine, Calif.

Division of Ser. No. 530,204, May 30, 1990, Pat. No. Des. 358,600, and a continuation-in-part of Ser. No. 436,471, Nov. 20, 1989, abandoned. This application May 22, 1995, Ser. No. 39,137

Term of patent 14 years

U.S. Cl. D16—335





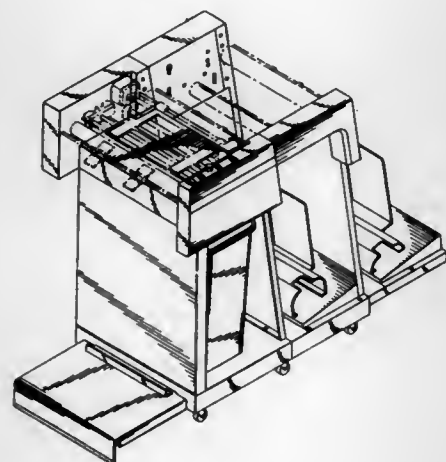
374,885  
DELEAVER

Andrew L. Alger, Wilmette, Ill., assignor to Uarco Incorporated, Barrington, Ill.

Filed Sep. 1, 1993, Ser. No. 12,414

Term of patent 14 years

U.S. Cl. D18—47



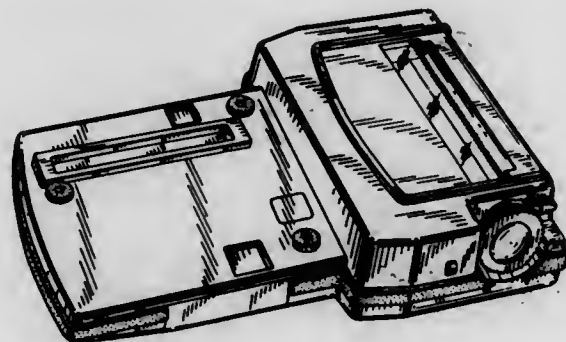
374,887  
PRINTER

Hiromitsu Takahashi, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 13,242, Sep. 22, 1993, Pat. No. Des. 360,567. This application Jul. 26, 1994, Ser. No. 26,313

Term of patent 14 years

U.S. Cl. D18—50



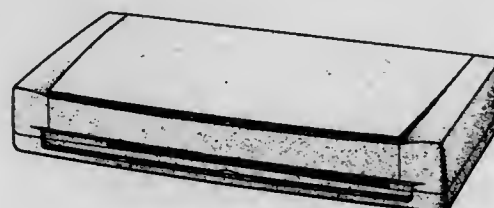
374,888  
COMPUTER PRINTER

Masamichi Udagawa, San Francisco, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Jun. 6, 1995, Ser. No. 39,849

Term of patent 14 years

U.S. Cl. D18—50



374,886

ORIGINAL FEEDING DEVICE

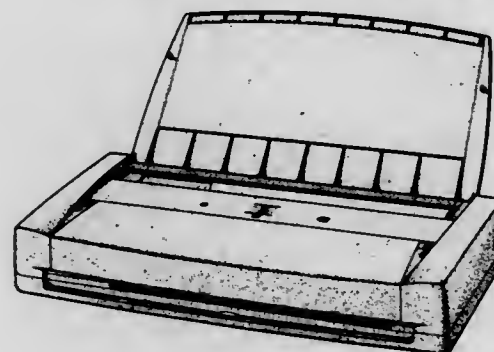
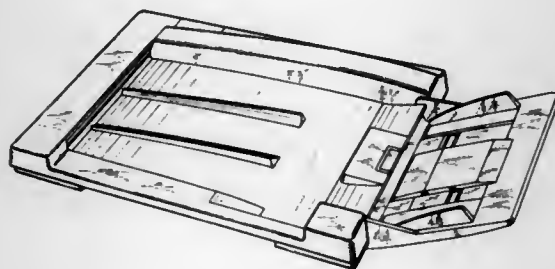
Masaki Takahashi, Yokohama, and Hiroki Umeda, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1995, Ser. No. 42,701

Claims priority, application Japan, Feb. 17, 1995, 7-4160

Term of patent 14 years

U.S. Cl. D18—49



374,889

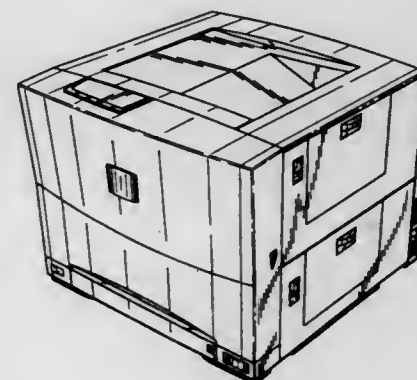
COMPUTER PRINTER

Lawrence E. Barbera, San Mateo, and Kenneth D. Wood, Woodside, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Jun. 5, 1995, Ser. No. 39,817

Term of patent 14 years

U.S. Cl. D18—54



374,891

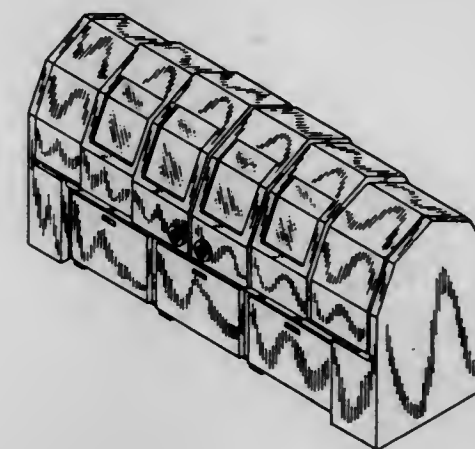
ENGRAVER

Kenneth F. Bornhorst, Jr., Centerville; Pierre L. Crease, Dayton; Kim E. Izor, Miamisburg; Larry D. Lucous, and Larry L. Uptegraph, both of Dayton, all of Ohio, assignors to Ohio Electronic Engravers, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 16,023, Dec. 3, 1993, Pat. No. Des. 366,061. This application Sep. 13, 1995, Ser. No. 43,864. The portion of the term of this patent subsequent to Jan. 9, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D18—57



374,890

INK TANK FOR PRINTER

Hiroiyuki Tokuda; Masanori Takenouchi, both of Yokohama; Yasuo Kotaki, Tokyo, and Yuji Hamasaki, Sagami-hara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

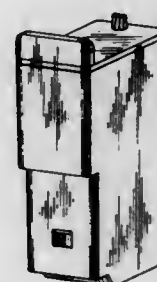
Filed Feb. 22, 1995, Ser. No. 35,181

Claims priority, application Japan, Aug. 23, 1994, 6-25186

The portion of the term of this patent subsequent to Jul. 30, 2013, has been disclaimed.

Term of patent 14 years

U.S. Cl. D18—56



374,892

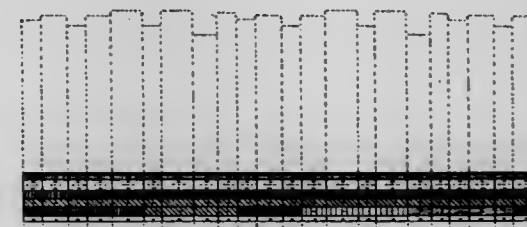
SET OF COLOR CODED LABELS FOR ORGANIZING BOOKS

Michael D. Nalepka, 5051 NW. 58 Ter., Coral Springs, Fla. 33067, and William H. Gunn, 1523 Butlercrest, Houston, Tex. 77080

Filed Jun. 24, 1994, Ser. No. 24,983

Term of patent 14 years

U.S. Cl. D19—32



374,893

## BALL POINT PEN

Teruya Yazawa, Tokyo, Japan, assignor to Zebra Co., Ltd., Shinichi Mochizuki, Tokyo, Japan, assignor to Sega Enterprises, Ltd., Tokyo, Japan

Filed Nov. 28, 1995, Ser. No. 47,186

Claims priority, application Japan, Jul. 7, 1995, 7-19800

Term of patent 14 years

U.S. Cl. D19—51



374,895

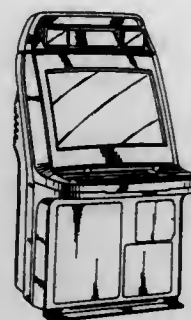
## VIDEO GAME MACHINE

Shinichi Mochizuki, Tokyo, Japan, assignor to Sega Enterprises, Ltd., Tokyo, Japan

Filed Nov. 7, 1995, Ser. No. 46,115

Term of patent 14 years

U.S. Cl. D21—13



374,894

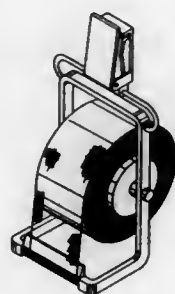
## TAPE DISPENSER

Kyle Towns, P.O. Box 1109, Riverton, Wyo. 82501, and Cher Hesse, 1121 E. 1300 North, Shelley, Id. 83274

Filed Sep. 28, 1995, Ser. No. 44,670

Term of patent 14 years

U.S. Cl. D19—69



374,896

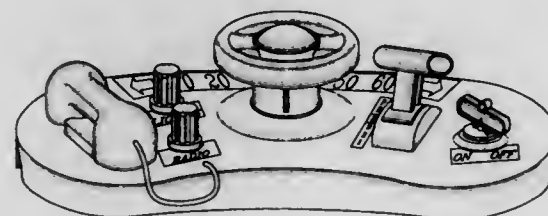
## AUTO DASHBOARD ACTIVITY CENTER

David J. Stroud, Dayton; Tracy C. Roan, Springfield, and Ilango Sanaralingam, Tipp City, both of Ohio, assignors to Lisco, Inc., Tampa, Fla.

Filed Nov. 13, 1995, Ser. No. 46,359

Term of patent 14 years

U.S. Cl. D21—142



374,897

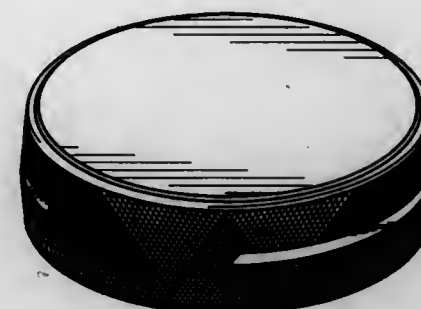
## GAME PUCK

John L. Whisman, 528 Laurel Ave., Menlo Park, Calif. 94025

Filed Jul. 17, 1995, Ser. No. 41,470

Term of patent 14 years

U.S. Cl. D21—203



374,899

## GOLF CLUB DRIVER HEAD

Steve Mahaffey, Hampden, Mass., assignor to Lisco, Inc., Tampa, Fla.

Filed Jul. 21, 1995, Ser. No. 41,699

Term of patent 14 years

U.S. Cl. D21—214



374,898

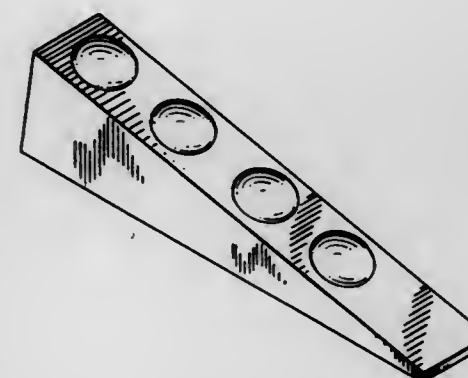
## GOLF TEE

Peter S. C. Cheng, 99 Glencairn Street, Toronto, Ontario, Canada

Filed Jun. 29, 1995, Ser. No. 40,879

Term of patent 14 years

U.S. Cl. D21—208



374,900

## INLINE ROLLER SKATE WHEEL FRAME

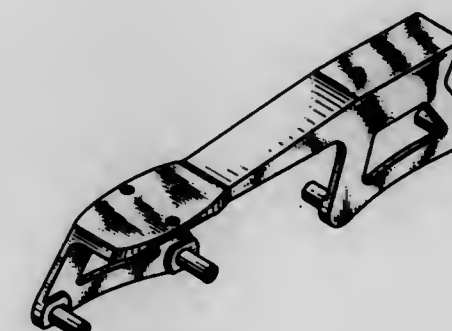
Terry W. Taylor, 4631 S. "F" St., Oxnard, Calif. 93033, and

Floyd J. Taylor, 393 Imperial Ave., Ventura, Calif. 93004

Filed Jul. 15, 1994, Ser. No. 26,022

Term of patent 14 years

U.S. Cl. D21—226





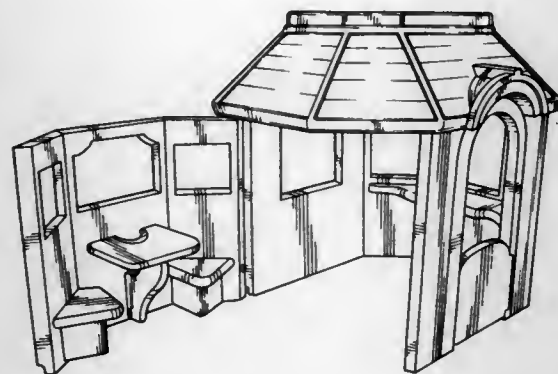
374,901

## PLAY HOUSE

Joseph C. Cacciola, and William K. Ford, both of Hudson, Ohio, assignors to The Little Tikes Company, Hudson, Ohio  
Filed Jul. 10, 1995, Ser. No. 41,214

Term of patent 14 years

U.S. Cl. D21—240



374,903

## PISTOL GRIP

R. Lane Pearce, Bothell, Wash., assignor to Pearce Grip, Inc.  
Filed Apr. 22, 1994, Ser. No. 21,703

Term of patent 14 years

U.S. Cl. D22—108



374,902

## PLAYGROUND ASSEMBLY SUPPORT MEMBER

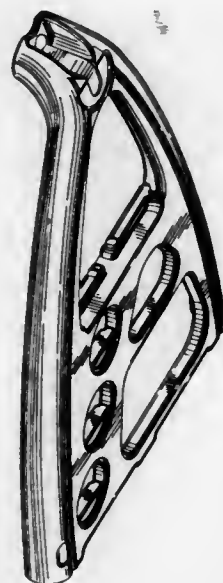
Charles W. Bookstaver, Olney, Ill.; Samuel G. Smith, Starkville, Miss., and Frank Mercurio, Wallingford, Conn., assignors to Roadmaster Corporation, Olney, Ill.

Continuation of Ser. No. 23,392, May 23, 1994, abandoned.

This application Oct. 18, 1994, Ser. No. 32,385

Term of patent 14 years

U.S. Cl. D21—246



374,904

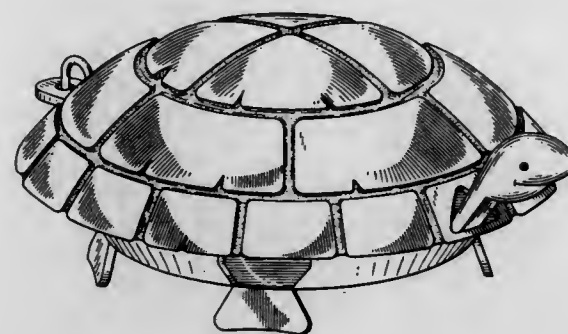
## SNAIL BAIT HOLDER AND SNAIL TRAP

Albert Miller, San Jose, Calif., assignor to Termination Turtle LP, San Leandro, Calif.

Filed Aug. 3, 1995, Ser. No. 42,186

Term of patent 14 years

U.S. Cl. D22—119



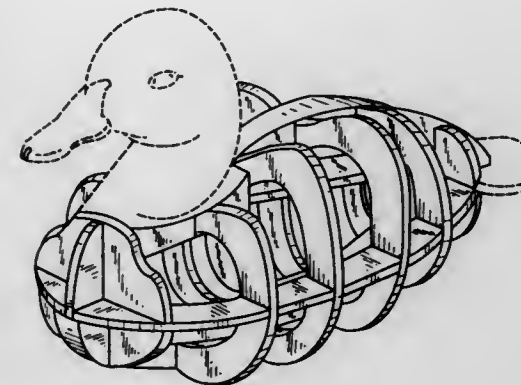
374,905

## WILDLIFE DECOY FORM

John N. Szolis, 640 Pearce Mill Rd., Wexford, Pa. 15090  
Filed Sep. 14, 1995, Ser. No. 44,000

Term of patent 14 years

U.S. Cl. D22—125



374,907

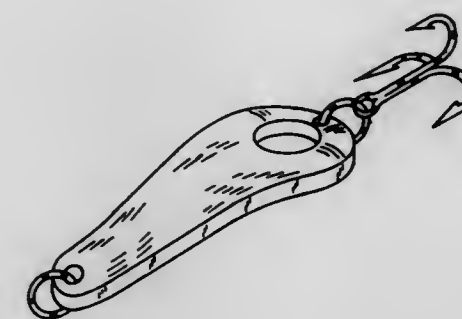
## SPOON TYPE FISHING LURE

Michael W. Ketchum, 24772 Lagrima, Mission Viejo, Calif. 92692

Filed Oct. 12, 1995, Ser. No. 45,195

Term of patent 14 years

U.S. Cl. D22—129



374,906

## FISHING LURE

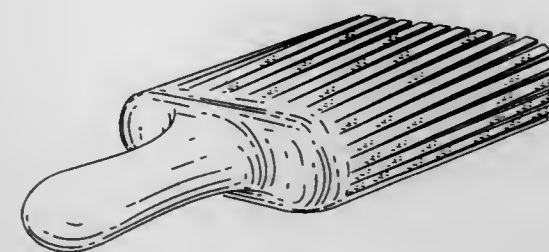
Fred H. Coggins, Brookland, Ark., assignor to Southern Pro Lures, Inc., Brookland, Ark.

Filed Feb. 22, 1994, Ser. No. 19,034

The portion of the term of this patent subsequent to Apr. 16, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D22—128



374,908

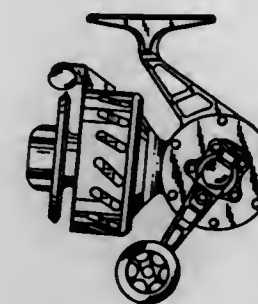
## FISHING REEL

Robert W. Koelewyn, 110 Birchwood Rd., Fairfield, Conn. 06430

Continuation-in-part of Ser. No. 2,638, Dec. 15, 1992, abandoned. This application Apr. 12, 1994, Ser. No. 21,232

Term of patent 14 years

U.S. Cl. D22—141



374,909

**LINE ROLLER FOR A SPINNING FISHING REEL**

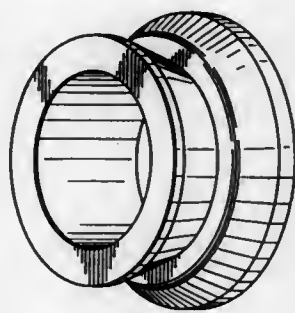
Kyoichi Kaneko, and Eiji Shinohara, both of Higashikurume, Japan, assignors to Daiwa Seiko, Inc., Higashikurume, Japan

Division of Ser. No. 29,010, Sep. 27, 1994. This application Oct. 31, 1995, Ser. No. 45,854

Claims priority, application Japan, Jun. 15, 1994, 6-17598; Jul. 22, 1994, 6-22187

Term of patent 14 years

U.S. Cl. D22—141



374,911

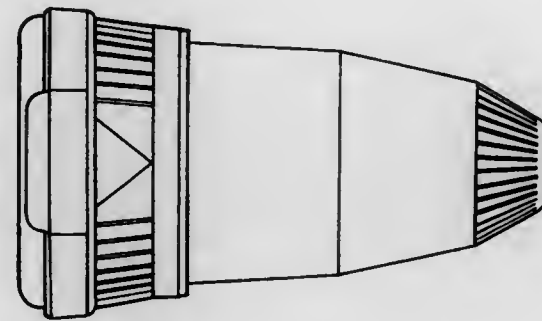
**FILTER HOUSING**

Dov Kahana, 880 Yale La., Highland Park, Ill. 60035

Filed Sep. 15, 1995, Ser. No. 44,072

Term of patent 14 years

U.S. Cl. D23—209



374,910

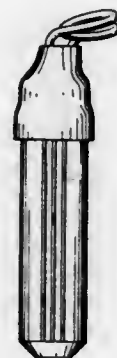
**REPLACEMENT FISHING ROD TIP**

Christopher R. Phethean, Calgary, Canada, assignor to Allyson Visser, Calgary, Canada

Filed Aug. 22, 1995, Ser. No. 42,970

Term of patent 14 years

U.S. Cl. D22—143



374,912

**FILTER HOUSING**

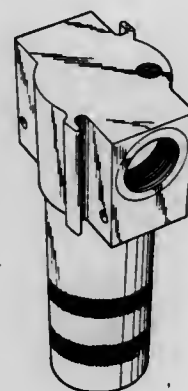
Pieter Engeland, Veenendaal, Netherlands, assignor to Faurey Arlon B.V., Arnhem, Netherlands

Filed Sep. 27, 1995, Ser. No. 44,616

Claims priority, application Benelux TM/Des. Off., Mar. 31, 1995, 70679-00

Term of patent 14 years

U.S. Cl. D23—209



374,913

**SHOWER HEAD**

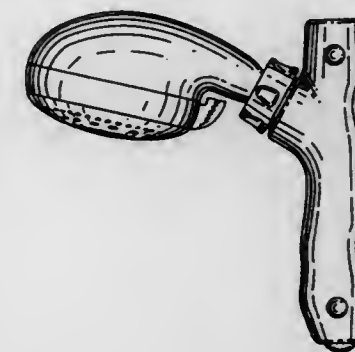
Marc Sadler, Vicenza, Italy, assignor to Domino S.p.A., Porde- none, Italy

Filed Aug. 18, 1995, Ser. No. 42,844

Claims priority, application Italy, Mar. 27, 1995, PN9500003

Term of patent 14 years

U.S. Cl. D23—213



374,915

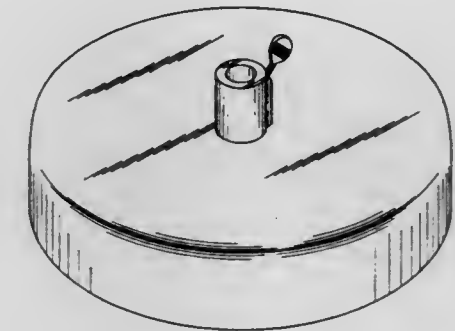
**PRESSURIZED WATER SHIELD**

Mark C. Copp, 829 Mulberry St., Lake Worth, Fla. 33461

Filed Jul. 7, 1995, Ser. No. 41,176

Term of patent 14 years

U.S. Cl. D23—227



374,916

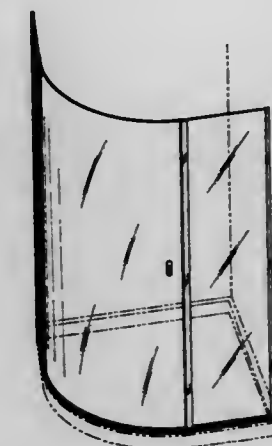
**SHOWER ENCLOSURE**

Henry J. Casden, 430 Weymouth Dr., Wyckoff, N.J. 07481

Filed Sep. 22, 1995, Ser. No. 44,368

Term of patent 14 years

U.S. Cl. D23—283



374,914

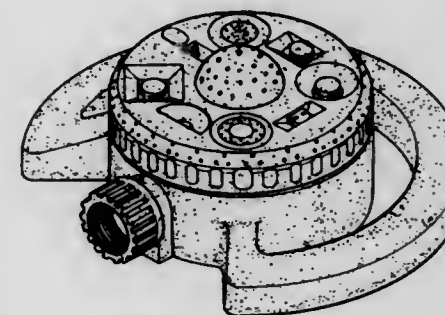
**LAWN SPRINKLER**

King-Yuan Wang, Changhua Hsien, Taiwan, assignor to Yuan Net Comp., Changhua Hsien, Taiwan

Filed Nov. 24, 1995, Ser. No. 46,995

Term of patent 14 years

U.S. Cl. D23—214

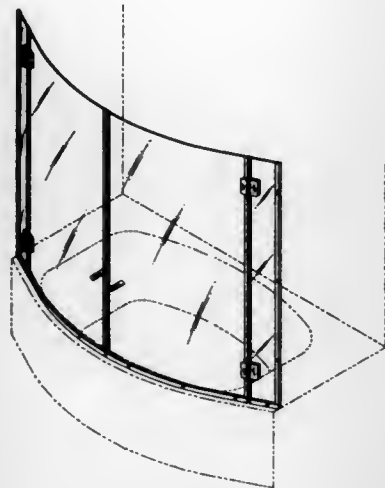




374,917

## ENCLOSURE FOR A BATHTUB

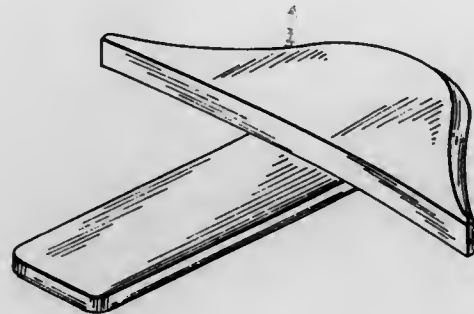
Henry J. Casden, 430 Weymouth Dr., Wyckoff, N.J. 07481  
 Filed Sep. 22, 1995, Ser. No. 44,369  
 Term of patent 14 years  
 U.S. Cl. D23—283



374,919

## TOILET SEAT HANDLE

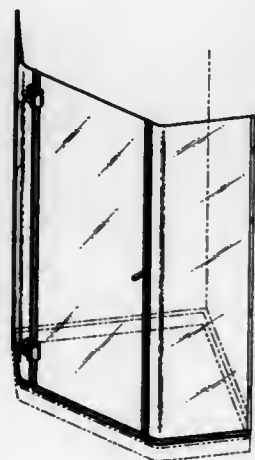
Shel L. Samuelson, 14 Lookout Dr., Ledgewood, N.J. 07852  
 Filed Sep. 21, 1995, Ser. No. 44,243  
 Term of patent 14 years  
 U.S. Cl. D23—309



374,918

## SHOWER ENCLOSURE

Henry J. Casden, 430 Weymouth Dr., Wyckoff, N.J. 07481  
 Filed Sep. 22, 1995, Ser. No. 44,738  
 Term of patent 14 years  
 U.S. Cl. D23—283



374,920

## WALL ATTACHMENT HOUSING FOR A REFRIGERATING MACHINE

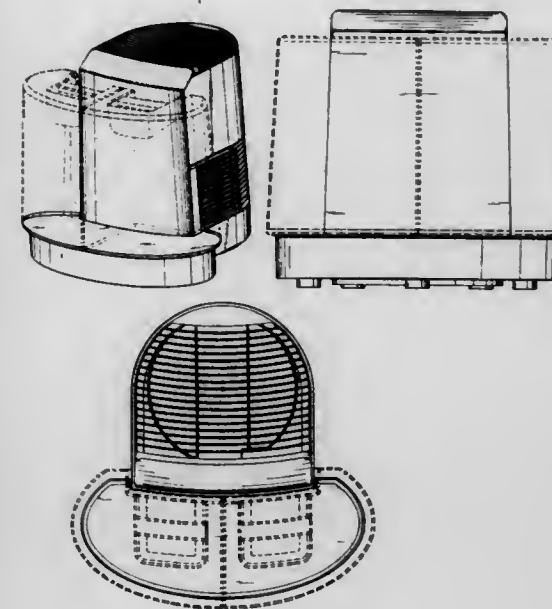
Norbert Müller, Dietzhölztal; Adam Pawlowski, Dillenburg; Heinrich Styppa, Giessen, and Jürgen Bernhardt, Halger-Rodenbach, all of Germany, assignors to Rittal-Werk Rudolf Loh GmbH & Co. KG, Germany  
 Filed Oct. 18, 1994, Ser. No. 29,902  
 Claims priority, application Germany, Apr. 18, 1994, M 94 03 149.5  
 Term of patent 14 years  
 U.S. Cl. D23—354



374,921

## HUMIDIFIER HOUSING

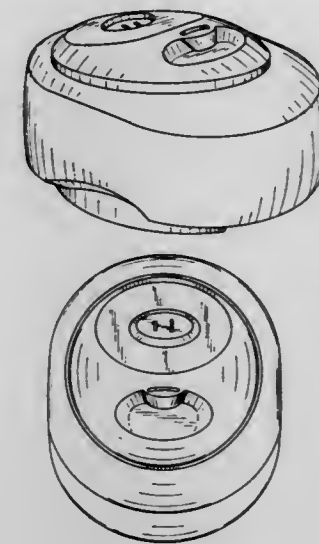
Rodney Jané, Westboro, Mass.; Jui-Shang Wang, Taipei, Taiwan; Stanley Gresens, Homewood; Gregory Holderfield, Palatine, both of Ill., and John Longan, Shrewsbury, Mass., assignors to Duracraft Corporation, Southborough, Mass.  
 Filed Oct. 30, 1995, Ser. No. 45,812  
 Term of patent 14 years  
 U.S. Cl. D23—356



374,923

## VAPORIZER

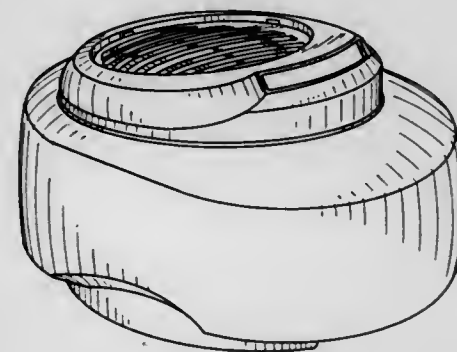
Devin L. Moore, Decatur, Ga., assignor to Sunbeam Products, Inc., Fort Lauderdale, Fla.  
 Filed Oct. 31, 1995, Ser. No. 45,830  
 Term of patent 14 years  
 U.S. Cl. D23—360



374,922

## HUMIDIFIER

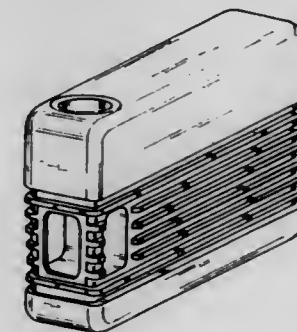
Devin L. Moore, Decatur, Ga., assignor to Sunbeam Products, Inc., Fort Lauderdale, Fla.  
 Filed Oct. 31, 1995, Ser. No. 45,850  
 Term of patent 14 years  
 U.S. Cl. D23—356



374,924

## AIR FRESHENER DEVICE

Ronald G. Cramer, Mount Pleasant, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.  
 Filed Jul. 31, 1995, Ser. No. 42,026  
 Term of patent 14 years  
 U.S. Cl. D23—366



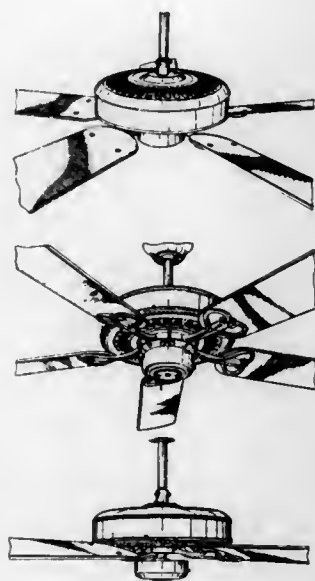
374,925

## CEILING FAN

Jan Jaspers-Fayer, Idyllwild, Calif., assignor to Minka Lighting, Inc., Corona, Calif.

Filed Apr. 4, 1995, Ser. No. 37,118  
Term of patent 14 years

U.S. Cl. D23—377



374,927

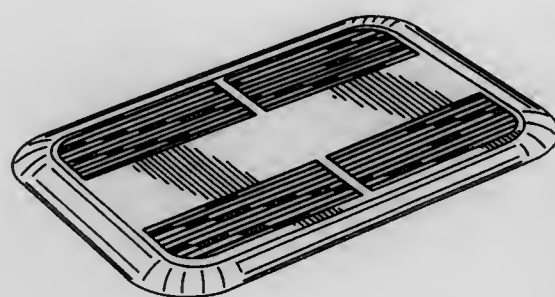
## HEATER GRILL

John Chabot, Drummondville, Canada, assignor to Chalair Elektrik Inc., Boucherville, Canada

Filed Apr. 20, 1994, Ser. No. 21,559

Term of patent 14 years

U.S. Cl. D23—387



374,928

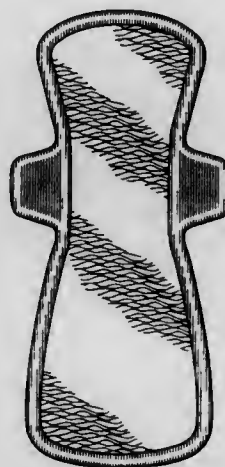
## DISPOSABLE ABSORBENT PRODUCT

Zulfikar Murji, Brossard, Canada, assignor to Johnson & Johnson Inc., Montreal, Canada

Filed Sep. 21, 1993, Ser. No. 13,228

Term of patent 14 years

U.S. Cl. D24—125



374,926

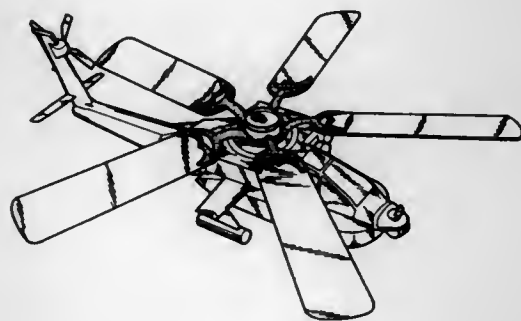
## COMBINED HELICOPTER PENDANT AND CEILING FAN

Kuo-Chine Sheh, 58, Ma Yuan West St., Taichung, Taiwan

Filed Jul. 24, 1995, Ser. No. 41,790

Term of patent 14 years

U.S. Cl. D23—377



374,929

Patent Not Issued For This Number

374,930

## NEUROLOGICAL TOOL FOR TESTING NERVE SENSITIVITY

Jeffrey M. Scott, 111 Westwood Cir., East Hills, N.Y. 11577

Filed Jan. 18, 1995, Ser. No. 33,709

Term of patent 14 years

U.S. Cl. 24—142



374,932

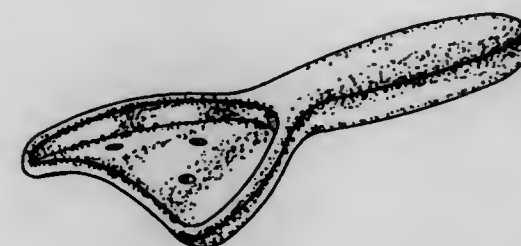
## CLEFT PALATE IMPRESSION TRAY

Joseph A. Engelman, Rte. 2, 1000 Cedar Grove, Columbia, Mo. 65201

Filed Jan. 20, 1995, Ser. No. 33,777

Term of patent 14 years

U.S. Cl. D24—181



374,933

## MASSAGER

Sen-Nen Lie, Kowloon, Hong Kong, assignor to Kolvin Industries Limited, Hong Kong

Filed Jun. 30, 1994, Ser. No. 25,333

Claims priority, application United Kingdom, Jan. 6, 1994, 2036173

Term of patent 14 years

U.S. Cl. D24—213



374,931

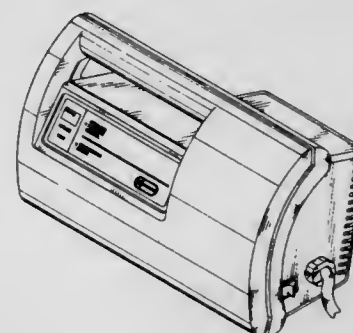
## CONTROLLER FOR SYSTEM FOR APPLYING COMPRESSIVE PRESSURE TO THE LEG

William C. Cesaroni, Glenview; Shawn O. Barrett, Grayslake, and Jason J. Alvarez, Chicago, all of Ill., assignors to The Kendail Company, Manfield, Mass.

Filed Nov. 18, 1994, Ser. No. 31,156

Term of patent 14 years

U.S. Cl. D24—169





374,934

## MASSAGER

Sen-Nen Lie, Kowloon, Hong Kong, assignor to Kolvin Industries Limited, Hong Kong

Filed Jun. 30, 1994, Ser. No. 25,342

Claims priority, application United Kingdom, Jan. 6, 1994, 2036175

Term of patent 14 years

U.S. Cl. D24—215



374,936

## PERFORATED SHEET METAL CONTAINER

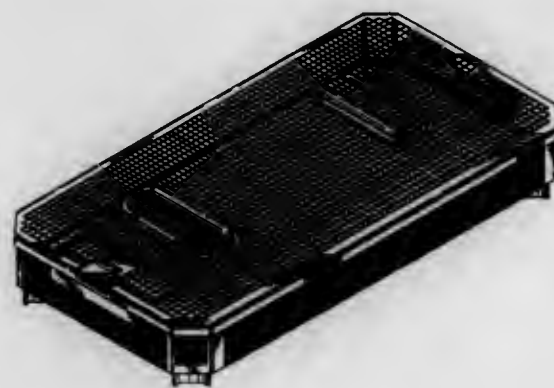
Mariana Jakab, Tuttlingen, Germany, assignor to Aesculap AG, Tuttlingen, Germany

Filed Aug. 28, 1995, Ser. No. 43,380

Claims priority, application Germany, Mar. 8, 1995, M 95 01 938.3

Term of patent 14 years

U.S. Cl. D24—217



374,935

## MASSAGER

Sen-Nen Lie, Kowloon, Hong Kong, assignor to Kolvin Industries Limited, Hong Kong

Filed Jun. 28, 1994, Ser. No. 25,771

Claims priority, application United Kingdom, Dec. 30, 1993, 2036090

Term of patent 14 years

U.S. Cl. D24—215



374,937

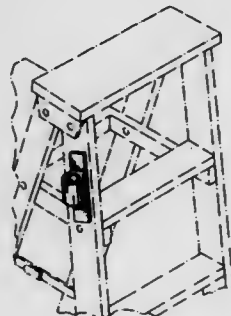
## TOOL HOLSTER

Richard O. Salas, Phoenix, Ariz., assignor to Newell Operating Company, Freeport, Ill.

Filed Feb. 16, 1995, Ser. No. 34,970

Term of patent 14 years

U.S. Cl. D25—68



374,938

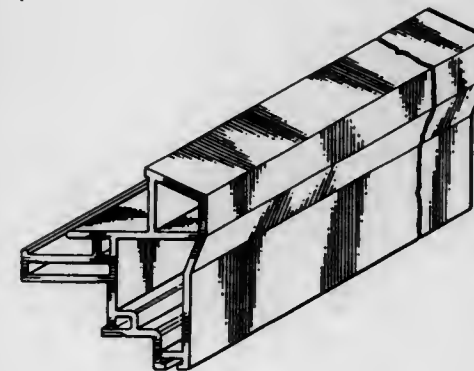
## CASEMENT SASH

Tony DiGiorgio, Woodbridge, Canada, assignor to Dominion Plastics Inc., Woodbridge, Canada

Filed Oct. 16, 1995, Ser. No. 45,263

Term of patent 14 years

U.S. Cl. D25—124



374,940

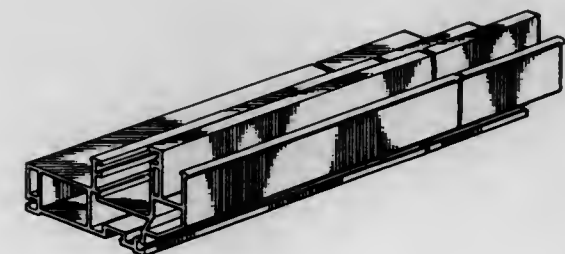
## WINDOW HEADER

Keith Hart, Newmarket, Canada, assignor to Majestic Plastics Ltd., Weston, Canada

Filed Oct. 24, 1995, Ser. No. 45,572

Term of patent 14 years

U.S. Cl. D25—124



374,941

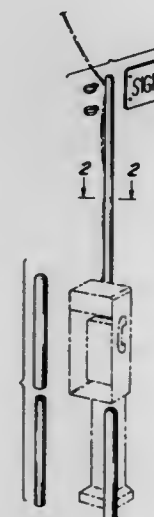
## COMBINED STANCHION WITH SLEEVE AND SIGNAGE

Frank Venegas, Jr., 10800 Hamburg Rd. - P.O. Bx 310, Hamburg, Mich. 48139-0310

Continuation-in-part of Ser. No. 38,673, Mar. 26, 1993, Pat. No. 5,392,179. This application Mar. 7, 1994, Ser. No. 19,652

Term of patent 14 years

U.S. Cl. D25—126



374,939

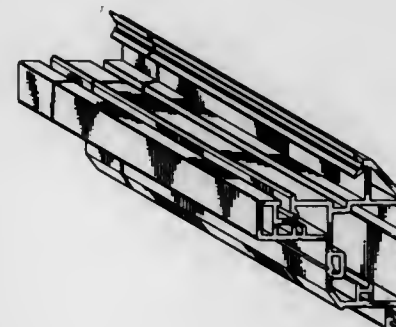
## CASEMENT SASH

Tony DiGiorgio, Woodbridge, Canada, assignor to Dominion Plastics Inc., Woodbridge, Canada

Filed Oct. 18, 1995, Ser. No. 45,403

Term of patent 14 years

U.S. Cl. D25—124



374,942

## LAMP SECURING POST

Hong-Jen Lee, Taipei, Taiwan, assignor to Fu-Chi Plastics Co., Taipei, Taiwan

Filed Mar. 20, 1995, Ser. No. 36,370

Term of patent 14 years

U.S. Cl. D25—126



374,944

## BICYCLE LIGHT

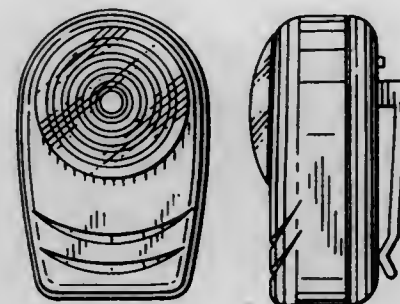
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing, Ltd., Kowloon, Hong Kong

Filed Aug. 22, 1995, Ser. No. 43,135

Claims priority, application United Kingdom, Mar. 30, 1995, 2046359

Term of patent 14 years

U.S. Cl. D26—28



374,945

## TABLE LAMP

Simon Benghozi, Outremont, Canada, assignor to Bazz Inc., Montreal, Canada

Filed Aug. 7, 1995, Ser. No. 42,730

Term of patent 14 years

U.S. Cl. D26—106



374,943

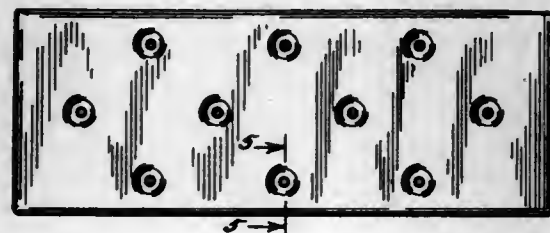
## TUFTED INTERIOR WALL PANEL

Morris Carter, Jr., Rte. 2, Box 2125, Starke, Fla. 32091

Filed Mar. 14, 1995, Ser. No. 36,173

Term of patent 14 years

U.S. Cl. D25—138



374,946

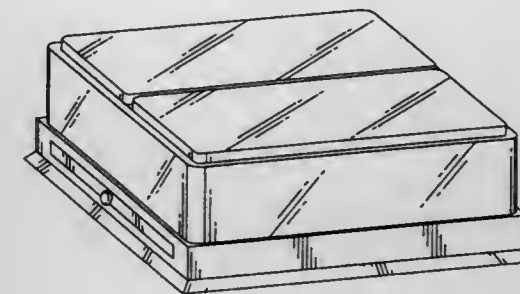
## BLEND, MOISTEN AND STORAGE SYSTEM FOR TOBACCO PRODUCTS

Donald Meurlin, 135 Forest Ave., Massapequa, N.Y. 11758

Filed Apr. 13, 1994, Ser. No. 21,253

Term of patent 14 years

U.S. Cl. D27—189



374,948

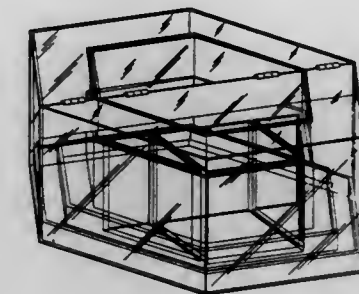
## ORGANIZER FOR MANICURE POLISH AND IMPLEMENTS

Xiao Y. Mers, 316 Cameron St., SE., Atlanta, Ga. 30312

Filed Dec. 22, 1993, Ser. No. 16,669

Term of patent 14 years

U.S. Cl. D28—61



374,947

## LOTION APPLICATOR

Anthony Chiaramonte, 135 Richmond Ave., Medford, N.Y. 11763

Filed Nov. 9, 1995, Ser. No. 46,247

Term of patent 14 years

U.S. Cl. D28—7



374,949

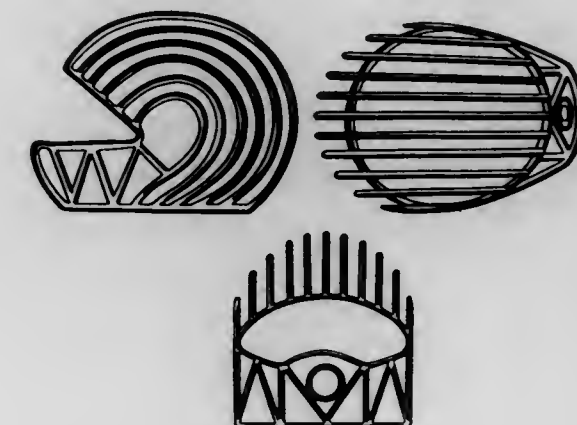
## HELMET

Ferdinand H. Ferino, 736 Robinson Ave., San Diego, Calif. 92103

Filed Apr. 10, 1995, Ser. No. 37,307

Term of patent 14 years

U.S. Cl. D29—102





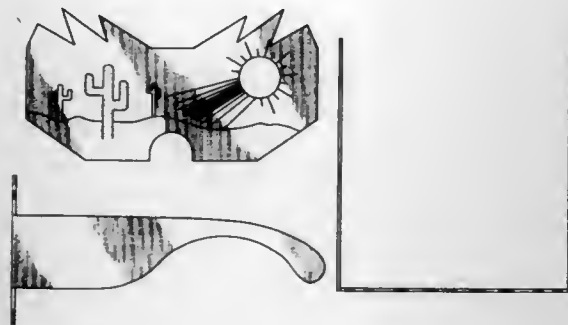
374,950

## EYE SHIELD

Russell T. Clark, 12223 Taylors Crossing, Tomball, Tex. 77375  
 Filed Apr. 26, 1994, Ser. No. 21,973

Term of patent 14 years

U.S. Cl. D29—109



374,952

## POULTRY FOUNT

Thomas W. Wenstrand, 1702 Oakland Mills Rd., Mt. Pleasant,  
 Iowa 52641

Filed Nov. 22, 1995, Ser. No. 46,974

Term of patent 14 years

U.S. Cl. D30—132



374,951

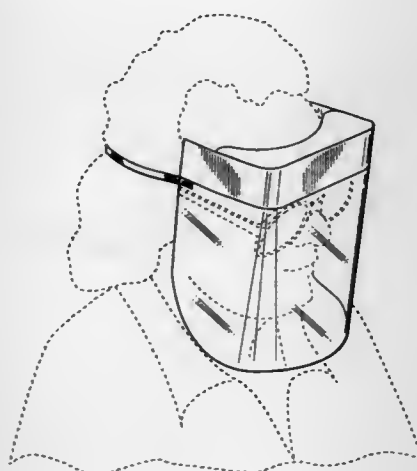
## FACE SHIELD

Roger Machson, 445 Coloma, Sausalito, Calif. 94965

Filed Jun. 30, 1994, Ser. No. 25,445

Term of patent 14 years

U.S. Cl. D29—110



374,953

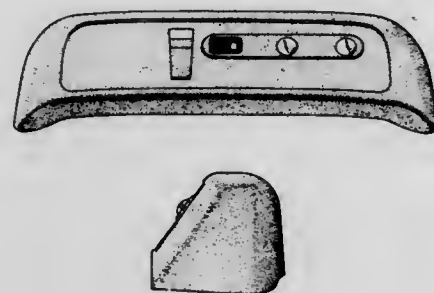
## VACUUM CLEANER TOP CONSOLE

Richard A. Wareham, North Canton, and Ronald J. Stephens,  
 Rittman, both of Ohio, assignors to The Hoover Company,  
 North Canton, Ohio

Filed Aug. 9, 1995, Ser. No. 42,375

Term of patent 14 years

U.S. Cl. D32—31



374,954

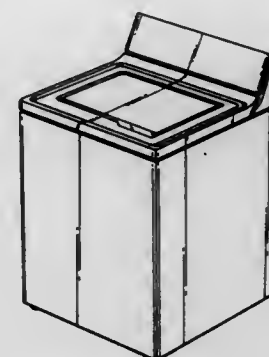
## APPLIANCE CABINET

Jonathan M. Katz; Kevin S. Laundroche, and Scott A. Calvert,  
 all of Louisville, Ky., assignors to General Electric Company,  
 Louisville, Ky.

Filed Oct. 7, 1994, Ser. No. 29,544

Term of patent 14 years

U.S. Cl. D32—6



374,956

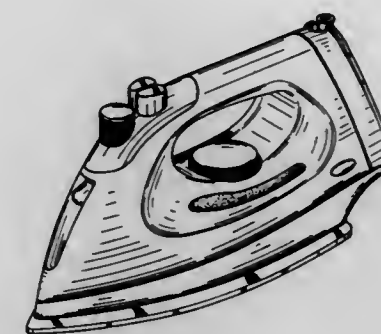
## ELECTRIC IRON

Tony Hsu, Tainan Hsien, Taiwan, assignor to Lundar Electric  
 Industrial Co., Ltd., Tainan Hsien, Taiwan

Filed Dec. 7, 1995, Ser. No. 47,577

Term of patent 14 years

U.S. Cl. D32—70



374,955

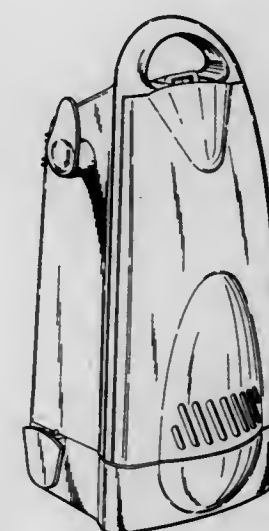
## VACUUM CLEANER

Steven Umbach, East Grand Rapids, Mich., assignor to Bissell  
 Inc., Grand Rapids, Mich.

Division of Ser. No. 18,742, Feb. 14, 1994. This application  
 Aug. 21, 1995, Ser. No. 42,939

Term of patent 14 years

U.S. Cl. D32—21



374,957

## ELECTRIC GOLF BAG CART

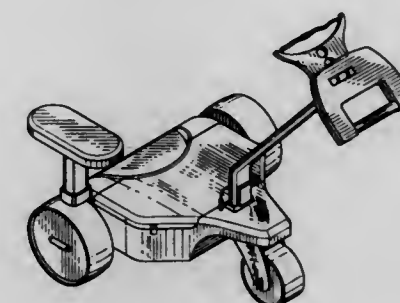
Robert Keller, Wallisellen, Switzerland, and Said Tanta, Meri-  
 gnac, France, assignors to Keller Golf A.G., Wallisellen,  
 Switzerland

Filed Dec. 11, 1995, Ser. No. 47,720

Claims priority, application Switzerland, Aug. 25, 1995,  
 DMA/003045

Term of patent 14 years

U.S. Cl. D34—15



374,958

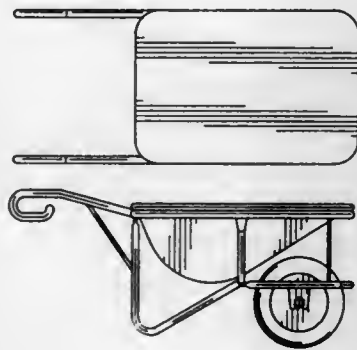
## WHEELBARROW

Yoshihisa Watanabe, Mie, Japan, assignor to Suntool Co., Ltd., Robert A. Tobin, 1842 Turk Hill Rd., Fairport, N.Y. 14450  
Mie, Japan

Filed Aug. 4, 1995, Ser. No. 42,230

Term of patent 14 years

U.S. Cl. D34—16



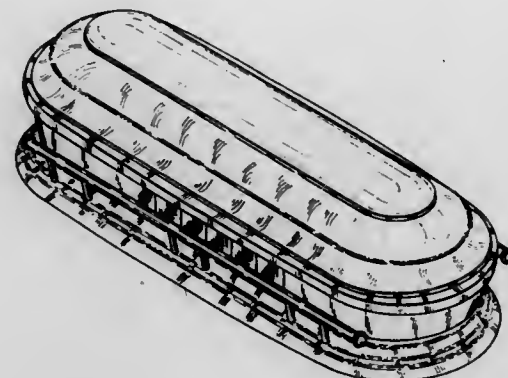
374,960

## CASKET

Filed Mar. 24, 1995, Ser. No. 36,695

Term of patent 14 years

U.S. Cl. D99—1



374,959

## BEER KEG

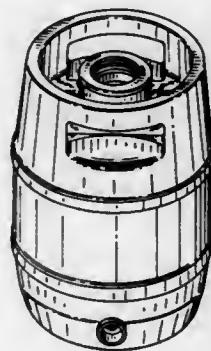
Ulrich Müll, Haiger, Germany, assignor to Thielmann AG  
Kommanditgesellschaft, Germany

Filed Jan. 14, 1994, Ser. No. 18,991

Claims priority, application Germany, Jul. 17, 1993, 93 05 591.9

Term of patent 14 years

U.S. Cl. D34—39



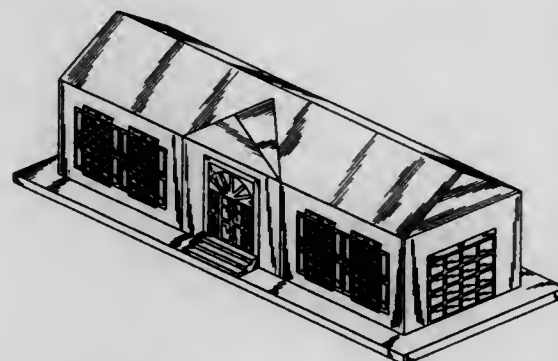
374,961

## BURIAL CASKET

Filed Aug. 24, 1994, Ser. No. 27,580

Term of patent 14 years

U.S. Cl. D99—3



374,962

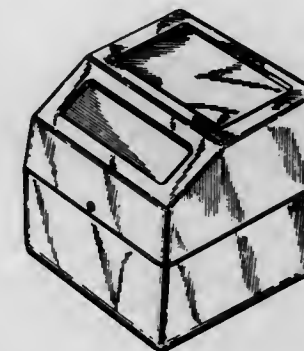
## CONVERTIBLE URN VAULT

Frank Allen, and Kim Allen, both of Libertyville, Ill., assignors  
to F. H. Noble & Company, Mundelein, Ill.

Filed Jun. 8, 1995, Ser. No. 40,011

Term of patent 14 years

U.S. Cl. D99—5



374,964

## CROSS

Ronald A. Ritter, 833A S. Main St. #122, Fallbrook, Calif.  
92088

Filed Aug. 5, 1994, Ser. No. 29,265

Term of patent 14 years

U.S. Cl. D99—23



374,965

## ATM COMMUNICATION APPARATUS

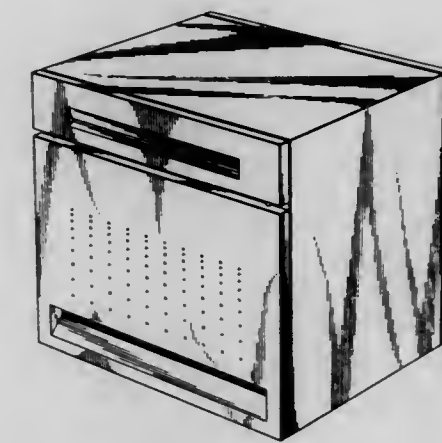
Toshiyuki Utsuki, Tachikawa; Yukio Kuroiwa, Tokyo; Yoshiki  
Yoshida, Iruma; Kenta Kumagai, Tokyo, and Setsuo Taka-  
hashi, Yokohama, all of Japan, assignors to Hitachi, Ltd.,  
Tokyo, Japan

Filed Oct. 18, 1994, Ser. No. 29,879

Claims priority, application Japan, Apr. 27, 1994, 6-11887

Term of patent 14 years

U.S. Cl. D99—28



374,963

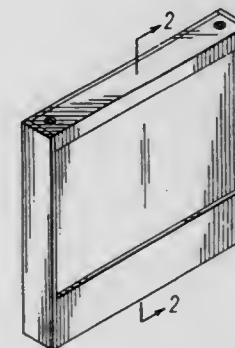
## URN FOR CREMATED REMAINS

Cheryl G. Neuberger, P.O. Box 7064, Vero Beach, Fla. 32961,  
and Lindsay C. McClenny, 272 Easy St., Ft. Pierce, Fla.  
34982

Filed Aug. 14, 1995, Ser. No. 42,592

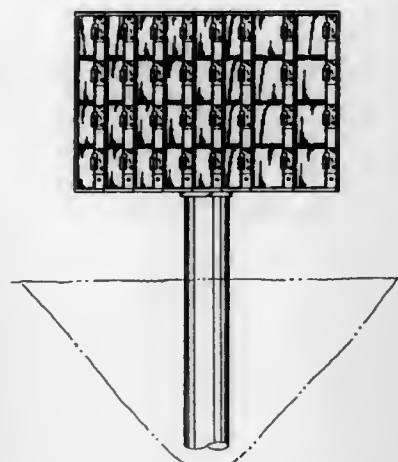
Term of patent 14 years

U.S. Cl. D99—5





374,966  
**BEACH SAFE**  
 Nanette Matassa, 200 S.E. 12th Ave. Apt. 414, Fort Lauderdale,  
 Fla. 33301  
 Filed Oct. 17, 1994, Ser. No. 30,077  
 Term of patent 14 years  
 U.S. Cl. D99—28



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TO WHOM

PATENTS WERE ISSUED ON THE 22nd DAY OF OCTOBER, 1996

NOTE— Arranged in accordance with the first significant character or word of the name  
 (in accordance with city and telephone directory practice).

- A. Schulman, Inc.: *See—*  
 Christ, Hubert; and Schneider, Wolfgang, 5,567,797, Cl. 528-310.000.
- A. Stephan u. Söhne GmbH & Company: *See—*  
 Otto, Friedrich; and Eusterbarkey, Friedhelm, 5,566,895, Cl. 241-82.700.
- A.W. Faber-Castell Unternehmensverwaltung GmbH & Co.: *See—*  
 Jankewitz, Axel; and Lugert, Gerhard, 5,567,206, Cl. 8-402.000.
- Aamodt, James: *See—*  
 Klatte, Fred; Aamodt, James; and Biswell, David, 5,567,405, Cl. 423-477.000.
- Abar Ipsen Industries, Inc.: *See—*  
 Carter, Matthew D., 5,567,381, Cl. 266-250.000.
- ABB Kent Plc: *See—*  
 Holmes-Higgin, Ian J.; and Rogers, Ivor T., 5,567,876, Cl. 73-257.000.
- ABB Vetco Gray, Inc.: *See—*  
 Pallini, Joseph W., Jr.; and Lyle, Rockford D., 5,566,761, Cl. 166-345.000.
- Abbas, Saeed A.: *See—*  
 Nashed, Mina A.; Dasgupta, Falguni; Abbas, Saeed A.; Musser, John H.; and Asa, Darwin S., 5,567,683, Cl. 514-25.000.
- Abbema, William D.; and Lewis, John K. Cylindrical corrosion barrier for pipe connections. 5,566,984, Cl. 285-22.000.
- Abbott Laboratories: *See—*  
 Grabenkort, Richard W.; Tanner, John C., II; and Wecker, Sheldon M., 5,566,729, Cl. 141-25.000.
- Sheppard, George S.; Davidsen, Steven K.; Summers, James B.; and Carrera, George M., Jr., 5,567,711, Cl. 514-303.000.
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- Abe, Hajime: *See—*  
 Takai, Atsushi; and Abe, Hajime, 5,568,576, Cl. 385-24.000.
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- Abe, Tomonori: *See—*  
 Nishizawa, Yoshifumi; Abe, Tomonori; Yamane, Iwao; and Yamada, Satoru, 5,566,632, Cl. 112-470.030.
- Abe, Toshiya: *See—*  
 Enomoto, Takeo; Abe, Toshiya; Murakami, Hironobu; and Hiraki, Shini-chi, 5,567,446, Cl. 425-84.000.
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- Tsuji, Yoichiro; Abe, Yoshiharu; Sagane, Toshihiro; and Takata, Toshi-masa, 5,567,777, Cl. 525-289.000.
- Abe, Yuji: *See—*  
 Furuya, Rikizo; Okushima, Hiromi; and Abe, Yuji, 5,567,699, Cl. 514-222.500.
- Abel, Todd C.: *See—*  
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- Abersfelder, Günter: *See—*  
 Khelifa, Noureddine; Krumbach, Karl-Gerd; Löhle, Michael; Abersfelder, Günter; Grantz, Helmut; Odebrecht, Wolfgang; Wertenbach, Jürgen; and Wagner, Oliver, 5,566,880, Cl. 237-12.30A.
- Abou-Gharbia, Magid A.: *See—*  
 Skotnicki, Jerauld S.; Palmer, Yvette L.; Kao, Wenling; and Abou-Gharbia, Magid A., 5,567,709, Cl. 514-291.000.
- Ace Controls, Inc.: *See—*  
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- Acer Peripherals, Inc.: *See—*  
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- Ach, Ernst: *See—*  
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- Achter, Eugene K.; Gray, Glenn; Klotzsch, Helmut W.; and Lieb, David, to Thermedics Detection Inc. Detection of unpressurized moving containers. 5,566,569, Cl. 73-37.000.
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- Ackroyd, Rand H.; and Hofmann, Steven P., to Watts Investment Company. Backflow preventer and test cock assembly. 5,566,704, Cl. 137-14.000.
- Acovic, Alexandre; Hsu, Ching-Hsiang; and Wu, Being S., to International Business Machines Corporation. Method of making a three dimensional trench EEPROM cell structure. 5,567,635, Cl. 437-43.000.
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 Greco, Robert C.; Robinson, Michael J.; and Dunn, Paul M., 5,568,540, Cl. 379-89.000.
- Acushnet Company: *See—*  
 Boehm, Herbert C., 5,566,943, Cl. 473-384.000.
- Adachi, Daisaburo: *See—*  
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- Adachi, Masakazu: *See—*  
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- Adam, Peter; and Fiedler, Rudolf, to Siemens Aktiengesellschaft. Adjusting drive, in particular a window-lift drive for a motor vehicle. 5,566,592, Cl. 74-606.00R.
- Adams, Barry T.: *See—*  
 Gochenour, Daniel V.; Adams, Barry T.; Knmmer, Martin E.; Davis, Christopher M.; Lepard, Steven D.; Bassett, Michael L.; and Schlosser, Kevin F., 5,566,804, Cl. 192-70.250.
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- Adang, Michael J.; Rocheleau, Thomas A.; Merlo, Donald J.; and Murray, Elizabeth E., to Mycogen Plant Sciences, Inc. Synthetic insecticidal crystal protein gene. 5,567,600, Cl. 536-23.710.
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- Addinall, Ross: *See—*  
 Mudd, Mark S. J.; and Addinall, Ross, 5,568,345, Cl. 361-56.000.
- Addiss, Robert R.: *See—*  
 Rosenfeldt, Bernd; Fuchs, Kenneth; and Addiss, Robert R., 5,566,676, Cl. 128-672.000.
- Adir et Compagnie: *See—*  
 Koch, Michel; Tillequin, François; Skaltsounis, Alexios-Leandros; Rolland, Yves; Pierre, Alain; and Atassi, Ghanem, 5,567,707, Cl. 514-280.000.
- de Nanteuil, Guillaume; Portevin, Bernard; and Canet, Emmanuel, 5,567,804, Cl. 530-331.000.
- Adra, Hosni: *See—*  
 Willis, Donald F.; Brooks, John E.; Adra, Hosni; and Hou, Hsieh S., 5,568,571, Cl. 382-254.000.
- Advanced Micro Devices: *See—*  
 MacDonald, James; and Mahalingaiah, Rupaka, 5,568,649, Cl. 395-868.000.
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- Wincn, John M., 5,568,515, Cl. 375-257.000.
- Advanced Peptides and Biotechnology Sciences: *See—*  
 Pert, Candace B., 5,567,682, Cl. 514-15.000.
- Advanced Risc Machines Limited: *See—*  
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- AER Energy Resources, Inc.: *See—*  
 Thibault, William C.; and Tinker, Lawrence A., 5,567,172, Cl. 439-371.000.
- Aerodyne Research, Inc.: *See—*  
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- Aerospace Corporation, The: *See—*  
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Ag-Bag International Limited: *See*—  
Inman, Larry; and Koskela, Mike, 5,566,532, Cl. 53-529.000.

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Gatti, Giuliano, 5,568,087, Cl. 330-149.000.

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Joos, François; and Van den Bergen, Patrick, 5,568,220, Cl. 396-626.000.

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AGRI Ventilation Systems, Inc.: *See*—  
Beery, Neil D., 5,566,644, Cl. 119-448.000.

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Funk, Erwin D.; Henricson, Kaj; and Dunn, Stephen J., 5,567,274, Cl. 162-49.000.

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Aihara, Makoto: *See*—  
Akagi, Kyo; Futamoto, Masaaki; Kugiya, Fumio; Miyamura, Yoshinori; Takano, Hisashi; Matsuda, Yoshiyumi; Suzuki, Mikio; Nakao, Takeshi; Munemoto, Takayuki; Fukuoka, Hirotugu; Aihara, Makoto; Takagaki, Tokuhito; Aoi, Hajime; and Seo, Yosuke, 5,568,331, Cl. 360-77.070.

Aikawa, Toshiya: *See*—  
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Fukawa, Yasuou, 5,568,654, Cl. 455-33.100.

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Sugarman, Michael N.; Beesely, Michael; Kelsey, Shannon J.; and Steger, Robert J., 5,567,909, Cl. 136-201.000.
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Steenblik, Richard A.; and Hurt, Mark J., 5,568,313, Cl. 359-463.000.
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Kobayashi, Atsushi; and Arai, Satoshi, 5,567,209, Cl. 29-25.030.
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Marze, Henri-James R.; Routhieu, Vincent J. L.; Arnaud, Gilles L.; and Arnaud, Rémy E., 5,566,907, Cl. 244-17.190.
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Hahn, Stan S.; and Baek, Sung K., 5,568,365, Cl. 361-837.000.
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Goldstein, Leonard; and Baz, Mohammad, 5,568,370, Cl. 363-34.000.
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Bellinger, Ray M., 5,567,187, Cl. 439-877.000.
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Siedziowski, Andrzej Z.; Bell, Lillian A.; and Kindsvogel, Wayne R., 5,567,584, Cl. 435-6.000.
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Bogatini, Jacob G.; and Belov, Andrey, 5,567,891, Cl. 75-244.000.
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Hébert, Francois; Kwan, Sze-Hon; and Bencuya, Izak, 5,567,634, Cl. 437-41.000.
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Goux, Nicolas; and Bene, Bernard, 5,567,320, Cl. 210-739.000.
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Linden, Galina; Domb, Abraham J.; Polachack, Itzhack; and Benita, Shimon, 5,567,685, Cl. 514-31.000.
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- Beretta, Grazia: See—  
Selva, Enrico; Beretta, Grazia; Borghi, Angelo; and Denaro, Maurizio, 5,567,676, Cl. 514-8.000.
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Richardson, David L.; Tung, James C. S.; and Berg, David C., 5,568,527, Cl. 376-245.000.
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Lemke, Timothy, 5,567,166, Cl. 439-74.000.
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Burgess, Clyde; Morrison, Gerald; and Berger, M. Steven, 5,566,630, Cl. 112-80.410.
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Rountree, Steven P.; and Berjaoui, Samir W., 5,568,449, Cl. 367-99.000.
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Dierschke, Eugene G.; and Bertien, John H., Jr., 5,567,976, Cl. 257-443.000.
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- Berry, Haskell B., Jr.: See—  
Miller, Charles R.; and Berry, Haskell B., Jr., 5,567,385, Cl. 422-28.000.
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Beilstein, Kenneth E., Jr.; Bertin, Claude L.; Cronin, John E.; Howell, Wayne J.; Leas, James M.; and Perlman, David J., 5,567,654, Cl. 437-209.000.
- Bertram, Gary B.: See—  
Durfee, Katherine E.; Barry, James C.; Bennett, Charles J.; Bertram, Gary B.; Kristansen, Mark; MacLellan, Bruce D.; and Sacino, Anthony, 5,568,243, Cl. 355-299.000.
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- Beta Squared, Inc.: See—  
Briganti, Joseph, 5,566,584, Cl. 74-490.070.



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- Klobucar, Joseph M.; and Bhushan, Dinesh, 5,567,229, Cl. 95-113.000.
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- Brodnax, Timothy B.; Bialas, John S., Jr.; King, Steven A.; LeBlanc, Johnny J.; Rickard, Dale A.; Spencer, Clark J.; and Stanley, Daniel L., 5,568,380, Cl. 364-184.000.
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- Bianchi, Giuseppe: See—
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- Bichon, Daniel: See—
- Schneider, Michel; Bichon, Daniel; Bussat, Philippe; Puginier, Jerome; and Hybl-Sutherland, Eva, 5,567,414, Cl. 424-9.520.
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- Biegelsen, David K.: See—
- Jackson, Warren B.; and Biegelsen, David K., 5,567,971, Cl. 257-431.000.
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- Bigelow, Louis K.: See—
- Kapoor, Rakesh R.; Nagy, Bela G.; and Bigelow, Louis K., 5,567,525, Cl. 428-408.000.
- Bigham, David L.: See—
- Bolton, Danny R.; and Bigham, David L., 5,566,469, Cl. 34-135.000.
- Biller, Scott A.: See—
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- Bilodeau, Victor L.: See—
- Phillips, Joseph R.; Weston, John D.; Bilodeau, Victor L.; Bain, Ronald G.; Barrett, Mark D.; Greenwood, Brian F.; and Pietrangelo, John, 5,567,279, Cl. 162-232.000.
- Binder, Rolf; and Witschi, Martin. Method and apparatus for repairing a yarn breakage in a pair of spinning units. 5,566,539, Cl. 57-261.000.
- BiolInvent International AB: See—
- Borrebaeck, Carl; Danielsson, Lena; and Möller, Susanna, 5,567,610, Cl. 435-240.200.
- Biotronics Corporation: See—
- Wang, Chang-Ning J.; and Wu, Kai-Yuan, 5,567,583, Cl. 435-6.000.
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- Biro, John P.: See—
- Moore, Lawrence P.; and Biro, John P., 5,566,985, Cl. 285-39.000.
- Bishop, Judith L.: See—
- Grande, David W.; Sundvik, Michael T.; Bishop, Judith L.; and Cole, Bernard F., 5,568,450, Cl. 367-131.000.
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- Biswell, David: See—
- Klatte, Fred; Aamodt, James; and Biswell, David, 5,567,405, Cl. 423-477.000.
- Bitner, Harry J., to Micrel, Inc. Voltage regulator that operates in either PWM or PFM mode. 5,568,044, Cl. 323-272.000.
- Bizen, Takehiko: See—
- Sasaki, Yasuyuki; and Bizen, Takehiko, 5,566,851, Cl. 220-441.000.
- BJ Services Co.: See—
- Tjon-Joe-Pin, Robert M.; and Beall, Brian B., 5,566,759, Cl. 166-300.000.
- Blaauw, Cornelis: See—
- Pakulski, Grzegorz; Blaauw, Cornelis; Margittai, Agnes; and Moore, Ronald, 5,567,659, Cl. 437-228.000.
- Black, Charles D.: See—
- Black, Wesley F.; and Black, Charles D., 5,566,934, Cl. 273-26.00A.
- Black, Donald L.: See—
- Fenton, David E.; Fox, Lucius S.; and Black, Donald L., 5,567,580, Cl. 430-567.000.
- Black, Jeffrey D.: See—
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- Black, Wesley F.; and Black, Charles D., to Stringliner Company. Baseball trainer. 5,566,934, Cl. 273-26.00A.
- Blackburn, Brian K.: See—
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- Blanco, Rafael: See—
- Curran, Brian W.; and Blanco, Rafael, 5,568,075, Cl. 327-172.000.
- Blankenship, Robert J.; Lee, Richard H.; and Jergins, Ernesto E., to Heat-It International Sales, Inc. Disposable liquid fuel burner. 5,567,146, Cl. 431-320.000.
- Blase, James L.; and McCreary, Charles H., to General Motors Corporation. Turbocharger drive and planet bearing therefor. 5,567,056, Cl. 384-286.000.
- Blättner, Susanne: See—
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- Blay, George A.: See—
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- Blecker, Armin, to Balzers-Pfeiffer GmbH. Arrangement for vacuum-tight sealing of electron tubes. 5,567,193, Cl. 445-70.000.
- Bleger, Claude: See—
- Muschelknautz, Claudius; Bleger, Claude; and Goehre, Jochen, 5,567,393, Cl. 422-168.000.
- Blinchikoff, Herman J.: See—
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- Blom, Kenneth M.: See—
- Martin, Lynn E.; Williamson, Jay D.; Blom, Kenneth M.; Vaughan, Jamieson; and Smith, Charles S., 5,566,518, Cl. 52-426.000.
- Blum, Joachim: See—
- Stoffler, Achim; Gensheimer, Valentin; Werber, Edgar; Hinz, Marc; Hummel, Peter; Wenzel, Jürgen; Volz, Albrecht; Blum, Joachim; Zschetsche, Hubert; and Straub, Manfred, 5,566,613, Cl. 101-350.000.
- Board of Governors, University of Alberta: See—
- Dovich, Norman J.; and Zhang, Jian Z., 5,567,294, Cl. 204-603.000.
- Board of Regents—Univ. of NE: See—
- Markin, Rodney S., 5,567,386, Cl. 422-65.000.
- Board of Regents, The University of Texas System: See—
- Hubbell, Jeffrey A.; Pathak, Chandrashekhar P.; Sawhney, Amarpreet S.; Desai, Neil P.; and Hill-West, Jennifer L., 5,567,435, Cl. 424-426.000.
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- Board Of Trustees Of The University Of Illinois, The: See—
- Holonyak, Nick, Jr.; and Dallesasse, John M., 5,567,980, Cl. 257-631.000.
- Bodenseewerk Gerätechnik GmbH: See—
- Wick, Detlev J.; and Senn, Hans J., 5,566,461, Cl. 33-326.000.
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- Boeing Company, The: See—
- Cundiff, Thomas R.; and Frye, Bradley A., 5,567,499, Cl. 428-116.000.
- Givler, Gregory C.; and Clark, Gregory L., 5,566,747, Cl. 165-47.000.
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- Bogan, Leonard E., Jr., to Rohm and Haas Company. Method for dispersing ceramic material in an aqueous medium. 5,567,353, Cl. 252-313.100.
- Bogatin, Jacob G.; and Belov, Andrey, to YBM Technologies, Inc. Rare earth element-metal-hydrogen-boron permanent magnet. 5,567,891, Cl. 75-244.000.
- Bogdan, Jeffrey A. Nut butter and jelly food slice. 5,567,454, Cl. 426-93.000.
- Bohlen, Peter: See—
- Backer, Joseph M.; Bohlen, Peter; and Sum, Phaik-Eng, 5,567,693, Cl. 514-154.000.
- Bohn, David D.; and Gerrard, Jesse M., to Hewlett-Packard Company. Beam splitter/combiner with path length compensator and method for making the same. 5,568,317, Cl. 359-618.000.
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- Boles, Fred: See—
- Theobald, Greg; Tavernese, Luigi; Boles, Fred; and Sugg, Edwin, 5,567,036, Cl. 362-80.000.
- Boliden Mineral AB: See—
- Lindgren, Per-Olov; Paulsson, Karin; and Svedberg, Anna, 5,567,223, Cl. 75-401.000.
- Boller, C. William. Tilting pad thrust bearing assembly. 5,567,057, Cl. 384-122.000.
- Bollinger, David S.: See—

- Schleisman, Anthony J.; and Bollinger, David S., 5,567,887, Cl. 73-863.120.
- Bolton, Danny R.; and Bigham, David L., to Fen-Tech Environmental, Inc. Drying apparatus with rotatable housing. 5,566,469, Cl. 34-135.000.
- Bonardi, G. Fonda. Thrust control system for gas-bearing turbocompressors. 5,567,129, Cl. 417-365.000.
- Bonnin, Joel: See—
- Schapiro, Joseph; Cheminaud, Jean-Claude; Gasse, Jean-Jacques; Hadzmann, Eric; and Bonnini, Joel, 5,567,236, Cl. 106-728.000.
- Borell, Michael: See—
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- Borg-Warner Automotive, Inc.: See—
- Kirkwood, Malcolm E., 5,566,802, Cl. 192-3.290.
- Borghi, Angelo: See—
- Selva, Enrico; Beretta, Grazia; Borghi, Angelo; and Denaro, Maurizio, 5,567,676, Cl. 514-8.000.
- Borgianini, Stephen A.: See—
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- Bathurst, Ian C.; Bradley, John D.; Tomei, L. David; and Barr, Philip J., 5,567,425, Cl. 424-195.100.
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- Barri, Sami A. I.; Bratton, Graham J.; and Naylor, Timothy D., 5,567,664, Cl. 502-4.000.
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- Breese, Douglas E., to Dana Corporation. Driveshaft tube having sound deadening coating. 5,566,721, Cl. 138-145.000.
- Breslow, Kenneth: See—
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- Focke, Heinz; Gosebruch, Harald; and Brethauer, Hans-Jürgen, 5,567,104, Cl. 414-331.000.
- Bricot, Claude: See—
- Lehureau, Jean C.; Massie, Francis; and Bricot, Claude, 5,566,982, Cl. 283-83.000.
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- Stoney, Clement P., III; Stendera, James W.; and Bridger, Keith, 5,567,519, Cl. 428-402.000.
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- Hall, James E.; Lawson, David F.; and Antkowiak, Thomas A., 5,567,815, Cl. 540-541.000.
- Briganti, Joseph, to Beta Squared, Inc. Flexure support for a fixture positioning device. 5,566,584, Cl. 74-490.070.
- Briner, Michael S.: See—
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- Brinkley, Kenneth L. Firearm monitoring device. 5,566,486, Cl. 42-1.020.
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- Kim, Choung U.; Misco, Peter F., Jr.; Wichtowski, John A.; Ueda, Yasutsugu; Hudyma, Thomas W.; Matiskella, John D.; D'Andrea, Stanley V.; Hoeft, Shelley E.; Miller, Raymond F.; Mansuri, Muzammil M.; and Bronson, Joanne J., 5,567,698, Cl. 514-210.000.
- Magnin, David R.; Biller, Scott A.; Dickson, John K., Jr.; Lawrence, R. Michael; and Sulsky, Richard B., 5,567,841, Cl. 562-23.000.
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- Czernakowski, Waldemar; Wetter, Hermann; and Burleigh, David W., 5,567,007, Cl. 297-250.100.
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- British Aerospace Public Limited Company: See—
- Ball, Craig E.; and Oliver, David J., 5,567,082, Cl. 403-407.100.
- British Nuclear Fuels PLC: See—
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- Barri, Sami A. I.; Bratton, Graham J.; and Naylor, Timothy D., 5,567,664, Cl. 502-4.000.
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- Marsh, Michael J. C.; Carson, Mark H.; Gouws, Gideon J.; Marais, Mario A.; and Hodson, Trevor M., 5,566,441, Cl. 29-600.000.
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- Brockmanns, Karl-Josef: See—
- Stahlecker, Fritz; and Brockmanns, Karl-Josef, 5,566,541, Cl. 57-408.000.
- Broder, Damon: See—
- Cavello, Christopher; Gluskoter, Steven; and Broder, Damon, 5,568,359, Cl. 361-686.000.
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- Brooks, John E.: See—  
Willis, Donald F.; Brooks, John E.; Adra, Hosni; and Hou, Hsieh S., 5,568,571, Cl. 382-254.000.
- Brooks, Robert: See—  
McCarthy, Kevin; and Brooks, Robert, 5,566,408, Cl. 5-682.000.
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Ishida, Kazuhito; Tokuda, Hiroshi; and Kimura, Shinji, 5,568,237, Cl. 355-260.000.
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Harper, Matthew C., 5,566,566, Cl. 72-336.000.
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Williams, Charles V., 5,567,105, Cl. 414-360.000.
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Smeal, Thomas W.; and Brownell, George L., 5,567,766, Cl. 525-44.000.
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Pamode, Gregg A.; Bruno, John E.; Rutherford, Denise R.; Sandison, Walter B.; and Schlei, Dietmar, 5,567,510, Cl. 428-288.000.
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Aviram, Ari; Brunsvold, William R.; Bucca, Daniel; Conley, Willard E., Jr.; and Seeger, David E., 5,567,569, Cl. 430-296.000.
- Brush, Robert W., Jr.: See—  
Henderson, Kevin G.; Jones, Timothy A.; Howland, Jeffrey C.; Brush, Robert W., Jr.; and Parker, Phil B., 5,567,185, Cl. 439-733.100.
- Brunton, Jeffrey H.: See—  
Lovell, Stephen J.; and Brunton, Jeffrey H., 5,567,591, Cl. 435-7.500.
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- Bubnis, Edward A., Jr.: See—  
Gray, Dale A.; Chmielewski, Michael; Bubnis, Edward A., Jr.; Burch, Michael G.; Heaps, Charles W.; Galante, Robert M.; and Wancowicz, Keith A., 5,568,402, Cl. 364-514.00C.
- Bucca, Daniel: See—  
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- Bucek, James R. Decorative light fixture covers for outdoor and indoor lights, 5,567,045, Cl. 362-363.000.
- Buch, Bruce: See—  
Leshay, Bruce; and Buch, Bruce, 5,568,627, Cl. 395-439.000.
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- Buck, Vernon E. Bicycle crank arm extender, 5,566,589, Cl. 74-594.100.
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- Buckman Laboratories Int'l., Inc.: See—  
Romocki, Julian, 5,567,675, Cl. 507-131.000.
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Romocki, Julian, 5,567,675, Cl. 507-131.000.
- Buisson, Claude: See—  
Schmuck, Jean-Claude; Jeannot, Claude; and Buisson, Claude, 5,567,922, Cl. 181-284.000.
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Vert, Michel; Mauduit, Jacques; and Bukh, Niels, 5,567,431, Cl. 424-426.000.
- Bull, David W.: See—  
Andersen, Christian J.; and Bull, David W., 5,568,118, Cl. 340-384.100.
- Bull HN Information Systems Inc.: See—  
Stewart, Wilbur; Demers, Richard L.; and Lange, Ronald E., 5,568,622, Cl. 395-375.000.
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- Bunker, S. Mark: See—  
Green, David J.; Lauritzen, Donald R.; Bunker, S. Mark; and Rose, Larry D., 5,566,973, Cl. 280-728.200.
- Burch, Michael G.: See—  
Gray, Dale A.; Chmielewski, Michael; Bubnis, Edward A., Jr.; Burch, Michael G.; Heaps, Charles W.; Galante, Robert M.; and Wancowicz, Keith A., 5,568,402, Cl. 364-514.00C.
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- Burgess, Clyde; Morrison, Gerald; and Berger, M. Steven, to Durkan Patterned Carpets, Inc. In-line needle bar arrangement for tufting machines, 5,566,630, Cl. 112-80.410.
- Burke, Louis C.: See—  
Drevline, Eric; and Burke, Louis C., 5,567,945, Cl. 250-372.000.
- Burkett, James D. Engine/transmission adapter kit, 5,566,591, Cl. 74-606.00R.
- Burleigh, David W.: See—  
Czernakowski, Waldemar; Wetter, Hermann; and Burleigh, David W., 5,567,007, Cl. 297-250.100.
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Queen, Lawrence E.; and Guess, Roy E., 5,567,256, Cl. 156-72.000.
- Burnham, Roy. Truck step guard, 5,566,962, Cl. 280-163.000.
- Burns, Barbara J.: See—  
Shuman, Ralph J.; and Burns, Barbara J., 5,567,753, Cl. 524-249.000.
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Oltman, John E.; Dopp, Robert B.; and Burns, John D., 5,567,538, Cl. 429-27.000.
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Wolf, Christian V.; and Burns, Thomas S., 5,566,636, Cl. 114-230.000.
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Stitt, David T.; Burrell, Gregory J.; Hu, Kwok-Yu; Monthony, James F.; and Sapitowicz, Robert, 5,567,598, Cl. 435-29.000.
- Busby, Andrew D.; and Vernon, Philip, to Asland Inc. Reclamation of ester-cured phenolic resin bonded foundry sands, 5,567,743, Cl. 523-143.000.
- Bushinsky, Shay H.: See—  
Ur, Shmuel, 5,568,550, Cl. 380-3.000.
- Bussat, Philippe: See—  
Schneider, Michel; Bichon, Daniel; Bussat, Philippe; Puginier, Jerome; and Hybl-Sutherland, Eva, 5,567,414, Cl. 424-9.520.
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Pejryd, Lars; Lundberg, Robert; and Butler, Edwin, 5,567,518, Cl. 428-378.000.
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Napiorkowski, John J.; Butler, Walter K., III; Cote, Mark P.; and Kroll, Thomas W., 5,567,916, Cl. 174-153.00G.
- Buuck, David C.; and Gloster, Mark, to Apple Computer, Inc. Transmission line having impedance set by reference plane fenestration, 5,568,107, Cl. 333-238.000.
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Galbi, David E.; and Purcell, Stephen C., 5,568,167, Cl. 348-589.000.
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Schapira, Joseph; Cheminaud, Jean-Claude; Gasse, Jean-Jacques; Hadzaman, Eric; and Bonnin, Joël, 5,567,236, Cl. 106-728.000.
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Schwarz, Alois, 5,566,525, Cl. 52-745.090.
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Banji, Cyrus; and Varadarajan, Ravi, 5,568,396, Cl. 364-491.000.
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Cadwell, John A., 5,566,678, Cl. 128-731.000.
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Barraud, Jean-Yves; Gervat, Sophie; Ratovelomanana, Victorin; Boutevin, Bernard; Parisi, Jean-Pierre; Cahuzac, Aline; and Jocteur, Robert, 5,567,794, Cl. 528-70.000.
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- Cal-West Equipment Company, Inc.: See—  
Swidler, Ronald, 5,567,756, Cl. 524-389.000.
- Calberg, Cedric: See—  
Mertens, Marc; Calberg, Cedric; Martinot, Lucien; Jerome, Robert; and Schrijnemackers, Jean, 5,567,297, Cl. 205-334.000.
- Caldwell, Karl N.: See—  
Classon, Robert J.; Caldwell, Karl N.; and Leazenbee, Louis O., 5,567,309, Cl. 210-233.000.
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- Calgon Corporation: See—  
Elliott, David L.; Hunter, Wood E.; and Falcione, Ronald J., 5,567,277, Cl. 162-163.000.
- Calico, Steve E.: See—  
O'Loughlin, James P.; and Calico, Steve E., 5,567,995, Cl. 307-109.000.
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Thom, Kelsey C., Jr., 5,566,902, Cl. 241-227.000.
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- Camco International Inc.: See—  
Kroeber, Richard B., 5,567,170, Cl. 439-186.000.
- Cameron, Charles G.: See—  
Allcock, Harry R.; O'Connor, Stephen J. M.; Napierala, Mark E.; Cameron, Charles G.; and Olmeijer, David, 5,567,783, Cl. 525-538.000.
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Zurowski, Edward J.; Campbell, James H.; Yurish, George E.; and Diaz, Dinah, 5,567,450, Cl. 426-5.000.
- Campillo, Anthony J.: See—  
Justus, Brian L.; Huston, Alan L.; Campillo, Anthony J.; and Merritt, Charles D., 5,568,496, Cl. 372-11.000.
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- Canet, Emmanuel: See—  
de Nanteuil, Guillaume; Portevin, Bernard; and Canet, Emmanuel, 5,567,804, Cl. 530-331.000.
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- Canon Kabushiki Kaisha: See—  
Murata, Tatsuo; Ishiwata, Kazuya; and Yoshioka, Toshifumi, 5,568,291, Cl. 359-67.000.
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Cannon, Gregory L.; Macko, William J.; Fuller, Gregory W.; Cannon, Nancy M.; and Raser, Gregg E., 5,568,134, Cl. 340-825.440.
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Ando, Masahiro, 5,568,339, Cl. 360-85.000.
- Aoyama, Keisuke, 5,568,222, Cl. 396-123.000.
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- Hamano, Hiroyuki, 5,568,197, Cl. 348-342.000.
- Ikedo, Yoshinori, 5,568,285, Cl. 358-518.000.
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- Makino, Jun, 5,568,559, Cl. 381-98.000.
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- Murata, Mitsushige; Miyake, Norifumi; and Onodera, Kazuo, 5,568,247, Cl. 355-324.000.
- Nagata, Satoshi, 5,567,061, Cl. 400-61.000.
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- Ohashi, Kazuhito, 5,568,276, Cl. 386-20.000.
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Gibot, Claude; and Bouguet, Philippe, 5,566,553, Cl. 62-603.000.
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Abbott, Thomas P.; Carlson, Kenneth D.; and Kleiman, Robert, 5,567,812, Cl. 536-128.000.
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Campbell, Fred A.; Fliin, Michael A.; Graves, Jeffrey D.; and Zuo, Lianghe, 5,566,660, Cl. 123-496.000.  
Childress, Dale B.; and Manning, Noah D., 5,567,123, Cl. 417-222.100.  
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Bianco, James A.; Woodson, Paul; Porubek, David; and Singer, Jack, 5,567,704, Cl. 514-263.000.
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Then, Alan M.; Snider, Gregory L.; Soave, Robert J.; and Tasker, G. William, 5,568,013, Cl. 313-532.000.
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Joshi, Ashok V.; Gordon, John H.; and Shen, Yousheng, 5,567,287, Cl. 204-265.000.
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Durrer, Bernhard; Bötschi, Hans; and Gruber, Peter, 5,568,133, Cl. 340-693.000.
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Bourgeois, Bernard; Fourrey, François; Quenel, David; and Zunino, Eric, 5,567,017, Cl. 297-452.200.
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Wallace, Paul S.; and Chan, Henry C., 5,566,891, Cl. 241-21.000.
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Pelella, Antonio R.; and Chan, Yuen H., 5,568,076, Cl. 327-174.000.
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Wang, Chin-Kun; and Chang, Cheng-Cheng, 5,567,658, Cl. 437-228.000.
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Lee, Jin-Yuan; Wei, John C.-S.; and Chao, Ying-Chen, 5,567,643, Cl. 437-60.000.
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Unruh, Jerry D.; Segmuller, Brigitte E.; Chapa, Gabriel R.; and Pryor, Kent E., 5,567,856, Cl. 568-454.000.
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Parish, Roger; Chapin, Frederic W.; Kono, Yoshiaki; and Tsukui, Makoto, 5,567,691, Cl. 514-94.000.
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Ur, Shmuel, 5,568,550, Cl. 380-3.000.
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Chu, Ron F.; Lim, Chet P.; and Loong, Sheau-Tan, 5,567,271, Cl. 156-659.110.
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Bai, Lijun; Kines, Joseph G.; and Chason, Marc, 5,568,353, Cl. 361-523.000.
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Ramm, Dov; and Chazan, Dan, 5,568,558, Cl. 381-94.000.
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Caprio, Craig A.; Van der Gaag, Michael R.; Hincley, Charles C.; and Chemelli, John B., 5,567,617, Cl. 435-287.200.
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Schapira, Joseph; Cheminaud, Jean-Claude; Gasse, Jean-Jacques; Hadzaman, Eric; and Bonnin, Joël, 5,567,236, Cl. 106-728.000.
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Houben, Jochen; Herrmann, Edgar; and Dahmen, Kurt, 5,567,478, Cl. 427-342.000.
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Fang, Yen-Kun; Chen, Fu-Yuan; and Chen, Jiann-Ruey, 5,567,940, Cl. 250-338.200.
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Welter, Thomas R.; Dickinson, David A.; and Chen, Keath T., 5,567,577, Cl. 430-544.000.
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Brasseur, Michael J.; and Chen, Kun-Long, 5,567,764, Cl. 524-755.000.
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Gluy, James D.; and Chene, William R., 5,566,983, Cl. 285-14.000.
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Chu, Chung K.; Cheng, Yung-Chi; Pai, Balakrishna S.; and Yao, Gang-Oing, 5,567,688, Cl. 514-46.000.
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Hanna, Paul K.; and Cheron, Teresa M., 5,567,801, Cl. 528-392.000.
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Lui, Henry Y.; and Cheung, Sammy S. Y., 5,568,081, Cl. 327-380.000.
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Jommi, Giancarlo; Chiarino, Dario; and Pagliarin, Roberto, 5,567,844, Cl. 564-209.000.
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Iwahara, Takahisa; Chiba, Makoto; Takahara, Tomoko; and Yonezawa, Kazuya, 5,567,833, Cl. 556-434.000.
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Turi, Mordechay; DeRossett, Edmund Z.; and Yang, Ching-Yun M., 5,567,376, Cl. 264-455.000.
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Naito, Takao; Chikama, Terumi; and Onaka, Hiroshi, 5,568,305, Cl. 359-191.000.
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Keefe, Brian J.; Childers, Winthrop D.; Steinfield, Steven W.; and Reid, W. Bruce, 5,568,171, Cl. 347-58.000.
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Sasisekharan, Ramnath; Moses, Marsha A.; Nugent, Matthew A.; Cooney, Charles L.; and Langer, Robert S., 5,567,417, Cl. 424-94.500.
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Vacanti, Joseph P.; and Freeman, Michael R., 5,567,612, Cl. 435-240.230.
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Kirchner, Bernard; and Chioccia, Rene, 5,567,952, Cl. 250-506.100.
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Ennis, Dan O.; Gooch, Robert E.; Chipman, Stephen R.; and Nelson, Jonathan D., 5,566,923, Cl. 251-315.040.
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Ogawara, Takeshi; Chisaka, Yukinori; and Fujihara, Masato, 5,566,741, Cl. 160-297.000.
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Nakajima, Yuji; and Taniguchi, Masahiko, 5,567,517, Cl. 428-364.000.
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Gray, Dale A.; Chmielewski, Michael; Bubnis, Edward A., Jr.; Burch, Michael G.; Heaps, Charles W.; Galante, Robert M.; and Wancowicz, Keith A., 5,568,402, Cl. 364-514.00C.
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Lee, Jue H.; and Cho, Seong M., 5,567,942, Cl. 250-353.000.
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Park, Gun C.; Choi, Do Y.; and Cho, Young H., 5,568,338, Cl. 360-85.000.
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Chen, Shih-Shiung; and Chou, Kern-Shen, 5,567,660, Cl. 437-231.000.
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Pal, Uday B.; Chou, Kuo-Chih; Yuan, Shi; and Hasham, Zain, 5,567,286, Cl. 204-246.000.
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Hubbell, Jeffrey A.; Elbert, Donald; Hill-West, Jennifer L.; Drumbeller, Paul D.; Chowdhury, Sanghamitra; and Sawhney, Amarpreet, 5,567,440, Cl. 424-484.000.
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Dovak, James; Bazil, Thomas E.; and Christian, Todd H., 5,567,074, Cl. 403-197.000.
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Vadgama, Pankaj M.; Christie, Ian M.; Benmakroha, Yazid M.; and Reddy, Subrayal M., 5,567,290, Cl. 204-415.000.
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Snell, William M.; Eaton, Rodney L.; White, David A.; and Kaliszewski, Thomas S., 5,566,585, Cl. 74-493.000.
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Ohi, Hideo; and Ozawa, Noriyuki, 5,567,825, Cl. 548-264.200.
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Sheu, Shing-Ren; Hsue, Chen-Chiu; and Chung, Chen-Hui, 5,567,970, Cl. 257-390.000.
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Hsu, Ching-Hsiang; Wong, Shyh-Chyi; Liang, Mong-Song; and Chung, Steve S., 5,567,631, Cl. 437-32.000.
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Vezzoli, Annibale; Ciaperoni, Aldemaro; and Furlan, Piero, 5,567,491, Cl. 428-35.700.
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Hall, Roger G.; Maier, Ludwig; and Fröstl, Wolfgang, 5,567,840, Cl. 562-11.000.
- Kapp-Schworer, Diethard; and Krauss, Rainer, 5,567,237, Cl. 118-58.000.
- Mittermeier, Ludwig; and Ruess, Wilhelm, 5,567,705, Cl. 514-275.000.
- Cimernan, Christopher D.: See—  
Hungerford, Roger L.; Cimernan, Christopher D.; Hufnagel, Paul J.; and Pieroni, Robert J., 5,567,120, Cl. 417-63.000.
- Cirrus Logic, Inc.: See—  
Du, He, 5,568,099, Cl. 331-57.000.
- Rao, G. R. Mohan, 5,567,963, Cl. 257-296.000.
- Rao, G. R. Mohan, 5,568,431, Cl. 365-189.120.
- Cisar, James M.: See—  
Kochis, Gary; Delaplane, Neil C.; Rebh, William R.; Cisar, James M.; and Chang, Yung-Fu, 5,568,357, Cl. 361-681.000.
- Ciza, Jean-Charles; and Moreno, Alain, to MTS Colorimetrie. Colorimeter and colorimetric control device. 5,568,266, Cl. 356-402.000.
- Claas oHG Beschränkt haftende offene Handelsgesellschaft: See—  
Gersmann, Manfred, 5,566,773, Cl. 180-9.500.
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- Clark, Gregory L.: See—  
Givler, Gregory C.; and Clark, Gregory L., 5,566,747, Cl. 165-47.000.
- Clark, James M.; Shoemaker, Kevin R.; and Warne, Robert L., to Arris Pharmaceutical Corporation. Recombinant production of chymase. 5,567,602, Cl. 435-226.000.
- Clark, John S.: See—  
Farchmin, David W.; and Clark, John S., 5,567,042, Cl. 362-241.000.
- Clarke, John M., to Caterpillar Inc. In-line engines having residual cycles and method of operation. 5,566,549, Cl. 60-620.000.
- Classon, Robert J.; Caldwell, Karl N.; and Leazenbee, Louis O., to Alcott Chromatography, Inc. Self-filtration cap. 5,567,309, Cl. 210-233.000.
- Clayson, Frank J.: See—



- Lockman, William J.; and Clayson, Frank J., 5,567,207, Cl. 8-444.000.  
 Cleary, James M. Counterflow catalytic device with interactive dilution control. 5,567,390, Cl. 422-111.000.  
 Clementi, Cesare: See—  
 Crisenza, Giuseppe; and Clementi, Cesare, 5,568,418, Cl. 365-185.010.  
 Cline, Michael W. Hose storage system. 5,566,898, Cl. 242-379.000.  
 Clouston, Robert D.; Graham, John S., Jr.; and Zeiger, John H., to International Business Machines Corporation. Resolving conflicting topology information. 5,568,605, Cl. 395-182.020.  
 Co-Op Chemical Co. Ltd.: See—  
 Kinami, Nobuyuki; Okamoto, Masami; Shinoda, Yoshihiro; Sekura, Tsuyoshi; and Yamaguchi, Akira, 5,567,758, Cl. 524-401.000.  
 Coach, Thomas P.: See—  
 Schmidt, Melvin J.; Coach, Thomas P.; Hause, Glenn C.; Galowitz, Dennis A.; Wyman, James P.; Hendricks, Robert A.; Van Steeg, Lawrence J.; and Evans, Harold H., 5,566,507, Cl. 49-428.000.  
 Coating Machinery Systems, Inc.: See—  
 Long, Richard L., Jr.; and Barber, Donald E., 5,567,238, Cl. 118-303.000.  
 Coburn Optical Industries, Inc.: See—  
 Cook, Merritt S., 5,567,198, Cl. 451-384.000.  
 Coca-Cola Company, The: See—  
 Rounbehler, David P.; Fine, David H.; Achter, Eugene K.; MacDonald, Stephen J.; and Dennison, Daniel B., 5,567,623, Cl. 436-158.000.  
 Cocensys, Inc.: See—  
 Upasani, Ravindra B., 5,567,830, Cl. 552-575.000.  
 Coe, Charles G.; Gaffney, Thomas R.; Li, Hong-Xin; Xiong, Yanliang; Martens, Johan A.; and Jacobs, Pierre A. Li-exchanged low silica EMT-containing metallosilicates. 5,567,407, Cl. 423-700.000.  
 Cohen, Ariel: See—  
 Blackledge, John W.; Cohen, Ariel; Katz, Sagi; and Merkin, Cindy M., 5,568,619, Cl. 395-281.000.  
 Cohen, Yakov, to State of Israel-Ministry of Defense Armament Development Authority-Rafael. System and a method for the instantaneous determination of the frequencies and angles of arrival of simultaneously incoming RF signals. 5,568,154, Cl. 342-443.000.  
 Coin Acceptors, Inc.: See—  
 Vogt, Carl L.; and Lovall, Ronald E., 5,566,809, Cl. 194-348.000.  
 Cole, Bernard F.: See—  
 Grande, David W.; Sundvik, Michael T.; Bishop, Judith L.; and Cole, Bernard F., 5,568,450, Cl. 367-131.000.  
 Cole, Graydon W.: See—  
 Grgrich, Keith A.; and Cole, Graydon W., 5,567,118, Cl. 417-46.000.  
 Cole, Louis F.: See—  
 Jacobsen, Kenneth H.; and Cole, Louis F., 5,566,866, Cl. 222-495.000.  
 Cole, Toni H. Animal training method and apparatus. 5,566,645, Cl. 119-712.000.  
 Coleman, Robert R.: See—  
 Schakel, Eric G.; Coleman, Robert R.; Matthews, Kent R.; and Morton, Lowell K., 5,567,504, Cl. 428-167.000.  
 Collier, John B., Jr.: See—  
 Ali, Debra R.; and Collier, John B., Jr., 5,566,847, Cl. 217-57.000.  
 Collins & Aikman Products Co.: See—  
 Ziegler, Stephen A.; Weinle, Paul L.; and Moot, Lorence M., 5,567,497, Cl. 428-95.000.  
 Collins, David, to Amgen Inc. Liposome preparation and material encapsulation method. 5,567,433, Cl. 424-450.000.  
 Collins, John L. F. C. Planar horn array microwave antenna. 5,568,160, Cl. 343-778.000.  
 Color Prelude, Inc.: See—  
 Gunderman, Anthony J.; Moir, David; O'Connell, Robert M., deceased, 5,566,693, Cl. 132-333.000.  
 Colorama Creations, a division of Life Lines, Inc.: See—  
 Swenson, Robert E., 5,566,831, Cl. 206-767.000.  
 ColorCode Unlimited, Inc.: See—  
 Shamir, Harry A., 5,568,555, Cl. 380-51.000.  
 Combust, Christopher E., to Multi Service Corporation. Audio crossover circuit. 5,568,560, Cl. 381-99.000.  
 Combustion Engineering, Inc.: See—  
 Cote, Gary A., 5,567,919, Cl. 177-50.000.  
 Combustion Tec, Inc.: See—  
 Joshi, Mahendra L.; Broadway, Lee; Mohr, Patrick J.; and Nitzman, Jack L., 5,567,141, Cl. 431-8.000.  
 Commissariat à l'Energie Atomique: See—  
 Gaud, Pierre; and Sibuet, Henri, 5,566,442, Cl. 29-603.140.  
 Ladirat, Christian; Pilliol, Henri; and Gnlika, Jean-Pierre, 5,567,218, Cl. 65-327.000.  
 Commonwealth Scientific and Industrial Research Organisation: See—  
 Bockenham, Peter; and Ly, Nhan G., 5,566,480, Cl. 38-17.000.  
 Compagnie Generale Des Matieres Nucleaires: See—  
 Ladirat, Christian; Pilliol, Henri; and Gnlika, Jean-Pierre, 5,567,218, Cl. 65-327.000.  
 Compaq Computer Corporation: See—  
 Marsh, Edward K.; Nelson, Richard A.; McCleerey, Earl W.; DeFibaugh, George R.; and Verdun, Gary J., 5,567,168, Cl. 439-181.000.  
 Compaq Computer Corporation: See—  
 McCleerey, Earl W.; DeFibaugh, George R.; Marsh, Edward K.; Nelson, Richard A.; and Verdun, Gary J., 5,567,169, Cl. 439-181.000.  
 Wooten, David R., 5,568,621, Cl. 395-292.000.  
 Comptel Domotique Inc.: See—  
 Longtin, Pierre, 5,566,879, Cl. 236-46.000.  
 Comsat Corporation: See—  
 Hemmati, Farhad, 5,568,473, Cl. 370-18.000.  
 Cone, Richard E., II, to Cosco, Inc. Portable infant seat having a detachable base. 5,567,008, Cl. 297-256.160.  
 Conley, Ralph F., to Graph-It, Inc. System and method for encrypting sensitive information. 5,568,556, Cl. 380-54.000.  
 Conley, Willard E., Jr.: See—  
 Aviram, Ari; Brunsfold, William R.; Bucca, Daniel; Conley, Willard E., Jr.; and Seeger, David E., 5,567,569, Cl. 430-296.000.  
 Connolly, Dennis A.: See—  
 Leong, Kerry; and Connolly, Dennis A., 5,567,076, Cl. 405-11.000.  
 Conrad, Daniel J.: See—  
 Schlein, Robert J.; Conrad, Daniel J.; and Kuchersky, Joseph S., 5,566,616, Cl. 101-483.000.  
 Conrad, Neal D.: See—  
 Carson, Stephen W.; Dirks, Ryan R.; Papanu, Victor D.; and Conrad, Neal D., 5,567,235, Cl. 106-287.160.  
 Conroy, Brian G.: See—  
 Brown, Trevor P.; Conroy, Brian G.; Cox, Stephen J.; Gardner, Christopher; Larke, Roger D.; Marshall, Barry; and Svendsen, Jan, 5,566,882, Cl. 238-343.000.  
 Consep, Inc.: See—  
 Long, Roger H., 5,566,500, Cl. 43-121.000.  
 Considine, Richard, to Cornucopia Products Inc. Structural panel jig apparatus and method of use. 5,566,931, Cl. 269-111.000.  
 Constable, Douglas W., to Eastman Kodak Company. Filmstrip and flexible battery unit. 5,567,543, Cl. 429-127.000.  
 Contico International, Inc.: See—  
 Foster, Donald D.; and Nelson, Philip L., 5,566,885, Cl. 239-333.000.  
 Continental Aktiengesellschaft: See—  
 Thurow, Gerhard, 5,566,929, Cl. 267-64.240.  
 Continental White Cap, Inc.: See—  
 James, Albert J., 5,566,846, Cl. 215-230.000.  
 Conwell, Stanley L.; and Wood, William P., to Minnesota Mining and Manufacturing Company. Method for making sintered abrasive grain. 5,567,150, Cl. 432-14.000.  
 Cook, Merritt S., to Coburn Optical Industries, Inc. Compression sleeve ophthalmic lens chuck. 5,567,198, Cl. 451-384.000.  
 Cook, Paul C.: See—  
 Thomson, Graham A.; Neilson, Peter J.; and Cook, Paul C., 5,568,282, Cl. 358-489.000.  
 Cook, Richard B., to Opta Food Ingredients, Inc. Shellac dispersions and coatings, and method of forming aqueous-based shellac dispersions and coatings. 5,567,438, Cl. 424-474.000.  
 Cool Care Consulting, Inc.: See—  
 Vejdani, Mehrdad; and Kilarski, Zbigniew, 5,566,608, Cl. 99-475.000.  
 Coon, Warren P.; Watkins, Stuart C.; and Kropp, Charles M., to Sunward Technologies, Inc. Method and apparatus for calibration of a transducer flying height measurement instrument. 5,567,864, Cl. 73-1.001.  
 Coone, Malcolm; and Kelley, Thomas L., to Davis-Lynch, Inc. Telescoping casing joint for landing a casting string in a well bore. 5,566,772, Cl. 175-321.000.  
 Cooney, Charles L.: See—  
 Sasisekharan, Ramnath; Moses, Marsha A.; Nugent, Matthew A.; Cooney, Charles L.; and Langer, Robert S., 5,567,417, Cl. 424-94.500.  
 Cooper, Arthur J.: See—  
 Tien, Jien-Heh J.; Menzia, Jerome A.; and Cooper, Arthur J., 5,567,823, Cl. 548-204.000.  
 Cooper Industries, Inc.: See—  
 Hassler, Stephen P.; Johnson, Stephen P.; and Lapp, John, 5,566,423, Cl. 16-319.000.  
 Kettner, Konrad K., 5,567,886, Cl. 73-862.230.  
 Cooper, Sherman: See—  
 Warden, Harold; and Cooper, Sherman, 5,567,175, Cl. 439-490.000.  
 Coopersmith, Jonathan; Weiss, Nathaniel; and Madden, Henry, to Lyrrus Incorporated. Transducer assembly for a stringed musical instrument. 5,567,903, Cl. 84-723.000.  
 Cord, Albert B.; Cord, Cameron W.; Gehrich, David N.; Jensen, Gregory N.; and Parr, Ted K., to Intercontinental Chemical Corporation. Oscillator screen cleaning apparatus. 5,566,697, Cl. 134-109.000.  
 Cord, Cameron W.: See—  
 Cord, Albert B.; Cord, Cameron W.; Gehrich, David N.; Jensen, Gregory N.; and Parr, Ted K., 5,566,697, Cl. 134-109.000.  
 Cordoliani, Jean-François: See—  
 Bru-Magniez, Nicole; Cordoliani, Jean-François; Thauvin, Gérard; and Drouin, Jehan-Yves, 5,567,437, Cl. 424-466.000.  
 Cords, Bruce R.: See—  
 Hei, Robert D.; Wei, Guange-jong J.; Cords, Bruce R.; and Lokkesmoe, Keith D., 5,567,444, Cl. 424-616.000.  
 Corkell, Anthony F.: See—  
 Tiller, Byron K.; Allard, David J.; Au, Connie Y.; Canova, Francis J., Jr.; Hsieh, Daniel M.; Goodwin, Julie F.; Johnson, Debra A. G.; Lanier, Charles S.; Lewis, James R.; Stout, Jean L.; Villafana, William; Yee, Raymond L.; Padgett, Russell S.; Ferrier, Robert B.; Corkell, Anthony F.; Murakami, Thomas T.; DeBauche, Bradley J.; Whitley, Wayne P.; Osborn, Neal A.; Beatty, Brent A.; Cox, Roger L.; Wulf, James C.; and Rivero, Jose L., 5,568,536, Cl. 379-58.000.  
 Corning Incorporated: See—  
 Wu, Shy-Hsien, 5,568,652, Cl. 419-2.000.  
 Cornucopia Products Inc.: See—  
 Considine, Richard, 5,566,931, Cl. 269-111.000.

- Cortex Pharmaceuticals, Inc.: See—  
 Kelleher, Judith A.; and Eveleth, David D., 5,567,724, Cl. 514-368.000.  
 Cortjens, Leo M.; Franklin, Kenneth A.; Mays, Richard C.; and Smith, Curtis M., to Videoconferencing Systems, Inc. Network videoconferencing system. 5,568,183, Cl. 348-15.000.  
 Coscarella, Anthony; Sachs, Martin W.; and Temple, Joseph, to International Business Machines Corporation. Indirect addressing of channels via logical channel groups. 5,568,648, Cl. 395-862.000.  
 Cosco, Inc.: See—  
 Cone, Richard E., II, 5,567,008, Cl. 297-256.160.  
 Coslett, W. Andrew: See—  
 Srinivasan, Ramesh; Coslett, W. Andrew; Guerrero, Leonardo B. L.; and McCoombs, Donald V., 5,567,501, Cl. 428-137.000.  
 Cote, Denis, to Les Entreprises Denis Darveau. Pressure and recirculating pump for concentrating a solution. 5,567,312, Cl. 210-321.660.  
 Cote, Gary A., to Combustion Engineering, Inc. Gravimetric feeding system for boiler fuel and sorbent. 5,567,919, Cl. 177-50.000.  
 Cote, Mark P.: See—  
 Napiorkowski, John J.; Butler, Walter K., III; Cote, Mark P.; and Kroll, Thomas W., 5,567,916, Cl. 174-153.000.  
 Cotilletta, Joseph. Cosmetic tester module. 5,566,829, Cl. 206-581.000.  
 Cotteret, Jean; Audoussert, Marie P.; LaGrange, Alain; and Vandenbosche, Jean J., to L'Oreal. Oxidation dye composition for keratinous fibres comprising a para-aminophenol, a meta-aminophenol and a para-phenylenediamine and/or a bis(phenylalkylenediamine). 5,567,421, Cl. 424-70.100.  
 Cotton, Therese: See—  
 Tarcha, Peter J.; Rohr, Thomas E.; Markese, James J.; Cotton, Therese; and Rospendowski, Bernard N., 5,567,628, Cl. 436-525.000.  
 Couch, Harold T.: See—  
 Birbara, Philip J.; Couch, Harold T.; Genovesi, Joseph E.; and Rethke, Donald W., 5,567,389, Cl. 422-28.000.  
 Couderc, Bernard; Szafranski, Pierre; Bejean, Alain; and Arduin, Joël, to Salomon S.A. Device for modifying the pressure distribution of a ski along its sliding surface. 5,566,966, Cl. 280-602.000.  
 Counts, Michael W.; Thompson, John A.; Lavoie, Jack O.; and Aleksejczyk, Robert A., to Henkel Corp. Wet treatment of leather hides. 5,567,205, Cl. 8-94.180.  
 Cowger, Bruce, to Hewlett-Packard Company. Printing method and apparatus for registering dots. 5,568,172, Cl. 347-19.000.  
 Cowles, Russell W.: See—  
 Sederlund, Edward R.; Thomas, Nadene T.; Lindesmith, Robert J.; and Cowles, Russell W., 5,568,615, Cl. 395-200.080.  
 Cox, George B., Jr.: See—  
 Paulus, Donald E.; and Cox, George B., Jr., 5,566,544, Cl. 60-258.000.  
 Cox, James R.: See—  
 Qi, Ru-Yi; Karam, Ronald E.; Reddy, Vaddi B.; and Cox, James R., 5,567,351, Cl. 252-301.40R.  
 Cox, Jennifer. Smoke filter with automated clogging prevention for open-hearth fireplaces. 5,566,667, Cl. 126-507.000.  
 Cox, Roger L.: See—  
 Tiller, Byron K.; Allard, David J.; Au, Connie Y.; Canova, Francis J., Jr.; Hsieh, Daniel M.; Goodwin, Julie F.; Johnson, Debra A. G.; Lanier, Charles S.; Lewis, James R.; Stout, Jean L.; Villafana, William; Yee, Raymond L.; Padgett, Russell S.; Ferrier, Robert B.; Corkell, Anthony F.; Murakami, Thomas T.; DeBauche, Bradley J.; Whitley, Wayne P.; Osborn, Neal A.; Beatty, Brent A.; Cox, Roger L.; Wulf, James C.; and Rivero, Jose L., 5,568,536, Cl. 379-58.000.  
 Cox, Stephen J.: See—  
 Brown, Trevor P.; Conroy, Brian G.; Cox, Stephen J.; Gardner, Christopher; Larke, Roger D.; Marshall, Barry; and Svendsen, Jan, 5,566,882, Cl. 238-343.000.  
 Coy, David H.: See—  
 Henderson, Lee A.; Coy, David H.; and Garry, Robert F., Jr., 5,567,805, Cl. 530-350.000.  
 Coyard, Henri; and Deligny, Philippe, to Societe Francaise Hoechst. Acrylate-styrene resins cross-linked by a blocked polyisocyanate preparation and uses as paint and/or lacquer. 5,567,762, Cl. 524-590.000.  
 Craig, Stephen R.; Welsh, Paul B.; and Henderson, Robert C., to Hewlett-Packard Company. Planar manifold assembly. 5,567,868, Cl. 73-23.420.  
 Craig, William S.; Harper, John R.; Kostel, Paul J.; Parker, Jonathan R.; and Vedvick, Thomas S., to La Jolla Cancer Research Foundation. Processes for the purification of human recombinant decorin and the detection of guanidinium ions. 5,567,807, Cl. 530-395.000.  
 Crawford, Brian B.: See—  
 Robinson, Jeffrey C.; and Crawford, Brian B., 5,567,933, Cl. 250-227.150.  
 Creative Learning Systems, Inc.: See—  
 Durkin, James C.; and Foster, Francine P., 5,567,164, Cl. 434-432.000.  
 Creative Products Inc. of Rossville: See—  
 Clapp, Clarence P.; and Torrey, George S., 5,567,456, Cl. 426-116.000.  
 Creatura, John A.; McKnight, Catherine A.; Duggan, Michael J.; Dombroski, Thomas C.; Kelly, Bernard A.; Mahabadi, Hadi K.; and Cunningham, Michael F., 5,567,562, Cl. 430-108.000.  
 Cure, Jorge. Method and apparatus for reducing the strength of pulsating magnetic fields. 5,568,112, Cl. 335-214.000.  
 Curran, Brian W.; and Blanco, Rafael, to International Business Machines Corporation. Timing signal generator. 5,568,075, Cl. 327-172.000.  
 Currin, R. Thomas, Jr.: See—  
 Dover, B. Troy; Kamienski, Conrad W.; Morrison, Robert C.; and Currin, R. Thomas, Jr., 5,567,474, Cl. 427-213.300.  
 Curry, Paul F. Highly wind resistant pre-assembled relocatable building structure with continuous sheet outer wall. 5,566,515, Cl. 52-79.120.  
 Custom Metalcraft, Inc.: See—  
 Rude, Arthur D.; and Horine, Vinton F., 5,566,848, Cl. 220-4.120.  
 Cutler, Maxwell: See—  
 Priestner, William B.; and Cutler, Maxwell, 5,568,209, Cl. 351-243.000.  
 Cypress Semiconductor Corporation: See—  
 Lui, Henry Y.; and Cheung, Sammy S. Y., 5,568,081, Cl. 327-380.000.  
 Cyprus Amax Minerals Company: See—  
 Hart, Wm. Mark, 5,567,018, Cl. 299-111.000.  
 Cyrix Corporation: See—  
 McDermott, Mark W.; and Turner, John E., 5,568,067, Cl. 326-55.000.  
 CytRx Corporation: See—



- Emanuele, R. Martin; Balasubramanian, Mannarsamy; and Allaudeen, Hameedsulthan S., 5,567,859, Cl. 568-624.000.
- Czernakowski, Waldemar; Wetter, Hermann; and Burleigh, David W., to Britax Romer Kindersicherheit GmbH; and Britax-Excelsior Limited. Infant safety seat. 5,567,007, Cl. 297-250.100.
- Czerwoniak, Erich. See—
- Pfeffer, Jochen G.; and Czerwoniak, Erich, 5,566,833, Cl. 209-273.000.
- Daewoo Electronics Co., Ltd.: See—
- Lee, Hyun-Moo, 5,568,334, Cl. 360-107.000.
- Park, Chan Soo, 5,567,162, Cl. 434-307.00A.
- Park, Chan-Kyu, 5,568,462, Cl. 369-112.000.
- Yoo, Jang-Yeol, 5,567,023, Cl. 303-119.200.
- Yoon, Sang-Ho, 5,568,139, Cl. 341-67.000.
- DaFoe, John. Two-part blind rivet. 5,567,099, Cl. 411-54.000.
- Dahl, Ernest A. Fire detector. 5,568,130, Cl. 340-630.000.
- Dahlen, Richard. See—
- Lutovsky, Arnold J.; and Dahlen, Richard, 5,567,028, Cl. 312-246.000.
- Dahlgren, Derek A.; and Wasson, Jeffrey B., to Dana Corporation. Pre-detent tactile feedback assembly for a fluid control valve. 5,566,710, Cl. 137-556.000.
- Dahm, Horst. See—
- Dobler, Karl-Otto; Klett, Gustav; Dahm, Horst; and Joher, Rainer, 5,567,035, Cl. 362-66.000.
- Dahmen, Kurt. See—
- Houben, Jochen; Herrmann, Edgar; and Dahmen, Kurt, 5,567,478, Cl. 427-342.000.
- Dai Nippon Insatsu Kabushiki Kaisha. See—
- Sasaki, Yasuyuki; and Bizen, Takehiko, 5,566,851, Cl. 220-441.000.
- Dai Nippon Printing Co., Ltd.: See—
- Harada, Nobuyuki; and Eguchi, Hiroshi, 5,567,669, Cl. 503-227.000.
- Nakamura, Osamu; and Ikegami, Takeshi, 5,567,555, Cl. 430-29.000.
- Daido Tokushuko Kabushiki Kaisha. See—
- Noda, Toshiharu; Sato, Katsuki; and Saka, Tsutomu, 5,567,383, Cl. 420-584.100.
- Daimler-Benz Aerospace Airbus GmbH. See—
- Diekmann, Thomas; Geyer, Norbert; and Martens, Wilhelm, 5,566,910, Cl. 244-216.000.
- Daimler-Benz AG. See—
- Maly-Schreiber, Martha; and Michel, Josef, 5,567,546, Cl. 429-207.000.
- Rumez, Werner; and Sumser, Siegfried, 5,566,655, Cl. 123-306.000.
- Stückrad, Björn; and Löhr, Karsten, 5,566,832, Cl. 209-9.000.
- Dainippon Screen Manufacturing Co., Ltd.: See—
- Kusuda, Tatsufumi; Kouno, Motohiro; Nakatani, Ikuyoshi; and Hirae, Sadao, 5,568,252, Cl. 356-72.000.
- Dalgleish, Rick. Illuminated bag. 5,567,054, Cl. 383-10.000.
- Dallas Semiconductor Corporation. See—
- Jones, Brian W.; and Morton, Alan M., 5,567,993, Cl. 307-43.000.
- Dallesasse, John M.: See—
- Holonyak, Nick, Jr.; and Dallesasse, John M., 5,567,980, Cl. 257-631.000.
- Daly, Theodore J. Use of CGRP in treating alopecia. 5,567,679, Cl. 514-12.000.
- Dame, Paul G.: See—
- McClung, Duane G.; and Dame, Paul G., 5,567,027, Cl. 312-219.000.
- Damon Ventures, LLC. See—
- Gill, Jeffrey J., 5,567,003, Cl. 296-173.000.
- Dana Corporation. See—
- Baronovsky, Richard A.; Kaplan, Martin; and Senak, Peter, Jr., 5,567,999, Cl. 310-194.000.
- Breese, Douglas E., 5,566,721, Cl. 138-145.000.
- Dahlgren, Derek A.; and Wasson, Jeffrey B., 5,566,710, Cl. 137-556.000.
- Gochenour, Daniel V.; Adams, Barry T.; Kummer, Martin E.; Davis, Christopher M.; Lepard, Steven D.; Bassett, Michael L.; and Schlosser, Kevin F., 5,566,804, Cl. 192-70.250.
- Sommer, Randy L., 5,566,805, Cl. 192-87.160.
- Willford, George A.; Baer, Kurt R.; Loeffler, John M.; and Schwaiger, Dennis D., 5,566,579, Cl. 74-335.000.
- D'Andrea, Stanley V.: See—
- Kim, Choung U.; Misco, Peter F., Jr.; Wichtowski, John A.; Ueda, Yasutsugu; Hudyma, Thomas W.; Matiskella, John D.; D'Andrea, Stanley V.; Hoeft, Shelley E.; Miller, Raymond F.; Mansuri, Muzamil M.; and Bronson, Joanne J., 5,567,698, Cl. 514-210.000.
- Danelia, Evgeny P., to OTD Products L.L.C. Dispersion strengthened copper. 5,567,382, Cl. 419-19.000.
- Dang, Loanne P.: See—
- Keeler, Thomas C.; Dang, Loanne P.; and Kelly, Chuck S., 5,568,544, Cl. 379-273.000.
- Daniel, Edwin R.: See—
- White, George W.; Daniel, Edwin R.; Kirkland, James E.; and Shively, James S., 5,566,712, Cl. 137-587.000.
- Danielsson, Lena. See—
- Borrebaeck, Carl; Danielsson, Lena; and Möller, Susanna, 5,567,610, Cl. 435-240.200.
- Dao, Huy-Can. See—
- Foulkes, Harvey B.; Warrin, George E.; Dao, Huy-Can; and Perdreaux, Rene, 5,567,153, Cl. 433-119.000.
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Rebhan, Herbert, 5,567,452, Cl. 426-72.000.
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Laskaris, Evangelos T.; and Dorri, Bizhan, 5,568,104, Cl. 335-216.000.
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Bank, Howard M.; and Nguyen, Binh T., 5,567,834, Cl. 556-442.000.
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Manzouji, Ryuko; and Okawa, Tadashi, 5,567,789, Cl. 528-18.000.
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- Dowdy, Jacklyn M.: See—  
Kochis, Richard L.; and Dowdy, Jacklyn M., 5,568,281, Cl. 358-475.000.
- Downs, William: See—  
Chu, Paul; Downs, William; Doyle, John B.; and Smith, Peter V., 5,567,394, Cl. 422-177.000.
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Chu, Paul; Downs, William; Doyle, John B.; and Smith, Peter V., 5,567,394, Cl. 422-177.000.
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O'Leary, Thomas M.; Drake, Peter R.; Merrill, Philip R., deceased, 5,568,105, Cl. 333-81.00R.
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- Drewitz, Hugues, to H.G. Kalish, Inc. Apparatus for applying a heat-shrinkable band to the neck of a container. 5,566,527, Cl. 53-295.000.
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Van Winkle, D. Wayne; and Hurst, Bobby G., 5,566,753, Cl. 166-84.100.
- Dries, John E.; and Edwards, James M., to White Consolidated Industries, Inc. Dishwasher with balancing vanes on pump impeller. 5,566,696, Cl. 134-104.100.
- Drouin, Jehan-Yves: See—  
Bru-Magniez, Nicole; Cordoliani, Jean-François; Thauvin, Gérard; and Drouin, Jehan-Yves, 5,567,437, Cl. 424-466.000.
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Inoue, Kazuhiro; Ito, Tetsuo; Kawaguchi, Takayuki; Aono, Katsutoshi; Okuno, Satoshi; and Yano, Toshiro, 5,567,690, Cl. 514-54.000.
- Drujon, Frederic; Daude, Gerard; and Gosse, Cecile, to Saint Gobain Vitrage International. Method of treatment of a pane for the bonding of a peripheral profile. 5,567,530, Cl. 428-429.000.
- Drumbeller, Paul D.: See—  
Hubbell, Jeffrey A.; Elbert, Donald; Hill-West, Jennifer L.; Drumbeller, Paul D.; Chowdhury, Sanghamitra; and Sawhney, Amarpreet, 5,567,440, Cl. 424-484.000.
- Drysdale, Walter: See—  
Snell, Rusty B.; and Drysdale, Walter, 5,566,961, Cl. 280-47.350.
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- Du Pont de Nemours, E. I., and Company: See—  
Amuti, Kofi S.; Hong, Wonpyo; and Semple, Joseph E., 5,567,670, Cl. 504-230.000.
- Dorothy, Robert G., 5,567,330, Cl. 216-18.000.
- Face, Dean W.; and Myers, Kirsten E., 5,567,673, Cl. 505-329.000.
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- Johnson, Melvin H.; and Willis, Frank M., 5,568,581, Cl. 385-78.000.
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- Yang, Zhenyu, 5,567,846, Cl. 564-307.000.
- Dubin, Mark D.: See—  
Buchanan, Alan L.; Jenden, Donald J.; Ament, Marvin E.; Breslow, Kenneth; and Dubin, Mark D., 5,567,736, Cl. 514-642.000.
- DuBois, Donald W.; Maloney, Bernard A.; and Pickens, Stanley R., to PPG Industries, Inc. Method of operating chlor-alkali cells. 5,567,298, Cl. 205-350.000.
- Dubois, Laurent: See—  
de Laforcade, Vincent; Guillaumat-Louvard, Fanny; and Dubois, Laurent, 5,567,073, Cl. 401-190.000.
- Dubreuil, Gerard: See—  
Dubreuil, Jean; Dubreuil, Gerard; and Masson, Joseph, 5,566,767, Cl. 172-708.000.
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- Dudney, Nancy J.: See—  
Bates, John B.; and Dudney, Nancy J., 5,567,210, Cl. 29-623.500.
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Bhatt, Ashwinkumar C.; Duffy, Thomas P.; Knight, Jeffrey A.; and Walsh, James P., 5,566,448, Cl. 29-840.000.
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Creatura, John A.; McKnight, Catherine A.; Duggan, Michael J.; Dombroski, Thomas C.; Kelly, Bernard A.; Mahabadi, Hadi K.; and Cunningham, Michael F., 5,567,562, Cl. 430-108.000.
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- Dulout, Jean-Michael: See—  
Lebrun, Erik; Astegno, Jean-Paul; Macera, Alain; Rouches, Alexandre; and Dulout, Jean-Michael, 5,566,605, Cl. 99-302.00C.
- Duncan, Richard L.: See—  
Wert, Joseph D.; and Duncan, Richard L., 5,568,065, Cl. 326-33.000.
- Dunleavy, Thomas J.; and Kemmerer, Walter K., to Risdon Corporation. Mascara applicator having slotted bristles. 5,567,072, Cl. 401-129.000.
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- Dunn, Paul M.: See—  
Greco, Robert C.; Robinson, Michael J.; and Dunn, Paul M., 5,568,540, Cl. 379-89.000.
- Dunn, Stephen J.: See—  
Funk, Erwin D.; Henricson, Kaj; and Dunn, Stephen J., 5,567,274, Cl. 162-49.000.
- Dupont, Serge: See—  
Dehennau, Claude; and Dupont, Serge, 5,567,505, Cl. 428-188.000.
- Dupont-Delhouven, Nathalie, to Nestec S.A. Animal food compositions and preparation thereof. 5,567,466, Cl. 426-641.000.
- Dupre, Lawrence W.: See—  
Ineson, David J.; and Dupre, Lawrence W., 5,567,998, Cl. 310-90.000.
- Dupuis, Francis A.; and Nasr, Ali M., to Endura Pumps International, Inc. Seal for pump having an internal gas pump. 5,567,132, Cl. 417-420.000.
- Dura Automotive Systems, Inc.: See—  
Smale, Randall D.; and Novotny, Gary A., 5,566,581, Cl. 74-475.000.
- Durchschlag, Gerald, to VAE Aktiengesellschaft. Device for locking of movable switch parts. 5,566,912, Cl. 246-448.000.
- Durfée, Katherine E.; Barry, James C.; Bennett, Charles J.; Bertram, Gary B.; Kristansen, Mark; McLellan, Bruce D.; and Sacino, Anthony, to Eastman Kodak Company. Cleaning mechanism for a transfer drum of a reproduction apparatus. 5,568,243, Cl. 355-299.000.
- Durkan Patterned Carpets, Inc.: See—  
Burgess, Clyde; Morrison, Gerald; and Berger, M. Steven, 5,566,630, Cl. 112-80.410.
- Durkin, James C.; and Foster, Francine P., to Creative Learning Systems, Inc. Method of facilitating learning using a learning complex. 5,567,164, Cl. 434-432.000.
- Durr Industries, Inc.: See—  
Klobucar, Joseph M.; and Bhushan, Dinesh, 5,567,229, Cl. 95-113.000.
- Durrer, Bernhard; Bötschi, Hans; and Gruber, Peter, to Cerberus AG. Fire alarm. 5,568,133, Cl. 340-693.000.
- Durmagel, Klaus, to MAN Roland Druckmaschinen AG. Method for cleaning a rotating cylinder in a printing machine. 5,566,617, Cl. 101-483.000.
- Dussinger, Thomas E.; and Smart, David C., to Eastman Kodak Company. Lens clamping light-baffle in camera assemblage. 5,568,218, Cl. 396-529.000.
- Dvorak, Charles A.: See—  
Kowalczyk, Bruce A.; and Dvorak, Charles A., 5,567,818, Cl. 546-97.000.
- Dyllick-Brenzinger, Rainer: See—  
Beck, Karin H.; Bellaire, Helmut; Kormann, Claudius; and Dyllick-Brenzinger, Rainer, 5,567,233, Cl. 106-20.00R.
- Dzelzkalns, Brenda. No-slip underclothing. 5,566,392, Cl. 2-73.000.
- E.R. Squibb & Sons, Inc.: See—  
Patel, Ramesh N.; Szarka, Laszlo J.; and Partyka, Richard, 5,567,614, Cl. 435-280.000.
- E-Systems, Inc.: See—  
Shannon, Charles P., 5,568,608, Cl. 395-183.200.
- Eastlake, Donald E., 3rd, to Digital Equipment Corporation. Method for improving the processing and storage performance of digital signature schemes. 5,568,554, Cl. 380-25.000.
- Eastman Chemical Company: See—  
Shih, Wayne K.; and Turney, Robert J., 5,567,511, Cl. 428-314.800.
- Webster, Dean C.; Su, Chih-Heng J., deceased; and Foster, Charles H., 5,567,527, Cl. 428-412.000.
- Eastman, David L.: See—  
Edwards, Steven D.; Hickey, Daniel K.; Olson, Dave A.; Muntean, George L.; Shah, Chandresh; and Eastman, David L., 5,566,658, Cl. 123-470.000.
- Eastman Kodak Company: See—  
Agostinelli, John A.; and Mehra, Madhav, 5,568,216, Cl. 396-515.000.
- Constable, Douglas W., 5,567,543, Cl. 429-127.000.



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- Dussinger, Thomas E.; and Smart, David C., 5,568,218, Cl. 396-529,000.
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- Gourlaouen, Luc R.; Friour, Gerard A. D.; Martin, Didier J.; and Strauel, Philippe, 5,567,579, Cl. 430-567,000.
- Jamzadeh, Feraydoon S., 5,568,269, Cl. 358-298,000.
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- Manico, Joseph A.; and Petrichuk, Dwight J., 5,568,219, Cl. 396-281,000.
- Rabbani, Majid, 5,568,570, Cl. 382-238,000.
- Stiehler, Wayne E., 5,568,214, Cl. 396-411,000.
- Takizawa, Yoshinori; and Yoshida, Naoka, 5,568,568, Cl. 382-220,000.
- Tombs, Thomas N., 5,568,228, Cl. 355-208,000.
- Welter, Thomas R.; Dickinson, David A.; and Chen, Keath T., 5,567,577, Cl. 430-544,000.
- Easton, Dan T.; and Easton, David J., to Easton Goers, Inc. Device to measure and provide data for plant population and spacing variability, 5,568,405, Cl. 364-561,000.
- Easton, David J.: See—
- Easton, Dan T.; and Easton, David J., 5,568,405, Cl. 364-561,000.
- Easton Goers, Inc.: See—
- Easton, Dan T.; and Easton, David J., 5,568,405, Cl. 364-561,000.
- Eaton Corporation: See—
- Deppe, David W., 5,566,652, Cl. 123-90,350.
- Dovak, James; Bazil, Thomas E.; and Christian, Todd H., 5,567,074, Cl. 403-197,000.
- Gluyts, James D.; and Chene, William R., 5,566,983, Cl. 285-14,000.
- Krueger, Donald M.; and Kwiatek, David J., 5,567,148, Cl. 431-354,000.
- Eaton, Jay S. Self-loading tobacco trailer, 5,567,109, Cl. 414-679,000.
- Eaton, Rodney L.: See—
- Snell, William M.; Eaton, Rodney L.; White, David A.; and Kaliszewski, Thomas S., 5,566,585, Cl. 74-493,000.
- Ebara Corporation: See—
- Kobayashi, Makoto; Yamamoto, Masakazu; Miyake, Yoshio; and Ise-moto, Koji, 5,567,133, Cl. 417-423,700.
- Ebihara & Company: See—
- Ebihara, Katsuji, 5,566,599, Cl. 83-76,100.
- Ebihara, Katsuji, to Ebihara & Company. Cutter apparatus, 5,566,599, Cl. 83-76,100.
- Ebner, Cindy A.: See—
- Webb, Adele A.; Ebner, Cindy A.; and Hamann, Mary V., 5,566,413, Cl. 5-653,000.
- Ebrey, John S.: See—
- Beadle, Robin E.; Chauhan, Mahesh; Ebrey, John S.; Lewis, forwerth D.; Powell, Robin C.; Ralton, Robert J.; Robinson, Michael; and Shep-pard, Alan F., 5,566,582, Cl. 74-475,000.
- Eckardt, Andreas: See—
- Creutzmann, Edmund; Eckardt, Andreas; Hoffmann, Joachim; Kopp, Walter; and Windele, Josef, 5,568,241, Cl. 355-259,000.
- Eckel Manufacturing Company, Inc.: See—
- Stuart, Randolph L., 5,566,769, Cl. 173-149,000.
- Eckert, Steven J.: See—
- Watanabe, Shunso F.; Eckert, Steven J.; and Engelman, Gerald H., 5,566,703, Cl. 137-1,000.
- Eckoldt, Uwe: See—
- Bauer, Helmut; Derisavi-Fard, Foad; Eckoldt, Uwe; Gehrman, Ralf; and Kickel, Heribert, 5,567,284, Cl. 204-256,000.
- Ecolab Inc.: See—
- Hei, Robert D.; Wei, Guange-jong J.; Cords, Bruce R.; and Lokkesmoe, Keith D., 5,567,444, Cl. 424-616,000.
- Ecopic Corporation: See—
- Pugh, William H.; and Kottzieper, Dieter, 5,566,694, Cl. 134-64,000.
- Eda, Masami: See—
- Toda, Hiroshi; Kawasaki, Akihiro; Eda, Masami; Takemoto, Shinichi; and Sakuraba, Tamotsu, 5,568,236, Cl. 355-259,000.
- Edwards, James M.: See—
- Dries, John E.; and Edwards, James M., 5,566,696, Cl. 134-104,100.
- Edwards, Steven D.; Hickey, Daniel K.; Olson, Dave A.; Muntean, George L.; Shah, Chandresh; and Eastman, David L., to Cummins Engine Company, Inc. Clamping load distributor and top stop for a fuel injector, 5,566,658, Cl. 123-470,000.
- Efcavitch, J. William: See—
- Madabhushi, Ramakrishna S.; Menchen, Steven M.; Efcavitch, J. Wil-liam; and Grossman, Paul D., 5,567,292, Cl. 204-451,000.
- Egashira, Yasuo; and Yamasaki, Isao, to Matsushita Electric Industrial Co., Ltd. Multifunction printer, 5,567,068, Cl. 400-625,000.
- Eggerstorfer, Vilmar: See—
- Ferber, Otto; and Eggerstorfer, Vilmar, 5,568,245, Cl. 355-309,000.
- Eguchi, Hiroshi: See—
- Harada, Nobuyuki; and Eguchi, Hiroshi, 5,567,669, Cl. 503-227,000.
- Eguchi, Tadashi; Momose, Katsumi; Narumi, Hiroji; Nishimura, Tetsuharu; Hosaka, Kotaro; Tsukiji, Masaki; and Ishizuka, Koh, to Canon Kabushiki Kaisha. Head positioning using a disk drive mounted to a rotating table, 5,568,337, Cl. 360-78,110.
- Eheim GmbH & Co. KG.: See—
- Weidenmann, Walter; Luetzau, Frank v.; Frank, Gerhard; Schmidt, Michael; Mayer, Ferdinand; and Herold, Ulrich, 5,567,315, Cl. 210-123,000.
- Ehm, Thomas: See—
- Verding, Markus; and Ehm, Thomas, 5,568,355, Cl. 361-676,000.
- Ehrlich, Robert M., to Sanofi Bio-Industries, Inc. Pecto-cellulosic product from whole citrus peel and other materials, 5,567,462, Cl. 426-425,000.
- Eiler, Robyn F. Bedding ensemble, 5,566,411, Cl. 5-494,000.
- Einzigler, Mark D.: See—
- Hazen, James L.; Einziger, Mark D.; and Denton, William K., 5,567,475, Cl. 427-221,000.
- Eisenbraun, Kenneth D., to United Industrial Trading Corp. Power cutting shears, 5,566,454, Cl. 30-228,000.
- Eitan, Boaz; Kazerounian, Reza; Shubut, Alex; and Pasternak, John H., to WaferScale Integration Inc. Unit for stabilizing voltage on a capacitive node, 5,568,085, Cl. 327-546,000.
- Eitel, John E.: See—
- Minghetti, Ettore; Eitel, John E.; and Welter, Carol A., 5,567,745, Cl. 523-202,000.
- Ekenberg, Steven J.; and Brisco, Paula R. G., to Promega Corporation. Multisample magnetic separation device, 5,567,326, Cl. 210-695,000.
- Ekins, Robert; and Guillard, Alain, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude. Process and unit for supplying a gas under pressure to an installation that consumes a constituent of air, 5,566,556, Cl. 62-654,000.
- Ekman, Gunnar, to Nitro Nobel AB. Particulate explosive, manufacturing method and use, 5,567,911, Cl. 149-46,000.
- Elantec, Inc.: See—
- Pierret, Joseph R., 5,568,090, Cl. 330-255,000.
- Elbert, Donald: See—
- Hubbell, Jeffrey A.; Elbert, Donald; Hill-West, Jennifer L.; Drumbeller, Paul D.; Chowdhury, Sanghamitra; and Sawhney, Amarpreet, 5,567,440, Cl. 424-484,000.
- Electronics & Telecommunications Research Inst.: See—
- Jung, Sang-Don; and Song, Seok-Ho, 5,567,363, Cl. 264-2,600.
- Elephant Chain Block Company Limited: See—
- Wada, Yasuo; Ueno, Yoshio; and Honda, Munenobu, 5,566,925, Cl. 254-358,000.
- Elf Atochem North America, Inc.: See—
- Carson, Stephen W.; Dirks, Ryan R.; Papanu, Victor D.; and Conrad, Neal D., 5,567,235, Cl. 106-287,160.
- Crooker, Richard M.; Elsheikh, Maher Y.; Kelton, Anthony D.; Walker, Morris P.; and Wright, Danny W., 5,567,281, Cl. 203-6,000.
- Elf Sanofi: See—
- Gubin, Jean; and Inion, Henri, 5,567,827, Cl. 548-484,000.
- Eli Lilly and Company: See—
- Basinski, Margaret; DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Schoner, Brigitte E.; Shields, James E.; and Smiley, David L., 5,567,803, Cl. 530-324,000.
- Bruns, Robert F., Jr.; Gehlert, Donald R.; Howbert, J. Jeffrey; and Lun, William H. W., 5,567,714, Cl. 514-324,000.
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- Chang, Jen P., 5,567,620, Cl. 436-87,000.
- Cullinan, George J.; and Yen, Terence T., 5,567,713, Cl. 514-324,000.
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- Dodge, Jeffrey A.; Lindstrom, Terry D.; Luger, Charles W., III; and Staten, Gilbert S., 5,567,820, Cl. 546-202,000.
- Dodge, Jeffrey A., 5,567,828, Cl. 549-51,000.
- Palkowitz, Alan D., 5,567,712, Cl. 514-231,200.
- el Kouni, Mahmoud H.: See—
- Sommadosi, Jean-Pierre; and el Kouni, Mahmoud H., 5,567,689, Cl. 514-50,000.
- Elliott, David L.; Hunter, Wood E.; and Falcione, Ronald J., to Calgon Corporation. Cellulosic, modified lignin and cationic polymer composition and process for making improved paper or paperboard, 5,567,277, Cl. 162-163,000.
- Ellis, Steve: See—
- Thomas, Donald; Ellis, Steve; Kriz, Paul; and Scott, Gordon, 5,566,813, Cl. 198-495,000.
- Elliston, Tom. Improved coil tubing injector unit, 5,566,764, Cl. 166-385,000.
- Elpatronic AG: See—
- Baessler, Peter; Marriott, Alan; Maurer, Urs; and Oberholzer, Marcel, 5,567,335, Cl. 219-61,200.
- Elsheikh, Maher Y.: See—
- Crooker, Richard M.; Elsheikh, Maher Y.; Kelton, Anthony D.; Walker, Morris P.; and Wright, Danny W., 5,567,281, Cl. 203-6,000.
- Elsoufi, Walid: See—
- Wells, James; Johnson, David B.; Tennant, Edward A.; and Elsoufi, Walid, 5,568,280, Cl. 358-468,000.
- Elum, Charles R. Crossword puzzle game and method of generating the same, 5,566,942, Cl. 273-153,000.
- Emanuele, R. Martin; Balasubramanian, Mannarsamy; and Allaudeen, Hameedsulthan S., to CytRx Corporation. Polyoxypolyene/polyoxyethylene copolymers with improved biological activity, 5,567,859, Cl. 568-624,000.
- Emde, Herbert: See—
- Kissener, Wolfram; Emde, Herbert; and Fessenbecker, Achim, 5,567,854, Cl. 568-424,000.

- Emerick, Alan J.: See—
- Zalesinski, Jerzy M.; and Emerick, Alan J., 5,567,984, Cl. 257-697,000.
- Emerson Electric Co.: See—
- Davis, Wendell, 5,566,464, Cl. 33-712,000.
- Davis, Wendell, 5,568,058, Cl. 324-772,000.
- Emert, Jacob; Lundberg, Robert D.; and Lohse, David J., to Exxon Chemical Patents Inc. Gel-free dispersant additives useful in oleaginous compositions, derived from functionalized and grafted alpha-olefin polymers, 5,567,344, Cl. 508-452,000.
- Emery, Roy W. Carry out tray with fixed panel, 5,566,852, Cl. 220-556,000.
- Emery, Vincent: See—
- Grundt, Jane; and Emery, Vincent, 5,567,582, Cl. 435-5,000.
- Emhart Inc.: See—
- Chiff, Fred Y. F.; Mark, Darren M.; Segien, Donald J., Jr.; and Woolley, Curtis S., 5,566,707, Cl. 137-359,000.
- Emigh, Jonathan D.: See—
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- Calenoff, Emanuel, 5,567,594, Cl. 435-7,320.
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- Siehr, Norbert; and Schmitt, Philipp, 5,566,896, Cl. 241-171,000.
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- Weigand, Michael; Ganss, Werner; and Grehn, Martin, 5,567,059, Cl. 384-560,000.
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- Weder, Donald E., 5,566,439, Cl. 29-469,500.
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Namur, Marc, 5,566,635, Cl. 114-97.000.
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Cassidy, William A.; Schwartz, James R.; and Farris, Richard D., 5,567,359, Cl. 510-135.000.
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Tavazzani, Claudio; Fassina, Andrea; and Stefani, Fabrizio, 5,568,342, Cl. 361-18.000.
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Schwendimann, Christian; Keller, Jacques; Auger, Jean-Luc; and Fatrez, Philippe, 5,567,354, Cl. 252-387.000.
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Lacz, David J.; Skochdopole, Todd R.; Hagemeier, Larry D.; Fees, Anita M.; Thomas, Brian; and McSweeney, Gary J., 5,567,473, Cl. 427-211.000.
- Felder, Anton. Method for the hydraulic branching of an open stream and hydraulically working channel branch. 5,567,079, Cl. 405-80.000.
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Baier, Paul-Walter; Felbauer, Tobias; Zimmermann, Thomas; and Klein, Anja, 5,568,519, Cl. 375-343.000.
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Ruhl, Robert C.; and Felice, Ralph A., 5,567,398, Cl. 422-197.000.
- Fellman, Michael L.: See—  
Marshall, Andrew C.; and Fellman, Michael L., 5,567,500, Cl. 428-116.000.
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Bolton, Danny R.; and Bigham, David L., 5,566,469, Cl. 34-135.000.
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Demeny, Rodney L.; and Hurley, Robert B., 5,566,406, Cl. 4-620.000.
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Law, Kam S.; Robertson, Robert; Kollrack, Michael; Lee, Angela T.; Takehara, Takako; Feng, Guofu J.; and Maydan, Dan, 5,567,476, Cl. 427-255.700.
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Ferber, Andrew R., 5,567,037, Cl. 362-104.000.
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Allen, Scott I.; Ferguson, Michael; and Tung, Harvey, 5,567,488, Cl. 428-34.100.
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- Ferrier, Robert B.: See—  
Tiller, Byron K.; Allard, David J.; Au, Connie Y.; Canova, Francis J., Jr.; Hsieh, Daniel M.; Goodwin, Julie F.; Johnson, Debra A. G.; Lanier, Charles S.; Lewis, James R.; Stout, Jean L.; Villafana, William; Yee, Raymond L.; Padgett, Russell S.; Ferrier, Robert B.; Corkell, Anthony F.; Murakami, Thomas T.; DeBauche, Bradley J.; Whitley, Wayne P.; Osborn, Neal A.; Beatty, Brent A.; Cox, Roger L.; Wulf, James C.; and Rivero, Jose L., 5,568,536, Cl. 379-58.000.
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Dudek, Lesley P.; Dewar, Vaughan L.; Ferringer, Michael C.; and Torpey, Peter A., 5,568,169, Cl. 347-43.000.
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Weber, Eduard; Rohr, René; and Suter, Jürg, 5,567,321, Cl. 210-376.000.
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Nelson, John C.; Fesler, Robert M.; and Vanderwerf, Dennis F., 5,568,324, Cl. 359-742.000.
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Kissener, Wolfram; Emde, Herbert; and Fessenbecker, Achim, 5,567,854, Cl. 568-424.000.
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Lindner, Joachim; Sudau, Jörg; and Schierling, Bernhard, 5,566,803, Cl. 192-70.170.
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Grossbach, Rudolf; Huber, Peter; Lierke, Ernst-Günter; Fiedler, Michael; Weiss, Rainer; Neri, Armando; Santin, Giancarlo; and Squarzon, Giovanni, 5,566,686, Cl. 131-84.400.
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Adam, Peter; and Fiedler, Rudolf, 5,566,592, Cl. 74-606.00R.
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Schulze, Joachim; Haerzschel, Reinhard; and Figge, Reiner, 5,567,750, Cl. 524-3.000.
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Ashe, John B., 5,567,053, Cl. 374-155.000.
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Reinhart, Terry L.; and Piper, Vaughn J., 5,566,631, Cl. 112-235.000.
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Rounbehler, David P.; Fine, David H.; Achter, Eugene K.; MacDonald, Stephen J.; and Dennison, Daniel B., 5,567,623, Cl. 436-158.000.
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Desai, Sureshchandra G.; Hessel, John F.; Urfer, Allen D.; Allen, Charles B.; and Fischer, Stephen A., 5,567,808, Cl. 536-4.100.
- Fisher-Rosemount Systems, Inc.: See—  
Wojcisz, Wilhelm K., 5,568,378, Cl. 364-164.000.
- Fitch, James G. Folding swivel chair. 5,567,014, Cl. 297-344.210.
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Holber, William M.; Smith, Donald K.; Besen, Matthew M.; Fitzner, Matthew P.; and Georgelis, Eric J., 5,568,015, Cl. 315-39.000.
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Johnstone, Peter; Emmerton, Gary; Fitzpatrick, Paul J.; Hanara, Perehama; and Wyborn, Lindsay G., 5,566,530, Cl. 53-441.000.
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- Fleming, James M.: See—  
Siegfried, Robert H.; Fleming, James M.; Stalford, Michael J.; and Janson, John P., 5,567,472, Cl. 427-180.000.
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- Fletcher Challenge Canada Limited: See—  
Offerhaus, Douglas H.; Lilburn, James E.; and Silver, Hugh D., 5,567,273, Cl. 162-199.000.
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Camplin, Fred A.; Flinn, Michael A.; Graves, Jeffrey D.; and Zuo, Lianghe, 5,566,660, Cl. 123-496.000.
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Bialik, Leon; and Flomen, Felix, 5,568,588, Cl. 395-2.320.
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Basinski, Margaret; DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Schoner, Brigitte E.; Shields, James E.; and Smiley, David L., 5,567,803, Cl. 530-324.000.
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Lemieux, Christine S., 5,567,599, Cl. 435-172.300.
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Castensson, Staffan; Florin-Robertsson, Ebba; Hökby, Elvy; and Thomé, Sirkka, 5,567,677, Cl. 514-12.000.
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- Flynn, Richard M.: See—  
Moore, George G. I.; Flynn, Richard M.; and Guerra, Miguel A., 5,567,765, Cl. 524-801.000.
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Dover, B. Troy; Kamienski, Conrad W.; Morrison, Robert C.; and Currin, R. Thomas, Jr., 5,567,474, Cl. 427-213.300.
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- Foamex, L.P.: See—  
Free, Sharon A., 5,567,740, Cl. 521-128.000.
- Foamseal, Inc.: See—  
Madan, Sanjeev; and Hyde-Smith, Peter K., 5,567,763, Cl. 524-701.000.
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Focke, Heinz; Gosebruch, Harald; and Brethauer, Hans-Jürgen, 5,567,104, Cl. 414-331.000.
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- Folk, Rudolf: See—  
Steinberger, Wolfgang; Folk, Rudolf; and Malik, Reinhart, 5,567,060, Cl. 384-569.000.
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Lever, James H.; Gooch, Gordon E.; and Folton, Edward P., 5,567,078, Cl. 405-61.000.
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Sharpe-Geisler, Bradley A.; and Fontana, Fabiano, 5,568,066, Cl. 326-39.000.
- Fontana, Robert E.; and Santini, Hugo A. E., to International Business Machines Corporation. Multi-layer gap structure for high resolution magnetoresistive read head. 5,568,335, Cl. 360-113.000.
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Hamburg, Douglas R.; and Zorka, Nicholas G., 5,566,663, Cl. 123-679.000.
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- Messih, Isis A., 5,566,662, Cl. 123-674.000.
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Johnson, Arthur A.; Lindee, Scott A.; and Sandberg, Glenn A., 5,566,600, Cl. 83-77.000.
- Forrester, Randolph. Sports shoe having rotatable traction pad. 5,566,478, Cl. 36-134.000.
- Forsheda-Stefa GmbH: See—  
Preisendoerfer, Gerhard, 5,566,955, Cl. 277-207.00A.
- Forsyth, Michael J.; Mediate, Bruno A.; and Pecot, David E., to Weatherchem Corporation. Rotor-type dispenser. 5,566,850, Cl. 220-253.000.
- Foster, Charles H.: See—  
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- Foster, Donald D.; and Nelson, Philip L., to Contico International, Inc. Low cost trigger sprayer having plug with integral valve element. 5,566,885, Cl. 239-333.000.
- Foster, Francine P.: See—  
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- Foster, Robert F.; Hillman, Joseph T.; and LeBlanc, Rene E., to Sony Corporation; and Materials Research Corporation. Apparatus for producing thin films by low temperature plasma-enhanced chemical vapor deposition using a rotating susceptor reactor. 5,567,243, Cl. 118-730.000.
- Foster, Robert F.; Hillman, Joseph T.; and Arora, Rikhit, to Sony Corporation; and Materials Research Corporation. Process for plasma enhanced anneal of titanium nitride. 5,567,483, Cl. 427-535.000.
- Foster Wheeler Energia Oy: See—  
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- Basak, Arun K.; and Sellakumar, Karukkampalayam M., 5,567,090, Cl. 406-155.000.
- Foster Wheeler Energy Corporation: See—  
Abdullally, Iqbal F., 5,567,228, Cl. 95-109.000.
- Foulkes, Harvey B.; Warrin, George E.; Dao, Huy-Can; and Perdreux, Rege, to Dentsply Research & Development Corp. Transducer activated tool tip. 5,567,153, Cl. 433-119.000.
- Fourcart, Jean: See—  
Abdul-Malak, Nabil; Fourcart, Jean; and Huc, Alain, 5,567,806, Cl. 530-356.000.
- Fourrey, François: See—  
Bourgeois, Bernard; Fourrey, François; Quenel, David; and Zunino, Eric, 5,567,017, Cl. 297-452.200.
- Fowles, Martin: See—  
Morris, Michael A.; Fowles, Martin; and Mackrodt, William C., 5,567,667, Cl. 502-302.000.
- Fox, Lucius S.: See—  
Fenton, David E.; Fox, Lucius S.; and Black, Donald L., 5,567,580, Cl. 430-567.000.
- Foy, Dennis: See—  
Hochstein, Peter A.; and Foy, Dennis, 5,568,136, Cl. 340-903.000.
- Framatome: See—  
Pascal, Yves, 5,566,647, Cl. 122-34.000.
- Francx, Joris I., to N.V. Raychem S.A. Electrical connector. 5,567,173, Cl. 439-418.000.
- Frank, Gerhard: See—  
Weidenmann, Walter; Luetzau, Frank v.; Frank, Gerhard; Schmidt, Michael; Mayer, Ferdinand; and Herold, Ulrich, 5,567,315, Cl. 210-123.000.
- Frank, Steven J., to IDEA Laboratories, Inc. Container having a seal puncturing device. 5,566,845, Cl. 215-208.000.
- Franken, Joachim: See—  
Lepsius, Tilwin; Gierenz, Gerhard; Tranelis, Klaus; Reinfelder, Gerd-Ruediger; Franken, Joachim; and Halm, Hans, 5,567,071, Cl. 401-68.000.
- Franken, Richard F.: See—  
Beers, Gregory E.; Franken, Richard F.; and Smadi, Mithkal M., 5,568,064, Cl. 326-31.000.
- Frankland, James D., to New Castle Industries, Inc. Roll for processing uniformly flat products. 5,567,448, Cl. 425-363.000.
- Franklin, Kenneth A.: See—  
Cortjens, Leo M.; Franklin, Kenneth A.; Mays, Richard C.; and Smith, Curtis M., 5,568,183, Cl. 348-15.000.
- Franson, Alvin D., to Motorola, Inc. A/D converter subsystem with half linear buffer amplifier. 5,568,149, Cl. 341-156.000.
- Franz, Lothar; Mohr, Juergen; Schreyer, Peter; Thomas, Juergen; Oppenlaender, Knut; and Guenther, Wolfgang, to BASF Aktiengesellschaft. Fuel additives, their preparation and gasoline engine fuels containing the additives. 5,567,845, Cl. 564-278.000.
- Franz, Markus: See—  
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- Franz Plasser Bahnmaschinen-Industriegesellschaft M.B.H.: See—  
Theurer, Josef, 5,566,619, Cl. 104-2.000.
- Theurer, Josef, 5,567,196, Cl. 451-347.000.
- Franzke, Klaus; and Keller, Stefan, to Robert Bosch GmbH. Method and device for controlling an electromagnetic load. 5,566,659, Cl. 123-490.000.
- Fraunhofer Gesellschaft zur Förderung der angewandten Forschung e.V.: See—  
Körner, Klaus; Holger, Fritz; Nyarsik, Lajos; Spur, Günter; and Uhlmann, Eckart, 5,568,256, Cl. 356-359.000.
- Frazier, Ian A.; and McClelland, Thomas W. Apparatus and method for removing plastic bags and other debris from trees. 5,566,538, Cl. 56-239.000.
- Frazzitta, Joseph. Method and apparatus for use in offset printing. 5,566,618, Cl. 101-492.000.
- Fredericks Company, The: See—  
Drubetsky, Emil; and Taylor, Donald R., Jr., 5,568,053, Cl. 324-463.000.
- Fredin, Gerald J.: See—  
Gentry, Timothy W.; Fredin, Gerald J.; and Riedl, Daniel A., 5,568,629, Cl. 395-441.000.
- Free, Sharon A., to Foamex, L.P. Conductive polyurethane foam compositions and method for producing same. 5,567,740, Cl. 521-128.000.
- Freeman, Michael R.: See—  
Vacanti, Joseph P.; and Freeman, Michael R., 5,567,612, Cl. 435-240.230.
- Frei, Walter: See—  
Lauer, Armin; Frei, Walter; and Schobinger, Alfred, 5,566,586, Cl. 74-523.000.
- Freitas, Danny L.: See—



Killian, Earl A.; Riordan, Thomas J.; Freitas, Danny L.; Dixit, Ashish B.; and Hennessy, John L., 5,568,630, Cl. 395-375.000.  
 Freiler, Walter. Self-supporting building structure. 5,566,514, Cl. 52-79.500.  
 French, John F.: See—  
 Flynn, Gary A.; Beight, Douglas W.; Warshawsky, Alan M.; Mehdi, Shujaath; French, John F.; and Kehne, John H., 5,567,814, Cl. 540-521.000.  
 Friour, Gerard A. D.: See—  
 Gourlaouen, Luc R.; Friour, Gerard A. D.; Martin, Didier J.; and Strauel, Philippe, 5,567,579, Cl. 430-567.000.  
 Fritsch, Thomas, to Braun Aktiengesellschaft. Tool coupling assembly for a handheld blender. 5,567,047, Cl. 366-129.000.  
 Fritz Stahlecker: See—  
 Stahlecker, Fritz; and Brockmanns, Karl-Josef, 5,566,541, Cl. 57-408.000.  
 Friwo Silberkraft Gesellschaft fuer Batterietechnik mbH: See—  
 Bauer, Helmut; Derisavi-Fard, Foad; Eckoldt, Uwe; Gehrmann, Ralf; and Kieckel, Heribert, 5,567,284, Cl. 204-256.000.  
 Frontier, Inc.: See—  
 Fenn, Gordon W.; and Ryoo, Young M., 5,566,648, Cl. 122-367.300.  
 Fenn, Gordon W.; and Lee, Yong S., 5,567,147, Cl. 431-328.000.  
 Fröstl, Wolfgang: See—  
 Hall, Roger G.; Maier, Ludwig; and Fröstl, Wolfgang, 5,567,840, Cl. 562-11.000.  
 Frye, Bradley A.: See—  
 Cundiff, Thomas R.; and Frye, Bradley A., 5,567,499, Cl. 428-116.000.  
 FSI International: See—  
 Mehta, Jitesh, 5,567,332, Cl. 216-57.000.  
 Fuchs, Kenneth: See—  
 Rosenfeldt, Bernd; Fuchs, Kenneth; and Addiss, Robert R., 5,566,676, Cl. 128-672.000.  
 Fueki, Nobuhiro: See—  
 Nishio, Tomoyuki; Kuriyama, Nariaki; and Fueki, Nobuhiro, 5,567,877, Cl. 73-504.060.  
 Fuisz, Richard C.: See—  
 Myers, Garry L.; Battist, Gerald E.; and Fuisz, Richard C., 5,567,439, Cl. 424-486.000.  
 Fuisz Technologies Ltd.: See—  
 Myers, Garry L.; Battist, Gerald E.; and Fuisz, Richard C., 5,567,439, Cl. 424-486.000.  
 Fuji Electric Co.: See—  
 Mori, Nobuyoshi, 5,567,557, Cl. 430-58.000.  
 Fuji Electric Co., Ltd.: See—  
 Kuboyama, Katsunori; and Uchida, Naoshi, 5,566,818, Cl. 200-271.000.  
 Saitoh, Tetsuya; and Shimizu, Hideo, 5,568,580, Cl. 385-46.000.  
 Fuji Jukogyo Kabushiki Kaisha: See—  
 Suzuki, Akira, 5,568,024, Cl. 318-139.000.  
 Yamamoto, Hiroshi, 5,566,888, Cl. 241-3.000.  
 Fuji Photo Film Co., Ltd.: See—  
 Endo, Azuchi, 5,568,270, Cl. 358-298.000.  
 Harada, Akinori, 5,568,308, Cl. 359-326.000.  
 Ishida, Toshio; Satake, Masaki; Watanabe, Hideomi; Yasunaga, Tadashi; and Okita, Tsutomu, 5,567,524, Cl. 428-408.000.  
 Kawamura, Kazuo; Hasegawa, Jun; and Miida, Takashi, 5,568,249, Cl. 356-3.140.  
 Makuta, Toshiyuki; Seto, Nobuo; and Yoshioka, Yasuhiro, 5,567,578, Cl. 430-551.000.  
 Nakamura, Taku, 5,568,290, Cl. 359-63.000.  
 Nishikawa, Toshihiro, 5,567,571, Cl. 430-506.000.  
 Nishio, Akira, 5,567,568, Cl. 430-162.000.  
 Oku, Seichiro; Kubo, Masahiro; and Tatsumi, Setsuji, 5,568,284, Cl. 358-518.000.  
 Suzuki, Fumiyuki; Okutu, Toshimaru; and Otsu, Masaaki, 5,567,576, Cl. 430-533.000.  
 Takahashi, Osamu; and Tanaka, Mitsutoshi, 5,567,539, Cl. 429-57.000.  
 Yago, Atsushi; and Tanaka, Katsuhiko, 5,566,897, Cl. 242-348.100.  
 Fuji Xerox Co., Ltd.: See—  
 Ageishi, Kentaro; Watanabe, Ryuji; and Sugimoto, Tsutomu, 5,567,494, Cl. 428-36.900.  
 Furuki, Makoto; and Pu, Lyong Sun, 5,568,417, Cl. 365-106.000.  
 Murai, Kazumasa, 5,568,414, Cl. 364-825.000.  
 Nashimoto, Keiichi; and Masuda, Atsushi, 5,567,979, Cl. 257-627.000.  
 Tsuji, Masato; Kouno, Katsuyuki; Nishigai, Hidefumi; Nakamura, Hideyasu; and Kodera, Nobuyuki, 5,568,268, Cl. 358-296.000.  
 Fujicopian Co., Ltd.: See—  
 Cai, Zheng L.; and Imae, Yasuhiro, 5,567,065, Cl. 400-202.400.  
 Sogabe, Jun, 5,567,506, Cl. 428-212.000.  
 Fujihara, Masato: See—  
 Ogawara, Takeshi; Chisaka, Yukinori; and Fujihara, Masato, 5,566,741, Cl. 160-297.000.  
 Fujii, Hiroshi, to Nissan Motor Co., Ltd. Locking system for vehicle doors. 5,566,562, Cl. 70-277.000.  
 Fujii, Tadashi; Kataoka, Yoshiyuki; and Kinoshita, Shoichi, to Hitachi, Ltd. Fluid plant and its operating method. 5,566,709, Cl. 137-487.500.  
 Fujii, Yasufumi: See—  
 Sakagami, Teruo; Ogihara, Takeo; Fujii, Yasufumi; and Katono, Hiroki, 5,567,778, Cl. 525-326.600.  
 Fujikawa, Kazuhiko; Nomura, Koji; Shiono, Teruhiro; and Ogawa, Hisahito, to Matsushita Electric Industrial Co., Ltd. Pyroelectric type infrared sensor. 5,567,941, Cl. 250-353.000.  
 Fujikiko Kabushiki Kaisha: See—

Suzuki, Yasuhiro, 5,566,583, Cl. 74-477.000.  
 Fujimori, Naoki: See—  
 Tanabe, Keiichi; Ikegaya, Akihiko; Takahashi, Toshiya; and Fujimori, Naoki, 5,567,522, Cl. 428-408.000.  
 Fujinami, Yasushi; and Veltman, Markus H., to Sony Corporation. Apparatus and method for processing a variable-rate coded signal for recording to provide a high-speed search capability, apparatus and method for reproducing such processed signal, and recording including such processed signal. 5,568,274, Cl. 386-107.000.  
 Fujinawa, Nobuhiro: See—  
 Tazawa, Masashi; Aikawa, Toshiya; Maeda, Eisaku; and Fujinawa, Nobuhiro, 5,568,225, Cl. 355-75.000.  
 Fujino, Seiji: See—  
 Tsuruta, Kazuhiro; Fukumoto, Harutsugu; and Fujino, Seiji, 5,567,968, Cl. 257-356.000.  
 Fujioka, Kazuyoshi: See—  
 Tsubota, Koujiro; Fujioka, Kazuyoshi; Yoshimura, Yohji; Ohgami, Hiroyuki; and Takafuji, Yutaka, 5,568,297, Cl. 359-80.000.  
 Fujisawa, Masayasu: See—  
 Hira, Yasuo; Toba, Tamaki; Imayama, Hirotaka; Ohkawa, Atsuko; Fujisawa, Masayasu; Nate, Kazuo; Sonobe, Hideki; Suzuki, Saburo; Togawa, Eisei; Ishizaki, Hiroshi; and Hagiwara, Yoshiki, 5,567,333, Cl. 216-22.000.  
 Fujita, Kei: See—  
 Matsumoto, Shigeyuki; Saito, Asao; Nanase, Yashiro; and Fujita, Kei, 5,567,630, Cl. 437-31.000.  
 Fujita, Kouichi: See—  
 Sato, Fumiki; and Fujita, Kouichi, 5,568,077, Cl. 327-199.000.  
 Fujita, Takayuki: See—  
 Nakatsuka, Shigeki; Ichikawa, Iwao; Morioka, Manabu; Kato, Kenji; Fujita, Takayuki; Negishi, Shigetoshi; and Shiga, Kazuhiro, 5,568,264, Cl. 356-394.000.  
 Fujitsu Limited: See—  
 Fujiwara, Masakazu, 5,568,422, Cl. 365-185.330.  
 Furuya, Akira; Anayama, Chikashi; and Kondo, Makoto, 5,568,500, Cl. 372-46.000.  
 Hara, Hirotaka; Yugami, Nobuhiro; and Ohishi, Kazuhiro, 5,568,381, Cl. 364-402.000.  
 Hayashi, Katsumi; Mitani, Masaaki; and Kitao, Shinzi, 5,568,638, Cl. 395-600.000.  
 Ishibashi, Ryoichi, 5,568,300, Cl. 359-137.000.  
 Matsuda, Atsushi; and Yuasa, Tachio, 5,568,147, Cl. 341-154.000.  
 Naito, Takao; Chikama, Terumi; and Onaka, Hiroshi, 5,568,305, Cl. 359-191.000.  
 Naito, Takao, 5,568,310, Cl. 359-341.000.  
 Nishio, Hidetoshi; Furuse, Takako; Hamada, Yumiko; and Uesugi, Hiroyuki, 5,567,661, Cl. 437-228.000.  
 Ogawa, Hironobu, 5,568,164, Cl. 345-145.000.  
 Shikano, Kazunori, 5,568,341, Cl. 360-97.020.  
 Shinozaki, Yutaka, 5,568,135, Cl. 340-825.060.  
 Sugiyama, Hitoshi; Hiraishi, Toshinori; and Kumano, Tuiyoshi, 5,568,609, Cl. 428-36.900.  
 Takahashi, Yuji; and Fukasawa, Hideo, 5,568,553, Cl. 380-9.000.  
 Takemae, Yoshihiro, 5,568,427, Cl. 365-189.020.  
 Wada, Minoru; and Kanemitsu, Norio, 5,568,573, Cl. 382-317.000.  
 Yamauchi, Toshiya; Yutani, Yoshikazu; and Toyoda, Rika, 5,568,601, Cl. 395-142.000.  
 Yoshihara, Toshiaki; Mochizuki, Akihiro; Shiroto, Hironori; and Makino, Tetsuya, 5,568,299, Cl. 359-100.000.  
 Fujitsu Limited: See—  
 Watanabe, Yoshihiro; Kakuma, Satoshi; Morita, Sumie; Okuyama, Yuzo; and Okabe, Kenichi, 5,568,479, Cl. 370-60.100.  
 Fujiwara, Hideki: See—  
 Konishi, Yoshihiro; Okuma, Yoshio; Baba, Yoshihiko; and Fujiwara, Hideki, 5,568,101, Cl. 333-134.000.  
 Fujiwara, Kazuo: See—  
 Oda, Kunio; Kitada, Nobuhiko; Tanaka, Akihiro; Fujiwara, Kazuo; and Matsumoto, Shinichi, 5,567,668, Cl. 503-204.000.  
 Fujiwara, Masakazu, to Fujitsu Limited. Flash memory having a side wall immediately adjacent the side of a gate electrode as a mask to effect the etching of a substrate. 5,568,422, Cl. 365-185.330.  
 Fukada, Yasushi: See—  
 Hatano, Yasuhiro; Takayama, Hajime; Fukada, Yasushi; Kurita, Kazuhiko; and Nojiri, Kazuo, 5,568,277, Cl. 358-400.000.  
 Fukanuma, Tetsuhiko: See—  
 Nakashima, Masafumi; Sakai, Takeshi; Watanabe, Yasushi; and Fukanuma, Tetsuhiko, 5,567,137, Cl. 418-15.000.  
 Fukasawa, Hideo: See—  
 Takahashi, Yuji; and Fukasawa, Hideo, 5,568,553, Cl. 380-9.000.  
 Fukawa, Yasuhiro, to Any Co., Ltd. Mobile radio telecommunications system. 5,568,654, Cl. 455-33.100.  
 Fukaya, Hiroshi: See—  
 Makuta, Fujio; Fukaya, Hiroshi; and Kawakubo, Katsuhiro, 5,567,358, Cl. 252-518.000.  
 Fukuchi, Masami; Miyoshi, Yoshitaka; Kanno, Masahide; Hattori, Shin-ichi; Nakamura, Kazunari; Hiyama, Keiichi; and Hasegawa, Jun, to Olympus Optical Co., Ltd. Image information recording apparatus for recording a plurality of image information onto a plurality of information recording means. 5,568,271, Cl. 386-46.000.  
 Fukuda Metal Foil and Powder Co., Ltd.: See—  
 Yano, Masami; and Takami, Masato, 5,567,534, Cl. 428-607.000.

Fukumoto, Harutsugu: See—  
 Tsuruta, Kazuhiro; Fukumoto, Harutsugu; and Fujino, Seiji, 5,567,968, Cl. 257-356.000.  
 Fukunaga, Takao; and Takeshita, Shigeru, to Kabushiki Kaisha Daikin Seisakusho. Torque converter having a retarder mechanism therein. 5,566,801, Cl. 192-3.230.  
 Fukuoka, Hirotugu: See—  
 Akagi, Kyo; Futamoto, Masaaki; Kugiya, Fumio; Miyamura, Yoshinori; Takano, Hisashi; Matsuda, Yoshihumi; Suzuki, Mikio; Nakao, Takeshi; Munemoto, Takayuki; Fukuoka, Hirotugu; Aihara, Makoto; Takagaki, Tokuhio; Aoi, Hajime; and Seo, Yosuke, 5,568,331, Cl. 360-77.070.  
 Fukuoka, Shingoro: See—  
 Imai, Toshihiro; Shirai, Tokuo; Yamamoto, Ken; and Fukuoka, Shingoro, 5,567,493, Cl. 428-36.900.  
 Fukushima, Kiyoto: See—  
 Miyabara, Hiroyuki; Watase, Shigeharu; Kawakami, Yoshio; and Fukushima, Kiyoto, 5,567,502, Cl. 428-141.000.  
 Fukushima, Yoshihisa: See—  
 Inagaki, Masahiro; Fukushima, Yoshihisa; Yamashita, Haruo; Azumani, Yasushi; and Hamasaka, Hiroshi, 5,568,467, Cl. 369-275.300.  
 Fukutomi, Hiroshi, to Sharp Kabushiki Kaisha. Compact electronic apparatus. 5,568,451, Cl. 368-10.000.  
 Fukutomi, Masao; Aoki, Shigeki; Komori, Kazunori; Asano, Toshihisa; Tanaka, Yoshiaki; and Maeda, Hiroshi, to Mituba Electric Mfg. Co., Ltd.; and National Research Institute for Metals. Crystal-oriented thin film manufacturing apparatus. 5,567,288, Cl. 204-298.060.  
 Fuller, Gregory W.: See—  
 Cannon, Gregory L.; Macko, William J.; Fuller, Gregory W.; Cannon, Nancy M.; and Rasor, Gregg E., 5,568,134, Cl. 340-825.440.  
 Fullmark Pte Ltd.: See—  
 Yeong, Wong C., 5,567,064, Cl. 400-235.100.  
 Fulmer, Leon F., Sr., to Glassmaster Company. Sectionalized antenna. 5,568,161, Cl. 343-816.000.  
 Funato, Katsuro: See—  
 Nishida, Kiyoshi; Sugiyama, Tsutomu; Funato, Katsuro; and Hattori, Kenzi, 5,567,521, Cl. 428-408.000.  
 Funk, Erwin D.; Henricson, Kaj; and Dunn, Stephen J., to Ahlstrom Machinery Inc. Method of controlling pressurized ozone to a pulp delignification reactor. 5,567,274, Cl. 162-49.000.  
 Furlan, Piero: See—  
 Vezzoli, Annibale; Ciaperoni, Aldemaro; and Furlan, Piero, 5,567,491, Cl. 428-35.700.  
 Furukawa Electric Co., Ltd.: See—  
 Akasaka, Youichi; Sugizaki, Ryuichi; Umeda, Atsushi; and Kokura, Kunio, 5,568,583, Cl. 385-123.000.  
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 Furukawa, Takehiro; Yamashita, Eizo; and Saiki, Nobuyuki, to Mitsubishi Denki Kabushiki Kaisha. Analog/digital conversion circuit. 5,568,148, Cl. 341-155.000.  
 Furukawa, Yutaka; Kumai, Seisaku; and Yoshino, Mami, to Asahi Glass Company Ltd. Stainproofing oil for a heat fixing roller. 5,568,239, Cl. 355-284.000.  
 Furuki, Makoto; and Pu, Lyong Sun, to Fuji Xerox Co., Ltd. Fluorescent method, fluorescent device, fluorescent recording method, fluorescent recording media, fluorescent record reading method, fluorescent record reading device and fluorescent record deleting device. 5,568,417, Cl. 365-106.000.  
 Furuse, Takako: See—  
 Nishio, Hidetoshi; Furuse, Takako; Hamada, Yumiko; and Uesugi, Hiroyuki, 5,567,661, Cl. 437-228.000.  
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 Furuya, Rikizo; Okushima, Hiromi; and Abe, Yuji, to Mitsubishi Chemical Corporation. Thiadiazine derivatives. 5,567,699, Cl. 514-222.500.  
 Furuyama, Tohru, to Kabushiki Kaisha Toshiba. Semiconductor device and method of screening the same. 5,568,436, Cl. 365-201.000.  
 Fusco, James V.: See—  
 Wang, Hsien C.; Gardner, Irwin J.; and Fusco, James V., 5,567,775, Cl. 525-279.000.  
 Fuselage Engineering Services Ltd.: See—  
 Luria, David, 5,567,108, Cl. 414-518.000.  
 Futamoto, Masaaki: See—  
 Akagi, Kyo; Futamoto, Masaaki; Kugiya, Fumio; Miyamura, Yoshinori; Takano, Hisashi; Matsuda, Yoshihumi; Suzuki, Mikio; Nakao, Takeshi; Munemoto, Takayuki; Fukuoka, Hirotugu; Aihara, Makoto; Takagaki, Tokuhio; Aoi, Hajime; and Seo, Yosuke, 5,568,331, Cl. 360-77.070.  
 Futral, William T., to Ungermann-Bass, Inc. Dataframe bridge filter with communication node recordkeeping. 5,568,613, Cl. 395-200.020.  
 Futsuhara, Koichi; and Sakai, Masayoshi, to Nippon Signal Co., Ltd., The. Current sensor and motor rotation sensor using such current sensor. 5,568,059, Cl. 324-772.000.  
 Futsuhara, Koichi: See—  
 Sakai, Masayoshi; and Futsuhara, Koichi, 5,568,131, Cl. 340-648.000.  
 G & G Intellectual Properties, Inc.: See—  
 Gearin, Peter; and Miller, David J., 5,567,111, Cl. 414-786.000.  
 G.D. Societa' Per Azioni: See—

Grossbach, Rudolf; Huber, Peter; Lierke, Ernst-Guenter; Fiedler, Michael; Weiss, Rainer; Neri, Armando; Santin, Giancarlo; and Squaroni, Giovanni, 5,566,686, Cl. 131-84.400.  
 G.D. Societa' Per Azioni: See—  
 Draghetti, Fiorenzo; and Rizzoli, Salvatore, 5,566,811, Cl. 198-399.000.  
 G&G Sewing Machine Company, Inc.: See—  
 Weststrom, Martin K., 5,566,633, Cl. 112-470.030.  
 Gabrielson, James E.: See—  
 Lookman, Aziz A.; Glickert, Roger W.; and Gabrielson, James E., 5,567,226, Cl. 95-3.000.  
 Gaddis, Benjamin A.: See—  
 Higgins, Kenneth B.; and Gaddis, Benjamin A., 5,567,257, Cl. 156-72.000.  
 Gaffney, Thomas R.: See—  
 Coe, Charles G.; Gaffney, Thomas R.; Li, Hong-Xin; Xiong, Yanliang; Martens, Johan A.; and Jacobs, Pierre A., 5,567,407, Cl. 423-700.000.  
 Gafvert, Uno: See—  
 Fogelberg, Thomas; Gafvert, Uno; and Hornfeldt, Sven, 5,568,114, Cl. 336-206.000.  
 Gahan, Richard A.: See—  
 Sherer, William P.; Gahan, Richard A.; and Hickey, John F., 5,568,476, Cl. 370-60.000.  
 Gaillard, Alain, to Robert Bosch GmbH. Power-assisted brake system. 5,567,021, Cl. 303-3.000.  
 Gait, Michael: See—  
 Misiura, Konrad; and Gait, Michael, 5,567,811, Cl. 536-25.340.  
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 Galbi, David E.; and Purcell, Stephen C., to C-Cube Microsystems, Inc. System for providing antialiased video overlays. 5,568,167, Cl. 348-589.000.  
 Galileo Electro-Optics Corporation: See—  
 Vacha, Lubos; and Melling, Peter J., 5,567,219, Cl. 65-432.000.  
 Galowitz, Dennis A.: See—  
 Schmidt, Melvin J.; Coach, Thomas P.; Hause, Glenn C.; Galowitz, Dennis A.; Wyman, James P.; Hendricks, Robert A.; Van Steeg, Lawrence J.; and Evans, Harold H., 5,566,507, Cl. 49-428.000.  
 Gandhi, Harish, to Philips Electronics North America Corporation. Electric lamp having a lamp cap with solder-free connections. 5,568,009, Cl. 313-18.010.  
 Gano, John C.: See—  
 Williamson, Jimmie R.; Gano, John C.; and Reising, David L., 5,566,763, Cl. 166-382.000.  
 Ganss, Werner: See—  
 Weigand, Michael; Ganss, Werner; and Grehn, Martin, 5,567,059, Cl. 384-560.000.  
 Ganter, Udo, to Heidelberg Druckmaschinen AG. Adjusting device for a gripper opening cam in a chain delivery of a sheet-fed printing press. 5,566,614, Cl. 101-408.000.  
 GAO Gesellschaft fuer Automation und Organisation mbH: See—  
 Boehm, Michael; and Kaule, Wittich, 5,567,276, Cl. 162-103.000.  
 GAO Gesellschaft fuer Automation und Organisation mbH: See—  
 Grün, Herbert, 5,567,362, Cl. 264-1.310.  
 Gardiner, Eric S.; and Geoghegan, John T., to Arizona Chemical Company. Polymers having decreased surface energy. 5,567,531, Cl. 428-447.000.  
 Gardner, Christopher: See—  
 Brown, Trevor P.; Conroy, Brian G.; Cox, Stephen J.; Gardner, Christopher; Larke, Roger D.; Marshall, Barry; and Svendsen, Jan, 5,566,882, Cl. 238-343.000.  
 Gardner, Eric E.: See—  
 Hollingshead, Chris J.; and Gardner, Eric E., 5,566,510, Cl. 49-479.100.  
 Gardner, Irwin J.: See—  
 Wang, Hsien C.; Gardner, Irwin J.; and Fusco, James V., 5,567,775, Cl. 525-279.000.  
 Gardner, Leland V.: See—  
 Hardy, Arthur H., Jr.; and Gardner, Leland V., 5,568,577, Cl. 385-33.000.  
 Gardner, Sandra J.: See—  
 Hsiao, Cheng-Kuo; Hor, Ah-Mee; Gardner, Sandra J.; Gaynor, Roger E.; and Poltras, Jacques, 5,567,558, Cl. 430-58.000.  
 Garfinkel, Michael: See—  
 Amend, Brian J.; and Garfinkel, Michael, 5,567,931, Cl. 250-221.000.  
 Garner, Scott D.: See—  
 Anderson, William G.; Richardson, Kevin H.; and Garner, Scott D., 5,566,751, Cl. 165-104.270.  
 Garry, Robert F., Jr.: See—  
 Henderson, Lee A.; Coy, David H.; and Garry, Robert F., Jr., 5,567,805, Cl. 530-350.000.  
 Garside, Robert M., to British Nuclear Fuels PLC. Measuring fluid flow rate. 5,567,885, Cl. 73-861.070.  
 Garvey, Chad E.: See—  
 Dulany, Margaret A.; Garvey, Chad E.; Ringold, Clay E.; and Srinivasan, Ramji, 5,567,798, Cl. 528-332.000.  
 Gasperek, Michael J.: See—



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- Gasse, Jean-Jacques: See—  
Schapira, Joseph; Cheminaud, Jean-Claude; Gasse, Jean-Jacques; Hadzmann, Eric; and Bonnin, Joël, 5,567,236, Cl. 106-728.000.
- Gassner, Benno. Apparatus for charging a trash sorting device with the contents of trash bags. 5,567,106, Cl. 414-412.000.
- Gates Rubber Company, The: See—  
Johnston, Jonathan A.; Peake, Michael V.; and Krause, Keith M., 5,566,988, Cl. 285-93.000.
- Gatti, Giuliano, to Agence Spatiale Européenne. Pre-distorting linearization circuit. 5,568,087, Cl. 330-149.000.
- Gatzmanga, Heinz: See—  
Baschant, Dieter; Gatzmanga, Heinz; and Juppe, Heinz, 5,567,951, Cl. 250-504.00R.
- Gaud, Pierre; and Sibuet, Henri, to Commissariat à l'Energie Atomique. Method of making a vertical magnetic head with an integrated coil. 5,566,442, Cl. 29-603.140.
- Gaussen, Louis W., Jr.; and Sahasrabudhe, Arun P., to Westinghouse Electric Corporation. Method and system for compensating a rod position indication system for non-linearity. 5,568,528, Cl. 376-258.000.
- Gautier, André, to Eurocopter France. Composite material lattice elements. 5,567,509, Cl. 428-227.000.
- Gavras, Haralambos. Method for treating impotence. 5,567,706, Cl. 514-280.000.
- Gay, David E., to General Motors Corporation. Moldable ferromagnetic particles and method. 5,567,746, Cl. 523-220.000.
- Gaynor, Roger E.: See—  
Hsiao, Cheng-Kuo; Hor, Ah-Mee; Gardner, Sandra J.; Gaynor, Roger E.; and Poitras, Jacques, 5,567,558, Cl. 430-58.000.
- Gazelle, G. Scott: See—  
Torchilin, Vladimir P.; Trubetskoy, Vladimir S.; Wolf, Gerald L.; and Gazelle, G. Scott, 5,567,410, Cl. 424-9.400.
- Gearin, Peter; and Miller, David J., to G & G Intellectual Properties, Inc. Method for handling and transporting wheeled vehicles. 5,567,111, Cl. 414-786.000.
- GEC Alsthom Electromecanique SA: See—  
Bourcier, Pierre, 5,567,116, Cl. 416-324.000.
- Gec-Alsthom Limited: See—  
Allan, Dennis J.; and Grant, John V., 5,566,443, Cl. 29-605.000.
- GEC Alsthom T&D SA: See—  
Perret, Michel, 5,567,923, Cl. 218-60.000.
- Geffen, Samuel: See—  
Tamir, Giora; Tamir, Baruch; and Geffen, Samuel, 5,568,538, Cl. 379-58.000.
- Gehlert, Donald R.: See—  
Bruns, Robert F., Jr.; Gehlert, Donald R.; Howbert, J. Jeffrey; and Lunz, William H. W., 5,567,714, Cl. 514-324.000.
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- Geho, W. Blair: See—  
Lau, John R.; and Geho, W. Blair, 5,567,432, Cl. 424-450.000.
- Gehrlich, David N.: See—  
Cord, Cameron W.; Gehrich, David N.; Jensen, Gregory N.; and Parr, Ted K., 5,566,697, Cl. 134-109.000.
- Gehrmann, Ralf: See—  
Bauer, Helmut; Derisavi-Fard, Foad; Eckoldt, Uwe; Gehrman, Ralf; and Kinkel, Henibert, 5,567,284, Cl. 204-256.000.
- Geiler, Martin: See—  
Ohms, Franz; and Geiler, Martin, 5,568,369, Cl. 363-26.000.
- Gelfand, Leonid B.: See—  
De Haan, Joel D.; De Haan, Daniel; De Haan, Gregory; Spyker, David J.; McLeod, David P.; Koops, Wesley G.; and Gelfand, Leonid B., 5,567,327, Cl. 210-768.000.
- Gemma, Edward A., Jr.: See—  
Brown, David L.; Stellan, Andrew P.; and Gemma, Edward A., Jr., 5,566,821, Cl. 206-63.300.
- Gemplus Card International: See—  
Gordons, Edouard M., 5,568,634, Cl. 395-497.010.
- Gen-Probe Incorporated: See—  
Kohne, David E., 5,567,587, Cl. 435-6.000.
- GenCorp Inc.: See—  
Hollingshead, Chris J.; and Gardner, Eric E., 5,566,510, Cl. 49-479.100.
- Gendel, Steven M.: See—  
Stetter, Joseph R.; Hesketh, Peter J.; Gendel, Steven M.; and MacLay, G. Jordan, 5,567,301, Cl. 205-777.500.
- Genelabs Diagnostics PTE Ltd.: See—  
Kok, Lim J., 5,567,595, Cl. 435-7.920.
- General Electric Company: See—  
Caruso, Andrew J.; and Lee, Julia L., 5,567,829, Cl. 549-388.000.
- Chiao, Richard Y.; Hewes, Ralph A.; and Gilmore, Robert S., 5,568,144, Cl. 341-139.000.
- Davenport, John M.; Hansler, Richard L.; and Cassarly, William J., 5,567,031, Cl. 362-32.000.
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- Engeler, William E.; and Ribner, David B., 5,568,446, Cl. 367-11.000.
- Hershey, John E.; Saulnier, Gary J.; and Hassan, Amer A., 5,568,507, Cl. 375-200.000.
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- Iacovangelo, Charles D.; and DiConza, Paul J., 5,567,985, Cl. 257-701.000.
- Khoury, Farid F., 5,567,780, Cl. 525-394.000.
- Laskaris, Evangelos T.; and Dorri, Bizhan, 5,568,104, Cl. 335-216.000.
- McCloskey, Patrick J., 5,567,802, Cl. 528-487.000.
- Pickett, James E., 5,567,850, Cl. 568-322.000.
- Richardson, David L.; Tung, James C. S.; and Berg, David C., 5,568,527, Cl. 376-245.000.
- Riza, Nabeel A., 5,568,286, Cl. 359-53.000.
- Schneider, John L., 5,568,260, Cl. 356-376.000.
- Staver, Daniel A.; and Hakkarainen, Juha M., 5,568,047, Cl. 324-127.000.
- Steigerwald, Robert L.; and Ludwig, Gerald W., 5,568,368, Cl. 363-17.000.
- Stein, Judith; Wengrovius, Jeffrey H.; and Willey, Paul R., 5,567,752, Cl. 524-188.000.
- Tiemann, Jerome J.; Hershey, John E.; and Hassan, Amer A., 5,568,301, Cl. 359-140.000.
- Ward, William J., III, 5,567,739, Cl. 521-123.000.
- Wojnarowski, Robert J.; and Gorczyca, Thomas B., 5,567,657, Cl. 437-214.000.
- General Hospital Corporation, The: See—  
Torchilin, Vladimir P.; Trubetskoy, Vladimir S.; Wolf, Gerald L.; and Gazelle, G. Scott, 5,567,410, Cl. 424-9.400.
- General Motors Corporation: See—  
Blase, James L.; and McCreary, Charles H., 5,567,056, Cl. 384-286.000.
- Gay, David E., 5,567,746, Cl. 523-220.000.
- Ross, Craig S., 5,567,201, Cl. 475-280.000.
- Schroeder, Thaddeus; and Pawlak, Andrzej M., 5,568,048, Cl. 324-207.210.
- Gennat, Bernd: See—  
Waldner, Paul R.; and Gennat, Bernd, 5,566,840, Cl. 211-41.000.
- Genovese, Joseph E.: See—  
Birbara, Philip J.; Couch, Harold T.; Genovese, Joseph E.; and Rethke, Donald W., 5,567,389, Cl. 422-28.000.
- Gensheimer, Valentin: See—  
Stoffler, Achim; Gensheimer, Valentin; Werber, Edgar; Hinz, Marc; Hummel, Peter; Wenzel, Jürgen; Volz, Albrecht; Blum, Joachim; Zschetzsch, Hubert; and Straub, Manfred, 5,566,613, Cl. 101-350.000.
- Gentric, Philippe: See—  
Minot, Joël; and Gentric, Philippe, 5,568,591, Cl. 395-22.000.
- Gentry, David R.; Pancio, Gerald T.; and Weers, Jerry J., to Petrolite Corporation. Use of olefinic imines to scavenge sulfur species. 5,567,212, Cl. 44-420.000.
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- Gentry, Scott B.: See—  
Mazur, Joseph F.; Blackburn, Brian K.; Gentry, Scott B.; and Steffens, Charles E., Jr., 5,566,974, Cl. 280-730.200.
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- Geoghegan, John T.: See—  
Gardiner, Eric S.; and Geoghegan, John T., 5,567,531, Cl. 428-447.000.
- Georgelis, Eric J.: See—  
Holber, William M.; Smith, Donald K.; Besen, Matthew M.; Fitzer, Matthew P.; and Georgelis, Eric J., 5,568,015, Cl. 315-39.000.
- Georges, Eric S.: See—  
Galand, Claude; Jacquart, Xavier; Lebizay, Gerald; Leboudec, Jean-Yves; Louis, Philippe; Poiraud, Clement; Georges, Eric S.; Spagnol, Victor; Suffern, Edward; and Truong, Hong L., 5,568,477, Cl. 370-60.000.
- Georgia-Pacific Resins, Inc.: See—  
Dulany, Margaret A.; Garvey, Chad E.; Ringold, Clay E.; and Srinivasan, Ramji, 5,567,798, Cl. 528-332.000.
- Gerber, Eliot S. Stolen car detection system and method. 5,568,406, Cl. 364-562.000.
- Gerlach, Hans-J.: See—  
Will, Ronald; Franz, Markus; Waegner, Ralf; Gerlach, Hans-J.; and Schlachter, Werner, 5,566,575, Cl. 73-862.629.
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- Gernhardt, Paul; Chan, David; and Krzyzanowski, Serge, to Leviton Manufacturing Co., Inc. In-line cord ground fault circuit interrupter. 5,568,344, Cl. 361-42.000.
- Gerrard, Jesse M.: See—  
Bohn, David D.; and Gerrard, Jesse M., 5,568,317, Cl. 359-618.000.

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- Gervat, Sophie: See—  
Barraud, Jean-Yves; Gervat, Sophie; Ratovelomanana, Victorin; Boutevin, Bernard; Parisi, Jean-Pierre; Cahuzac, Aline; and Jocteur, Robert, 5,567,794, Cl. 528-70.000.
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Bederka, Stefan; and Simon, Reinhard, 5,568,021, Cl. 315-506.000.
- Getz, Roland A. Portable recycle crusher. 5,566,893, Cl. 241-27.000.
- Geyer, Norbert: See—  
Dickmann, Thomas; Geyer, Norbert; and Martens, Wilhelm, 5,566,910, Cl. 244-216.000.
- Geyer, Robert A., to Tennant Company. Tank configuration for a small floor scrubber. 5,566,422, Cl. 15-320.000.
- Ghoda, Isamu: See—  
Koshida, Hitoshi; Ghoda, Isamu; Ohyama, Tsukasa; and Takuma, Keisuke, 5,567,470, Cl. 427-151.000.
- Giannini, Dennis A.: See—  
Brown, Henry F.; and Giannini, Dennis A., 5,566,624, Cl. 108-51.100.
- Giasi, Joseph P. Method of manufacturing a pallet of cardboard. 5,567,263, Cl. 156-252.000.
- Gibot, Claude; and Bouguet, Philippe, to Carboxyque Française. Process for the preservation of products at low temperature in an insulated chamber, installation for practicing the process, insulated chamber and container for such a chamber. 5,566,553, Cl. 62-603.000.
- Gibson, Brian C.; Jubien, Christopher M.; and Roden, Brian J., to IVL Technologies Ltd. Method and apparatus for changing the timbre and/or pitch of audio signals. 5,567,901, Cl. 84-603.000.
- Gibson, Keith H.: See—  
Russell, Keith; Ohnmacht, Cyrus J.; and Gibson, Keith H., 5,567,735, Cl. 514-628.000.
- Gierenz, Gerhard: See—  
Lepsius, Tilwin; Gierenz, Gerhard; Tranelis, Klaus; Reinfelder, Gerd-Ruediger; Franken, Joachim; and Halm, Hans, 5,567,071, Cl. 401-68.000.
- Gieseke, Bruce A.: See—  
McLellan, Edward J.; and Gieseke, Bruce A., 5,568,415, Cl. 365-49.000.
- Gill, Jeffrey J., to Damon Ventures, LLC. Tent camper with slide-out room. 5,567,003, Cl. 296-173.000.
- Gilmore, Robert S.: See—  
Chiao, Richard Y.; Hewes, Ralph A.; and Gilmore, Robert S., 5,568,144, Cl. 341-139.000.
- Girard, André; and Piu, Giovanni, to Hutchinson. Motion transmitting rod with security device. 5,566,580, Cl. 74-473.00R.
- Givler, Gregory C.; and Clark, Gregory L., to Boeing Company, The. Method of cooling a coil. 5,566,747, Cl. 165-47.000.
- GKN Automotive AG: See—  
Trommer, Jörg; and Eschbach, Markus, 5,566,777, Cl. 180-232.000.
- Glabe, John R.: See—  
Pelton, Edward L.; and Glabe, John R., 5,568,159, Cl. 343-767.000.
- Gladue, Raymond: See—  
Kyle, David J.; and Gladue, Raymond, 5,567,732, Cl. 514-560.000.
- Glansk, Leif; and Marstorp, Leif, to Tour & Andersson AB. Combined control and regulating valve for liquids or gases. 5,566,711, Cl. 137-557.000.
- Glassmaster Company: See—  
Fulmer, Leon F., Sr., 5,568,161, Cl. 343-816.000.
- Glaser, Michael: See—  
Zlobinsky, Yury; Glaser, Michael; and Grave, Frank, 5,567,050, Cl. 366-209.000.
- Glaxo Wellcome Inc.: See—  
Hudson, Alan T., 5,567,738, Cl. 514-682.000.
- Gleisner, Roland L., Jr.: See—  
Hankel, Steven G.; Gunderson, Dennis E.; Scott, C. Timothy; and Gleisner, Roland L., Jr., 5,566,570, Cl. 73-159.000.
- Glickert, Roger W.: See—  
Lookman, Aziz A.; Glickert, Roger W.; and Gabrielson, James E., 5,567,226, Cl. 95-3.000.
- Gloster, Mark: See—  
Buuck, David C.; and Gloster, Mark, 5,568,107, Cl. 333-238.000.
- Gluskoter, Steven: See—  
Cavello, Christopher; Gluskoter, Steven; and Broder, Damon, 5,568,359, Cl. 361-686.000.
- Gluys, James D.; and Chene, William R., to Eaton Corporation. Fluid interface. 5,566,983, Cl. 285-14.000.
- Glycomed Incorporated: See—  
Nashed, Mina A.; Dasgupta, Falguni; Abbas, Saeed A.; Musser, John H.; and Asa, Darwin S., 5,567,683, Cl. 514-25.000.
- Gnilka, Jean-Pierre: See—  
Ladirat, Christian; Pilliot, Henri; and Gnilka, Jean-Pierre, 5,567,218, Cl. 65-327.000.
- Gochenour, Daniel V.; Adams, Barry T.; Kummer, Martin E.; Davis, Christopher M.; Lepard, Steven D.; Bassett, Michael L.; and Schlosser, Kevin F., to Dana Corporation. Automatically adjusting friction torque device. 5,566,804, Cl. 192-70.250.
- Goeckler, Heinz, to ANT Nachrichtentechnik GmbH. Device for processing modulated rail analog television signal. 5,568,206, Cl. 348-726.000.
- Goehtner Industries, Inc.: See—  
Goehtner, Steven J., 5,566,849, Cl. 220-7.000.
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- Goehre, Jochen: See—  
Muschelknautz, Claudius; Bieger, Claude; and Goehre, Jochen, 5,567,393, Cl. 422-168.000.
- Goettl, David R. Differential hoist fixture. 5,566,999, Cl. 294-103.100.
- Goff, Thomas R., to Socket Retainer Systems, Inc. Socket mounting arrangement. 5,566,595, Cl. 81-177.850.
- Gold, Larry; and Ringquist, Steven, to University Research Corporation. Systematic evolution of ligands by exponential enrichment: Solution SELEX. 5,567,588, Cl. 435-6.000.
- Gold, Peter N. Packaging coding system and method for employing same. 5,567,514, Cl. 428-350.000.
- Goldstar Company, Limited: See—  
Han, Tack D.; Lee, Shi W.; and Park, Woo C., 5,568,412, Cl. 364-748.000.
- Joo, Phil D.; Lim, Kyung S.; and Lee, Kwan H., 5,567,339, Cl. 219-748.000.
- Kim, Jeong J., 5,568,292, Cl. 359-67.000.
- Lee, Jue H.; and Cho, Seong M., 5,567,942, Cl. 250-353.000.
- Shin, Jong-Keun, 5,567,030, Cl. 353-85.000.
- Goldstar Electron Co., Ltd.: See—  
Chun, Dong-Suck, 5,567,656, Cl. 437-211.000.
- Lee, Chang-Jae; and Kim, Hyeung-Tae, 5,567,244, Cl. 134-3.000.
- Park, Yong-In, 5,568,146, Cl. 341-145.000.
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- Golightly, Ralph W., to Goodyear Tire & Rubber Company, The. Tire bead making apparatus with two winding tension levels. 5,567,269, Cl. 156-361.000.
- Golin, Stuart J., to Intel Corporation. Method and apparatus for analyzing digital video images by merging displacement vectors. 5,568,569, Cl. 382-236.000.
- Golovatai-Schmidt, Eduard: See—  
Strauss, Andreas; and Golovatai-Schmidt, Eduard, 5,566,651, Cl. 123-90.170.
- Golovin, Milton N.; Shackle, Dale R.; and Moulton, Russel D. Solid, glyme-containing cathode materials. 5,567,547, Cl. 429-217.000.
- Goltsos, William C.: See—  
Leger, James R.; and Goltsos, William C., 5,568,318, Cl. 359-618.000.
- Gonda, Masahiro: See—  
Koga, Hitoshi; Kameyama, Masao; Iwata, Kazuo; and Gonda, Masahiro, 5,567,515, Cl. 428-355.000.
- Gonzalez Gonzalez, Carlos: See—  
Sigtes Menendez, Francisco J.; Sigtes Menendez, Fernando; Alvarez Tamargo, Francisco; Tamargo Garcia, Francisco; Quiroga Alvarez, Jose M.; Lefevre, Yves; and Gonzalez Gonzalez, Carlos, 5,567,285, Cl. 204-227.000.
- Gonzalez-Hernandez, Jesus; De La Luz Martinez, Jose; Sanchez-Sinencio, Feliciano; Martinez-Bustos, Fernando; De Dios Figueroa C., Juan; and Ruiz-Torres, Maximiano, to Centro de Investigacion y de Estudios Avanzados del I.P.N. Method of cooking corn dough tortillas using infrared radiation. 5,567,459, Cl. 426-237.000.
- Gooch, Gordon E.: See—  
Lever, James H.; Gooch, Gordon E.; and Folton, Edward P., 5,567,078, Cl. 405-61.000.
- Gooch, Robert E.: See—  
Ennis, Dan O.; Gooch, Robert E.; Chipman, Stephen R.; and Nelson, Jonathan D., 5,566,923, Cl. 251-315.040.
- Goodwin, Julie F.: See—  
Tiller, Byron K.; Allard, David J.; Au, Connie Y.; Canova, Francis J., Jr.; Hsieh, Daniel M.; Goodwin, Julie F.; Johnson, Debra A. G.; Lanier, Charles S.; Lewis, James R.; Stout, Jean L.; Villafana, William; Yee, Raymond L.; Padgett, Russell S.; Ferrier, Robert B.; Corkell, Anthony F.; Murakami, Thomas T.; DeBauche, Bradley J.; Whitley, Wayne P.; Osborn, Neal A.; Beatty, Brent A.; Cox, Roger L.; Wulf, James C.; and Rivero, Jose L., 5,568,536, Cl. 379-58.000.
- Goodyear Tire & Rubber Company, The: See—  
Golightly, Ralph W., 5,567,269, Cl. 156-361.000.
- Kuczkowski, Joseph A.; Rodgers, Michael B.; and Rollick, Kevin L., 5,567,821, Cl. 548-126.000.
- Goray, Jill. Customizable garment form system. 5,566,867, Cl. 223-66.000.
- Gorczyca, Thomas B.: See—  
Wojnarowski, Robert J.; and Gorczyca, Thomas B., 5,567,657, Cl. 437-214.000.
- Gorden, Don. Tethered ball game device. 5,566,949, Cl. 273-345.000.
- Gordon, Gary, to TRW Inc. Releasable fastener assembly. 5,567,098, Cl. 411-48.000.
- Gordon, John H.: See—  
Joshi, Ashok V.; Gordon, John H.; and Shen, Yousheng, 5,567,287, Cl. 204-265.000.
- Gordon, Michael J.: See—  
Papazian, Harold A.; Shepard, Donald F.; Pierson, Edward A.; and Gordon, Michael J., 5,567,490, Cl. 428-34.400.
- Gordon, Peter C. Improvements relating to life jackets. 5,567,191, Cl. 441-117.000.
- Gordons, Edouard M., to Gemplus Card International. Method of writing in a non-volatile memory, notably in a memory card employing memory allocation strategies on size and occupancy basis. 5,568,634, Cl. 395-497.010.
- Gordzelik, Michael L.: See—  
Ericson, John E., Jr.; Wilson, Eric F.; Gordzelik, Michael L.; and Ignasiak, Martin C., 5,567,174, Cl. 439-462.000.
- Gorman-Rupp Industries: See—



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 Gornik, Erich: See—  
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 Grantz, Helmut: See—  
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 Conley, Ralph F., 5,568,556, Cl. 380-54.000.  
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 Gresshoff, Peter M.: See—  
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 Greven, Rolf: See—  
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 Grote Industries, Inc.: See—  
 Theobald, Greg; Tavernese, Luigi; Boles, Fred; and Sugg, Edwin, 5,567,036, Cl. 362-80.000.  
 Gruber, Peter: See—  
 Durrer, Bernhard; Bötschi, Hans; and Gruber, Peter, 5,568,133, Cl. 340-693.000.  
 Grula, Jerome A.: See—  
 Flint, Andrew; Trent, James R.; and Grula, Jerome A., 5,568,492, Cl. 371-22.100.  
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 Müller, Werner, 5,568,480, Cl. 370-69.100.  
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 Selva, Enrico; Beretta, Grazia; Borghi, Angelo; and Denaro, Maurizio, 5,567,676, Cl. 514-8.000.  
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 GSE Process Solutions, Inc.: See—  
 Gray, Dale A.; Chmielewski, Michael; Bubnis, Edward A., Jr.; Burch, Michael G.; Heaps, Charles W.; Galante, Robert M.; and Wancowicz, Keith A., 5,568,402, Cl. 364-514.00C.

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 Bishop, Stephen G.; Gu, Shiquan; and Turnbull, Douglas A., 5,568,497, Cl. 372-40.000.  
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 Larsson, Jeanene M.; and Gudmundson, Lars S., 5,567,208, Cl. 29-24.500.  
 Guenther, Wolfgang: See—  
 Franz, Lothar; Mohr, Juergen; Schreyer, Peter; Thomas, Juergen; Oppen-laender, Knut; and Guenther, Wolfgang, 5,567,845, Cl. 564-278.000.  
 Guentherberg, Norbert: See—  
 Deckers, Andreas; and Guentherberg, Norbert, 5,567,785, Cl. 526-212.000.  
 Guergov, Milko G. Method of injecting molten metal into a mold cavity. 5,566,743, Cl. 164-457.000.  
 Guerra, Miguel A.: See—  
 Moore, George G. I.; Flynn, Richard M.; and Guerra, Miguel A., 5,567,765, Cl. 524-801.000.  
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 Guertin Bros. Coatings and Sealants Ltd.: See—  
 Song, Zhiqiang, 5,567,761, Cl. 524-523.000.  
 Guess, Roy E.: See—  
 Queen, Lawrence E.; and Guess, Roy E., 5,567,256, Cl. 156-72.000.  
 Guiblin, Alexander R.: See—  
 Baker, Raymond; Castro Pineiro, Jose L.; Guiblin, Alexander R.; Reeve, Austin J.; Sternfeld, Francine; Matassa, Victor G.; and Street, Leslie J., 5,567,726, Cl. 514-383.000.  
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 Guiffida, Thomas S.: See—  
 Doshi, Bharat T.; Farber, N.; Harshavardhana, P.; Kapoor, Rajiv; Kash-per, Arik; Katz, Steven S.; Meier-Hellstern, Kathleen S.; and Guiffida, Thomas S., 5,568,475, Cl. 370-58.200.  
 Guillard, Alain: See—  
 Ekins, Robert; and Guillard, Alain, 5,566,556, Cl. 62-654.000.  
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 Guinto, Joseph F.: See—  
 Schaefer, Walter R.; Vassiliou, Eustathios; Kuhn, Bruno R.; and Guinto, Joseph F., 5,566,626, Cl. 110-246.000.  
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 Gunderman, Anthony J.; Moir, David; O'Connell, Robert M., deceased (by Jo H. O'Connell, executor), to Color Prelude, Inc. Fragrance sampler. 5,566,693, Cl. 132-333.000.  
 Gunderson, Dennis E.: See—  
 Hankel, Steven G.; Gunderson, Dennis E.; Scott, C. Timothy; and Gleisner, Roland L., Jr., 5,566,570, Cl. 73-159.000.  
 Gunn, Doyle M.; and Ramsey, Larry A. Recirculation fan portable mounting apparatus. 5,567,117, Cl. 416-244.00R.  
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 LaBrash, Robert A.; and Willging, Stephen M., 5,567,234, Cl. 106-205.900.  
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 Drewitz, Hugues, 5,566,527, Cl. 53-295.000.  
 Haag, Earl C., III. Port system for sterile transfer. 5,567,025, Cl. 312-1.000.  
 Haag-Streit AG: See—  
 Widmer, Hansruedi; and Stucki, Jürg, 5,568,188, Cl. 348-79.000.  
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 Lehtinen, Jukka; Rautakorpi, Paavo; and Haavisto, Seppo, 5,566,472, Cl. 34-242.000.  
 Haberern, Kevin W., to Philips Electronics North America Corporation. Method of making a stripe-geometry IUVI semiconductor gain-guided injection laser structure using ion implantation. 5,567,646, Cl. 437-129.000.  
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 Hada, Mayumi: See—  
 Hasemi, Ryujii; Iwata, Keiichi; Hada, Mayumi; and Ikeda, Hidetoshi, 5,567,574, Cl. 430-331.000.  
 Haddie, Blair: See—  
 Tufis, Arthur W.; Jellema, Mark; and Haddie, Blair, 5,567,195, Cl. 451-11.000.  
 Hadzemann, Eric: See—  
 Schapira, Joseph; Cheminaud, Jean-Claude; Gasse, Jean-Jacques; Hadzemann, Eric; and Bonnin, Joël, 5,567,236, Cl. 106-728.000.  
 Haenisch, Thomas J.; Heims, Douglas A.; and Johnson, Warren F., to Maytag Corporation. Adjustable retainer assembly for a refrigerator door shelf. 5,567,029, Cl. 312-405.100.  
 Haerzschel, Reinhard: See—  
 Schulze, Joachim; Haerzschel, Reinhard; and Figge, Reiner, 5,567,750, Cl. 524-3.000.  
 Hafeman, Dean G.: See—  
 Song, Herking; and Hafeman, Dean G., 5,567,302, Cl. 205-777.500.  
 Haffner, Eugene F.; Royce, Thomas P.; and Shingle, John M., to Owens-Illinois Closure Inc. Liquid containing and dispensing package. 5,566,862, Cl. 222-111.000.  
 Hagemeyer, Larry D.: See—  
 Lacz, David J.; Skochdopole, Todd R.; Hagemeyer, Larry D.; Fees, Anita M.; Thomas, Brian; and McSweeney, Gary J., 5,567,473, Cl. 427-211.000.  
 Hager, Herbert: See—  
 Becker, Oliver; Kolz, Sabine; and Hager, Herbert, 5,567,392, Cl. 422-174.000.  
 Hager, Kathleen. Fitness device. 5,567,202, Cl. 482-131.000.  
 Hagiwara, Seiji: See—  
 Tsunekawa, Koichi; and Hagiwara, Seiji, 5,568,155, Cl. 343-700.00MS.  
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 Hagiwara, Yoshiki: See—  
 Hira, Yasuo; Toba, Tamaki; Imayama, Hiroaki; Ohkawa, Atsuko; Fujisawa, Masayasu; Nate, Kazuo; Sonobe, Hideki; Suzuki, Saburo; Togawa, Eisei; Ishizaki, Hiroshi; and Hagiwara, Yoshiki, 5,567,333, Cl. 216-22.000.  
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 Hagman, John F.; and Statz, Robert J., to Du Pont de Nemours, E. I., and Company. High flow ionomer resin compositions useful for golf ball covers. 5,567,772, Cl. 525-221.000.  
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 Hagstrom, Leonard. Rotary filament vegetation trimmer with air cooled filament. 5,566,455, Cl. 30-276.000.  
 Hahn Elastomer Corporation: See—  
 Hahn, Thomas R., 5,566,954, Cl. 277-184.000.  
 Hahn, Stan S.; and Baek, Sung K., to Asian Micro Sources, Inc. High output, compact power supply. 5,568,365, Cl. 361-837.000.  
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 Hakala, Harri, to Kone Oy. Elevator drive machine placed in the counter-weight. 5,566,785, Cl. 187-250.000.  
 Hakkarainen, Juha M.: See—  
 Staver, Daniel A.; and Hakkarainen, Juha M., 5,568,047, Cl. 324-127.000.  
 Hall, Howard F.: See—  
 Dart, Peter J.; Hall, Howard F.; and Johnson, David A., 5,566,951, Cl. 273-358.000.  
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 Hall, John H. Compound modulated integrated transistor structure with reduced bipolar switch back effect. 5,567,969, Cl. 257-370.000.  
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 Meeker, David L.; and Hall, Kenneth G., 5,567,950, Cl. 250-504.00R.  
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 Carpenter, Robert B.; Badalamenti, Anthony M.; Logan, Jerry L.; and Laurel, David F., 5,566,757, Cl. 166-285.000.  
 Harris, Phillip C., 5,566,760, Cl. 166-308.000.  
 Williamson, Jimmie R.; Gano, John C.; and Reesing, David L., 5,566,763, Cl. 166-382.000.  
 Halling, Robert A.: See—  
 Huang, Hsu-Nan; and Halling, Robert A., 5,567,857, Cl. 568-615.000.  
 Halm, Hans: See—  
 Lepsius, Tilwin; Gierenz, Gerhard; Tranelis, Klaus; Reinfelder, Gerd-Ruediger; Franken, Joachim; and Halm, Hans, 5,567,071, Cl. 401-68.000.  
 Halm, Roland L.: See—  
 Diaz, Michael; Halm, Roland L.; McIntyre, Michael A.; and Wilding, Oliver K., 5,567,836, Cl. 556-466.000.  
 Ham, Young Mok, to Hyundai Electronics Industries. Method for fabricating a phase shift mask. 5,567,552, Cl. 430-5.000.  
 Hamada, Takahiro; Kawada, Ryoichi; and Matsumoto, Shuichi, to Kokusai Denshin Denwa Kabushiki Kaisha. Motion adaptive noise reduction filter and motion compensated interframe coding system using the same. 5,568,196, Cl. 348-416.000.  
 Hamada, Yumiko: See—  
 Nishio, Hidetoshi; Furuse, Takako; Hamada, Yumiko; and Uesugi, Hiroyuki, 5,567,661, Cl. 437-228.000.  
 Hamamatsu Photonics K.K.: See—  
 Kosugi, Mitsuo, 5,568,343, Cl. 361-36.000.



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Webb, Adele A.; Ebner, Cindy A.; and Hamann, Mary V., 5,566,413, Cl. 5-655.000.
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Inagaki, Masahiro; Fukushima, Yoshihisa; Yamashita, Haruo; Azumani, Yasushi; and Hamasaka, Hiroshi, 5,568,467, Cl. 369-275.300.
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Mowry, John R.; Harris, Jacqueline A.; Luebke, Charles P.; and Hamm, David A., 5,567,860, Cl. 585-639.000.
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Hammonds, Carl L., 5,567,048, Cl. 366-139.000.
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Diehl, Eric; and Hamon, Joel, 5,568,179, Cl. 348-6.000.
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Kogame, Toshihiko; and Hamuro, Mitsuro, 5,567,240, Cl. 118-665.000.
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Schloemer, George C.; Han, Yeun-Kwei; and Harrington, Peter J., 5,567,816, Cl. 544-276.000.
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Johnstone, Peter; Emmerton, Gary; Fitzpatrick, Paul J.; Hanara, Pehama; and Wyborn, Lindsay G., 5,566,530, Cl. 53-441.000.
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Davenport, John M.; Hansler, Richard L.; and Cassarly, William J., 5,567,031, Cl. 362-32.000.
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Koehn, Steven E.; Miller, Phillip; Hanson, George E.; Schultz, Darald R.; and Krumfuss, Jeffrey S., 5,567,925, Cl. 235-375.000.
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Ganter, Udo, 5,566,614, Cl. 101-408.000.
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Hofbauer, Stefan, 5,566,467, Cl. 34-79.000.
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Haenisch, Thomas J.; Heims, Douglas A.; and Johnson, Warren F., 5,567,029, Cl. 312-405.100.
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Scheucher, Peter; Heindler, Gerhard; Schininger, Walter; Paier, Gerhard; and Mraz, Peter, 5,566,611, Cl. 100-127.000.
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Craig, Stephen R.; Welsh, Paul B.; and Henderson, Robert C., 5,567,868, Cl. 73-23.420.
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Wilcox, Jonathan J.; Henderson, Thomas A.; and Wilcox, Jon A., 5,568,639, Cl. 395-600.000.
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Schmidt, Melvin J.; Coach, Thomas P.; Hause, Glenn C.; Galowitz, Dennis A.; Wyman, James P.; Hendricks, Robert A.; Van Steeg, Lawrence J.; and Evans, Harold H., 5,566,507, Cl. 49-428.000.



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Yu, Tom Y.; and Hendrickson, Randy L., 5,567,481, Cl. 427-428.000.
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Johnson, John R.; Roder, William R.; and Henegar, C. Sherill, 5,567,480, Cl. 427-410.000.
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Counts, Michael W.; Thompson, John A.; Lavoie, Jack O.; and Aleksejczyk, Robert A., 5,567,205, Cl. 8-94.180.  
Desai, Sureshchandra G.; Hessel, John F.; Urfer, Allen D.; Allen, Charles B.; and Fischer, Stephen A., 5,567,808, Cl. 536-4.100.  
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Lepsius, Tilwin; Gierenz, Gerhard; Tranelis, Klaus; Reinfelder, Gerd-Ruediger; Franken, Joachim; and Halm, Hans, 5,567,071, Cl. 401-68.000.
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Funk, Erwin D.; Henricson, Kaj; and Dunn, Stephen J., 5,567,274, Cl. 162-49.000.
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Hemmerle, Horst; Schubert, Gerrit; Below, Peter; Herling, Andreas; and Burger, Hans-Jörg, 5,567,725, Cl. 514-381.000.
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McClung, Duane G.; and Dame, Paul G., 5,567,027, Cl. 312-219.000.
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Pfeffer, Jochen G.; and Czerwoniak, Erich, 5,566,833, Cl. 209-273.000.
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Weidenmann, Walter; Luetzau, Frank v.; Frank, Gerhard; Schmidt, Michael; Mayer, Ferdinand; and Herold, Ulrich, 5,567,315, Cl. 210-123.000.
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Tiemann, Jerome J.; Hershey, John E.; and Hassan, Amer A., 5,568,301, Cl. 359-140.000.
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Stetter, Joseph R.; Hesketh, Peter J.; Gendel, Steven M.; and Maclay, G. Jordan, 5,567,301, Cl. 205-777.500.
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Desai, Sureshchandra G.; Hessel, John F.; Urfer, Allen D.; Allen, Charles B.; and Fischer, Stephen A., 5,567,808, Cl. 536-4.100.
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Humphrey, Stephen J.; Meisner, Kaushik D.; Ludens, James H.; and Hester, Jackson B., Jr., 5,567,722, Cl. 514-353.000.
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Chiao, Richard Y.; Hewes, Ralph A.; and Gilmore, Robert S., 5,568,144, Cl. 341-139.000.
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Reasoner, Kelly J., 5,568,592, Cl. 395-80.000.
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Bohn, David D.; and Gerrard, Jesse M., 5,568,317, Cl. 359-618.000.  
Cowger, Bruce, 5,568,172, Cl. 347-19.000.  
Craig, Stephen R.; Welsh, Paul B.; and Henderson, Robert C., 5,567,868, Cl. 73-23.420.  
Henderson, Robert C., 5,567,227, Cl. 95-22.000.  
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Nelson, Marvin D.; Oldfield, Barry J.; and Petersen, Mark D., 5,568,641, Cl. 395-700.000.
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Sherer, William P.; Lo, Lai-Chin; and Hickey, John F., 5,568,469, Cl. 370-17.000.  
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Takenaka, Kenji; Kayukawa, Hiroaki; and Hidaka, Shigeyuki, 5,567,124, Cl. 417-222.000.
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- Higuma, Masahiko: See—  
Sato, Osamu; Sugitani, Hiroshi; Orikasa, Tsuyoshi; Ujita, Toshihiko; Higuma, Masahiko; Kotaki, Yasuo; and Hinami, Jun, 5,567,373, Cl. 264-112.000.
- Hijikata, Toshihiko; Hiraoka, Tetsuya; and Umehara, Kazuhiko, to NGK Insulators, Ltd.: Process and an apparatus for treating an exhaust gas, and a honeycomb structural exhaust gas filter. 5,566,545, Cl. 60-274.000.
- Hilgendorf, Rolf: See—  
Hass, Jürgen; Hilgendorf, Rolf; Neuber, Siegfried; Schlupf, Thomas; and Ulland, Hartmut, 5,568,407, Cl. 364-579.000.
- Hill, Fletcher L.: See—  
Beal, David G.; Chikira, Joetta S.; Hill, Fletcher L.; Jurestovsky, Nancy R.; and Stephens, Michael R., 5,568,491, Cl. 371-30.000.
- Hill, James A.; Marsh, Gregory A.; and Smith, Myron L., to General Electric Company: Shuttered radiator system with control. 5,567,745, Cl. 165-299.000.
- Hill, John P., to United Technologies Automotive, Inc.: Balanced oscillator and transmitter arrangement. 5,568,095, Cl. 331-56.000.
- Hill, Rickey L.: See—  
Dolan, John W.; Spener, John W., Jr.; and Hill, Rickey L., 5,566,872, Cl. 225-41.000.
- Hillman, Joseph T.: See—  
Foster, Robert F.; Hillman, Joseph T.; and LeBlanc, Rene E., 5,567,243, Cl. 118-730.000.  
Foster, Robert F.; Hillman, Joseph T.; and Arora, Rikhit, 5,567,483, Cl. 427-535.000.
- Hill-West, Jennifer L.: See—  
Hubbell, Jeffrey A.; Pathak, Chandrashekar P.; Sawhney, Amarpreet S.; Desai, Neil P.; and Hill-West, Jennifer L., 5,567,435, Cl. 424-426.000.  
Hubbell, Jeffrey A.; Elbert, Donald; Hill-West, Jennifer L.; Drumbeller, Paul D.; Chowdhury, Sanghamitra; and Sawhney, Amarpreet, 5,567,440, Cl. 424-484.000.
- Hinami, Jun: See—  
Sato, Osamu; Sugitani, Hiroshi; Orikasa, Tsuyoshi; Ujita, Toshihiko; Higuma, Masahiko; Kotaki, Yasuo; and Hinami, Jun, 5,567,373, Cl. 264-112.000.
- Hinckley, Charles C.: See—  
Caprio, Craig A.; Van der Gaag, Michael R.; Hinckley, Charles C.; and Chemelli, John B., 5,567,617, Cl. 435-287.000.
- Hinman, Brian L.; and Rodman, Jeffrey C., to Polycom, Inc.: Remote interactive projector. 5,568,279, Cl. 358-452.000.
- Hinz, Marc: See—  
Stoffler, Achim; Gensheimer, Valentin; Werber, Edgar; Hinz, Marc; Hummel, Peter; Wenzel, Jürgen; Volz, Albrecht; Blum, Joachim; Zschetzsche, Hubert; and Straub, Manfred, 5,566,613, Cl. 101-350.000.
- Hioki, Yuichi: See—  
Hayashi, Masaharu; Hioki, Yuichi; Shonaka, Masafumi; and Moriyama, Tadashi, 5,567,606, Cl. 435-106.000.

- Hira, Yasuo; Toba, Tamaki; Imayama, Hirota; Ohkawa, Atsuko; Fujisawa, Masayasu; Nate, Kazuo; Sonobe, Hideki; Suzuki, Saburo; Togawa, Eisei; Ishizaki, Hiroshi; and Hagiwara, Yoshiki, to Hitachi, Ltd.: Thin film magnetic head, process for production thereof. 5,567,333, Cl. 216-22.000.
- Hirae, Sadao: See—  
Kusuda, Tatsufumi; Kouno, Motohiro; Nakatani, Ikuyoshi; and Hirae, Sadao, 5,568,252, Cl. 356-72.000.
- Hiraga, Kaoru: See—  
Ito, Susumu; Kamiguchi, Masao; Yamamura, Masato; Neko, Noriaki; Uchiyama, Tatsuhiko; Hosoya, Yuichi; Takeda, Nobuto; and Hiraga, Kaoru, 5,567,367, Cl. 264-40.100.
- Hirai, Atsuto; Ueda, Masahide; Terasaka, Yoshihisa; Sano, Eiichi; Matsuura, Masahiko; Yamasaki, Hiroyuki; Yamada, Masami; and Izumi, Tomoo, to Minolta Co., Ltd.: Image forming apparatus including an endless transfer member. 5,568,244, Cl. 355-309.000.
- Hiraishi, Toshinori: See—  
Sugiyama, Hitoshi; Hiraishi, Toshinori; and Kumano, Tuiyoshi, 5,568,609, Cl. 395-183.190.
- Hirakawa, Kiyoshi: See—  
Nakatsukasa, Sigeki; Yoshioka, Kenichi; Hirakawa, Kiyoshi; Tanaka, Kazuhiko; Kawamoto, Masao; Sugoh, Nozomu; Migaki, Atsuko; and Taniguchi, Shunro, 5,567,796, Cl. 528-272.000.
- Hiraki, Shinichi: See—  
Enomoto, Takeo; Abe, Toshiya; Murakami, Hironobu; and Hiraki, Shinichi, 5,567,446, Cl. 425-84.000.
- Hirama, Masahide, to Sony Corporation: Method of manufacturing semiconductor devices. 5,567,575, Cl. 430-394.000.
- Hirano, Hideki; Tomita, Hidemi; and Shinozaki, Kenji, to Sony Corporation: Laser recording apparatus for vaporizing colder dye across a gap, and recording method thereof. 5,568,170, Cl. 347-51.000.
- Hirano, Hiroyuki; and Ito, Takayuki, to Asahi Kogaku Kogyo Kabushiki Kaisha: Achromatic lens system. 5,568,325, Cl. 359-785.000.
- Hirano, Hiroyuki: See—  
Azami, Kae; and Hirano, Hiroyuki, 5,568,322, Cl. 359-689.000.
- Hirano, Naohiko; and Yamaji, Yasuhiro, to Kabushiki Kaisha Toshiba: Semiconductor apparatus capable of cooling a semiconductor element with radiation efficiency. 5,567,983, Cl. 257-722.000.
- Hirano, Tsuneo: See—  
Kashiwagi, Nobuhito; Asakura, Syojiro; Ide, Tatsuo; Sakurai, Masato; Adachi, Masakazu; Tomiyoshi, Katsumi; and Hirano, Tsuneo, 5,567,443, Cl. 424-529.000.
- Hirano, Yoshitaka: Electromotive curtain for drying clothes. 5,566,471, Cl. 34-201.000.
- Hiraoka, Tetsuya: See—  
Hijikata, Toshihiko; Hiraoka, Tetsuya; and Umehara, Kazuhiko, 5,566,545, Cl. 60-274.000.
- Hirata Corporation: See—  
Hirata, Yasunari, 5,566,436, Cl. 29-33.00K.
- Hirata, Hideki: See—  
Komaki, Tsuyoshi; Endo, Hiroyuki; Hirata, Hideki; and Kuribayashi, Isamu, 5,568,466, Cl. 369-275.200.
- Hirata, Kazumi: See—  
Sasaki, Takanobu; and Hirata, Kazumi, 5,566,899, Cl. 242-381.100.
- Hirata, Masakuni: See—  
Inoue, Kiyoshi; and Hirata, Masakuni, 5,567,342, Cl. 508-287.000.
- Hirata, Yasunari, to Hirata Corporation: Method of inserting machine parts into a workpiece. 5,566,436, Cl. 29-33.00K.
- Hirohata, Naoto; Shudo, Katsuyuki; and Miyazaki, Yuuki, to Victor Company of Japan, Ltd.: Audio signal processing apparatus for high speed or forward/reverse direction reproduction. 5,568,329, Cl. 360-32.000.
- Hiroki, Masaaki: See—  
Yamazaki, Shunpei; Mase, Akira; and Hiroki, Masaaki, 5,568,288, Cl. 359-59.000.
- Hironaka, Misao, to Mitsubishi Denki Kabushiki Kaisha: Semiconductor laser device. 5,568,502, Cl. 372-50.000.
- Hirose Electric Co., Ltd.: See—  
Mizuguchi, Shinji, 5,567,171, Cl. 439-326.000.
- Hirose, Masakazu: See—  
Sunamori, Takasbi; Sato, Hiroshi; Hirose, Masakazu; and Yanauti, Kazuo, 5,568,267, Cl. 356-416.000.
- Hirota, Masaharu; Ito, Toru; Endo, Norikazu; Nojima, Akihiko; and Kato, Yoshitaka, to Toyota Jidosha Kabushiki Kaisha: Navigation system to be mounted on vehicles. 5,568,390, Cl. 364-449.000.
- Hirota, Toshiyuki, to NEC Corporation: Method of fabricating a micro-trench floating gate electrode for flash memory cell. 5,567,637, Cl. 437-43.000.
- Hirsch, Jeffrey: See—  
Harrington, James A.; Abel, Todd C.; and Hirsch, Jeffrey, 5,567,471, Cl. 427-163.200.
- Hislop, Jennifer M.: See—  
Kepplinger, Daniel J.; and Hislop, Jennifer M., 5,568,548, Cl. 379-446.000.
- Hitachi America, Ltd.: See—  
Pearlstein, Larry A.; Augenbraun, Joseph E.; and Lane, Frank A., 5,568,200, Cl. 348-426.000.
- Hitachi Chemical Company, Ltd.: See—  
Kawata, Tatsuo; Suzuki, Hiroshi; Sashima, Hiroki; Miyabayashi, Kazuhiko; and Horie, Osamu, 5,567,990, Cl. 257-788.000.
- Hitachi, Ltd.: See—  
Akagi, Kyo; Futamoto, Masaaki; Kugiya, Fumio; Miyamura, Yoshinori; Takano, Hisashi; Matsuda, Yoshibumi; Suzuki, Mikio; Nakao, Takeshi; Munemoto, Takayuki; Fukuoka, Hirotugu; Aihara, Makoto; Takagaki, Tokuhito; Aoi, Hajime; and Seo, Yosuke, 5,568,331, Cl. 360-77.070.
- Fujii, Tadashi; Kataoka, Yoshiyuki; and Kinoshita, Shoichiro, 5,566,709, Cl. 137-487.500.
- Hira, Yasuo; Toba, Tamaki; Imayama, Hirota; Ohkawa, Atsuko; Fujisawa, Masayasu; Nate, Kazuo; Sonobe, Hideki; Suzuki, Saburo; Togawa, Eisei; Ishizaki, Hiroshi; and Hagiwara, Yoshiki, 5,567,333, Cl. 216-22.000.
- Kametani, Masatsugu, 5,568,617, Cl. 395-280.000.
- Makino, Toshiaki; Terada, Katsuyuki; Sebata, Michio; Hattori, Morishige; Takai, Hideo; Yasui, Toshi; Oshima, Masabumi; Iida, Akiyoshi; Takano, Yasushi; Kato, Chisachi; and Kobayashi, Kenji, 5,566,800, Cl. 191-67.000.
- Mimura, Tadao; Kato, Yoshiaki; and Matsumura, Kazumi, 5,567,938, Cl. 250-288.000.
- Nishiyama, Tatsuya; Wakayama, Satoshi; Matsuda, Yoshiaki; Hashimoto, Tetsuya; Kojima, Keiji; and Yamamoto, Kiyoshi, 5,568,640, Cl. 395-600.000.
- Ogasawara, Nobuo; Endo, Noboru; Miki, Kazuo; and Takase, Akihiko, 5,568,468, Cl. 370-13.000.
- Sato, Takao; Ichinomiya, Hiroshi; Takeuchi, Hisaharu; and Yamamoto, Akira, 5,568,628, Cl. 395-440.000.
- Sawaguchi, Hideki; Ouchi, Yasuhide; Sato, Naoki; and Hori, Yosuke, 5,568,330, Cl. 360-46.000.
- Shibata, Koichi; and Kinoshita, Taizo, 5,568,184, Cl. 348-15.000.
- Takai, Atsushi; and Abe, Hajime, 5,568,576, Cl. 385-24.000.
- Takekuma, Toshitsugu; Kurihara, Ryoichi; and Yamagawa, Akira, 5,568,063, Cl. 326-30.000.
- Uchiyama, Akira; Shibata, Ryujii; Nakagome, Yoshinobu; and Kubo, Masaharu, 5,568,083, Cl. 327-538.000.
- Usagawa, Toshiyuki; Takai, Atsushi; and Itoh, Hiroyuki, 5,567,961, Cl. 257-197.000.
- Yamashita, Keiichiro; and Uchida, Akihiro, 5,568,397, Cl. 364-491.000.
- Yano, Makoto; Tsukushi, Masanori; and Yaginuma, Noriyuki, 5,567,924, Cl. 218-143.000.
- Yokota, Yoshihiro; Naito, Shotaro; Suzuki, Toshihiko; and Koide, Akira, 5,567,880, Cl. 73-514.330.
- Hitachi Metals, Ltd.: See—  
Yoshizawa, Yoshitomo; and Arakawa, Shunsuke, 5,567,537, Cl. 428-692.000.
- Hitachi Microcomputer System, Ltd.: See—  
Sato, Takao; Ichinomiya, Hiroshi; Takeuchi, Hisaharu; and Yamamoto, Akira, 5,568,628, Cl. 395-440.000.
- Uchiyama, Akira; Shibata, Ryujii; Nakagome, Yoshinobu; and Kubo, Masaharu, 5,568,083, Cl. 327-538.000.
- Hitachi Seibu Software Co., Ltd.: See—  
Nishiyama, Tatsuya; Wakayama, Satoshi; Matsuda, Yoshiaki; Hashimoto, Tetsuya; Kojima, Keiji; and Yamamoto, Kiyoshi, 5,568,640, Cl. 395-600.000.
- Hiyama, Keiichi: See—  
Fukuchi, Masami; Miyoshi, Yoshitaka; Kanno, Masahide; Hattori, Shin-ichiro; Nakamura, Kazunari; Hiyama, Keiichi; and Hasegawa, Jun, 5,568,271, Cl. 386-46.000.
- HMT Technology Corporation: See—  
Chen, Ga-Lane; and Do, Hoa, 5,567,512, Cl. 428-332.000.
- Ho, Diana, to Monotype Supply Co., Ltd.: In-line roller skate having adjustable biasing angle for each individual wheel. 5,566,957, Cl. 280-11.220.
- Hobbs, Billy J., Jr., to LSP Products Group, Inc.: Valve connector system for plastic pipe. 5,566,708, Cl. 137-360.000.
- Hoch, Samuel, to Witco Corporation: Alkyl-tin PVC stabilizers with added aromatic ether alcohol to prevent precipitation. 5,567,751, Cl. 524-181.000.
- Hochstein, Peter A.; and Foy, Dennis: Method and apparatus for identifying and measuring the distance between vehicles. 5,568,136, Cl. 340-903.000.
- Hodson, Trevor M.: See—  
Marsh, Michael J. C.; Carson, Mark H.; Gouws, Gideon J.; Marais, Mario A.; and Hodson, Trevor M., 5,566,441, Cl. 29-600.000.
- Hoechst Aktiengesellschaft: See—  
Hemmerle, Horst; Schubert, Gerrit; Below, Peter; Herling, Andreas; and Burger, Hans-Jörg, 5,567,725, Cl. 514-381.000.  
Hentzschel, Peter; Kamutzki, Walter; and Wolf, Dieter, 5,567,272, Cl. 162-9.000.  
Marten, Manfred; and Wehner, Bernhard, 5,567,782, Cl. 525-523.000.  
Melzer, Werner, 5,567,291, Cl. 204-420.000.  
Okaniwa, Kaoru, 5,568,579, Cl. 385-43.000.  
Schwark, Jan-Robert; Kleemann, Heinz-Werner; Lang, Hans-Jochen; Weichert, Andreas; Scholz, Wolfgang; and Albus, Udo, 5,567,734, Cl. 514-617.000.
- Hoechst Celanese Corporation: See—  
Borjas, Ricardo E.; Araullo-McAdams, Carina; Alexander, Steven R.; Blay, George A.; and Liu, Yaw-Hwa, 5,567,299, Cl. 205-449.000.  
Unruh, Jerry D.; Segmuller, Brigitte E.; Chapa, Gabriel R.; and Pryor, Kent E., 5,567,856, Cl. 568-454.000.  
Vicari, Richard; Juneau, Kathleen N.; and Murphy, Carl D., 5,567,795, Cl. 528-206.000.
- Hoechst Marion Roussel Inc.: See—



- Shutske, Gregory M.; and Kapples, Kevin J., 5,567,718, Cl. 514-339,000.
- Hoef, Shelley E.: See—  
Kim, Choung U.; Misco, Peter F., Jr.; Wichtowski, John A.; Ueda, Yasutsugu; Hudyma, Thomas W.; Matiskella, John D.; D'Andrea, Stanley V.; Hoef, Shelley E.; Miller, Raymond F.; Mansuri, Muzamil M.; and Bronson, Joanne J., 5,567,698, Cl. 514-210,000.
- Hofbauer, Stefan, to Heidelberger Zement Aktiengesellschaft. Cyclone heat exchanger. 5,566,467, Cl. 34-79,000.
- Hofele, Hans, to L. Schuler GmbH. Press, malistation press or similar forming machine. 5,566,814, Cl. 198-621,100.
- Hoffman, John: See—  
Raines, Jeffrey K.; Snyder, Leon T.; and Hoffman, John, 5,566,677, Cl. 128-694,000.
- Hoffman, Robert E. Separation resistant slat connections for folding shutters. 5,566,739, Cl. 160-183,000.
- Hoffmann, James A.: See—  
Basinski, Margaret; DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Schoner, Brigitte E.; Shields, James E.; and Smiley, David L., 5,567,803, Cl. 530-324,000.
- DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Shields, James E.; and Smiley, David L., 5,567,678, Cl. 530-324,000.
- Hoffmann, Joachim: See—  
Creutzmann, Edmund; Eckardt, Andreas; Hoffmann, Joachim; Kopp, Walter; and Windele, Josef, 5,568,241, Cl. 355-259,000.
- Hoffmann-La Roche Inc.: See—  
Apple, Raymond J.; Erlich, Henry A.; Griffith, Robert L.; and Scharf, Stephen J., 5,567,809, Cl. 536-24,300.
- Kelly, Stephen; Schadt, Martin; and Schmitt, Klaus, 5,567,349, Cl. 252-299,010.
- Hofmann, Steven P.: See—  
Ackroyd, Rand H.; and Hofmann, Steven P., 5,566,704, Cl. 137-14,000.
- Hoganas AB: See—  
Lindberg, Caroline; and Johansson, Björn, 5,567,890, Cl. 75-243,000.
- Hökby, Elvy: See—  
Castenon, Staffan; Florin-Robertsson, Ebba; Hökby, Elvy; and Thomé, Sirkka, 5,567,677, Cl. 514-12,000.
- Holber, William M.; Smith, Donald K.; Besen, Matthew M.; Fitzner, Matthew P.; and Georgelis, Eric J., to Applied Science and Technology, Inc. Fluid-cooled dielectric window for a plasma system. 5,568,015, Cl. 315-39,000.
- Holger, Fritz: See—  
Körner, Klaus; Holger, Fritz; Nyarsik, Lajos; Spur, Günter; and Uhlmann, Eckart, 5,568,256, Cl. 356-359,000.
- Holland, Herbert W. Marine vessel fuel spill prevention device. 5,566,731, Cl. 141-86,000.
- Holler, Calvin L.: See—  
Haugen, John M., Sr.; Haugen, John M., Jr.; Holler, Calvin L.; and Higgins, Charles T., 5,568,215, Cl. 396-512,000.
- Hollingshead, Chris J.; and Gardner, Eric E., to GenCorp Inc. Molded glass run channel corner assembly. 5,566,510, Cl. 49-479,100.
- Holmes-Higgin, Ian J.; and Rogers, Ivor T., to ABB Kent Plc. Fluid meters and pumps. 5,567,876, Cl. 73-257,000.
- Holonyak, Nick, Jr.; and Dallesasse, John M., to Board Of Trustees Of The University Of Illinois, The. Native oxide of an aluminum-bearing group III-V semiconductor. 5,567,980, Cl. 257-631,000.
- Holy Ghost, Duguesne University of the: See—  
Li, Pui-Kai, 5,567,831, Cl. 554-43,000.
- Holzer, Reuven, to National Semiconductor Corporation. Efficient, high frequency, class A-B amplifier for translating low voltage clock signal levels to CMOS logic levels. 5,568,093, Cl. 330-264,000.
- Homaco, Inc.: See—  
Lerman, Zev Z., 5,566,836, Cl. 211-26,000.
- Honda Giken Kogyo Kabushiki Kaisha: See—  
Kosuge, Masami; Takemoto, Satoshi; and Suzuki, Masami, 5,567,005, Cl. 296-204,000.
- Nishio, Tomoyuki; Kuriyama, Nariaki; and Fueki, Nobuhiro, 5,567,877, Cl. 73-504,060.
- Noda, Toshiharu; Sato, Katsuaki; and Saka, Tsutomu, 5,567,383, Cl. 420-584,100.
- Okamoto, Kenji; Horimura, Hiroyuki; Minemi, Masahiko; Takeda, Yoshinobu; Takano, Yoshishige; and Kaji, Toshihiko, 5,566,449, Cl. 29-888,092.
- Honda, Masato: See—  
Nishigami, Akira; Nakamura, Tetsuzo; and Honda, Masato, 5,567,377, Cl. 264-515,000.
- Honda, Munenobu: See—  
Wada, Yasuo; Ueno, Yoshio; and Honda, Munenobu, 5,566,925, Cl. 254-358,000.
- Honeywell Inc.: See—  
Straight, John B.; Youngner, Daniel W.; and Anderson, James C., 5,567,650, Cl. 437-195,000.
- Hong, Wonpyo: See—  
Amuti, Kofi S.; Hong, Wonpyo; and Semple, Joseph E., 5,567,670, Cl. 504-230,000.
- Hong, Yu-L. Infrared scanner and stand assembly. 5,567,939, Cl. 250-338,100.
- Honjo, Masahiro: See—  
Takamori, Hiroki; and Honjo, Masahiro, 5,568,459, Cl. 369-50,000.
- Hoogovens Staal. B.V.: See—  
Bernard, Johannes G.; Meijer, Hendrikus K. A.; and Teerhuis, Cornelis P., 5,567,225, Cl. 75-453,000.
- Hoover, Donald P. Rotary retort heat treating furnace seals. 5,567,380, Cl. 266-173,000.
- Hor, Ah-Mee: See—  
Hsiao, Cheng-Kuo; Hor, Ah-Mee; Gardner, Sandra J.; Gaynor, Roger E.; and Poitras, Jacques, 5,567,558, Cl. 430-58,000.
- Hori, Osamu; Shimotsuji, Shigeyoshi; and Asano, Mieko, to Kabushiki Kaisha Toshiba. Drawing processing apparatus. 5,568,566, Cl. 382-197,000.
- Hori, Yosuke: See—  
Sawaguchi, Hideki; Ouchi, Yasuhide; Sato, Naoki; and Hori, Yosuke, 5,568,330, Cl. 360-46,000.
- Horie, Hiroshi; and Tobita, Tsutomu, to Toshiba Corporation. Frequency synthesizer for use in radio transmitter and receiver. 5,568,098, Cl. 331-16,000.
- Horie, Osamu: See—  
Kawata, Tatsuo; Suzuki, Hiroshi; Sashima, Hiroki; Miyabayashi, Kazuhiko; and Horie, Osamu, 5,567,990, Cl. 257-788,000.
- Horie, Yuji, to Olympus Optical Co., Ltd. Semiconductor laser driving apparatus utilizing three current sources to control read and write light power. 5,568,464, Cl. 369-116,000.
- Horimura, Hiroyuki: See—  
Okamoto, Kenji; Horimura, Hiroyuki; Minemi, Masahiko; Takeda, Yoshinobu; Takano, Yoshishige; and Kaji, Toshihiko, 5,566,449, Cl. 29-888,092.
- Horine, Vinton F.: See—  
Rude, Arthur D.; and Horine, Vinton F., 5,566,848, Cl. 220-4,120.
- Horinouchi, Teruhiko; and Ono, Nobumasa, to Sharp Kabushiki Kaisha. Photo interrupter and a method of manufacturing the same. 5,567,953, Cl. 250-551,000.
- Hörmfeldt, Sven: See—  
Fogelberg, Thomas; Gäfvert, Uno; and Hörmfeldt, Sven, 5,568,114, Cl. 336-206,000.
- Horton, Richard F., to Symbiosis Corporation. Relay lens system for endoscope. 5,568,312, Cl. 359-435,000.
- Hosaka, Kotaro: See—  
Eguchi, Tadashi; Momose, Katsumi; Narumi, Hiroji; Nishimura, Tetsuharu; Hosaka, Kotaro; Tsukiji, Masaaki; and Ishizuka, Koh, 5,568,337, Cl. 360-78,110.
- Hoshino Gakki Co., Ltd.: See—  
Hoshino, Yoshiaki, 5,566,911, Cl. 248-124,100.
- Hoshino, Yoshiaki, 5,567,899, Cl. 84-422,100.
- Hoshino, Kouichi; Watanabe, Takamoto; and Ohtsuka, Yoshinori, to Nippon Soken Inc.; and Nippondenso Co., Ltd. Pulse phase difference encoding circuit. 5,568,071, Cl. 377-43,000.
- Hoshino, Masahiko: See—  
Mochizuki, Shunji; Takagi, Hiromi; Hoshino, Masahiko; and Yoshikawa, Sumi, 5,567,378, Cl. 266-44,000.
- Hoshino, Yoshiaki, to Hoshino Gakki Co., Ltd. Stand for drum and cymbal. 5,566,911, Cl. 248-124,100.
- Hoshino, Yoshiaki, to Hoshino Gakki Co., Ltd. Beater rotary shaft arrangement for dual drum pedal. 5,567,899, Cl. 84-422,100.
- Hosoe, Katsuharu, to Nippondenso Co., Ltd. Acceleration responsive control system and method for internal combustion engine. 5,566,657, Cl. 123-418,000.
- Hosoya, Yasuhiko; Kuroda, Toshiki; and Katashiba, Hideaki, to Mitsubishi Denki Kabushiki Kaisha. Controlling apparatus for introducing air into an exhaust pipe of an internal combustion engine. 5,566,547, Cl. 60-284,000.
- Hosoya, Yuichi: See—  
Ito, Susumu; Kamiguchi, Masao; Yamamura, Masato; Neko, Noriaki; Uchiyama, Tatsuhito; Hosoya, Yuichi; Takeda, Nobuto; and Hiraga, Kaoru, 5,567,367, Cl. 264-40,100.
- Hospital AG: See—  
Goux, Nicolas; and Bene, Bernard, 5,567,320, Cl. 210-739,000.
- Hottinger Baldwin Messtechnik GmbH: See—  
Will, Ronald; Franz, Markus; Waegner, Ralf; Gerlach, Hans-J.; and Schlachter, Werner, 5,566,575, Cl. 73-862,629.
- Hou, Hsieh S.: See—  
Willis, Donald F.; Brooks, John E.; Adra, Hosni; and Hou, Hsieh S., 5,568,571, Cl. 382-254,000.
- Houben, Jochen; Hermann, Edgar; and Dahmen, Kurt, to Chemische Fabrik Stockhausen GmbH. Process for producing a water-absorbing sheet material and the use thereof. 5,567,478, Cl. 427-342,000.
- Houghton, Peter G., to Merck, Sharp & Dohme, Ltd. Process for preparing indole derivatives containing a 1,2,4-triazol-1-yl substituent. 5,567,819, Cl. 546-201,000.
- Houston, John C., to American Sterilizer Company. Drive system for a sliding chamber door. 5,566,508, Cl. 49-445,000.
- How, Hoton: See—  
Fang, Ta-Ming; How, Hoton; and Vittoria, Carmine, 5,568,106, Cl. 333-204,000.
- Howard, Douglas D. Shear-pin system for logging truck bunk. 5,567,096, Cl. 410-42,000.
- Howard, W. Todd: See—  
Smith, Murvel L., Jr.; and Howard, W. Todd, 5,566,939, Cl. 463-58,000.
- Howbert, J. Jeffrey: See—  
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Okada, Setsuo, 5,568,453, Cl. 369-7,000.
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Taylor, Robert D.; and Hussey, Brett, 5,566,543, Cl. 60-219,000.
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Stone, Marcia J., 5,567,619, Cl. 436-77,000.
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Creghan, Robert D., 5,566,892, Cl. 241-22,000.
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Ham, Young Mok, 5,567,552, Cl. 430-5,000.
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Bae, Do-In, 5,567,542, Cl. 429-99,000.
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Martin, Lynn E.; Williamson, Jay D.; Blom, Kenneth M.; Vaughan, Jamieson; and Smith, Charles S., 5,566,518, Cl. 52-426,000.
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Satoh, Takao; Ichinomiya, Hiroshi; Takeuchi, Hisaharu; and Yamamoto, Akira, 5,568,628, Cl. 395-440,000.
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Chattopadhyay, Arun K., 5,567,910, Cl. 149-3,000.
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Lockman, William J.; and Clayson, Frank J., 5,567,207, Cl. 8-444,000.
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Kashiwagi, Nobuhito; Asakura, Syojiro; Ide, Tatsuo; Sakurai, Masato; Adachi, Masakazu; Tomiyoshi, Katsumi; and Hirano, Tsuneo, 5,567,443, Cl. 424-529,000.
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Frank, Steven J., 5,566,845, Cl. 215-208,000.
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Lehureau, Jean C.; Massie, Francis; and Bricot, Claude, 5,566,982, Cl. 283-83,000.
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Kawakatsu, Takaharu; Tada, Yutaka; and Ieki, Hideharu, 5,568,002, Cl. 310-313,000.
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Ericson, John E., Jr.; Wilson, Eric F.; Gordzelik, Michael L.; and Ignasiak, Martin C., 5,567,174, Cl. 439-462,000.
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Ohi, Hideo; and Ozawa, Noriyuki, 5,567,825, Cl. 548-264,200.
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Makino, Toshiaki; Terada, Katsuyuki; Sebata, Michio; Hattori, Morishige; Takai, Hideo; Yasui, Toshi; Oshima, Masabumi; Iida, Akiyoshi; Takano, Yasushi; Katoo, Chisachi; and Kobayashi, Kenji, 5,566,800, Cl. 191-67,000.
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Iino, Shinji; and Iida, Itaru, 5,568,054, Cl. 324-760,000.
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Asano, Masaki; Iino, Shuji; Ikegawa, Akihito; and Osawa, Izumi, 5,568,231, Cl. 355-219,000.
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Inada, Hiroshi; and Iiyama, Michitomo, 5,567,674, Cl. 505-475,000.
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Hasemi, Ryuji; Iwata, Keiichi; Hada, Mayumi; and Ikeda, Hidetoshi, 5,567,574, Cl. 430-331,000.
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Nakamura, Osamu; and Ikegami, Takeshi, 5,567,555, Cl. 430-29,000.
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Asano, Masaki; Iino, Shuji; Ikegawa, Akihito; and Osawa, Izumi, 5,568,231, Cl. 355-219,000.
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Tanabe, Keiichiro; Ikegaya, Akihiko; Takahashi, Toshiya; and Fujimori, Naoki, 5,567,522, Cl. 428-408,000.
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Arpalahti, Olli E.; Ikonen, Ossi; and Jantti, Arto, 5,566,750, Cl. 165-104,160.
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Gross, Peter L.; and Poole, Norman G., 5,566,816, Cl. 198-817,000.
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Cai, Zheng L.; and Imae, Yasuhiro, 5,567,065, Cl. 400-202,400.
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Takahashi, Katsunori; Maeda, Eizo; Suzuki, Hajime; Yamada, Sumio; Nakazawa, Taichi; and Imaiida, Yasuo, 5,567,222, Cl. 75-376,000.
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Takayama, Toru; Narisawa, Tsutomu; and Imanari, Hitoshi, 5,568,223, Cl. 396-123,000.
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Hira, Yasuo; Toba, Tamaki; Imayama, Hirotaka; Ohkawa, Atsuko; Fujisawa, Masayasu; Nate, Kazuo; Sonobe, Hideo; Suzuki, Saburo; Togawa, Eisei; Ishizaki, Hiroshi; and Hagiwara, Yoshiki, 5,567,333, Cl. 216-22,000.
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Morris, Michael A.; Fowles, Martin; and Mackrodt, William C., 5,567,667, Cl. 502-302,000.
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- Tury, Bernard, 5,567,341, Cl. 508-436,000.
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Sway-Tin, Min; Roterman, Thaddeus; Impullitti, Joseph F.; Meir, David S.; and Zawacki, Ronald A., 5,568,052, Cl. 324-435,000.
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Steinberger, Wolfgang; Folk, Rudolf; and Malik, Reinhart, 5,567,060, Cl. 384-569,000.
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Motegi, Kentaro; Ito, Yukio; Okamoto, Yoshitaka; and Komura, Kuniyoshi, 5,567,366, Cl. 264-39,000.
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Zhao, Xi; and Wong, Tai-kin, 5,567,607, Cl. 435-172,100.
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Chiou, Yee-Haur; and Ju, Jyh-Jong, 5,568,340, Cl. 360-96,500.
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Doddapaneni, Narayan; and Ingersoll, David, 5,567,401, Cl. 423-179,500.
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Wolfer, Dale R.; and Lyon, Leland H., 5,566,771, Cl. 175-296,000.
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Gubin, Jean; and Inion, Henri, 5,567,827, Cl. 548-484,000.
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De Leys, Robert; Vanderborcht, Bart; Saman, Eric; and Van Heuverswyn, Hugo, 5,567,603, Cl. 435-235,100.
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Morita, Youzo; and Inoue, Keiji, 5,567,388, Cl. 422-80,000.
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Yamamoto, Iwao; Niwa, Kazuo; Seki, Hitoshi; Kusahara, Toshiro; and Inoue, Yoshiaki, 5,566,792, Cl. 188-218,000.
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Ficcidenti, Maurizio, 5,567,070, Cl. 401-7,000.
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Le Gal, Jean-Hervé; Maute, Michel; and Boucort, Pierre, 5,567,397, Cl. 422-192,000.
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Negoro, Fumio; Murata, Tetsuri; Sawamura, Kozo; Yuki, Junichi; Murai, Hiroshi; Onuki, Masayasu; Ito, Norihito; Jiang, Wiegao; and Yonemura, Masako, 5,568,642, Cl. 395-700,000.
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Popp, Victor A., 5,567,866, Cl. 73-11,090.
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Johnson, Larry D.; and Pilling, David J., 5,568,444, Cl. 365-230,060.
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Steinberg, George N., 5,567,255, Cl. 156-345,000.
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- International Data Matrix, Inc.: See—  
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- International Lubricants, Inc.: See—  
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- Ishida, Toshiro; Satake, Masaki; Watanabe, Hideomi; Yasunaga, Tadashi; and Okita, Tsutomu, to Fuji Photo Film Co., Ltd. Magnetic recording medium having a cobalt thin film magnetic layer, carbon protective layer, and fluorolubricant layer. 5,567,524, Cl. 428-408,000.
- Ishida, Yoshio, to Diamond Electric Mfg. Co., Ltd. Heat sink. 5,567,986, Cl. 257-707,000.
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- Ishii, Takashi; Watanabe, Tamio; and Nagano, Toru, to Yazaki Corporation. Ultra multiple connector. 5,567,182, Cl. 439-701,000.
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- Yamanobe, Masato; Takeda, Shinichi; Ishii, Takayuki; Saika, Toshihiro; and Kobayashi, Isao, 5,567,956, Cl. 257-55.000.
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- Ishikawa, Kenji: See—
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- Ishimoto, Takashi, to Tokyo Seimitsu Co., Ltd. Wafer prober, 5,568,056, Cl. 324-754.000.
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- Yokota, Toru; and Ishiwata, Hiroshi, 5,566,921, Cl. 251-129.220.
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- Murata, Tatsuo; Ishiwata, Kazuya; and Yoshioka, Toshifumi, 5,568,291, Cl. 359-67.000.
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- Isorea, Inc.: See—
- Philipps, Thomas E., 5,567,364, Cl. 264-140.000.
- ISP Investments Inc.: See—
- Kwak, Yoon T.; Narayanan, Kolazi S.; and Kopolow, Stephen L., 5,567,787, Cl. 526-271.000.
- Tseng, Susan Y.; and Wolf, Philip F., 5,567,786, Cl. 526-264.000.
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- Thomson, Graham A.; Neilson, Peter J.; and Cook, Paul C., 5,568,282, Cl. 358-489.000.
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- Ito, Mikio: See—
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- Ito, Norihito: See—
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- Itoh, Hiromi: See—
- Kashihara, Keiichi; and Itoh, Hiromi, 5,567,964, Cl. 257-310.000.
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- Itoh, Koichi, to Megabass Co., Ltd. Mechanism for moving and holding balance-weight in lure, 5,566,498, Cl. 43-42.310.
- Itoh, Masao: See—
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- Miura, Takaharu; Itoh, Masataka; and Tanaka, Chieko, 5,567,572, Cl. 430-510.000.
- Itoh, Toyotsugu: See—
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- ITT Automotive Electrical Systems, Inc.: See—
- Zhou, Peter S., 5,566,419, Cl. 15-250.352.
- ITT Automotive Europe GmbH: See—
- Klar, Josef, 5,566,577, Cl. 74-42.000.
- Volz, Peter; Obersteiner, Georg; and Otto, Albrecht, 5,567,128, Cl. 417-313.000.
- ITT Corporation: See—
- Cheney, Craig; and Mitchell, Frank L., 5,566,720, Cl. 138-137.000.
- Dodd, Ian, 5,567,140, Cl. 418-178.000.
- ITT Fluid Technology Corporation: See—
- Grgurich, Keith A.; and Cole, Graydon W., 5,567,118, Cl. 417-46.000.
- Iverson, Brent: See—
- Magda, Darren; Sessler, Jonathan L.; Iverson, Brent; Jansen, Petra L.; Wright, Meredith; Mody, Tarak D.; and Hemmi, Gregory W., 5,567,687, Cl. 514-44.000.
- IVL Technologies Ltd.: See—
- Gibson, Brian C.; Jubien, Christopher M.; and Roden, Brian J., 5,567,901, Cl. 84-603.000.
- Iwade, Takashi; Takagi, Jun; and Migaki, Yoshiro, to Toray Engineering Co., Ltd. Apparatus for winding a plurality of yarns, 5,566,905, Cl. 242-43.00A.
- Iwahara, Takahisa; Chiba, Makoto; Takahara, Tomoko; and Yonezawa, Kazuya, to Kanegafuchi Chemical Industry Co., Ltd. Curing agent, preparation thereof and curable composition comprising the same, 5,567,833, Cl. 556-434.000.
- Iwai, Hisayuki: See—
- Taniguchi, Hiroshi; Yamamoto, Akihiko; Nomura, Takao; Nishio, Takeyoshi; and Iwai, Hisayuki, 5,567,759, Cl. 524-451.000.
- Iwamoto, Masako: See—
- Iwamoto, Yukio; and Iwamoto, Masako, 5,566,782, Cl. 186-49.000.
- Iwamoto, Yukio; and Iwamoto, Masako. Hydraulic system for serving food, 5,566,782, Cl. 186-49.000.
- Iwamoto, Kengo: See—
- Hidaka, Hideto; Iwamoto, Kengo; Noguchi, Yasuhiro; Miyamura, Motohiro; Yazima, Seiichi; and Sakai, Inao, 5,566,799, Cl. 191-55.000.
- Iwamura, Wako, to Sumitomo Rubber Industries, Ltd. Pneumatic tire, 5,567,253, Cl. 152-209.00R.
- Iwasaki, Osamu: See—
- Yano, Hideyuki; Araya, Junji; and Iwasaki, Osamu, 5,567,556, Cl. 430-55.000.
- Iwashita, Tetsuji: See—
- Shima, Yasuji; and Iwashita, Tetsuji, 5,568,454, Cl. 369-13.000.
- Iwata, Hiroshi: See—
- Togashi, Yoshio; Nakamura, Kenji; Iwata, Hiroshi; Sakamoto, Michisada; and Yasuhara, Yutaka, 5,566,716, Cl. 137-636.100.
- Iwata, Kazuo: See—
- Koga, Hitoshi; Kameyama, Masao; Iwata, Kazuo; and Gonda, Masahiro, 5,567,515, Cl. 428-355.000.
- Iwata, Keiichi: See—
- Hasemi, Ryuji; Iwata, Keiichi; Hada, Mayumi; and Ikeda, Hidetoshi, 5,567,574, Cl. 430-331.000.
- Iwata, Toru, to Nissan Motor Co., Ltd. Differential limit torque control apparatus, 5,566,776, Cl. 180-197.000.
- Iwaya, Masaki; Hayashi, Kyohel; Matsuzaki, Hiroshi; and Suematsu, Yoshi-ro, to NGK Spark Plug Co., Ltd. Ceramic composition for thermistor and thermistor element, 5,568,116, Cl. 338-22.0SD.
- Iyer, Shridhar V.: See—
- Cha, Chin Y.; and Iyer, Shridhar V., 5,568,010, Cl. 313-440.000.
- Izumi, Tomoo: See—
- Hirai, Atsuto; Ueda, Masahide; Terasaka, Yoshihisa; Sano, Eiichi; Matsura, Masahiko; Yamasaki, Hiroyuki; Yamada, Masami; and Izumi, Tomoo, 5,568,244, Cl. 355-309.000.
- Izumisawa, Yoshiaki; Kawahara, Tukas; and Toyosawa, Akihiko, to Mitsubishi Chemical Corporation. Process for producing terephthalic acid, 5,567,842, Cl. 562-486.000.
- Jackson, Warren B.; and Biegelsen, David K., to Xerox Corporation. Variable size light sensor element, 5,567,971, Cl. 257-431.000.
- Jackson, Warren B.: See—
- Biegelsen, David; Jackson, Warren B.; and Weisfield, Richard L., 5,567,957, Cl. 257-57.000.
- Jacobs, Pierre A.: See—
- Coe, Charles G.; Gaffney, Thomas R.; Li, Hong-Xin; Xiong, Yanliang; Martens, Johan A.; and Jacobs, Pierre A., 5,567,407, Cl. 423-700.000.
- Jacobsen, Kenneth H.; and Cole, Louis F. Combination port for surface crack filling, 5,566,866, Cl. 222-495.000.
- Jacquart, Xavier: See—
- Galand, Claude; Jacquart, Xavier; Lebizay, Gerald; Leboudec, Jean-yves; Louis, Philippe; Poiraud, Clement; Georges, Eric S.; Spagnol, Victor; Suffern, Edward; and Truong, Hong L., 5,568,477, Cl. 370-60.000.
- Jaduszliwer, Bernardo; and Klimcak, Charles M., to Aerospace Corporation, The. Sensor for detection of nitrogen dioxide and nitrogen tetroxide, 5,567,622, Cl. 436-106.000.
- Jaeger, Siegfried, to Lindauer Dornier Gesellschaft mbH. Weft clamp controller for a weft gripper in a shuttleless loom, 5,566,725, Cl. 139-446.000.
- Jaeggi, Jean-Pierre, to Speno International SA. Installation for the reprofiling of tracks carried out on a railway line, 5,566,437, Cl. 29-33.00R.
- Jaggard, David V., to Advanced Risc Machines Limited. Multiple instruction set mapping, 5,568,646, Cl. 395-800.000.
- Jagiela, Walter J., to Mercury Enterprises, Inc. Door security system, 5,566,995, Cl. 292-346.000.

- Jamal, Kamran, to VLSI Technology, Inc. Built-in self test for integrated circuits having read/write memory, 5,568,437, Cl. 365-201.000.
- James, Albert J., to Continental White Cap, Inc. Button enhancement coating system, 5,566,846, Cl. 215-230.000.
- James, David R.; and Turner, Thomas D. Vehicular mobile occupant carrier, 5,567,095, Cl. 410-7.000.
- Jamex: See—
- Wells, James; Johnson, David B.; Tennant, Edward A.; and Elsoufi, Walid, 5,568,280, Cl. 358-468.000.
- Jamzadeh, Feraydoon S., to Eastman Kodak Company. Method and apparatus for scanning and printing documents with text and images, 5,568,269, Cl. 358-298.000.
- Jang, Hyun-Soon: See—
- Park, Churoo; Lee, Si-Yeol; Lee, Ho-Cheol; and Jang, Hyun-Soon, 5,568,445, Cl. 365-233.000.
- Jang, Jae-Young, to Samsung Electronics Co., Ltd. Water purifier with electrical components isolated from leaked water, 5,567,311, Cl. 210-243.000.
- Janhonen, Tarmo, to Pussikeskusoy. Book packaging container, 5,566,827, Cl. 206-424.000.
- Janisch, Andreas: See—
- Wladar, Helmut; Stritzl, Karl; Janisch, Andreas; and Wuerthner, Hubert, 5,566,967, Cl. 280-625.000.
- Jankewitz, Axel; and Lugert, Gerhard, to A.W. Faber-Castell Unternehmensverwaltung GmbH & Co. Stain and method for staining wood, 5,567,206, Cl. 8-402.000.
- Janky, James M.; Loomis, Peter V. W.; and Schipper, John F., to Trimble Navigation Limited. Integrated image transfer for remote target location, 5,568,152, Cl. 342-357.000.
- Janky, James M.: See—
- Schipper, John F.; and Janky, James M., 5,568,119, Cl. 340-825.370.
- Jansen, Martin: See—
- Perchenek, Nils; Baldus, Hans-Peter; Löffelholz, Josua; and Jansen, Martin, 5,567,832, Cl. 556-28.000.
- Jansen, Petra L.: See—
- Magda, Darren; Sessler, Jonathan L.; Iverson, Brent; Jansen, Petra L.; Wright, Meredith; Mody, Tarak D.; and Hemmi, Gregory W., 5,567,687, Cl. 514-44.000.
- Jansen, Yvonne: See—
- Behler, Ansgar; Ploog, Uwe; Uphues, Guenther; Wahle, Bernd; Waltenberger, Peter; and Jansen, Yvonne, 5,567,340, Cl. 510-527.000.
- Janson, John P.: See—
- Siegfried, Robert H.; Fleming, James M.; Stalford, Michael J.; and Janson, John P., 5,567,472, Cl. 427-180.000.
- Jantti, Arto: See—
- Arpalahiti, Olli E.; Ikonen, Ossi; and Jantti, Arto, 5,566,750, Cl. 165-104.160.
- Japan Immunoresearch Laboratories Co., Ltd.: See—
- Kashiwagi, Nobuhito; Asakura, Syojiro; Ide, Tatsuo; Sakurai, Masato; Adachi, Masakazu; Tomiyoshi, Katsumi; and Hirano, Tsuneo, 5,567,443, Cl. 424-529.000.
- Japan Tobacco Inc.: See—
- Irikura, Takayuki, 5,566,812, Cl. 198-471.100.
- Jaquette, Glen A.: See—
- Hutchins, Robert A.; and Jaquette, Glen A., 5,568,465, Cl. 369-124.000.
- Jasco Corporation: See—
- Yamura, Hiroyuki; Kanomata, Takeshi; and Kikuchi, Shin-ichi, 5,568,007, Cl. 313-35.000.
- Jean, Tsong-Shin: See—
- Yang, Chen-Jen; Jean, Tsong-Shin; Wu, Lung-Tarn; Yang, Ching-Liang; and Teng, Kuei-Fei, 5,567,559, Cl. 430-58.000.
- Jeannot, Claude: See—
- Schmuck, Jean-Claude; Jeannot, Claude; and Buisson, Claude, 5,567,922, Cl. 181-284.000.
- Jefferies, Kent S., to United States of America, National Aeronautics and Space Administration. Compact solar simulator with a small subtense angle and controlled magnification optics, 5,568,366, Cl. 362-1.000.
- Jelic, Ralph, to Verosol USA Inc. Roman-type shade, 5,566,735, Cl. 160-84.040.
- Jellema, Mark: See—
- Tufts, Arthur W.; Jellema, Mark; and Haddle, Blair, 5,567,195, Cl. 451-11.000.
- Jenden, Donald J.: See—
- Buchman, Alan L.; Jenden, Donald J.; Ament, Marvin E.; Breslow, Kenneth; and Dubin, Mark D., 5,567,736, Cl. 514-642.000.
- Jeng, Kevin: See—
- Bhansali, Ameet S.; Samuelson, Gay M.; Murali, Venkatesan; Gasperek, Michael J.; Chen, Shou H.; Mencinger, Nicholas P.; Lee, Ching C.; and Jeng, Kevin, 5,567,981, Cl. 257-643.000.
- Jenkins, B. Keith: See—
- Tanguay, Armand R., Jr.; and Jenkins, B. Keith, 5,568,574, Cl. 385-14.000.
- Jensen, David G.; and Tichenor, Daniel R., to Boeing Company, The. Mask for producing radomes to high precision, 5,567,554, Cl. 430-5.000.
- Jensen, Gregory N.: See—
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- Nishimaki, Kimiji; and Kamiharako, Takashi, 5,566,876, Cl. 228-102.000.
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- Kamiya, Ryo: See—
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- Kaplinsky, Cecil H. Low noise tri-state output buffer. 5,568,062, Cl. 326-27.000.
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- Larson, Steven D.; and Kastner, Richard J., 5,567,221, Cl. 71-28.000.
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- Kaule, Wittich: See—  
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- Kebabian, Paul L., to Aerodyne Research, Inc. Spectral line discriminator for passive detection of fluorescence, 5,567,947, Cl. 250-458.100.
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- Keenan, Glenn M.: See—  
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Euteneuer, Charles L.; Mattison, Richard C.; Adams, Daniel O.; Hektner, Thomas R.; and Keith, Peter T., 5,567,203, Cl. 604-96.000.
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- Linkner, Herbert L., Jr., 5,567,022, Cl. 303-87.000.
- Schneider, Peter W.; Schnobel, Timothy J.; and Tuck, Brian C., 5,568,388, Cl. 364-424.010.
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- Kemmerer, Walter K.: See—  
Dunleavy, Thomas J.; and Kemmerer, Walter K., 5,567,072, Cl. 401-129.000.
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Martinek, Donnie R.; Shelton, Clinton D.; and Kemp, John S., 5,567,457, Cl. 426-233.000.

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- Khelifa, Noureddine; Krumbach, Karl-Gerd; Löhle, Michael; Abersfelder, Günter; Grantz, Helmut; Odebrecht, Wolfgang; Wertenbach, Jürgen; and Wagner, Oliver, to Behr GmbH & Co.; and Mercedes-Benz Aktiengesellschaft. Process and apparatus for heating the passenger compartment of a motor vehicle, 5,566,880, Cl. 237-12.30A.
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- Khurana, Gresh, to Caterpillar Inc. Exhaust manifold joint, 5,566,548, Cl. 60-322.000.
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- Kiely, John S.: See—  
DeWitt, Sheila H. H.; Kiely, John S.; Pavia, Michael R.; Schroeder, Mel C.; and Stankovic, Charles J., 5,567,391, Cl. 422-131.000.
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LaChapelle, Joseph G.; and Kiest, Cary S., 5,568,262, Cl. 356-379.000.
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Vejdani, Mehrdad; and Kilarski, Zbigniew, 5,566,608, Cl. 99-475.000.
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- Kim, Hyeon S.; and Lee, Choong H., to Hyundai Electronics Industries Co., Ltd. Method of fabricating gate electrode of CMOS device, 5,567,642, Cl. 437-57.000.
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Kim, Sun K.; and Kim, Pok K., 5,566,495, Cl. 43-21.200.
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Larisch, Linda G., 5,566,533, Cl. 54-23.000.
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Nohr, Ronald S.; and MacDonald, John G., 5,567,372, Cl. 264-103.000.
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Bai, Lijun; Kincs, Joseph G.; and Chason, Marc, 5,568,353, Cl. 361-523.000.
- Kindsvogel, Wayne R.: See—  
Sledziwski, Andrzej Z.; Bell, Lillian A.; and Kindsvogel, Wayne R., 5,567,584, Cl. 435-6.000.
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- Kinlen, Patrick J., to Monsanto Company. Emulsion-polymerization process and electrically-conductive polyaniline salts, 5,567,356, Cl. 252-500.000.
- Kinoshita, Hiroyuki: See—  
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Fujii, Tadashi; Kataoka, Yoshiyuki; and Kinoshita, Shoichiro, 5,566,709, Cl. 137-487.500.
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Shibata, Koichi; and Kinoshita, Taizo, 5,568,184, Cl. 348-15.000.
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Shimizu, Takaaki; Kinsho, Takeshi; Ogihara, Tsutomu; Kaneko, Tarushi; Saito, Ryuichi; and Kurihara, Hideshi, 5,567,350, Cl. 252-299.610.
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- Kirkland, James E.: See—  
White, George W.; Daniel, Edwin R.; Kirkland, James E.; and Shively, James S., 5,566,712, Cl. 137-587.000.
- Kirkwood, Malcolm E., to Borg-Warner Automotive, Inc. Continuous slip hydrokinetic torque converter clutch interface with circuitous groove for cooling and wetting clutch interface zone, 5,566,802, Cl. 192-3.290.
- Kirsch, Eberhard. Security relay with guided switch stack and monostable drive, 5,568,108, Cl. 335-130.000.
- Kirschner, Suzanne. Shopping cart clipboard and coupon holder, 5,566,609, Cl. 108-42.000.
- Kiscellus, William: See—  
Luff, Martin; Skoda, William; and Kiscellus, William, 5,568,006, Cl. 310-348.000.
- Kiser, Willie C.: See—  
Foreman, Kevin G.; Kiser, Willie C.; and Miller, Paul J., 5,568,348, Cl. 361-118.000.
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Nakamura, Katsutoshi; Kaneko, Shuzo; Kishi, Etsuro; Miyata, Hirokatsu; and Shibata, Masaaki, 5,568,295, Cl. 359-75.000.
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Nagahata, Takaya; Kishimoto, Tokihiko; and Wada, Koichi, 5,568,174, Cl. 347-200.000.
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Ando, Yukimasa; and Kishino, Katsutomi, 5,567,368, Cl. 264-40.100.
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- Kitada, Nobuhiko: See—  
Oda, Kunio; Kitada, Nobuhiko; Tanaka, Akihiro; Fujiwara, Kazuo; and Matsumoto, Shinichi, 5,567,668, Cl. 503-204.000.
- Kitaguchi, Kouichi; and Okumura, Yoshihide, to Kanebo, Ltd.; and Mitsubishi Denki Kabushiki Kaisha. Voltage monitoring circuit, 5,568,074, Cl. 327-77.000.
- Kitahara, Akira. Surface mount components and semfinished products thereof, 5,568,363, Cl. 361-773.000.
- Kitao, Shinzi: See—  
Hayashi, Katsumi; Mitani, Masaaki; and Kitao, Shinzi, 5,568,638, Cl. 395-600.000.
- Kitchen, Simon J.: See—  
Gulliver, David J.; and Kitchen, Simon J., 5,567,839, Cl. 560-245.000.
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Otsuka, Nobuyuki; Kitoh, Masahiro; Ishino, Masato; and Matsui, Yasushi, 5,568,501, Cl. 372-46.000.



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Niskanen, Juhani; Kivioja, Pekka; Lahtinen, Juha; Lensu, Esa; and Salavami, Esa, 5,566,451, Cl. 29-895.300.
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Tanaka, Toshio; and Nishizawa, Takaaki, 5,567,033, Cl. 362-61.000.
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Suzuki, Haruhiko; Tamura, Takahiro; Miyahara, Masahiko; Yamaguchi, Hiroaki; Ohuchi, Hideaki; Kondo, Akira; and Matsushita, Toshikazu, 5,567,874, Cl. 73-118.200.
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Hakala, Harri, 5,566,785, Cl. 187-250.000.
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De Kock, Cornelis, 5,566,796, Cl. 188-299.000.
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Hasegawa, Takuji; Wada, Yasunori; and Nishio, Syoji, 5,568,221, Cl. 396-630.000.
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Kwak, Yoon T.; Narayanan, Kolazi S.; and Kopolow, Stephen L., 5,567,787, Cl. 526-271.000.
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Oh, Yun S., 5,568,481, Cl. 370-79.000.
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Johnston, Jonathan A.; Peake, Michael V.; and Krause, Keith M., 5,566,988, Cl. 285-93.000.
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Kapp-Schwoerer, Diethard; and Krauss, Rainer, 5,567,237, Cl. 118-58.000.
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Lustgarten, James R.; Stuhlmacher, John A.; Kretzmann, Jon; and Martin, Elmer, 5,566,819, Cl. 200-407.000.
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Mohr, Bernhard; Ueding, Michael; Strobel, Michael; and Kriegler, Albert, 5,566,425, Cl. 19-159.00R.
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Wieder, Wolfgang; Kuhlmann, Dieter; and Nentwig, Wolfgang, 5,567,784, Cl. 526-164.000.
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Takekuma, Toshitsugu; Kurihara, Ryoichi; and Yamagiwa, Akira, 5,568,063, Cl. 326-30.000.
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Hatano, Yasuhiro; Takayama, Hajime; Fukada, Yasushi; Kurita, Kazuhiko; and Nojiri, Kazuo, 5,568,277, Cl. 358-400.000.
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Hosoya, Yasuhiko; Kuroda, Toshiki; and Katashiba, Hideaki, 5,566,547, Cl. 60-284.000.
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Aizawa, Katsuo; and Kuroiwa, Yukari, 5,567,409, Cl. 424-9.363.
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Hébert, Francois; Kwan, Sze-Hon; and Bencuya, Izak, 5,567,634, Cl. 437-41.000.
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Krueger, Donald M.; and Kwiatek, David J., 5,567,148, Cl. 431-354.000.
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Mohri, Jun; and Endoh, Noboru, 5,568,012, Cl. 313-517.000.
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Hofele, Hans, 5,566,814, Cl. 198-621.100.
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- Fay, Judy E.; LaPointe, Larry P.; and Staleler, Chad S., 5,567,009, Cl. 297-258.100.
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Faasse, Adrian L., Jr., 5,566,672, Cl. 128-640.000.
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Cortet, Jean; Audoussot, Marie P.; LaGrange, Alain; and Vandenberg, Jean J., 5,567,421, Cl. 424-70.100.
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Asher, Amram; and Lahav, Nathan, 5,567,926, Cl. 235-382.000.
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Niskanen, Juhani; Kivioja, Pekka; Lahtinen, Juha; Lensu, Esa; and Salavamäki, Esa, 5,566,451, Cl. 29-895.300.
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Lin, Yung-Hao; Lai, Chao-Sung; Lee, Chung-Len; and Lei, Tan-Fu, 5,567,638, Cl. 437-46.000.
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Sarandhar, Nitin V.; Lai, Konrad K.; and Singh, Gurbir, 5,568,620, Cl. 395-285.000.
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Germain, Jean-Pierre, 5,566,733, Cl. 141-192.000.
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Elkins, Robert; and Guillard, Alain, 5,566,556, Cl. 62-654.000.
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Rose, Paul B.; and Lamanna, John L., 5,567,329, Cl. 216-18.000.
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Dent, Paul W.; and Lampe, Ross W., 5,568,088, Cl. 330-151.000.
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Swanson, Dennis K., 5,567,043, Cl. 362-250.000.
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Pearlstein, Larry A.; Augenbraun, Joseph E.; and Lane, Frank A., 5,568,200, Cl. 348-426.000.
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Schwark, Jan-Robert; Kleemann, Heinz-Werner; Lang, Hans-Jochen; Weichert, Andreas; Scholz, Wolfgang; and Albus, Udo, 5,567,734, Cl. 514-617.000.
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Huscroft, Charles K.; Wong, David W.; Lang, Steven F.; and Little, Vernon R., 5,568,486, Cl. 370-94.200.
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Sasisekharan, Ramnath; Moses, Marsha A.; Nugent, Matthew A.; Cooney, Charles L.; and Langer, Robert S., 5,567,417, Cl. 424-94.500.
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Ross, Colin F.; and Langley, Andrew J., 5,568,557, Cl. 381-71.000.
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Tiller, Byron K.; Allard, David J.; Au, Connie Y.; Canova, Francis J., Jr.; Hsieh, Daniel M.; Goodwin, Julie F.; Johnson, Debra A. G.; Lanier, Charles S.; Lewis, James R.; Stout, Jean L.; Villafana, William; Yee, Raymond L.; Padgett, Russell S.; Ferrier, Robert B.; Corkell, Anthony F.; Murakami, Thomas T.; DeBauche, Bradley J.; Whitley, Wayne P.; Osborn, Neal A.; Beatty, Brent A.; Cox, Roger L.; Wulf, James C.; and Rivero, Jose L., 5,568,536, Cl. 379-58.000.
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Fay, Judy E.; LaPointe, Larry P.; and Staleler, Chad S., 5,567,009, Cl. 297-258.100.
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Hassler, Stephen P.; Johnson, Stephen P.; and Lapp, John, 5,566,423, Cl. 16-319.000.
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Ralph, Peter; Martin, George; Piatak, Michael; and Larrick, James W., 5,567,611, Cl. 435-240.200.
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Carpenter, Robert B.; Badalamenti, Anthony M.; Logan, Jerry L.; and Laurel, David F., 5,566,757, Cl. 166-285.000.
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Green, David J.; Lauritzen, Donald R.; Bunker, S. Mark; and Rose, Larry D., 5,566,973, Cl. 280-728.200.
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Ferraiole, Frank D.; Capowski, Robert S.; Casper, Daniel F.; Jordan, Richard C.; and Laviola, William C., 5,568,526, Cl. 375-356.000.
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Counts, Michael W.; Thompson, John A.; Lavoie, Jack O.; and Aleksejczyk, Robert A., 5,567,205, Cl. 8-94.180.
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Magnin, David R.; Biller, Scott A.; Dickson, John K., Jr.; Lawrence, R. Michael; and Sulsky, Richard B., 5,567,841, Cl. 562-23.000.
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McCarter, Kevin S.; Young, Steven A.; and Laws, Pamela K., 5,567,498, Cl. 428-113.000.



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Hall, James E.; Lawson, David F.; and Antkowiak, Thomas A., 5,567,815, Cl. 540-541.000.
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Callahan, Sean M.; Harp, Edward; and Leak, Bruce, 5,568,602, Cl. 395-154.000.
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Classon, Robert J.; Caldwell, Karl N.; and Leazenbee, Louis O., 5,567,309, Cl. 210-233.000.
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Galand, Claude; Jacquart, Xavier; Lebizay, Gerald; Leboudec, Jean-yves; Louis, Philippe; Poiraud, Clement; Georges, Eric S.; Spagnol, Victor; Suffern, Edward; and Truong, Hong L., 5,568,477, Cl. 370-60.000.
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Brodnax, Timothy B.; Bialas, John S., Jr.; King, Steven A.; LeBlanc, Johnny J.; Rickard, Dale A.; Spencer, Clark J.; and Stanley, Daniel L., 5,568,380, Cl. 364-184.000.
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Foster, Robert F.; Hillman, Joseph T.; and LeBlanc, Rene E., 5,567,243, Cl. 118-730.000.
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Kim, Hyeon S.; and Lee, Choong H., 5,567,642, Cl. 437-57.000.
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Jeon, Yong-Weon, 5,568,434, Cl. 365-201.000.
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Della Valle, Francesco; Lorenzi, Silvana; and Marcolongo, Gabriele, 5,567,716, Cl. 514-332.000.
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Offerhaus, Douglas H.; Lilburn, James E.; and Silver, Hugh D., 5,567,273, Cl. 162-199.000.
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Robinson, Lonnie R.; and Taylor, Robert L., II, 5,566,610, Cl. 100-98.000.
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Dodge, Jeffrey A.; Lindstrom, Terry D.; Luger, Charles W., III; and Staten, Gilbert S., 5,567,820, Cl. 546-202.000.
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Schiltz, William C.; and Wasmire, Frederick D., 5,566,860, Cl. 222-94.000.
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Huscroft, Charles K.; Wong, David W.; Lang, Steven F.; and Little, Vernon R., 5,568,486, Cl. 370-94.200.
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Wang, Hann-Ping; and Liu, Cheng-Ming, 5,567,282, Cl. 204-450.000.
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Samela, Francis M.; and Llorens, Joseph R., 5,568,046, Cl. 324-71.100.
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Arnold, Judson V.; Peoples, James R.; and McKague, Elbert L., 5,566,752, Cl. 165-185.000.
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Liu, Ju-Chao, 5,567,266, Cl. 156-310.000.
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Casey, T. Eisiart; and Nevin, Peter J., 5,567,741, Cl. 521-133.000.
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Willford, George A.; Baer, Kurt R.; Loeffler, John M.; and Schwaiger, Dennis D., 5,566,579, Cl. 74-335.000.
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Perchenek, Nils; Baldus, Hans-Peter; Löffelholz, Josua; and Jansen, Martin, 5,567,832, Cl. 556-28.000.
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Carpenter, Robert B.; Badalamenti, Anthony M.; Logan, Jerry L.; and Laurel, David F., 5,566,757, Cl. 166-285.000.
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Hsu, Louis L.; Hsieh, Chang-Ming; and Logan, Lyndon R., 5,567,553, Cl. 430-5.000.
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Kheifia, Noureddine; Krumbach, Karl-Gerd; Löhle, Michael; Abersfelder, Günter; Grantz, Helmut; Odebrecht, Wolfgang; Wertenbach, Jürgen; and Wagner, Oliver, 5,566,880, Cl. 237-12.30A.
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Trommer, Jörg; and Eschbach, Markus, 5,566,777, Cl. 180-232.000.
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Stückrad, Björn; and Löhr, Karsten, 5,566,832, Cl. 209-9.000.
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Emert, Jacob; Lundberg, Robert D.; and Lohse, David J., 5,567,344, Cl. 508-452.000.
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Hei, Robert D.; Wei, Guang-jong J.; Cords, Bruce R.; and Lokkesmoe, Keith D., 5,567,444, Cl. 424-616.000.
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Janky, James M.; Loomis, Peter V. W.; and Schipper, John F., 5,568,152, Cl. 342-357.000.
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Chu, Ron F.; Lim, Chet P.; and Loong, Sheau-Tan, 5,567,271, Cl. 156-659.110.
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Della Valle, Francesco; Lorenzi, Silvana; and Marcolongo, Gabriele, 5,567,716, Cl. 514-332.000.
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Galand, Claude; Jacquart, Xavier; Leibzay, Gerald; Leboudec, Jean-Yves; Louis, Philippe; Poiraud, Clement; Georges, Eric S.; Spagnol, Victor; Suffern, Edward; and Truong, Hong L., 5,568,477, Cl. 370-60.000.
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Vogt, Carl L.; and Lovall, Ronald E., 5,566,809, Cl. 194-348.000.
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Wanvik, Jarle; and Lovoll, Stein, 5,566,621, Cl. 104-173.100.
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Lee, Timothy C. P.; and Lowe, George B., 5,567,258, Cl. 156-109.000.
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Cartwright, Rudolph; and Lowe, John E., 5,566,399, Cl. 2-421.000.
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Huang, Tammy, 5,568,395, Cl. 364-489.000.
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Luckhardt, Wolfgang; Luckhardt, Heinrich, deceased, 5,566,446, Cl. 29-798.000.
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Hayashi, Akihiko, 5,567,167, Cl. 439-75.000.
- Mac Valves: See—  
Robert, Michael E., 5,566,717, Cl. 137-883.000.
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Morris, Michael A.; Fowles, Martin; and Mackrodt, William C., 5,567,667, Cl. 502-302.000.
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Stetter, Joseph R.; Hesketh, Peter J.; Gendel, Steven M.; and Maclay, G. Jordan, 5,567,301, Cl. 205-777.500.
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Fajardo, Mario E.; and Macler, Michel, 5,567,935, Cl. 250-251.000.
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Coopersmith, Jonathan; Weiss, Nathaniel; and Madden, Henry, 5,567,903, Cl. 84-723.000.
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MacDonald, James; and Mahalingaiah, Rupaka, 5,568,649, Cl. 395-868.000.
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Hall, Roger G.; Maier, Ludwig; and Fröstl, Wolfgang, 5,567,840, Cl. 562-11.000.
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Borshchevsky, Max; and Makaryan, Mikhail, 5,568,542, Cl. 379-171.000.
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- Benmergui, Alberto D.; and Maloney, Kurt, 5,568,376, Cl. 364-145.000.
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- Mandel, Victor, to Tachner, Leonard. Laser beam control and imaging system. 5,568,306, Cl. 359-223.000.
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- Becker, Oliver; Kolz, Sabine; and Hager, Herbert, 5,567,392, Cl. 422-174.000.
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- Marchand, Gary R.: See—
- Walther, Brian W.; and Marchand, Gary R., 5,567,760, Cl. 524-505.000.
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- Walk, Charles R.; and Margalit, Nehemiah, 5,567,548, Cl. 429-218.000.
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- Margittai, Agnes: See—
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- Margolin, Herbert E. Sample display and distribution device. 5,566,830, Cl. 206-730.000.
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- Guido, Joseph J., 5,566,873, Cl. 225-106.000.
- Marioni, Elio, to Askoll S.p.A. Electronic immersion aquarium heater with spring biased NTC sensor. 5,568,587, Cl. 392-498.000.
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- Mariscal, Jose; and Mariscal, Fernando, 5,566,868, Cl. 223-113.000.
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- Markese, James J.: See—
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- Marr, Kenneth W., to Micron Technology, Inc. Circuit for SRAM test mode isolated bitline modulation. 5,568,435, Cl. 365-201.000.
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- Beaudet, Jean-Yves; Marriere, Marc; and Trocherie, Jean-Pierre, 5,567,049, Cl. 366-206.000.
- Marriott, Alan: See—
- Baessler, Peter; Marriott, Alan; Maurer, Urs; and Oberholzer, Marcel, 5,567,335, Cl. 219-61.200.
- Mars Incorporated: See—
- Morun, Mark J., 5,566,807, Cl. 194-217.000.
- Marsh, Edward K.; Nelson, Richard A.; McCleerey, Earl W.; DeFibaugh, George R.; and Verdun, Gary J., to Whitaker Corporation, The; and Compaq Computer Corporation. Electrical connector having electrostatic discharge protection. 5,567,168, Cl. 439-181.000.
- Marsh, Edward K.: See—
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- Marshall, Andrew C.; and Fellman, Michael L., to Speciality Cellular Products Company. Composite honeycomb core structure comprising cell walls constructed of at least three unidirectional fiber layers or at least two unidirectional fiber layers and a random fiber layer. 5,567,500, Cl. 428-116.000.
- Marshall, Barry: See—
- Brown, Trevor P.; Conroy, Brian G.; Cox, Stephen J.; Gardner, Christopher; Lark, Roger D.; Marshall, Barry; and Svendsen, Jan, 5,566,882, Cl. 238-343.000.
- Marstorp, Leif: See—
- Glansk, Leif; and Marstorp, Leif, 5,566,711, Cl. 137-557.000.
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- Kyle, David J.; and Gladue, Raymond, 5,567,732, Cl. 514-560.000.
- Marten, Manfred; and Wehner, Bernhard, to Hoechst Aktiengesellschaft. Bonding with polyepoxide-polyoxyalkylenemonoamines product. 5,567,782, Cl. 525-523.000.
- Martens, Harald: See—
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- Martens, Wilhelm: See—
- Dickmann, Thomas; Geyer, Norbert; and Martens, Wilhelm, 5,566,910, Cl. 244-216.000.
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- Gourlaouen, Luc R.; Friour, Gerard A. D.; Martin, Didier J.; and Strauel, Philippe, 5,567,579, Cl. 430-567.000.
- Martin, Donald A. Lock-in grip arm shank nail. 5,567,101, Cl. 411-447.000.
- Martin, Elmer: See—
- Lustgarten, James R.; Stuhlmacher, John A.; Kretzmann, Jon; and Martin, Elmer, 5,566,819, Cl. 200-407.000.
- Martin, George: See—
- Ralph, Peter; Martin, George; Piatak, Michael; and Larrick, James W., 5,567,611, Cl. 435-240.200.
- Martin, Lynn E.; Williamson, Jay D.; Blom, Kenneth M.; Vaughan, Jamieson; and Smith, Charles S., to I.S.M., Inc. Concrete forming system with brace ties. 5,566,518, Cl. 52-426.000.
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- Papazian, Harold A.; Shepard, Donald F.; Pierson, Edward A.; and Gordon, Michael J., 5,567,490, Cl. 428-34.400.
- Rose, Paul B.; and Lamanna, John L., 5,567,329, Cl. 216-18.000.
- Martin Marietta Energy Systems, Inc.: See—
- Bates, John B.; and Dudley, Nancy J., 5,567,210, Cl. 29-623.500.
- Rajic, Slobodan; and Muhs, Jeffrey D., 5,568,582, Cl. 385-95.000.
- Martin Marietta Magnesia Specialties, Inc.: See—
- Stoney, Clement P., III; Stendera, James W.; and Bridger, Keith, 5,567,519, Cl. 428-402.000.
- Martin, Vladimir: See—
- Keana, John F. W.; Martin, Vladimir; and Ralston, William H., 5,567,411, Cl. 424-9.100.
- Martineau, Micheal J.: See—
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- Martinek, Donnie R.; Shelton, Clinton D.; and Kemp, John S., to McKinney Grain, Inc. Method for treating feed grains. 5,567,457, Cl. 426-233.000.
- Martinez, David M.; and Tilman, Paul A., to Minigrip, Inc. Extruded zipper with orienting means and method for orienting same. 5,566,429, Cl. 24-587.000.
- Martinez-Bustos, Fernando: See—
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- Maru, Tsuguo, to NEC Corporation. Fully differential amplifier including common mode feedback circuit. 5,568,089, Cl. 330-253.000.
- Maruha Corporation: See—
- Miyashita, Kazuo; Ota, Toru; Okazaki, Suguru; Nishikawa, Masazumi; and Maruyama, Kazuaki, 5,567,730, Cl. 514-549.000.
- Marutiak, David J., to Lucent Technologies, Inc. Method and apparatus for dynamic abbreviated dialing assignment. 5,568,546, Cl. 379-355.000.
- Maruyama, Kazuaki: See—
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- Marze, Henri-James R.; Routhieu, Vincent J. L.; Arnaud, Gilles L.; and Arnaud, Remy E., to Eurocopter France. Counter-torque device with ducted rotor and phase modulation of the blades, for helicopter. 5,566,907, Cl. 244-17.190.
- Mase, Akira; and Shimizu, Michio, to Semiconductor Energy Laboratory Co., Ltd. Ferroelectric liquid crystal blue color shutter with color correction filter. 5,568,298, Cl. 359-100.000.
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- Yamazaki, Shunpei; Mase, Akira; and Hiroki, Masaaki, 5,568,288, Cl. 359-59.000.
- Masley, Francis J., to W. L. Gore & Associates, Inc. Method of manufacturing a hand covering. 5,566,405, Cl. 2-169.000.
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- Robinson, Jeffrey C.; and Crawford, Brian B., 5,567,933, Cl. 250-227.150.
- Mason, Rodney J., to Regents of University of California, The. Multi-gap high impedance plasma opening switch. 5,568,019, Cl. 315-344.000.
- Massachusetts Institute of Technology: See—
- Leger, James R.; and Goltsois, William C., 5,568,318, Cl. 359-618.000.
- Pal, Uday B.; Chou, Kuo-Chih; Yuan, Shi; and Hasham, Zain, 5,567,286, Cl. 204-246.000.
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- Vacanti, Joseph P.; and Freeman, Michael R., 5,567,612, Cl. 435-240.230.
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- Vert, Michel; Mauduit, Jacques; and Bukh, Niels, 5,567,431, Cl. 424-426.000.
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- Aspri, Roberto; and Mauffette, Claude, 5,567,895, Cl. 84-294.000.
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- McCreight, Marion E.: See—
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- McDonald, Paul T.: See—
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- McGee, Richard L.: See—
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- Lustgarten, James R.; Stuhlmacher, John A.; Kretzmann, Jon; and Martin, Elmer, 5,566,819, Cl. 200-407.000.
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- Martinek, Donnie R.; Shelton, Clinton D.; and Kemp, John S., 5,567,457, Cl. 426-233.000.
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- Meadows, Vernon: See—
- Massaroni, Kenneth M.; and Meadows, Vernon, 5,568,037, Cl. 320-2.000.
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- Itoh, Koichi, 5,566,498, Cl. 43-42.310.
- Meharg, Stephen W. Batter dummy for pitching practice, 5,566,935, Cl. 273-26.00A.
- Mehdi, Shujaath: See—
- Flynn, Gary A.; Beight, Douglas W.; Warshawsky, Alan M.; Mehdi, Shujaath; French, John F.; and Kehne, John H., 5,567,814, Cl. 540-521.000.
- Mehra, Madhav: See—
- Agostinelli, John A.; and Mehra, Madhav, 5,568,216, Cl. 396-515.000.
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- Meigs, Thomas E.: See—
- Bradford, David L.; Simoni, Robert D.; and Meigs, Thomas E., 5,567,729, Cl. 514-546.000.
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- Bienayme, Hugues; and Meilland, Pierre, 5,567,852, Cl. 568-378.000.
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- Meir, David S.: See—
- Sway-Tin, Min; Roterman, Thaddeus; Impullitti, Joseph F.; Meir, David S.; and Zawacki, Ronald A., 5,568,052, Cl. 324-435.000.
- Meisner, Kaushik D.: See—
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- Mejeur, Roger. Auxiliary carrying handle for golf bags, 5,566,870, Cl. 224-218.000.
- Melling, Peter J.: See—
- Vacha, Lubos; and Melling, Peter J., 5,567,219, Cl. 65-432.000.
- Melloni, Piero: See—
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- Melzer, Werner, to Hoechst Aktiengesellschaft. PH glass electrode, 5,567,291, Cl. 204-420.000.
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- Wilcox, Jonathan J.; Henderson, Thomas A.; and Wilcox, Jon A., 5,568,639, Cl. 395-600.000.
- Menchen, Steven M.: See—
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- Bhansali, Ameet S.; Samuelson, Gay M.; Murali, Venkatesan; Gasparek, Michael J.; Chen, Shou H.; Mencinger, Nicholas P.; Lee, Ching C.; and Jeng, Kevin, 5,567,981, Cl. 257-643.000.
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- Dixon, R. Paul; and Mentzelopoulos, Thanos, 5,568,443, Cl. 365-230.050.
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- Tien, Jien-Heh J.; Menzia, Jerome A.; and Cooper, Arthur J., 5,567,823, Cl. 548-204.000.
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- Tantermusch, Peter, 5,566,969, Cl. 280-688.000.
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- Khelifa, Noureddine; Krumbach, Karl-Gerd; Löhle, Michael; Abersfelder, Günter; Grantz, Helmut; Odebrecht, Wolfgang; Wertenbach, Jürgen; and Wagner, Oliver, 5,566,880, Cl. 237-12.30A.
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- Chen, Cheng Y.; Larsen, Robert D.; and Verhoeven, Thomas R., 5,567,824, Cl. 548-252.000.
- Rasmusson, Gary H.; and Reynolds, Glenn F., 5,567,708, Cl. 514-284.000.
- Merck, Sharp & Dohme Ltd.: See—
- Baker, Raymond; Castro Pineiro, Jose L.; Guiblin, Alexander R.; Reeve, Austin J.; Sternfeld, Francine; Matassa, Victor G.; and Street, Leslie J., 5,567,726, Cl. 514-383.000.
- Houghton, Peter G., 5,567,819, Cl. 546-201.000.
- Mercury Enterprises, Inc.: See—
- Jagiela, Walter J., 5,566,995, Cl. 292-346.000.
- Merkin, Cindy M.: See—
- Blackledge, John W.; Cohen, Ariel; Katz, Sagi; and Merkin, Cindy M., 5,568,619, Cl. 395-281.000.
- Merkin, Cynthia M.: See—
- Khatir, Bharat; Marx, Fred; Mayer, Dan E.; Merkin, Cynthia M.; and Vila, Ileana, 5,568,611, Cl. 395-186.000.
- Merlo, Donald J.: See—
- Adang, Michael J.; Rocheleau, Thomas A.; Merlo, Donald J.; and Murray, Elizabeth E., 5,567,600, Cl. 536-23.710.
- Adang, Michael J.; Rocheleau, Thomas A.; Merlo, Donald J.; and Murray, Elizabeth E., 5,567,862, Cl. 800-205.000.
- Merrell Pharmaceuticals Inc.: See—
- Flynn, Gary A.; Beight, Douglas W.; Warshawsky, Alan M.; Mehdi, Shujaath; French, John F.; and Kehne, John H., 5,567,814, Cl. 540-521.000.
- Merrill, Jerilyn L., administratrix: See—
- O'Leary, Thomas M.; Drake, Peter R.; Merrill, Philip R., deceased, 5,568,105, Cl. 333-81.00R.
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- O'Leary, Thomas M.; Drake, Peter R.; Merrill, Philip R., deceased, 5,568,105, Cl. 333-81.00R.
- Merritt, Charles D.: See—
- Justus, Brian L.; Huston, Alan L.; Campillo, Anthony J.; and Merritt, Charles D., 5,568,496, Cl. 372-11.000.
- Merritt, David A. Statistical averaging method for wind profiler doppler spectra, 5,568,151, Cl. 342-192.000.
- Mertens, Marc; Calberg, Cedric; Martinot, Lucien; Jerome, Robert; and Schrijnemackers, Jean, to Recherche et Développement du Groupe Cockerill Sambre en abrégé: "RD-CS". Process for depositing by electropolymerization on organic film onto an electrically conductive surface, 5,567,297, Cl. 205-334.000.
- Mesenbring, John M.; Patriquin, Lawrence J.; Ramirez, Rory F.; and Smith, Dell W., to Dispenser King, Inc. Conditment dispenser, 5,566,863, Cl. 222-132.000.
- Messih, Isis A., to Ford Motor Company. Engine air/fuel control system with an adaptively learned range of authority, 5,566,662, Cl. 123-674.000.
- Metalgrafica Rojek Ltda.: See—
- Rojek, Arnaldo, 5,566,568, Cl. 72-379.400.
- Rojek, Arnaldo, 5,566,854, Cl. 220-658.000.
- Metanetics Corporation: See—
- Kochis, Gary; Delaplane, Neil C.; Rebb, William R.; Cisar, James M.; and Chang, Yung-Fu, 5,568,357, Cl. 361-681.000.
- Methode Electronics, Inc.: See—
- Samela, Francis M.; and Llorens, Joseph R., 5,568,046, Cl. 324-71.100.
- Metsler, Alexander, to Steward, Inc. Ferrite common mode choke adapted for circuit board mounting, 5,568,111, Cl. 336-65.000.
- Mettler-Toledo AG: See—



- Bachmann, Rudolf; and Hartmann, Beat, 5,567,918, Cl. 177-25.130.  
Meyer, Frank L.: See—  
Levy, Arnold; and Meyer, Frank L., 5,566,734, Cl. 160-84.040.  
Meyer, Helmut; von Herz, Alfons; and Winkelhake, Dirk, to Otis Elevator Company. Reduction of handrail vibration in passenger conveyors. 5,566,810, Cl. 198-331.000.  
Meyer, Rolf-Volker: See—  
Sackmann, Günter; Meyer, Rolf-Volker; Korte, Siegfried; and Schapowalow, Sergej, 5,567,779, Cl. 525-329.100.  
Meyke, Joachim: See—  
Desseke, Otto; Meyke, Joachim; and Pfeiffer, Armin, 5,567,370, Cl. 264-53.000.  
Mezger, Mark J.: See—  
Manning, Thelma G.; Turci, Joseph; Mezger, Mark J.; and Strauss, Bernard, 5,567,912, Cl. 149-12.000.  
Michel, Josef: See—  
Maly-Schreiber, Martha; and Michel, Josef, 5,567,546, Cl. 429-207.000.  
Michlin, Steven B. Long life re-rulable steel rule die system. 5,566,594, Cl. 76-107.800.  
Micrel, Inc.: See—  
Bittner, Harry J., 5,568,044, Cl. 323-272.000.  
Micron Communications, Inc.: See—  
Rotzoll, Robert R., 5,568,512, Cl. 375-221.000.  
Micron Quantum Devices, Inc.: See—  
Roopparvar, Fariborz F.; and Briner, Michael S., 5,568,426, Cl. 365-185.220.  
Micron Technology, Inc.: See—  
Marr, Kenneth W., 5,568,435, Cl. 365-201.000.  
Rolfson, J. Brett; and Manning, Monte, 5,567,644, Cl. 437-60.000.  
Migaki, Atsuko: See—  
Nakatsukasa, Sigeaki; Yoshioka, Kenichi; Hirakawa, Kiyoshi; Tanaka, Kazuhiko; Kawamoto, Masao; Sugoh, Nozomu; Migaki, Atsuko; and Taniguchi, Shunro, 5,567,796, Cl. 528-272.000.  
Migaki, Yoshio: See—  
Iwade, Takashi; Takagi, Jun; and Migaki, Yoshio, 5,566,905, Cl. 242-43.00A.  
Mignani, Serge: See—  
Audiau, François; Jimonet, Patrick; and Mignani, Serge, 5,567,822, Cl. 548-164.000.  
Miida, Takashi: See—  
Kawamura, Kazuo; Hasegawa, Jun; and Miida, Takashi, 5,568,249, Cl. 356-3.140.  
Miki, Kazuo: See—  
Ogasawara, Nobuo; Endo, Noboru; Miki, Kazuo; and Takase, Akihiko, 5,568,468, Cl. 370-13.000.  
Miles, Paul A.: See—  
Mc Cubbin, Melvin J.; Weeks, James A.; and Miles, Paul A., 5,567,908, Cl. 102-519.000.  
Miller, Alan G.: See—  
Paff, Armin J.; Miller, Alan G.; and Williams, Donald J., 5,567,507, Cl. 428-213.000.  
Miller, Charles R.; and Berry, Haskell B., Jr., to Premier Medical Technology, Inc. Sterilant composition. 5,567,385, Cl. 422-28.000.  
Miller, David J.: See—  
Gearin, Peter; and Miller, David J., 5,567,111, Cl. 414-786.000.  
Miller, Douglas P., to Applied Power Inc. Hydraulic coupler. 5,566,714, Cl. 137-614.040.  
Miller, Joseph D.: See—  
McLaughlin, Kevin M.; and Miller, Joseph D., 5,568,389, Cl. 364-424.050.  
Miller, Paul J.: See—  
Foreman, Kevin G.; Kiser, Willie C.; and Miller, Paul J., 5,568,348, Cl. 361-118.000.  
Miller, Phillip: See—  
Koenck, Steven E.; Miller, Phillip; Hanson, George E.; Schultz, Darald R.; and Krummfasz, Jeffrey S., 5,567,925, Cl. 235-375.000.  
Miller, Raymond F.: See—  
Kim, Choung U.; Misco, Peter F., Jr.; Wichtowski, John A.; Ueda, Yasutsugu; Hudyma, Thomas W.; Matiskella, John D.; D'Andrea, Stanley V.; Hoeft, Shelley E.; Miller, Raymond F.; Mansuri, Muzamil M.; and Bronson, Joanne J., 5,567,698, Cl. 514-210.000.  
Miller, Scott C., to Zeneca Limited. Therapeutic heterocycles which antagonize neurokinin receptors. 5,567,700, Cl. 514-226.800.  
Miller, Steven D., to Battelle Memorial Institute. Composite material dosimeters. 5,567,948, Cl. 250-484.500.  
Milliken Research Corporation: See—  
Higgins, Kenneth B.; and Gaddis, Benjamin A., 5,567,257, Cl. 156-72.000.  
Love, Franklin S., III; and Brown, Robert S., 5,566,433, Cl. 26-2.00R.  
Milwaukee Electric Tool Corporation: See—  
Bednar, Thomas R., 5,566,458, Cl. 30-392.000.  
Mimura, Tadao; Kato, Yoshiaki; and Matsumura, Kazumi, to Hitachi, Ltd. Mass spectrometer. 5,567,938, Cl. 250-288.000.  
Minakata, Hiroshi, to International Business Machines Corporation. Handwriting input method and apparatus. 5,568,565, Cl. 382-187.000.  
Minami, Tohru, to Sanyo Chemical Industries, Ltd. Toner binder composition and toner composition. 5,567,563, Cl. 430-110.000.  
Minami, Yoshihiko: See—  
Yoshida, Ryoichi; Kosugi, Noriyuki; Tanaka, Yoshihiko; Yanagi, Eiji; Atoh, Tadayuki; Kokeguchi, Akira; and Minami, Yoshihiko, 5,566,972, Cl. 280-728.200.  
Minarovic, Joe T.; and Rebers, Kenneth D., to Minnesota Mining and Manufacturing Company. Splice closure with animal protection. 5,567,914, Cl. 174-93.000.  
Mineji, Akira, to NEC Corporation. Laminated complementary thin film transistor device with improved threshold adaptability. 5,567,959, Cl. 257-69.000.  
Minemi, Masahiko: See—  
Okamoto, Kenji; Horimura, Hiroyuki; Minemi, Masahiko; Takeda, Yoshinobu; Takano, Yoshishige; and Kaji, Toshihiko, 5,566,449, Cl. 29-888.092.  
Ming, Tan A.: See—  
Suzuki, Tetsuo; Taniguro, Masahiro; Saito, Hiroyuki; Tanno, Koichi; Yanagi, Haruyuki; Kawamura, Makoto; Kinoshita, Hiroyuki; Shinmachi, Masaya; and Ming, Tan A., 5,567,069, Cl. 400-636.000.  
Minghetti, Ettore; Eitel, John E.; and Wetter, Carol A., to Aristech Chemical Corporation. Acrylic sheet having uniform distribution of coloring and mineral filler before and after thermoforming. 5,567,745, Cl. 523-202.000.  
Minigrip, Inc.: See—  
Martinez, David M.; and Tilman, Paul A., 5,566,429, Cl. 24-587.000.  
Minnesota Mining and Manufacturing Company: See—  
Conwell, Stanley L.; and Wood, William P., 5,567,150, Cl. 432-14.000.  
Kiehne, Douglas A.; and Luthy, Kenneth W., 5,568,210, Cl. 353-120.000.  
Minarovic, Joe T.; and Rebers, Kenneth D., 5,567,914, Cl. 174-93.000.  
Moore, George G. I.; Flynn, Richard M.; and Guerra, Miguel A., 5,567,765, Cl. 524-801.000.  
Nelson, John C.; Fessler, Robert M.; and Vanderwerf, Dennis F., 5,568,324, Cl. 359-742.000.  
Paff, Armin J.; Miller, Alan G.; and Williams, Donald J., 5,567,507, Cl. 428-213.000.  
Patnode, Gregg A.; Bruno, John E.; Rutherford, Denise R.; Sandison, Walter B.; and Schlei, Dietmar, 5,567,510, Cl. 428-288.000.  
Minolta Camera Kabushiki Kaisha: See—  
Asano, Masaki; Iino, Shuji; Ikegawa, Akihito; and Osawa, Izumi, 5,568,231, Cl. 355-219.000.  
Minolta Co., Ltd.: See—  
Hirai, Atsuto; Ueda, Masahide; Terasaka, Yoshihisa; Sano, Eiichi; Matsumura, Masahiko; Yamasaki, Hiroyuki; Yamada, Masami; and Izumi, Tomoo, 5,568,244, Cl. 355-309.000.  
Jinbo, Noriyuki; and Takasu, Akira, 5,568,031, Cl. 318-630.000.  
Toda, Hiroshi; Kawasaki, Akihiro; Eda, Masami; Takemoto, Shinichi; and Sakuraba, Tamotsu, 5,568,236, Cl. 355-259.000.  
Minorics, Richard T. Lamp with retractable universal bulb for fishing rods. 5,566,493, Cl. 43-17.500.  
Minot, Joël; and Gentric, Philippe, to U.S. Philips Corporation. Method and device using a neural network for classifying data. 5,568,591, Cl. 395-22.000.  
Mirza, Daryl; and Barasa, Robert A., to DGA Industries, Inc. Grease filter assembly. 5,567,216, Cl. 55-323.000.  
Misco, Peter F., Jr.: See—  
Kim, Choung U.; Misco, Peter F., Jr.; Wichtowski, John A.; Ueda, Yasutsugu; Hudyma, Thomas W.; Matiskella, John D.; D'Andrea, Stanley V.; Hoeft, Shelley E.; Miller, Raymond F.; Mansuri, Muzamil M.; and Bronson, Joanne J., 5,567,698, Cl. 514-210.000.  
Misiura, Konrad; and Gait, Michael, to Amersham International plc. Phosphoramidite derivatives, their preparation and the use thereof in the incorporation of reporter groups on synthetic oligonucleotides. 5,567,811, Cl. 536-25.340.  
Mitani, Masaaki: See—  
Hayashi, Katsumi; Mitani, Masaaki; and Kitao, Shinzi, 5,568,638, Cl. 395-600.000.  
Mitchell, Albert W.: See—  
Mullet, Willis J.; and Mitchell, Albert W., 5,566,740, Cl. 160-229.100.  
Mitchell, Frank L.: See—  
Cheney, Craig; and Mitchell, Frank L., 5,566,720, Cl. 138-137.000.  
Mitel Corporation: See—  
Orchard-Webb, Jonathan H., 5,568,346, Cl. 361-58.000.  
Mitsubishi Chemical Corporation: See—  
Furuya, Rikizo; Okushima, Hiromi; and Abe, Yuji, 5,567,699, Cl. 514-222.500.  
Izumisawa, Yoshiaki; Kawahara, Tuka; and Toyosawa, Akihiko, 5,567,842, Cl. 562-486.000.  
Kakiuchi, Hiroyuki; and Oka, Masahiro, 5,567,346, Cl. 252-70.000.  
Yamamoto, Iwao; Niwa, Kazuo; Seki, Hitoshi; Kusahara, Toshiro; and Inoue, Yoshiaki, 5,566,792, Cl. 188-218.0XL.  
Mitsubishi Denki Kabushiki Kaisha: See—  
Furukawa, Takehiro; Yamashita, Eizo; and Saiki, Nobuyuki, 5,568,148, Cl. 341-155.000.  
Hayashi, Satoru, 5,567,917, Cl. 174-258.000.  
Hironaka, Misao, 5,568,502, Cl. 372-50.000.  
Hosoya, Yasuhiko; Kuroda, Toshiaki; and Katashiba, Hideaki, 5,566,547, Cl. 60-284.000.  
Kashihara, Keiichi; and Itoh, Hiromi, 5,567,964, Cl. 257-310.000.  
Kitaguchi, Kouichi; and Okumura, Yoshihide, 5,568,074, Cl. 327-77.000.  
Kobayashi, Eiji, 5,567,878, Cl. 73-514.120.  
Matsumoto, Keisuke, 5,568,311, Cl. 359-344.000.  
Nakashima, Teruya; and Umevama, Takehiko, 5,568,103, Cl. 331-185.000.  
Nishizawa, Yoshifumi; Abe, Tomonori; Yamane, Iwao; and Yamada, Satoru, 5,566,632, Cl. 112-470.030.  
Osaki, Akitoshi; and Matsui, Hideo, 5,568,070, Cl. 326-113.000.  
Ota, Yoshiyuki; Tomioka, Ichiro; and Murakami, Eiji, 5,568,068, Cl. 326-82.000.  
Sanemitsu, Yoshikado, 5,568,441, Cl. 365-229.000.  
Sato, Fumiki; and Fujita, Kouichi, 5,568,077, Cl. 327-199.000.  
Shiono, Satoru; and Tanifuji, Manabu, 5,566,673, Cl. 128-653.100.  
Tanaka, Ken-ichi; and Shimizu, Masako, 5,568,563, Cl. 382-144.000.  
Taniguchi, Ryosuke; Hattori, Shinichi; and Sakamoto, Takahiro, 5,568,448, Cl. 367-82.000.  
Tsukude, Masaki; and Arimoto, Kazutami, 5,568,440, Cl. 365-222.000.  
Wada, Tomohisa, 5,568,432, Cl. 365-200.000.  
Mitsubishi Electric Engineering Co., Ltd.: See—  
Nakashima, Teruya; and Umevama, Takehiko, 5,568,103, Cl. 331-185.000.  
Mitsubishi Electric Semiconductor Software Co., Ltd.: See—  
Ota, Yoshiyuki; Tomioka, Ichiro; and Murakami, Eiji, 5,568,068, Cl. 326-82.000.  
Mitsubishi Gas Chemical Company, Inc.: See—  
Hasemi, Ryuji; Iwata, Keiichi; Hada, Mayumi; and Ikeda, Hidetoshi, 5,567,574, Cl. 430-331.000.  
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: See—  
Yoshida, Masato, 5,566,774, Cl. 180-65.400.  
Mitsubishi Petrochemical Engineering Co., Ltd.: See—  
Kakiuchi, Hiroyuki; and Oka, Masahiro, 5,567,346, Cl. 252-70.000.  
Mitsui, Hidoro: See—  
Sakurai, Nobumasa; Mitsui, Hidoro; and Okayasu, Yoshisada, 5,568,198, Cl. 348-372.000.  
Mitsui Petrochemical Industries, Ltd.: See—  
Koga, Hitoshi; Kameyama, Masao; Iwata, Kazuo; and Gonda, Masahiro, 5,567,515, Cl. 428-355.000.  
Taniguchi, Hiroshi; Yamamoto, Akihiko; Nomura, Takao; Nishio, Takeyoshi; and Iwai, Hisayuki, 5,567,759, Cl. 524-451.000.  
Tsuiji, Yoichiro; Abe, Yoshiharu; Sagane, Toshihiro; and Takata, Toshimasa, 5,567,776, Cl. 525-289.000.  
Tsuiji, Yoichiro; Abe, Yoshiharu; Sagane, Toshihiro; and Takata, Toshimasa, 5,567,777, Cl. 525-289.000.  
Mitsui Toatsu Chemicals, Incorporated: See—  
Koshida, Hitoshi; Ghoda, Isamu; Ohyama, Tsukasa; and Takuma, Keisuke, 5,567,470, Cl. 427-151.000.  
Mitsutake, Hideaki; and Yoshinaga, Kazuo, to Canon Kabushiki Kaisha. Optical modulation device and display apparatus with three birefringent films each acting as a half waveplate. 5,568,283, Cl. 359-053.000.  
Mitsutake, Hideaki: See—  
Shingaki, Junko; Kaneko, Shuzo; Kurematsu, Katsumi; and Mitsutake, Hideaki, 5,568,287, Cl. 359-53.000.  
Mittermeier, Ludwig; and Ruess, Wilhelm, to Ciba-Geigy Corporation. Microbicides. 5,567,705, Cl. 514-275.000.  
Mittlender, Herbert: See—  
Batschari, Constantine; and Mittlender, Herbert, 5,566,457, Cl. 30-390.000.  
Mituba Electric Mfg. Co., Ltd.: See—  
Fukutomi, Masao; Aoki, Shigeki; Komori, Kazunori; Asano, Toshihisa; Tanaka, Yoshiaki; and Maeda, Hiroshi, 5,567,288, Cl. 204-298.060.  
Miura, Takaharu; Itoh, Masataka; and Tanaka, Chieko, to New Oji Paper Co., Ltd. Support sheet for photographic printing sheet. 5,567,572, Cl. 430-510.000.  
Miyabara, Hiroyuki; Watae, Shigeharu; Kawakami, Yoshio; and Fukushima, Kiyoto, to TDK Corporation. Magnetic recording medium having a magnetic layer containing abrasive particles. 5,567,502, Cl. 428-141.000.  
Miyabayashi, Kazuhiko: See—  
Kawata, Tatsuo; Suzuki, Hiroshi; Sashima, Hiroki; Miyabayashi, Kazuhiko; and Horie, Osamu, 5,567,990, Cl. 257-788.000.  
Miyagawa, Noyasu: See—  
Nishiuchi, Kenichi; Miyagawa, Noyasu; Ohno, Eiji; and Akahira, Nobuo, 5,568,461, Cl. 369-110.000.  
Miyagoshi, Eiji: See—  
Imanishi, Hiroshi; Miyagoshi, Eiji; and Takeno, Hiroshi, 5,568,140, Cl. 341-67.000.  
Miyahara, Masahiko: See—  
Suzuki, Haruhiko; Tamura, Takahiro; Miyahara, Masahiko; Yamaguchi, Hiroaki; Ohuchi, Hideaki; Kondo, Akira; and Matsushita, Toshikazu, 5,567,874, Cl. 73-118.200.  
Miyake, Norifumi: See—  
Murata, Mitsushige; Miyake, Norifumi; and Onodera, Kazuo, 5,568,247, Cl. 355-324.000.  
Miyake, Tetsuo: See—  
Uemura, Ken; Nagashima, Yukiko; Saito, Yasunari; Kurita, Takao; Miyake, Tetsuo; and Shimizu, Kazuaki, 5,568,258, Cl. 356-371.000.  
Miyake, Yoshio: See—  
Kobayashi, Makoto; Yamamoto, Masakazu; Miyake, Yoshio; and Ise-moto, Koji, 5,567,133, Cl. 417-423.700.  
Miyamura, Motohiro: See—  
Hidaka, Hideto; Iwamoto, Kengo; Noguchi, Yasuhiro; Miyamura, Motohiro; Yazima, Seiichi; and Sakai, Inao, 5,566,799, Cl. 191-55.000.  
Miyamura, Yoshinori: See—  
Akagi, Kyo; Futamoto, Masaaki; Kugiyu, Fumio; Miyamura, Yoshinori; Takano, Hisashi; Matsuda, Yoshinori; Suzuki, Mikio; Nakao, Takeshi; Munemoto, Takayuki; Fukuoaka, Hirosugu; Aihara, Makoto; Takagaki, Tokuhiko; Aoi, Hajime; and Seo, Yosuke, 5,568,331, Cl. 360-77.070.

- Miyashita, Kazuo; Ota, Toru; Okazaki, Suguru; Nishikawa, Masazumi; and Maruyama, Kazuaki, to Maruha Corporation. Method of stabilizing an  $\omega$ -3 unsaturated fatty acid compound. 5,567,730, Cl. 514-549.000.  
Miyata, Hirokatsu: See—  
Nakamura, Katsutoshi; Kaneko, Shuzo; Kishi, Etsuro; Miyata, Hirokatsu; and Shibata, Masaaki, 5,568,295, Cl. 359-75.000.  
Miyawaki, Mamoru; Ishizaki, Akira; Momma, Genzo; Yuzurihara, Hiroshi; and Kohchi, Tetsunobu, to Canon Kabushiki Kaisha. Semiconductor memory device. 5,567,962, Cl. 257-296.000.  
Miyazaki, Yuuki: See—  
Hirohata, Naoto; Shudo, Katsuyuki; and Miyazaki, Yuuki, 5,568,329, Cl. 360-32.000.  
Miyoshi, Yoshitaka: See—  
Fukuchi, Masami; Miyoshi, Yoshitaka; Kanno, Masahide; Hattori, Shin-ichiro; Nakamura, Kazunari; Hiyama, Keiichi; and Hasegawa, Jun, 5,568,271, Cl. 386-46.000.  
Mizoguchi, Naotake; and Takahashi, Tadao, to Senju Metal Industry Company Limited. Reflow furnaces with hot air blow type heaters. 5,567,151, Cl. 432-145.000.  
Mizuguchi, Shinji, to Hirose Electric Co., Ltd. Electrical connector with a latch. 5,567,171, Cl. 439-326.000.  
Mizutani, Hideo: See—  
Ota, Kazuya; Mizutani, Hideo; and Komatsu, Kouichiro, 5,568,257, Cl. 356-363.000.  
Mobil Oil Corporation: See—  
Beck, Jeffrey S.; and Stern, David L., 5,567,666, Cl. 502-71.000.  
McGee, Dennis E.; and Touhsaent, Robert E., 5,567,773, Cl. 525-221.000.  
Mochizuki, Akihiro: See—  
Yoshihara, Toshiaki; Mochizuki, Akihiro; Shiroto, Hironori; and Makino, Tetsuya, 5,568,299, Cl. 359-100.000.  
Mochizuki, Shunji; Takagi, Hiromi; Hoshino, Masahiko; and Yoshikawa, Sumi, to Nippondenso Co., Ltd. Molten metal holding furnace and method of holding molten metal within the same. 5,567,378, Cl. 266-44.000.  
Modak, Shanta; and Sampath, Lester, to Trustees of Columbia University In The City of New York, The. Infection resistant medical devices. 5,567,495, Cl. 428-36.900.  
Mody, Tarak D.: See—  
Magda, Daren; Sessler, Jonathan L.; Iverson, Brent; Jansen, Petra L.; Wright, Meredith; Mody, Tarak D.; and Hemmi, Gregory W., 5,567,687, Cl. 514-44.000.  
Moeres, Reiner. Double-sided miter box for machine tools in particular panel saws. 5,566,603, Cl. 83-468.300.  
Mofidi, Mehrdad: See—  
Cernea, Raul-Adrian; Lee, Douglas J.; Mofidi, Mehrdad; and Mehrotra, Sanjay, 5,568,424, Cl. 365-185.330.  
Mohr, Bernhard; Ueding, Michael; Strobel, Michael; and Krieger, Albert, to Rieter Ingolstadt Spinnereimaschinenbau AG. Process and device for the deposit of a fiber sliver end on a flat can. 5,566,425, Cl. 19-159.00R.  
Mohr, Juergen: See—  
Franz, Lothar; Mohr, Juergen; Schreyer, Peter; Thomas, Juergen; Oppenlaender, Knut; and Guenther, Wolfgang, 5,567,845, Cl. 564-278.000.  
Mohr, Patrick J.: See—  
Joshi, Mahendra L.; Broadway, Lee; Mohr, Patrick J.; and Nitzman, Jack L., 5,567,141, Cl. 431-8.000.  
Mohri, Jun; and Endoh, Noboru, to Noritake Co., Limited; and Kyushu Noritake Co., Ltd. Fluorescent display tube wherein grid electrodes are formed on ribs contacting fluorescent segments, and process of manufacturing the display tube. 5,568,012, Cl. 313-517.000.  
Moir, David: See—  
Gunderman, Anthony J.; Moir, David; O'Connell, Robert M., deceased, 5,566,693, Cl. 132-333.000.  
Molecular Devices Corporation: See—  
Song, Herking; and Hafeman, Dean G., 5,567,302, Cl. 205-777.500.  
Möller, Susanna: See—  
Borrebaeck, Carl; Danielsson, Lena; and Möller, Susanna, 5,567,610, Cl. 435-240.200.  
Momma, Genzo: See—  
Miyawaki, Mamoru; Ishizaki, Akira; Momma, Genzo; Yuzurihara, Hiroshi; and Kohchi, Tetsunobu, 5,567,962, Cl. 257-296.000.  
Momose, Katsumi: See—  
Eguchi, Tadashi; Momose, Katsumi; Narumi, Hiroji; Nishimura, Tetsu-haru; Hosaka, Kotaro; Tsukiji, Masaaki; and Ishizuka, Koh, 5,568,337, Cl. 360-78.110.  
Momota, Kiyoshi: See—  
Aoki, Yasuhiro; Momota, Kiyoshi; Yamamoto, Tetsuo; Ide, Hideki; and Onihashi, Hiroshi, 5,568,014, Cl. 315-3.500.  
Monegato, Achille: See—  
Nicolucci, Clemente; and Monegato, Achille, 5,567,275, Cl. 162-99.000.  
Mononen, Tarmo: See—  
Ålander, Casper; and Mononen, Tarmo, 5,566,522, Cl. 52-630.000.  
Monotype Supply Co., Ltd.: See—  
Ho, Diana, 5,566,957, Cl. 280-11.220.  
Monsanto Company: See—  
Kinlen, Patrick J., 5,567,356, Cl. 252-500.000.  
Montedipe S.r.l.: See—  
Vezzoli, Annibale; Ciaperoni, Aldemaro; and Furlan, Piero, 5,567,491, Cl. 428-35.700.  
Montell North America Inc.: See—  
Preiss, Joachim, 5,566,889, Cl. 241-19.000.  
Monthony, James F.: See—



- Stitt, David T.; Burrell, Gregory J.; Hu, Kwok-Yu; Monthony, James F.; and Sapitowicz, Robert, 5,567,598, Cl. 435-29.000.
- Moon, Kyung-Ha; Lee, Bae-Won; and Yang, Hong-Geun, to Samsung Electronics Co., Ltd. Thermal print head and method of making the same. 5,568,176, Cl. 347-200.000.
- Moore, George O. I.; Flynn, Richard M.; and Guerra, Miguel A., to Minnesota Mining and Manufacturing Company. Physiologically acceptable emulsions containing perfluorocarbon ether hydrides and methods of use. 5,567,765, Cl. 524-801.000.
- Moore, Lawrence P.; and Biro, John P. Fiberglass pipe with rough wrench surfaces. 5,566,985, Cl. 285-39.000.
- Moore, Ronald: See—  
Pakulski, Grzegorz; Blaauw, Cornelis; Margittai, Agnes; and Moore, Ronald, 5,567,659, Cl. 437-228.000.
- Moot, Lorence M.: See—  
Zegler, Stephen A.; Weinle, Paul L.; and Moot, Lorence M., 5,567,497, Cl. 428-95.000.
- Moratschke, Rainer: See—  
Boing, Eberhard; and Moratschke, Rainer, 5,566,989, Cl. 285-163.000.
- Moreno, Alain: See—  
Ciza, Jean-Charles; and Moreno, Alain, 5,568,266, Cl. 356-402.000.
- Mori, Hidehito, to Nippondenso Co., Ltd. Waveform shaping apparatus. 5,568,141, Cl. 341-118.000.
- Mori, Nobuyoshi, to Fuji Electric Co. Electrophotographic photoreceptor. 5,567,557, Cl. 430-58.000.
- Mori, Shigeru: See—  
Ishii, Mikio; and Mori, Shigeru, 5,566,517, Cl. 52-387.000.
- Mori, Yoshiaki, to NEC Corporation. Control unit for controlling reading and writing of a magnetic tape unit. 5,568,650, Cl. 395-872.000.
- Morimoto, Tamotsu, to Tokyo Electron Limited. Heat processing apparatus. 5,567,152, Cl. 432-241.000.
- Morin, Pascal, to Valeo Systemes D'Essuyage. Device for fastening an assembly on the bodywork of a motor vehicle, and a screen wiper module including such a device. 5,567,097, Cl. 411-34.000.
- Morinaka, Katsuya: See—  
Yoshiike, Nobuyuki; Arita, Koji; and Morinaka, Katsuya, 5,567,052, Cl. 374-124.000.
- Morino, Shigeru: See—  
Hara, Kei; and Morino, Shigeru, 5,568,178, Cl. 347-237.000.
- Morioka, Manabu: See—  
Nakatsuka, Shigeki; Ichikawa, Iwao; Morioka, Manabu; Kato, Kenji; Fujita, Takayuki; Negishi, Shigetoshi; and Shiga, Kazuhiro, 5,568,264, Cl. 356-394.000.
- Morita, Kouichi; Sakamoto, Junshi; and Okada, Takamichi, to NSK Ltd.; and Shindengen Electric Manufacturing Co., Ltd. Rolling bearing unit with rotating speed sensor. 5,567,058, Cl. 384-448.000.
- Morita, Sumie: See—  
Watanabe, Yoshihiro; Kakuma, Satoshi; Morita, Sumie; Okuyama, Yuzo; and Okabe, Kenichi, 5,568,479, Cl. 370-60.100.
- Morita, Yauzo: See—  
Tahara, Shu; and Morita, Yauzo, 5,567,621, Cl. 436-103.000.
- Morita, Yoshiyuki: See—  
Watanabe, Toshiaki; Saeki, Shinji; and Morita, Yoshiyuki, 5,567,920, Cl. 178-18.000.
- Morita, Youzo; and Inoue, Keiji, to Shimadzu Corporation. Apparatus for measuring total organic carbon. 5,567,388, Cl. 422-80.000.
- Moriya, Kouji, to Casio Computer Co., Ltd. Electronic device having pseudo-SRAM and CPU operating in an active mode and in an idle mode. 5,568,637, Cl. 395-550.000.
- Moriya, Masato: See—  
Wakai, Hideyuki; Suzuki, Toru; Terada, Keiji; Moriya, Masato; and Ando, Manabu, 5,568,261, Cl. 356-376.000.
- Moriyama, Tadashi: See—  
Hayashi, Masaharu; Hioki, Yuichi; Shonaka, Masafumi; and Moriyama, Tadashi, 5,567,606, Cl. 435-106.000.
- Morris, John O., to Texas Instruments Incorporated. Scan based testing for analog module within a mixed analog and digital circuit. 5,568,493, Cl. 371-22.300.
- Morris, Michael A.; Fowles, Martin; and Mackrodt, William C., to Imperial Chemical Industries PLC. Oxidation catalysts. 5,567,667, Cl. 502-302.000.
- Morris, Michael D.; and Zumbach, Lyle L., to Norand Corporation. Versatile RF data capture system. 5,568,645, Cl. 395-800.000.
- Morrison, David W., to Grain Systems, Inc. Metering grain unloader for tower dryer. 5,566,470, Cl. 34-167.000.
- Morrison, Gerald: See—  
Burgess, Clyde; Morrison, Gerald; and Berger, M. Steven, 5,566,630, Cl. 112-80.410.
- Morrison, Robert C.: See—  
Dover, B. Troy; Kamienski, Conrad W.; Morrison, Robert C.; and Currin, R. Thomas, Jr., 5,567,474, Cl. 427-213.300.
- Morton, Alan M.: See—  
Jones, Brian W.; and Morton, Alan M., 5,567,993, Cl. 307-43.000.
- Morton International, Inc.: See—  
Barnes, Michael W.; Deppert, Thomas M.; and Taylor, Robert D., 5,567,905, Cl. 102-289.000.
- Green, David J.; Lauritzen, Donald R.; Bunker, S. Mark; and Rose, Larry D., 5,566,973, Cl. 280-728.000.
- Stull, Mark W.; Ravenberg, Michael J.; Lauritzen, Donald R.; Rose, Larry D.; and Green, David J., 5,566,975, Cl. 280-732.000.
- Taylor, Robert D.; and Hussey, Brett, 5,566,543, Cl. 60-219.000.
- Morton International Limited: See—  
Lee, Timothy C. P.; and Lowe, George B., 5,567,258, Cl. 156-109.000.
- Morton, Lowell K.: See—  
Schakel, Eric G.; Coleman, Robert R.; Matthews, Kent R.; and Morton, Lowell K., 5,567,504, Cl. 428-167.000.
- Morton, Steven G. Optical device bearing a pattern for representing at least one image that is capable of having microscopic detail. 5,567,573, Cl. 430-321.000.
- Morun, Mark J., to Mars Incorporated. Coin acceptance method and apparatus. 5,566,807, Cl. 194-217.000.
- Moses, Marsha A.: See—  
Sasisekharan, Ramnath; Moses, Marsha A.; Nugent, Matthew A.; Cooney, Charles L.; and Langer, Robert S., 5,567,417, Cl. 424-94.500.
- Moses, Steven R.: See—  
Lentz, Mark; Moses, Steven R.; Pettiford, Eloy F.; Stewart, Craig; and Wright, Douglas D., 5,567,181, Cl. 439-694.000.
- Moskwa, Patricia S.: See—  
Weis, Alexander L.; Oakes, Fred T.; Hausheer, Frederick H.; Cavanaugh, Paul F., Jr.; and Moskwa, Patricia S., 5,567,810, Cl. 536-25.300.
- Mossner, David D.: See—  
Dunmead, Stephen D.; and Mossner, David D., 5,567,662, Cl. 501-87.000.
- Motegi, Kentaro; Ito, Yukio; Okamoto, Yoshitaka; and Komura, Kuniyoshi, to Inax Corporation. Method of finishing a green body. 5,567,366, Cl. 264-39.000.
- Motorola, Inc.: See—  
Bai, Lijun; Kines, Joseph G.; and Chason, Marc, 5,568,353, Cl. 361-523.000.
- Cannon, Gregory L.; Macko, William J.; Fuller, Gregory W.; Cannon, Nancy M.; and Rasor, Gregg E., 5,568,134, Cl. 340-825.440.
- Davenport, Roger A., 5,568,001, Cl. 310-313.00R.
- Fernandez, Jose M., 5,568,039, Cl. 320-29.000.
- Flint, Andrew; Trent, James R.; and Grula, Jerome A., 5,568,492, Cl. 371-22.100.
- Franson, Alvin D., 5,568,149, Cl. 341-156.000.
- Gupta, Debabrata, 5,567,648, Cl. 437-183.000.
- Jones, Robert E., Jr., 5,567,636, Cl. 437-43.000.
- Kowalewski, Rolf E., 5,568,349, Cl. 361-154.000.
- Lesk, Israel A.; Robb, Francine Y.; Terry, Lewis E.; and Secco d'Aragona, Frank, 5,567,649, Cl. 437-190.000.
- Luff, Marlin; Skoda, William; and Kiscellus, William, 5,568,006, Cl. 310-348.000.
- Massaroni, Kenneth M.; and Meadows, Vernon, 5,568,037, Cl. 320-2.000.
- McCormack, Dave W., 5,566,877, Cl. 228-105.000.
- Orlowski, Marius; Hayden, James D.; and Nguyen, Bich-Yen, 5,567,958, Cl. 257-66.000.
- Replinger, Daniel J.; and Hislop, Jennifer M., 5,568,548, Cl. 379-446.000.
- Schuss, Jack J.; Maloney, Peter R.; Upton, David M.; and McMorrow, Robert J., 5,568,086, Cl. 330-124.00R.
- Motoyama, Tetsuro, to Ricoh Company, Ltd.; and Ricoh Corporation. Method and apparatus for controlling and communicating with business office devices. 5,568,618, Cl. 395-280.000.
- Moulinex S.A.: See—  
Beaudet, Jean-Yves; Marriere, Marc; and Trocherie, Jean-Pierre, 5,567,049, Cl. 366-206.000.
- Moulton, Russel D.: See—  
Golovin, Milton N.; Shackle, Dale R.; and Moulton, Russel D., 5,567,547, Cl. 429-217.000.
- Mountainsmith, Inc.: See—  
Smith, Patrick D., 5,567,055, Cl. 383-38.000.
- Moving Target Sports, Inc.: See—  
Mullin, Carol; and Mullin, James, 5,566,952, Cl. 273-400.000.
- Mowry, John R.; Harris, Jacqueline A.; Luebke, Charles P.; and Hamm, David A., to UOP. High purity tertiary olefin process using removal of secondary ethers. 5,567,860, Cl. 585-639.000.
- Mraz, Peter: See—  
Scheucher, Peter; Heindler, Gerhard; Schininger, Walter; Paier, Gerhard; and Mraz, Peter, 5,566,611, Cl. 100-127.000.
- MTS Colorimetric: See—  
Ciza, Jean-Charles; and Moreno, Alain, 5,568,266, Cl. 356-402.000.
- Mudd, Mark S. J.; and Addinall, Ross, to Plessey Semiconductors Limited. Overvoltage protection circuit. 5,568,345, Cl. 361-56.000.
- Mudge, Elbert H.; and Brabson, Thomas D., to Henkel Corporation. Process for applying a low soiling fiber finish. 5,567,400, Cl. 252-8.620.
- Mueller, Erwin; and Schuller, Wolfgang, to Robert Bosch GmbH. Reciprocating pump. 5,567,135, Cl. 417-549.000.
- Mueller, Peter; and Beck, Martin, to Robert Bosch GmbH. Apparatus for cutting containers, away from a foil web. 5,566,601, Cl. 83-123.000.
- Muhs, Jeffrey D.: See—  
Rajic, Slobodan; and Muhs, Jeffrey D., 5,568,582, Cl. 385-95.000.
- Mulkey, Steven L.: See—  
Flickner, Brett J.; Preston, Charles E.; Saldana, Daniel M.; Emigh, Jonathan D.; Fagan, Marc J.; Mulkey, Steven L.; Spear, Cindy M.; Camesecca, Lino E.; and Pensa, David P., Jr., 5,568,392, Cl. 364-478.150.
- Müller, Friedemann: See—  
Bräuer, Wolfgang; Müller, Friedemann; Heidingsfeld, Herbert; Schulte, Bernhard; and Winkler, Jürgen, 5,567,791, Cl. 528-52.000.
- Müller, Hans-Peter. Stand for holding objects of the same shape. 5,566,839, Cl. 211-40.000.

- Müller, Werner, to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig. Method of determining a free channel in FDM radiocommunication systems. 5,568,480, Cl. 370-69.100.
- Mullet, Willis J.; and Mitchell, Albert W., to Wayne-Dalton Corp. Sectional overhead door. 5,566,740, Cl. 160-229.100.
- Mullin, Carol; and Mullin, James, to Moving Target Sports, Inc. Foldable sports goal structure. 5,566,952, Cl. 273-400.000.
- Mullin, James: See—  
Mullin, Carol; and Mullin, James, 5,566,952, Cl. 273-400.000.
- Multi Service Corporation: See—  
Combest, Christopher E., 5,568,560, Cl. 381-99.000.
- Multifastener Corporation: See—  
Luckhardt, Wolfgang; Luckhardt, Heinrich, deceased, 5,566,446, Cl. 29-798.000.
- Multiline International Europa L.P.: See—  
Waldner, Paul R.; and Gennat, Bernd, 5,566,840, Cl. 211-41.000.
- Mumper, Richard G. Apparatus and method for palletizing work pieces. 5,567,113, Cl. 414-791.600.
- Munemoto, Takayuki: See—  
Akagi, Kyo; Futamoto, Masaaki; Kugiya, Fumio; Miyamura, Yoshinori; Takano, Hisashi; Matsuda, Yoshihumi; Suzuki, Mikio; Nakao, Takeshi; Munemoto, Takayuki; Fukuoka, Hirotugu; Aihara, Makoto; Takagaki, Tokuhiko; Aoi, Hajime; and Seo, Yosuke, 5,568,331, Cl. 360-77.070.
- Muntean, George L.: See—  
Edwards, Steven D.; Hickey, Daniel K.; Olson, Dave A.; Muntean, George L.; Shah, Chandresh; and Eastman, David L., 5,566,658, Cl. 123-470.000.
- Murai, Hiroshi: See—  
Negoro, Fumio; Murata, Tetsuri; Sawamura, Kozo; Yuki, Junichi; Murai, Hiroshi; Onuki, Masayasu; Ito, Norihito; Jiang, Wiegao; and Yone-mura, Masako, 5,568,642, Cl. 395-700.000.
- Murai, Kazumasa, to Fuji Xerox Co., Ltd. Nonlinear operation unit and data processing apparatus using the nonlinear operation unit. 5,568,414, Cl. 364-825.000.
- Murakami, Eiji: See—  
Ota, Yoshiyuki; Tomioka, Ichiro; and Murakami, Eiji, 5,568,068, Cl. 326-82.000.
- Murakami, Hironobu: See—  
Enomoto, Takeo; Abe, Toshiya; Murakami, Hironobu; and Hiraki, Shinichi, 5,567,446, Cl. 425-84.000.
- Murakami, Hiroshi, to Nikon Corporation. Battery housing device with movable electrical contact member. 5,567,545, Cl. 429-163.000.
- Murakami, Thomas T.: See—  
Tiller, Byron K.; Allard, David J.; Au, Connie Y.; Canova, Francis J., Jr.; Hsieh, Daniel M.; Goodwin, Julie F.; Johnson, Debra A. G.; Lanier, Charles S.; Lewis, James R.; Stout, Jean L.; Villafana, William; Yee, Raymond L.; Padgett, Russell S.; Ferrier, Robert B.; Corkell, Anthony F.; Murakami, Thomas T.; DeBauche, Bradley J.; Whitley, Wayne P.; Osborn, Neal A.; Beatty, Brent A.; Cox, Roger L.; Wulf, James C.; and Rivero, Jose L., 5,568,536, Cl. 379-58.000.
- Murakami, Yasuo, to NSK Ltd. Rolling bearing with surface hardened layer. 5,567,508, Cl. 428-217.000.
- Murali, Venkatesan: See—  
Bhansali, Ameet S.; Samuelson, Gay M.; Murali, Venkatesan; Gasparek, Michael J.; Chen, Shou H.; Mencinger, Nicholas P.; Lee, Ching C.; and Jeng, Kevin, 5,567,981, Cl. 257-643.000.
- Murao, Kouzou: See—  
Doi, Toshiaki; Bamba, Hiroyasu; and Murao, Kouzou, 5,567,608, Cl. 435-182.000.
- Murata Kikai Kabushiki Kaisha: See—  
Hashimoto, Kinzo, 5,566,904, Cl. 242-18.00A.
- Murata Manufacturing Co., Ltd.: See—  
Kawakatsu, Takaharu; Tada, Yutaka; and Ieki, Hideharu, 5,568,002, Cl. 310-313.00B.
- Kogame, Toshihiko; and Hamuro, Mitsuro, 5,567,240, Cl. 118-665.000.
- Murata, Mitsuhide; Miyake, Norifumi; and Onodera, Kazuo, to Canon Kabushiki Kaisha. Image forming system capable of stapling sheets at plural points. 5,568,247, Cl. 355-324.000.
- Murata, Tatsuo; Ishiwata, Kazuya; and Yoshioka, Toshifumi, to Cannon Kabushiki Kaisha. Electrode substrate with light shielding film having upper surface coplanar with upper surface of laminate electrodes. 5,568,291, Cl. 359-67.000.
- Murata, Tatsuo: See—  
Takao, Hideaki; Murata, Tatsuo; Kanbe, Junichiro; Tamura, Miki; Kamio, Masaru; Sekimura, Nobuyuki; and Kikuchi, Yoshiki, 5,568,293, Cl. 356-68.000.
- Murata, Tetsuri: See—  
Negoro, Fumio; Murata, Tetsuri; Sawamura, Kozo; Yuki, Junichi; Murai, Hiroshi; Onuki, Masayasu; Ito, Norihito; Jiang, Wiegao; and Yone-mura, Masako, 5,568,642, Cl. 395-700.000.
- Muroi, Souichi; and Tsai, Hsi-Chuan, to W. R. Grace & Co.-Conn. Spherical curing agent for epoxy resin, curing agent masterbatch for epoxy resin and their preparation. 5,567,792, Cl. 528-53.000.
- Murphy, Carl D.: See—  
Vicari, Richard; Juneau, Kathleen N.; and Murphy, Carl D., 5,567,795, Cl. 528-206.000.
- Murray, Elizabeth E.: See—  
Adang, Michael J.; Rocheleau, Thomas A.; Merlo, Donald J.; and Murray, Elizabeth E., 5,567,600, Cl. 536-23.710.
- Adang, Michael J.; Rocheleau, Thomas A.; Merlo, Donald J.; and Murray, Elizabeth E., 5,567,862, Cl. 800-205.000.
- Muschelknautz, Claudius; Bieger, Claude; and Goehre, Jochen, to Robert Bosch GmbH. Aggregate for producing fresh air stream. 5,567,393, Cl. 422-168.000.
- Musser, John H.: See—  
Nashed, Mina A.; Dasgupta, Falguni; Abbas, Saeed A.; Musser, John H.; and Asa, Darwin S., 5,567,683, Cl. 514-25.000.
- Muzic, Fred A., to Muzic, Fred A. Fluorescent light ballast circuit. 5,568,018, Cl. 315-276.000.
- Mycogen Plant Sciences, Inc.: See—  
Adang, Michael J.; Rocheleau, Thomas A.; Merlo, Donald J.; and Murray, Elizabeth E., 5,567,600, Cl. 536-23.710.
- Adang, Michael J.; Rocheleau, Thomas A.; Merlo, Donald J.; and Murray, Elizabeth E., 5,567,862, Cl. 800-205.000.
- Myers, Eugene A., to McDonnell Douglas Corporation. Method and apparatus for inspecting a structural part having surface irregularities. 5,567,881, Cl. 73-629.000.
- Myers, Garry L.; Battist, Gerald E.; and Fuisz, Richard C., to Fuisz Technologies Ltd. Delivery of controlled-release systems(s). 5,567,439, Cl. 424-486.000.
- Myers, Kirsten E.: See—  
Face, Dean W.; and Myers, Kirsten E., 5,567,673, Cl. 505-329.000.
- Myers, Robert B.: See—  
Bielawski, Gregory T.; Johnson, Dennis W.; and Myers, Robert B., 5,567,215, Cl. 55-222.000.
- N.V. Raychem S.A.: See—  
Franchx, Joris I., 5,567,173, Cl. 439-418.000.
- Naasz, Brian M.: See—  
Bank, Howard M.; Naasz, Brian M.; and Nguyen, Binh T., 5,567,837, Cl. 556-468.000.
- Nabet, Bahram: See—  
Paoletta, Arthur; and Nabet, Bahram, 5,567,973, Cl. 257-257.000.
- Nadaud, Jean F.; and Sebillotte, Laurence, to L'Oreal. Cosmetic composition in the form of a gelled triple water/silicone oil/water emulsion. 5,567,426, Cl. 424-401.000.
- Naeger, Thomas: See—  
Romann, Peter; Reiter, Ferdinand; Maier, Martin; and Naeger, Thomas, 5,566,920, Cl. 251-129.210.
- Nagahata, Takaya; Kishimoto, Tokihiko; and Wada, Koichi, to Rohm Co., Ltd. Connector and printer head using the same. 5,568,174, Cl. 347-200.000.
- Nagai, Shigekazu; Matsushima, Hiroshi; Ito, Yoshiharu; and Saitoh, Akio, to SMC Kabushiki Kaisha. Fluid pressure device. 5,566,718, Cl. 137-884.000.
- Nagano, Toru: See—  
Ishii, Takashi; Watanabe, Tamio; and Nagano, Toru, 5,567,182, Cl. 439-701.000.
- Nagasawa, Kenichi: See—  
Takahashi, Koji; Nagasawa, Kenichi; and Kashida, Motokazu, 5,568,328, Cl. 360-22.000.
- Nagashima, Yoshitake: See—  
Nakayama, Tadayoshi; Nagashima, Yoshitake; and Saito, Takashi, 5,568,597, Cl. 395-132.000.
- Nagashima, Yukiko: See—  
Uemura, Ken; Nagashima, Yukiko; Saito, Yasunari; Kurita, Takao; Miyake, Tetsuo; and Shimizu, Kazuaki, 5,568,258, Cl. 356-371.000.
- Nagata, Manabu; Yamamoto, Takashi; Takemori, Shinichi; Hashimoto, Naoyuki; Ishikawa, Hiroki; and Yamada, Yozo, to Sumitomo Seika Chemicals Co., Ltd.; and Uni-Charm Corporation. High water-absorbent resin composition. 5,567,744, Cl. 523-200.000.
- Nagata, Satoshi, to Canon Kabushiki Kaisha. Output apparatus with detachable character storing cartridge. 5,567,061, Cl. 400-61.000.
- Nagy, Bela G.: See—  
Kapoor, Rakesh R.; Nagy, Bela G.; and Bigelow, Louis K., 5,567,525, Cl. 428-408.000.
- Naigai Carbon Ink Co., Ltd.: See—  
Oda, Kunio; Kitada, Nobuhiko; Tanaka, Akihiro; Fujiwara, Kazuo; and Matsumoto, Shinichi, 5,567,668, Cl. 503-204.000.
- Nair, Rajesh M. Self learning diaper wetness detector and toilet trainer. 5,568,128, Cl. 340-604.000.
- Naito, Shotaro: See—  
Yokota, Yoshihiro; Naito, Shotaro; Suzuki, Toshihiko; and Koide, Akira, 5,567,880, Cl. 73-514.330.
- Naito, Takao; Chikama, Terumi; and Onaka, Hiroshi, to Fujitsu Limited. Heterodyne receiver provided with a frequency discriminator for coherent lightwave communications. 5,568,305, Cl. 359-191.000.
- Naito, Takao, to Fujitsu Limited. Optical transmission line relayed with multistage optical amplifiers. 5,568,310, Cl. 359-341.000.
- Nakagome, Yoshinobu: See—  
Uchiyama, Akira; Shibata, Ryujii; Nakagome, Yoshinobu; and Kubo, Masaharu, 5,568,083, Cl. 327-538.000.
- Nakai, Yasuhiro: See—  
Chigusa, Kaoru; and Nakai, Yasuhiro, 5,567,314, Cl. 210-150.000.
- Nakajima, Yuji; and Taniguchi, Masahiko, to Chisso Corporation. Flame-retardant fiber and nonwoven fabric. 5,567,517, Cl. 428-364.000.
- Nakamoto, Masayuki: See—  
Ichimura, Kouichi; Nakamoto, Masayuki; Obama, Masao; and Masumoto, Hiroshi, 5,567,882, Cl. 73-717.000.
- Nakamura, Daijiro, to Power Tool Holders Incorporated. Torque enhancing clamping nut. 5,567,100, Cl. 411-433.000.



- Nakamura, Hideyasu: *See*—  
Tsuji, Masato; Kouno, Katsuyuki; Nishigai, Hidefumi; Nakamura, Hideyasu; and Kōdera, Nobuyuki, 5,568,268, Cl. 358-296.000.
- Nakamura, Katsutoshi; Kaneko, Shuzo; Kishi, Etsuro; Miyata, Hirokatsu; and Shibata, Masaaki, to Canon Kabushiki Kaisha. Chiral smectic LCD with small pretilt angle, substrate rubbed in two opposing directions, and no cholesteric phase or tilt angle > the pretilt plus inclination angles. 5,568,295, Cl. 359-75.000.
- Nakamura, Kazunari: *See*—  
Fukuchi, Masami; Miyoshi, Yoshitaka; Kanno, Masahide; Hattori, Shin-ichiro; Nakamura, Kazunari; Hiyama, Keiichi; and Hasegawa, Jun, 5,568,271, Cl. 386-46.000.
- Nakamura, Kenji: *See*—  
Togashi, Yoshio; Nakamura, Kenji; Iwata, Hiroshi; Sakamoto, Michisada; and Yasuhara, Yutaka, 5,566,716, Cl. 137-636.100.
- Nakamura, Osamu; and Ikegami, Takeshi, to Dai Nippon Printing Co., Ltd. Method for manufacturing shadow mask and shadow mask manufactured by said method. 5,567,555, Cl. 430-29.000.
- Nakamura, Taku, to Fuji Photo Film Co., Ltd. Elliptically polarizing plate comprising discotic liquid crystal and in which  $30 \leq [(NX+NY)/2 - NZ] \times D \leq 150$ , 5,568,290, Cl. 359-63.000.
- Nakamura, Tetsuzo: *See*—  
Nishigami, Akira; Nakamura, Tetsuzo; and Honda, Masato, 5,567,377, Cl. 264-515.000.
- Nakamura, Tetuji. Hair iron for straight-perming. 5,566,688, Cl. 132-21.100.
- Nakano, Kazushi: *See*—  
Ishibashi, Akira; Ito, Satoshi; Okuyama, Hiroyuki; Nakano, Kazushi; Kondo, Kenji; and Takeishi, Reiko, 5,567,960, Cl. 257-103.000.
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Davies, Michael; and Dobrowolski, Jerzy A., 5,568,251, Cl. 356-71.000.
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- Kobayashi, Takayuki, 5,568,488, Cl. 370-105.100.
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- Maru, Tsuguo, 5,568,089, Cl. 330-253.000.
- Masuda, Hitoshi, 5,568,529, Cl. 377-16.000.
- Mineji, Akira, 5,567,959, Cl. 257-69.000.
- Mori, Yoshiaki, 5,568,650, Cl. 395-872.000.
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- Nishio, Naoharu, 5,567,652, Cl. 437-200.000.
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Bauer, Werner; and Masson, Gerard, 5,567,465, Cl. 426-613.000.
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Kieffer, Fernand; Walter, Rene; and Neuerburg, Horst, 5,566,537, Cl. 56-15.200.
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Casey, T. Elisit; and Nevin, Peter J., 5,567,741, Cl. 521-133.000.
- New Castle Industries, Inc.: *See*—  
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- Kotani, Wataru; Ono, Yoshiro; and Kumazawa, Kazuhiko, 5,567,663, Cl. 501-119.000.
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Ward, Stephen A.; Pratt, Gill A.; Nguyen, John N.; and Pezaris, John S., 5,568,361, Cl. 361-735.000.
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Shigetoyo, Hiromi, 5,566,502, Cl. 43-125.000.
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Kondou, Tsutomu; and Yuki, Akifumi, 5,567,467, Cl. 426-659.000.
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Kishi, Mitsuhiro; Sunaoka, Toyohiko; and Shimoyama, Mikio, 5,566,401, Cl. 4-300.000.
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Kaneko, Masanobu; and Ueno, Yasunori, 5,568,319, Cl. 359-643.000.
- Kanzaki, Masatoshi; and Uematsu, Kimio, 5,568,213, Cl. 396-257.000.
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- Ota, Kazuya; Mizutani, Hideo; and Komatsu, Kouichiro, 5,568,257, Cl. 356-363.000.
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Takeuchi, Tatsuo; Kuroyama, Yoshihiro; and Shimada, Teruhisa, 5,567,513, Cl. 428-331.000.
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Aizawa, Katsuo; and Kuroiwa, Yukari, 5,567,409, Cl. 424-9.363.
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Futsuhara, Koichi; and Sakai, Masayoshi, 5,568,059, Cl. 324-772.000.
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Hoshino, Kouichi; Watanabe, Takamoto; and Ohtsuka, Yoshinori, 5,568,071, Cl. 377-43.000.
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Akamatsu, Satoshi; and Matsumura, Yoshikazu, 5,567,250, Cl. 148-320.000.
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- Inoue, Hiroshi, 5,567,134, Cl. 417-490.000.
- Inoue, Yoshimitsu; Ito, Koichi; and Sugi, Hikaru, 5,566,881, Cl. 237-12.30B.
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- Shirai, Katsuhiko; Kurokawa, Kazunori; and Harada, Takashi, 5,568,347, Cl. 361-98.000.
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- Nishihagi, Kazuo; and Kawabata, Atsushi, to Technos Co., Ltd. Surface defect evaluating apparatus, 5,568,531, Cl. 378-71.000.
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Chigusa, Kaoru; and Nakai, Yasuhiro, 5,567,314, Cl. 210-150.000.
- Nishikawa, Masazumi: See—  
Miyashita, Kazuo; Ota, Toru; Okazaki, Suguru; Nishikawa, Masazumi; and Maruyama, Kazuaki, 5,567,730, Cl. 514-549.000.
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Hasegawa, Takuji; Wada, Yasunori; and Nishio, Syoji, 5,568,221, Cl. 396-630.000.
- Nishio, Takeyoshi: See—  
Taniguchi, Hiroshi; Yamamoto, Akihiko; Nomura, Takao; Nishio, Takeyoshi; and Iwai, Hisayuki, 5,567,759, Cl. 524-451.000.
- Nishio, Tomoyuki; Kuriyama, Nariaki; and Fukui, Nobuhiro, to Honda Giken Kogyo Kabushiki Kaisha. Multiple-axis gas flow type angular velocity sensor, 5,567,877, Cl. 73-504.060.
- Nishioka, Akira, to Fuji Photo Film Co., Ltd. Photosensitive composition and photosensitive lithographic printing plate, 5,567,568, Cl. 430-162.000.
- Nishitani, Mikihiko: See—  
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- Nishiuchi, Kenichi; Miyagawa, Noyasu; Ohno, Eiji; and Akahira, Nobuo, to Matsushita Electric Industrial Co., Ltd. Optical information recording and reproducing apparatus, 5,568,461, Cl. 369-110.000.
- Nishiumi, Kenji: See—  
Watabe, Masayuki; and Nishiumi, Kenji, 5,566,990, Cl. 292-95.000.
- Nishiyama, Tatsuya; Wakayama, Satoshi; Matsuda, Yoshiki; Hashimoto, Tetsuya; Kojima, Keiji; and Yamamoto, Kiyoshi, to Hitachi, Ltd.; and Hitachi Seibu Software Co., Ltd. Document retrieving method in a document managing system, 5,568,640, Cl. 395-600.000.
- Nishiyama, Tetsuji; and Teraguchi, Takashi, to Sumitomo Rubber Industries, Ltd. Apparatus and method for measuring the velocity of a flying spherical object, 5,568,250, Cl. 356-28.000.
- Nishizawa, Takaaki: See—  
Tanaka, Toshio; and Nishizawa, Takaaki, 5,567,033, Cl. 362-61.000.
- Nishizawa, Yoshifumi; Abe, Tomonori; Yamane, Iwao; and Yamada, Satoru, to Mitsubishi Denki Kabushiki Kaisha. Control method for automatic sewing machine and apparatus thereof, 5,566,632, Cl. 112-470.030.
- Niskanen, Juhani; Kivioja, Pekka; Lahtinen, Juha; Lensu, Esa; and Salavamäki, Esa, to Valmet Corporation. Method for providing a roll mantle of a tubular roll for a paper machine or equivalent with roll bearings, 5,566,451, Cl. 29-895.300.
- Nissan Motor Co., Ltd.: See—  
Fujii, Hiroshi, 5,566,562, Cl. 70-277.000.
- Iwata, Toru, 5,566,776, Cl. 180-197.000.
- Nitro Nobel AB: See—  
Ekman, Gunnar, 5,567,911, Cl. 149-46.000.
- Nitto Chemical Industry Co., Ltd.: See—  
Doi, Toshiaki; Bamba, Hiroyasu; and Murao, Kouzou, 5,567,608, Cl. 435-182.000.
- Nitz, Theodore J.: See—  
Aldous, David J.; Bailey, Thomas R.; Diana, Guy D.; and Nitz, Theodore J., 5,567,717, Cl. 514-336.000.
- Aldous, David J.; Bailey, Thomas R.; Diana, Guy D.; and Nitz, Theodore J., 5,567,719, Cl. 514-342.000.
- Nitzman, Jack L.: See—  
Joshi, Mahendra L.; Broadway, Lee; Mohr, Patrick J.; and Nitzman, Jack L., 5,567,141, Cl. 431-8.000.
- Niwa, Kazuo: See—  
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- NK Technology Ltd.: See—  
Chiu, Shun-Pui, 5,567,063, Cl. 400-174.000.
- Noah, Bruce C.; Phillips, Robert S.; and Venable, Frederick D., to TRW Inc. Pump assembly with tubular bypass liner with at least one projection, 5,567,125, Cl. 417-310.000.
- Nock, Levin: See—  
Li, Ming; and Nock, Levin, 5,566,675, Cl. 128-661.010.
- Noda, Isao: See—  
Shine, Annette D.; Smith, Steven D.; and Noda, Isao, 5,567,769, Cl. 525-63.000.
- Noda, Toshiharu; Sato, Katsuki; and Saka, Tsutomu, to Daido Tokushuko Kabushiki Kaisha; and Honda Giken Kogyo Kabushiki Kaisha. Heat resisting alloys, 5,567,383, Cl. 420-584.100.
- Noguchi, Kazuhiro; Ogino, Shigeru; and Kobayashi, Takashi, to Canon Kabushiki Kaisha. Image pickup apparatus with camera vibration correction, 5,568,190, Cl. 348-208.000.
- Noguchi, Yasuhiro: See—  
Hidaka, Hideto; Iwamoto, Kengo; Noguchi, Yasuhiro; Miyamura, Motohiro; Yazima, Seiichi; and Sakai, Inao, 5,566,799, Cl. 191-55.000.
- Noh, Sung W.: See—  
Yang, Keun Y.; and Noh, Sung W., 5,568,457, Cl. 369-44.230.
- Nohr, Ronald S.; and MacDonald, John G., to Kimberly-Clark Corporation. Method for preparing a nonoven web containing antimicrobial siloxane quaternary ammonium salts, 5,567,372, Cl. 264-103.000.
- Noise Cancellation Technologies, Inc.: See—  
Ross, Colin F.; and Langley, Andrew J., 5,568,557, Cl. 381-71.000.
- Nojima, Akihiko: See—  
Hirota, Masaharu; Ito, Toru; Endo, Norikazu; Nojima, Akihiko; and Kato, Yoshitaka, 5,568,390, Cl. 364-449.000.
- Nojiri, Kazuo: See—  
Hatano, Yasuhiro; Takayama, Hajime; Fukada, Yasushi; Kurita, Kazuhiko; and Nojiri, Kazuo, 5,568,277, Cl. 358-400.000.
- Nokia Mobile Phones Ltd.: See—  
Heinonen, Jouko; Sunell, Henrik; and Koskinen, Matti, 5,568,655, Cl. 455-38.100.
- Nokia Telecommunications Oy: See—  
Vesterinen, Timo, 5,568,545, Cl. 379-333.000.
- Noll, Joachim: See—  
van Loo, Gerri J., Jr.; Noll, Joachim; and Schwoppe, Andreas, 5,568,478, Cl. 370-60.100.
- Nomura, Koji: See—  
Fujikawa, Kazuhiko; Nomura, Koji; Shiono, Teruhiro; and Ogawa, Hisahito, 5,567,941, Cl. 250-353.000.
- Nomura, Takao: See—  
Taniguchi, Hiroshi; Yamamoto, Akihiko; Nomura, Takao; Nishio, Takeyoshi; and Iwai, Hisayuki, 5,567,759, Cl. 524-451.000.
- Nonaka, Haluo, to Matsuo Engineering Co., Ltd. Bridge raising/supporting method and bearing device for the method, 5,566,414, Cl. 14-73.500.
- Norand Corporation: See—  
Beard, Paul, 5,568,016, Cl. 315-169.300.
- Koenck, Steven E.; Miller, Phillip; Hanson, George E.; Schultz, Darald R.; and Krunnusz, Jeffrey S., 5,567,925, Cl. 235-375.000.
- Morris, Michael D.; and Zumbach, Lyle L., 5,568,645, Cl. 395-800.000.
- Nordiska Dental AB: See—  
Hagne, Leif; and Greven, Rolf, 5,567,156, Cl. 433-226.000.
- Nordstrom, Barbara A.: See—  
Nordstrom, John E.; and Rusch, Christopher J., 5,566,531, Cl. 53-466.000.
- Nordstrom, John E.; and Rusch, Christopher J., to Nordstrom, John E.; and Nordstrom, Barbara A. Napkin wrapping machine and method for wrapping napkins, 5,566,531, Cl. 53-466.000.
- Norfolk Scientific, Inc.: See—  
Shepherd, Larry E., 5,566,919, Cl. 248-604.000.
- Norinder, Ulf; Bajorath, Jürgen; and Steams, Jay F., to Karobio Aktiebolag. Receptor ligands, 5,567,728, Cl. 514-465.000.
- Noritake Co., Limited: See—  
Mohri, Jun; and Endoh, Noboru, 5,568,012, Cl. 313-517.000.
- Noritsu Koki Co., Ltd.: See—  
Nakashima, Yoshihiko, 5,567,310, Cl. 210-235.000.
- Norris, Orin. Method and apparatus for the cleaning of fire tubes in a fire tube boiler, 5,566,649, Cl. 122-379.000.
- North American Philips Corporation: See—  
Koo, David, 5,568,202, Cl. 348-611.000.

- Northern Telecom Limited: See—  
Pakulski, Grzegorz; Blaauw, Cornelis; Margittai, Agnes; and Moore, Ronald, 5,567,659, Cl. 437-228.000.
- Northrop Grumman Corporation: See—  
Schantz, David L.; DeOms, James H.; Starling, Ronnie L.; and Ankrom, Michael J., 5,567,991, Cl. 307-10.100.
- Taylor, John W., Jr.; Blinichoff, Herman J.; Martineau, Micheal J.; and Hyer, Scott A., 5,568,150, Cl. 342-189.000.
- Norton Company: See—  
Sher, Samuel E.; Borgianini, Stephen A.; Carpenter, Robert E.; Santora, Scott; and Scavuzzo, William S., 5,566,576, Cl. 73-864.650.
- Norton, Ian F.: See—  
Agha el-Rifai, Mohammed T. S.; and Norton, Ian F., 5,566,402, Cl. 4-420.400.
- Norton, Mark J.; and Walsh, John J., to Avid Technology, Inc. Method for visually and audibly representing computer instructions for editing, 5,568,275, Cl. 386-52.000.
- Novo Nordisk A/S: See—  
Hauch, Ole; Knudsen, Jens B.; and Plum, Thomas M., 5,567,869, Cl. 73-64.410.
- Novotny, Gary A.: See—  
Smale, Randall D.; and Novotny, Gary A., 5,566,581, Cl. 74-475.000.
- Nozawa, Masanori; and Kashiwara, Eiji, to Kao Corporation. Detergent composition for precision parts or jigs, 5,567,348, Cl. 510-175.000.
- NSK Ltd.: See—  
Morita, Kouichi; Sakamoto, Junshi; and Okada, Takamichi, 5,567,058, Cl. 384-448.000.
- Murakami, Yasuo, 5,567,508, Cl. 428-217.000.
- Sasaki, Takanobu; and Hirata, Kazumi, 5,566,899, Cl. 242-381.100.
- NTT Mobile Communications Network Inc.: See—  
Umeda, Narumi; Matsumoto, Tadashi; and Douzono, Youichi, 5,568,472, Cl. 370-18.000.
- NTT Mobile Communications Network Incorporation: See—  
Tsunekawa, Koichi; and Hagiwara, Seiji, 5,568,155, Cl. 343-700.0MS.
- Nugent, Matthew A.: See—  
Sasisekharan, Ramnath; Moses, Marsha A.; Nugent, Matthew A.; Cooney, Charles L.; and Langer, Robert S., 5,567,417, Cl. 424-94.500.
- Nyarsik, Lajos: See—  
Körner, Klaus; Holger, Fritz; Nyarsik, Lajos; Spur, Günter; and Uhlmann, Eckart, 5,568,256, Cl. 356-359.000.
- Nyberg, Krister; and Aström, Urban, to ASEA Brown Boveri AB. Monitoring and control of a filter in a power network, 5,568,042, Cl. 323-211.000.
- Nycomed Imaging AS: See—  
Klaveness, Jo; Rongved, Pål; and Stubberud, Lars, 5,567,412, Cl. 424-9.350.
- Klaveness, Jo; Priebe, Hanno; Rongved, Pål; and Stubberud, Lars, 5,567,413, Cl. 424-9.510.
- Oakes, Fred T.: See—  
Weis, Alexander L.; Oakes, Fred T.; Hausheer, Frederick H.; Cavanaugh, Paul F., Jr.; and Moskwa, Patricia S., 5,567,810, Cl. 536-25.300.
- Oates, Kenneth W. Variable angle of attack finbox assembly for surfboards and the like, 5,567,190, Cl. 441-79.000.
- Oba, Hiroaki: See—  
Tsuiji, Tsuyoshi; Oba, Hiroaki; Watanabe, Kousuke; and Koga, Masao, 5,567,771, Cl. 525-215.000.
- Obama, Masao: See—  
Ichimura, Kouichi; Nakamoto, Masayuki; Obama, Masao; and Masumoto, Hiroshi, 5,567,882, Cl. 73-717.000.
- Oberholzer, Marcel: See—  
Baessler, Peter; Marriott, Alan; Maurer, Urs; and Oberholzer, Marcel, 5,567,335, Cl. 219-61.200.
- Obersteiner, Georg: See—  
Volz, Peter; Obersteiner, Georg; and Otto, Albrecht, 5,567,128, Cl. 417-313.000.
- O'Brien, Patrick: See—  
Boydle, Timothy; and O'Brien, Patrick, 5,567,888, Cl. 73-863.860.
- Oceanit Laboratories, Inc.: See—  
Sullivan, Patrick K.; Vithanage, Dayananda; and Bourke, Robert E., 5,567,889, Cl. 73-863.230.
- Ochi, Kengo, to Uni-Charm Corporation. Granular absorbent material for pet animal, 5,566,642, Cl. 119-171.000.
- O'Connell, Jo H., executor: See—  
Gunderman, Anthony J.; Moir, David; O'Connell, Robert M., deceased, 5,566,693, Cl. 132-333.000.
- O'Connell, Robert M., deceased (by Jo H. O'Connell, executor): See—  
Gunderman, Anthony J.; Moir, David; O'Connell, Robert M., deceased, 5,566,693, Cl. 132-333.000.
- O'Connor, Stephen J. M.: See—  
Alcock, Harry R.; O'Connor, Stephen J. M.; Napierala, Mark E.; Cameron, Charles G.; and Olmeijer, David, 5,567,783, Cl. 525-538.000.
- Oda, Kunio; Kitada, Nobuhiko; Tanaka, Akihiro; Fujiwara, Kazuo; and Matsumoto, Shinichi, to Naigai Carbon Ink Co., Ltd. Pressure- and heat-sensitive multilayer copying paper, 5,567,668, Cl. 503-204.000.
- Odebrecht, Wolfgang: See—  
Khelifa, Noureddine; Krumbach, Karl-Gerd; Löhle, Michael; Abersfelder, Günter; Grantz, Helmut; Odebrecht, Wolfgang; Wertenbach, Jürgen; and Wagner, Oliver, 5,566,880, Cl. 237-12.30A.
- Odenwalder, Joseph P.: See—  
Padovani, Roberto; Tiedemann, Edward G., Jr.; Odenwalder, Joseph P.; Zehavi, Ephraim; and Wheatley, Charles E., III, 5,568,483, Cl. 370-84.000.
- Odor, William E.: See—  
Betker, Jay B.; Scalise, Anthony J.; and Odor, William E., 5,566,900, Cl. 242-388.000.
- Oesterreich, Gerald W. Sound producing fishing lure, 5,566,497, Cl. 43-42.160.
- Offerhaus, Douglas H.; Lilburn, James E.; and Silver, Hugh D., to Fletcher Challenge Canada Limited. Method of reducing surface irregularities in paper machine headbox components, 5,567,273, Cl. 162-199.000.
- Ogasawara, Kunio: See—  
Takano, Seiichi; and Ogasawara, Kunio, 5,567,851, Cl. 568-354.000.
- Ogasawara, Nobuo; Endo, Noboru; Miki, Kazuo; and Takase, Akihiko, to Hitachi, Ltd. Usage parameter control apparatus for performing a plurality of conformance checking operations at high speed, 5,568,468, Cl. 370-13.000.
- Ogata, Toshiyuki: See—  
Uchiyama, Tatsuhiro; Takemoto, Masanobu; and Ogata, Toshiyuki, 5,568,028, Cl. 318-566.000.
- Ogawa, Hideki; Tanaka, Tsunefumi; and Koyama, Takeshi, to Canon Kabushiki Kaisha. Zoom lens, 5,568,321, Cl. 359-676.000.
- Ogawa, Hironobu, to Fujitsu Limited. Cursor display system, 5,568,164, Cl. 345-145.000.
- Ogawa, Hisahito: See—  
Fujikawa, Kazuhiko; Nomura, Koji; Shiono, Teruhiro; and Ogawa, Hisahito, 5,567,941, Cl. 250-353.000.
- Ogawa, Tetsuro: See—  
Yokoo, Akihiko; and Ogawa, Tetsuro, 5,567,231, Cl. 96-153.000.
- Ogawa, Yuji, to NEC Corporation. Method for rearranging instruction sequence in risc architecture, 5,568,623, Cl. 395-375.000.
- Ogawara, Takeshi; Chisaka, Yukinori; and Fujiwara, Masato, to Kabushiki Kaisha Nichibei. Roll screen apparatus, 5,566,741, Cl. 160-297.000.
- Ogihara, Takeo: See—  
Sakagami, Tetsuo; Ogihara, Takeo; Fujii, Yasufumi; and Katono, Hiroki, 5,567,778, Cl. 525-326.600.
- Ogihara, Tsutomu: See—  
Shimizu, Takaaki; Kinsho, Takeshi; Ogihara, Tsutomu; Kaneko, Tatsushi; Saito, Ryuichi; and Kurihara, Hideshi, 5,567,350, Cl. 252-299.610.
- Ogino, Shigeru: See—  
Noguchi, Kazuhiro; Ogino, Shigeru; and Kobayashi, Takashi, 5,568,190, Cl. 348-208.000.
- Ogle, Michele D.: See—  
Dorri, Bizhan; Laskaris, Evangelos T.; and Ogle, Michele D., 5,568,102, Cl. 335-216.000.
- Dorri, Bizhan; Laskaris, Evangelos T.; and Ogle, Michele D., 5,568,110, Cl. 335-216.000.
- Ogren, Andrew R. Illuminated sign, 5,566,483, Cl. 40-564.000.
- Oh, Hee M. T.: See—  
Kim, Sung K.; Lim, Jong C.; Kim, Seong N.; Oh, Hee M.; and Kim, Woo H., 5,567,813, Cl. 540-222.000.
- Oh, Yun S., to Korea Telecom Co., Ltd. Communication line adapter and the method thereof, 5,568,481, Cl. 370-79.000.
- Ohashi, Kazuhito, to Canon Kabushiki Kaisha. Image signal recording and reproducing system, 5,568,276, Cl. 386-20.000.
- Ohgami, Hiroyuki: See—  
Tsubota, Koujiro; Fujioka, Kazuyoshi; Yoshimura, Yohji; Ohgami, Hiroyuki; and Takafuji, Yutaka, 5,568,297, Cl. 359-80.000.
- Ohi, Hideo; and Ozawa, Noriyuki, to Chugai Seiyaku Kabushiki Kaisha; and Ihara Chemical Industry Co., Ltd. Method for the preparation of a triazole compound, 5,567,825, Cl. 548-264.200.
- Ohira, Akira: See—  
Kawada, Sunao; Inagi, Masataka; Itoh, Masao; Itoh, Toyotsugu; Hashimoto, Takayoshi; and Ohira, Akira, 5,566,598, Cl. 82-1.110.
- Ohishi, Hidenori, to Sumitomo Electric Industries, Ltd. Disc brake, 5,566,791, Cl. 188-73.390.
- Ohishi, Kazuhiro: See—  
Hara, Hirotaka; Yugami, Nobuhiro; and Ohishi, Kazuhiro, 5,568,381, Cl. 364-402.000.
- Ohkawa, Atsuko: See—  
Hira, Yasuo; Toba, Tamaki; Imayama, Hirotaka; Ohkawa, Atsuko; Fujisawa, Masayasu; Nite, Kazuo; Sonobe, Hideki; Suzuki, Saburo; Togawa, Eisei; Ishizaki, Hiroshi; and Hagiwara, Yoshiki, 5,567,333, Cl. 216-22.000.
- Ohlstedt, Mats C. S., to Telefonaktiebolaget LM Ericsson. Stored program controlled digital public exchange, 5,568,543, Cl. 379-268.000.
- Ohms, Franz; and Geiler, Martin, to Ant Nachrichtentechnik GmbH. Method for operating a voltage converter, and a voltage converter and its application, 5,568,369, Cl. 363-26.000.
- Ohnmacht, Cyrus J.: See—  
Russell, Keith; Ohnmacht, Cyrus J.; and Gibson, Keith H., 5,567,735, Cl. 514-628.000.
- Ohno, Eiji: See—  
Nishiuchi, Kenichi; Miyagawa, Noyasu; Ohno, Eiji; and Akahira, Nobuo, 5,568,461, Cl. 369-110.000.
- Ohno, Kenzo, to Kabushiki Kaisha Toshiba. Step-up method and step-up circuit, 5,568,079, Cl. 327-349.000.
- Ohsawa, Hisao: See—  
Saikan, Seishiro; Uchikawa, Kiyoshi; and Ohsawa, Hisao, 5,568,460, Cl. 369-100.000.



- Ohsugi, Masakatsu: *See—*  
Tomita, Takashi; Ohsugi, Masakatsu; and Adachi, Daisaburo, 5,567,485, Cl. 428-1.000.
- Ohtsuka, Yasumasa, to Canon Kabushiki Kaisha. Image heating apparatus. 5,568,240, Cl. 355-285.000.
- Ohtsuka, Yoshinori: *See—*  
Hoshino, Kouichi; Watanabe, Takamoto; and Ohtsuka, Yoshinori, 5,568,071, Cl. 377-43.000.
- Ohuchi, Hideaki: *See—*  
Suzuki, Haruhiko; Tamura, Takahiro; Miyahara, Masahiko; Yamaguchi, Hiroaki; Ohuchi, Hideaki; Kondo, Akira; and Matsushita, Toshikazu, 5,567,874, Cl. 73-118.200.
- Ohyama, Tsukasa: *See—*  
Koshida, Hitoshi; Ghoda, Isamu; Ohyama, Tsukasa; and Takuma, Keisuke, 5,567,470, Cl. 427-151.000.
- Ojwang, Joshua O.: *See—*  
Rando, Robert F.; Fennwald, Susan; Zendegei, Joseph G.; and Ojwang, Joshua O., 5,567,604, Cl. 435-238.000.
- Oka, Masahiro: *See—*  
Kakiuchi, Hiroyuki; and Oka, Masahiro, 5,567,346, Cl. 252-70.000.
- Okabe, Akihiko: *See—*  
Kano, Hiroshi; Suzuki, Atsuko; Kagawa, Kiyoshi; and Okabe, Akihiko, 5,568,115, Cl. 338-32.000.
- Okabe, Kenichi: *See—*  
Watanabe, Yoshihiro; Kakuma, Satoshi; Morita, Sumie; Okuyama, Yuzo; and Okabe, Kenichi, 5,568,479, Cl. 370-60.100.
- Okabe, Shinichi; Yoshinaga, Tohru; Watanabe, Kiyohiko; and Kawabe, Yasuyuki, to Nippon Soken, Inc. Catalyst carrier for a catalytic converter for purifying an exhaust gas in an internal combustion engine. 5,567,395, Cl. 422-180.000.
- Okada, Setsuo, to Hudson Soft Co., Ltd. Radio having a recording and reproducing unit responsive to a radio wave of a predetermined frequency. 5,568,453, Cl. 369-7.000.
- Okada, Takamichi: *See—*  
Morita, Kouichi; Sakamoto, Junshi; and Okada, Takamichi, 5,567,058, Cl. 384-448.000.
- Okamoto, Kenji; Horimura, Hiroyuki; Minemi, Masahiko; Takeda, Yoshinobu; Takano, Yoshihide; and Kaji, Toshihiko, to Sumitomo Electric Industries, Ltd.; and Honda Giken Kogyo Kabushiki Kaisha. Process for producing a shaft clamping member. 5,566,449, Cl. 29-888.092.
- Okamoto, Masami: *See—*  
Kinami, Nobuyuki; Okamoto, Masami; Shinoda, Yoshihiro; Sekura, Tsuyoshi; and Yamaguchi, Akira, 5,567,758, Cl. 524-401.000.
- Okamoto, Tadashi, to Matsushita Electric Industrial Co., Ltd. Video-on-demand system of reduced storage capacity which can provide noninterrupted broadcast to a plurality of users. 5,568,180, Cl. 348-7.000.
- Okamoto, Yoshitaka: *See—*  
Motegi, Kentaro; Ito, Yukio; Okamoto, Yoshitaka; and Komura, Kuniyoshi, 5,567,366, Cl. 264-39.000.
- Okaniwa, Kaoru, to Hoechst Aktiengesellschaft. Waveguide coupling device including tapered waveguide with a particular tapered angle to reduce coupling loss. 5,568,579, Cl. 385-43.000.
- Okawa, Tadashi, to Dow Corning Toray Silicone Co., Ltd. Method for the preparation of diphenylsiloxane-dimethylsiloxane copolymers. 5,567,790, Cl. 528-18.000.
- Okawa, Tadashi: *See—*  
Manzouji, Ryuko; and Okawa, Tadashi, 5,567,789, Cl. 528-18.000.
- Okayasu, Yoshisada: *See—*  
Sakurai, Nobumasa; Mitsui, Hidoro; and Okayasu, Yoshisada, 5,568,198, Cl. 348-372.000.
- Okazaki, Suguru: *See—*  
Miyashita, Kazuo; Ota, Toru; Okazaki, Suguru; Nishikawa, Masazumi; and Maruyama, Kazuaki, 5,567,730, Cl. 514-549.000.
- Oki Electric Industry Co., Ltd.: *See—*  
Abe, Takato, 5,567,972, Cl. 257-433.000.
- Okino, Tadashi, to Canon Kabushiki Kaisha. Image pickup apparatus including distance measurement. 5,568,187, Cl. 348-224.000.
- Okino, Teruaki, to Nikon Corporation. Charged particle beam transfer apparatus. 5,567,949, Cl. 250-492.230.
- Okita, Tsutomu: *See—*  
Ishida, Toshio; Satake, Masaki; Watanabe, Hideomi; Yasunaga, Tadashi; and Okita, Tsutomu, 5,567,524, Cl. 428-408.000.
- Oku, Seiichi; Kubo, Masahiro; and Tatsumi, Setsuji, to Fuji Photo Film Co., Ltd. Image recording apparatus. 5,568,284, Cl. 358-518.000.
- Okuda, Tetsuro; Yamada, Hirohito; and Torikai, Toshitaka, to NEC Corporation. Laser diode element with excellent intermodulation distortion characteristic. 5,568,505, Cl. 372-96.000.
- Okuma, Yoshio: *See—*  
Konishi, Yoshihiro; Okuma, Yoshio; Baba, Yoshihiko; and Fujiwara, Hideki, 5,568,101, Cl. 333-134.000.
- Okumura, Fujio, to NEC Corporation. Apparatus for driving gate storage type liquid crystal display panel capable of simultaneously driving two scan lines. 5,568,163, Cl. 345-100.000.
- Okumura, Yoshihide: *See—*  
Kitaguchi, Kouichi; and Okumura, Yoshihide, 5,568,074, Cl. 327-77.000.
- Okuno, Satoshi: *See—*  
Inoue, Kazuhiro; Ito, Teruomi; Kawaguchi, Takayuki; Aono, Katsutoshi; Okuno, Satoshi; and Yano, Toshiro, 5,567,690, Cl. 514-54.000.
- Okura, Akira: *See—*  
Ando, Yukito; Okura, Akira; and Ito, Mikio, 5,568,393, Cl. 364-478.020.
- Okushima, Hiromi: *See—*  
Furuya, Rikizo; Okushima, Hiromi; and Abe, Yuji, 5,567,699, Cl. 514-222.500.
- Okutu, Toshimitu: *See—*  
Suzuki, Fumiaki; Okutu, Toshimitu; and Otoshi, Masaaki, 5,567,576, Cl. 430-533.000.
- Okuyama, Hiroyuki: *See—*  
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- Okuyama, Yuzo: *See—*  
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Horinouchi, Teruhiko; and Ono, Nobumasa, 5,567,953, Cl. 250-551.000.
- Ono, Yoshinori: *See—*  
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- Ono, Yoshiro: *See—*  
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Hearne, John S., 5,566,466, Cl. 34-58.000.
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Ragland, Frank R., Jr.; and Opreko, Stephen T., 5,568,011, Cl. 313-477.00R.
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Weinl, Gerold; and Oskarsson, Rolf, 5,568,653, Cl. 419-13.000.
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Amend, Brian J.; and Garfinkel, Michael, 5,567,931, Cl. 250-221.000.
- Meyer, Helmut; von Herz, Alfons; and Winkelhake, Dirk, 5,566,810, Cl. 198-331.000.
- Rennetaud, Jean-Marie, 5,566,784, Cl. 187-249.000.
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- Ovniczek, Eugene D., to World Wide Horseshoes, Inc. Horseshoe. 5,566,765, Cl. 168-4.000.
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- Owen, Dave. Sight cover. 5,566,490, Cl. 42-90.000.
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- Ozanne, Leroy. Wall panel construction. 5,566,523, Cl. 52-655.100.
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- Ozawa, Noriaki: *See—*  
Ohi, Hideo; and Ozawa, Noriaki, 5,567,825, Cl. 548-264.200.
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Lintz, Timothy S.; and Paddock, Ralph W., 5,567,536, Cl. 428-688.000.
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- Page, George. Inflatable storage chamber. 5,566,512, Cl. 52-2.160.
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Scheucher, Peter; Heindler, Gerhard; Schininger, Walter; Paier, Gerhard; and Mraz, Peter, 5,566,611, Cl. 100-127.000.
- Pakulski, Grzegorz; Blaauw, Cornelis; Margittai, Agnes; and Moore, Ronald, to Northern Telecom Limited. Method of etching patterns in III-V material with accurate depth control. 5,567,659, Cl. 437-228.000.



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- Pall Corporation: See—  
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Gentry, David R.; Pancio, Gerald T.; and Weers, Jerry J., 5,567,212, Cl. 44-420.000.  
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Brown, Trevor P.; Couroy, Brian G.; Cox, Stephen J.; Gardner, Christopher; Lark, Roger D.; Marshall, Barry; and Svendsen, Jan, 5,566,882, Cl. 238-343.000.
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Kim, Gu Sung; and Park, Jae Myung, 5,568,057, Cl. 324-755.000.
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Lee, Jung-Min; Suh, Jeong-Kwon; Jeong, Soon-Yong; Park, Chun-Hee; and Park, Jeong-Hwan, 5,567,404, Cl. 423-332.000.
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Ahn, Sung-tae; and Park, Tai-su, 5,567,645, Cl. 437-69.000.
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Han, Tack D.; Lee, Shi W.; and Park, Woo C., 5,568,412, Cl. 364-748.000.
- Park, Yong-In, to Goldstar Electron Co., Ltd. Digital/analog converter. 5,568,146, Cl. 341-145.000.
- Park, Young M., to Universal Electronics Inc. Remote control with key lighting. 5,568,367, Cl. 362-109.000.
- Parker, Alan G. Method of playing a card game. 5,566,946, Cl. 273-292.000.
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Parker, Donald O.; and Parker, Keith W., 5,566,808, Cl. 194-317.000.
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Henderson, Kevin G.; Jones, Timothy A.; Howland, Jeffrey C.; Brush, Robert W., Jr.; and Parker, Phil B., 5,567,185, Cl. 439-733.100.
- Parr, Ted K.: See—  
Cord, Albert B.; Cord, Cameron W.; Gehrich, David N.; Jensen, Gregory N.; and Parr, Ted K., 5,566,697, Cl. 134-109.000.
- Parrella, Eugene L.: See—  
Bartholomay, William G.; Parrella, Eugene L.; Upp, Daniel C.; and Ichiba, Mikio S., 5,568,060, Cl. 326-86.000.
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Gray, Frank B.; Parris, John L.; and Riffert, Rainer G., 5,566,479, Cl. 36-137.000.
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Patel, Ramesh N.; Szarka, Laszlo J.; and Partyka, Richard, 5,567,614, Cl. 435-280.000.
- Pascal, Yves, to Framatome. Steam generator equipped with a device for trapping migrating bodies. 5,566,647, Cl. 122-34.000.
- Pasch, Nicholas F.: See—  
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Eitan, Boaz; Kazerounian, Reza; Shubat, Alex; and Pasternak, John H., 5,568,085, Cl. 327-546.000.
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Yahalom, Joseph; and Peckerar, Martin, 5,567,551, Cl. 430-5.000.
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Allcock, Harry R.; O'Connor, Stephen J. M.; Napierala, Mark E.; Cameron, Charles G.; and Olmeijer, David, 5,567,783, Cl. 525-538.000.
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Joillat, Claude; Pennaneach, Hervé; and Theot, Michel, 5,566,865, Cl. 222-287.000.
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- Peterson, William C. Indicator-ported discharge valves for reciprocating compressors. 5,567,121, Cl. 417-63.000.
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Manico, Joseph A.; and Petruchik, Dwight J., 5,568,219, Cl. 396-281.000.
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Deseke, Otto; Meyke, Joachim; and Pfeiffer, Armin, 5,567,370, Cl. 264-53.000.
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Parish, Roger; Chapin, Frederic W.; Kono, Yoshiaki; and Tsukui, Makoto, 5,567,691, Cl. 514-94.000.  
Ray, Stephen J.; and Richardson, Kenneth, 5,567,817, Cl. 544-333.000.
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Castensson, Staffan; Florin-Robertsson, Ebba; Hökby, Elvy; and Thomé, Sirkka, 5,567,677, Cl. 514-12.000.
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Magda, Darren; Sessler, Jonathan L.; Iverson, Brent; Jansen, Petra L.; Wright, Meredith; Mody, Tarak D.; and Hemmi, Gregory W., 5,567,687, Cl. 514-44.000.
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Gandhi, Harish, 5,568,009, Cl. 313-318.010.  
Haberem, Kevin W., 5,567,646, Cl. 437-129.000.  
Ineson, David J.; and Dupre, Lawrence W., 5,567,998, Cl. 310-90.000.
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- Phillips, Cal M.; and Stewart, John V., to S.A.F.E.-Q.R. Corporation. Quick-release bicycle axle fastener. 5,567,020, Cl. 301-124.200.
- Phillips, Joseph; and Weston, John, to Ahlstrom Machinery Inc. Two stage pressure diffuser. 5,567,262, Cl. 162-251.000.
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- Phillips, Kenneth D. Grain bin lid opener. 5,566,506, Cl. 49-357.000.
- Phillips, Richard J. Method and apparatus for animating a floating waterfowl decoy. 5,566,491, Cl. 43-3.000.
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Noah, Bruce C.; Phillips, Robert S.; and Venable, Frederick D., 5,567,125, Cl. 417-310.000.
- Phonic Ear Incorporated: See—  
Strohallen, Gene M.; and Young, Robert F., 5,568,516, Cl. 375-259.000.
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Pasquetti, Ornella, 5,566,557, Cl. 63-15.200.
- Piao, Tseng S. IC mounting tool. 5,566,445, Cl. 29-741.000.
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Ralph, Peter; Martin, George; Piatlak, Michael; and Larrick, James W., 5,567,611, Cl. 435-240.200.
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DuBois, Donald W.; Maloney, Bernard A.; and Pickens, Stanley R., 5,567,298, Cl. 205-350.000.
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Mei, George C.; and Pickett, James W., 5,567,252, Cl. 149-22.000.
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Hungerford, Roger L.; Cimerman, Christopher D.; Hufnagel, Paul J.; and Pieroni, Robert J., 5,567,120, Cl. 417-63.000.
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Koch, Michel; Tillequin, François; Skaltsounis, Alexios-Leandros; Rolland, Yves; Pierre, Alain; and Atassi, Ghanem, 5,567,707, Cl. 514-280.000.
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Pietzsch, Ludwig, 5,567,004, Cl. 296-190.000.
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Bernardon, Jean-Michel; and Pilgrim, William R., 5,567,721, Cl. 514-353.000.
- Pilling, David J.: See—  
Johnson, Larry D.; and Pilling, David J., 5,568,444, Cl. 365-230.060.
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Ladirat, Christian; Pilliol, Henri; and Gnllka, Jean-Pierre, 5,567,218, Cl. 65-327.000.
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Hayashi, Hideki; and Haraguchi, Yukiyo, 5,568,456, Cl. 369-132.000.  
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Niebur, William S., 5,567,861, Cl. 800-200.000.  
Piper, Vaughn J.: *See*—  
Reinhart, Terry L.; and Piper, Vaughn J., 5,566,631, Cl. 112-235.000.  
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Mendelson, Richard N.; and Pipitone, Ralph M., 5,568,614, Cl. 395-200.080.  
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Pitel, John A. Combination door gasket and safety edge strip, 5,566,504, Cl. 49-28.000.  
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Hubbard, David W., 5,566,932, Cl. 271-245.000.  
Pittman, James. Vacuum compensation valve, 5,566,421, Cl. 15-314.000.  
Piu, Giovanni: *See*—  
Girard, André; and Piu, Giovanni, 5,566,580, Cl. 74-473.00R.  
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Mudd, Mark S. J.; and Addinall, Ross, 5,568,345, Cl. 361-56.000.  
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Ploog, Uwe: *See*—  
Behler, Ansgar; Ploog, Uwe; Uphues, Guenther; Wahle, Bernd; Waltenberger, Peter; and Jansen, Yvonne, 5,567,340, Cl. 510-527.000.  
Plum, Thomas M.: *See*—  
Hauch, Ole; Knudsen, Jens B.; and Plum, Thomas M., 5,567,869, Cl. 73-64.410.  
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Huscroft, Charles K.; Wong, David W.; Lang, Steven F.; and Little, Vernon R., 5,568,486, Cl. 370-94.200.  
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Kepplinger, Leopold W.; Matzawrakos, Panajiotis; Schenk, Johannes; and Siuka, Dieter, 5,567,379, Cl. 266-143.000.  
Poiraud, Clement: *See*—  
Galand, Claude; Jacquart, Xavier; Lebizay, Gerald; Leboudec, Jean-yves; Louis, Philippe; Poiraud, Clement; Georges, Eric S.; Spagnol, Victor; Suffern, Edward; and Truong, Hong L., 5,568,477, Cl. 370-60.000.  
Poitras, Jacques: *See*—  
Hsiao, Cheng-Kuo; Hor, Ah-Mee; Gardner, Sandra J.; Gaynor, Roger E.; and Poitras, Jacques, 5,567,558, Cl. 430-58.000.  
Polacheck, Itzhack: *See*—  
Linden, Galina; Domb, Abraham J.; Polacheck, Itzhack; and Benita, Shimon, 5,567,685, Cl. 514-31.000.  
Polycorn, Inc.: *See*—  
Hinman, Brian L.; and Rodman, Jeffrey C., 5,568,279, Cl. 358-452.000.  
POM Technology Oy Ab: *See*—  
Meinander, Paul O., 5,567,278, Cl. 162-190.000.  
Pompanette, Inc.: *See*—  
Anderson, Andrew; and Fallon, Gregory S., 5,566,992, Cl. 292-241.000.  
Poole, Norman G.: *See*—  
Gross, Peter L.; and Poole, Norman G., 5,566,816, Cl. 198-817.000.  
Popp, Victor A., to Instron Corporation. Side load tester, 5,567,866, Cl. 73-11.090.  
Porter, Thomas R., to University of Nebraska, The Board of Regents of the. Ultrasound contrast agents and methods for their manufacture and use, 5,567,415, Cl. 424-9.520.  
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de Nanteuil, Guillaume; Portevin, Bernard; and Canet, Emmanuel, 5,567,804, Cl. 530-331.000.  
Porubek, David: *See*—  
Bianco, James A.; Woodson, Paul; Porubek, David; and Singer, Jack, 5,567,704, Cl. 514-263.000.  
Post, Yngve, to Sandvik AB. Milling cutter providing multiple adjustments for inserts carried thereby, 5,567,092, Cl. 407-38.000.  
Potts, Luken W.: *See*—  
Schenker, Alfred R.; and Potts, Luken W., 5,566,853, Cl. 220-581.000.  
Powell, John W. Air driven lottery game, 5,566,940, Cl. 273-144.00A.  
Powell, Robin C.: *See*—  
Beadle, David E.; Chauhan, Mahesh; Ebrey, John S.; Lewis, Iorwerth D.; Powell, Robin C.; Raitlon, Robert J.; Robinson, Michael; and Sheppard, Alan F., 5,566,582, Cl. 74-475.000.  
Power Lone Star, Inc.: *See*—  
Toerner, Thomas J.; and Tran, Bang T., 5,567,528, Cl. 428-414.000.  
Power Tool Holders Incorporated: *See*—  
Nakamura, Daijiro, 5,567,100, Cl. 411-433.000.  
Powers, Ralph L.: *See*—  
Smith, Leonard; and Powers, Ralph L., 5,566,788, Cl. 188-1.120.  
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DuBois, Donald W.; Maloney, Bernard A.; and Pickens, Stanley R., 5,567,298, Cl. 205-350.000.  
Pratt, Gill A.: *See*—  
Ward, Stephen A.; Pratt, Gill A.; Nguyen, John N.; and Pizaris, John S., 5,568,361, Cl. 361-735.000.  
Pratt, Hugh M. Load insulator, 5,568,132, Cl. 340-657.000.  
Precision Fukuhara Works, Ltd.: *See*—  
Tsuchiya, Koji, 5,566,558, Cl. 66-151.000.  
Preczewski, Thomas F.: *See*—  
Raza, Irfan F.; Preczewski, Thomas F.; and Walther, Ronald D., 5,567,019, Cl. 301-5.300.

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Preiss, Joachim, to Montell North America Inc. Process for production of recycled plastic products, 5,566,889, Cl. 241-19.000.  
Premier Medical Technology, Inc.: *See*—  
Miller, Charles R.; and Berry, Haskell B., Jr., 5,567,385, Cl. 422-28.000.  
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Baker, James C.; Trombley, Henry; and Prengle, Scott H., 5,567,334, Cl. 216-24.000.  
Preston, Charles E.: *See*—  
Flickner, Brett J.; Preston, Charles E.; Saldana, Daniel M.; Emigh, Jonathan D.; Fagan, Marc J.; Mulkey, Steven L.; Spear, Cindy M.; Carneseca, Lino E.; and Pensa, David P., Jr., 5,568,392, Cl. 364-478.150.  
Price, David, to Wilson Sporting Goods Co. Golf bag with a pocket having multiple openings, 5,566,825, Cl. 206-315.500.  
Priebe, Hanno: *See*—  
Klaveness, Jo; Priebe, Hanno; Rongved, Pål; and Stubberud, Lars, 5,567,413, Cl. 424-9.510.  
Priester, William B.; and Cutler, Maxwell. Automated pocket-sized near vision tester, 5,568,209, Cl. 351-243.000.  
Procter & Gamble Company, The: *See*—  
Hughes, Kendrick J., 5,567,428, Cl. 424-401.000.  
McFall, Ronald R., 5,567,260, Cl. 156-201.000.  
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Siegfried, Robert H.; Fleming, James M.; Stalford, Michael J.; and Janson, John P., 5,567,472, Cl. 427-180.000.  
Tack, Joris G. J.; and Verhelle, Christian D., 5,566,824, Cl. 206-213.100.  
Trokhon, Paul D.; and Boutillier, Glenn D., 5,566,724, Cl. 139-383.00A.  
Procter & Gamble Company, The: *See*—  
Cassidy, William A.; Schwartz, James R.; and Farris, Richard D., 5,567,359, Cl. 510-135.000.  
Sageser, David M., 5,567,254, Cl. 156-73.100.  
Prokop, David M. Wrist rest apparatus, 5,566,913, Cl. 248-118.000.  
Promega Corporation: *See*—  
Ekenberg, Steven J.; and Brisco, Paula R. G., 5,567,326, Cl. 210-695.000.  
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Bartholomew, Donald D., 5,566,722, Cl. 138-166.000.  
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Pryor, Alan E. Method and apparatus for ozone treatment of soil to kill living organisms, 5,566,627, Cl. 111-118.000.  
Pryor, Kent E.: *See*—  
Unruh, Jerry D.; Segmuller, Brigitte E.; Chapa, Gabriel R.; and Pryor, Kent E., 5,567,856, Cl. 568-454.000.  
PSI Telecommunications, Inc.: *See*—  
Smith, Donald J., 5,568,584, Cl. 385-135.000.  
Pu, Lyong Sun: *See*—  
Furuki, Makoto; and Pu, Lyong Sun, 5,568,417, Cl. 365-106.000.  
Pugach, Joseph; Salek, Jeffrey S.; and Aiken, John E., to Amstech Chemical Corporation. Transisomerization reaction of alkoxylated bisphenol-a and methyl methacrylate, 5,567,838, Cl. 560-60.000.  
Puget Consultants Inc.: *See*—  
Sumic, Zarko, 5,568,399, Cl. 364-492.000.  
Pugh, William H.; and Kottzieper, Dieter, to Allegheny Plastics, Inc.; and Ecopac Corporation. Continuous pickling tank with expandable seals, 5,566,694, Cl. 134-64.00R.  
Puginier, Jerome: *See*—  
Schneider, Michel; Bichon, Daniel; Bussat, Philippe; Puginier, Jerome; and Hybl-Sutherland, Eva, 5,567,414, Cl. 424-9.520.  
Pulp and Paper Research Institute of Canada: *See*—  
Paleologou, Michael; Berry, Richard M.; Thompson, Rokhsareh; and Wearing, James T., 5,567,293, Cl. 204-523.000.  
Purcell, Stephen C.: *See*—  
Galbi, David E.; and Purcell, Stephen C., 5,568,167, Cl. 348-589.000.  
Purdy, Bruce. Burner system for a radio-controlled hot air balloon, 5,567,142, Cl. 431-18.000.  
Puri, Rajen: *See*—  
Chaback, Joseph J.; Yee, Dan; Volz, Richard F., Jr.; Seidle, John P.; and Puri, Rajen, 5,566,756, Cl. 166-263.000.  
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Pussikeskusoy: *See*—  
Janhonen, Tarmo, 5,566,827, Cl. 206-424.000.  
Puzey, Kenneth A., to International Business Machines Corporation. Method of transmitting data via an optical data link, 5,568,302, Cl. 359-157.000.  
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Quadri, Luisa: *See*—

Almirante, Nicoletta; Bernardi, Luigi; Cerri, Alberto; Melloni, Piero; Padoani, Gloria; and Quadri, Luisa, 5,567,694, Cl. 514-169.000.  
Qualcomm Incorporated: *See*—  
Padovani, Roberto; Tiedemann, Edward G., Jr.; Odenwalder, Joseph P.; Zehavi, Ephraim; and Wheatley, Charles E., III, 5,568,483, Cl. 370-84.000.  
Quantel Limited: *See*—  
Cawley, Robin A., 5,568,596, Cl. 395-131.000.  
Quantum Corporation: *See*—  
Leshay, Bruce; and Buch, Bruce, 5,568,627, Cl. 395-439.000.  
Queen, Lawrence E.; and Guess, Roy E., to Burlington Industries, Inc. Process of making cotton room-size rugs, 5,567,256, Cl. 156-72.000.  
Queen's University at Kingston: *See*—  
Terentiev, Alexander N.; and Harrison, John P., 5,567,672, Cl. 505-166.000.  
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Stull, Mark W.; Ravenberg, Michael J.; Lauritzen, Donald R.; Rose, Larry D.; and Green, David J., 5,566,975, Cl. 280-732.000.  
Ray, Michael: *See*—  
Walsh, Devin T.; and Ray, Michael, 5,567,975, Cl. 257-442.000.  
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Oltman, John E.; Dopp, Robert B.; and Burns, John D., 5,567,538, Cl. 429-27.000.  
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O'Leary, Thomas M.; Drake, Peter R.; Merrill, Philip R., deceased, 5,568,105, Cl. 333-81.00R.  
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Khan, Amanullah, 5,568,332, Cl. 360-104.000.  
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Minarovic, Joe T.; and Rebers, Kenneth D., 5,567,914, Cl. 174-93.000.  
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Mertens, Marc; Calberg, Cedric; Martinot, Lucien; Jerome, Robert; and Schrijnemackers, Jean, 5,567,297, Cl. 205-334.000.  
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Qi, Ru-Yi; Karam, Ronald E.; Reddy, Vaddi B.; and Cox, James R., 5,567,351, Cl. 252-301.40R.  
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Kahn, Randolph W.; and Reed, James C., Jr., 5,567,927, Cl. 235-462.000.  
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Williamson, Jimmie R.; Gano, John C.; and Reesing, David L., 5,566,763, Cl. 166-382.000.  
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Rokosny, Gary, 5,566,638, Cl. 116-63.00C.  
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Liedenbaum, Coen T. H. F.; and Reid, John J. E., 5,568,303, Cl. 359-184.000.  
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Keefe, Brian J.; Childers, Winthrop D.; Steinfield, Steven W.; and Reid, W. Bruce, 5,568,171, Cl. 347-58.000.  
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Johnson, John R.; Roder, William R.; and Henegar, C. Sherill, 5,567,480, Cl. 427-410.000.  
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Lepsius, Tilwin; Gierenz, Gerhard; Tranelis, Klaus; Reinfelder, Gerd-Ruediger; Franken, Joachim; and Halm, Hans, 5,567,071, Cl. 401-68.000.



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Romann, Peter; Reiter, Ferdinand; Maier, Martin; and Naeger, Thomas, 5,566,920, Cl. 251-129.210.
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DeWachter, Gary, 5,567,306, Cl. 210-168.000.
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Hastings, Carl W., 5,567,424, Cl. 424-195.100.
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Leenders, Luc; Remmerie, Herman; and Uyttendaele, Carlo, 5,568,173, Cl. 347-96.000.
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Yien, Richard S.; and Stratigos, William N., 5,568,489, Cl. 370-110.100.
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Gregory, David B.; and Oliver, Dan A., 5,567,259, Cl. 156-242.000.
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Crivello, James V., 5,567,858, Cl. 568-616.000.
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Diamond, Scott L.; and Wu, Jung-He, 5,567,596, Cl. 435-13.000.
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Kepplinger, Leopold W.; Matzawrakos, Panajiotis; Schenk, Johannes; and Siuka, Dieter, 5,567,379, Cl. 266-143.000.
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Birbara, Philip J.; Couch, Harold T.; Genovese, Joseph E.; and Rethke, Donald W., 5,567,389, Cl. 422-28.000.
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Kosal, Jeffrey A.; Kosal, Diane M.; and Revis, Anthony, 5,567,347, Cl. 252-8.620.
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Rasmussen, Gary H.; and Reynolds, Glenn F., 5,567,708, Cl. 514-284.000.
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Zamora, Paul O., 5,567,408, Cl. 424-1.690.
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Zezza, Charles A., 5,567,788, Cl. 526-334.000.
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Bienayme, Hugues; and Meilland, Pierre, 5,567,852, Cl. 568-378.000.
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Audiau, François; Jimonet, Patrick; and Mignani, Serge, 5,567,822, Cl. 548-164.000.
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Versluys, Richard J.; and Riall, J. Daniel, 5,567,387, Cl. 422-67.000.
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Engeler, William E.; and Ribner, David B., 5,568,446, Cl. 367-11.000.
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Ray, Stephen J.; and Richardson, Kenneth, 5,567,817, Cl. 544-333.000.
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Allen, William C.; Rickard, William M.; Hoyer, Daniel P.; Stickers, David E.; and Kelley, Matthew J., 5,566,986, Cl. 285-55.000.
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Kamada, Takeshi; and Takehara, Kenichi, 5,566,906, Cl. 242-563.000.
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Motoyama, Tetsuro, 5,568,618, Cl. 395-280.000.
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Salmon, Roland A., Jr.; Payne, James H.; and Culnan, Thomas R., 5,567,157, Cl. 434-29.000.
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Scholz, Eugen, 5,567,618, Cl. 436-42.000.
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Gentry, Timothy W.; Fredin, Gerald J.; and Riedl, Daniel A., 5,568,629, Cl. 395-441.000.
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Mohr, Bernhard; Ueding, Michael; Strobel, Michael; and Kriegler, Albert, 5,566,425, Cl. 19-159.00R.
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Gray, Frank B.; Parris, John L.; and Riffert, Rainer G., 5,566,479, Cl. 36-137.000.
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Agha el-Rifai, Mohammed T. S.; and Norton, Ian F., 5,566,402, Cl. 4-420.400.
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Dulany, Margaret A.; Garvey, Chad E.; Ringold, Clay E.; and Srinivasan, Ramji, 5,567,798, Cl. 528-332.000.
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Gold, Larry; and Ringquist, Steven, 5,567,588, Cl. 435-6.000.
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Killian, Earl A.; Riordan, Thomas J.; Freitas, Danny L.; Dixit, Ashish B.; and Hennessy, John L., 5,568,630, Cl. 395-375.000.
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Charter, Graeme E.; Ripley, Sherman H.; and Starkey, Norman G., 5,566,643, Cl. 119-220.000.
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Dietrich, Horst; Ripperger, Joachim; Stempf, Tassilo; and Gröber, Albert, 5,567,034, Cl. 362-66.000.
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Dunleavy, Thomas J.; and Kemmerer, Walter K., 5,567,072, Cl. 401-129.000.
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Satoh, Yuji, 5,566,612, Cl. 101-119.000.
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Tiller, Byron K.; Allard, David J.; Au, Connie Y.; Canova, Francis J., Jr.; Hsieh, Daniel M.; Goodwin, Julie F.; Johnson, Debra A. G.; Lanier, Charles S.; Lewis, James R.; Stout, Jean L.; Villafana, William; Yee, Raymond L.; Padgett, Russell S.; Ferrier, Robert B.; Corkell, Anthony F.; Murakami, Thomas T.; DeBauche, Bradley J.; Whitley, Wayne P.; Osborn, Neal A.; Beatty, Brent A.; Cox, Roger L.; Wulf, James C.; and Rivero, Jose L., 5,568,536, Cl. 379-58.000.
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Braddick, Britt O.; and Rives, Allen K., 5,566,762, Cl. 166-382.000.
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Cappuccio, Anthony R.; and Rizopoulos, Athanasios P., 5,567,747, Cl. 523-403.000.
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Draghetti, Firenze; and Rizzoli, Salvatore, 5,566,811, Cl. 198-399.000.
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Szczepanski, Thomas R., 5,567,757, Cl. 524-435.000.
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Niese, Michael W., 5,566,930, Cl. 267-153.000.
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Dobler, Karl-Otto; Klett, Gustav; Dahm, Horst; and Jocher, Rainer, 5,567,035, Cl. 362-66.000.
- Franzke, Klaus; and Keller, Stefan, 5,566,659, Cl. 123-490.000.
- Gaillard, Alain, 5,567,021, Cl. 303-3.000.
- Heizmann, Frieder, 5,567,032, Cl. 362-37.000.
- Mueller, Erwin; and Schuller, Wolfgang, 5,567,135, Cl. 417-549.000.
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Robert, Jimmie H.; and Robert, Eddie L., 5,566,781, Cl. 184-1.500.
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Lehrer, Robert, 5,567,461, Cl. 426-417.000.
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Beadle, David E.; Chauhan, Mahesh; Ebrey, John S.; Lewis, Iorwerth D.; Powell, Robin C.; Raiton, Robert J.; Robinson, Michael; and Sheppard, Alan F., 5,566,582, Cl. 74-475.000.
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Greco, Robert C.; Robinson, Michael J.; and Dunn, Paul M., 5,568,540, Cl. 379-89.000.
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Adang, Michael J.; Rocheleau, Thomas A.; Merlo, Donald J.; and Murray, Elizabeth E., 5,567,600, Cl. 536-23.710.
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Hansotte, Richard R., Jr.; Neff, Dieter K.; Rock, Dennis A.; Walker, Jeffrey A.; and Wanser, Roland M., 5,567,149, Cl. 432-6.000.
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Callahan, Sean M.; Harp, Edward; and Leak, Bruce, 5,568,602, Cl. 395-154.000.
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Arriola, Martin F.; and Roddick, Daniel M., 5,566,953, Cl. 273-115.000.
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Gibson, Brian C.; Jubien, Christopher M.; and Roden, Brian J., 5,567,901, Cl. 84-603.000.
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Johnson, John R.; Roder, William R.; and Henegar, C. Sherill, 5,567,480, Cl. 427-410.000.
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Kuczkowski, Joseph A.; Rodgers, Michael B.; and Rollick, Kevin L., 5,567,821, Cl. 548-126.000.
- Rodman, Jeffrey C.: See—  
Hinman, Brian L.; and Rodman, Jeffrey C., 5,568,279, Cl. 358-452.000.
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Annati, Richard E.; Rodrigue, Allan J.; Sublett, James T.; and Irwin, Craig W., 5,567,051, Cl. 374-57.000.
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Cree, Robert E.; and Rodriguez, Ricardo P., 5,567,445, Cl. 425-72.100.
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Knebel, Joachim; Arndt, Peter J.; and Ude, Werner, 5,567,826, Cl. 548-324.100.
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Holmes-Higgin, Ian J.; and Rogers, Ivor T., 5,567,876, Cl. 73-257.000.
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Nagahata, Takaya; Kishimoto, Tokihiko; and Wada, Koichi, 5,568,174, Cl. 347-200.000.
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Weber, Eduard; Rohr, René; and Suter, Jürg, 5,567,321, Cl. 210-376.000.
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Tarcha, Peter J.; Rohr, Thomas E.; Markese, James J.; Cotton, Therese; and Rospendowski, Bernard N., 5,567,628, Cl. 436-525.000.
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- Sano, Eiichi: See—
- Hirai, Atsuto; Ueda, Masahide; Terasaka, Yoshihisa; Sano, Eiichi; Matsura, Masahiko; Yamasaki, Hiroyuki; Yamada, Masami; and Izumi, Tomoo, 5,568,244, Cl. 355-309.000.
- Sano, Naoto, to Canon Kabushiki Kaisha. Scanning exposure apparatus and method including controlling irradiation timing of an irradiation beam with respect to relative movement between the beam and a substrate. 5,567,928, Cl. 250-205.000.
- Sano, Takahiro, to Yazaki Corporation. Terminal retaining connector. 5,567,183, Cl. 439-751.000.
- Sanofi Bio-Industries, Inc.: See—
- Ehrlich, Robert M., 5,567,462, Cl. 426-425.000.
- Santa Barbara Research Center: See—
- Walsh, Devin T.; and Ray, Michael, 5,567,975, Cl. 257-442.000.
- Santel, Hans-Joachim: See—
- Fischer, Reiner; Bretschneider, Thomas; Krüger, Bernd-Wieland; Santel, Hans-Joachim; Dollinger, Markus; Turberg, Andreas; and Wachendorf-Neumann, Ulrike, 5,567,671, Cl. 504-283.000.
- Santin, Giancarlo: See—
- Grossbach, Rudolf; Huber, Peter; Lierke, Ernst-Günter; Fiedler, Michael; Weiss, Rainer; Neri, Armando; Santin, Giancarlo; and Squar-zoni, Giovanni, 5,566,686, Cl. 131-84.400.
- Santini, Hugo A. E.: See—
- Fontana, Robert E.; and Santini, Hugo A. E., 5,568,335, Cl. 360-113.000.
- Santora, Scott: See—
- Sher, Samuel E.; Borganini, Stephen A.; Carpenter, Robert E.; Santora, Scott; and Scavuzzo, William S., 5,566,576, Cl. 73-864.650.
- Sanyo Chemical Industries, Ltd.: See—
- Minami, Tohru, 5,567,563, Cl. 430-110.000.
- Sapitowicz, Robert: See—
- Stitt, David T.; Burrell, Gregory J.; Hu, Kwok-Yu; Monihony, James F.; and Sapitowicz, Robert, 5,567,598, Cl. 435-29.000.
- Sarangdhar, Nitin V.; Lai, Konrad K.; and Singh, Gurbir, to Intel Corporation. Method and apparatus for performing bus transactions in a computer system. 5,568,620, Cl. 395-285.000.
- Sarras, Michael P., Jr.; and Hudson, Billy G., to University of Kansas Medical Center. Use of isolated domains of type IV collagen to modify cell and tissue interactions. 5,567,609, Cl. 435-240.200.
- Sasai, Osamu; Suzuki, Masaji; and Sakatani, Atsushi, to Sumitomo Wiring Systems, Ltd. Connector with integral retainer, connector conveying and positioning device, and method for conveying and positioning a connector. 5,567,184, Cl. 439-752.000.
- Sasaki, Takanobu; and Hirata, Kazumi, to NSK Ltd. Retractor with a clamping mechanism for use in a seat belt device. 5,566,899, Cl. 242-381.100.
- Sasaki, Yasuyuki; and Bizen, Takehiko, to Dai Nippon Insatsu Kabushiki Kaisha. Liquid container and mouth thereof. 5,566,851, Cl. 220-441.000.



Sasame, Hiroshi; Anayama, Hideki; and Maebashi, Yoichiro, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member, image forming apparatus and process unit having this electrophotographic photosensitive member. 5,568,242, Cl. 355-299.000.

Sashima, Hiroki: See—  
Kawata, Tatsuo; Suzuki, Hiroshi; Sashima, Hiroki; Miyabayashi, Kazuhiko; and Horie, Osamu, 5,567,990, Cl. 257-788.000.

Sasisekharan, Ramnath; Moses, Marsha A.; Nugent, Matthew A.; Cooney, Charles L.; and Langer, Robert S., to Massachusetts Institute of Technology; and Children's Medical Center Corporation. Method for inhibiting angiogenesis using heparinase. 5,567,417, Cl. 424-94.500.

Satake, Masaki: See—  
Ishida, Toshio; Satake, Masaki; Watanabe, Hideomi; Yasunaga, Tadashi; and Okita, Tsutomu, 5,567,524, Cl. 428-408.000.

Satian Industries Co., Ltd.: See—  
Lorhipipat, Boonchai; and Lorpipatana, Boonsakdi, 5,566,937, Cl. 273-58.008.

Sato, Fumiki; and Fujita, Kouichi, to Mitsubishi Denki Kabushiki Kaisha. Latch circuit. 5,568,077, Cl. 327-199.000.

Sato, Hiroshi: See—  
Sunamori, Takashi; Sato, Hiroshi; Hirose, Masakazu; and Yanauti, Kazuo, 5,568,267, Cl. 356-416.000.

Sato, Katsuaki: See—  
Noda, Toshiharu; Sato, Katsuaki; and Saka, Tsutomu, 5,567,383, Cl. 420-584.100.

Sato, Kazuyoshi, to NEC Corporation. Optical array module and the control method of the same. 5,568,575, Cl. 385-16.000.

Sato, Naoki: See—  
Sawaguchi, Hideki; Ouchi, Yasuhide; Sato, Naoki; and Hori, Yosuke, 5,568,330, Cl. 360-46.000.

Sato, Osamu; Sugitani, Hiroshi; Orikasa, Tsuyoshi; Ujita, Toshihiko; Higuma, Masahiko; Kotaki, Yasuo; and Hinami, Jun, to Canon Kabushiki Kaisha. Method and apparatus for manufacturing a liquid container having plural porous members. 5,567,373, Cl. 264-112.000.

Sato, Shoichi; Tabuchi, Toshi; Urushida, Shigeo; and Shimizu, Sakae, to Ricoh Company, Ltd. Slow-volatilizing terpenoid composition. 5,567,416, Cl. 424-76.400.

Sato, Yuichi; and Suzuki, Nobukazu, to Canon Kabushiki Kaisha. Image reading apparatus with image magnification and scanning speed changed to correct for focus adjustment. 5,568,273, Cl. 358-451.000.

Satoh, Takao; Ichinomiya, Hiroshi; Takeuchi, Hisaharu; and Yamamoto, Akira, to Hitachi, Ltd.; and Hitachi Microcomputer System, Ltd. Storage control method and apparatus for highly reliable storage controller with multiple cache memories. 5,568,628, Cl. 395-440.000.

Satoh, Yuji, to Riso Kagaku Corporation. Mimeographic printing machine. 5,566,612, Cl. 101-119.000.

Satterfield, William H., to Spencer Wright Industries, Inc. Tufting machine patterning apparatus. 5,566,629, Cl. 112-80.010.

Saulnier, Gary J.: See—  
Hershey, John E.; Saulnier, Gary J.; and Hassan, Amer A., 5,568,507, Cl. 375-200.000.

Hershey, John E.; Hassan, Amer A.; and Saulnier, Gary J., 5,568,509, Cl. 375-200.000.

Hershey, John E.; and Saulnier, Gary J., 5,568,522, Cl. 375-346.000.

Saulpaugh, Thomas E.: See—  
Nelson, Matthew R.; and Saulpaugh, Thomas E., 5,568,644, Cl. 395-741.000.

Savant Instruments, Inc.: See—  
Zlobinsky, Yury; Glater, Michael; and Grave, Frank, 5,567,050, Cl. 366-209.000.

Sawaguchi, Hideki; Ouchi, Yasuhide; Sato, Naoki; and Hori, Yosuke, to Hitachi, Ltd. Recording/reproducing apparatus with maximum likelihood sequence estimation. 5,568,330, Cl. 360-46.000.

Sawamura, Kozo: See—  
Negoro, Fumio; Murata, Tetsuri; Sawamura, Kozo; Yuki, Junichi; Murai, Hiroshi; Onuki, Masayasu; Ito, Norihito; Jiang, Wieguo; and Yone-mura, Masako, 5,568,642, Cl. 395-700.000.

Sawamura, Yasushi; Teshiba, Toshihiro; and Tanaka, Masayuki, to Toray Industries, Inc. Semiconductor device-encapsulating epoxy resin composition. 5,567,749, Cl. 523-443.000.

Sawhney, Amarpreet: See—  
Hubbell, Jeffrey A.; Elbert, Donald; Hill-West, Jennifer L.; Drumbeller, Paul D.; Chowdhury, Sanghamitra; and Sawhney, Amarpreet, 5,567,440, Cl. 424-484.000.

Sawhney, Amarpreet S.: See—  
Hubbell, Jeffrey A.; Pathak, Chandrashekar P.; Sawhney, Amarpreet S.; Desai, Neil P.; and Hill-West, Jennifer L., 5,567,435, Cl. 424-426.000.

Sawyer, Thomas K., Jr. Precision cut saw guide base plate. 5,566,456, Cl. 30-374.000.

Scalise, Anthony J.: See—  
Barker, Jay B.; Scalise, Anthony J.; and Odor, William E., 5,566,900, Cl. 242-388.000.

Scania CV Aktiebolag: See—  
Andersson, Roger, 5,568,387, Cl. 364-424.100.

Scanlon, Christopher, to United States Surgical Corporation. Suture retainer. 5,566,822, Cl. 206-63.300.

Scavuzzo, William S.: See—  
Sher, Samuel E.; Borganiani, Stephen A.; Carpenter, Robert E.; Santora, Scott; and Scavuzzo, William S., 5,566,576, Cl. 73-864.650.

Schaa, Heinz, to Schaa Technologie GmbH. Cooker-extruder apparatus and process for cooking-extrusion of biopolymers. 5,567,463, Cl. 426-523.000.

Schaa Technologie GmbH: See—  
Schaa, Heinz, 5,567,463, Cl. 426-523.000.

Schadt, Martin: See—  
Kelly, Stephen; Schadt, Martin; and Schmitt, Klaus, 5,567,349, Cl. 252-299.010.

Schaechter, Alan L. Quick seal pillow cover configuration and method. 5,566,410, Cl. 5-490.000.

Schaefer Brush Manufacturing Company, Inc.: See—  
Karl, Jamie L., 5,566,416, Cl. 15-104.040.

Schaefer, Ronald H.: See—  
Ewards, Gary C.; Rose, William; and Schaefer, Ronald H., 5,567,337, Cl. 219-205.000.

Schaefer, Walter R.; Vassiliou, Eustathios; Kuhn, Bruno R.; and Guinto, Joseph F., to Rollins Environmental Services, Inc. Incineration kiln devices and methods of protecting the same. 5,566,626, Cl. 110-246.000.

Schafer, Robert: See—  
Peker, Atakan; Johnson, William L.; Schafer, Robert; and Scruggs, David M., 5,567,251, Cl. 148-522.000.

Peker, Atakan; Johnson, William L.; Schafer, Robert; and Scruggs, David M., 5,567,532, Cl. 428-457.000.

Schakel, Eric G.; Coleman, Robert R.; Matthews, Kent R.; and Morton, Lowell K., to Schuller International, Inc. Glass fiber duct board with coated grooves and the method of making the same. 5,567,504, Cl. 428-167.000.

Schantz, David L.; DeOms, James H.; Starling, Ronnie L.; and Ankrom, Michael J., to Northrop Grumman Corporation. Electric vehicle relay assembly using flexible circuit connector coupling the relay to the relay circuit. 5,567,991, Cl. 307-10.100.

Schapira, Joseph; Cheminaud, Jean-Claude; Gasse, Jean-Jacques; Hadzmann, Eric; and Bonnin, Joël, to C F P I. Composition containing materials improving the rheological properties of cement-based products. 5,567,236, Cl. 106-728.000.

Schapowalow, Sergej: See—  
Sackmann, Günter; Meyer, Rolf-Volker; Korte, Siegfried; and Schapowalow, Sergej, 5,567,779, Cl. 525-329.100.

Scharf, Stephen J.: See—  
Apple, Raymond J.; Erlich, Henry A.; Griffith, Robert L.; and Scharf, Stephen J., 5,567,809, Cl. 536-24.300.

Scharton, Terry D.: See—  
Bamford, Robert M., 5,568,211, Cl. 396-429.000.

Schenk, Johannes: See—  
Kepplinger, Leopold W.; Matzawrakos, Panajiotis; Schenk, Johannes; and Siuka, Dieter, 5,567,379, Cl. 266-143.000.

Schenker, Alfred R.; and Potts, Luken W., to VIZ Manufacturing Co. Apparatus for sealing a vessel under pressure. 5,566,853, Cl. 220-581.000.

Scheucher, Peter; Heindler, Gerhard; Schininger, Walter; Paier, Gerhard; and Mraz, Peter, to Andritz Patentverwaltungs-Gesellschaft m.b.H. Apparatus for separating liquid from fibrous suspensions. 5,566,611, Cl. 100-127.000.

Schierling, Bernhard: See—  
Lindner, Joachim; Sudau, Jörg; and Schierling, Bernhard, 5,566,803, Cl. 192-70.170.

Schiltz, William C.; and Wasmire, Frederick D., to Liquid Control Corporation. Dual component cartridge. 5,566,860, Cl. 222-94.000.

Schininger, Walter: See—  
Scheucher, Peter; Heindler, Gerhard; Schininger, Walter; Paier, Gerhard; and Mraz, Peter, 5,566,611, Cl. 100-127.000.

Schipper, John F.; and Janky, James M., to Trimble Navigation Limited. Arrestee monitoring with variable site boundaries. 5,568,119, Cl. 340-825.370.

Schipper, John F.: See—  
Janky, James M.; Loomis, Peter V. W.; and Schipper, John F., 5,568,152, Cl. 342-357.000.

Schlachter, Werner: See—  
Will, Ronald; Franz, Markus; Waegner, Ralf; Gerlach, Hans-J.; and Schlachter, Werner, 5,566,575, Cl. 73-862.629.

Schlage Lock Company: See—  
Massey, William S.; and Carestia, Rocco A., 5,566,996, Cl. 292-357.000.

Schlei, Dietmar: See—  
Patnode, Gregg A.; Bruno, John E.; Rutherford, Denise R.; Sandison, Walter B.; and Schlei, Dietmar, 5,567,510, Cl. 428-288.000.

Schleimer, Norman. Grill with grease deflector assembly. 5,566,607, Cl. 99-446.000.

Schleinz, Robert J.; Conrad, Daniel J.; and Kuchersky, Joseph S., to Kimberly-Clark Corporation. Substrate printed by a single substrate, repeat-pass printing process. 5,566,616, Cl. 101-483.000.

Schleisman, Anthony J.; and Bollinger, David S., to Texas Instruments Incorporated. Anhydrous ammonia gas sampler and concentration system. 5,567,887, Cl. 73-863.120.

Schlesener, Carmen M.: See—  
Penniman, Mark B.; Schlesener, Carmen M.; and Kizer, Jim J., 5,568,360, Cl. 361-687.000.

Schlienger, Max E., to Sandia Corporation. Constant voltage electro-slag remelting control. 5,568,506, Cl. 373-50.000.

Schlipf, Thomas: See—  
Hass, Jürgen; Hilgendorf, Rolf; Neuber, Siegfried; Schlipf, Thomas; and Ulland, Hartmut, 5,568,407, Cl. 364-579.000.

Schloemer, George C.; Han, Yeun-Kwei; and Harrington, Peter J., to Syntex (U.S.A.) Inc. Preparation of acyclovir using 1,3 dioxolane. 5,567,816, Cl. 544-276.000.

Schlusser, Kevin F.: See—

Gochenour, Daniel V.; Adams, Barry T.; Kummer, Martin E.; Davis, Christopher M.; Lepard, Steven D.; Bassett, Michael L.; and Schloesser, Kevin F., 5,566,804, Cl. 192-70.250.

Schlumberger Industries, Inc.: See—  
Adams, David P., 5,567,875, Cl. 73-204.000.

Schmidt, Melvin J.; Coach, Thomas P.; Hause, Glenn C.; Galowitz, Dennis A.; Wyman, James P.; Hendricks, Robert A.; Van Steeg, Lawrence J.; and Evans, Harold H., to Andersen Corporation. Double-hung tilting sash type window system. 5,566,507, Cl. 49-428.000.

Schmidt, Michael: See—  
Weidenmann, Walter; Luetzau, Frank v.; Frank, Gerhard; Schmidt, Michael; Mayer, Ferdinand; and Herold, Ulrich, 5,567,315, Cl. 210-123.000.

Schmitt, Klaus: See—  
Kelly, Stephen; Schadt, Martin; and Schmitt, Klaus, 5,567,349, Cl. 252-299.010.

Schmitt, Philipp: See—  
Stehr, Norbert; and Schmitt, Philipp, 5,566,896, Cl. 241-171.000.

Schmuck, Jean-Claude; Jeannot, Claude; and Buisson, Claude, to Matec Holding AG. Sound insulating vehicle body part. 5,567,922, Cl. 181-284.000.

Schneider, Michel; Bichon, Daniel; Bussat, Philippe; Puginier, Jerome; and Hybl-Sutherland, Eva, to Bracco International B.V. Stable microbubbles suspensions injectable into living organisms. 5,567,414, Cl. 424-9.520.

Schneider, Wolfgang: See—  
Christ, Hubert; and Schneider, Wolfgang, 5,567,797, Cl. 528-310.000.

Schneiter, John L., to General Electric Company. Precision non-contact measurement system for curved workpieces. 5,568,260, Cl. 356-376.000.

Schneider, Peter W.; Schnobel, Timothy J.; and Tuck, Brian C., to Kelsey-Hayes Company. Method and system for automatically calibrating control logic of a vehicle control system. 5,568,388, Cl. 364-424.010.

Schnobel, Timothy J.: See—  
Schneider, Peter W.; Schnobel, Timothy J.; and Tuck, Brian C., 5,568,388, Cl. 364-424.010.

Schobinger, Alfred: See—  
Lauer, Armin; Frei, Walter; and Schobinger, Alfred, 5,566,586, Cl. 74-523.000.

Schoell, Harry. Skirted surface effect vehicle. 5,566,775, Cl. 180-120.000.

Schoellkopf, Jean-Pierre, to SGS-Thomson Microelectronics S.A. Circuit indicating the phase relation between several signals having the same frequency. 5,568,072, Cl. 327-12.000.

Schoenhofer, Walter. Ground closer kit for attachment to a seeding/fertilizing apparatus and a seeding/fertilizing apparatus having a ground closer plate. 5,566,628, Cl. 111-198.000.

Schoetz, Claus, to Leonhard Kurz GmbH & Co. Method and apparatus for decorating articles having a conical peripheral surface portion. 5,567,261, Cl. 156-238.000.

Scholz, Eugen, to Riedel-De Haen Aktiengesellschaft. Karl Fischer reagent. 5,567,618, Cl. 436-42.000.

Scholz, Wolfgang: See—  
Schwark, Jan-Robert; Kleemann, Heinz-Werner; Lang, Hans-Jochen; Weichert, Andreas; Scholz, Wolfgang; and Albus, Udo, 5,567,734, Cl. 514-617.000.

Schonbek Worldwide Lighting Inc.: See—  
Lucas, John M., 5,567,046, Cl. 362-405.000.

Lucas, John M., 5,567,468, Cl. 427-9.000.

Schoner, Brigitte E.: See—  
Basinski, Margret; DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Schoner, Brigitte E.; Shields, James E.; and Smiley, David L., 5,567,803, Cl. 530-324.000.

Schoormans, Johannes A. H. M.; and Van der Net, Dirk, to Johannes A. Schoormans. Method for the fabrication of an outflow element. 5,566,440, Cl. 29-507.000.

Schrenk, Walter J.; Arends, Charles B.; Balazs, Conrad F.; Lewis, Ray A.; and Wheatley, John A., to Dow Chemical Company. The Formable reflective multilayer body. 5,568,316, Cl. 359-584.000.

Schreyer, Peter: See—  
Franz, Lothar; Mohr, Juergen; Schreyer, Peter; Thomas, Juergen; Oppenlaender, Knut; and Guenther, Wolfgang, 5,567,845, Cl. 564-278.000.

Schrijnemackers, Jean: See—  
Mertens, Marc; Calberg, Cedric; Martinot, Lucien; Jerome, Robert; and Schrijnemackers, Jean, 5,567,297, Cl. 205-334.000.

Schroeder, Mel C.: See—  
DeWitt, Sheila H. H.; Kiely, John S.; Pavia, Michael R.; Schroeder, Mel C.; and Stankovic, Charles J., 5,567,391, Cl. 422-131.000.

Schroeder, Thaddeus; and Pawlak, Andrzej M., to General Motors Corporation. Three sensor rotational position and displacement detection apparatus with common mode noise rejection. 5,568,048, Cl. 324-207.210.

Schubert, Gerrit: See—  
Hemmerle, Horst; Schubert, Gerrit; Below, Peter; Herling, Andreas; and Burger, Hans-Jörg, 5,567,725, Cl. 514-381.000.

Schuller International, Inc.: See—  
Schakel, Eric G.; Coleman, Robert R.; Matthews, Kent R.; and Morton, Lowell K., 5,567,504, Cl. 428-167.000.

Schuller, Wolfgang: See—  
Mueller, Erwin; and Schuller, Wolfgang, 5,567,135, Cl. 417-549.000.

Schulte, Bernhard: See—  
Bräuer, Wolfgang; Müller, Friedemann; Heidingsfeld, Herbert; Schulte, Bernhard; and Winkler, Jürgen, 5,567,791, Cl. 528-52.000.

Schulte, Harvey, to Walter, Barry J. Cylinder pump having controllable piston/drive detachment. 5,567,122, Cl. 417-214.000.

Schultz, Darald R.: See—  
Koenck, Steven E.; Miller, Phillip; Hanson, George E.; Schultz, Darald R.; and Krunnusz, Jeffrey S., 5,567,925, Cl. 235-375.000.

Schulze, Joachim; Haerzschel, Reinhard; and Figge, Reiner, to Wacker-Chemie GmbH. Redispersible dispersion powder composition. 5,567,750, Cl. 524-3.000.

Schuss, Jack J.; Maloney, Peter R.; Upton, David M.; and McMorrow, Robert J., to Motorola, Inc. Linear power amplifier for high efficiency multi-carrier performance. 5,568,086, Cl. 330-124.000.

Schwaiger, Dennis D.: See—  
Willford, George A.; Baer, Kurt R.; Loeffler, John M.; and Schwaiger, Dennis D., 5,566,579, Cl. 74-335.000.

Schwark, Jan-Robert; Kleemann, Heinz-Werner; Lang, Hans-Jochen; Weichert, Andreas; Scholz, Wolfgang; and Albus, Udo, to Hoechst Aktiengesellschaft. Phenyl-substituted alkylcarbonylides carrying perfluoroalkyl groups, a process for their preparation, their use as a medicament or a diagnostic agent, and a medicament containing them. 5,567,734, Cl. 514-617.000.

Schwartz, David A., to Hughes Aircraft Company. Stacked module assembly including electrically interconnected switching module and plural electronic modules. 5,568,356, Cl. 361-679.000.

Schwartz, James R.: See—  
Cassidy, William A.; Schwartz, James R.; and Farris, Richard D., 5,567,359, Cl. 510-135.000.

Schwarz, Alois, to C. M. E. Schwarz Holding-Gesellschaft m.b.H. Method of erecting walls, and form elements therefor. 5,566,525, Cl. 52-745.090.

Schwendemann, Christian; Keller, Jacques; Auger, Jean-Luc; and Fatrez, Philippe, to Sollac (Société Anonyme). Inhibitor of the corrosion of a metal material such as steel. 5,567,354, Cl. 252-387.000.

Schwindeman, James A.; Granger, Eric J.; Engel, John F.; and Kamienski, Conrad W., to FMC Corporation. Anionic polymerization process using functionalized initiators. 5,567,774, Cl. 525-272.000.

Schwöpe, Andreas: See—  
van Loo, Gerrit J., Jr.; Noll, Joachim; and Schwöpe, Andreas, 5,568,478, Cl. 370-60.100.

Sciamanna, Aldo F.: See—  
Lynn, Scott; Sciamanna, Steven F.; and Sciamanna, Aldo F., 5,567,283, Cl. 204-228.000.

Sciamanna, Steven F.: See—  
Lynn, Scott; Sciamanna, Steven F.; and Sciamanna, Aldo F., 5,567,283, Cl. 204-228.000.

SCIMED Life Systems, Inc.: See—  
Euteneuer, Charles L.; Mattison, Richard C.; Adams, Daniel O.; Hekter, Thomas R.; and Keith, Peter T., 5,567,203, Cl. 604-96.000.

Scitex Corporation Ltd.: See—  
Yosefi, Hanan; and Armoni, Shimon R., 5,568,595, Cl. 395-126.000.

Scott, Alexander R. Shortened stretch belt for garments. 5,566,397, Cl. 2-338.000.

Scott, C. Timothy: See—  
Hankel, Steven G.; Gunderson, Dennis E.; Scott, C. Timothy; and Gleisner, Roland L., Jr., 5,566,570, Cl. 73-159.000.

Scott, Gordon: See—  
Thomas, Donald; Ellis, Steve; Kriz, Paul; and Scott, Gordon, 5,566,813, Cl. 198-495.000.

Scruggs, David M.: See—  
Peker, Atakan; Johnson, William L.; Schafer, Robert; and Scruggs, David M., 5,567,251, Cl. 148-522.000.

Peker, Atakan; Johnson, William L.; Schafer, Robert; and Scruggs, David M., 5,567,532, Cl. 428-457.000.

Sea Quest, Inc.: See—  
Oliver, Bill N., 5,567,084, Cl. 405-186.000.

SEB S.A.: See—  
Lebrun, Erik; Astegno, Jean-Paul; Macera, Alain; Rouches, Alexandre; and Dulout, Jean-Michael, 5,566,605, Cl. 99-302.000.

Sebata, Michio: See—  
Makino, Toshiaki; Terada, Katsuyuki; Sebata, Michio; Hattori, Morishige; Takai, Hideo; Yasui, Toshi; Oshima, Masabumi; Iida, Akiyoshi; Takano, Yasushi; Katoo, Chisachi; and Kobayashi, Kenji, 5,566,800, Cl. 191-67.000.

Sebillotte, Laurence: See—  
Nadaud, Jean F.; and Sebillotte, Laurence, 5,567,426, Cl. 424-401.000.

Secco d'Aragona, Frank: See—  
Lesk, Israel A.; Robb, Francine Y.; Terry, Lewis E.; and Secco d'Aragona, Frank, 5,567,649, Cl. 437-190.000.

SECO Manufacturing Co., Inc.: See—  
Bates, Steven W., 5,566,460, Cl. 33-296.000.

Secretary of State for Defence: See—  
Dobson, Peter J.; Leigh, Peter A.; and Pearson, Richard O., 5,567,954, Cl. 257-3.000.

Securicor Datatrak Limited: See—  
Anderson, Philip M., 5,568,157, Cl. 343-713.000.

Sederlund, Edward R.; Thomas, Nadene T.; Lindesmith, Robert J.; and Cowles, Russell W., to Dow Chemical Company. The Stealth interface for process control computers. 5,568,615, Cl. 395-200.080.

Seeger, David E.: See—  
Aviram, Ari; Brunsold, William R.; Bucca, Daniel; Conley, Willard E., Jr.; and Seeger, David E., 5,567,569, Cl. 430-296.000.

Seem, John E.; and Decious, Gaylon M., to Johnson Service Company. Fast automatic tuning of a feedback controller. 5,568,377, Cl. 364-157.000.

Segien, Donald J., Jr.: See—



- Ching, Fred Y. F.; Mark, Darren M.; Segien, Donald J., Jr.; and Woolley, Curtis S., 5,566,707, Cl. 137-359,000.
- Segmuller, Brigitte E.: See—
- Unruh, Jerry D.; Segmuller, Brigitte E.; Chapa, Gabriel R.; and Pryor, Kent E., 5,567,856, Cl. 568-454,000.
- Sehl, Douglas P. Sailboat rudder-motor prop guard. 5,567,189, Cl. 440-71,000.
- Seidle, John P.; Yee, Dan; and Puri, Rajen, to Amoco Corporation. Method for recovering methane from a solid carbonaceous subterranean formation. 5,566,755, Cl. 166-263,000.
- Seidle, John P.: See—
- Chaback, Joseph J.; Yee, Dan; Volz, Richard F., Jr.; Seidle, John P.; and Puri, Rajen, 5,566,756, Cl. 166-263,000.
- Seike, Takeshi: See—
- Kishida, Masahiro; Yoshimizu, Toshiyuki; and Seike, Takeshi, 5,568,289, Cl. 359-58,000.
- Seiko Epson Corporation: See—
- Shu, Joseph S., 5,568,572, Cl. 382-260,000.
- Seiko Instruments Inc.: See—
- Watanabe, Toshiaki; Saeki, Shinji; and Morita, Yoshiyuki, 5,567,920, Cl. 178-18,000.
- Seki, Hitoshi: See—
- Yamamoto, Iwao; Niwa, Kazuo; Seki, Hitoshi; Kusahara, Toshiro; and Inoue, Yoshiaki, 5,566,792, Cl. 188-218,0XL.
- Sekimura, Nobuyuki: See—
- Takao, Hideaki; Murata, Tatsuo; Kanbe, Junichiro; Tamura, Miki; Kamio, Masaru; Sekimura, Nobuyuki; and Kikuchi, Yoshiki, 5,568,293, Cl. 356-68,000.
- Sekisui Chemical Co., Ltd.: See—
- Kashiwagi, Nobuhito; Asakura, Syojiro; Ide, Tatsuo; Sakurai, Masato; Adachi, Masakazu; Tomiyoshi, Katsumi; and Hirano, Tsuneo, 5,567,443, Cl. 424-529,000.
- Sekura, Tsuyoshi: See—
- Kinami, Nobuyuki; Okamoto, Masami; Shinoda, Yoshihiro; Sekura, Tsuyoshi; and Yamaguchi, Akira, 5,567,758, Cl. 524-401,000.
- Selectech, Incorporated: See—
- Ricciardelli, Thomas E., 5,566,890, Cl. 241-20,000.
- Sell, William J.: See—
- Levey, William D.; and Sell, William J., 5,566,695, Cl. 134-83,000.
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- Basak, Arun K.; and Sellakumar, Karukkampalayam M., 5,567,090, Cl. 406-155,000.
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- Kusumoto, Naoko, 5,567,967, Cl. 257-353,000.
- Mase, Akira; and Shimizu, Michio, 5,568,298, Cl. 359-100,000.
- Yamazaki, Shunpei, 5,567,249, Cl. 136-249,000.
- Yamazaki, Shunpei; Mase, Akira; and Hiroki, Masaaki, 5,568,288, Cl. 359-59,000.
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- Amuti, Kofi S.; Hong, Wonpyo; and Semple, Joseph E., 5,567,670, Cl. 504-230,000.
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- Senbo, Satoshi, to Sumitomo Chemical Company, Limited. Pest controlling composition. 5,567,429, Cl. 424-405,000.
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- Beckwith, Robert W., 5,567,369, Cl. 264-40,100.
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- Mizoguchi, Naotake; and Takahashi, Tadao, 5,567,151, Cl. 432-145,000.
- Senn, Hans J.: See—
- Wick, Detlev J.; and Senn, Hans J., 5,566,461, Cl. 33-326,000.
- Senna, Randall. Urinal arcade game. 5,566,950, Cl. 463-60,000.
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- Sensui, Takayuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens. 5,568,323, Cl. 359-689,000.
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- Main, Ralph, 5,566,567, Cl. 72-361,000.
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- Sessler, Jonathan L.: See—
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- Makuta, Toshiyuki; Seto, Nobuo; and Yoshioka, Yasuhiro, 5,567,578, Cl. 430-551,000.
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- McClure, David C., 5,568,061, Cl. 326-13,000.
- McClure, David C., 5,568,073, Cl. 327-51,000.
- McClure, David C.; and Teel, Thomas A., 5,568,084, Cl. 327-538,000.
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- Chaisemartin, Philippe, 5,568,485, Cl. 370-85,600.
- Jimenez, Jean, 5,567,977, Cl. 257-538,000.
- Schoellkopf, Jean-Pierre, 5,568,072, Cl. 327-12,000.
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- Crisenza, Giuseppe; and Clementi, Cesare, 5,568,418, Cl. 365-185,010.
- Tavazzani, Claudio; Fassina, Andrea; and Stefani, Fabrizio, 5,568,342, Cl. 361-18,000.
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- Shannon, Charles P., to E-Systems, Inc. Method for protecting data in media recording peripheral devices. 5,568,608, Cl. 395-183,200.
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- Sturms, Peter, 5,566,874, Cl. 228-17,000.
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- Fukutomi, Hiroshi, 5,568,451, Cl. 368-10,000.
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- Shechet, Mark J. Transportable mobile cellular system. 5,568,537, Cl. 379-58,000.
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- Shields, James E.: See—
- Basinski, Margaret; DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Schoner, Brigitte E.; Shields, James E.; and Smiley, David L., 5,567,803, Cl. 530-324,000.
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- Takeuchi, Tatsuo; Kuroyama, Yoshihiro; and Shimada, Teruhisa, 5,567,513, Cl. 428-331,000.
- Shimadzu Corporation: See—
- Kamegawa, Masayuki, 5,568,259, Cl. 356-373,000.
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- Mase, Akira; and Shimizu, Michio, 5,568,298, Cl. 359-100,000.
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- Sato, Shoichi; Tabuchi, Toshi; Urushida, Shigeo; and Shimizu, Sakae, 5,567,416, Cl. 424-76,400.
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- Kimura, Yuji; and Sakai, Shigeru, 5,567,403, Cl. 423-263,000.
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- Shuman, Curtis A., to Discovision Associates. Optical beamsplitter. 5,568,315, Cl. 359-487,000.
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 Trainor, John J., 5,568,398, Cl. 364-492.000.  
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 Ferber, Otto; and Eggerstorfer, Vilmar, 5,568,245, Cl. 355-309.000.  
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 Keeler, Thomas C.; Dang, Loane P.; and Kelly, Chuck S., 5,568,544, Cl. 379-273.000.  
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 Hungerford, Roger L.; Cimerman, Christopher D.; Hufnagel, Paul J.; and Pieroni, Robert J., 5,567,120, Cl. 417-63.000.  
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 Bradfute, David L.; Simoni, Robert D.; and Meigs, Thomas E., 5,567,729, Cl. 514-546.000.  
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 Peiffer, Norman A.; and Simonyi, Victor R., 5,566,878, Cl. 229-117.160.  
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 Sinonar Corp.: See—  
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 Sitz, Hans-Dieter: See—  
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 Kepplinger, Leopold W.; Matzawrakos, Panajiotis; Schenk, Johannes; and Siuka, Dieter, 5,567,379, Cl. 266-143.000.  
 Sjödin, Sven-Eric. Rotating tool, 5,566,666, Cl. 125-15.000.  
 Sjostrand, Mats: See—  
 Soderberg, Staffan; Shahani, Hamid; and Sjostrand, Mats, 5,567,242, Cl. 118-723.0MN.  
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 Koch, Michel; Tilquin, François; Skaltsounis, Alexios-Leandros; Rolland, Yves; Pierre, Alain; and Atassi, Ghanem, 5,567,707, Cl. 514-280.000.  
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 Luff, Marlin; Skoda, William; and Kiscellus, William, 5,568,006, Cl. 310-348.000.  
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 Beers, Gregory E.; Frankeny, Richard F.; and Smadi, Mithkal M., 5,568,064, Cl. 326-31.000.  
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 Small, Kenneth T. Tolerant power converter, 5,568,373, Cl. 363-132.000.  
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 SMC Kabushiki Kaisha: See—  
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 Vaid, Pardip K.; and Stevens, Philip H., 5,566,487, Cl. 42-7.000.  
 Smith, Charles A., to Du Pont de Nemours, E. I., and Company. Multilayered glass laminate having enhanced resistance to penetration by high velocity projectiles, 5,567,529, Cl. 428-425.600.  
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 Martin, Lynn E.; Williamson, Jay D.; Blom, Kenneth M.; Vaughan, Jamieson; and Smith, Charles S., 5,566,518, Cl. 52-426.000.  
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 Cortjens, Leo M.; Franklin, Kenneth A.; Mays, Richard C.; and Smith, Curtis M., 5,568,183, Cl. 348-15.000.  
 Smith, David A., to Astec International, Ltd. Circuit for detecting negative output rails, 5,568,372, Cl. 363-74.000.  
 Smith, Dell W.: See—  
 Mesenbring, John M.; Patriquin, Lawrence J.; Ramirez, Rory F.; and Smith, Dell W., 5,566,863, Cl. 222-132.000.  
 Smith, Donald J., to PSI Telecommunications, Inc. Fiber optic closure with cable adapter spool, 5,568,584, Cl. 385-135.000.  
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 Holber, William M.; Smith, Donald K.; Besen, Matthew M.; Fitzner, Matthew P.; and Georgelis, Eric J., 5,568,015, Cl. 315-39.000.  
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 Hergenrother, Paul M.; and Smith, Joseph G., Jr., 5,567,800, Cl. 528-353.000.

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 Johnson, William J.; Smith, Michael D.; and Williams, Marvin L., 5,568,383, Cl. 364-419.020.  
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 Smith, Patrick D., to Mountain Smith, Inc. System for lashing components to material, 5,567,055, Cl. 383-38.000.  
 Smith, Peter V.: See—  
 Chu, Paul; Downs, William; Doyle, John B.; and Smith, Peter V., 5,567,394, Cl. 422-177.000.  
 Smith, Roger E., to Utah Medical Products, Inc. Carbazine dyes and derivatives for pH measurement, 5,567,624, Cl. 436-163.000.  
 Smith, Steven D.: See—  
 Shine, Annette D.; Smith, Steven D.; and Noda, Isao, 5,567,769, Cl. 525-63.000.  
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 Jordan, William D.; and Smithers, Matthew C., 5,566,749, Cl. 165-80.300.  
 Smithills MultiMedia Systems, Inc.: See—  
 Dixon, R. Paul; and Mentzelopoulos, Thanos, 5,568,443, Cl. 365-230.050.  
 Snell, Rusty B.; and Drysdale, Walter, to Rubbermaid Office Products Inc. Modular storage unit, 5,566,961, Cl. 280-47.350.  
 Snell, William M.; Eaton, Rodney L.; White, David A.; and Kaliszewski, Thomas S., to Chrysler Corporation. Tilt steering column locking mechanism, 5,566,585, Cl. 74-493.000.  
 Snider, Gregory L.: See—  
 Then, Alan M.; Snider, Gregory L.; Soave, Robert J.; and Tasker, G. William, 5,568,013, Cl. 313-532.000.  
 Snowblade Corporation: See—  
 Tiramani, Paolo M. B., 5,566,959, Cl. 280-28.140.  
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 Fallen, Norma; Rivera, Tony; Snyder, Doug; and Travis, David, 5,566,856, Cl. 221-150.0HC.  
 Snyder, Guy T., Jr. Method and apparatus for pumping high viscosity fluids, 5,567,477, Cl. 427-282.000.  
 Snyder, Leon T.: See—  
 Raines, Jeffrey K.; Snyder, Leon T.; and Hoffman, John, 5,566,677, Cl. 128-694.000.  
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 Then, Alan M.; Snider, Gregory L.; Soave, Robert J.; and Tasker, G. William, 5,568,013, Cl. 313-532.000.  
 Societe Francaise Hoechst: See—  
 Coyard, Henri; and Deligny, Philippe, 5,567,762, Cl. 524-590.000.  
 Societe Nationale D'Etude et de Construction de Moteurs D'Aviation S.N.E.C.M.A.: See—  
 Hardy, Jean-Marie E. C.; Jourdain, Gérard E. A.; and Soligny, Marcel R., 5,566,884, Cl. 239-265.410.  
 Socket Retainer Systems, Inc.: See—  
 Goff, Thomas R., 5,566,595, Cl. 81-177.850.  
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 Backlund, Ake; Bellstrom, Kenneth; Oulie, Finn; Svanberg, Johanna; and Soderqvist, Soren, 5,567,280, Cl. 162-237.000.  
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 Pahr, Per O.; Strand, Steinar J.; and Solhjell, Erik, 5,568,327, Cl. 360-53.000.  
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 Hardy, Jean-Marie E. C.; Jourdain, Gérard E. A.; and Soligny, Marcel R., 5,566,884, Cl. 239-265.410.  
 Sollac (Societe Anonyme): See—  
 Schwendemann, Christian; Keller, Jacques; Auger, Jean-Luc; and Fatrez, Philippe, 5,567,354, Cl. 252-387.000.  
 Solvay (Societe Anonyme): See—  
 Dehennau, Claude; and Dupont, Serge, 5,567,505, Cl. 428-188.000.  
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 Croft, Thomas M.; Dent, Paul W.; Harte, Lawrence J.; and Solve, Torbjorn, 5,568,513, Cl. 375-224.000.  
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 Graeff, Roderich W., 5,566,468, Cl. 34-80.000.

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 Song, Seok-Ho: See—  
 Jung, Sang-Don; and Song, Seok-Ho, 5,567,363, Cl. 264-2.600.  
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 Krainer, Erich; and Sonnek, Martin, 5,568,040, Cl. 320-37.000.  
 Sonobe, Hideki: See—  
 Hira, Yasuo; Toba, Tamaki; Imayama, Hirota; Ohkawa, Atsuko; Fujisawa, Masayasu; Nate, Kazuo; Sonobe, Hideki; Suzuki, Saburo; Togawa, Eisei; Ishizaki, Hiroshi; and Hagiwara, Yoshiki, 5,567,333, Cl. 216-22.000.  
 Sony Corporation: See—  
 Balsom, James, 5,568,455, Cl. 369-30.000.  
 Foster, Robert F.; Hillman, Joseph T.; and LeBlanc, Rene E., 5,567,243, Cl. 118-730.000.  
 Foster, Robert F.; Hillman, Joseph T.; and Arora, Rikhit, 5,567,483, Cl. 427-535.000.  
 Fujinami, Yasushi; and Veltman, Markus H., 5,568,274, Cl. 386-107.000.  
 Gosain, Dharam P.; Westwater, Jonathan; and Usui, Setsuo, 5,567,633, Cl. 437-40.000.  
 Hiramasa, Masahide, 5,567,575, Cl. 430-394.000.  
 Hirano, Hideki; Tomita, Hidemi; and Shinozaki, Kenji, 5,568,170, Cl. 347-51.000.  
 Ishibashi, Akira; Ito, Satoshi; Okuyama, Hiroyuki; Nakano, Kazushi; Kondo, Kenji; and Takeishi, Reiko, 5,567,960, Cl. 257-103.000.  
 Kadomura, Shingo, 5,567,268, Cl. 156-345.000.  
 Kano, Hiroshi; Suzuki, Atsuko; Kagawa, Kiyoshi; and Okabe, Akihiko, 5,568,115, Cl. 338-32.00R.  
 Kawashima, Isao, 5,568,551, Cl. 380-4.000.  
 Kobayashi, Yuji, 5,568,647, Cl. 395-823.000.  
 Matsumoto, Hiroaki, 5,568,201, Cl. 348-500.000.  
 Sahara, Kenji; Narui, Hironobu; Doi, Masato; and Matsuda, Osamu, 5,568,463, Cl. 369-112.000.  
 Sakurai, Nobumasa; Mitsui, Hidoro; and Okayasu, Yoshisada, 5,568,198, Cl. 348-372.000.  
 Takamori, Tsutomu, 5,568,204, Cl. 348-705.000.  
 Tanaka, Toshiyuki, 5,568,643, Cl. 395-739.000.  
 Yoshitake, Nobuyuki; and Takakura, Shinji, 5,567,974, Cl. 257-443.000.  
 Sony Electronics: See—  
 Balsom, James, 5,568,455, Cl. 369-30.000.  
 Sony/Tektronix Corporation: See—  
 Kato, Katsuhisa; and Onozawa, Toshihiko, 5,568,035, Cl. 320-1.000.  
 Sorensen, Jens O.: See—  
 Andersen, Stig L.; and Sorensen, Jens O., 5,568,126, Cl. 340-574.000.  
 Soriano, Alexandre M.: See—  
 Diniz, Milton E.; and Soriano, Alexandre M., 5,567,186, Cl. 439-783.000.  
 South Jersey Port Corporation: See—  
 Balzano, Joseph A., 5,567,112, Cl. 414-786.000.  
 Southall, Leslie R.: See—  
 Chen, Allen G.; and Southall, Leslie R., 5,566,542, Cl. 60-39.050.  
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 Majewski, Stanislaw; Kross, Brian J.; Zorn, Carl J.; and Majewski, Lukasz A., 5,568,532, Cl. 378-98.300.  
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 Weder, Donald E., 5,566,439, Cl. 29-469.500.  
 Weder, Donald E., 5,567,486, Cl. 428-4.000.  
 Spagnol, Victor: See—  
 Galand, Claude; Jacquart, Xavier; Lebizay, Gerald; Leboudec, Jean-Yves; Louis, Philippe; Poiraud, Clement; Georges, Eric S.; Spagnol, Victor; Suffern, Edward; and Truong, Hong L., 5,568,477, Cl. 370-60.000.  
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 Leung, Donald Y. M.; Szefer, Stanley J.; and Spahn, Joseph D., 5,567,590, Cl. 435-7.200.  
 Spanset Inter AG: See—  
 Lange, Guenter, 5,566,728, Cl. 141-10.000.  
 Sparks, Michael, to Bostrom Seating, Inc. Adjustable lumbar support, 5,567,010, Cl. 297-284.400.  
 Spear, Cindy M.: See—  
 Flickner, Brett J.; Preston, Charles E.; Saldana, Daniel M.; Emigh, Jonathan D.; Fagan, Marc J.; Mulkey, Steven L.; Spear, Cindy M.; Carnesecca, Lino E.; and Pensa, David P., Jr., 5,568,392, Cl. 364-478.150.  
 Spears, Dennis R.; and Vincent, John B., to United States of America, Interior. Process for recovering metals from solution utilizing metalloprotein affinity chromatography, 5,567,316, Cl. 210-635.000.  
 Specht, Mary. Device for cleaning the surface of a tire, 5,566,420, Cl. 15-256.500.  
 Specialty Cellular Products Company: See—  
 Marshall, Andrew C.; and Fellman, Michael L., 5,567,500, Cl. 428-116.000.  
 Spector, George: See—  
 Steffen, David H.; and Spector, George, 5,566,418, Cl. 15-244.100.



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Brodnax, Timothy B.; Bialas, John S., Jr.; King, Steven A.; LeBlanc, Johnny J.; Rickard, Dale A.; Spencer, Clark J.; and Stanley, Daniel L., 5,568,380, Cl. 364-184.000.
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Dolan, John W.; Spencer, John W., Jr.; Wilson, Richard; and Walter, James, 5,566,691, Cl. 132-321.000.
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Satterfield, William H., 5,566,629, Cl. 112-80.010.
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Dolan, John W.; Spener, John W., Jr.; and Hill, Rickey I., 5,566,872, Cl. 225-41.000.
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Jaggi, Jean-Pierre, 5,566,437, Cl. 29-33.00R.
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Sperling, Werner; and Lührig, Jürgen, 5,566,604, Cl. 87-31.000.
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Körner, Klaus; Holger, Fritz; Nyarsik, Lajos; Spur, Günter; and Uhlmann, Eckart, 5,568,256, Cl. 356-359.000.
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De Haan, Joel D.; De Haan, Daniel; De Haan, Gregory; Spyker, David J.; McLeod, David P.; Koops, Wesley G.; and Gelfand, Leonid B., 5,567,327, Cl. 210-768.000.
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Grossbach, Rudolf; Huber, Peter; Lierke, Ernst-Günter; Fiedler, Michael; Weiss, Rainer; Neri, Armando; Santin, Giancarlo; and Squarizoni, Giovanni, 5,566,686, Cl. 131-84.000.
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Dulany, Margaret A.; Garvey, Chad E.; Ringold, Clay E.; and Srinivasan, Ramji, 5,567,798, Cl. 528-332.000.
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Siegfried, Robert H.; Fleming, James M.; Stalford, Michael J.; and Janson, John P., 5,567,472, Cl. 427-180.000.
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Ruhl, Robert C.; and Felice, Ralph A., 5,567,398, Cl. 422-197.000.
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DeWitt, Sheila H. H.; Kiely, John S.; Pavia, Michael R.; Schroeder, Mel C.; and Stankovic, Charles J., 5,567,391, Cl. 422-131.000.
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Brodnax, Timothy B.; Bialas, John S., Jr.; King, Steven A.; LeBlanc, Johnny J.; Rickard, Dale A.; Spencer, Clark J.; and Stanley, Daniel L., 5,568,380, Cl. 364-184.000.
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Harris, Robert S., 5,566,705, Cl. 137-43.000.
- Stapleton, Jonathan W. Multi-faceted nesting modules, 5,567,194, Cl. 446-124.000.
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DeVries, Robert A.; and Stark, Edmund J., 5,567,835, Cl. 556-453.000.
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Charter, Graeme E.; Ripley, Sherman H.; and Starkey, Norman G., 5,566,643, Cl. 119-220.000.
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Schantz, David L.; DeOms, James H.; Starling, Ronnie L.; and Ankrom, Michael J., 5,567,991, Cl. 307-10.100.
- State of Israel-Ministry of Defense Armament Development Authority-Rafael: *See*—  
Cohen, Yakov, 5,568,154, Cl. 342-443.000.
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Fay, Judy E.; LaPointe, Larry P.; and Stateler, Chad S., 5,567,009, Cl. 297-258.100.
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Dodge, Jeffrey A.; Lindstrom, Terry D.; Lugar, Charles W., III; and Staten, Gilbert S., 5,567,820, Cl. 546-202.000.
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Hagman, John F.; and Statz, Robert J., 5,567,772, Cl. 525-221.000.
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Norinder, Ulf; Bajorath, Jürgen; and Stearns, Jay F., 5,567,728, Cl. 514-465.000.
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Knoblock, Glenn A., 5,567,012, Cl. 297-303.300.
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Tavazzani, Claudio; Fassina, Andrea; and Stefani, Fabrizio, 5,568,342, Cl. 361-18.000.
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Mazur, Joseph F.; Blackburn, Brian K.; Gentry, Scott B.; and Steffens, Charles E., Jr., 5,566,974, Cl. 280-730.200.
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Sugarman, Michael N.; Beesely, Michael; Kelsey, Shannon J.; and Steger, Robert J., 5,567,909, Cl. 136-201.000.
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Keefe, Brian J.; Childers, Winthrop D.; Steinfeld, Steven W.; and Reid, W. Bruce, 5,568,171, Cl. 347-58.000.
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Brown, David L.; Stellon, Andrew P.; and Gemma, Edward A., Jr., 5,566,821, Cl. 206-63.300.
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Dietewich, Horst; Ripperger, Joachim; Stempfl, Tassilo; and Gröber, Albert, 5,567,034, Cl. 362-66.000.
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Stoney, Clement P., III; Stendera, James W.; and Bridger, Keith, 5,567,519, Cl. 428-402.000.
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Beal, David G.; Chikira, Joetta S.; Hill, Fletcher L.; Jurestovsky, Nancy R.; and Stephens, Michael R., 5,568,491, Cl. 371-30.000.
- Stephenson, Roger D.: *See*—  
Kafka, Jerry L.; Stephenson, Roger D.; and Verhulst, Michael J., 5,566,536, Cl. 56-15.200.
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- Sterling Winthrop, Inc.: *See*—  
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- Aldous, David J.; Bailey, Thomas R.; Diana, Guy D.; and Nitz, Theodore J., 5,567,719, Cl. 514-342.000.
- Stern, David L.: *See*—  
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- Sternfeld, Francine: *See*—  
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- Stevens, Philip H.: *See*—  
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- St. Martin, Edward J., to UOP. Assay for D-allose using a NAD cofactor coupled D-allose dehydrogenase, 5,567,605, Cl. 435-26.000.
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- Stoffler, Achim; Gensheimer, Valentin; Werber, Edgar; Hinz, Marc; Hummel, Peter; Wenzel, Jürgen; Volz, Albrecht; Blum, Joachim; Zschetzsche, Hubert; and Straub, Manfred, to MAN Roland Druckmaschinen. Method and apparatus for regulating ink distribution in an undershot inking unit of a printing machine, 5,566,613, Cl. 101-350.000.
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- Stolz, Heinrich, to Heinrich Stolz GmbH & Co. KG. Childproof closure for a container comprising a lower portion with extensible spout and a screw cap, 5,566,864, Cl. 222-153.140.
- Stone, Gordon R.; McGee, Richard L.; and Amick, Douglas J., to Voltek, Inc. Electrochemical power generating system, 5,567,540, Cl. 429-63.000.
- Stone, Marcia J., to HybriVet Systems, Inc. Process and apparatus for testing for substances in liquids, 5,567,619, Cl. 436-77.000.
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Tiller, Byron K.; Allard, David J.; Au, Connie Y.; Canova, Francis J., Jr.; Hsieh, Daniel M.; Goodwin, Julie F.; Johnson, Debra A. G.; Lanier, Charles S.; Lewis, James R.; Stout, Jean L.; Villafana, William; Yee, Raymond L.; Padgett, Russell S.; Ferrier, Robert B.; Corkell, Anthony F.; Murakami, Thomas T.; DeBauche, Bradley J.; Whitley, Wayne P.; Osborn, Neal A.; Beatty, Brent A.; Cox, Roger L.; Wulf, James C.; and Rivero, Jose L., 5,568,536, Cl. 379-58.000.
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- Stramel, Rodney D., to Kerr-McGee Corporation. Pigments with improved dispersibility in thermoplastic resins, 5,567,754, Cl. 524-308.000.
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Yien, Richard S.; and Stratigos, William N., 5,568,489, Cl. 370-110.100.
- Straub, Manfred: *See*—  
Stoffler, Achim; Gensheimer, Valentin; Werber, Edgar; Hinz, Marc; Hummel, Peter; Wenzel, Jürgen; Volz, Albrecht; Blum, Joachim; Zschetzsche, Hubert; and Straub, Manfred, 5,566,613, Cl. 101-350.000.
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Gourlaouen, Luc R.; Friour, Gerard A. D.; Martin, Didier J.; and Strauel, Philippe, 5,567,579, Cl. 430-567.000.
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- Strauss, Andreas; and Golovatai-Schmidt, Eduard, to Ina Walzlager Schaeffler KG. Device for continuous angular adjustment between two shafts in driving relationship, 5,566,651, Cl. 123-90.170.
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Manning, Thelma G.; Turci, Joseph; Mezger, Mark J.; and Strauss, Bernard, 5,567,912, Cl. 149-12.000.
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Baker, Raymond; Castro Pineiro, Jose L.; Guiblin, Alexander R.; Reeve, Austin J.; Sternfeld, Francine; Matassa, Victor G.; and Street, Leslie J., 5,567,726, Cl. 514-383.000.
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Perry, George K.; and Strickland, John C., 5,567,396, Cl. 422-190.000.
- Stringliner Company: *See*—  
Black, Wesley F.; and Black, Charles D., 5,566,934, Cl. 273-26.00A.
- Stritzl, Karl: *See*—  
Wladar, Helmut; Stritzl, Karl; Janisch, Andreas; and Wuerthner, Hubert, 5,566,967, Cl. 280-625.000.
- Strobel, Michael: *See*—  
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- Strohallen, Gene M.; and Young, Robert F., to Phonic Ear Incorporated. Very low power cordless headset system, 5,568,516, Cl. 375-259.000.
- Strumolo, Gary S., to Ford Motor Company. Method and system for predicting sound pressure levels within a vehicle due to wind noise, 5,568,404, Cl. 364-558.000.
- Stuart, Randolph L., to Eckel Manufacturing Company, Inc. Tubular rotation tool for snubbing operations, 5,566,769, Cl. 173-149.000.
- Stubberud, Lars: *See*—  
Klaveness, Jo; Rongved, Pål; and Stubberud, Lars, 5,567,412, Cl. 424-9.350.
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- Stucki, Jürg: *See*—  
Widmer, Hansruedi; and Stucki, Jürg, 5,568,188, Cl. 348-79.000.
- Stückrad, Björn; and Lohr, Karsten, to Daimler-Benz AG. Method for sorting plastics from a particle mixture composed of different plastics, 5,566,832, Cl. 209-9.000.
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- Stull, Mark W.; Ravenberg, Michael J.; Lauritzen, Donald R.; Rose, Larry D.; and Green, David J., to Morton International, Inc. Controlled pressure relief of an inflatable restraint reaction canister, 5,566,975, Cl. 280-732.000.
- Sturuss, Peter, to Shape Corporation. Apparatus for forming an end bumper for vehicles, 5,566,874, Cl. 228-17.000.
- STX Inc.: *See*—  
Tucker, Richard B. C.; Lewis, Fielding H., Jr.; and Davis, Jackie L., 5,566,947, Cl. 273-326.000.
- Su, Chih-Herng J., deceased (by Yann-Fen Su, executrix): *See*—  
Webster, Dean C.; Su, Chih-Herng J., deceased; and Foster, Charles H., 5,567,527, Cl. 428-412.000.
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- Sudau, Jörg: *See*—  
Lindner, Joachim; Sudau, Jörg; and Schierling, Bernhard, 5,566,803, Cl. 192-70.170.
- Suematsu, Yoshirou: *See*—  
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- Suffern, Edward: *See*—  
Galand, Claude; Jacquart, Xavier; Lebizay, Gerald; Leboudec, Jean-Yves; Louis, Philippe; Poiraud, Clement; Georges, Eric S.; Spagnol, Victor; Suffern, Edward; and Truong, Hong L., 5,568,477, Cl. 370-60.000.
- Suga, Yasutaka, to Ibaraki Seiki Machinery Company, Ltd. Device motor controlling apparatus for use in packaging machine, 5,566,526, Cl. 53-75.000.
- Sugarman, Michael N.; Beesely, Michael; Kelsey, Shannon J.; and Steger, Robert J., to Applied Materials Inc. Method for supporting a wafer in a combined wafer support and temperature monitoring device, 5,567,909, Cl. 136-201.000.
- Sugaya, Takumi: *See*—  
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- Sugg, Edwin: *See*—  
Theobald, Greg; Tavernese, Luigi; Boles, Fred; and Sugg, Edwin, 5,567,036, Cl. 362-80.000.
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Inoue, Yoshimitsu; Ito, Koichi; and Sugi, Hikaru, 5,566,881, Cl. 237-12.30B.
- Sugimoto, Tsutomu: *See*—  
Ageishi, Kentaro; Watanabe, Ryuji; and Sugimoto, Tsutomu, 5,567,494, Cl. 428-36.900.
- Sugitani, Hiroshi: *See*—  
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- Sugiura, Masayuki; Kawaguchi, Masahiro; Matsui, Shinichi; and Suzuki, Kenji, to Aisin AW Co., Ltd. Automated correction control system and method for characteristics of throttle position sensor, 5,568,386, Cl. 364-424.100.
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- Sugizaki, Ryuichi: *See*—  
Akasaka, Youichi; Sugizaki, Ryuichi; Umeda, Atsushi; and Kokura, Kunio, 5,568,583, Cl. 385-123.000.
- Sugoh, Nozomu: *See*—  
Nakatsukasa, Sigeki; Yoshioka, Kenichi; Hirakawa, Kiyoshi; Tanaka, Kazuhiko; Kawamoto, Masao; Sugoh, Nozomu; Migaki, Atsuko; and Taniguchi, Shunro, 5,567,796, Cl. 528-272.000.
- Suh, Jeong-Kwon: *See*—  
Lee, Jung-Min; Suh, Jeong-Kwon; Jeong, Soon-Yong; Park, Chun-Hee; and Park, Jeong-Hwan, 5,567,404, Cl. 423-332.000.
- Suh, Kang-Deog: *See*—  
Lim, Young-Ho; and Suh, Kang-Deog, 5,568,420, Cl. 365-185.170.
- Suh, Moon H., to Samsung Electronics Co., Ltd. Teletext and videotex processing system and method, 5,568,182, Cl. 348-13.000.
- Suh, Su-hn-Ji; and Yang, Hong-Geun, to Samsung Electronics Co., Ltd. Thermal print head, 5,568,175, Cl. 347-200.000.
- Sullivan, Patrick K.; Vithanage, Dayananda; and Bourke, Robert E., to Oceanit Laboratories, Inc. Lysimeter for collecting chemical samples from the vadose zone, 5,567,889, Cl. 73-863.230.
- Sulsky, Richard B.: *See*—



- Magnin, David R.; Biller, Scott A.; Dickson, John K., Jr.; Lawrence, R. Michael; and Sulsky, Richard B., 5,567,841, Cl. 562-23.000.  
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 Meltzer, Frank P., 5,566,903, Cl. 241-261.200.  
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 Backer, Joseph M.; Bohlen, Peter; and Sum, Phaik-Eng, 5,567,693, Cl. 514-154.000.  
 Sumic, Zarko, to Puget Consultants Inc. Method and apparatus for power outage determination using distribution system information, 5,568,399, Cl. 364-492.000.  
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 Sumitomo Chemical Company, Limited: See—  
 Senbo, Satoshi, 5,567,429, Cl. 424-405.000.  
 Sumitomo Electric Industries, Ltd.: See—  
 Inada, Hiroshi; and Iiyama, Michitomo, 5,567,674, Cl. 505-475.000.  
 Ohishi, Hidenori, 5,566,791, Cl. 188-73.390.  
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 Takayama, Takeshi, 5,568,109, Cl. 335-213.000.  
 Sumitomo Metal Mining Company Limited: See—  
 Makuta, Fujio; Fukaya, Hiroshi; and Kawakubo, Katsuhiko, 5,567,358, Cl. 252-518.000.  
 Sumitomo Rubber Industries, Ltd.: See—  
 Iwamura, Wako, 5,567,253, Cl. 152-209.00R.  
 Nishiyama, Tetsuji; and Teraguchi, Takashi, 5,568,250, Cl. 356-28.000.  
 Sumitomo Seika Chemicals Co., Ltd.: See—  
 Nagata, Manabu; Yamamoto, Takashi; Takemori, Shinichi; Hashimoto, Naoyuki; Ishikawa, Hiroki; and Yamada, Yozo, 5,567,744, Cl. 523-200.000.  
 Sumitomo Wiring Systems, Ltd.: See—  
 Sasai, Osamu; Suzuki, Masaji; and Sakatani, Atsushi, 5,567,184, Cl. 439-752.000.  
 Sumida, Yoshitaka; and Takahashi, Shinichiro, 5,568,025, Cl. 318-287.000.  
 Summers, James B.: See—  
 Sheppard, George S.; Davidsen, Steven K.; Summers, James B.; and Carrera, George M., Jr., 5,567,711, Cl. 514-303.000.  
 Summers, Shirley F. Toothbrush holder, 5,566,823, Cl. 206-209.100.  
 Sumser, Siegfried: See—  
 Rumez, Werner; and Sumser, Siegfried, 5,566,655, Cl. 123-306.000.  
 Sun Chemical Corporation: See—  
 Cappuccio, Anthony R.; and Rizopoulos, Athanasios P., 5,567,747, Cl. 523-403.000.  
 Sun Microsystems, Inc.: See—  
 D'Souza, Godfrey P.; and Testa, James F., 5,568,429, Cl. 365-189.050.  
 Sunamori, Takashi; Sato, Hiroshi; Hirose, Masakazu; and Yanauti, Kazuo, to Taisei Chemical Industries, Ltd. Simple transmittance-measuring instrument, 5,568,267, Cl. 356-416.000.  
 Sunaoka, Toyohiko: See—  
 Kishi, Mitsuhiro; Sunaoka, Toyohiko; and Shimoyama, Mikio, 5,566,401, Cl. 4-300.000.  
 Sundstrom, Tim P.: See—  
 Idebro, Mats G.; and Sundstrom, Tim P., 5,567,338, Cl. 219-718.000.  
 Sundvik, Michael T.: See—  
 Grande, David W.; Sundvik, Michael T.; Bishop, Judith L.; and Cole, Bernard F., 5,568,450, Cl. 367-131.000.  
 Sunell, Henrik: See—  
 Heinonen, Jouko; Sunell, Henrik; and Koskinen, Matti, 5,568,655, Cl. 455-38.100.  
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 Coon, Warren P.; Watkins, Stuart C.; and Kropp, Charles M., 5,567,864, Cl. 73-1.00J.  
 Surles, Billy W.: See—  
 Shotts, Noel J.; Surles, Billy W.; and Fader, Philip D., 5,567,088, Cl. 405-270.000.  
 Survival Technology, Inc.: See—  
 Massino, Frank, 5,567,160, Cl. 434-262.000.  
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 Weinschenk, Joseph L., III; Deacon, Jim; and Sussman, Glenn R., 5,567,365, Cl. 264-1.700.  
 Sussmeier, John: See—  
 Zheng, Joe; and Sussmeier, John, 5,567,934, Cl. 250-237.00R.  
 Suter, Jürg: See—  
 Weber, Eduard; Rohr, René; and Suter, Jürg, 5,567,321, Cl. 210-376.000.  
 Sutherland, Ivan E. Robot arm structure, 5,567,110, Cl. 414-735.000.  
 Suzuki, Akira, to Fuji Jukogyo Kabushiki Kaisha. Drive control system and method for battery car, 5,568,024, Cl. 318-139.000.  
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 Suzuki, Fumiaki; Okuta, Toshimitsu; and Otoshi, Masaaki, to Fuji Photo Film Co., Ltd. Photographic support, 5,567,576, Cl. 430-533.000.  
 Suzuki, Hajime: See—  
 Takahashi, Katsunori; Maeda, Eizo; Suzuki, Hajime; Yamada, Sumio; Nakazawa, Taichi; and Imaiida, Yasuo, 5,567,222, Cl. 75-376.000.  
 Suzuki, Haruhiko; Tamura, Takahiro; Miyahara, Masahiko; Yamaguchi, Hiroaki; Ohuchi, Hideaki; Kondo, Akira; and Matsushita, Toshikazu, to Nippondenso Co., Ltd. Rotary position detecting device, 5,567,874, Cl. 73-118.200.  
 Suzuki, Hiroshi: See—  
 Kawata, Tatsuo; Suzuki, Hiroshi; Sashima, Hiroki; Miyabayashi, Kazuhiko; and Horie, Osamu, 5,567,990, Cl. 257-788.000.  
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 Omori, Shigeru; Hattori, Tomohiko; and Suzuki, Jun, 5,568,314, Cl. 359-464.000.  
 Suzuki, Kazuhisa, to Kabushiki Kaisha Toshiba. Image forming apparatus with improved ability to emulate other image forming apparatuses, 5,568,594, Cl. 395-112.000.  
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 Sugiura, Masayuki; Kawaguchi, Masahiro; Matsui, Shinichi; and Suzuki, Kenji, 5,568,386, Cl. 364-424.100.  
 Suzuki, Koji; and Saito, Hiroshi, to Canon Kabushiki Kaisha. Three-value power supply device and image forming apparatus utilizing the same, 5,567,997, Cl. 307-127.000.  
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 Kodera, Yasuto; Onuma, Kenji; and Suzuki, Masaaki, 5,568,296, Cl. 359-76.000.  
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 Sasai, Osamu; Suzuki, Masaji; and Sakatani, Atsushi, 5,567,184, Cl. 439-752.000.  
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 Suzuki, Mikio: See—  
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 Suzuki Motor Corporation: See—  
 Toyota, Katsuhiko, 5,567,873, Cl. 73-117.300.  
 Suzuki, Nobukazu: See—  
 Sato, Yuichi; and Suzuki, Nobukazu, 5,568,273, Cl. 358-451.000.  
 Suzuki, Saburo: See—  
 Hira, Yasuo; Toba, Tamaki; Iwayama, Hirokazu; Ohkawa, Atsuko; Fujisawa, Masayasu; Nate, Kazuo; Sonobe, Hideki; Suzuki, Saburo; Togawa, Eisai; Ishizaki, Hiroshi; and Hagiwara, Yoshiki, 5,567,333, Cl. 216-22.000.  
 Suzuki, Tetsuo; Taniguro, Masahiro; Saito, Hiroyuki; Tanno, Koichi; Yanagi, Haruki; Kawamura, Makoto; Kinoshita, Hiroyuki; Shinmachi, Masaya; and Ming, Tan A., to Canon Kabushiki Kaisha. Recording medium transport mechanism and ink jet recording apparatus using the mechanism, 5,567,069, Cl. 400-636.000.  
 Suzuki, Toru: See—  
 Wakai, Hideyuki; Suzuki, Toru; Terada, Keiji; Moriya, Masato; and Ando, Manabu, 5,568,261, Cl. 356-376.000.  
 Suzuki, Toshihiko: See—  
 Yokota, Yoshihiro; Naito, Shotaro; Suzuki, Toshihiko; and Koide, Akira, 5,567,880, Cl. 73-514.330.  
 Suzuki, Yasuhiro, to Fujikiko Kabushiki Kaisha. Shifting apparatus of automatic transmission, 5,566,583, Cl. 74-477.000.  
 Svanberg, Johanna: See—  
 Backlund, Ake; Bellstrom, Kenneth; Oulie, Finn; Svanberg, Johanna; and Soderqvist, Soren, 5,567,280, Cl. 162-237.000.  
 Svedberg, Anna: See—  
 Lindgren, Per-Olov; Paulsson, Karin; and Svedberg, Anna, 5,567,223, Cl. 75-401.000.  
 Svehaug, Oswald C. Martial arts board, 5,567,496, Cl. 428-60.000.  
 Svendsen, Jan: See—  
 Brown, Trevor P.; Conroy, Brian G.; Cox, Stephen J.; Gardner, Christopher; Larke, Roger D.; Marshall, Barry; and Svendsen, Jan, 5,566,882, Cl. 238-343.000.  
 Swamy, Deepak N.; and Pecore, Victor K., to Dell USA L.P. Method and apparatus for making staggered blade edge connectors, 5,567,295, Cl. 205-125.000.  
 Swanson, Dennis K., to Lamps Plus, Inc. Torchier lamp with vertically adjustable task light, 5,567,043, Cl. 362-250.000.  
 Swartzendruber, Ray E., to CTB Inc. Method and apparatus for circulating air, 5,567,200, Cl. 454-338.000.  
 Sway-Tin, Min; Roterman, Thaddeus; Impullitti, Joseph F.; Meir, David S.; and Zawacki, Ronald A., to Chrysler Corporation. Performance monitor for electric vehicle, 5,568,052, Cl. 324-435.000.  
 Swenson, Michael D., to Sanders, Bruce C. Vacuum device for harvesting brine shrimp eggs, 5,566,492, Cl. 43-6.500.  
 Swenson, Robert E., to Colorama Creations, a division of Life Lines, Inc. Unitary blank for forming a merchandising display container convertible into a mailable container, 5,566,831, Cl. 206-767.000.  
 Swidler, Ronald, to Cal-West Equipment Company, Inc. Protective coating composition and method of using such composition, 5,567,756, Cl. 524-389.000.  
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- Gentry, Timothy W.; Fredin, Gerald J.; and Riedl, Daniel A., 5,568,629, Cl. 395-441.000.  
 Symbios Corporation: See—  
 Horton, Richard F., 5,568,312, Cl. 359-435.000.  
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 Kowalczyk, Bruce A.; and Dvorak, Charles A., 5,567,818, Cl. 546-97.000.  
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 Theisen, Marc S., 5,567,087, Cl. 405-258.000.  
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 Szarka, Laszlo J.: See—  
 Patel, Ramesh N.; Szarka, Laszlo J.; and Partyka, Richard, 5,567,614, Cl. 435-280.000.  
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 Asher, Amram; and Lahav, Nathan, 5,567,926, Cl. 235-382.000.  
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 Lee, Jin-Yuan; Wei, John C.-S.; and Chao, Ying-Chen, 5,567,643, Cl. 437-60.000.  
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 Chan, Shu F.; Tsao, Min H.; Hsu, Kuo Y.; and Peng, Hwei C., 5,568,253, Cl. 356-246.000.  
 Chen, Shih-Shiung; and Chou, Kern-Shen, 5,567,660, Cl. 437-231.000.  
 Wang, Chin-Kun; and Chang, Cheng-Cheng, 5,567,658, Cl. 437-228.000.  
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 Tsubota, Koujiro; Fujioka, Kazuyoshi; Yoshimura, Yohji; Ohgami, Hiroyuki; and Takafuji, Yutaka, 5,568,297, Cl. 359-80.000.  
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 Takagi, Jun: See—  
 Iwade, Takashi; Takagi, Jun; and Migaki, Yoshiro, 5,566,905, Cl. 242-43.00A.  
 Takahara, Tomoko: See—  
 Iwahara, Takahisa; Chiba, Makoto; Takahara, Tomoko; and Yonezawa, Kazuya, 5,567,833, Cl. 556-434.000.  
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 Sogo, Yoshitaka; Kanematsu, Hideki; and Takahashi, Kazuo, 5,566,587, Cl. 74-526.000.  
 Takahashi, Kiyoshi, to NEC Corporation. Method for fabricating a gate electrode structure of compound semiconductor device, 5,567,647, Cl. 437-177.000.  
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 Sumida, Yoshitaka; and Takahashi, Shinichiro, 5,568,025, Cl. 318-287.000.  
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 Mizoguchi, Naotake; and Takahashi, Tadao, 5,567,151, Cl. 432-145.000.  
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 Takai, Atsushi; and Abe, Hajime, to Hitachi, Ltd. Optical parallel transmission device, 5,568,576, Cl. 385-24.000.  
 Takai, Atsushi: See—  
 Usagawa, Toshiyuki; Takai, Atsushi; and Itoh, Hiroyuki, 5,567,961, Cl. 257-197.000.  
 Takai, Hideo: See—  
 Makino, Toshiaki; Terada, Katsuyuki; Sebata, Michio; Hattori, Morishige; Takai, Hideo; Yasui, Toshi; Oshima, Masabumi; Iida, Akiyoshi; Takano, Yasushi; Katoo, Chisachi; and Kobayashi, Kenji, 5,566,800, Cl. 191-67.000.  
 Takakura, Shinji: See—  
 Yoshitake, Nobuyuki; and Takakura, Shinji, 5,567,974, Cl. 257-443.000.  
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 Takamori, Tsutomu, to Sony Corporation. Digital video switching apparatus, 5,568,204, Cl. 348-705.000.  
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 Akagi, Kyo; Futamoto, Masaaki; Kugiya, Fumio; Miyamura, Yoshinori; Takano, Hisashi; Matsuda, Yoshihumi; Suzuki, Mikio; Nakao, Takeshi; Munemoto, Takayuki; Fukuoka, Hirotosugu; Aihara, Makoto; Takagaki, Tokuhio; Aoi, Hajime; and Seo, Yosuke, 5,568,331, Cl. 360-77.070.  
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 Takano, Yoshishige: See—  
 Okamoto, Kenji; Horimura, Hiroyuki; Minemi, Masahiko; Takeda, Yoshinobu; Takano, Yoshishige; and Kaji, Toshihiko, 5,566,449, Cl. 29-888.092.  
 Takao, Hideaki; Murata, Tatsuo; Kanbe, Junichiro; Tamura, Miki; Kamio, Masaru; Sekimura, Nobuyuki; and Kikuchi, Yoshiki, to Canon Kabushiki Kaisha. Liquid crystal display having trapezoidal color filters formed from a low-temperature curing polyamino resin having a photosensitive group, 5,568,293, Cl. 356-68.000.  
 Takarada, Mitsuhiro: See—  
 Yoshikawa, Yuji; and Takarada, Mitsuhiro, 5,567,561, Cl. 430-106.600.  
 Takasago International Corporation: See—  
 Hagiwara, Toshimitsu; Sugiyama, Hiroshi; Matsushima, Yoshimasa; and Kobayashi, Tohru, 5,567,560, Cl. 430-59.000.  
 Takase, Akihiko: See—  
 Ogasawara, Nobuo; Endo, Noboru; Miki, Kazuo; and Takase, Akihiko, 5,568,468, Cl. 370-13.000.  
 Takasu, Akira: See—  
 Jinbo, Noriyuki; and Takasu, Akira, 5,568,031, Cl. 318-630.000.  
 Takata Corporation: See—  
 Yoshida, Ryoichi; Kosugi, Noriyuki; Tanaka, Yoshihiko; Yanagi, Eiji; Atoh, Tadayuki; Koeguchi, Akira; and Minami, Yoshihiko, 5,566,972, Cl. 280-728.200.  
 Takata, Toshimasa: See—  
 Tsuji, Yoichiro; Abe, Yoshiharu; Sagane, Toshihiro; and Takata, Toshimasa, 5,567,776, Cl. 525-289.000.  
 Tsuji, Yoichiro; Abe, Yoshiharu; Sagane, Toshihiro; and Takata, Toshimasa, 5,567,777, Cl. 525-289.000.  
 Takatori, Sunao: See—  
 Shou, Guoliang; Takatori, Sunao; and Yamamoto, Makoto, 5,568,080, Cl. 327-356.000.  
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 Hatano, Yasuhiro; Takayama, Hajime; Fukada, Yasushi; Kurita, Kazuhiko; and Nojiri, Kazuo, 5,568,277, Cl. 358-400.000.  
 Takayama, Takeshi, to Sumitomo Heavy Industries, Ltd. Normal conducting bending electromagnet, 5,568,109, Cl. 335-213.000.



- Takayama, Toru; Narisawa, Tsutomu; and Imanari, Hitoshi, to Nikon Corporation. Multiple point focus detection camera. 5,568,223, Cl. 396-123.000.
- Takeda Chemical Industries, Ltd.: *See—*  
Parish, Roger; Chapin, Frederic W.; Kono, Yoshiaki; and Tsukui, Makoto, 5,567,691, Cl. 514-94.000.
- Takeda, Nobuto: *See—*  
Ito, Susumu; Kamiguchi, Masao; Yamamura, Masato; Neko, Noriaki; Uchiyama, Tatsuhiro; Hosoya, Yuichi; Takeda, Nobuto; and Hiraga, Kaoru, 5,567,367, Cl. 264-40.100.
- Takeda, Shinichi: *See—*  
Yamanobe, Masato; Takeda, Shinichi; Ishii, Takayuki; Saika, Toshihiro; and Kobayashi, Isao, 5,567,956, Cl. 257-55.000.
- Takeda, Yoshinobu: *See—*  
Okamoto, Kenji; Horimura, Hiroyuki; Minemi, Masahiko; Takeda, Yoshinobu; Takano, Yoshishige; and Kaji, Toshihiko, 5,566,449, Cl. 29-888.092.
- Takehara, Kenichi: *See—*  
Kamada, Takeshi; and Takehara, Kenichi, 5,566,906, Cl. 242-563.000.
- Takehara, Takako: *See—*  
Law, Kam S.; Robertson, Robert; Kollrack, Michael; Lee, Angela T.; Takehara, Takako; Feng, Guofu J.; and Maydan, Dan, 5,567,476, Cl. 427-255.700.
- Takeishi, Reiko: *See—*  
Ishibashi, Akira; Ito, Satoshi; Okuyama, Hiroyuki; Nakano, Kazushi; Kondo, Kenji; and Takeishi, Reiko, 5,567,960, Cl. 257-103.000.
- Takekuma, Toshitsugu; Kurihara, Ryoichi; and Yamagiwa, Akira, to Hitachi, Ltd. Signal transmitting device, circuit block and integrated circuit suited to fast signal transmission. 5,568,063, Cl. 326-30.000.
- Takemae, Yoshihiro, to Fujitsu Limited. Memory and method of reading out of the memory. 5,568,427, Cl. 365-189.020.
- Takemori, Shinichi: *See—*  
Nagata, Manabu; Yamamoto, Takushi; Takemori, Shinichi; Hashimoto, Naoyuki; Ishikawa, Hiroki; and Yamada, Yoza, 5,567,744, Cl. 523-200.000.
- Takemoto, Masanobu: *See—*  
Uchiyama, Tatsuhiro; Takemoto, Masanobu; and Ogata, Toshiyuki, 5,568,028, Cl. 318-566.000.
- Takemoto, Satoshi: *See—*  
Kosuge, Masami; Takemoto, Satoshi; and Suzuki, Masami, 5,567,005, Cl. 296-204.000.
- Takemoto, Shinichi: *See—*  
Toda, Hiroshi; Kawasaki, Akihiro; Eda, Masami; Takemoto, Shinichi; and Sakuraba, Tamotsu, 5,568,236, Cl. 355-259.000.
- Takemoto, Takashi: *See—*  
Kaneko, Kenji; and Takemoto, Takashi, 5,568,020, Cl. 315-370.000.
- Takenaka, Kenji; Kayukawa, Hiroaki; and Hidaka, Shigeyuki, to Kabushiki Kaisha Toyota Jidoshokki Seisakusho. Variable capacity swash-plate type compressor with an improved capacity control means. 5,567,124, Cl. 417-222.200.
- Takeno, Hiroshi: *See—*  
Imanishi, Hiroshi; Miyagoshi, Eiji; and Takeno, Hiroshi, 5,568,140, Cl. 341-67.000.
- Takeshita, Shigeru: *See—*  
Fukunaga, Takao; and Takeshita, Shigeru, 5,566,801, Cl. 192-3.230.
- Takeuchi, Hisaharu: *See—*  
Satoh, Takao; Ichinomiya, Hiroshi; Takeuchi, Hisaharu; and Yamamoto, Akira, 5,568,628, Cl. 395-440.000.
- Takeuchi, Tatsu; Kuroyama, Yoshihiro; and Shimada, Teruhisa, to Canon Kabushiki Kaisha; and Nippon Paper Industries Co., Inc. Ink-jet recording paper, and ink-jet recording method. 5,567,513, Cl. 428-331.000.
- Takimoto, Kiyoshi: *See—*  
Kyogaku, Masafumi; and Takimoto, Kiyoshi, 5,567,872, Cl. 73-105.000.
- Takizawa, Hiroshi, to NEC Corporation. Method and system for rewriting data in a non-volatile memory a predetermined large number of times. 5,568,626, Cl. 395-430.000.
- Takizawa, Yoshinori; and Yoshida, Naoka, to Eastman Kodak Company. Pattern recognition apparatus. 5,568,568, Cl. 382-220.000.
- Takuma, Keisuke: *See—*  
Koshida, Hitoshi; Ghoda, Isamu; Ohyama, Tsukasa; and Takuma, Keisuke, 5,567,470, Cl. 427-151.000.
- Talvalkar, Shashi G.; and McCreight, Marion E., to AT&T Global Information Solutions Company. Thermal transfer printing ribbon for printing security bar code symbols. 5,568,177, Cl. 347-217.000.
- Tam, Andrew C.: *See—*  
Baumgart, Peter M.; Leung, Wing P.; Nguyen, Hung V.; Nguyen, Thao A.; Tam, Andrew C.; and Wu, Anthony, 5,567,484, Cl. 427-555.000.
- Tam, Herbert W., to AT&T IPM Corp. Apparatus and method for obtaining synchronism between a base station and a portable unit arranged for operation in a frequency hopping system. 5,568,510, Cl. 375-202.000.
- Tamargo Garcia, Francisco: *See—*  
Sitges Menendez, Francisco J.; Sitges Menendez, Fernando; Alvarez Tamargo, Francisco; Tamargo Garcia, Francisco; Quiroga Alvarez, Jose M.; Lefevre, Ives; and Gonzalez Gonzalez, Carlos, 5,567,285, Cl. 204-227.000.
- Tambrands Inc.: *See—*  
Brown, Robert W., Jr., 5,566,435, Cl. 28-120.000.
- Tamir, Baruch: *See—*  
Tamir, Giora; Tamir, Baruch; and Geffen, Samuel, 5,568,538, Cl. 379-58.000.
- Tamir, Giora; Tamir, Baruch; and Geffen, Samuel. Voice message recorder for use with telephones. 5,568,538, Cl. 379-58.000.
- Tamura, Miki: *See—*  
Takao, Hideaki; Murata, Tatsuo; Kanbe, Junichiro; Tamura, Miki; Kamio, Masaru; Sekimura, Nobuyuki; and Kikuchi, Yoshiki, 5,568,293, Cl. 356-68.000.
- Tamura, Takahiro: *See—*  
Suzuki, Haruhiko; Tamura, Takahiro; Miyahara, Masahiko; Yamaguchi, Hiroaki; Ohuchi, Hideaki; Kondo, Akira; and Matsushita, Toshikazu, 5,567,874, Cl. 73-118.200.
- Tamura, Yoshiyuki: *See—*  
Shimizu, Toshifumi; Narikawa, Hiroshi; and Tamura, Yoshiyuki, 5,568,092, Cl. 330-260.000.
- Tanabe, Keiichiro; Ikegaya, Akihiko; Takahashi, Toshiya; and Fujimori, Naoki, to Sumitomo Electric Industries, Ltd. Diamond cutting tool and method of manufacturing the same. 5,567,522, Cl. 428-408.000.
- Tanaka, Akihiro: *See—*  
Oda, Kunio; Kitada, Nobuhiko; Tanaka, Akihiro; Fujiwara, Kazuo; and Matsumoto, Shinichi, 5,567,668, Cl. 503-204.000.
- Tanaka, Chieko: *See—*  
Miura, Takaharu; Itoh, Masataka; and Tanaka, Chieko, 5,567,572, Cl. 430-510.000.
- Tanaka, Katsuhiko: *See—*  
Yago, Atsushi; and Tanaka, Katsuhiko, 5,566,897, Cl. 242-348.100.
- Tanaka, Kazuhiko: *See—*  
Nakatsukasa, Sigeki; Yoshioka, Kenichi; Hirakawa, Kiyoshi; Tanaka, Kazuhiko; Kawamoto, Masao; Sugoh, Nozomu; Migaki, Atsuko; and Taniguchi, Shunro, 5,567,796, Cl. 528-272.000.
- Tanaka, Ken-ichi; and Shimizu, Masako, to Mitsubishi Denki Kabushiki Kaisha. Method and apparatus of pattern recognition. 5,568,563, Cl. 382-144.000.
- Tanaka, Masayuki: *See—*  
Sawamura, Yasushi; Teshiba, Toshihiro; and Tanaka, Masayuki, 5,567,749, Cl. 523-443.000.
- Tanaka, Mitsutoshi: *See—*  
Takahashi, Osamu; and Tanaka, Mitsutoshi, 5,567,539, Cl. 429-57.000.
- Tanaka, Nobuhiro, to Kao Corporation. Method and apparatus for correcting load appearance. 5,567,102, Cl. 414-274.000.
- Tanaka, Toshio; and Nishizawa, Takaaki, to Koito Manufacturing Co., Ltd. Vehicular headlamp having thermally protected front lens. 5,567,033, Cl. 362-61.000.
- Tanaka, Toshiyuki, to Sony Corporation. Efficient interrupt control apparatus with a common interrupt control program and control method thereof. 5,568,643, Cl. 395-739.000.
- Tanaka, Tsunefumi: *See—*  
Ogawa, Hideki; Tanaka, Tsunefumi; and Koyama, Takeshi, 5,568,321, Cl. 359-676.000.
- Tanaka, Yoshiaki; and Tanimoto, Masashi, to Sharp Kabushiki Kaisha. Printing machine having a menu with mode selection. 5,567,062, Cl. 400-62.000.
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Fukutomi, Masao; Aoki, Shigeki; Komori, Kazunori; Asano, Toshihisa; Tanaka, Yoshiaki; and Maeda, Hiroshi, 5,567,288, Cl. 204-298.060.
- Tanaka, Yoshihiko: *See—*  
Yoshida, Ryoichi; Kosugi, Noriyuki; Tanaka, Yoshihiko; Yanagi, Eiji; Atoh, Tadayuki; Kokeguchi, Akira; and Minami, Yoshihiko, 5,566,972, Cl. 280-728.200.
- Tanaka, Yutaka; Ozawa, Kunitaka; Kariya, Takao; and Uzawa, Shunichi, to Canon Kabushiki Kaisha. Gate valve device. 5,566,922, Cl. 251-157.000.
- Tandberg Data AS: *See—*  
Pahr, Per O.; Strand, Steinar J.; and Solhjell, Erik, 5,568,327, Cl. 360-53.000.
- Tanguay, Armand R., Jr.; and Jenkins, B. Keith, to University of Southern California. Modulator-based photonic chip-to-chip interconnections for dense three-dimensional multichip module integration. 5,568,574, Cl. 385-14.000.
- Tani, Naoki; Sugaya, Takumi; Rokutan, Takao; Oshiba, Mitsuo; and Sakurada, Takefumi, to Olympus Optical Co., Ltd. Optical information recording and reproducing apparatus in which reproducing light is used to perform servo control having no offset at recording mode. 5,568,458, Cl. 369-44.350.
- Tanifuji, Manabu: *See—*  
Shiono, Satoru; and Tanifuji, Manabu, 5,566,673, Cl. 128-653.100.
- Taniguchi, Hiromichi, to NEC Corporation. Chip type solid electrolyte capacitor. 5,568,354, Cl. 361-540.000.
- Taniguchi, Hiroshi; Yamamoto, Akihiko; Nomura, Takao; Nishio, Takeyoshi; and Iwai, Hisayuki, to Mitsui Petrochemical Industries, Ltd.; and Toyota Jidosha Kabushiki Kaisha. Propylene polymer composition. 5,567,759, Cl. 524-451.000.
- Taniguchi, Masahiko: *See—*  
Nakajima, Yuji; and Taniguchi, Masahiko, 5,567,517, Cl. 428-364.000.
- Taniguchi, Shunro: *See—*  
Nakatsukasa, Sigeki; Yoshioka, Kenichi; Hirakawa, Kiyoshi; Tanaka, Kazuhiko; Kawamoto, Masao; Sugoh, Nozomu; Migaki, Atsuko; and Taniguchi, Shunro, 5,567,796, Cl. 528-272.000.
- Taniguro, Masahiro: *See—*  
Suzuki, Tetsuo; Taniguro, Masahiro; Saito, Hiroyuki; Tanno, Koichi; Yanagi, Haruyuki; Kawamura, Makoto; Kinoshita, Hiroyuki; Shinmachi, Masaya; and Ming, Tan A., 5,567,069, Cl. 400-636.000.
- Taniguchi, Ryosuke; Hattori, Shinichi; and Sakamoto, Takahiro, to Mitsubishi Denki Kabushiki Kaisha. System for transmitting a signal. 5,568,448, Cl. 367-82.000.
- Tanimoto, Masashi: *See—*

- Tanaka, Yoshiaki; and Tanimoto, Masashi, 5,567,062, Cl. 400-62.000.
- Tanitsa, Katsuya: *See—*  
Hashimoto, Akira; and Tanitsa, Katsuya, 5,567,755, Cl. 524-317.000.
- Tanner, John C., II: *See—*  
Grabenkort, Richard W.; Tanner, John C., II; and Wecker, Sheldon M., 5,566,729, Cl. 141-25.000.
- Tanno, Koichi: *See—*  
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- Tarcha, Peter J.; Rohr, Thomas E.; Markese, James J.; Cotton, Therese; and Rospendowski, Bernard N., to Abbott Laboratories. Surface-enhanced raman spectroscopy immunoassay method, composition and kit. 5,567,628, Cl. 436-525.000.
- Tasco Electronics Co., Ltd.: *See—*  
Yoshikazu, Nishimura, 5,568,185, Cl. 348-22.000.
- Tasker, G. William: *See—*  
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- Tatah, Abdelkrim, to Matsushita Electric Industrial Co., Ltd. Laser ablation forward metal deposition with electrostatic assisted bonding. 5,567,336, Cl. 219-121.660.
- Tatsumi, Satoshi, to NEC Corporation. Portable electric equipment and rechargeable built-in batteries. 5,568,038, Cl. 320-14.000.
- Tatsumi, Setsuji: *See—*  
Oku, Seiichi; Kubo, Masahiro; and Tatsumi, Setsuji, 5,568,284, Cl. 358-518.000.
- Tatsuta Electric Wire & Cable Co., Ltd.: *See—*  
Wakita, Shinichi, 5,567,357, Cl. 252-514.000.
- Tattermusch, Peter, to Mercedes-Benz AG. Rear axle suspension with reduced oversteer. 5,566,969, Cl. 280-688.000.
- Tavazzani, Claudio; Fassina, Andrea; and Stefani, Fabrizio, to SGS-Thomson Microelectronics S.r.l. Apparatus and method for protecting an amplifier circuit. 5,568,342, Cl. 361-18.000.
- Tavernese, Luigi: *See—*  
Theobald, Greg; Tavernese, Luigi; Boles, Fred; and Sugg, Edwin, 5,567,036, Cl. 362-80.000.
- Taylor, Clifford L.; and Crowley, Daniel T., to Viratec Thin Films, Inc. Rotating floating magnetron dark-space shield and cone end. 5,567,289, Cl. 204-298.110.
- Taylor, Donald R., Jr.: *See—*  
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Lindeboom, Wieger; Tiesinga, Jan; and Viet, Peter S., 5,568,374, Cl. 364-131.000.
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Martinez, David M.; and Tilman, Paul A., 5,566,429, Cl. 24-587.000.
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Ishimoto, Takashi, 5,568,056, Cl. 324-754.000.
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Bathurst, Ian C.; Bradley, John D.; Tomei, L. David; and Barr, Philip J., 5,567,425, Cl. 424-195.100.
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Ota, Yoshiyuki; Tomioka, Ichiro; and Murakami, Eiji, 5,568,068, Cl. 326-82.000.
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Hirano, Hideki; Tomita, Hidemi; and Shinozaki, Kenji, 5,568,170, Cl. 347-51.000.
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Nishida, Kiyoshi; Sugiyama, Tsutomu; Funato, Katsuro; and Hattori, Kenji, 5,567,521, Cl. 428-403.000.
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Iwade, Takashi; Takagi, Jun; and Migaki, Yoshiro, 5,566,905, Cl. 242-43.00A.
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Grah, Micael; and Tordby, Håkan, 5,567,992, Cl. 307-10.100.
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Okuda, Tetsuro; Yamada, Hirohito; and Torikai, Toshitaka, 5,568,505, Cl. 372-96.000.
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Benmergui, Alberto D.; and Maloney, Kurt, 5,568,376, Cl. 364-145.000.
- Torpey, Peter A.: See—  
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Clapp, Clarence P.; and Torrey, George S., 5,567,456, Cl. 426-116.000.
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Horie, Hiroshi; and Tobita, Tsutomu, 5,568,098, Cl. 331-16.000.
- Tosoh Corporation: See—  
Shima, Yasuji; and Iwashita, Tetsuji, 5,568,454, Cl. 369-13.000.
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Enomoto, Takeo; Abe, Toshiya; Murakami, Hironobu; and Hiraki, Shini-chi, 5,567,446, Cl. 425-84.000.
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McGee, Dennis E.; and Touhsaent, Robert E., 5,567,773, Cl. 525-221.000.
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Glansk, Leif; and Marstorp, Leif, 5,566,711, Cl. 137-557.000.
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Townsley, Phillip M.; and Townsley, Peter J., 5,567,325, Cl. 210-612.000.
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Yamauchi, Toshiya; Yutani, Yoshikazu; and Toyoda, Rika, 5,568,601, Cl. 395-142.000.
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Ishii, Mikio; and Mori, Shigeru, 5,566,517, Cl. 52-387.000.
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Izumisawa, Yoshiaki; Kawahara, Tukas; and Toyosawa, Akihiko, 5,567,842, Cl. 562-486.000.
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Hirota, Masaharu; Ito, Toru; Endo, Norikazu; Nojima, Akihiko; and Kato, Yoshitaka, 5,568,390, Cl. 364-449.000.
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Ando, Yukito; Okura, Akira; and Ito, Mikio, 5,568,393, Cl. 364-478.020.
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Sheffer, Eliezer A.; and Verma, Shiv P., 5,568,535, Cl. 379-39.000.
- Tracor Applied Sciences, Inc.: See—  
Walk, Charles R.; and Margalit, Nehemiah, 5,567,548, Cl. 429-218.000.
- Trainor, John J., to Siemens Energy & Automation, Inc. Electronic operations counter for a voltage regulator controller, 5,568,398, Cl. 364-492.000.
- Tran, Bang T.: See—  
Toerner, Thomas J.; and Tran, Bang T., 5,567,528, Cl. 428-414.000.
- Tranelis, Klaus: See—  
Lepsius, Tilwin; Gierenz, Gerhard; Tranelis, Klaus; Reinfelder, Gerd-Ruediger; Franken, Joachim; and Halm, Hans, 5,567,071, Cl. 401-68.000.
- Tranovich, Stephen J., to HR Textron Inc. Integrated compliance servovalve, 5,568,022, Cl. 318-566.000.
- Trans-Med Biotech, Incorporated: See—  
Lehnen, Brian C., 5,567,627, Cl. 436-518.000.
- Transnuclear: See—  
Kirchner, Bernard; and Chiocci, Rene, 5,567,952, Cl. 250-506.100.
- TransSwitch Corporation: See—  
Bartholomay, William G.; Parrella, Eugene L.; Upp, Daniel C.; and Ichiba, Mikio S., 5,568,060, Cl. 326-86.000.
- Trapanovski, Tomislav. Hairdresser's comb, 5,566,687, Cl. 132-148.000.
- Travis, David: See—  
Fallen, Norma; Rivera, Tony; Snyder, Doug; and Travis, David, 5,566,856, Cl. 221-150.0HC.
- Treasury, Director, Bureau of Engraving and Printing, Department of the: See—  
Hankel, Steven G.; Gunderson, Dennis E.; Scott, C. Timothy; and Gleisner, Roland L., Jr., 5,566,570, Cl. 73-159.000.
- Trent, James R.: See—  
Flint, Andrew; Trent, James R.; and Grula, Jerome A., 5,568,492, Cl. 371-22.100.
- TriEnda Corporation: See—  
Brown, Henry F.; and Giannini, Dennis A., 5,566,624, Cl. 108-51.100.
- Trimble Navigation Limited: See—  
Janky, James M.; Loomis, Peter V. W.; and Schipper, John F., 5,568,152, Cl. 342-357.000.
- Samsel, Robert A.; Westfall, Brian G.; and Will, Stephen K., 5,568,162, Cl. 343-842.000.
- Schipper, John F.; and Janky, James M., 5,568,119, Cl. 340-825.370.
- TriTech Microelectronics International Pte Ltd.: See—  
Neoh, Chong L., 5,568,409, Cl. 364-702.000.
- Trocherie, Jean-Pierre: See—  
Baudet, Jean-Yves; Marriere, Marc; and Trocherie, Jean-Pierre, 5,567,049, Cl. 366-206.000.
- Trokan, Paul D.; and Boutillier, Glenn D., to Procter & Gamble Company. The Multiple layer, multiple opacity backside textured belt, 5,566,724, Cl. 139-383.00A.
- Trombley, Henry: See—  
Baker, James C.; Trombley, Henry; and Prengle, Scott H., 5,567,334, Cl. 216-24.000.
- Trommer, Jörg; and Eschbach, Markus, to GKN Automotive AG; and Lohr & Bromkamp GmbH. Upset tube, 5,566,777, Cl. 180-232.000.
- Trubetskoy, Vladimir S.: See—  
Torchilin, Vladimir P.; Trubetskoy, Vladimir S.; Wolf, Gerald L.; and Gazelle, G. Scott, 5,567,410, Cl. 424-9.400.
- Truong, Hong L.: See—  
Galand, Claude; Jacquart, Xavier; Lebizay, Gerald; Leboudec, Jean-Yves; Louis, Philippe; Poiraud, Clement; Georges, Eric S.; Spagnol, Victor; Suffern, Edward; and Truong, Hong L., 5,568,477, Cl. 370-60.000.
- Trustees of Columbia University In The City of New York, The: See—  
Modak, Shanta; and Sampath, Lester, 5,567,495, Cl. 428-36.900.
- TRW Inc.: See—  
Cuevas, Jess A., 5,566,976, Cl. 280-737.000.
- Foreman, Kevin G.; Kiser, Willie C.; and Miller, Paul J., 5,568,348, Cl. 361-118.000.
- Gordon, Gary, 5,567,098, Cl. 411-48.000.
- McLaughlin, Kevin M.; and Miller, Joseph D., 5,568,389, Cl. 364-424.050.
- Noah, Bruce C.; Phillips, Robert S.; and Venable, Frederick D., 5,567,125, Cl. 417-310.000.
- TRW Vehicle Safety Systems Inc.: See—  
Fleming, William J.; and Bauer, Barney J., 5,566,978, Cl. 280-801.200.
- Mazur, Joseph F.; Blackburn, Brian K.; Gentry, Scott B.; and Steffens, Charles E., Jr., 5,566,974, Cl. 280-730.200.
- Wipacuramont, Pongdet P., 5,566,977, Cl. 280-743.100.
- Tsai, Cheng-Hsien. Trunk with a concealable retractable handle, 5,566,798, Cl. 190-115.000.
- Tsai, Hsi-Chuan: See—  
Muroi, Souichi; and Tsai, Hsi-Chuan, 5,567,792, Cl. 528-53.000.
- Tsao, Min H.: See—  
Chan, Shu F.; Tsao, Min H.; Hsu, Kuo Y.; and Peng, Huei C., 5,568,253, Cl. 356-246.000.
- Tsay, Yuh-Geng: See—  
Lin, Cheng-I; and Tsay, Yuh-Geng, 5,567,581, Cl. 435-4.000.



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- Tsubota, Rumi. See—  
Kajimoto, Kazuo; Kanno, Kinya; and Tsubota, Rumi, 5,568,199, Cl. 348-390.000.
- Tsuchiya, Koji, to Precision Fukuhara Works, Ltd. Fabric slitting and take-up mechanism for a circular knitting machine. 5,566,558, Cl. 66-151.000.
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- Tsukiji, Masaki. See—  
Eguchi, Tadashi; Momose, Katsumi; Narumi, Hiroji; Nishimura, Tetsu-haru; Hosaka, Kotaro; Tsukiji, Masaaki; and Ishizuka, Koh, 5,568,337, Cl. 360-78.110.
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- Tsukui, Makoto. See—  
Parish, Roger; Chapin, Frederic W.; Kono, Yoshiaki; and Tsukui, Makoto, 5,567,691, Cl. 514-94.000.
- Tsukushi, Masanori. See—  
Yano, Makoto; Tsukushi, Masanori; and Yaginuma, Noriyuki, 5,567,924, Cl. 218-143.000.
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- Tsuruta, Kazuhiro; Fukumoto, Harutsugu; and Fujino, Seiji, to Nippondenso Co., Ltd. Semiconductor device having SOI structure and method for fabricating the same. 5,567,968, Cl. 257-356.000.
- Tsuyama, Osamu. See—  
Yoshida, Norio; and Tsuyama, Osamu, 5,568,326, Cl. 359-872.000.
- Tuck, Brian C. See—  
Schrner, Peter W.; Schnobel, Timothy J.; and Tuck, Brian C., 5,568,388, Cl. 364-424.010.
- Tucker, Richard B. C.; Lewis, Fielding H., Jr.; and Davis, Jackie L., to STX Inc. Lacrosse stick having open sidewall structure. 5,566,947, Cl. 273-326.000.
- Tufts, Arthur W.; Jellema, Mark; and Haddle, Blair, to Tufts Grinding, Inc. Method and apparatus for grinding bars. 5,567,195, Cl. 451-11.000.
- Tufts Grinding, Inc. See—  
Tufts, Arthur W.; Jellema, Mark; and Haddle, Blair, 5,567,195, Cl. 451-11.000.
- Tulane Educational Fund, Administrators of the. See—  
Henderson, Lee A.; Coy, David H.; and Garry, Robert F., Jr., 5,567,805, Cl. 530-350.000.
- Tung, Harvey. See—  
Allen, Scott I.; Ferguson, Michael; and Tung, Harvey, 5,567,488, Cl. 428-34.100.
- Allen, Scott I.; Ferguson, Michael; and Tung, Harvey, 5,567,489, Cl. 428-34.100.
- Tung, James C. S. See—  
Richardson, David L.; Tung, James C. S.; and Berg, David C., 5,568,527, Cl. 376-245.000.
- Turberg, Andreas. See—  
Fischer, Reiner; Bretschneider, Thomas; Krüger, Bernd-Wieland; Santel, Hans-Joachim; Dollinger, Markus; Turberg, Andreas; and Wachendorf-Neumann, Ulrike, 5,567,671, Cl. 504-283.000.
- Turci, Joseph. See—  
Manning, Thelma G.; Turci, Joseph; Mezger, Mark J.; and Strauss, Bernard, 5,567,912, Cl. 149-12.000.
- Turi, Mordechai; DeRossett, Edmund Z.; and Yang, Ching-Yun M., to Chicopee. Method of forming textile-like apertured plastic films. 5,567,376, Cl. 264-455.000.
- Turnbull, Douglas A. See—  
Bishop, Stephen G.; Gu, Shiqun; and Turnbull, Douglas A., 5,568,497, Cl. 372-40.000.
- Turner, John E. See—  
McDermott, Mark W.; and Turner, John E., 5,568,067, Cl. 326-55.000.
- Turner, Thomas D. See—  
James, David R.; and Turner, Thomas D., 5,567,095, Cl. 410-7.000.
- Turney, Robert J. See—  
Shih, Wayne K.; and Turney, Robert J., 5,567,511, Cl. 428-314.800.
- Tury, Bernard, to Imperial Chemical Industries PLC. Ammonium organo-phosphorus acid salts. 5,567,341, Cl. 508-436.000.
- U S West Technologies, Inc. See—  
Hansen, Benjamin E., 5,568,604, Cl. 395-161.000.
- UAB Research Foundation, The. See—  
Sommadosi, Jean-Pierre; and el Kouni, Mahmoud H., 5,567,689, Cl. 514-50.000.
- Uchida, Akihiro. See—  
Yamashita, Keiichiro; and Uchida, Akihiro, 5,568,397, Cl. 364-491.000.
- Uchida, Naoshi. See—  
Kuboyama, Katsunori; and Uchida, Naoshi, 5,566,818, Cl. 200-271.000.
- Uchikawa, Kiyoshi. See—  
Saikan, Seishiro; Uchikawa, Kiyoshi; and Ohsawa, Hisao, 5,568,460, Cl. 369-100.000.
- Uchiya, Satoshi. See—  
Nakashiba, Yasutaka; and Uchiya, Satoshi, 5,567,632, Cl. 437-35.000.
- Uchiyama, Akira; Shibata, Ryuji; Nakagome, Yoshinobu; and Kubo, Masaharu, to Hitachi, Ltd.; and Hitachi Microcomputer System Ltd. Semiconductor integrated circuit device having an internally produced operation voltage matched to operation speed of circuit. 5,568,083, Cl. 327-538.000.
- Uchiyama, Tatsuhiro; Takemoto, Masanobu; and Ogata, Toshiyuki, to Fanuc Ltd. Tool life management system. 5,568,028, Cl. 318-566.000.
- Uchiyama, Tatsuhiro. See—  
Ito, Susumu; Kamiguchi, Masao; Yamamura, Masato; Neko, Noriaki; Uchiyama, Tatsuhiro; Hosoya, Yuichi; Takeda, Nobuto; and Hiraga, Kaoru, 5,567,367, Cl. 264-40.100.
- Ude, Werner. See—  
Knebel, Joachim; Arndt, Peter J.; and Ude, Werner, 5,567,826, Cl. 548-324.100.
- Udelle, Steven D. Process for liquid catnip aromas. 5,567,436, Cl. 424-439.000.
- Ueda, Masahide. See—  
Hirai, Atsuro; Ueda, Masahide; Terasaka, Yoshihisa; Sano, Eiichi; Matsura, Masahiko; Yamasaki, Hiroyuki; Yamada, Masami; and Izumi, Tomoo, 5,568,244, Cl. 355-309.000.
- Ueda, Yasutsugu. See—  
Kim, Choung U.; Misco, Peter F., Jr.; Wichtowski, John A.; Ueda, Yasutsugu; Hudyma, Thomas W.; Matiskella, John D.; D'Andrea, Stanley V.; Hoeft, Shelley E.; Miller, Raymond F.; Mansuri, Muzam-mil M.; and Bronson, Joanne J., 5,567,698, Cl. 514-210.000.
- Ueda, Yoichi. See—  
Kazama, Kouichi; Komino, Mitsuki; Ishikawa, Kenji; and Ueda, Yoichi, 5,567,267, Cl. 156-345.000.
- Ueding, Michael. See—  
Mohr, Bernhard; Ueding, Michael; Strobel, Michael; and Kriegler, Albert, 5,566,425, Cl. 19-159.00R.
- Uematsu, Kimio. See—  
Kanzaki, Masatoshi; and Uematsu, Kimio, 5,568,213, Cl. 396-257.000.
- Uemura, Ken; Nagashima, Yukiko; Saito, Yasunari; Kurita, Takao; Miyake, Tetsuo; and Shimizu, Kazuaki, to Asahi Glass Company Ltd. Method and device for measuring distortion of a transmitting beam or a surface shape of a three-dimensional object. 5,568,258, Cl. 356-371.000.
- Ueno, Yasunori. See—  
Kaneko, Masanobu; and Ueno, Yasunori, 5,568,319, Cl. 359-643.000.
- Ueno, Yoshio. See—  
Wada, Yasuo; Ueno, Yoshio; and Honda, Munenobu, 5,566,925, Cl. 254-358.000.
- Uesugi, Hiroyuki. See—  
Nishio, Hidetoshi; Furuse, Takako; Hamada, Yumiko; and Uesugi, Hiroyuki, 5,567,661, Cl. 437-228.000.
- Uhlmann, Eckart. See—  
Körner, Klaus; Holger, Fritz; Nyarsik, Lajos; Spur, Günter; and Uhlmann, Eckart, 5,568,256, Cl. 356-359.000.
- Ujita, Toshihiko. See—  
Sato, Osamu; Sugitani, Hiroshi; Orikasa, Tsuyoshi; Ujita, Toshihiko; Higuma, Masahiko; Kotaki, Yasuo; and Hinami, Jun, 5,567,373, Cl. 264-112.000.
- Ulland, Hartmut. See—  
Hass, Jürgen; Hilgendorf, Rolf; Neuber, Siegfried; Schlipf, Thomas; and Ulland, Hartmut, 5,568,407, Cl. 364-579.000.
- Ulmer, Dale T. See—  
de Nijs, Richard H. J.; Haymes, Charles L.; and Ulmer, Dale T., 5,568,525, Cl. 375-356.000.
- Umeda, Atsushi. See—  
Akasaka, Youichi; Sugizaki, Ryuichi; Umeda, Atsushi; and Kokura, Kunio, 5,568,583, Cl. 385-123.000.
- Umeda, Narumi; Matsumoto, Tadashi; and Douzono, Youichi, to NTT Mobile Communications Network Inc. Code division multiple access mobile communication system. 5,568,472, Cl. 370-18.000.
- Umehara, Kazuhiko. See—  
Hijikata, Toshihiko; Hiraoka, Tetsuya; and Umehara, Kazuhiko, 5,566,545, Cl. 60-274.000.
- Umeyama, Takehiko. See—  
Nakashima, Teruya; and Umeyama, Takehiko, 5,568,103, Cl. 331-185.000.

- Umezawa, Akira. See—  
Atsumi, Shigeru; Kuriyama, Masao; Banba, Hironori; Umezawa, Akira; and Otsuka, Nobuaki, 5,568,419, Cl. 365-185.300.
- Ungermann-Bass, Inc. See—  
Futrel, William T., 5,568,613, Cl. 395-200.020.
- Uni-Charm Corporation. See—  
Nagata, Manabu; Yamamoto, Takushi; Takemori, Shinichi; Hashimoto, Naoyuki; Ishikawa, Hiroki; and Yamada, Yozo, 5,567,744, Cl. 523-200.000.
- Ochi, Kengo, 5,566,642, Cl. 119-171.000.
- Uniden Corporation. See—  
Konishi, Yoshihiro; Okuma, Yoshio; Baba, Yoshihiko; and Fujiwara, Hideki, 5,568,101, Cl. 333-134.000.
- Unifrax Corporation. See—  
Lintz, Timothy S.; and Paddock, Ralph W., 5,567,536, Cl. 428-688.000.
- Union Carbide Chemicals & Plastics Technology Corporation. See—  
Wagner, Burkhard E.; Zilker, Daniel P., Jr.; and Jorgensen, Robert J., 5,567,665, Cl. 502-9.000.
- Union Oil Company of California. See—  
Allen, William C.; Rickard, William M.; Hoyer, Daniel P.; Stickers, David E.; and Kelley, Matthew J., 5,566,986, Cl. 285-55.000.
- Uniroyal Chemical Company, Inc. See—  
Dekeyser, Mark A.; McPhee, Derek J.; and McDonald, Paul T., 5,567,723, Cl. 514-357.000.
- Uniroyal Chemical Ltd./Lee. See—  
Dekeyser, Mark A.; McPhee, Derek J.; and McDonald, Paul T., 5,567,723, Cl. 514-357.000.
- Unisys Corporation. See—  
Jou, Edwin; and Jeppesen, James H., III, 5,568,423, Cl. 365-185.330.
- Williams, Bruce H.; Arbanas, Glenn A.; and Greeff, Roy E., 5,568,521, Cl. 375-344.000.
- United Industrial Trading Corp. See—  
Eisenbraun, Kenneth D., 5,566,454, Cl. 30-228.000.
- United Microelectronics Corporation. See—  
Sheu, Shing-Ren; Hsue, Chen-Chiu; and Chung, Chen-Hui, 5,567,970, Cl. 257-390.000.
- United Parcel Service of America, Inc. See—  
Zheng, Joe; and Sussmeier, John, 5,567,934, Cl. 250-237.00R.
- U.S. Farathane Corporation. See—  
Raza, Irfan F.; Preczewski, Thomas F.; and Walther, Ronald D., 5,567,019, Cl. 301-5.300.
- United States of America  
Agriculture. See—  
Abbott, Thomas P.; Carlson, Kenneth D.; and Kleiman, Robert, 5,567,812, Cl. 536-128.000.
- Air Force. See—  
Fajardo, Mario E.; and Macier, Michel, 5,567,935, Cl. 250-251.000.
- O'Loughlin, James P.; and Calico, Steve E., 5,567,995, Cl. 307-109.000.
- Pinkus, Alan R., 5,567,937, Cl. 250-252.100.
- America. See—  
Stetter, Joseph R.; Hesketh, Peter J.; Gendel, Steven M.; and MacLay, G. Jordan, 5,567,301, Cl. 205-777.500.
- Army. See—  
Althouse, Mark L. G., 5,568,186, Cl. 348-33.000.
- Basso, Michael J., 5,567,936, Cl. 250-252.100.
- Lever, James H.; Gooch, Gordon E.; and Folton, Edward P., 5,567,078, Cl. 405-61.000.
- Manning, Thelma G.; Turci, Joseph; Mezger, Mark J.; and Strauss, Bernard, 5,567,912, Cl. 149-12.000.
- Meeker, David L.; and Hall, Kenneth G., 5,567,950, Cl. 250-504.00R.
- Paolella, Arthur; and Nabet, Bahram, 5,567,973, Cl. 257-257.000.
- Energy. See—  
Johnson, Gary W., 5,568,255, Cl. 356-352.000.
- Kramer, Daniel P., 5,568,585, Cl. 385-139.000.
- Stevens, Robyn L.; Arnold, Greg N.; and McBride, Ryan G., 5,567,946, Cl. 250-376.000.
- Health and Human Services. See—  
Zaslloff, Michael A., 5,567,681, Cl. 514-13.000.
- Interior. See—  
Spears, Dennis R.; and Vincent, John B., 5,567,316, Cl. 210-635.000.
- National Aeronautics and Space Administration. See—  
Hergenrother, Paul M.; and Smith, Joseph G., Jr., 5,567,800, Cl. 528-353.000.
- Jefferies, Kent S., 5,568,366, Cl. 362-1.000.
- Yost, William T., 5,566,573, Cl. 73-643.000.
- Navy. See—  
Ames, Gregory H., 5,568,578, Cl. 385-34.000.
- Bucholtz, Frank, 5,568,049, Cl. 324-244.100.
- Grande, David W.; Sundvik, Michael T.; Bishop, Judith L.; and Cole, Bernard F., 5,568,450, Cl. 367-131.000.
- Greenhalgh, Samuel, 5,566,908, Cl. 244-138.00R.
- Justus, Brian L.; Huston, Alan L.; Campillo, Anthony J.; and Merritt, Charles D., 5,568,496, Cl. 372-11.000.
- Williams, Michael R., 5,568,447, Cl. 367-20.000.
- Yahalom, Joseph; and Peckerr, Martin, 5,567,551, Cl. 430-5.000.
- U.S. Philips Corporation. See—  
Bernsen, Johannes A. C.; and Kashioka, Seiji, 5,568,524, Cl. 375-350.000.
- Krainer, Erich; and Sonnek, Martin, 5,568,040, Cl. 320-37.000.
- Liedenbaum, Coen T. H. F.; and Reid, John J. E., 5,568,303, Cl. 359-184.000.
- Lindeboom, Wiegert; Tiesinga, Jan; and Viet, Peter S., 5,568,374, Cl. 364-131.000.
- Minot, Joël; and Gentric, Philippe, 5,568,591, Cl. 395-22.000.
- Ramalho, Joao N. V. L.; and Voorman, Johannes O., 5,568,091, Cl. 330-258.000.
- Zwaans, Bernardus A. M., 5,568,494, Cl. 371-40.100.
- United States Surgical Corporation. See—  
Brown, David L.; Stellan, Andrew P.; and Gemma, Edward A., Jr., 5,566,821, Cl. 206-63.300.
- Scanlon, Christopher, 5,566,822, Cl. 206-63.300.
- U.S. Test, Inc. See—  
Rountree, Steven P.; and Berjaoui, Samir W., 5,568,449, Cl. 367-99.000.
- United Technologies Automotive, Inc. See—  
Hill, John P., 5,568,095, Cl. 331-56.000.
- United Technologies Corporation. See—  
Birbara, Philip J.; Couch, Harold T.; Genovese, Joseph E.; and Rethke, Donald W., 5,567,389, Cl. 422-28.000.
- Pankow, Richard J.; and Epler, J. David, 5,566,572, Cl. 73-304.00C.
- Paulus, Donald E.; and Cox, George B., Jr., 5,566,544, Cl. 60-258.000.
- United Technologies Motor Systems, Inc. See—  
Welch, David W., 5,568,026, Cl. 318-443.000.
- Univ. of Delaware. The. See—  
Shine, Annette D.; Smith, Steven D.; and Noda, Isao, 5,567,769, Cl. 525-63.000.
- Univ. of GA Research Foundation. See—  
Chu, Chung K.; Cheng, Yung-Chi; Pai, Balakrishna S.; and Yao, Gang-Oing, 5,567,688, Cl. 514-46.000.
- Universal Electronics Inc. See—  
Park, Young M., 5,568,367, Cl. 362-109.000.
- University Microfilms, Inc. See—  
Willis, Donald F.; Brooks, John E.; Adra, Hosni; and Hou, Hsieh S., 5,568,571, Cl. 382-254.000.
- University of British Columbia. The. See—  
Chan, Danley C. K.; and Lawrence, Peter D., 5,568,029, Cl. 318-568.110.
- University of California, Regents of the. See—  
Benet, Leslie; and Wu, Chi Y., 5,567,592, Cl. 435-7.210.
- Dennis, Edward A.; and Washburn, William N., 5,567,597, Cl. 435-18.000.
- Ladisch, Stephan; and Hasegawa, Akira, 5,567,684, Cl. 514-25.000.
- Szoka, Francis C., Jr., 5,567,434, Cl. 424-450.000.
- University of Cincinnati. See—  
Robe, Ronald C.; and Valentine, John D., 5,567,944, Cl. 250-370.090.
- University of Connecticut. See—  
Ouimette, Donald R., 5,567,929, Cl. 250-214.0VT.
- University of Illinois, The Board of Trustees of the. See—  
Bishop, Stephen G.; Gu, Shiqun; and Turnbull, Douglas A., 5,568,497, Cl. 372-40.000.
- University of Kansas Medical Center. See—  
Sarras, Michael P., Jr.; and Hudson, Billy G., 5,567,609, Cl. 435-240.200.
- University of Maryland. See—  
Bryan, Philip N.; Alexander, Patrick A.; and Strausberg, Susan L., 5,567,601, Cl. 435-222.000.
- University of Minnesota, Regents of the. See—  
Vince, Robert; and Hua, Mei, 5,567,703, Cl. 514-261.000.
- University of Nebraska, The Board of Regents of the. See—  
Porter, Thomas R., 5,567,415, Cl. 424-9.520.
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Keana, John F. W.; Martin, Vladimir; and Ralston, William H., 5,567,411, Cl. 424-9.100.
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Lates, Alan M.; and Stone, Richard A., 5,567,731, Cl. 514-554.000.
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Tanguay, Armand R., Jr.; and Jenkins, B. Keith, 5,568,574, Cl. 385-14.000.
- University of Tennessee Research Corporation, The. See—  
Caetano-Anolles, Gustavo; Bassam, Brant J.; and Gresshoff, Peter M., 5,567,585, Cl. 435-6.000.
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Magda, Darren; Sessler, Jonathan L.; Iverson, Brent; Jansen, Petra L.; Wright, Meredith; Mody, Tarak D.; and Hemmi, Gregory W., 5,567,687, Cl. 514-44.000.
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Gold, Larry; and Ringquist, Steven, 5,567,588, Cl. 435-6.000.
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Davis, Gerald W.; Huang, Shipping; and Unsworth, Peter J., 5,567,994, Cl. 307-105.000.
- Unterman, Ronald. See—  
Rothmel, Randi K.; and Unterman, Ronald, 5,567,324, Cl. 210-611.000.
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Mowry, John R.; Harris, Jacqueline A.; Luebke, Charles P.; and Hamm, David A., 5,567,860, Cl. 585-639.000.
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Behler, Ansgar; Ploog, Uwe; Uphues, Guenther; Wahle, Bernd; Waltenberger, Peter; and Jansen, Yvonne, 5,567,340, Cl. 510-527.000.
- Upjohn Company, The: See—  
Claes, Paul; De Bondt, Leo; and Van Giel, Walter, 5,566,828, Cl. 206-570.000.
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Bartholomay, William G.; Parrella, Eugene L.; Upp, Daniel C.; and Ichiba, Mikio S., 5,568,060, Cl. 326-86.000.
- Upton, David M.: See—  
Schuss, Jack J.; Maloney, Peter R.; Upton, David M.; and McMorrow, Robert J., 5,568,086, Cl. 330-124.00R.
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Desai, Sureshchandra G.; Hessel, John F.; Urfer, Allen D.; Allen, Charles B.; and Fischer, Stephen A., 5,567,808, Cl. 536-4.100.
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- Urushida, Shigeo: See—  
Sato, Shoichi; Tabuchi, Toshi; Urushida, Shigeo; and Shimizu, Sakae, 5,567,416, Cl. 424-76.400.
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Narita, Mitsuo, 5,568,008, Cl. 313-113.000.
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Saegusa, Shigeru, 5,566,565, Cl. 72-306.000.
- Usui, Setsuo: See—  
Gosain, Dharam P.; Westwater, Jonathan; and Usui, Setsuo, 5,567,633, Cl. 437-40.000.
- USX Corporation: See—  
Ilgar, Ersan; Patula, Edward J.; and Roney, James R., 5,567,482, Cl. 427-510.000.
- Utah Medical Products, Inc.: See—  
Smith, Roger E., 5,567,624, Cl. 436-163.000.
- Utron Technology Inc.: See—  
Chang, Su-Jaw, 5,567,639, Cl. 437-52.000.
- Uytendaele, Carlo: See—  
Leenders, Luc; Remmerie, Herman; and Uytendaele, Carlo, 5,568,173, Cl. 347-96.000.
- Uzawa, Shunichi: See—  
Tanaka, Yutaka; Ozawa, Kunitaka; Kariya, Takao; and Uzawa, Shunichi, 5,566,922, Cl. 251-157.000.
- Vacanti, Joseph P.; and Freeman, Michael R., to Massachusetts Institute of Technology; and Children's Medical Center Corporation. Genitourinary cell-matrix structure for implantation into a human and a method of making. 5,567,612, Cl. 435-240.230.
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- Vacmetal Gesellschaft für Vakuum-Metallurgie mbH: See—  
Boing, Eberhard; and Moratschke, Rainer, 5,566,989, Cl. 285-163.000.
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Reutimann, Ernesto J.; Vadehra, Dharam V.; and Wedral, Elaine R., 5,567,453, Cl. 426-89.000.
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- VAE Aktiengesellschaft: See—  
Durchschlag, Gerald, 5,566,912, Cl. 246-448.000.
- Vaid, Pardip K.; and Stevens, Philip H., to Smith & Wesson Corp. Integral butt plate with latch and catch mechanisms for pistol magazine. 5,566,487, Cl. 42-7.000.
- Valentine, John D.: See—  
Rohe, Ronald C.; and Valentine, John D., 5,567,944, Cl. 250-370.090.
- Valentino, Loredana: See—  
Quadri, Luisa; Bernardi, Luigi; Bianchi, Giuseppe; Ferrari, Patrizia; Melloni, Piero; and Valentino, Loredana, 5,567,697, Cl. 514-176.000.
- Valeo Systemes D'Essuyage: See—  
Morin, Pascal, 5,567,097, Cl. 411-34.000.
- Valeo Vision: See—  
Albou, Pierre, 5,568,017, Cl. 315-219.000.
- Lopez, Francois, 5,567,044, Cl. 362-348.000.
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- Vallance, William E. T., to Titus International Limited. Joint forming device. 5,567,081, Cl. 403-406.100.
- Valmet Corporation: See—  
Niskanen, Juhani; Kivioja, Pekka; Lahtinen, Juha; Lensu, Esa; and Salavamäki, Esa, 5,566,451, Cl. 29-895.300.
- Rantanen, Rauno, 5,567,479, Cl. 427-359.000.
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Lehtinen, Jukka; Rautakorpi, Paavo; and Haavisto, Seppo, 5,566,472, Cl. 34-242.000.
- Valois S.A.: See—  
Jouillat, Claude; Pennaneac'h, Hervé; and Theot, Michel, 5,566,865, Cl. 222-287.000.
- Valspar Corporation, The: See—  
Martino, Phillip C.; and Davis, Kenneth G., 5,567,781, Cl. 525-438.000.
- Valtek, Inc.: See—  
Ennis, Dan O.; Gooch, Robert E.; Chipman, Stephen R.; and Nelson, Jonathan D., 5,566,923, Cl. 251-315.040.
- Van den Bergen, Patrick: See—  
Joos, François; and Van den Bergen, Patrick, 5,568,220, Cl. 396-626.000.
- Vandenbosche, Jean J.: See—  
Cotteret, Jean; Audoussat, Marie P.; LaGrange, Alain; and Vandenbosche, Jean J., 5,567,421, Cl. 424-70.100.
- Vanderborcht, Bart: See—  
De Leys, Robert; Vanderborcht, Bart; Saman, Eric; and Van Heuvel-swyn, Hugo, 5,567,603, Cl. 435-235.100.
- Van der Gaag, Michael R.: See—  
Caprio, Craig A.; Van der Gaag, Michael R.; Hinckley, Charles C.; and Chemelli, John B., 5,567,617, Cl. 435-287.200.
- Van der Net, Dirk: See—  
Schoormans, Johannes A. H. M.; and Van der Net, Dirk, 5,566,440, Cl. 29-507.000.
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Nelson, John C.; Fesler, Robert M.; and Vanderwerf, Dennis F., 5,568,324, Cl. 359-742.000.
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- Van Giel, Walter: See—  
Claes, Paul; De Bondt, Leo; and Van Giel, Walter, 5,566,828, Cl. 206-570.000.
- Vanguard International Semiconductor Corporation: See—  
Tseng, Heng-Huei, 5,567,640, Cl. 437-52.000.
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De Leys, Robert; Vanderborcht, Bart; Saman, Eric; and Van Heuverswyn, Hugo, 5,567,603, Cl. 435-235.100.
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Schmidt, Melvin J.; Coach, Thomas P.; Hause, Glenn C.; Galowitz, Dennis A.; Wyman, James P.; Hendricks, Robert A.; Van Steeg, Lawrence J.; and Evans, Harold H., 5,566,507, Cl. 49-428.000.
- Van Vollenhoven, Ronald F.: See—  
McGuire, James L.; Van Vollenhoven, Ronald F.; and Engleman, Edgar G., 5,567,696, Cl. 514-170.000.
- Van Winkle, D. Wayne; and Hurst, Bobby G., to Drexel Oil Field Services, Inc. Stripper/packer. 5,566,753, Cl. 166-84.100.
- Varadarajan, Ravi: See—  
Bamji, Cyrus; and Varadarajan, Ravi, 5,568,396, Cl. 364-491.000.
- Varaprasad, Desaraju V.; Lynam, Niall R.; Habibi, Hamid R.; and Desaraju, Padma. Electrochromic mirror. 5,567,360, Cl. 252-583.000.
- Vassiliou, Eustathios: See—  
Schaefer, Walter R.; Vassiliou, Eustathios; Kuhn, Bruno R.; and Guinto, Joseph F., 5,566,626, Cl. 110-246.000.
- Vaughan, Jamieson: See—  
Martin, Lynn E.; Williamson, Jay D.; Blom, Kenneth M.; Vaughan, Jamieson; and Smith, Charles S., 5,566,518, Cl. 52-426.000.
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- Vedvick, Thomas S.: See—  
Craig, William S.; Harper, John R.; Kostel, Paul J.; Parker, Jonathan R.; and Vedvick, Thomas S., 5,567,807, Cl. 530-395.000.
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Fujinami, Yasushi; and Veltman, Markus H., 5,568,274, Cl. 386-107.000.
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Noah, Bruce C.; Phillips, Robert S.; and Venable, Frederick D., 5,567,125, Cl. 417-310.000.
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Marsh, Edward K.; Nelson, Richard A.; McCleerey, Earl W.; DeFibaugh, George R.; and Verdun, Gary J., 5,567,168, Cl. 439-181.000.
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Tack, Joris G. J.; and Verhelle, Christian D., 5,566,824, Cl. 206-213.100.
- Verhoeven, Thomas R.: See—

- Chen, Cheng Y.; Larsen, Robert D.; and Verhoeven, Thomas R., 5,567,824, Cl. 548-252.000.
- Verhulst, Michael J.: See—  
Kafka, Jerry L.; Stephenson, Roger D.; and Verhulst, Michael J., 5,566,536, Cl. 56-15.200.
- Verma, Shiv P.: See—  
Sheffer, Eliezer A.; and Verma, Shiv P., 5,568,535, Cl. 379-39.000.
- Vernier, Jean-Michel: See—  
Whitten, Jeffrey P.; McDonald, Ian A.; and Vernier, Jean-Michel, 5,567,710, Cl. 514-292.000.
- Vernon, Philip: See—  
Busby, Andrew D.; and Vernon, Philip, 5,567,743, Cl. 523-143.000.
- Verosol USA Inc.: See—  
Jelic, Ralph, 5,566,735, Cl. 160-84.040.
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- Vicard, Gilles: See—  
Vicard, Jean-François; and Vicard, Gilles, 5,567,402, Cl. 423-245.200.
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- Victor Company of Japan, Ltd.: See—  
Hirohata, Naoto; Shudo, Katsuyuki; and Miyazaki, Yuuki, 5,568,329, Cl. 360-32.000.
- Kaneko, Kenji; and Takemoto, Takashi, 5,568,020, Cl. 315-370.000.
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Vadgama, Pankaj M.; Christie, Ian M.; Benmakroha, Yazid M.; and Reddy, Subrayal M., 5,567,290, Cl. 204-415.000.
- Videoconferencing Systems, Inc.: See—  
Cortjes, Leo M.; Franklin, Kenneth A.; Mays, Richard C.; and Smith, Curtis M., 5,568,183, Cl. 348-15.000.
- Viet, Peter S.: See—  
Lindeboom, Wieger; Tiesinga, Jan; and Viet, Peter S., 5,568,374, Cl. 364-131.000.
- Vij, Sandeep: See—  
Foerstel, Joseph W.; and Vij, Sandeep, 5,567,177, Cl. 439-526.000.
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- Vila, Ileana: See—  
Khatri, Bharat; Marx, Fred; Mayer, Dan E.; Merkin, Cynthia M.; and Vila, Ileana, 5,568,611, Cl. 395-186.000.
- Villafana, William: See—  
Tiller, Byron K.; Allard, David J.; Au, Connie Y.; Canova, Francis J., Jr.; Hsieh, Daniel M.; Goodwin, Julie F.; Johnson, Debra A. G.; Lanier, Charles S.; Lewis, James R.; Stout, Jean L.; Villafana, William; Yee, Raymond L.; Padgett, Russell S.; Ferrier, Robert B.; Corkill, Anthony F.; Murakami, Thomas T.; DeBauche, Bradley J.; Whitley, Wayne P.; Osborn, Neal A.; Beatty, Brent A.; Cox, Roger L.; Wulf, James C.; and Rivero, Jose L., 5,568,536, Cl. 379-58.000.
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Spears, Dennis R.; and Vincent, John B., 5,567,316, Cl. 210-635.000.
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Deaton, Timothy E., 5,566,820, Cl. 206-15.300.
- Viratec Thin Films, Inc.: See—  
Taylor, Clifford L.; and Crowley, Daniel T., 5,567,289, Cl. 204-298.110.
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Visser, Timon J., 5,567,308, Cl. 210-232.000.
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McCree, Alan V.; and Viswanathan, Vishu R., 5,568,514, Cl. 375-245.000.
- Vithanage, Dayananda: See—  
Sullivan, Patrick K.; Vithanage, Dayananda; and Bourke, Robert E., 5,567,889, Cl. 73-863.230.
- Vitoria, Carmine: See—  
Fang, Ta-Ming; How, Hoton; and Vittoria, Carmine, 5,568,106, Cl. 333-204.000.
- VIZ Manufacturing Co.: See—  
Schenker, Alfred R.; and Potts, Luken W., 5,566,853, Cl. 220-581.000.
- VLSI Technology, Inc.: See—  
Jamal, Kamran, 5,568,437, Cl. 365-201.000.
- Vocal Co., Ltd.: See—  
Huang, Chia-Po, 5,568,562, Cl. 381-186.000.
- Vock, Curtis A.: See—  
McEleneey, John; Reenstra, Wende; and Vock, Curtis A., 5,567,420, Cl. 424-60.000.
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- Kepplinger, Leopold W.; Matzawrakos, Panajiotis; Schenk, Johannes; and Siuka, Dieter, 5,567,379, Cl. 266-143.000.
- Vogt, Carl L.; and Lovall, Ronald E., to Coin Acceptors, Inc. Vending machine protective device. 5,566,809, Cl. 194-348.000.
- Voight Products Incorporated: See—  
Voigt, William L., 5,566,926, Cl. 256-13.100.
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- Volk, Harald: See—  
Wessling, Bernhard; Volk, Harald; and Blättner, Susanne, 5,567,355, Cl. 252-500.000.
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Stone, Gordon R.; McGee, Richard L.; and Amick, Douglas J., 5,567,540, Cl. 429-63.000.
- Voltz, John, to W. L. Gore & Associates, Inc. Connector system for coaxial cables. 5,567,179, Cl. 439-578.000.
- Volvo Aero Corporation: See—  
Pejryd, Lars; Lundberg, Robert; and Butler, Edwin, 5,567,518, Cl. 428-378.000.
- Volz, Albrecht: See—  
Stoffler, Achim; Gensheimer, Valentin; Werber, Edgar; Hinz, Marc; Hummel, Peter; Wenzel, Jürgen; Volz, Albrecht; Blumhor, Joachim; Zschetzsch, Hubert; and Straub, Manfred, 5,566,613, Cl. 101-350.000.
- Volz, Peter; Obersteiner, Georg; and Otto, Albrecht, to ITT Automotive Europe GmbH. Pump containing a pressure valve. 5,567,128, Cl. 417-313.000.
- Volz, Richard F., Jr.: See—  
Chaback, Joseph J.; Yee, Dan; Volz, Richard F., Jr.; Seidle, John P.; and Puri, Rajen, 5,566,756, Cl. 166-263.000.
- Von Duprin, Inc.: See—  
Mader, Gerald E., 5,566,994, Cl. 292-336.300.
- Von Ammon, Wilfried; Domberger, Erich; Weidner, Herber; and Pardubitzki, Alfred, to Wacker Siltronic Gesellschaft für Halbleitermaterialien AG. Apparatus for producing a single crystal. 5,567,399, Cl. 722-245.100.
- von Herz, Alfons: See—  
Meyer, Helmut; von Herz, Alfons; and Winkelhake, Dirk, 5,566,810, Cl. 198-331.000.
- Voorman, Johannes O.: See—  
Ramalho, Joao N. V. L.; and Voorman, Johannes O., 5,568,091, Cl. 330-258.000.
- Vordermaier, Claus, to Webasto Karosseriesysteme GmbH. Drive device for a vehicle part that is displaceable between end positions. 5,566,593, Cl. 74-625.000.
- VSE Corporation: See—  
Goldstein, Leonard; and Baz, Mohammad, 5,568,370, Cl. 363-34.000.
- W. L. Gore & Associates, Inc.: See—  
Dolan, John W.; Spencer, John W., Jr.; Wilson, Richard; and Walter, James, 5,566,691, Cl. 132-321.000.
- Dolan, John W.; Spener, John W., Jr.; and Hill, Rickey I., 5,566,872, Cl. 225-41.000.
- Masley, Francis J., 5,566,405, Cl. 2-169.000.
- Voltz, John, 5,567,179, Cl. 439-578.000.
- W. R. Grace & Co.-Conn.: See—  
Muroi, Souichi; and Tsai, Hsi-Chuan, 5,567,792, Cl. 528-53.000.
- Toney, Gloria G.; Young, Robert A.; and Babb, David V., 5,567,533, Cl. 428-475.500.
- W. Schlafhorst AG & Co.: See—  
Bertrams, Josef; and Weich, Moritz O., 5,566,540, Cl. 57-281.000.
- Wachendorff-Neumann, Ulrike: See—  
Fischer, Reiner; Bretschneider, Thomas; Krüger, Bernd-Wieland; Santel, Hans-Joachim; Dollinger, Markus; Turberg, Andreas; and Wachendorff-Neumann, Ulrike, 5,567,671, Cl. 504-283.000.
- Wachter, Peter F., to Juno Lighting, Inc. Internally illuminated sign. 5,566,484, Cl. 40-570.000.
- Wacker-Chemie GmbH: See—  
Schulze, Joachim; Haerzschel, Reinhard; and Figge, Reiner, 5,567,750, Cl. 524-3.000.
- Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe AG: See—  
Huber, Anton; and Weiss, Robert, 5,567,199, Cl. 451-398.000.
- Wacker Siltronic Gesellschaft für Halbleitermaterialien AG: See—  
Von Ammon, Wilfried; Domberger, Erich; Weidner, Herber; and Pardubitzki, Alfred, 5,567,399, Cl. 722-245.100.
- Waclawsky, John G.: See—  
Hershey, Paul C.; and Waclawsky, John G., 5,568,471, Cl. 370-17.000.
- Wada, Koichi: See—  
Nagahata, Takaya; Kishimoto, Tokihiko; and Wada, Koichi, 5,568,174, Cl. 347-200.000.
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- Wada, Takahiro; Nishitani, Mikihiko; and Negami, Takayuki, to Matsuhita Electric Co., Ltd. Process for producing chalcopyrite type compound thin film. 5,567,469, Cl. 427-74.000.
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- Wada, Yasunori: See—  
Hasegawa, Takuji; Wada, Yasunori; and Nishio, Syoji, 5,568,221, Cl. 396-630.000.



- Wada, Yasuo; Ueno, Yoshio; and Honda, Munenobu, to Elephant Chain Block Company Limited. Manual chain block. 5,566,925, Cl. 254-358.000.
- Wade, David R.: See—
- Kimble, Thomas E.; and Wade, David R., 5,567,902, Cl. 84-658.000.
- Wadsworth, Robert D.: See—
- Barrett, Lorraine F.; Russell, William C.; Wadsworth, Robert D.; Kraslavsky, Andrew J.; and Kalwitz, George A., 5,568,612, Cl. 395-200.010.
- Waegner, Ralf: See—
- Will, Ronald; Franz, Markus; Waegner, Ralf; Gerlach, Hans-J.; and Schlachter, Werner, 5,566,575, Cl. 73-862.629.
- WaferScale Integration Inc.: See—
- Eitan, Boaz; Kazerounian, Reza; Shubat, Alex; and Pasternak, John H., 5,568,085, Cl. 327-546.000.
- Wagley, John S., to Xerox Corporation. Black and white reproducible pattern highlight color printing. 5,568,248, Cl. 355-328.000.
- Wagner, Burkhard E.; Zilker, Daniel P., Jr.; and Jorgensen, Robert J., to Union Carbide Chemicals & Plastics Technology Corporation. Shape-shifted magnesium alkoxide component for polymerizing olefins. 5,567,665, Cl. 502-9.000.
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- Behler, Ansgar; Ploog, Uwe; Uphues, Guenther; Wahle, Bernd; Waltenberger, Peter; and Jansen, Yvonne, 5,567,340, Cl. 510-527.000.
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- Walker, Karen L.: See—
- Laczko, Frank L., Sr.; and Walker, Karen L., 5,568,495, Cl. 371-471.000.
- Walker, Mark: See—
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- Schulte, Harvey, 5,567,122, Cl. 417-214.000.
- Walter, Helmut: See—
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- Wang, Di. In-line skateboard. 5,566,956, Cl. 280-7.140.
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- Warne, Robert L.: See—
- Clark, James M.; Shoemaker, Kevin R.; and Warne, Robert L., 5,567,602, Cl. 435-226.000.
- Warner-Lambert Company: See—
- DeWitt, Sheila H. H.; Kiely, John S.; Pavia, Michael R.; Schroeder, Mel C.; and Stankovic, Charles J., 5,567,391, Cl. 422-131.000.
- Warrin, George E.: See—
- Foulkes, Harvey B.; Warrin, George E.; Dao, Huy-Can; and Perdreaux, Rene, 5,567,153, Cl. 433-119.000.
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- Flynn, Gary A.; Beight, Douglas W.; Warszawsky, Alan M.; Mehdi, Shujaath; French, John F.; and Kehne, John H., 5,567,814, Cl. 540-521.000.
- Washburn, William N.: See—
- Dennis, Edward A.; and Washburn, William N., 5,567,597, Cl. 435-18.000.
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- Watkins, Joseph T. Apparatus and method for securing, transporting and analyzing a specimen. 5,568,534, Cl. 378-208.000.
- Watkins, Stuart C.: See—
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- Ackroyd, Rand H.; and Hofmann, Steven P., 5,566,704, Cl. 137-14.000.
- Wayne-Dalton Corp.: See—
- Mullet, Willis J.; and Mitchell, Albert W., 5,566,740, Cl. 160-229.100.
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- Chang, Fu L., 5,566,463, Cl. 33-710.000.
- Wearing, James T.: See—
- Paleologos, Michael; Berry, Richard M.; Thompson, Rokhsareh; and Wearing, James T., 5,567,293, Cl. 204-523.000.
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- Forsyth, Michael J.; Mediate, Bruno A.; and Pecot, David E., 5,566,850, Cl. 220-253.000.
- Weatherford/Lamb, Inc.: See—
- Stokka, Arnold, 5,566,754, Cl. 166-241.600.
- Weatherston, Roger C. Two rotor sliding vane compressor. 5,567,139, Cl. 418-173.000.
- Weaver, Chris: See—
- McNinch, Wayne; Wendling, Daniel; and Weaver, Chris, 5,568,490, Cl. 370-58.200.
- Webasto Karosserietechnik GmbH: See—
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- Wecker, Sheldon M.: See—
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- Wehner, Bernhard: See—
- Marten, Manfred; and Wehner, Bernhard, 5,567,782, Cl. 525-523.000.
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- Weich, Moritz O.: See—
- Bertrams, Josef; and Weich, Moritz O., 5,566,540, Cl. 57-281.000.
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- Schwark, Jan-Robert; Kleemann, Heinz-Werner; Lang, Hans-Jochen; Weichert, Andreas; Scholz, Wolfgang; and Albus, Udo, 5,567,734, Cl. 514-617.000.
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- Weigand, Michael; Ganss, Werner; and Grehn, Martin, to FAG Kugelfischer Georg Schafer AG. Window cage. 5,567,059, Cl. 384-560.000.
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- Zegler, Stephen A.; Weinle, Paul L.; and Moot, Lorence M., 5,567,497, Cl. 428-95.000.
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- Weisfield, Richard L.: See—
- Biegelsen, David; Jackson, Warren B.; and Weisfield, Richard L., 5,567,957, Cl. 257-57.000.
- Weiss, Nathaniel: See—
- Coopersmith, Jonathan; Weiss, Nathaniel; and Madden, Henry, 5,567,903, Cl. 84-723.000.
- Weiss, Rainer: See—
- Grossbach, Rudolf; Huber, Peter; Lierke, Ernst-Günter; Fiedler, Michael; Weiss, Rainer; Neri, Armando; Santin, Giancarlo; and Squar-zoni, Giovanni, 5,566,686, Cl. 131-84.400.
- Weiss, Robert: See—
- Huber, Anton; and Weiss, Robert, 5,567,199, Cl. 451-398.000.
- Welch, David W., to United Technologies Motor Systems, Inc. Synchronizing windshield wipers. 5,568,026, Cl. 318-443.000.
- Wells, James; Johnson, David B.; Tennant, Edward A.; and Elsoufi, Walid, to Jamex. Facsimile access controller for calculating a communication charge. 5,568,280, Cl. 358-468.000.
- Welsh, Paul B.: See—
- Craig, Stephen R.; Welsh, Paul B.; and Henderson, Robert C., 5,567,868, Cl. 73-23.420.
- Welter, Thomas R.; Dickinson, David A.; and Chen, Keath T., to Eastman Kodak Company. Photographic elements containing release compounds. 5,567,577, Cl. 430-544.000.
- Wemple, Robert P.: See—
- Staller, George E.; and Wemple, Robert P., 5,567,932, Cl. 250-227.140.
- Wemple, Stuart H.: See—
- Bowen, John W.; Daugherty, Dwight; Wemple, Stuart H.; and West, Melvin, Jr., 5,568,094, Cl. 330-279.000.
- Wendling, Daniel: See—
- McNinch, Wayne; Wendling, Daniel; and Weaver, Chris, 5,568,490, Cl. 370-58.200.
- Weng, Lee, to Siemens Medical Systems, Inc. Method and apparatus for reducing ultrasound image shadowing and speckle. 5,566,674, Cl. 128-660.070.
- Wengrovius, Jeffrey H.: See—
- Stein, Judith; Wengrovius, Jeffrey H.; and Willey, Paul R., 5,567,752, Cl. 524-188.000.
- Wentz, Kenneth W. Low noise air blower. 5,567,127, Cl. 417-312.000.
- Wenzel, Jürgen: See—
- Stoffler, Achim; Gensheimer, Valentin; Werber, Edgar; Hinz, Marc; Hummel, Peter; Wenzel, Jürgen; Volz, Albrecht; Blumhor, Joachim; Zschetzsch, Hubert; and Straub, Manfred, 5,566,613, Cl. 101-350.000.
- Werber, Edgar: See—
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- Wert, Joseph D.; and Duncan, Richard L., to National Semiconductor Corporation. Circuit for connecting a node to a voltage source selected from alternative voltage sources. 5,568,065, Cl. 326-33.000.
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- Khelifa, Noureddine; Krumbach, Karl-Gerd; Löhle, Michael; Abersfelder, Günter; Grantz, Helmut; Odebrecht, Wolfgang; Wertenbach, Jürgen; and Wagner, Oliver, 5,566,880, Cl. 237-12.30A.
- Wessely, Hans J.: See—
- Klein, Dieter H.; and Wessely, Hans J., 5,567,748, Cl. 523-420.000.
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- Wesstrom, Martin K., to G&G Sewing Machine Company, Inc. Sewing machine with tape feed and pneumatic devices for clamping workpieces. 5,566,633, Cl. 112-470.030.
- West Company, Incorporated, The: See—
- Melton, Roy B., 5,567,930, Cl. 250-216.000.
- West Japan Railway Company: See—
- Hidaka, Hideto; Iwamoto, Kengo; Noguchi, Yasuhiro; Miyamura, Motohiro; Yazima, Seiichi; and Sakai, Inao, 5,566,799, Cl. 191-55.000.
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- Bowen, John W.; Daugherty, Dwight; Wemple, Stuart H.; and West, Melvin, Jr., 5,568,094, Cl. 330-279.000.
- West, Robert J.; and Hempel, Mark E., to Desco Industries, Inc. Adjustable antistatic bracelet with snap-assembled permanent cap. 5,568,351, Cl. 361-220.000.



- Western Atlas International, Inc.: See—  
Reese, James W.; and Slagle, Terry L., 5,567,906, Cl. 102-307,000.
- Westfall, Brian G.: See—  
Samsel, Robert A.; Westfall, Brian G.; and Will, Stephen K., 5,568,162, Cl. 343-842,000.
- Westfall, Thomas C. Fireworks support apparatus. 5,567,907, Cl. 102-344,000.
- Westinghouse Air Brake Company: See—  
Kahr, Joseph C., 5,566,793, Cl. 188-250,00G.
- Westinghouse Electric Corporation: See—  
Chen, Allen G.; and Southall, Leslie R., 5,566,542, Cl. 60-39,050.  
Gaussa, Louis W., Jr.; and Sahasrabudhe, Arun P., 5,568,528, Cl. 376-258,000.
- Weston, John: See—  
Phillips, Joseph; and Weston, John, 5,567,262, Cl. 162-251,000.
- Weston, John D.: See—  
Phillips, Joseph R.; Weston, John D.; Bilodeau, Victor L.; Bain, Ronald G.; Barrett, Mark D.; Greenwood, Brian F.; and Pietrangelo, John, 5,567,279, Cl. 162-232,000.
- Westwater, Jonathan: See—  
Gosain, Dharam P.; Westwater, Jonathan; and Usui, Setsuo, 5,567,633, Cl. 437-40,000.
- Wetter, Carol A.: See—  
Minghetti, Ettore; Eitel, John E.; and Wetter, Carol A., 5,567,745, Cl. 523-202,000.
- Wetter, Hermann: See—  
Czernakowski, Waldemar; Wetter, Hermann; and Burleigh, David W., 5,567,007, Cl. 297-250,100.
- Wheatley, Charles E., III: See—  
Padovani, Roberto; Tiedemann, Edward G., Jr.; Odenwalder, Joseph P.; Zehavi, Ephraim; and Wheatley, Charles E., III, 5,568,483, Cl. 370-84,000.
- Wheatley, John A.: See—  
Schrenk, Walter J.; Arends, Charles B.; Balazs, Conrad F.; Lewis, Ray A.; and Wheatley, John A., 5,568,316, Cl. 359-584,000.
- Whirlpool Europe B.V.: See—  
Idebro, Mats G.; and Sundstrom, Tim P., 5,567,338, Cl. 219-718,000.
- Whitaker Corporation, The: See—  
Diniz, Milton E.; and Soriano, Alexandre M., 5,567,186, Cl. 439-783,000.
- Engle, Paul F.; Lynch, Thomas J.; and Banks, Roger T., 5,567,328, Cl. 216-13,000.
- Marsh, Edward K.; Nelson, Richard A.; McCleerey, Earl W.; DeFibaugh, George R.; and Verdun, Gary J., 5,567,168, Cl. 439-181,000.
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- White, Clifford A. Celebration candle. 5,567,145, Cl. 431-288,000.
- White Consolidated Industries, Inc.: See—  
Dries, John E.; and Edwards, James M., 5,566,696, Cl. 134-104,100.
- White, David A.: See—  
Snell, William M.; Eaton, Rodney L.; White, David A.; and Kaliszewski, Thomas S., 5,566,585, Cl. 74-493,000.
- White, George W.; Daniel, Edwin R.; Kirkland, James E.; and Shively, James S. Fueling systems. 5,566,712, Cl. 137-587,000.
- White, Steven K.; Hwang, Chan K.; and Winn, David T., to Ligand Pharmaceuticals Incorporated. Methods for stereospecific synthesis of polyene aldehydes. 5,567,855, Cl. 568-449,000.
- Whitley, Wayne P.: See—  
Tiller, Byron K.; Allard, David J.; Au, Connie Y.; Canova, Francis J., Jr.; Hsieh, Daniel M.; Goodwin, Julie F.; Johnson, Debra A. G.; Lanier, Charles S.; Lewis, James R.; Stout, Jean L.; Villafana, William; Yee, Raymond L.; Padgett, Russell S.; Ferrier, Robert B.; Corkell, Anthony F.; Murakami, Thomas T.; DeBauche, Bradley J.; Whitley, Wayne P.; Osborn, Neal A.; Beatty, Brent A.; Cox, Roger L.; Wulf, James C.; and Rivero, Jose L., 5,568,536, Cl. 379-58,000.
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- Wiard, Harold D., to Ace Controls, Inc. Shock absorber having nonadjustable metering. 5,566,794, Cl. 188-287,000.
- Wichtowski, John A.: See—  
Kim, Choung U.; Misco, Peter F., Jr.; Wichtowski, John A.; Ueda, Yasutsugu; Hudyma, Thomas W.; Matiskella, John D.; D'Andrea, Stanley V.; Hoefl, Shelley E.; Miller, Raymond F.; Mansuri, Muzam-mil M.; and Bronson, Joanne J., 5,567,698, Cl. 514-210,000.
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Andrews, Richard E.; and Wilsley, Mark E., 5,566,521, Cl. 52-606,000.
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Ericson, John E., Jr.; Wilson, Eric F.; Gordzelik, Michael L.; and Ignasiak, Martin C., 5,567,174, Cl. 439-462,000.
- Wilson, Richard: See—  
Dolan, John W.; Spencer, John W., Jr.; Wilson, Richard; and Walter, James, 5,566,691, Cl. 132-321,000.
- Wilson Sporting Goods Co.: See—  
Price, David, 5,566,825, Cl. 206-315,500.
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Liu, Ming-Hsi, 5,567,270, Cl. 156-644,100.
- Wincn, John M., to Advanced Micro Devices Inc. Reversible AUI port for ethernet. 5,568,515, Cl. 375-257,000.
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Creutzmann, Edmund; Eckardt, Andreas; Hoffmann, Joachim; Kopp, Walter; and Windele, Josef, 5,568,241, Cl. 355-259,000.
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Meyer, Helmut; von Herz, Alfons; and Winkelhake, Dirk, 5,566,810, Cl. 198-331,000.
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Bräuer, Wolfgang; Müller, Friedemann; Heidingsfeld, Herbert; Schulte, Bernhard; and Winkler, Jürgen, 5,567,791, Cl. 528-52,000.
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White, Steven K.; Hwang, Chan K.; and Winn, David T., 5,567,855, Cl. 568-449,000.
- Wipasuramont, Pongdet P., to TRW Vehicle Safety Systems Inc. Air bag including restraint. 5,566,977, Cl. 280-743,100.
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Madden, Henry R., 5,568,364, Cl. 361-752,000.
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- Witek, Richard T.: See—  
Sites, Richard L.; and Witek, Richard T., 5,568,624, Cl. 395-375,000.
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Binder, Rolf; and Witschi, Martin, 5,566,539, Cl. 57-261,000.
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Hentzschel, Peter; Kamutski, Walter; and Wolf, Dieter, 5,567,272, Cl. 162-9,000.
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Torchilin, Vladimir P.; Trubetskoy, Vladimir S.; Wolf, Gerald L.; and Gazelle, G. Scott, 5,567,410, Cl. 424-9,400.
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Tseng, Susan Y.; and Wolf, Philip F., 5,567,786, Cl. 526-264,000.
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Zhao, Xi; and Wong, Tai-kin, 5,567,607, Cl. 435-172,100.
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Conwell, Stanley L.; and Wood, William P., 5,567,150, Cl. 432-14,000.
- Woodman, Gil R., Jr., to International Business Machines Inc. Ultra high availability clock chip. 5,568,097, Cl. 331-2,000.
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- Warden, Harold; and Cooper, Sherman, 5,567,175, Cl. 439-490,000.
- Woodson, Paul: See—  
Bianco, James A.; Woodson, Paul; Porubek, David; and Singer, Jack, 5,567,704, Cl. 514-263,000.
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Hulse, Stephen J.; Woody, George R.; and Radys, Ray G., 5,568,036, Cl. 320-2,000.
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Ching, Fred Y. F.; Mark, Darren M.; Segien, Donald J., Jr.; and Woolley, Curtis S., 5,566,707, Cl. 137-359,000.
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Amici, Robert M.; LaFleur, Edward E.; and Work, William J., 5,567,768, Cl. 525-57,000.
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Ovnicsek, Eugene D., 5,566,765, Cl. 168-4,000.
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Crocker, Richard M.; Elsheikh, Maher Y.; Kelton, Anthony D.; Walker, Morris P.; and Wright, Danny W., 5,567,281, Cl. 203-6,000.
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Sexton, John S.; and Wright, Derek N., 5,567,503, Cl. 428-143,000.
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Lentz, Mark; Moses, Steven R.; Pettiford, Eloy F.; Stewart, Craig; and Wright, Douglas D., 5,567,181, Cl. 439-694,000.
- Wright, Meredith: See—  
Magda, Darren; Sessler, Jonathan L.; Iverson, Brent; Jansen, Petra L.; Wright, Meredith; Mody, Tarak D.; and Hemmi, Gregory W., 5,567,687, Cl. 514-44,000.
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Baumgart, Peter M.; Leung, Wing P.; Nguyen, Hung V.; Nguyen, Thao A.; Tam, Andrew C.; and Wu, Anthony, 5,567,484, Cl. 427-555,000.
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Acovic, Alexandre; Hsu, Ching-Hsiang; and Wu, Being S., 5,567,635, Cl. 437-43,000.
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Benet, Leslie; and Wu, Chi Y., 5,567,592, Cl. 435-7,210.
- Wu, James M. Method and apparatus for automatic adiabatic cooking. 5,567,458, Cl. 426-233,000.
- Wu, Jung-He: See—  
Diamond, Scott L.; and Wu, Jung-He, 5,567,596, Cl. 435-13,000.
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Wang, Chang-Ning J.; and Wu, Kai-Yuan, 5,567,583, Cl. 435-6,000.
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Yang, Chen-Jen; Jean, Tsong-Shin; Wu, Lung-Tarn; Yang, Ching-Liang; and Teng, Kuei-Fei, 5,567,559, Cl. 430-58,000.
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Ben-Nun, Michael; Wu, Winthrop J.; and Darcy, Niamh, 5,568,470, Cl. 370-17,000.
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Wladar, Helmut; Stritzl, Karl; Janisch, Andreas; and Wuerthner, Hubert, 5,566,967, Cl. 280-625,000.
- Wulf, James C.: See—  
Tiller, Byron K.; Allard, David J.; Au, Connie Y.; Canova, Francis J., Jr.; Hsieh, Daniel M.; Goodwin, Julie F.; Johnson, Debra A. G.; Lanier, Charles S.; Lewis, James R.; Stout, Jean L.; Villafana, William; Yee, Raymond L.; Padgett, Russell S.; Ferrier, Robert B.; Corkell, Anthony F.; Murakami, Thomas T.; DeBauche, Bradley J.; Whitley, Wayne P.; Osborn, Neal A.; Beatty, Brent A.; Cox, Roger L.; Wulf, James C.; and Rivero, Jose L., 5,568,536, Cl. 379-58,000.
- Wyborn, Lindsay G.: See—  
Johnstone, Peter; Emmerton, Gary; Fitzpatrick, Paul J.; Hanara, Per-hama; and Wyborn, Lindsay G., 5,566,530, Cl. 53-441,000.
- Wyman, James P.: See—  
Schmidt, Melvin J.; Coach, Thomas P.; Hause, Glenn C.; Galowitz, Dennis A.; Wyman, James P.; Hendricks, Robert A.; Van Steeg, Lawrence J.; and Evans, Harold H., 5,566,507, Cl. 49-428,000.
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- Xaos Tools: See—  
Tolson, Michael, 5,568,590, Cl. 395-13,000.
- Xerox Corporation: See—  
Amarakoon, Kiri B., 5,568,235, Cl. 355-256,000.
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- Jackson, Warren B.; and Biegelsen, David K., 5,567,971, Cl. 257-431,000.
- Karch, Earl G., 5,566,894, Cl. 241-29,000.
- Keller, Paul D.; Keenan, Glenn M.; and Bean, Lloyd F., II, 5,568,246, Cl. 355-309,000.
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- Reddy, Karimreddy H.; and Litman, Alan M., 5,568,230, Cl. 355-215,000.
- Rees, James D.; and Leising, Walter F., 5,568,320, Cl. 359-652,000.
- Szlucha, Thomas F., 5,568,229, Cl. 355-208,000.
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- Wong, Lam F., 5,568,227, Cl. 355-200,000.
- Ziolo, Ronald F., 5,567,564, Cl. 430-115,000.
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Coe, Charles G.; Gaffney, Thomas R.; Li, Hong-Xin; Xiong, Yanliang; Martens, Johan A.; and Jacobs, Pierre A., 5,567,407, Cl. 423-700,000.
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Yano, Makoto; Tsukushi, Masanori; and Yaginuma, Noriyuki, 5,567,924, Cl. 218-143,000.
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Chu, Chung K.; Cheng, Yung-Chi; Pai, Balakrishna S.; and Yao, Gang-Qing, 5,567,688, Cl. 514-46,000.
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Nakano, Keiichi; and Yamada, Hidetoshi, 5,568,278, Cl. 358-427,000.
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Kumazaki, Tatsuo; and Yamada, Hifumi, 5,568,533, Cl. 378-156,000.
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- Hirai, Atsuto; Ueda, Masahide; Terasaka, Yoshihisa; Sano, Eiichi; Matsura, Masahiko; Yamasaki, Hiroyuki; Yamada, Masami; and Izumi, Tomoo, 5,568,244, Cl. 355-309.000.
- Yamada, Satomi: See—
- Togiya, Satoshi; Yamada, Satomi; and Kondo, Mitsuo, 5,567,419, Cl. 424-74.000.
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- Takahashi, Katsunori; Maeda, Eizo; Suzuki, Hajime; Yamada, Sumio; Nakazawa, Taichi; and Imai, Yasuo, 5,567,222, Cl. 75-376.000.
- Yamada, Yozo: See—
- Nagata, Manabu; Yamamoto, Takushi; Takemori, Shinichi; Hashimoto, Naoyuki; Ishikawa, Hiroki; and Yamada, Yozo, 5,567,744, Cl. 523-200.000.
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- Takekuma, Toshitsugu; Kurihara, Ryoichi; and Yamagiwa, Akira, 5,568,063, Cl. 326-30.000.
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- Kinami, Nobuyuki; Okamoto, Masami; Shinoda, Yoshihiro; Sekura, Tsuyoshi; and Yamaguchi, Akira, 5,567,758, Cl. 524-401.000.
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- Goto, Naoyuki; and Yamaguchi, Katsuhiko, 5,567,217, Cl. 65-33.100.
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- Higashi, Iwao, 5,567,900, Cl. 84-602.000.
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- Masuda, Tatsuyuki, 5,566,654, Cl. 123-271.000.
- Sakurai, Hiroshi, 5,566,447, Cl. 295-832.000.
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- Matsuoka, Noriyuki, 5,567,165, Cl. 439-42.000.
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- Hirano, Naohiko; and Yamaji, Yasuhiro, 5,567,983, Cl. 257-722.000.
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- Nishiyama, Tatsuya; Wakayama, Satoshi; Matsuda, Yoshiki; Hashimoto, Tetsuya; Kojima, Keiji; and Yamamoto, Kiyoshi, 5,568,640, Cl. 395-600.000.
- Yamamoto, Makoto: See—
- Shou, Guoliang; Takatori, Sunao; and Yamamoto, Makoto, 5,568,080, Cl. 327-356.000.
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- Kobayashi, Makoto; Yamamoto, Masakazu; Miyake, Yoshio; and Ise-moto, Koji, 5,567,133, Cl. 417-423.700.
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- Aoki, Yasuhiro; Momota, Kiyoshi; Yamamoto, Tetsuo; Ide, Hideki; and Onihashi, Hiroshi, 5,568,014, Cl. 315-3.500.
- Yamamura, Masato: See—
- Ito, Susumu; Kamiguchi, Masao; Yamamura, Masato; Neko, Noriaki; Uchiyama, Tatsuhiro; Hosoya, Yuichi; Takeda, Nobuto; and Hiraga, Kaoru, 5,567,367, Cl. 264-40.100.
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- Kumazaki, Tatsuo; and Yamada, Hifumi, 5,568,533, Cl. 378-156.000.
- Yamasaki, Hiroyuki: See—
- Hirai, Atsuto; Ueda, Masahide; Terasaka, Yoshihisa; Sano, Eiichi; Matsura, Masahiko; Yamasaki, Hiroyuki; Yamada, Masami; and Izumi, Tomoo, 5,568,244, Cl. 355-309.000.
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- Furukawa, Takehiro; Yamashita, Eizo; and Saiki, Nobuyuki, 5,568,148, Cl. 341-155.000.
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- Inagaki, Masahiro; Fukushima, Yoshihisa; Yamashita, Haruo; Azumata, Yasushi; and Hamasaka, Hiroshi, 5,568,467, Cl. 369-275.300.
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- Yoshida, Ryoichi; Kosugi, Noriyuki; Tanaka, Yoshihiko; Yanagi, Eiji; Atoh, Tadayuki; Kokeguchi, Akira; and Minami, Yoshihiko, 5,566,972, Cl. 280-728.200.
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- Suzuki, Tetsuo; Taniguro, Masahiro; Saito, Hiroyuki; Tanno, Koichi; Yanagi, Haruyuki; Kawamura, Makoto; Kinoshita, Hiroyuki; Shinmachi, Masaya; and Ming, Tan A., 5,567,069, Cl. 400-636.000.
- Yanauti, Kazuo: See—
- Sunamori, Takashi; Sato, Hiroshi; Hirose, Masakazu; and Yanauti, Kazuo, 5,568,267, Cl. 356-416.000.
- Yang, Chen-Jen; Jean, Tsong-Shin; Wu, Lung-Tarn; Yang, Ching-Liang; and Teng, Kuei-Fei, to Sinonar Corp., and Industrial Technology Research Institute. Electrophotographic photoreceptors containing titanyl phthalocyanine processed through ammoniated complex, and method for production thereof. 5,567,559, Cl. 430-58.000.
- Yang, Ching-Liang: See—
- Yang, Chen-Jen; Jean, Tsong-Shin; Wu, Lung-Tarn; Yang, Ching-Liang; and Teng, Kuei-Fei, 5,567,559, Cl. 430-58.000.
- Yang, Ching-Yun M.: See—
- Turi, Mordechai; DeRossett, Edmund Z.; and Yang, Ching-Yun M., 5,567,376, Cl. 264-455.000.
- Yang, Hong-Geun: See—
- Moon, Kyung-Ha; Lee, Bae-Won; and Yang, Hong-Geun, 5,568,176, Cl. 347-200.000.
- Suh, Su-Hi; and Yang, Hong-Geun, 5,568,175, Cl. 347-200.000.
- Yang, Jesse S. Drainage network. 5,567,077, Cl. 405-45.000.
- Yang, Keun Y.; and Noh, Sung W., to LG Electronics Inc. Optical pickup system for reading or writing information on disk using hologram device and wollaston prism. 5,568,457, Cl. 369-44.230.
- Yang, Zhenyu, to Du Pont de Nemours, E. I., and Company. Fluorinated aromatic dinitro compounds and diamines. 5,567,846, Cl. 564-307.000.
- Yano, Hideyuki; Araya, Junji; and Iwasaki, Osamu, to Canon Kabushiki Kaisha. Electrophotographic process and apparatus simultaneously effecting image exposure and developing steps to opposites sides of photosensitive member. 5,567,556, Cl. 430-55.000.
- Yano, Makoto; Tsukushi, Masanori; and Yaginuma, Noriyuki, to Hitachi, Ltd. Circuit breaker with parallel resistor. 5,567,924, Cl. 218-143.000.
- Yano, Masami; and Takami, Masato, to Fukuda Metal Foil and Powder Co., Ltd. Foil for a printed circuit. 5,567,534, Cl. 428-607.000.
- Yano, Toshiro: See—
- Inoue, Kazuhiro; Ito, Teruomi; Kawaguchi, Takayuki; Aono, Katsutoshi; Okuno, Satoshi; and Yano, Toshiro, 5,567,690, Cl. 514-54.000.
- Yao, Gang-Qing: See—
- Chu, Chung K.; Cheng, Yung-Chi; Pai, Balakrishna S.; and Yao, Gang-Qing, 5,567,688, Cl. 514-46.000.
- Yap, Edwin Y. Pistol grip magazine adaptor. 5,566,488, Cl. 42-49.020.
- Yasuhara, Yutaka: See—
- Togashi, Yoshio; Nakamura, Kenji; Iwata, Hiroshi; Sakamoto, Michisada; and Yasuhara, Yutaka, 5,566,716, Cl. 137-636.100.
- Yasui, Toshi: See—

- Makino, Toshiaki; Terada, Katsuyuki; Sebata, Michio; Hattori, Morishige; Takai, Hideo; Yasui, Toshi; Oshima, Masabumi; Iida, Akiyoshi; Takano, Yasushi; Katoo, Chisachi; and Kobayashi, Kenji, 5,566,800, Cl. 191-67.000.
- Yasunaga, Tadashi: See—
- Ishida, Toshiro; Satake, Masaki; Watanabe, Hideomi; Yasunaga, Tadashi; and Okita, Tsutomu, 5,567,524, Cl. 428-408.000.
- Yavitz, Edward Q. Therapeutic support device. 5,566,682, Cl. 128-845.000.
- Yazaki Corporation: See—
- Ishii, Takashi; Watanabe, Tamio; and Nagano, Toru, 5,567,182, Cl. 439-701.000.
- Sano, Takahiro, 5,567,183, Cl. 439-751.000.
- Yazima, Seiichi: See—
- Hidaka, Hideto; Iwamoto, Kengo; Noguchi, Yasuhiro; Miyamura, Motohiro; Yazima, Seiichi; and Sakai, Inao, 5,566,799, Cl. 191-55.000.
- YBM Technologies, Inc.: See—
- Bogatin, Jacob G.; and Belov, Andrey, 5,567,891, Cl. 75-244.000.
- Yeager, David A.: See—
- Rao, V. Durga Nageswar; Rose, Robert A.; Yeager, David A.; and Kabat, Daniel M., 5,566,450, Cl. 29-888.061.
- Yeater, Joan E. Hair-containing device. 5,566,689, Cl. 132-212.000.
- Yee, Dan: See—
- Chaback, Joseph J.; Yee, Dan; Volz, Richard F., Jr.; Seidle, John P.; and Puri, Rajen, 5,566,756, Cl. 166-263.000.
- Seidle, John P.; Yee, Dan; and Puri, Rajen, 5,566,755, Cl. 166-263.000.
- Yee, Raymond L.: See—
- Tiller, Byron K.; Allard, David J.; Au, Connie Y.; Canova, Francis J., Jr.; Hsieh, Daniel M.; Goodwin, Julie F.; Johnson, Debra A. G.; Lanier, Charles S.; Lewis, James R.; Stout, Jean L.; Villafana, William; Yee, Raymond L.; Padgett, Russell S.; Ferrier, Robert B.; Corkell, Anthony F.; Murakami, Thomas T.; DeBauche, Bradley J.; Whitley, Wayne P.; Osborn, Neal A.; Beatty, Brent A.; Cox, Roger L.; Wulf, James C.; and Rivero, Jose L., 5,568,536, Cl. 379-58.000.
- Yen, Terence T.: See—
- Cullinan, George J.; and Yen, Terence T., 5,567,713, Cl. 514-324.000.
- Yeong, Wong C., to Fullmark Pte Ltd. Ribbon cartridge. 5,567,064, Cl. 400-235.100.
- Yien, Richard S.; and Stratigos, William N., to Empire Blue Cross/Blue Shield; and Remote Systems Company, L.L.C. Method and apparatus for processing data received at a remote workstation. 5,568,489, Cl. 370-110.100.
- Ying, Thomas K. S., to Enzacor Properties, Ltd. Animal growth promotant. 5,567,423, Cl. 424-94.300.
- YKK Corporation: See—
- Takahashi, Yoshinobu, 5,566,428, Cl. 24-265.00H.
- Yokoo, Akihiko; and Ogawa, Tetsuro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Deodorants, deodorant sheets, filter sheets and functional papers as well as filtering mediums for exhaust gas. 5,567,231, Cl. 96-153.000.
- Yokoshima & Company: See—
- Kamiyama, Takao; and Yokoshima, Yasuhiro, 5,566,719, Cl. 138-98.000.
- Yokoshima, Yasuhiro: See—
- Kamiyama, Takao; and Yokoshima, Yasuhiro, 5,566,719, Cl. 138-98.000.
- Yokota, Toru; and Ishiwata, Hiroshi, to Zexel Corporation. Solenoid valve. 5,566,921, Cl. 251-129.220.
- Yokota, Yoshihiro; Naito, Shotaro; Suzuki, Toshihiko; and Koide, Akira, to Hitachi, Ltd. Semiconductor accelerometer. 5,567,880, Cl. 73-514.330.
- Yokoyama, Haruhiko, to Matsushita Electric Industrial Co., Ltd. Two-dimensional image processing method and apparatus for approximating circular arc configuration of an object. 5,568,567, Cl. 382-204.000.
- Yoneda, Masato: See—
- Kawana, Keiichi; Yoneda, Masato; and Konishi, Masahiro, 5,568,416, Cl. 365-49.000.
- Yonemura, Masako: See—
- Negoro, Fumio; Murata, Tetsuri; Sawamura, Kozo; Yuki, Junichi; Murai, Hiroshi; Onuki, Masayasu; Ito, Norihito; Jiang, Wieguo; and Yonemura, Masako, 5,568,642, Cl. 395-700.000.
- Yonezawa, Kazuya: See—
- Iwahara, Takahisa; Chiba, Makoto; Takahara, Tomoko; and Yonezawa, Kazuya, 5,567,833, Cl. 556-434.000.
- Yoo, Jang-Yeol, to Daewoo Electronics Co., Ltd. 3-position 3-way solenoid valve. 5,567,023, Cl. 303-119.200.
- Yoon, Sang-Ho, to Daewoo Electronics Co., Ltd. Apparatus for parallel decoding of variable length encoded image signals. 5,568,139, Cl. 341-67.000.
- Yosefi, Hanan; and Armoni, Shimon R., to Scitex Corporation Ltd. Method for generating artificial shadow. 5,568,595, Cl. 395-126.000.
- Yoshida, Masato, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Operating method for a hybrid vehicle. 5,566,774, Cl. 180-65.400.
- Yoshida, Naoka: See—
- Takizawa, Yoshinori; and Yoshida, Naoka, 5,568,568, Cl. 382-220.000.
- Yoshida, Norio; and Tsuyama, Osamu, to Ichikoh Industries, Ltd. Car rearview mirror. 5,568,326, Cl. 359-872.000.
- Yoshida, Ryoichi; Kosugi, Noriyuki; Tanaka, Yoshihiko; Yanagi, Eiji; Atoh, Tadayuki; Kokeguchi, Akira; and Minami, Yoshihiko, to Takata Corporation. Air bag device. 5,566,972, Cl. 280-728.200.
- Yoshihara, Toshiaki; Mochizuki, Akihiro; Shiroto, Hironori; and Makioo, Tetsuya, to Fujitsu Limited. Ferroelectric liquid crystal with pitch 1-2 times layer thickness and graduation by bistable/monostable ratio. 5,568,299, Cl. 359-100.000.
- Yoshiike, Nobuyuki; Arita, Koji; and Morinaka, Katsuya, to Matsushita Electric Industrial Co., Ltd. Temperature distribution measurement apparatus. 5,567,052, Cl. 374-124.000.
- Yoshikawa, Sumi: See—
- Mochizuki, Shunji; Takagi, Hiromi; Hoshino, Masahiko; and Yoshikawa, Sumi, 5,567,378, Cl. 266-44.000.
- Yoshikawa, Yuji; and Takarada, Mitsuhiro, to Shin-Etsu Chemical Co., Ltd. Coating agents for electrophotography and electrophotography carriers prepared by using them. 5,567,561, Cl. 430-106.600.
- Yoshikazu, Nishimura, to Tasco Electronics Co., Ltd. Audio communication band image transceiver. 5,568,185, Cl. 348-22.000.
- Yoshimizu, Toshiyuki: See—
- Kishida, Masahiro; Yoshimizu, Toshiyuki; and Seike, Takeshi, 5,568,289, Cl. 359-58.000.
- Yoshimura, Yohji: See—
- Tsubota, Koujiro; Fujioka, Kazuyoshi; Yoshimura, Yohji; Ohgami, Hiroyuki; and Takafuji, Yutaka, 5,568,297, Cl. 359-80.000.
- Yoshinaga, Kazuo: See—
- Mitsutake, Hideaki; and Yoshinaga, Kazuo, 5,568,283, Cl. 359-053.000.
- Yoshinaga, Tohru: See—
- Okabe, Shinichi; Yoshinaga, Tohru; Watanabe, Kiyohiko; and Kawabe, Yasuyuki, 5,567,395, Cl. 422-180.000.
- Yoshino, Hiroyuki; and Kojima, Takashi, to Casio Computer Co., Ltd. Electronic montage creation device. 5,568,599, Cl. 395-135.000.
- Yoshino Kogyosha Co., Ltd.: See—
- Nishigami, Akira; Nakamura, Tetsuzo; and Honda, Masato, 5,567,377, Cl. 264-515.000.
- Yoshino, Mami: See—
- Furukawa, Yutaka; Kumai, Seisaku; and Yoshino, Mami, 5,568,239, Cl. 355-284.000.
- Yoshioka, Kenichi: See—
- Nakatsukasa, Sigeki; Yoshioka, Kenichi; Hirakawa, Kiyoshi; Tanaka, Kazuhiko; Kawamoto, Masao; Sugoh, Nozomu; Migaki, Atsuko; and Taniguchi, Shunro, 5,567,796, Cl. 528-272.000.
- Yoshioka, Toshifumi: See—
- Murata, Tatsuo; Ishiwata, Kazuya; and Yoshioka, Toshifumi, 5,568,291, Cl. 359-67.000.
- Yoshioka, Yasuhiro: See—
- Makuta, Toshiyuki; Seto, Nobuo; and Yoshioka, Yasuhiro, 5,567,578, Cl. 430-551.000.
- Yoshitake, Nobuyuki; and Takakura, Shinji, to Sony Corporation. Semiconductor device to absorb stray carriers. 5,567,974, Cl. 257-443.000.
- Yoshizawa, Yoshitomo; and Arakawa, Shunsuke, to Hitachi Metals, Ltd. Magnetic core element for antenna, thin-film antenna, and card equipped with thin-film antenna. 5,567,537, Cl. 428-692.000.
- Yost, Dennis P.: See—
- Demarest, David; and Yost, Dennis P., 5,568,593, Cl. 395-82.000.
- Yost, William T., to United States of America, National Aeronautics and Space Administration. Capacitive acoustic wave detector and method of using same. 5,566,573, Cl. 73-643.000.
- Young, Bob W. Combustion apparatus including pneumatically suspended combustion zone for waste material incineration and energy production. 5,566,625, Cl. 110-243.000.
- Young, Quentin, to R R Brink Locking Systems, Inc. Lock with cam operated mechanism. 5,566,991, Cl. 292-201.000.
- Young, Robert A.: See—
- Toney, Gloria G.; Young, Robert A.; and Babb, David V., 5,567,533, Cl. 428-475.500.
- Young, Robert F.: See—
- Strohallen, Gene M.; and Young, Robert F., 5,568,516, Cl. 375-259.000.
- Young, Rosa: See—
- Tsu, David V.; Young, Rosa; and Ovshinsky, Stanford R., 5,567,241, Cl. 118-723.0MW.
- Young, Rosa T.: See—
- Ovshinsky, Stanford R.; and Young, Rosa T., 5,567,549, Cl. 429-223.000.
- Young, Steven A.: See—
- McCarter, Kevin S.; Young, Steven A.; and Laws, Pamela K., 5,567,498, Cl. 428-113.000.
- Youngner, Daniel W.: See—
- Straight, John B.; Youngner, Daniel W.; and Anderson, James C., 5,567,650, Cl. 437-195.000.
- Yozan Inc.: See—
- Shou, Guoliang; Takatori, Sunao; and Yamamoto, Makoto, 5,568,080, Cl. 327-356.000.
- Yu, Shih-Chung. AC power supply unit. 5,567,996, Cl. 307-125.000.
- Yu, Shu C. Safe actuating mechanism for an automatic umbrella. 5,566,698, Cl. 135-24.000.
- Yu, Tom Y.; and Hendrickson, Randy L. Apparatus and method for coating and drying paper sheets. 5,567,481, Cl. 427-428.000.
- Yuan Mei Corp.: See—
- Wang, King-Yuan, 5,566,886, Cl. 239-394.000.
- Yuan, Shi: See—
- Pal, Uday B.; Chou, Kuo-Chih; Yuan, Shi; and Hasham, Zain, 5,567,286, Cl. 204-246.000.
- Yuasa, Tachio: See—
- Matsuda, Atsushi; and Yuasa, Tachio, 5,568,147, Cl. 341-154.000.



- Yugami, Nobuhiro: *See—*  
Hara, Hirotaka; Yugami, Nobuhiro; and Ohishi, Kazuhiro, 5,568,381, Cl. 364-402.000.
- Yuki, Akifumi: *See—*  
Kondou, Tsutomu; and Yuki, Akifumi, 5,567,467, Cl. 426-659.000.
- Yuki, Junichi: *See—*  
Negoro, Fumio; Murata, Tetsuri; Sawamura, Kozo; Yuki, Junichi; Murai, Hiroshi; Onuki, Masayasu; Ito, Norihito; Jiang, Wieguo; and Yone-mura, Masako, 5,568,642, Cl. 395-700.000.
- Yurie Systems, Inc.: *See—*  
Li, Kwok-Leung; and Kim, Jeong H., 5,568,482, Cl. 370-79.000.
- Yurish, George E.: *See—*  
Zuromski, Edward J.; Campbell, James H.; Yurish, George E.; and Diaz, Dinah, 5,567,450, Cl. 426-5.000.
- Yutani, Yoshikazu: *See—*  
Yamauchi, Toshiya; Yutani, Yoshikazu; and Toyoda, Rika, 5,568,601, Cl. 395-142.000.
- Yuzurihara, Hiroshi: *See—*  
Miyawaki, Mamoru; Ishizaki, Akira; Momma, Genzo; Yuzurihara, Hiroshi; and Kohchi, Tetsunobu, 5,567,962, Cl. 257-296.000.
- Zajackowski, Peter: Method for producing absorbent garment with conformable pads, 5,567,265, Cl. 156-256.000.
- Zalesinski, Jerzy M.; and Emerick, Alan J., to International Business Machines Corporation: Process for fabricating an electronic circuit package, 5,567,984, Cl. 257-697.000.
- Zalewski, Wojciech, to Enhancements Unlimited, Inc.: Automotive vehicle seat for disabled persons, 5,567,001, Cl. 296-65.100.
- Zambon S.p.A.: *See—*  
Jommi, Giancarlo; Chiarino, Dario; and Pagliarin, Roberto, 5,567,844, Cl. 564-209.000.
- Zamora, Paul O., to RhoMed Incorporated: YIGSR peptide radiopharmaceutical applications, 5,567,408, Cl. 424-1.690.
- Zaslloff, Michael A., to United States of America, Health and Human Services: PGLa and XPF peptides and uses therefor, 5,567,681, Cl. 514-13.000.
- Zauns-Huber, Rudolf: *See—*  
Ritter, Wolfgang; Sitz, Hans-Dieter; Zauns-Huber, Rudolf; and Ruschei-nsky, Emil, 5,567,343, Cl. 252-857.000.
- Zawacki, Ronald A.: *See—*  
Sway-Tin, Min; Roterman, Thaddeus; Impullitti, Joseph F.; Meir, David S.; and Zawacki, Ronald A., 5,568,052, Cl. 324-435.000.
- Zegler, Stephen A.; Weinle, Paul L.; and Moot, Lorence M., to Collins & Aikman Products Co.: Skid-resistant floor covering and method of making same, 5,567,497, Cl. 428-95.000.
- Zehavi, Ephraim: *See—*  
Padovani, Roberto; Tiedemann, Edward G., Jr.; Odenwalder, Joseph P.; Zehavi, Ephraim; and Wheatley, Charles E., III, 5,568,483, Cl. 370-84.000.
- Zeiger, John H.: *See—*  
Clouston, Robert D.; Graham, John S., Jr.; and Zeiger, John H., 5,568,605, Cl. 395-182.020.
- Zelayeta, Joe: *See—*  
Rostoker, Michael D.; Pasch, Nicholas F.; and Zelayeta, Joe, 5,567,570, Cl. 430-311.000.
- Rostoker, Michael D.; Pasch, Nicholas F.; and Zelayeta, Joe, 5,567,655, Cl. 437-209.000.
- Zeller, Robert L., III; and Johnson, David L.: Manufacturing clear potassium sulfate, 5,567,406, Cl. 423-519.200.
- Zendegui, Joseph G.: *See—*  
Rando, Robert F.; Fennwald, Susan; Zendegui, Joseph G.; and Ojwang, Joshua O., 5,567,604, Cl. 435-238.000.
- Zeneca Limited: *See—*  
Miller, Scott C., 5,567,700, Cl. 514-226.800.
- Zexel Corporation: *See—*  
Yokota, Toru; and Ishiwata, Hiroshi, 5,566,921, Cl. 251-129.220.
- Zeza, Charles A., to Rhone-Poulenc Inc.: Liquid resin-forming composition and two-package system for providing the composition, 5,567,788, Cl. 526-334.000.
- ZF Friedrichshafen AG: *See—*  
Lauer, Armin; Frei, Walter; and Schobinger, Alfred, 5,566,586, Cl. 74-523.000.
- Zhang, Jian Z.: *See—*  
Dovich, Norman J.; and Zhang, Jian Z., 5,567,294, Cl. 204-603.000.
- Zhao, Xi; and Wong, Tai-kin, to Incell: Method of producing transgenic animals, 5,567,607, Cl. 435-172.100.
- Zheng, Joe; and Sussmeier, John, to United Parcel Service of America, Inc.: Method and apparatus for illumination and imaging of a surface using opaque shroud, 5,567,934, Cl. 250-237.00R.
- Zhou, Peter S., to ITT Automotive Electrical Systems, Inc.: Windshield wiper system for curved windshields, 5,566,419, Cl. 15-250.352.
- Ziaylek, Michael P.: *See—*  
Ziaylek, Theodore, Jr.; and Ziaylek, Michael P., 5,566,622, Cl. 104-275.000.
- Ziaylek, Theodore, Jr.; and Ziaylek, Michael P.: Collapsible hose bridging apparatus, 5,566,622, Cl. 104-275.000.
- Zilker, Daniel P., Jr.: *See—*  
Wagner, Burkhard E.; Zilker, Daniel P., Jr.; and Jorgensen, Robert J., 5,567,665, Cl. 502-9.000.
- Zimmer, Stephen A.: Luminescent fishing lure, 5,566,494, Cl. 43-17.600.
- Zimmermann, Thomas: *See—*  
Baier, Paul-Walter; Felhauer, Tobias; Zimmermann, Thomas; and Klein, Anja, 5,568,519, Cl. 375-343.000.
- Ziolo, Ronald F., to Xerox Corporation: Liquid development composition having a colorant comprising a stable dispersion of magnetic particles in an aqueous medium, 5,567,564, Cl. 430-115.000.
- Zipperling Kessler & Co. (GmbH & Co.): *See—*  
Wessling, Bernhard; Volk, Harald; and Blätner, Susanne, 5,567,355, Cl. 252-500.000.
- Zlobinsky, Yury; Glater, Michael; and Grave, Frank, to Savant Instruments, Inc.: Apparatus and method for rapidly oscillating specimen vessels, 5,567,050, Cl. 366-209.000.
- Zoellner, Carl W.; and Ramsey, John S.: Stick mate/gauge stabilizer, 5,566,465, Cl. 33-723.000.
- Zorita, D. Gonzalo G.: Fuel economizers, applicable to gas-oil and gasoline engines and burners, 5,566,661, Cl. 123-538.000.
- Zorka, Nicholas G.: *See—*  
Hamburg, Douglas R.; and Zorka, Nicholas G., 5,566,663, Cl. 123-679.000.
- Zorn, Carl J.: *See—*  
Majewski, Stanislaw; Kross, Brian J.; Zorn, Carl J.; and Majewski, Lukasz A., 5,568,532, Cl. 378-98.300.
- Zschetzsche, Hubert: *See—*  
Stoffler, Achim; Gensheimer, Valentin; Werber, Edgar; Hinz, Marc; Hummel, Peter; Wenzel, Jürgen; Volz, Albrecht; Blamor, Joachim; Zschetzsche, Hubert; and Straub, Manfred, 5,566,613, Cl. 101-350.000.
- Zubelewicz, Aleksander: *See—*  
Dickinson, Gerard T.; McGinniss, James L., Jr.; Tokarz, Ronald F.; and Zubelewicz, Aleksander, 5,567,884, Cl. 73-814.000.
- Zumbach, Lyle L.: *See—*  
Morris, Michael D.; and Zumbach, Lyle L., 5,568,645, Cl. 395-800.000.
- Zunino, Eric: *See—*  
Bourgeois, Bernard; Fourrey, François; Quenel, David; and Zunino, Eric, 5,567,017, Cl. 297-452.200.
- Zuo, Lianghe: *See—*  
Campbell, Fred A.; Flinn, Michael A.; Graves, Jeffrey D.; and Zuo, Lianghe, 5,566,660, Cl. 123-496.000.
- Zuromski, Edward J.; Campbell, James H.; Yurish, George E.; and Diaz, Dinah, to Wm. Wrigley Jr. Company: Gum base manufacturing method, 5,567,450, Cl. 426-5.000.
- Zwaans, Bernardus A. M., to U.S. Philips Corporation: Encoding or decoding device comprising a paged memory, 5,568,494, Cl. 371-40.100.
- Zygo Corporation: *See—*  
Deck, Leslie L., 5,568,003, Cl. 310-316.000.
- Zymogenetics, Inc.: *See—*  
Siedziwski, Andrzej Z.; Bell, Lillian A.; and Kindsvogel, Wayne R., 5,567,584, Cl. 435-6.000.
- 3COM Corporation: *See—*  
Scherer, William P.; Lo, Lai-Chin; and Hickey, John F., 5,568,469, Cl. 370-17.000.
- Scherer, William P.; Gahan, Richard A.; and Hickey, John F., 5,568,476, Cl. 370-60.000.

## LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 22nd DAY OF OCTOBER, 1996

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Beiser, Jess L.: Fastening bolt assembly with anti-rotation device and providing both axial and radial holding forces, Re. 35,358, Cl. 411-342.000.
- Browne, John, to Mark IV Industries, Ltd.: Display element with notched disk, Re. 35,357, Cl. 345-84.000.
- Ciba-Geigy Corporation: *See—*  
Hari, Stefan; and Cseh, Georg, Re. 35,359, Cl. 534-728.000.
- Cseh, Georg: *See—*  
Hari, Stefan; and Cseh, Georg, Re. 35,359, Cl. 534-728.000.
- Dorai, Suriyanarayana, to Du Pont de Nemours, E. I., and Company: Reduction of molecular weight of poly(tetramethylene ether) glycol, Re. 35,360, Cl. 568-617.000.
- Du Pont de Nemours, E. I., and Company: *See—*  
Dorai, Suriyanarayana, Re. 35,360, Cl. 568-617.000.
- Gill, Manzur, to Texas Instruments Incorporated: EEPROM cell array with tight erase distribution, Re. 35,356, Cl. 257-316.000.
- Gottlieb, Milton S.: *See—*  
Ryan, Fredrick M.; and Gottlieb, Milton S., Re. 35,355, Cl. 250-343.000.
- Hari, Stefan; and Cseh, Georg, to Ciba-Geigy Corporation: Amine salts of azo pigments based on pyrazolone derivatives, Re. 35,359, Cl. 534-728.000.
- Intel Corporation: *See—*  
Tokita, Masakuni; Kobayashi, Akira; Yamakawa, Shinichi; Shimizu, Mitsuharu; and Masuda, Norihiro, Re. 35,353, Cl. 29-830.000.
- Kersten, Jens-Heinrich; Schmitz, Detlef; and Runte, Peter, to Perfect-Valois Ventil GmbH: Pack for free-flowing filler, Re. 35,354, Cl. 222-209.000.
- Kobayashi, Akira: *See—*  
Tokita, Masakuni; Kobayashi, Akira; Yamakawa, Shinichi; Shimizu, Mitsuharu; and Masuda, Norihiro, Re. 35,353, Cl. 29-830.000.
- Mark IV Industries, Ltd.: *See—*  
Browne, John, Re. 35,357, Cl. 345-84.000.
- Masuda, Norihiro: *See—*  
Tokita, Masakuni; Kobayashi, Akira; Yamakawa, Shinichi; Shimizu, Mitsuharu; and Masuda, Norihiro, Re. 35,353, Cl. 29-830.000.
- Perfect-Valois Ventil GmbH: *See—*  
Kersten, Jens-Heinrich; Schmitz, Detlef; and Runte, Peter, Re. 35,354, Cl. 222-209.000.
- Rosemount Analytical Inc.: *See—*  
Ryan, Fredrick M.; and Gottlieb, Milton S., Re. 35,355, Cl. 250-343.000.
- Runte, Peter: *See—*  
Kersten, Jens-Heinrich; Schmitz, Detlef; and Runte, Peter, Re. 35,354, Cl. 222-209.000.
- Ryan, Fredrick M.; and Gottlieb, Milton S., to Rosemount Analytical Inc.: Method and arrangement for measuring the optical absorptions of gaseous mixtures, Re. 35,355, Cl. 250-343.000.
- Schmitz, Detlef: *See—*  
Kersten, Jens-Heinrich; Schmitz, Detlef; and Runte, Peter, Re. 35,354, Cl. 222-209.000.
- Shimizu, Mitsuharu: *See—*  
Tokita, Masakuni; Kobayashi, Akira; Yamakawa, Shinichi; Shimizu, Mitsuharu; and Masuda, Norihiro, Re. 35,353, Cl. 29-830.000.
- Shinko Electric Ind. Co., Ltd.: *See—*  
Tokita, Masakuni; Kobayashi, Akira; Yamakawa, Shinichi; Shimizu, Mitsuharu; and Masuda, Norihiro, Re. 35,353, Cl. 29-830.000.
- Texas Instruments Incorporated: *See—*  
Gill, Manzur, Re. 35,356, Cl. 257-316.000.
- Tokita, Masakuni; Kobayashi, Akira; Yamakawa, Shinichi; Shimizu, Mitsuharu; and Masuda, Norihiro, to Shinko Electric Ind. Co., Ltd.; and Intel Corporation: Process for manufacturing a multi-layer lead frame, Re. 35,353, Cl. 29-830.000.
- Yamakawa, Shinichi: *See—*  
Tokita, Masakuni; Kobayashi, Akira; Yamakawa, Shinichi; Shimizu, Mitsuharu; and Masuda, Norihiro, Re. 35,353, Cl. 29-830.000.

## LIST OF DESIGN PATENTEEES

- Aesculap AG: *See—*  
Jakab, Mariana, 374,936, Cl. D24-217.000.
- Agam, Yaacov: Picture frame, 374,777, Cl. D6-300.000.
- Ahern, Richard B., Jr., to Rubbermaid Incorporated: Lid for pasta keeper, 374,794, Cl. D7-392.100.
- Akeno, Mitsuru, to YKK Corporation: Male member of surface fastener, 374,813, Cl. D8-382.000.
- Alert Enterprises, Inc.: *See—*  
Yue, Gilbert Y., 374,829, Cl. D10-47.000.
- Alger, Andrew L., to Uarco Incorporated: Deleaver, 374,885, Cl. D18-47.000.
- Allen, Frank; and Allen, Kim, to F. H. Noble & Company: Convertible urn vault, 374,962, Cl. D99-5.000.
- Allen, Kim: *See—*  
Allen, Frank; and Allen, Kim, 374,962, Cl. D99-5.000.
- Allyson Visser: *See—*  
Phethean, Christopher R., 374,910, Cl. D22-143.000.
- Alsop, J. Douglas: *See—*  
Terpstra, Daniel A.; Beth, David E.; Watson, James B.; Alsop, J. Douglas; and Saunders, William J., 374,803, Cl. D8-66.000.
- Alvarez, Henry S.: *See—*  
Armenta, Vincent; Cruz, Louis J.; and Alvarez, Henry S., 374,758, Cl. D2-851.000.
- Alvarez, Jason J.: *See—*  
Cesaroni, William C.; Barrett, Shawn O.; and Alvarez, Jason J., 374,931, Cl. D24-169.000.
- Amero, Willard F., Jr.; Fay, Eugene R.; and McMurray, Charles R., to Motorola, Inc.: Battery for portable communication device, 374,860, Cl. D13-103.000.
- Apple Computer, Inc.: *See—*  
Barbera, Lawrence E.; and Wood, Kenneth D., 374,889, Cl. D18-54.000.
- Udagawa, Masamichi, 374,888, Cl. D18-50.000.
- Armenta, Vincent; Cruz, Louis J.; and Alvarez, Henry S.: Headgear accessory, 374,758, Cl. D2-851.000.
- Attanasio, Lee: Combined planter and lamp base, 374,843, Cl. D11-144.000.
- Austin, Clyde A.: Earring, 374,837, Cl. D11-40.000.
- Avery, Lynn: *See—*  
Kalista, Tammy; Cranston, Julia; and Avery, Lynn, 374,789, Cl. D6-596.000.
- Barbera, Lawrence E.; and Wood, Kenneth D., to Apple Computer, Inc.: Computer printer, 374,889, Cl. D18-54.000.
- Barrett, Shawn O.: *See—*  
Cesaroni, William C.; Barrett, Shawn O.; and Alvarez, Jason J., 374,931, Cl. D24-169.000.
- Baumman, Michael: *See—*  
Gobble, Harold; Bauman, Michael; Johnson, Gerry; and Zimmermann, Douglas R., 374,755, Cl. D1-125.000.
- Bazz Inc.: *See—*  
Benghozi, Simon, 374,945, Cl. D26-106.000.
- Beaulieu, Jocelyn: *See—*  
Tedesco, Romeo; and Beaulieu, Jocelyn, 374,778, Cl. D6-366.000.
- Below, Randall J.: *See—*  
Siemon, John A.; and Below, Randall J., 374,864, Cl. D13-154.000.
- Benghozi, Simon, to Bazz Inc.: Table lamp, 374,945, Cl. D26-106.000.
- Bennett Industries, Inc.: *See—*  
Phillips, Terry M., 374,822, Cl. D9-453.000.
- Bernhardt, Jürgen: *See—*  
Müller, Norbert; Pawlowski, Adam; Styppa, Heinrich; and Bernhardt, Jürgen, 374,920, Cl. D23-354.000.
- Berninger, Randy Q.: Combined cupholder and armrest for vehicles, 374,856, Cl. D12-419.000.
- Bertolini, Peter; Valls, William; and Marcus, Wayne, to Chesebrough-Pond's USA Co., Division of Conopco, Inc.: Cosmetic dispenser, 374,817, Cl. D9-338.000.
- Beth, David E.: *See—*  
Terpstra, Daniel A.; Beth, David E.; Watson, James B.; Alsop, J. Douglas; and Saunders, William J., 374,803, Cl. D8-66.000.
- Bethke, Paul: *See—*  
Scianna, Anthony, Sr.; Teteak, David G.; Bethke, Paul; and Williams, Daniel L., 374,872, Cl. D14-138.000.
- Bird, Richard H.: *See—*  
Bradley, Kathy L.; Bird, Richard H.; Dockery, Olden A.; Smitley, Randy A.; Sprinkle, Calvin F.; and Payne, Donald T., 374,796, Cl. D7-406.000.
- Bissell Inc.: *See—*  
Umbach, Steven, 374,955, Cl. D32-21.000.
- Bookstaver, Charles W.; Smith, Samuel G.; and Mercurio, Frank, to Roadmaster Corporation: Playground assembly support member, 374,902, Cl. D21-246.000.
- Booster PAC International Corporation: *See—*  
Guay, Etienne; and Côté, André, 374,859, Cl. D13-110.000.
- Bornhorst, Kenneth F., Jr.; Crease, Pierre L.; Izor, Kim E.; Lucous, Larry D.; and Uptegraph, Larry L., to Ohio Electronic Engravers, Inc.: Engraver, 374,891, Cl. D18-57.000.



- Bradley, Kathy L.; Bird, Richard H.; Dockery, Olden A.; Smitley, Randy A.; Sprinkle, Calvin F.; and Payne, Donald T., to Porcelain Metals Corporation. Barbeque grill ring shelf. 374,796, Cl. D7-406.000.
- Brunner, Merlin A.; and Draheim, Harvey J., to Simmons Juvenile Products Company, Inc. Dresser. 374,784, Cl. D6-445.000.
- Cacciola, Joseph C.; and Ford, William K., to Little Tikes Company, The. Play house. 374,901, Cl. D21-240.000.
- Caeran, Francesco: See—  
Edauw, Peter; and Caeran, Francesco, 374,759, Cl. D2-902.000.  
Edauw, Peter; and Caeran, Francesco, 374,760, Cl. D2-902.000.
- Calvert, Scott A.: See—  
Katz, Jonathan M.; Laundroche, Kevin S.; and Calvert, Scott A., 374,954, Cl. D32-6.000.
- Canavan, Eugene, to Logitech, Inc. Ergonomic trackball. 374,867, Cl. D14-114.000.
- Canon Kabushiki Kaisha: See—  
Takahashi, Masaki; and Umeda, Hiroki, 374,886, Cl. D18-49.000.  
Tokuda, Hiroyuki; Takenouchi, Masanori; Kotaki, Yasuo; and Hamasaki, Yuji, 374,890, Cl. D18-56.000.
- Carevich, Melinda K.: See—  
Lazzeroni, John J.; and Carevich, Melinda K., 374,855, Cl. D12-415.000.
- Carrera Eyewear Corporation: See—  
Lützbauser, Adolf, 374,883, Cl. D16-321.000.
- Carter, Morris, Jr. Tufted interior wall panel. 374,943, Cl. D25-138.000.
- Casden, Henry J. Shower enclosure. 374,916, Cl. D23-283.000.
- Casden, Henry J. Enclosure for a bathtub. 374,917, Cl. D23-283.000.
- Casden, Henry J. Shower enclosure. 374,918, Cl. D23-283.000.
- Case, Richard N., to RCP Enterprises, Inc. Flashlight and battery carrier. 374,769, Cl. D3-229.000.
- Case, Richard N., to RCP Enterprises, Inc. Flashlight and battery holster. 374,770, Cl. D3-229.000.
- Cassel, Timothy S., to Tucker Housewares. Tote with hinged cover. 374,774, Cl. D3-294.000.
- Central Park Conservancy Inc.: See—  
Poor, Jeffrey S.; and Rabinowitz, Mark, 374,842, Cl. D11-143.000.
- Cesaroni, William C.; Barrett, Shawn O.; and Alvarez, Jason J., to Kendall Company, The. Controller for system for applying compressive pressure to the leg. 374,931, Cl. D24-169.000.
- Chabot, John, to Chalmir Elektrik Inc. Heater grill. 374,927, Cl. D23-387.000.
- Chalmir Elektrik Inc.: See—  
Chabot, John, 374,927, Cl. D23-387.000.
- Challenger, Inc.: See—  
Pierce, Richard D., 374,853, Cl. D12-314.000.
- Chapman, Steven S.; Jackson, Daniel C.; McBride, John K.; Rydelek, James G.; and Yokajty, Joseph E., to Eastman Kodak Company. Flash camera with cover label. 374,881, Cl. D16-218.000.
- Cheng, Peter S. C. Golf tee. 374,898, Cl. D21-208.000.
- Chesbrough-Pond's USA Co., Division of Conopco, Inc.: See—  
Bertolini, Peter; Valls, William; and Marcus, Wayne, 374,817, Cl. D9-338.000.
- Valls, William, 374,827, Cl. D9-571.000.
- Chiaramonte, Anthony. Lotion applicator. 374,947, Cl. D28-7.000.
- Chipman, Robert G., to Landscape Forms, Inc. Bicycle rack. 374,849, Cl. D12-115.000.
- Chu, Chi-Tsong. Battery charger for a notebook personal computer. 374,858, Cl. D13-108.000.
- Clark, Russell T. Eye shield. 374,950, Cl. D29-109.000.
- Clerc, Oliver C., Jr.: See—  
Squire, Warner; and Clerc, Oliver C., Jr., 374,797, Cl. D7-515.000.
- Coggins, Fred H., to Southern Pro Lures, Inc. Fishing lure. 374,906, Cl. D22-128.000.
- Colibri Corporation: See—  
Levinger, Frederick N., 374,838, Cl. D11-86.000.
- Copeland, James L.: See—  
Decker, James D.; Copeland, James L.; and Olson, Scott R., 374,823, Cl. D9-520.000.
- Copp, Mark C. Pressurized water shield. 374,915, Cl. D23-227.000.
- Côté, André: See—  
Guay, Etienne; and Côté, André, 374,859, Cl. D13-110.000.
- CPC International Inc.: See—  
Mackinson, Peter J.; Doskoczynski, William J.; and Sirico, Michael A., 374,826, Cl. D9-542.000.
- Craft, Nancy L. Computer mouse rack. 374,868, Cl. D14-114.000.
- Cramer, Ronald G., to S. C. Johnson & Son, Inc. Air freshener device. 374,924, Cl. D23-366.000.
- Cranston, Julia: See—  
Kalista, Tammy; Cranston, Julia; and Avery, Lynn, 374,789, Cl. D6-596.000.
- Crease, Pierre L.: See—  
Bornhorst, Kenneth F., Jr.; Crease, Pierre L.; Izor, Kim E.; Lucous, Larry D.; and Uptegraph, Larry L., 374,891, Cl. D18-57.000.
- Crebolder meergenaamd Krijbolder, Jacobus J.: See—  
Keijser, Johannes W. M.; and Crebolder meergenaamd Krijbolder, Jacobus J., 374,810, Cl. D8-354.000.
- Cruz, Louis J.: See—  
Armenta, Vincent; Cruz, Louis J.; and Alvarez, Henry S., 374,758, Cl. D2-851.000.
- Cycle Computer Corp.: See—  
Johnston, Mark L., 374,866, Cl. D13-182.000.
- Daiwa Seiko, Inc.: See—  
Kaneko, Kyoichi; and Shinohara, Eiji, 374,909, Cl. D22-141.000.
- Decker, James D.; Copeland, James L.; and Olson, Scott R., to Ecolab Inc. Liquid detergent bottle. 374,823, Cl. D9-520.000.
- DeMatteo, John J., Jr. Pocket watch case. 374,828, Cl. D10-37.000.
- Denebeim, Sabrina S. Spherical hairbrush. 374,776, Cl. D4-128.000.
- Dexter, Andrea E.; Erickson, James E.; and Shultz, Guy M., to Honeywell Inc. Thermostat remote subbase housing cover. 374,830, Cl. D10-50.000.
- Dickhaut, Donald: See—  
Dickhaut, Jeffery J.; and Dickhaut, Donald, 374,846, Cl. D12-11.000.
- Dickhaut, Jeffery J.; and Dickhaut, Donald. Body snow sled with forearm blades. 374,846, Cl. D12-11.000.
- Diem, D. W., to Performance Marketing, Inc. Bench seat console. 374,857, Cl. D12-419.000.
- DiGiorgio, Tony, to Dominion Plastics Inc. Casement sash. 374,938, Cl. D25-124.000.
- DiGiorgio, Tony, to Dominion Plastics Inc. Casement sash. 374,939, Cl. D25-124.000.
- Dockery, Olden A.: See—  
Bradley, Kathy L.; Bird, Richard H.; Dockery, Olden A.; Smitley, Randy A.; Sprinkle, Calvin F.; and Payne, Donald T., 374,796, Cl. D7-406.000.
- Dominion Plastics Inc.: See—  
DiGiorgio, Tony, 374,938, Cl. D25-124.000.  
DiGiorgio, Tony, 374,939, Cl. D25-124.000.
- Domino S.p.A.: See—  
Sadler, Marc, 374,913, Cl. D23-213.000.
- Domotor, Agnes C., to Samsonite Corporation. Wheeled luggage case. 374,773, Cl. D3-279.000.
- Doskoczynski, William J.: See—  
Mackinson, Peter J.; Doskoczynski, William J.; and Sirico, Michael A., 374,826, Cl. D9-542.000.
- Draheim, Harvey J.: See—  
Brunner, Merlin A.; and Draheim, Harvey J., 374,784, Cl. D6-445.000.
- Drinkwater, Ian, to President Office Furniture Ltd. Cabling unit. 374,865, Cl. D13-154.000.
- Duracraft Corporation: See—  
Jané, Rodney; Wang, Jui-Shang; Gresens, Stanley; Holderfield, Gregory; and Longan, John, 374,921, Cl. D23-356.000.
- Dzibinski, DuWayne M. Cooking utensil. 374,792, Cl. D7-360.000.
- Eastman Kodak Company: See—  
Chapman, Steven S.; Jackson, Daniel C.; McBride, John K.; Rydelek, James G.; and Yokajty, Joseph E., 374,881, Cl. D16-218.000.
- Ecolab Inc.: See—  
Decker, James D.; Copeland, James L.; and Olson, Scott R., 374,823, Cl. D9-520.000.
- Edauw, Peter; and Caeran, Francesco, to Nordica S.p.A.; and Rollerblade, Inc. Sports shoe. 374,759, Cl. D2-902.000.
- Edauw, Peter; and Caeran, Francesco, to Nordica S.p.A.; and Rollerblade, Inc. Sports shoe. 374,760, Cl. D2-902.000.
- Eickel, Richard, to Heinrich Berndes Produktionsgesellschaft mbH. Glass lid for cooking utensils. 374,793, Cl. D7-391.000.
- Emerson Electric Co.: See—  
Terpstra, Daniel A.; Beth, David E.; Watson, James B.; Alsop, J. Douglas; and Saunders, William J., 374,803, Cl. D8-66.000.
- Engelander, Pieter, to Faurey Arlon B.V. Filter housing. 374,912, Cl. D23-209.000.
- Engelman, Joseph A. Cleft palate impression tray. 374,932, Cl. D24-181.000.
- Erickson, James E.: See—  
Dexter, Andrea E.; Erickson, James E.; and Shultz, Guy M., 374,830, Cl. D10-50.000.
- F. H. Noble & Company: See—  
Allen, Frank; and Allen, Kim, 374,962, Cl. D99-5.000.
- Faurey Arlon B.V.: See—  
Engelander, Pieter, 374,912, Cl. D23-209.000.
- Family Trust U/T/A, The: See—  
Weder, Donald E.; and Straeter, Joseph G., 374,844, Cl. D11-164.000.
- Fay, Eugene R.: See—  
Amero, Willard F., Jr.; Fay, Eugene R.; and McMurray, Charles R., 374,860, Cl. D13-103.000.
- Feldberg, Saul, to Global Upholstery Company. Chair. 374,779, Cl. D6-366.000.
- Ferino, Ferdinand H. Helmet. 374,949, Cl. D29-102.000.
- Ford, James J.; Ziemer, Lynn B.; and McCormack, Edward A., to Southco, Inc. Draw latch. 374,806, Cl. D8-331.000.
- Ford, William K.: See—  
Cacciola, Joseph C.; and Ford, William K., 374,901, Cl. D21-240.000.
- Fraquelli, Roberto G.: See—  
Stoddard, John P.; Lyons, David F.; and Fraquelli, Roberto G., 374,787, Cl. D6-484.000.
- Fu-Chi Plastics Co.: See—  
Lee, Hong-Jen, 374,942, Cl. D25-126.000.
- FunFoods Incorporated: See—  
Tintle, Douglas S., 374,753, Cl. D1-106.000.
- Gaumont, Michel, to SOLAIC (société anonyme). Smart card with two external contact regions. 374,870, Cl. D14-117.000.
- General Electric Company: See—  
Katz, Jonathan M.; Laundroche, Kevin S.; and Calvert, Scott A., 374,954, Cl. D32-6.000.
- Gillette Company, The: See—  
Poisson, Norman D., 374,818, Cl. D9-338.000.
- Gisser, Daryl. Automobile body. 374,847, Cl. D12-92.000.

- Global Upholstery Company: See—  
Feldberg, Saul, 374,779, Cl. D6-366.000.
- Tedesco, Romeo; and Beaulieu, Jocelyn, 374,778, Cl. D6-366.000.
- Gobbie, Harold; Bauman, Michael; Johnson, Gerry; and Zimmermann, Douglas R., to Kellogg Company. Waffle. 374,755, Cl. D1-125.000.
- Goldstein, Raymond J.: See—  
Scott, Vivian A. S.; and Goldstein, Raymond J., 374,839, Cl. D11-131.000.
- Grande, Frank, to Hse-McCann Telephone, Co., Inc. Ganged-jack cover. 374,863, Cl. D13-146.000.
- Grant, David F. Golf spike. 374,762, Cl. D2-962.000.
- Graves, James D. Housing for a portable telephone capable of hanging from a remote object. 374,875, Cl. D14-248.000.
- Greenlee Textron, Inc.: See—  
Moffatt, W. Keith; and Hurley, Paul, 374,805, Cl. D8-107.000.
- Gresens, Stanley: See—  
Jané, Rodney; Wang, Jui-Shang; Gresens, Stanley; Holderfield, Gregory; and Longan, John, 374,921, Cl. D23-356.000.
- Guay, Etienne; and Côté, André, to Booster PAC International Corporation. Portable power supply. 374,859, Cl. D13-110.000.
- Guegan, Jacques; Lecocq, Francis; and Moussaud, Jean-Pierre, to Meccano, S.A. Briefcase container for toys. 374,771, Cl. D3-276.000.
- Gunn, William H.: See—  
Nalepka, Michael D.; and Gunn, William H., 374,892, Cl. D19-32.000.
- Hamasaki, Yuji: See—  
Tokuda, Hiroyuki; Takenouchi, Masanori; Kotaki, Yasuo; and Hamasaki, Yuji, 374,890, Cl. D18-56.000.
- Hart, Keith, to Majestic Plastics Ltd. Window header. 374,940, Cl. D25-124.000.
- Haworth, Inc.: See—  
Stoddard, John P.; Lyons, David F.; and Fraquelli, Roberto G., 374,787, Cl. D6-484.000.
- Heinrich Berndes Produktionsgesellschaft mbH: See—  
Eickel, Richard, 374,793, Cl. D7-391.000.
- Hesse, Cher: See—  
Towns, Kyle; and Hesse, Cher, 374,894, Cl. D19-69.000.
- HEWI Heinrich Wilke GmbH: See—  
Scholl, Winfried, 374,788, Cl. D6-574.000.
- Hewlett-Packard Company: See—  
Mousa, Badir M., 374,861, Cl. D13-110.000.
- Hirano, Seiji; and Morioka, Masamichi, to Yazaki Industrial Chemical Co., Ltd. Claw coupling. 374,812, Cl. D8-382.000.
- Hitachi, Ltd.: See—  
Utsuki, Toshiyuki; Kuroiwa, Yukio; Yoshida, Yoshiki; Kumagai, Kenta; and Takahashi, Setsuo, 374,965, Cl. D99-28.000.
- Holderfield, Gregory: See—  
Jané, Rodney; Wang, Jui-Shang; Gresens, Stanley; Holderfield, Gregory; and Longan, John, 374,921, Cl. D23-356.000.
- Honeywell Inc.: See—  
Dexter, Andrea E.; Erickson, James E.; and Shultz, Guy M., 374,830, Cl. D10-50.000.
- Hoover Company, The: See—  
Wareham, Richard A.; and Stephens, Ronald J., 374,953, Cl. D32-31.000.
- Hotaling, Bryan; and Rossman, Jon, to Tucker Housewares. Foot locker. 374,772, Cl. D3-276.000.
- Hoyt, Thomas. Combined control panel, display unit and antenna for an emergency vehicle sensor system. 374,831, Cl. D10-104.000.
- Hse-McCann Telephone, Co., Inc.: See—  
Grande, Frank, 374,863, Cl. D13-146.000.
- Hsu, Tony, to Lundar Electric Ind. Co., Ltd. Electric roaster. 374,790, Cl. D7-352.000.
- Hsu, Tony, to Lundar Electric Industrial Co., Ltd. Electric iron. 374,956, Cl. D32-70.000.
- Hughes, Jeffrey T., to Hughes Products Co., Inc. Knife sharpener. 374,804, Cl. D8-93.000.
- Hughes Products Co., Inc.: See—  
Hughes, Jeffrey T., 374,804, Cl. D8-93.000.
- Hurley, Paul: See—  
Moffatt, W. Keith; and Hurley, Paul, 374,805, Cl. D8-107.000.
- Ikehara, Chikako, to YKK Corporation. Pull tab of slide fastener. 374,845, Cl. D11-221.000.
- ITT Corporation: See—  
Palmer, Gary L., 374,878, Cl. D16-130.000.
- Izor, Kim E.: See—  
Bornhorst, Kenneth F., Jr.; Crease, Pierre L.; Izor, Kim E.; Lucous, Larry D.; and Uptegraph, Larry L., 374,891, Cl. D18-57.000.
- Jackson, Daniel C.: See—  
Chapman, Steven S.; Jackson, Daniel C.; McBride, John K.; Rydelek, James G.; and Yokajty, Joseph E., 374,881, Cl. D16-218.000.
- Jakab, Mariana, to Aesculap AG. Perforated sheet metal container. 374,936, Cl. D24-217.000.
- Jané, Rodney; Wang, Jui-Shang; Gresens, Stanley; Holderfield, Gregory; and Longan, John, to Duracraft Corporation. Humidifier housing. 374,921, Cl. D23-356.000.
- Jannard, James H., to Oakley, Inc. Ear stems. 374,884, Cl. D16-335.000.
- Jones, Stephen W., 374,765, Cl. D3-212.000.
- Jaspers-Fayer, Jan, to Minka Lighting, Inc. Ceiling fan. 374,925, Cl. D23-377.000.
- John Manufacturing, Ltd.: See—  
Yuen, John S., 374,944, Cl. D26-28.000.
- Johnson & Johnson Consumer Products, Inc.: See—  
Yost, Kevin G.; and Trojanowski, Alan G., 374,775, Cl. D4-104.000.
- Johnson & Johnson Inc.: See—  
Murji, Zulfikar, 374,928, Cl. D24-125.000.
- Johnson, Gerry: See—  
Gobbie, Harold; Bauman, Michael; Johnson, Gerry; and Zimmermann, Douglas R., 374,755, Cl. D1-125.000.
- Johnson, Gustav E., to Lerner Packaging Corp. Container closure. 374,821, Cl. D9-447.000.
- Johnston, Mark L., to Cycle Computer Corp. Scalable processing architecture (SPARC) computer motherboard. 374,866, Cl. D13-182.000.
- Jones, Stephen W., to Jasco, Inc. Key holder. 374,765, Cl. D3-212.000.
- Juno Lighting, Inc.: See—  
Wachter, Peter F., 374,835, Cl. D10-114.000.
- Kahana, Dov. Filter housing. 374,911, Cl. D23-209.000.
- Kalista, Tammy; Cranston, Julia; and Avery, Lynn. Multi-purpose beach towel. 374,789, Cl. D6-596.000.
- Kaneko, Kyoichi; and Shinohara, Eiji, to Daiwa Seiko, Inc. Line roller for a spinning fishing reel. 374,909, Cl. D22-141.000.
- Karlin, James H., to PSC Inc. Hand-held scanner for reading optical indicia. 374,869, Cl. D14-116.000.
- Kataoka, Tetsu, to Sony Corporation. Combined video tape recorder and camera. 374,880, Cl. D16-202.000.
- Katz, Jonathan M.; Laundroche, Kevin S.; and Calvert, Scott A., to General Electric Company. Appliance cabinet. 374,954, Cl. D32-6.000.
- Keijser, Johannes W. M.; and Crebolder meergenaamd Krijbolder, Jacobus J., to Minkels Products B.V. Frame for mounting electronic equipment. 374,810, Cl. D8-354.000.
- Keller Golf A.G.: See—  
Keller, Robert; and Tanta, Said, 374,957, Cl. D34-15.000.
- Keller, H. Thomas; and Risdon, Scott, to Vaughan Furniture Company, Inc. Triple dresser with mirror. 374,783, Cl. D6-444.000.
- Keller, H. Thomas; and Risdon, Scott, to Vaughan Furniture Company, Inc. Nightstand. 374,785, Cl. D6-446.000.
- Keller, Robert; and Tanta, Said, to Keller Golf A.G. Electric golf bag cart. 374,957, Cl. D34-15.000.
- Kellogg Company: See—  
Gobbie, Harold; Bauman, Michael; Johnson, Gerry; and Zimmermann, Douglas R., 374,755, Cl. D1-125.000.
- Kendall Company, The: See—  
Cesaroni, William C.; Barrett, Shawn O.; and Alvarez, Jason J., 374,931, Cl. D24-169.000.
- Ketchum, Michael W. Spoon type fishing lure. 374,907, Cl. D22-129.000.
- Knoss, Robert; and Krupa, Calvin S., to Ultra Pac, Inc. Cake container. 374,820, Cl. D9-429.000.
- Koelewyn, Robert W. Fishing reel. 374,908, Cl. D22-141.000.
- Kolvin Industries Limited: See—  
Lie, Sen-Nen, 374,933, Cl. D24-213.000.  
Lie, Sen-Nen, 374,934, Cl. D24-215.000.  
Lie, Sen-Nen, 374,935, Cl. D24-215.000.
- Kong, Pang C.; Wah, Ho C.; and Shan, Wong F., to Vtech Communications, Ltd. Cordless telephone handset housing. 374,873, Cl. D14-147.000.
- Kotaki, Yasuo: See—  
Tokuda, Hiroyuki; Takenouchi, Masanori; Kotaki, Yasuo; and Hamasaki, Yuji, 374,890, Cl. D18-56.000.
- Krupa, Calvin S.: See—  
Knoss, Robert; and Krupa, Calvin S., 374,820, Cl. D9-429.000.
- Kumagai, Kenta: See—  
Utsuki, Toshiyuki; Kuroiwa, Yukio; Yoshida, Yoshiki; Kumagai, Kenta; and Takahashi, Setsuo, 374,965, Cl. D99-28.000.
- Kung, Su-Min. Periscope. 374,879, Cl. D16-132.000.
- Kuroiwa, Yukio: See—  
Utsuki, Toshiyuki; Kuroiwa, Yukio; Yoshida, Yoshiki; Kumagai, Kenta; and Takahashi, Setsuo, 374,965, Cl. D99-28.000.
- Landscape Forms, Inc.: See—  
Chipman, Robert G., 374,849, Cl. D12-115.000.
- Laundroche, Kevin S.: See—  
Katz, Jonathan M.; Laundroche, Kevin S.; and Calvert, Scott A., 374,954, Cl. D32-6.000.
- Lazzeroni, John J.; and Carevich, Melinda K. Windshield mounted radio housing with decoration. 374,855, Cl. D12-415.000.
- Leach, Otis M. Remote control holder. 374,767, Cl. D3-218.000.
- Lecocq, Francis: See—  
Guegan, Jacques; Lecocq, Francis; and Moussaud, Jean-Pierre, 374,771, Cl. D3-276.000.
- Lee, Hong-Jen, to Fu-Chi Plastics Co. Lamp securing post. 374,942, Cl. D25-126.000.
- Lee, Noel, to Monster Cable International, Ltd. Cable connector. 374,862, Cl. D13-133.000.
- Lerner Packaging Corp.: See—  
Johnson, Gustav E., 374,821, Cl. D9-447.000.
- Lerner, Jared A.: See—  
Levy, Adam H.; and Lerner, Jared A., 374,840, Cl. D11-132.000.
- Levy, Adam H.; and Lerner, Jared A. Plaque. 374,840, Cl. D11-132.000.
- Lie, Gunnar. Non-slip, resilient handle. 374,795, Cl. D7-395.000.
- Lie, Sen-Nen, to Kolvin Industries Limited. Massager. 374,933, Cl. D24-213.000.



- Lie, Sen-Nen, to Kolvin Industries Limited. Massager. 374,934, Cl. D24-215,000.
- Lie, Sen-Nen, to Kolvin Industries Limited. Massager. 374,935, Cl. D24-215,000.
- Liebers, Steven B. Eyeglass display support. 374,786, Cl. D6-468,000.
- Liistro, Brenda O.; and Petrie, Aidan J., to Playtex Products, Inc. Spoon. 374,800, Cl. D7-653,000.
- Liles, Michael B.; and Pierce, Patrick. Bicycle armor. 374,848, Cl. D12-114,000.
- Linares, Marta B.: See—
- Puig, Ramón B.; and Linares, Marta B., 374,801, Cl. D8-42,000.
- Lindeman, Phillip E.; and Pullman, Marc H., to Motorola, Inc. Microphone grille. 374,874, Cl. D14-225,000.
- Lisco, Inc.: See—
- Mahaffey, Steve, 374,899, Cl. D21-214,000.
- Stroud, David J.; Roan, Tracy C.; and Sankaralingam, Ilango, 374,896, Cl. D21-142,000.
- Little, James E.; and Little, Narcisa T. Tailgate gap cover. 374,854, Cl. D12-400,000.
- Little, Narcisa T.: See—
- Little, James E.; and Little, Narcisa T., 374,854, Cl. D12-400,000.
- Little Tikes Company, The: See—
- Cacciola, Joseph C.; and Ford, William K., 374,901, Cl. D21-240,000.
- Loehr, Robert P.; and Treglia, Frank. Handlebar with an integral locking collar for its crank. 374,851, Cl. D12-178,000.
- Logitech, Inc.: See—
- Canavan, Eugene, 374,867, Cl. D14-114,000.
- Longan, John: See—
- Jané, Rodney; Wang, Jui-Shang; Gresens, Stanley; Holderfield, Gregory; and Longan, John, 374,921, Cl. D23-356,000.
- Lonsky, Peter W. Mobile. 374,841, Cl. D11-141,000.
- Lucous, Larry D.: See—
- Bornhorst, Kenneth F., Jr.; Crease, Pierre L.; Izor, Kim E.; Lucous, Larry D.; and Uptegraph, Larry L., 374,891, Cl. D18-57,000.
- Lundar Electric Ind. Co., Ltd.: See—
- Hsu, Tony, 374,790, Cl. D7-352,000.
- Lundar Electric Industrial Co., Ltd.: See—
- Hsu, Tony, 374,956, Cl. D32-70,000.
- Lundie, Edgar, Jr. Holster for carrying telecommunication equipment. 374,768, Cl. D3-218,000.
- Lüzlbauer, Adolf, to Carrera Eyewear Corporation. Eyeglasses. 374,883, Cl. D16-321,000.
- Lyons, David F.: See—
- Stoddard, John P.; Lyons, David F.; and Fraquelli, Roberto G., 374,787, Cl. D6-484,000.
- Lyons Tetley Limited: See—
- Stevenson, John F. T., 374,756, Cl. D1-199,000.
- Machson, Roger. Face shield. 374,951, Cl. D29-110,000.
- Mackinson, Peter J.; Doskoczynski, William J.; and Sirico, Michael A., to CPC International Inc. Bottle. 374,826, Cl. D9-542,000.
- Mahaffey, Steve, to Lisco, Inc. Golf club driver head. 374,899, Cl. D21-214,000.
- Majestic Plastics Ltd.: See—
- Hart, Keith, 374,940, Cl. D25-124,000.
- Mannerfelt, Göran. Boat. 374,852, Cl. D12-314,000.
- Marcus, Wayne: See—
- Bertolini, Peter; Valls, William; and Marcus, Wayne, 374,817, Cl. D9-338,000.
- Martin, Leo, to Miami Metal Products, Inc. Lounge chair. 374,781, Cl. D6-379,000.
- Matassa, Nanette. Beach safe. 374,966, Cl. D99-28,000.
- McBride, John K.: See—
- Chapman, Steven S.; Jackson, Daniel C.; McBride, John K.; Rydelek, James G.; and Yokajty, Joseph E., 374,881, Cl. D16-218,000.
- McClenny, Lindsay C.: See—
- Neuberger, Cheryl G.; and McClenny, Lindsay C., 374,963, Cl. D99-5,000.
- McCormack, Edward A.: See—
- Ford, James J.; Zierner, Lynn B.; and McCormack, Edward A., 374,806, Cl. D8-331,000.
- McMurray, Charles R.: See—
- Amero, Willard F., Jr.; Fay, Eugene R.; and McMurray, Charles R., 374,860, Cl. D13-103,000.
- Meccano, S.A.: See—
- Guegan, Jacques; Lecocq, Francis; and Moussaud, Jean-Pierre, 374,771, Cl. D3-276,000.
- Mercurio, Frank: See—
- Bookstaver, Charles W.; Smith, Samuel G.; and Mercurio, Frank, 374,902, Cl. D21-246,000.
- Mers, Xiao Y. Organizer for manicure polish and implements. 374,948, Cl. D28-61,000.
- Meurlin, Donald. Blend, moisten and storage system for tobacco products. 374,946, Cl. D27-189,000.
- Miami Metal Products, Inc.: See—
- Martio, Leo, 374,781, Cl. D6-379,000.
- Miller, Albert, to Termination Turtle LP. Snail bait holder and snail trap. 374,904, Cl. D22-119,000.
- Minka Lighting, Inc.: See—
- Jaspers-Fayer, Jan, 374,925, Cl. D23-377,000.
- Minkels Products B.V.: See—
- Keijser, Johannes W. M.; and Crebolder meergenaamd Krijbolder, Jacobus J., 374,810, Cl. D8-354,000.
- Mirax Chemical Products Corporation: See—
- Squire, Warner; and Clerc, Oliver C., Jr., 374,797, Cl. D7-515,000.
- Miyashita, Muneharu, to Yazaki Industrial Chemical Co., Ltd. Joint for a rack frame. 374,811, Cl. D8-382,000.
- Mochizuki, Shinichi, to Sega Enterprises, Ltd. Video game machine. 374,895, Cl. D21-13,000.
- Moffatt, W. Keith; and Hurley, Paul, to Greenlee Textron, Inc. Crimper handle. 374,805, Cl. D8-107,000.
- Monster Cable International, Ltd.: See—
- Lee, Noel, 374,862, Cl. D13-133,000.
- Moore, Devin L., to Sunbeam Products, Inc. Humidifier. 374,922, Cl. D23-356,000.
- Moore, Devin L., to Sunbeam Products, Inc. Vaporizer. 374,923, Cl. D23-360,000.
- Morioka, Masamichi: See—
- Hirano, Seiji; and Morioka, Masamichi, 374,812, Cl. D8-382,000.
- Motorola, Inc.: See—
- Amero, Willard F., Jr.; Fay, Eugene R.; and McMurray, Charles R., 374,860, Cl. D13-103,000.
- Lindeman, Phillip E.; and Pullman, Marc H., 374,874, Cl. D14-225,000.
- Scianna, Anthony, Sr.; Teteak, David G.; Bethke, Paul; and Williams, Daniel L., 374,872, Cl. D14-138,000.
- Mousa, Badir M., to Hewlett-Packard Company. 600 VA uninterruptible power supply. 374,861, Cl. D13-110,000.
- Moussaud, Jean-Pierre: See—
- Guegan, Jacques; Lecocq, Francis; and Moussaud, Jean-Pierre, 374,771, Cl. D3-276,000.
- Müll, Ulrich, to Thielmann AG Kommanditgesellschaft. Beer keg. 374,959, Cl. D34-39,000.
- Müller, Norbert; Pawlowski, Adam; Styppa, Heinrich; and Bernhardt, Jürgen, to Rittal-Werk Rudolf Loh GmbH & Co. KG. Wall attachment housing for a refrigerating machine. 374,920, Cl. D23-354,000.
- Murji, Zulfikar, to Johnson & Johnson Inc. Disposable absorbent product. 374,928, Cl. D24-125,000.
- Nalepka, Michael D.; and Gunn, William H. Set of color coded labels for organizing books. 374,892, Cl. D19-32,000.
- Neuberger, Cheryl G.; and McClenny, Lindsay C. Urn for cremated remains. 374,963, Cl. D99-5,000.
- Nevitt, Bryant D. Dress tie. 374,757, Cl. D2-605,000.
- Newell Operating Company: See—
- Salas, Richard O., 374,937, Cl. D25-68,000.
- Nike, Inc.: See—
- Sell, James C., Jr., 374,761, Cl. D2-961,000.
- Nordica S.p.A.: See—
- Edauw, Peter; and Caeran, Francesco, 374,759, Cl. D2-902,000.
- Edauw, Peter; and Caeran, Francesco, 374,760, Cl. D2-902,000.
- Oakley, Inc.: See—
- Jannard, James H., 374,884, Cl. D16-335,000.
- Ohio Electronic Engravers, Inc.: See—
- Bornhorst, Kenneth F., Jr.; Crease, Pierre L.; Izor, Kim E.; Lucous, Larry D.; and Uptegraph, Larry L., 374,891, Cl. D18-57,000.
- Olson, Scott R.: See—
- Decker, James D.; Copeland, James L.; and Olson, Scott R., 374,823, Cl. D9-520,000.
- Oscar Mayer Foods Corporation: See—
- Wells, Cindie M., 374,819, Cl. D9-425,000.
- Palmer, Gary L., to TIT Corporation. Modular adaptor ring assembly for a night vision device. 374,878, Cl. D16-130,000.
- Panduit Corp.: See—
- Scherer, Craig; and Thuma, Michael, 374,809, Cl. D8-353,000.
- Paus, Michael J., to Universal Furniture Industries, Inc. Chest. 374,782, Cl. D6-444,000.
- Pawlowski, Adam: See—
- Müller, Norbert; Pawlowski, Adam; Styppa, Heinrich; and Bernhardt, Jürgen, 374,920, Cl. D23-354,000.
- Payne, Donald T.: See—
- Bradley, Kathy L.; Bird, Richard H.; Dockery, Olden A.; Smitley, Randy A.; Sprinkle, Calvin F.; and Payne, Donald T., 374,796, Cl. D7-406,000.
- Pearce Grip, Inc.: See—
- Pearce, R. Lane, 374,903, Cl. D22-108,000.
- Pearce, R. Lane, to Pearce Grip, Inc. Pistol grip. 374,903, Cl. D22-108,000.
- Penn, Deborah M. Sock dickie. 374,764, Cl. D2-980,000.
- Performance Marketing, Inc.: See—
- Diem, D. W., 374,857, Cl. D12-419,000.
- Petrie, Aidan J.: See—
- Liistro, Brenda O.; and Petrie, Aidan J., 374,800, Cl. D7-653,000.
- Phethean, Christopher R., to Allyson Visser. Replacement fishing rod tip. 374,910, Cl. D22-143,000.
- Phillips, Terry M., to Bennett Industries, Inc. Container closure. 374,822, Cl. D9-453,000.
- Pierce, Patrick: See—
- Liles, Michael B.; and Pierce, Patrick, 374,848, Cl. D12-114,000.
- Pierce, Richard D., to Challenger, Inc. Boat hull. 374,853, Cl. D12-314,000.
- Pippins, John W., Jr. Travel tray. 374,798, Cl. D7-553,000.
- Playtex Products, Inc.: See—
- Liistro, Brenda O.; and Petrie, Aidan J., 374,800, Cl. D7-653,000.
- Poisson, Norman D., to Gillette Company. The. Cosmetic dispenser. 374,818, Cl. D9-338,000.

- Poor, Jeffrey S.; and Rabinowitz, Mark, to Central Park Conservancy Inc. Urn. 374,842, Cl. D11-143,000.
- Porcelain Metals Corporation: See—
- Bradley, Kathy L.; Bird, Richard H.; Dockery, Olden A.; Smitley, Randy A.; Sprinkle, Calvin F.; and Payne, Donald T., 374,796, Cl. D7-406,000.
- President Office Furniture Ltd.: See—
- Drinkwater, Ian, 374,865, Cl. D13-154,000.
- PSC Inc.: See—
- Karlin, James H., 374,869, Cl. D14-116,000.
- Puig, Ramón B.; and Linares, Marta B. Corkscrew opener. 374,801, Cl. D8-42,000.
- Pullman, Marc H.: See—
- Lindeman, Phillip E.; and Pullman, Marc H., 374,874, Cl. D14-225,000.
- Rabinowitz, Mark: See—
- Poor, Jeffrey S.; and Rabinowitz, Mark, 374,842, Cl. D11-143,000.
- Ramos, Miguel A. Automobile fuel calculator. 374,832, Cl. D10-104,000.
- Raus, Craig. Belt attachment for articles having a belt clip. 374,766, Cl. D3-215,000.
- RCP Enterprises, Inc.: See—
- Case, Richard N., 374,769, Cl. D3-229,000.
- Case, Richard N., 374,770, Cl. D3-229,000.
- Reid Plastics, Inc.: See—
- Rokus, B. Joseph; Reusch, Ted; and Rendon, Richard, 374,824, Cl. D9-527,000.
- Rendon, Richard: See—
- Rokus, B. Joseph; Reusch, Ted; and Rendon, Richard, 374,824, Cl. D9-527,000.
- Reusch, Ted: See—
- Rokus, B. Joseph; Reusch, Ted; and Rendon, Richard, 374,824, Cl. D9-527,000.
- Richardson, Verna L. Burial casket. 374,961, Cl. D99-3,000.
- Risdon, Scott: See—
- Keller, H. Thomas; and Risdon, Scott, 374,783, Cl. D6-444,000.
- Keller, H. Thomas; and Risdon, Scott, 374,785, Cl. D6-446,000.
- Rittal-Werk Rudolf Loh GmbH & Co. KG: See—
- Müller, Norbert; Pawlowski, Adam; Styppa, Heinrich; and Bernhardt, Jürgen, 374,920, Cl. D23-354,000.
- Ritter, Ronald A. Cross. 374,964, Cl. D99-23,000.
- Roadmaster Corporation: See—
- Bookstaver, Charles W.; Smith, Samuel G.; and Mercurio, Frank, 374,902, Cl. D21-246,000.
- Roan, Tracy C.: See—
- Stroud, David J.; Roan, Tracy C.; and Sankaralingam, Ilango, 374,896, Cl. D21-142,000.
- Rockport Company, Inc.: See—
- Von Conta, Peter, 374,763, Cl. D2-970,000.
- Rokus, B. Joseph; Reusch, Ted; and Rendon, Richard, to Reid Plastics, Inc. Bottle. 374,824, Cl. D9-527,000.
- Rollerblade, Inc.: See—
- Edauw, Peter; and Caeran, Francesco, 374,759, Cl. D2-902,000.
- Edauw, Peter; and Caeran, Francesco, 374,760, Cl. D2-902,000.
- Rossman, Jon: See—
- Hotelling, Bryan; and Rossman, Jon, 374,772, Cl. D3-276,000.
- Rowe, Steven M. Combined bottle and cap. 374,825, Cl. D9-529,000.
- Rubbermaid Incorporated: See—
- Ahern, Richard B., Jr., 374,794, Cl. D7-392,100.
- Rusch, Marcella B. Table service indicator. 374,834, Cl. D10-114,000.
- Rydelek, James G.: See—
- Chapman, Steven S.; Jackson, Daniel C.; McBride, John K.; Rydelek, James G.; and Yokajty, Joseph E., 374,881, Cl. D16-218,000.
- S. C. Johnson & Son, Inc.: See—
- Cramer, Ronald G., 374,924, Cl. D23-366,000.
- Sadler, Marc, to Domino S.p.A. Shower head. 374,913, Cl. D23-213,000.
- Saito, Toshihiko. Double-nut headed ceramic bolt. 374,814, Cl. D8-387,000.
- Salas, Richard O., to Newell Operating Company. Tool holster. 374,937, Cl. D25-68,000.
- Samsonite Corporation: See—
- Domotor, Agnes C., 374,773, Cl. D3-279,000.
- Samuelson, Shel L. Toilet seat handle. 374,919, Cl. D23-309,000.
- Sankaralingam, Ilango: See—
- Stroud, David J.; Roan, Tracy C.; and Sankaralingam, Ilango, 374,896, Cl. D21-142,000.
- Saunders, William J.: See—
- Terpstra, Daniel A.; Beth, David E.; Watson, James B.; Alsups, J. Douglas; and Saunders, William J., 374,803, Cl. D8-66,000.
- Sava Kranj: See—
- Wohlfahrt, Raimund, 374,850, Cl. D12-147,000.
- Scherer, Craig; and Thuma, Michael, to Panduit Corp. Faceplate. 374,809, Cl. D8-353,000.
- Schneider, John A.: See—
- Spirer, Steven E.; and Schneider, John A., 374,802, Cl. D8-51,000.
- Scholl, Winfried, to HEWI Heinrich Wilke GmbH. Shelf. 374,788, Cl. D6-574,000.
- Scianna, Anthony, Sr.; Teteak, David G.; Bethke, Paul; and Williams, Daniel L., to Motorola, Inc. Portable telephone housing. 374,872, Cl. D14-138,000.
- Scott, Jeffrey M. Neurological tool for testing nerve sensitivity. 374,930, Cl. D4-142,000.
- Scott, Vivian A. S.; and Goldstein, Raymond J. Girl angel figure. 374,839, Cl. D11-131,000.
- Sega Enterprises, Ltd.: See—
- Mochizuki, Shinichi, 374,895, Cl. D21-13,000.
- Seiko Epson Corporation: See—
- Takahashi, Hiromitsu, 374,887, Cl. D18-50,000.
- Sell, James C., Jr., to Nike, Inc. Bladder for a shoe sole. 374,761, Cl. D2-961,000.
- Shan, Wong F.: See—
- Kong, Pang C.; Wah, Ho C.; and Shan, Wong F., 374,873, Cl. D14-147,000.
- Sheh, Kuo-Chine. Combined helicopter pendant and ceiling fan. 374,926, Cl. D23-377,000.
- Shines, Catherine D.: See—
- Shines, Oscar J., Sr.; Shines, Catherine D.; and Shines, Franklin P., Sr., 374,833, Cl. D10-106,000.
- Shines, Franklin P., Sr.: See—
- Shines, Oscar J., Sr.; Shines, Catherine D.; and Shines, Franklin P., Sr., 374,833, Cl. D10-106,000.
- Shines, Oscar J., Sr.; Shines, Catherine D.; and Shines, Franklin P., Sr. Motion detecting alarm system. 374,833, Cl. D10-106,000.
- Shinohara, Eiji: See—
- Kaneko, Kyoichi; and Shinohara, Eiji, 374,909, Cl. D22-141,000.
- Shoultz, Guy M.: See—
- Dexter, Andrea E.; Erickson, James E.; and Shoultz, Guy M., 374,830, Cl. D10-50,000.
- Siemon Company, The: See—
- Siemon, John A.; and Below, Randall J., 374,864, Cl. D13-154,000.
- Siemon, John A.; and Below, Randall J., to Siemon Company, The. Connector module. 374,864, Cl. D13-154,000.
- Simmons Juvenile Products Company, Inc.: See—
- Brunner, Merlin A.; and Draheim, Harvey J., 374,784, Cl. D6-445,000.
- Simon, Frank M.: See—
- Simon, Gloria C.; and Simon, Frank M., 374,799, Cl. D7-590,000.
- Simon, Gloria C.; and Simon, Frank M. Condiment dispenser. 374,799, Cl. D7-590,000.
- Sirico, Michael A.: See—
- Mackinson, Peter J.; Doskoczynski, William J.; and Sirico, Michael A., 374,826, Cl. D9-542,000.
- Smith, Samuel G.: See—
- Bookstaver, Charles W.; Smith, Samuel G.; and Mercurio, Frank, 374,902, Cl. D21-246,000.
- Smitley, Randy A.: See—
- Bradley, Kathy L.; Bird, Richard H.; Dockery, Olden A.; Smitley, Randy A.; Sprinkle, Calvin F.; and Payne, Donald T., 374,796, Cl. D7-406,000.
- Snow, Russell P. Extension cord retainer. 374,815, Cl. D8-394,000.
- SOLAIC (societe anonyme): See—
- Gaume, Michel, 374,870, Cl. D14-117,000.
- Sony Corporation: See—
- Kataoka, Tetsu, 374,880, Cl. D16-202,000.
- Taniguchi, Shuhei, 374,871, Cl. D14-136,000.
- Southco, Inc.: See—
- Ford, James J.; Zierner, Lynn B.; and McCormack, Edward A., 374,806, Cl. D8-331,000.
- Southern Pro Lures, Inc.: See—
- Coggins, Fred H., 374,906, Cl. D22-128,000.
- Southpac Trust International, Inc.: See—
- Weder, Donald E.; and Straeter, Joseph G., 374,844, Cl. D11-164,000.
- Spirer, Steven E.; and Schneider, John A. Nail punch. 374,802, Cl. D8-51,000.
- Sprinkle, Calvin F.: See—
- Bradley, Kathy L.; Bird, Richard H.; Dockery, Olden A.; Smitley, Randy A.; Sprinkle, Calvin F.; and Payne, Donald T., 374,796, Cl. D7-406,000.
- Squire, Warner; and Clerc, Oliver C., Jr., to Mirax Chemical Products Corporation. Fluids container. 374,797, Cl. D7-515,000.
- Stephens, Ronald J.: See—
- Wareham, Richard A.; and Stephens, Ronald J., 374,953, Cl. D32-31,000.
- Stevenson, John F. T., to Lyons Tetley Limited. Infusion package. 374,756, Cl. D1-199,000.
- Stoddard, John P.; Lyons, David F.; and Fraquelli, Roberto G., to Haworth, Inc. Table. 374,787, Cl. D6-484,000.
- Straeter, Joseph G.: See—
- Weder, Donald E.; and Straeter, Joseph G., 374,844, Cl. D11-164,000.
- Stroud, David J.; Roan, Tracy C.; and Sankaralingam, Ilango, to Lisco, Inc. Auto dashboard activity center. 374,896, Cl. D21-142,000.
- Styppa, Heinrich: See—
- Müller, Norbert; Pawlowski, Adam; Styppa, Heinrich; and Bernhardt, Jürgen, 374,920, Cl. D23-354,000.
- Sunbeam Products, Inc.: See—
- Moore, Devin L., 374,922, Cl. D23-356,000.
- Moore, Devin L., 374,923, Cl. D23-360,000.
- Suntool Co., Ltd.: See—
- Watanabe, Yoshihisa, 374,958, Cl. D34-16,000.
- Szolis, John N. Wildlife decoy form. 374,905, Cl. D22-125,000.
- Takahashi, Hiromitsu, to Seiko Epson Corporation. Printer. 374,887, Cl. D18-50,000.
- Takahashi, Masaki; and Umeda, Hiroki, to Canon Kabushiki Kaisha. Original feeding device. 374,886, Cl. D18-49,000.
- Takahashi, Setsuo: See—
- Utsuki, Toshiyuki; Kuroiwa, Yukio; Yoshida, Yoshiki; Kumagai, Kenta; and Takahashi, Setsuo, 374,965, Cl. D99-28,000.



- Takenouchi, Masanori: *See—*  
Tokuda, Hiroyuki; Takenouchi, Masanori; Kotaki, Yasuo; and Hamasaki, Yuji, 374,890, Cl. D18-56.000.
- Taniguchi, Shuhei, to Sony Corporation. Magnet optical disk recorder. 374,871, Cl. D14-136.000.
- Tanta, Said: *See—*  
Keller, Robert; and Tanta, Said, 374,957, Cl. D34-15.000.
- Taylor, Floyd J.: *See—*  
Taylor, Terry W.; and Taylor, Floyd J., 374,900, Cl. D21-226.000.
- Taylor, Terry W.; and Taylor, Floyd J. Inline roller skate wheel frame. 374,900, Cl. D21-226.000.
- Tedesco, Romeo; and Beaulieu, Jocelyn, to Global Upholstery Company. Chair. 374,778, Cl. D6-366.000.
- Termination Turtle LP: *See—*  
Miller, Albert, 374,904, Cl. D22-119.000.
- Terpstra, Daniel A.; Beth, David E.; Watson, James B.; Alsup, J. Douglas; and Saunders, William J., to Emerson Electric Co. Compound miter saw. 374,803, Cl. D8-66.000.
- Teteak, David G.: *See—*  
Scianna, Anthony, Sr.; Teteak, David G.; Bethke, Paul; and Williams, Daniel L., 374,872, Cl. D14-138.000.
- Thielmann AG Kommanditgesellschaft: *See—*  
Müll, Ulrich, 374,959, Cl. D34-39.000.
- Thomas, Jeffrey D. Safety net for freezer. 374,877, Cl. D15-89.000.
- Thuma, Michael: *See—*  
Scherer, Craig; and Thuma, Michael, 374,809, Cl. D8-353.000.
- Tintle, Douglas S., to FunFoods Incorporated. Pasta. 374,753, Cl. D1-106.000.
- Tobin, Robert A. Casket. 374,960, Cl. D99-1.000.
- Tokuda, Hiroyuki; Takenouchi, Masanori; Kotaki, Yasuo; and Hamasaki, Yuji, to Canon Kabushiki Kaisha. Ink tank for printer. 374,890, Cl. D18-56.000.
- Towns, Kyle; and Hesse, Cher. Tape dispenser. 374,894, Cl. D19-69.000.
- Treglia, Frank: *See—*  
Loehr, Robert P.; and Treglia, Frank, 374,851, Cl. D12-178.000.
- Trojanowski, Alan G.: *See—*  
Yost, Kevin G.; and Trojanowski, Alan G., 374,775, Cl. D4-104.000.
- Tsai, Cheng-Hsien. Caster seat of a cart. 374,816, Cl. D8-375.000.
- Tseng, Chun-Chu. Lawn chair. 374,780, Cl. D6-375.000.
- Tucker Housewares: *See—*  
Cassel, Timothy S., 374,774, Cl. D3-294.000.
- Hotaling, Bryan; and Rossman, Jon, 374,772, Cl. D3-276.000.
- Uarco Incorporated: *See—*  
Alger, Andrew L., 374,885, Cl. D18-47.000.
- Udagawa, Masamichi, to Apple Computer, Inc. Computer printer. 374,888, Cl. D18-50.000.
- Ultra Pac, Inc.: *See—*  
Knoss, Robert; and Krupa, Calvin S., 374,820, Cl. D9-429.000.
- Umbach, Steven, to Bissell Inc. Vacuum cleaner. 374,955, Cl. D32-21.000.
- Umeda, Hiroki: *See—*  
Takahashi, Masaki; and Umeda, Hiroki, 374,886, Cl. D18-49.000.
- Ungar, William D., to U.S. Divers Co., Inc. Diving computer retainer. 374,808, Cl. D8-349.000.
- U.S. Divers Co., Inc.: *See—*  
Ungar, William D., 374,808, Cl. D8-349.000.
- Universal Furniture Industries, Inc.: *See—*  
Paus, Michael J., 374,782, Cl. D6-444.000.
- Uptegraph, Larry L.: *See—*  
Bornhorst, Kenneth F., Jr.; Crease, Pierre L.; Izor, Kim E.; Lucous, Larry D.; and Uptegraph, Larry L., 374,891, Cl. D18-57.000.
- Utsuki, Toshiyuki; Kuroiwa, Yukio; Yoshida, Yoshiki; Kumagai, Kenta; and Takahashi, Setsuo, to Hitachi, Ltd. ATM communication apparatus. 374,965, Cl. D99-28.000.
- Valls, William, to Chesebrough-Pond's USA Co., Division of Conopco, Inc. Bottle. 374,827, Cl. D9-571.000.
- Valls, William: *See—*  
Bertolini, Peter; Valls, William; and Marcus, Wayne, 374,817, Cl. D9-338.000.
- Vaughan Furniture Company, Inc.: *See—*  
Keller, H. Thomas; and Risdon, Scott, 374,783, Cl. D6-444.000.
- Keller, H. Thomas; and Risdon, Scott, 374,785, Cl. D6-446.000.
- Venegas, Frank, Jr. Combined stanchion with sleeve and signage. 374,941, Cl. D25-126.000.
- Von Conta, Peter, to Rockport Company, Inc., The. Shoe upper. 374,763, Cl. D2-970.000.
- Vtech Communications, Ltd.: *See—*  
Kong, Pang C.; Wah, Ho C.; and Shan, Wong F., 374,873, Cl. D14-147.000.
- Wachter, Peter F., to Juno Lighting, Inc. Emergency light. 374,835, Cl. D10-114.000.
- Wah, Ho C.: *See—*  
Kong, Pang C.; Wah, Ho C.; and Shan, Wong F., 374,873, Cl. D14-147.000.
- Wang, Jui-Shang: *See—*  
Jané, Rodney; Wang, Jui-Shang; Gresens, Stanley; Holderfield, Gregory; and Longan, John, 374,921, Cl. D23-356.000.
- Wang, King-Yuan, to Yuan Net Comp. Lawn sprinkler. 374,914, Cl. D23-214.000.
- Wang, Wen-Te. Combined sunglasses and visor. 374,882, Cl. D16-310.000.
- Wareham, Richard A.; and Stephens, Ronald J., to Hoover Company, The. Vacuum cleaner top console. 374,953, Cl. D32-31.000.
- Watanabe, Yoshihisa, to Suntool Co., Ltd. Wheelbarrow. 374,958, Cl. D34-16.000.
- Watson, James B.: *See—*  
Terpstra, Daniel A.; Beth, David E.; Watson, James B.; Alsup, J. Douglas; and Saunders, William J., 374,803, Cl. D8-66.000.
- Weder, Donald E.; and Straeter, Joseph G., to Family Trust U/T/A, The; and Southpac Trust International, Inc. Flower pot cover. 374,844, Cl. D11-164.000.
- Weingarten, Shlomy. Hamburger product. 374,754, Cl. D1-125.000.
- Weiss, Paul. Ring commemorating four Wagner operas. 374,836, Cl. D11-26.000.
- Wells, Cindie M., to Oscar Mayer Foods Corporation. Package for sliced meat stacks. 374,819, Cl. D9-425.000.
- Wenstrand, Thomas W. Poultry fount. 374,952, Cl. D30-132.000.
- Whisman, John L. Game puck. 374,897, Cl. D21-203.000.
- Williams, Daniel L.: *See—*  
Scianna, Anthony, Sr.; Teteak, David G.; Bethke, Paul; and Williams, Daniel L., 374,872, Cl. D14-138.000.
- Wohlfahrt, Raimund, to Sava Kranj. Tire. 374,850, Cl. D12-147.000.
- Wood, Kenneth D.: *See—*  
Barbera, Lawrence E.; and Wood, Kenneth D., 374,889, Cl. D18-54.000.
- Wu, Ping-Huang. Fryer for food. 374,791, Cl. D7-354.000.
- Wu, Shin-wang. Cover head for bathroom receptacle support. 374,807, Cl. D8-349.000.
- Yazaki Industrial Chemical Co., Ltd.: *See—*  
Hirano, Seiji; and Morioka, Masamichi, 374,812, Cl. D8-382.000.
- Miyashita, Muneharu, 374,811, Cl. D8-382.000.
- Yazawa, Teruya, to Zebra Co., Ltd. Ball point pen. 374,893, Cl. D19-51.000.
- YKK Corporation: *See—*  
Akeno, Mitsuru, 374,813, Cl. D8-382.000.
- Ikehara, Chikako, 374,845, Cl. D11-221.000.
- Yokajty, Joseph E.: *See—*  
Chapman, Steven S.; Jackson, Daniel C.; McBride, John K.; Rydelek, James G.; and Yokajty, Joseph E., 374,881, Cl. D16-218.000.
- Yoshida, Yoshiki: *See—*  
Utsuki, Toshiyuki; Kuroiwa, Yukio; Yoshida, Yoshiki; Kumagai, Kenta; and Takahashi, Setsuo, 374,965, Cl. D99-28.000.
- Yost, Kevin G.; and Trojanowski, Alan G., to Johnson & Johnson Consumer Products, Inc. Bristled head for a toothbrush. 374,775, Cl. D4-104.000.
- Yuan Net Comp.: *See—*  
Wang, King-Yuan, 374,914, Cl. D23-214.000.
- Yue, Gilbert Y., to Alert Enterprises, Inc. Metal detector. 374,829, Cl. D10-47.000.
- Yuen, John S., to John Manufacturing, Ltd. Bicycle light. 374,944, Cl. D26-28.000.
- Zebra Co., Ltd.: *See—*  
Yazawa, Teruya, 374,893, Cl. D19-51.000.
- Ziemer, Lynn B.: *See—*  
Ford, James J.; Ziemer, Lynn B.; and McCormack, Edward A., 374,806, Cl. D8-331.000.
- Zimmerman, Mark. Rotary engine. 374,876, Cl. D15-1.000.
- Zimmermann, Douglas R.: *See—*  
Gobble, Harold; Bauman, Michael; Johnson, Gerry; and Zimmermann, Douglas R., 374,755, Cl. D1-125.000.

## LIST OF PLANT PATENTEES

- Bautista, Rodolfo V., to Bay City Flower Company, Inc. Helichrysum plant named 'Harvest Peach'. 9,666, Cl. Plt.-68.100.
- Bautista, Rodolfo V., to Bay City Flower Company, Inc. Helichrysum plant named Harvest Lemon. 9,667, Cl. Plt.-68.100.
- Bay City Flower Company, Inc.: *See—*  
Bautista, Rodolfo V., 9,666, Cl. Plt.-68.100.
- Bautista, Rodolfo V., 9,667, Cl. Plt.-68.100.
- Danziger - "Dan" Flower Farm: *See—*  
Dehan, Klara, 9,668, Cl. Plt.-87.600.
- Dehan, Klara, to Danziger - "Dan" Flower Farm. Impatiens plant named 'Micky Gini'. 9,668, Cl. Plt.-87.600.
- DeVor Nurseries, Inc.: *See—*  
Olesen, Pernille; and Olesen, Mogens, 9,664, Cl. Plt.-1.000.
- Olesen, Pernille; and Olesen, Mogens, 9,665, Cl. Plt.-1.000.
- Olesen, Pernille; and Olesen, Mogens, to DeVor Nurseries, Inc. Shrub rose plant named 'Poulans'. 9,664, Cl. Plt.-1.000.
- Olesen, Pernille; and Olesen, Mogens, to DeVor Nurseries, Inc. Shrub rose plant named 'Poulpyg'. 9,665, Cl. Plt.-1.000.
- Twyford International, Inc.: *See—*  
Hill, Herbert H., Jr., 9,670, Cl. Plt.-88.800.
- Van Rijn Plants: *See—*  
Van Rijn, Magdalena J. M., 9,669, Cl. Plt.-88.100.
- Van Rijn, Magdalena J. M., to Van Rijn Plants. Anthurium plant named 'Nathalie'. 9,669, Cl. Plt.-88.100.
- Warren's Turf Group, Inc.: *See—*  
Holmes, James M., 9,671, Cl. Plt.-90.100.

PI 107



360	5,566,708	CLASS 166	348	5,566,809	CLASS 215	29	5,566,894	197	5,567,961
487.5	5,566,709	84.1	5,566,753	CLASS 198	208	5,566,845	5,566,965	257	5,567,973
556	5,566,710	241.6	5,566,754	331	5,566,810	230	5,566,966	296	5,567,962
557	5,566,711	263	5,566,755	399	5,566,811	261.2	5,566,967	310	5,567,963
587	5,566,712	285	5,566,756	471.1	5,566,812	13	5,566,968	316	5,567,964
613	5,566,713	300	5,566,757	495	5,566,813	18	5,566,969	336	5,567,965
614.04	5,566,714	308	5,566,758	621.1	5,566,814	18 A	5,566,970	347	5,567,966
624.11	5,566,715	345	5,566,759	687.1	5,566,815	43 A	5,566,971	353	5,567,967
636.1	5,566,716	382	5,566,760	817	5,566,816	348.1	5,566,972	356	5,567,968
883	5,566,717	385	5,566,761	848	5,566,817	379	5,566,973	370	5,567,969
884	5,566,718	4	5,566,762	271	5,566,818	381.1	5,566,974	390	5,567,970
98	5,566,719	CLASS 168	5,566,763	407	5,566,819	388	5,566,975	433	5,567,971
137	5,566,720	CLASS 169	5,566,764	6	5,567,281	532.6	5,566,976	442	5,567,972
145	5,566,721	43	5,566,765	227	5,567,282	563	5,566,977	443	5,567,973
166	5,566,722	708	5,566,766	228	5,567,283	17.19	5,566,978	538	5,567,974
1 B	5,566,723	CLASS 170	5,566,767	246	5,567,284	138 R	5,566,979	550	5,567,975
383 A	5,566,724	CLASS 171	5,566,768	256	5,567,285	158 R	5,566,980	627	5,567,976
446	5,566,725	CLASS 172	5,566,769	265	5,567,286	216	5,566,981	631	5,567,977
123.6	5,566,726	CLASS 173	5,566,770	298.06	5,567,287	448	5,566,982	643	5,567,978
7	5,566,727	149	5,566,771	298.11	5,567,288	118	5,566,983	664	5,567,979
10	5,566,728	218	5,566,772	415	5,567,289	124.1	5,566,984	701	5,567,980
25	5,566,729	CLASS 174	5,566,773	420	5,567,290	124.1	5,566,985	722	5,567,981
64	5,566,730	58	5,566,774	450	5,567,291	156	5,566,986	754	5,567,982
66	5,566,731	93	5,566,775	451	5,567,292	188.8	5,566,987	774	5,567,983
86	5,566,732	153 G	5,566,776	523	5,567,293	230.1	5,566,988	788	5,567,984
94	5,566,733	258	5,566,777	556	5,567,294	311.2	5,566,989	801.2	5,567,985
192	5,566,734	CLASS 175	5,566,778	581	5,567,295	351	5,566,990	802	5,567,986
320	5,567,250	125	5,566,779	658	5,567,296	604	5,566,991	26	5,567,987
522	5,567,251	321	5,566,780	CLASS 205	5,567,297	CLASS 250	5,567,992	1.31	5,567,988
3	5,567,910	426	5,566,781	15	5,567,298	205	5,567,993	1.7	5,567,989
12	5,567,912	CLASS 177	5,567,918	150 HC	5,567,299	214 VT	5,567,994	2.6	5,567,990
22	5,567,913	25.13	5,567,919	229	5,567,300	216	5,567,995	39	5,567,991
46	5,567,914	50	5,567,920	637	5,567,301	227.14	5,567,996	40.1	5,567,992
209 R	5,567,253	18	5,567,921	666	5,567,302	227.15	5,567,997	53	5,567,993
72	5,567,256	CLASS 180	5,567,922	777.5	5,567,303	3	5,567,998	83	5,567,994
73.1	5,567,257	9.5	5,567,923	CLASS 206	5,567,304	83.5	5,567,999	103	5,567,995
109	5,567,258	65.4	5,567,924	153	5,567,305	109	5,568,000	112	5,567,996
201	5,567,259	120	5,567,925	153.14	5,567,306	111	5,568,001	137	5,567,997
238	5,567,260	197	5,567,926	209.1	5,567,307	132	5,568,002	140	5,567,998
242	5,567,261	232	5,567,927	287	5,567,308	132	5,568,003	140	5,567,999
252	5,567,262	334	5,567,928	495	5,567,309	288	5,568,004	251	5,567,999
256	5,567,263	CLASS 181	5,567,929	338	5,567,310	338.1	5,568,005	353	5,567,999
310	5,567,264	284	5,567,930	338	5,567,311	338.2	5,568,006	455	5,567,999
345	5,567,265	CLASS 182	5,567,931	338	5,567,312	338.3	5,568,007	515	5,567,999
361	5,567,266	116	5,567,932	338	5,567,313	338.4	5,568,008	44	5,567,999
644.1	5,567,267	CLASS 184	5,567,933	338	5,567,314	338.5	5,568,009	143	5,567,999
659.11	5,567,270	CLASS 186	5,567,934	338	5,567,315	338.6	5,568,010	173	5,567,999
84.04	5,567,271	CLASS 187	5,567,935	338	5,567,316	338.7	5,568,011	250	5,567,999
121.1	5,567,272	210	5,567,936	338	5,567,317	338.8	5,568,012	44	5,567,999
133	5,567,273	249	5,567,937	338	5,567,318	338.9	5,568,013	143	5,567,999
183	5,567,274	250	5,567,938	338	5,567,319	339	5,568,014	173	5,567,999
229.1	5,567,275	251	5,567,939	338	5,567,320	339	5,568,015	250	5,567,999
297	5,567,276	252	5,567,940	338	5,567,321	339	5,568,016	44	5,567,999
9	5,567,277	253	5,567,941	338	5,567,322	339	5,568,017	143	5,567,999
49	5,567,278	254	5,567,942	338	5,567,323	339	5,568,018	173	5,567,999
99	5,567,279	255	5,567,943	338	5,567,324	339	5,568,019	250	5,567,999
103	5,567,280	256	5,567,944	338	5,567,325	339	5,568,020	44	5,567,999
163	5,567,281	257	5,567,945	338	5,567,326	339	5,568,021	143	5,567,999
190	5,567,282	258	5,567,946	338	5,567,327	339	5,568,022	173	5,567,999
199	5,567,283	259	5,567,947	338	5,567,328	339	5,568,023	250	5,567,999
232	5,567,284	260	5,567,948	338	5,567,329	339	5,568,024	44	5,567,999
237	5,567,285	261	5,567,949	338	5,567,330	339	5,568,025	143	5,567,999
251	5,567,286	262	5,567,950	338	5,567,331	339	5,568,026	173	5,567,999
132	5,567,287	263	5,567,951	338	5,567,332	339	5,568,027	250	5,567,999
457	5,567,288	264	5,567,952	338	5,567,333	339	5,568,028	44	5,567,999
41	5,567,289	265	5,567,953	338	5,567,334	339	5,568,029	143	5,567,999
47	5,567,290	266	5,567,954	338	5,567,335	339	5,568,030	173	5,567,999
67	5,567,291	267	5,567,955	338	5,567,336	339	5,568,031	250	5,567,999
80.1	5,567,292	268	5,567,956	338	5,567,337	339	5,568,032	44	5,567,999
80.3	5,567,293	269	5,567,957	338	5,567,338	339	5,568,033	143	5,567,999
104.16	5,567,294	270	5,567,958	338	5,567,339	339	5,568,034	173	5,567,999
104.27	5,567,295	271	5,567,959	338	5,567,340	339	5,568,035	250	5,567,999
185	5,567,296	272	5,567,960	338	5,567,341	339	5,568,036	44	5,567,999
299	5,567,297	273	5,567,961	338	5,567,342	339	5,568,037	143	5,567,999

417.1	5,566,964	348	5,568,006	CLASS 330	124 R	5,568,086	134	5,568,166	CLASS 346	296	5,568,268	37	5,567,032
500	5,566,965				149	5,568,087				298	5,568,269	61	5,567,033
602	5,566,966	CLASS 312	5,568,007		151	5,568,088		CLASS 347			5,568,270	66	5,567,034
625	5,566,967	1	5,567,025		253	5,568,089	19	5,568,172	400	5,568,277	80	5,567,036	
634	5,566,968	135	5,567,026		255	5,568,090	43	5,568,168	427	5,568,278	104	5,567,037	
688	5,566,969	405.1	5,567,027		258	5,568,091	51	5,568,169	451	5,568,273	106	5,567,038	
689	5,566,970		5,567,028		260	5,568,092		5,568,170	452	5,568,279	108	5,567,039	
711	5,566,971		5,567,029		264	5,568,093	58	5,568,171	458	5,568,280	109	5,567,040	
728.2	5,566,972	CLASS 313			264	5,568,094	96	5,568,173	475	5,568,281	109	5,567,041	
	5,566,973				279	5,568,094	200	5,568,174	489	5,568,282	148	5,567,041	
730.2	5,566,974	35	5,568,007	CLASS 331				5,568,175	518	5,568,284	241	5,567,042	
732	5,566,975	113	5,568,008					5,568,176		5,568,285	250	5,567,043	
737	5,566,976	318.01	5,568,009	1 R	5,568,096			5,568,177			348	5,567,044	
743.1	5,566,977	440	5,568,010	2	5,568,097			5,568,178			348	5,567,044	
801.2	5,566,978	477 R	5,568,011	16	5,568,098				CLASS 359		363	5,567,045	
		517	5,568,012	56	5,568,099						405	5,567,046	
CLASS 281	5,566,979	532	5,568,013	57	5,568,099			CLASS 348	053	5,568,283			
21.1	5,566,979				57	5,568,100	6	5,568,179		5,568,286	CLASS 363		
31	5,566,980				74	5,568,103	6	5,568,180		5,568,287			
		CLASS 283	3.5	5,568,014			13	5,568,181	58	5,568,289	17	5,568,368	
58	5,566,981	39	5,568,015	CLASS 333			13	5,568,182	59	5,568,288	26	5,568,369	
83	5,566,982	169.3	5,568,016		81 R	5,568,105	15	5,568,183	63	5,568,291	39	5,568,370	
					134	5,568,101	22	5,568,184	67	5,568,292	39	5,568,371	
CLASS 285		219	5,568,017		208	5,568,106	15	5,568,185	73	5,568,294	132	5,568,373	
14	5,566,983	276	5,568,018		234	5,568,107	79	5,568,186	75	5,568,295			
22	5,566,984	344	5,568,019	CLASS 335			144	5,568,187	76	5,568,296			
39	5,566,985	370	5,568,020		130	5,568,108	208	5,568,188	80	5,568,297	131	5,568,374	
55	5,566,986	506	5,568,021		213	5,568,109	222	5,568,189	100	5,568,298		5,568,375	
86	5,566,987			CLASS 318				5,568,190		5,568,299	145	5,568,376	
93	5,566,988	139	5,568,023		195	5,568,109		5,568,191	137	5,568,300	157	5,568,377	
163	5,566,989		5,568,024		214	5,568,112		5,568,192	140	5,568,301	164	5,568,378	
		287	5,568,025		216	5,568,112	223	5,568,193	157	5,568,302	176	5,568,379	
CLASS 292		443	5,568,026		215	5,568,110	227	5,568,194	157	5,568,303	184	5,568,380	
95	5,566,990	483	5,568,027		227	5,568,110	342	5,568,195	184	5,568,304	402	5,568,381	
201	5,566,991	566	5,568,028	CLASS 336			372	5,568,196	189	5,568,305	419.02	5,568,383	
241	5,566,992		5,568,029		65	5,568,111	390	5,568,197	223	5,568,306	419.13	5,568,384	
288	5,566,993	568.11	5,568,030		206	5,568,114	416	5,568,198	295	5,568,307	420	5,568,385	
336.3	5,566,994	587	5,568,031	CLASS 338			500	5,568,199	326	5,568,308	424.01	5,568,388	
346	5,566,995	630	5,568,032		22 SD	5,568,116	611	5,568,200	338	5,568,309	424.05	5,568,389	
357	5,566,996	632	5,568,033		32 R	5,568,115	699	5,568,201	341	5,568,310	424.1	5,568,386	
CLASS 294		778	5,568,033	CLASS 340			723	5,568,202	341	5,568,311		5,568,387	
5	5,566,997	802	5,568,034				726	5,568,203	344	5,568,312	449	5,568,390	
24	5,566,998			CLASS 320			727	5,568,204	345	5,568,313	469.01	5,568,391	
103.1	5,566,999	1	5,568,035		321	5,568,117	728	5,568,205	346	5,568,314	478.02	5,568,393	
		2	5,568,036	CLASS 342			729	5,568,206	347	5,568,315	478.15	5,568,392	
CLASS 295		14	5,568,037		384.1	5,568,118			348	5,568,316	487	5,568,394	
732	5,566,447	29	5,568,038		426	5,568,120	57	5,568,207	349	5,568,317	489	5,568,395	
CLASS 296		37	5,568,039		539	5,568,121	221	5,568,208	350	5,568,318	491	5,568,396	
37.6	5,567,000		5,568,040		545	5,568,123	243	5,568,209	351	5,568,319		5,568,397	
65.1	5,567,001			CLASS 323					352	5,568,320	492	5,568,398	
136	5,567,002	207	5,568,041		550	5,568,124			353	5,568,321	498	5,568,400	
173	5,567,003	211	5,568,042	CLASS 324					354	5,568,322	514 A	5,568,401	
190	5,567,004	231	5,568,043		551	5,568,125	85	5,567,303	355	5,568,323	514 C	5,568,402	
204	5,567,005	272	5,568,044		574	5,568,126	120	5,568,210	356	5,568,324	514 R	5,568,403	
		314	5,568,045		575	5,568,127	215		357	5,568,325	558	5,568,404	
CLASS 297					604	5,568,128	246		358	5,568,326	561	5,568,405	
216.15	5,567,006			CLASS 325					359	5,568,327	562	5,568,406	
250.1	5,567,007	71.1	5,568,046		628	5,568,130	75	5,568,225	360	5,568,328	579	5,568,407	
256.16	5,567,008	127	5,568,047		648	5,568,131	200	5,568,226	361	5,568,329	580	5,568,408	
258.1	5,567,009	207.21	5,568,048		657	5,568,132	208	5,568,227	362	5,568,330	702	5,568,409	
284.4	5,567,010	244.1	5,568,049		693	5,568,133	215	5,568,228	363	5,568,331	715.1	5,568,410	
284.7	5,567,011	309	5,568,050		825.06	5,568,135	219	5,568,229	364	5,568,332	724.19	5,568,411	
303.3	5,567,012	318	5,568,051		825.370	5,568,136	215	5,568,230	365	5,568,333	748	5,568,412	
341	5,567,013	435	5,568,052		825.44	5,568,137	219	5,568,231	366	5,568,334	807	5,568,413	
344.21	5,567,014	463	5,568,053		905	5,568,138	246	5,568,232	367	5,568,335	825	5,568,414	
397	5,567,015	718	5,568,055	CLASS 341				5,568,233	368	5,568,336			
411.32	5,567,016	754	5,568,056		68	5,568,139	256	5,568,234	369	5,568,337			
452.2	5,567,017	755	5,568,057		118	5,568,140	259	5,568,235	370	5,568,338			
CLASS 299		760.054	5,568,058		126	5,568,141	274	5,568,236	371	5,568,339			
11	5,567,018	772	5,568,059		139	5,568,142	285	5,568,237	372	5,568,340			
					145	5,568,143	289	5,568,238	373	5,568,341			
CLASS 301				CLASS 326				5,568,239	374	5,568,342			
5.3	5,567,019	13	5,568,061		145	5,568,145		5,568,240	375	5,568,343			
124.2	5,567,020	27	5,568,062		154	5,568,146	309	5,568,241	376	5,568,344			
CLASS 303		30	5,568,063		155	5,568,147		5,568,242	377	5,568,345			
3	5,567,021	31	5,568,064		156	5,568,148	324	5,568,243	378	5,568,346			
87	5,567,022	33	5,568,065	CLASS 342			328	5,568,244	379	5,568,347			
119.2	5,567,023	39	5,568,066		189	5,568,150		5,568,245	380	5,568,348			
158	5,567,024	82	5,568,068		192	5,568,151	314	5,568,246	381	5,568,349			
		86	5,568,069		357	5,568,152	314	5,568,247	382	5,568,350			
CLASS 307		113	5,568,070		443	5,568,153	68	5,568,248	383	5,568,351			
10.1	5,567,991							5,568,249	384	5,568,352			
43	5,567,992	CLASS 327						5,568,250	385	5,568,353			
105	5,567,993			CLASS 343				5,568,251	386	5,568,354			
109	5,567,994	12	5,568,072		700 MS	5,568,155	246	5,568,252	387	5,568,355			
125	5,567,995	51	5,568,073		713	5,568,156	307	5,568,253	388	5,568,356			
127	5,567,996		5,568,074			5,568,157	352	5,568,254	389	5,568,357			
	5,567,997	77	5,568,075			5,568,158	357	5,568,255	390	5,568,358			
CLASS 310		172	5,568,076			5,568,159	363	5,568,256	391	5,568,359			
90	5,567,998	174	5,568,077			5,568,160	371	5,568,257	392	5,568,360			
194	5,567,999	199	5,568,078			5,568,161	373	5,568,258	393	5,568,361			
254	5,568,000	262	5,568,078			5,568,162	376	5,568,259	394	5,568,362			
313 B	5,568,001	349	5,568,079					5,568,260	395	5,568,363			
316 R	5,568,002	356	5,568,080	CLASS 345				5,568,261	396	5,568,364			
328	5,568,003	380	5,568,081					5,568,262	397	5,568,365			
	5,568,004	437	5,568,082					5,568,263	398	5,568,366			
	5,568,005	538	5,568,083					5,568,264	399	5,568,367			
			5,568,084					5,568,265	400	5,568,368			
			5,568,085					5,568,266	401	5,568,369			
			5,568,086					5,568,267	402	5,568,370			
			5,568,087		</								

206	5,567,049	5,568,526	13	5,568,590	CLASS 404	168	5,567,393	4	5,567,486
209	5,567,050		22	5,568,591		174	5,567,392	14	5,567,487
		CLASS 376	80	5,568,592	84.5	177	5,567,394	34.1	5,567,488
11	5,568,446	245	5,568,527	5,568,593	CLASS 405	180	5,567,395		5,567,489
20	5,568,447	258	5,568,528	5,568,594		190	5,567,396	34.4	5,567,490
82	5,568,448			5,568,595	11	192	5,567,397	35.7	5,567,491
99	5,568,449	16	5,568,529	5,568,596		197	5,567,398	36.9	5,567,493
131	5,568,450	43	5,568,071	5,568,597	CLASS 423				5,567,494
		CLASS 368		5,568,598		179.5	5,567,401	60	5,567,495
10	5,568,451	4	5,568,530	5,568,599		245.2	5,567,402	95	5,567,496
262	5,568,452	98.3	5,568,531	5,568,600	CLASS 406	263	5,567,403	113	5,567,498
		156	5,568,532	5,568,601		332	5,567,404	116	5,567,499
7	5,568,453	208	5,568,533	5,568,602	CLASS 407	477	5,567,405	137	5,567,500
13	5,568,454		5,568,534	5,568,603		519.2	5,567,406	141	5,567,501
30	5,568,455			5,568,604	CLASS 408	700	5,567,407	143	5,567,502
44.23	5,568,456	39	5,568,535	5,568,605				167	5,567,504
50	5,568,457	58	5,568,536	5,568,606	CLASS 409	1.69	5,567,408	188	5,567,505
100	5,568,458		5,568,537	5,568,607		9.1	5,567,411	212	5,567,506
110	5,568,459		5,568,538	5,568,608	CLASS 410	9.35	5,567,412	213	5,567,507
112	5,568,460		5,568,539	5,568,609		9.363	5,567,413	217	5,567,508
	5,568,461	67	5,568,540	5,568,610	CLASS 411	9.4	5,567,414	227	5,567,509
	5,568,462	89	5,568,541	5,568,611		9.51	5,567,415	288	5,567,510
	5,568,463	114	5,568,542	5,568,612	CLASS 412	9.52	5,567,416	314.8	5,567,511
	5,568,464		5,568,543	5,568,613		59	5,567,417	331	5,567,512
124	5,568,465	268	5,568,544	5,568,614	CLASS 413	60	5,567,418	332	5,567,513
132	5,568,466		5,568,545	5,568,615		70.1	5,567,419	355	5,567,514
175.3	5,568,467	355	5,568,546	5,568,616	CLASS 414	74	5,567,420	357	5,567,515
		382	5,568,547	5,568,617		76.4	5,567,421	364	5,567,516
		446	5,568,548	5,568,618	CLASS 415	78.3	5,567,422	378	5,567,517
			5,568,549	5,568,619		94.3	5,567,423	402	5,567,518
13	5,568,468			5,568,620	CLASS 416	94.5	5,567,424	403	5,567,519
17	5,568,469			5,568,621		195.1	5,567,425	408	5,567,520
	5,568,470	3	5,568,550	5,568,622	CLASS 417	401	5,567,426	5,567,521	
	5,568,471		5,568,551	5,568,623			5,567,427	5,567,522	
18	5,568,472	4	5,568,552	5,568,624	CLASS 418		5,567,428	5,567,523	
	5,568,473		5,568,553	5,568,625			5,567,429	5,567,524	
29	5,568,474	9	5,568,554	5,568,626	CLASS 419	405	5,567,430	5,567,525	
58.2	5,568,475	25	5,568,555	5,568,627		409	5,567,431	5,567,526	
	5,568,476	51	5,568,556	5,568,628	CLASS 420	426	5,567,432	5,567,527	
60	5,568,477	54	5,568,557	5,568,629		439	5,567,433	5,567,528	
60.1	5,568,478		5,568,558	5,568,630	CLASS 421	450	5,567,434	5,567,529	
	5,568,479	71	5,568,559	5,568,631			5,567,435	5,567,530	
69.1	5,568,480	94	5,568,560	5,568,632	CLASS 422	466	5,567,436	5,567,531	
79	5,568,481	98	5,568,561	5,568,633		474	5,567,437	5,567,532	
	5,568,482	99	5,568,562	5,568,634	CLASS 423	484	5,567,438	5,567,533	
84	5,568,483	120		5,568,635		486	5,567,439	5,567,534	
85.5	5,568,484	186		5,568,636	CLASS 424	494	5,567,440	5,567,535	
85.6	5,568,485			5,568,637		529	5,567,441	5,567,536	
94.1	5,568,486			5,568,638	CLASS 425	616	5,567,442	5,567,537	
94.2	5,568,487	144	5,568,563	5,568,639			5,567,443	5,567,538	
105.1	5,568,488	149	5,568,564	5,568,640	CLASS 426	27	5,567,444	5,567,539	
110.1	5,568,489	187	5,568,565	5,568,641		57	5,567,445	5,567,540	
		197	5,568,566	5,568,642	CLASS 427	63	5,567,446	5,567,541	
		204	5,568,567	5,568,643		93	5,567,447	5,567,542	
22.1	5,568,492	220	5,568,568	5,568,644	CLASS 428	72.1	5,567,448	5,567,543	
22.3	5,568,493	236	5,568,569	5,568,645		84	5,567,449	5,567,544	
30	5,568,494	238	5,568,570	5,568,646	CLASS 429	143	5,567,450	5,567,545	
40.1	5,568,495	254	5,568,571	5,568,647		363	5,567,451	5,567,546	
471	5,568,496	260	5,568,572	5,568,648	CLASS 430	381	5,567,452	5,567,547	
		317	5,568,573	5,568,649			5,567,453	5,567,548	
				5,568,650	CLASS 431	217	5,567,454	5,567,549	
				5,568,651		218	5,567,455	5,567,550	
11	5,568,496			5,568,652	CLASS 432	223	5,567,456	5,567,551	
40	5,568,497	10	5,567,054	5,568,653			5,567,457	5,567,552	
43	5,568,498	38	5,567,055	5,568,654	CLASS 433	5	5,567,458	5,567,553	
45	5,568,499			5,568,655			5,567,459	5,567,554	
46	5,568,500			5,568,656	CLASS 434	106	5,567,460	5,567,555	
	5,568,501	122	5,567,057	5,568,657			5,567,461	5,567,556	
50	5,568,502	286	5,567,058	5,568,658	CLASS 435	158	5,567,462	5,567,557	
70	5,568,503	448	5,567,059	5,568,659		163	5,567,463	5,567,558	
96	5,568,504	560	5,567,060	5,568,660	CLASS 436	164	5,567,464	5,567,559	
	5,568,505	569		5,568,661		178	5,567,465	5,567,560	
				5,568,662	CLASS 437	518	5,567,466	5,567,561	
CLASS 373				5,568,663		525	5,567,467	5,567,562	
50	5,568,506	14	5,568,574	5,568,664	CLASS 438			5,567,563	
CLASS 374		24	5,568,575	5,568,665				5,567,564	
57	5,567,051	33	5,568,576	5,568,666	CLASS 439	9	5,567,468	5,567,565	
124	5,567,052	34	5,568,577	5,568,667		74	5,567,469	5,567,566	
155	5,567,053	43	5,568,578	5,568,668	CLASS 440	151	5,567,470	5,567,567	
		46	5,568,579	5,568,669		180	5,567,471	5,567,568	
200	5,568,507	78	5,568,580	5,568,670	CLASS 441	182	5,567,472	5,567,569	
	5,568,508	95	5,568,581	5,568,671		211	5,567,473	5,567,570	
	5,568,509	123	5,568,582	5,568,672	CLASS 442	213.3	5,567,474	5,567,571	
	5,568,510	139	5,568,583	5,568,673		221	5,567,475	5,567,572	
202	5,568,511		5,568,584	5,568,674	CLASS 443	255.7	5,567,476	5,567,573	
211	5,568,512		5,568,585	5,568,675		282	5,567,477	5,567,574	
224	5,568,513	20	5,568,586	5,568,676	CLASS 444	342	5,567,478	5,567,575	
245	5,568,514	46	5,568,587	5,568,677		359	5,567,479	5,567,576	
257	5,568,515	52	5,568,588	5,568,678	CLASS 445	410	5,567,480	5,567,577	
259	5,568,516	58	5,568,589	5,568,679		428	5,567,481	5,567,578	
262	5,568,517	107	5,568,590	5,568,680	CLASS 446	510	5,567,482	5,567,579	
340	5,568,518			5,568,681		535	5,567,483	5,567,580	
343	5,568,519			5,568,682	CLASS 447	555	5,567,484		
344	5,568,520	376	5,568,586	5,568,683					
	5,568,521	498	5,568,587	5,568,684	CLASS 448				
346	5,568,522			5,568,685					
347	5,568,523			5,568,686	CLASS 449	8	5,567,485		
350	5,568,524	2.32	5,568,588	5,568,687		18	5,567,486		
356	5,568,525	3	5,568,589	5,568,688		22	5,567,487		

79	5,567,144	CLASS 437	43	5,567,686	451	5,567,759	CLASS 546	
288	5,567,145	24	44	5,567,687	503	5,567,760	97	5,567,818
320	5,567,146	31	46	5,567,688	525	5,567,761	201	5,567,819
328	5,567,147	32	50	5,567,689	550	5,567,762	202	5,567,820
354	5,567,148	35	54	5,567,690	701	5,567,763		
		40	94	5,567,691	755	5,567,764	CLASS 548	
		41	152	5,567,692	801	5,567,765	126	5,567,821
6	5,567,149	43	134	5,567,693			164	5,567,822
14	5,567,150	46	169	5,567,694	CLASS 525		204	5,567,823
145	5,567,151	52		5,567,695	44	5,567,766	252	5,567,824
241	5,567,152	56		5,567,696		5,567,767	264.2	5,567,825
		57		5,567,697		5,567,768	324.1	5,567,826
CLASS 433		58		5,567,698	57	5,567,769	484	5,567,827
119	5,567,153	33.1		5,567,699	165	5,567,770		
132	5,567,154	38.1		5,567,700	215	5,567,771	CLASS 549	
172	5,567,155			5,567,701	221	5,567,772	51	5,567,828
226	5,567,156			5,567,702		5,567,773	388	5,567,829
				5,567,703		5,567,774		
				5,567,704		5,567,775		
				5,567,705		5,567,776		
CLASS 434				5,567,706		5,567,777	CLASS 552	
29	5,567,157			5,567,707		5,567,778	575	5,567,830
178	5,567,158			5,567,708		5,567,779		
262	5,567,160			5,567,709		5,567,780	CLASS 554	
295	5,567,161			5,567,710		5,567,781	43	5,567,831
307 A	5,567,162			5,567,711		5,567,782		
317	5,567,163			5,567,712		5,567,783	CLASS 556	
432	5,567,164			5,567,713		5,567,784	28	5,567,832
				5,567,714		5,567,785	434	5,567,833
				5,567,715		5,567,786	442	5,567,834
CLASS 435				5,567,716		5,567,787	453	5,567,835
4	5,567,581			5,567,717		5,567,788	466	5,567,836
5	5,567,582			5,567,718		5,567,789	468	5,567,837
6	5,567,583			5,567,719		5,567,790		
	5,567,584			5,567,720		5,567,791	CLASS 560	
	5,567,585			5,567,721		5,567,792	60	5,567,838
	5,567,586			5,567,722		5,567,793	245	5,567,839
	5,567,587			5,567,723		5,567,794		
	5,567,588			5,567,724		5,567,795	CLASS 562	
7.2	5,567,590			5,567,725		5,567,796	11	5,567,840
7.5	5,567,592			5,567,726		5,567,797	23	5,567,841
7.23	5,567,593			5,567,727		5,567,798	486	5,567,842
7.32	5,567,594			5,567,728		5,567,799	804	5,567,843
7.5	5,567,591			5,567,729		5,567,800		
7.92	5,567,595			5,567,730		5,567,801		
13	5,567,596			5,567,731		5,567,802	CLASS 564	
18	5,567,597			5,567,732		5,567,803	209	5,567,844
26	5,567,605			5,567,733		5,567,804	278	5,567,845
29	5,567,598			5,567,734		5,567,805	307	5,567,846
106	5,567,606			5,567,735		5,567,806	493	5,567,847
172.1	5,567,607			5,567,736		5,567,807		
172.3	5,567,599			5,567,737		5,567,808	CLASS 568	
182	5,567,608			5,567,738		5,567,809	6	5,567,849
222	5,567,601					5,567,810	322	5,567,850
226	5,567,602			CLASS 521		5,567,811	354	5,567,851
235.1	5,567,603			123	5,567,739	5,567,812	378	5,567,852
238	5,567,604			128	5,567,740		381	5,567,853
240.2	5,567,609			133	5,567,741		424	5,567,854
	5,567,610			143	5,567,742		449	5,567,855
	5,567,611						454	5,567,856
240.23	5,567,612						464	5,567,857
280	5,567,614						485	5,567,858
	5,567,615						617	Re.35,360
283.1	5,567,616						624	5,567,859
287.2	5,567,617							
							CLASS 585	
CLASS 436							639	5,567,860
42	5,567,618						CLASS 604	
77	5,567,619						96	5,567,203
87	5,567,620							
103	5,567,621						CLASS 722	
106	5,567,622						245.1	5,567,399
158	5,567,623							
163	5,567,624						CLASS 800	
174	5,567,625							
178	5,567,626							
518	5,567,627							
525	5,567,628							



## CLASSIFICATION OF PATENTS

115 374,849	116 374,869	54 374,889	374,909	142 374,930	109 374,950
147 374,850	117 374,870	56 374,890	143 374,910	169 374,931	110 374,951
178 374,851	136 374,871	57 374,891	209 374,911	181 374,932	132 374,952
314 374,852	138 374,872	32 374,892	374,912	213 374,933	6 374,954
374,853	147 374,873	51 374,893	213 374,913	215 374,934	21 374,955
400 374,854	225 374,874	69 374,894	214 374,914	374,935	31 374,956
415 374,855	248 374,875	13 374,895	227 374,915	217 374,936	70 374,957
419 374,856	1 374,876	142 374,896	283 374,916	68 374,937	16 374,958
374,857	89 374,877	203 374,897	374,917	124 374,938	39 374,959
D13— 103 374,860	130 374,878	208 374,898	374,918	374,939	1 374,960
108 374,858	132 374,879	214 374,899	309 374,919	374,940	3 374,961
110 374,859	202 374,880	226 374,900	354 374,920	126 374,941	5 374,962
374,861	218 374,881	240 374,901	356 374,921	374,942	23 374,963
133 374,862	310 374,882	246 374,902	360 374,922	138 374,943	28 374,964
146 374,863	321 374,883	108 374,903	366 374,924	106 374,945	28 374,965
154 374,864	335 374,884	119 374,904	377 374,925	189 374,946	374,966
374,865	47 374,885	125 374,905	374,926	7 374,947	
D14— 182 374,866	49 374,886	128 374,906	387 374,927	61 374,948	
114 374,867	50 374,887	129 374,907	125 374,928	102 374,949	
374,868	374,888	141 374,908			

## CLASSIFICATION OF PLANTS

P—	1	9,664	68.1	9,666	87.6	9,668	88.8	9,670
		9,665		9,667	88.1	9,669	90.1	9,671

GEOGRAPHICAL INDEX  
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama.....	1	Kentucky.....	21	Oregon.....	41
Alaska.....	2	Louisiana.....	22	Pennsylvania.....	42
American Samoa.....	3	Maine.....	23	Puerto Rico.....	43
Arizona.....	4	Maryland.....	24	Rhode Island.....	44
Arkansas.....	5	Massachusetts.....	25	South Carolina.....	45
California.....	6	Michigan.....	26	South Dakota.....	46
Canal Zone.....	7	Minnesota.....	27	Tennessee.....	47
Colorado.....	8	Mississippi.....	28	Texas.....	48
Connecticut.....	9	Missouri.....	29	Utah.....	49
Delaware.....	10	Montana.....	30	Vermont.....	50
District of Columbia.....	11	Nebraska.....	31	Virginia.....	51
Florida.....	12	Nevada.....	32	Virgin Islands.....	52
Georgia.....	13	New Hampshire.....	33	Washington.....	53
Guam.....	14	New Jersey.....	34	West Virginia.....	54
Hawaii.....	15	New Mexico.....	35	Wisconsin.....	55
Idaho.....	16	New York.....	36	Wyoming.....	56
Illinois.....	17	North Carolina.....	37	U.S. Air Force.....	57
Indiana.....	18	North Dakota.....	38	U.S. Army.....	58
Iowa.....	19	Ohio.....	39	U.S. Navy.....	59
Kansas.....	20	Oklahoma.....	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

01 :	5,566,736	5,566,689	5,567,476	5,568,018	5,568,419	5,567,490
	5,567,010	5,566,695	5,567,484	5,568,022	5,568,423	5,567,504
	5,567,214	5,566,707	5,567,496	5,568,023	5,568,424	5,567,544
	5,567,246	5,566,734	5,567,500	5,568,034	5,568,425	5,567,588
	5,567,269	5,566,744	5,567,512	5,568,036	5,568,426	5,567,590
	5,567,316	5,566,748	5,567,523	5,568,044	5,568,429	5,567,733
	5,567,689	5,566,782	5,567,526	5,568,062	5,568,437	5,567,816
	5,567,933	5,566,813	5,567,532	5,568,066	5,568,439	5,568,151
04 :	5,566,681	5,566,837	5,567,535	5,568,069	5,568,442	5,568,281
	5,566,843	5,566,841	5,567,547	5,568,081	5,568,444	5,568,315
	5,566,893	5,566,863	5,567,570	5,568,085	5,568,452	5,568,317
	5,566,976	5,566,867	5,567,581	5,568,090	5,568,455	5,568,491
	5,567,051	5,566,868	5,567,587	5,568,097	5,568,469	5,568,592
	5,567,243	5,566,887	5,567,592	5,568,099	5,568,474	5,568,604
	5,567,483	5,566,900	5,567,597	5,568,107	5,568,476	5,566,494
	5,567,487	5,566,909	5,567,599	5,568,119	5,568,483	5,566,572
	5,567,648	5,566,952	5,567,602	5,568,121	5,568,484	5,566,584
	5,567,649	5,566,953	5,567,607	5,568,124	5,568,515	5,566,671
	5,568,000	5,566,979	5,567,611	5,568,126	5,568,516	5,566,692
	5,568,005	5,566,986	5,567,622	5,568,127	5,568,524	5,566,784
	5,568,149	5,567,000	5,567,627	5,568,130	5,568,527	5,566,821
	5,568,158	5,567,002	5,567,634	5,568,152	5,568,535	5,566,822
	5,568,465	5,567,013	5,567,655	5,568,159	5,568,539	5,566,932
	5,568,492	5,567,014	5,567,683	5,568,162	5,568,546	5,566,933
	5,568,552	5,567,043	5,567,687	5,568,165	5,568,561	5,566,959
	5,568,598	5,567,084	5,567,696	5,568,167	5,568,572	5,567,143
	5,568,622	5,567,088	5,567,710	5,568,171	5,568,574	5,567,255
05 :	5,566,504	5,567,090	5,567,724	5,568,192	5,568,577	5,567,266
	5,566,768	5,567,122	5,567,729	5,568,205	5,568,584	5,567,389
	5,566,948	5,567,129	5,567,756	5,568,211	5,568,590	5,567,453
	5,567,075	5,567,164	5,567,807	5,568,255	5,568,602	5,567,573
	5,567,127	5,567,177	5,567,809	5,568,279	5,568,603	5,567,698
06 :	Re. 35,356	5,567,190	5,567,818	5,568,306	5,568,606	5,567,723
	5,566,400	5,567,248	5,567,830	5,568,307	5,568,612	5,567,929
	5,566,403	5,567,251	5,567,855	5,568,309	5,568,618	5,567,931
	5,566,417	5,567,282	5,567,864	5,568,324	5,568,630	5,567,934
	5,566,460	5,567,283	5,567,870	5,568,332	5,568,632	5,567,945
	5,566,466	5,567,292	5,567,898	5,568,335	5,568,636	5,567,998
	5,566,476	5,567,296	5,567,908	5,568,351	5,568,639	5,568,003
	5,566,488	5,567,302	5,567,969	5,568,356	5,568,644	5,568,060
	5,566,528	5,567,305	5,567,935	5,568,364	5,568,647	5,568,447
	5,566,566	5,567,317	5,567,957	5,568,365	5,568,652	5,568,450
	5,566,567	5,567,365	5,567,969	5,568,373	5,568,726	5,568,578
	5,566,588	5,567,405	5,567,971	5,568,376	5,566,951	Re. 35,360
	5,566,620	5,567,425	5,567,975	5,568,392	5,566,988	5,566,405
	5,566,627	5,567,433	5,567,981	5,568,394	5,566,996	5,567,179
	5,566,630	5,567,434	5,567,982	5,568,395	5,567,018	5,567,461
	5,566,653	5,567,438	5,567,988	5,568,396	5,567,055	5,567,670
	5,566,684	5,567,462	5,568,016	5,568,411	5,567,464	5,567,673

5,567,700	5,567,103	5,566,495	5,566,722	32 :	5,566,591	5,567,514
5,567,735	5,567,123	5,566,551	5,566,743		5,566,708	5,567,531
5,567,769	5,567,148	5,566,552	5,566,794		5,566,836	5,567,536
5,567,772	5,567,195	5,566,685	5,566,802		5,566,993	5,567,543
5,567,846	5,567,197	5,566,693	5,566,808		5,566,985	5,567,553
5,567,857	5,567,216	5,566,947	5,566,870	33 :	5,567,078	5,567,562
5,567,868	5,567,301	5,566,956	5,566,871		5,567,375	5,567,564
5,566,491	5,567,318	5,567,121	5,566,874		5,568,128	5,567,565
5,566,509	5,567,427	5,567,160	5,566,927	34 :	5,566,576	5,567,569
5,566,542	5,567,454	5,567,230	5,566,941		5,566,626	5,567,577
5,566,544	5,567,455	5,567,309	5,566,954		5,566,638	5,567,580
5,566,608	5,567,456	5,567,481	5,566,974		5,566,641	5,567,596
5,566,677	5,567,486	5,567,519	5,566,977		5,566,649	5,567,615
5,566,706	5,567,540	5,567,551	5,566,978		5,566,680	5,567,617
5,566,739	5,567,594	5,567,591	5,566,983		5,566,829	5,567,625
5,566,740	5,567,605	5,567,598	5,566,987		5,566,898	5,567,626
5,566,770	5,567,628	5,567,601	5,567,009		5,566,950	5,567,635
5,566,775	5,567,686	5,567,681	5,567,012		5,566,958	5,567,646
5,566,789	5,567,711	5,567,682	5,567,019		5,566,965	5,567,657
5,566,838	5,567,812	5,567,684	5,567,022		5,567,041	5,567,679
5,566,839	5,567,823	5,567,732	5,567,024		5,567,092	5,567,692
5,566,849	5,567,860	5,567,991	5,567,027		5,567,132	5,567,739
5,566,981	5,567,980	5,568,049	5,567,098		5,567,228	5,567,751
5,567,038	5,568,006	5,568,150	5,567,130		5,567,324	5,567,752
5,567,057	5,568,046	5,568,186	5,567,201		5,567,376	5,567,773
5,567,141	5,568,129	5,568,402	5,567,229		5,567,422	5,567,780
5,567,155	5,568,349	5,568,473	5,567,241		5,567,450	5,567,786
5,567,189	5,568,353	5,568,490	5,567,259		5,567,471	5,567,802
5,567,207	5,568,497	5,568,435	5,567,327		5,567,829	5,567,829
5,567,322	5,568,548	5,566,487	5,567,347		5,567,495	5,567,850
5,567,329	5,568,586	5,566,569	5,567,360		5,567,614	5,567,858
5,567,430	5,566,496	5,566,676	5,567,391		5,567,665	5,567,884
5,567,436	5,566,510	5,566,704	5,567,520		5,567,666	5,567,985
5,567,441	5,566,548	5,566,835	5,567,549		5,567,693	5,567,985
5,567,978	5,566,658	5,566,857	5,567,616		5,567,708	5,567,985
5,567,999	5,566,705	5,566,890	5,567,662		5,567,709	5,568,076
5,568,001	5,566,804	5,566,892	5,567,722		5,567,718	5,568,102
5,568,037	5,566,805	5,566,943	5,567,764		5,567,787	5,568,104
5,568,112	5,566,816	5,567,001	5,567,834		5,567,788	5,568,110
5,568,125	5,566,819	5,567,067	5,567,835		5,567,801	5,568,143
5,568,272	5,566,831	5,567,157	5,567,837		5,567,808	5,568,144
5,568,536	5,566,918	5,567,219	5,567,843		5,567,824	5,568,169
5,568,607	5,566,980	5,567,286	5,567,848		5,567,841	5,568,202
5,568,611	5,566,994	5,567,319	5,568,010		5,567,912	5,568,214
5,568,614	5,566,995	5,567,336	5,568,048		5,567,936	5,568,216
5,568,619	5,567,003	5,567,369	5,568,052		5,567,943	5,568,218
5,566,606	5,567,036	5,567,390	5,568,095		5,567,973	5,568,219
5,566,629	5,567,117	5,567,410	5,568,118		5,568,371	5,568,227
5,566,630	5,567,125	5,567,417	5,568,120		5,568,475	5,568,228
5,566,826	5,567,175	5,567,420	5,568,122		5,568,510	5,568,229
5,566,847	5,567,181	5,567,438	5,568,136		5,568,569	5,568,230
5,566,935	5,567,200	5,567,501	5,568,263		5,568,593	5,568,235
5,566,940	5,567,460	5,567,525	5,568,316		5,568,600	5,568,238
5,567,095	5,567,480	5,567,583	5,568,388	35 :	5,567,142	5,568,243
5,567,105	5,567,620	5,567,612	5,568,389		5,567,401	5,568,246
5,567,172	5,567,678	5,567,619	5,568,404		5,567,408	5,568,248
5,567,257	5,567,712	5,567,623	5,568,534		5,567,932	5,568,260
5,567,361	5,567,713	5,567,651	5,568,571		5,567,995	5,568,265
5,567,372	5,567,714	5,567,706	5,568,615		5,568,019	5,568,269
5,567,380	5,567,715	5,567,753	5,566,422	27 :	5,568,312	5,568,280
5,567,497	5,567,746	5,567,866	5,566,483		5,568,348	5,568,286
5,567,600	5,567,803	5,567,919	5,566,507		5,568,409	5,568,301
5,567,688	5,567,820	5,567,947	5,566,516		5,568,506	5,568,320
5,567,736	5,567,828	5,568,013	5,566,602		5,566,396	5,568,344
5,567,747	5,567,849	5,568,015	5,566,710		5,566,397	5,568,368
5,567,798	5,568,041	5,568,086	5,566,963		5,566,410	5,568,400
5,567,859	5,568,403	5,568,105	5,567,085		5,566,420	5,568,406
5,568,039	5,566,394	5,568,106	5,567,093		5,566,429	5,568,446
5,568,183	5,566,536	5,568,111	5,567,119		5,566,448	5,568,489
5,568,313	5,566,639	5,568,142	5,567,136		5,566,482	5,568,507
5,567,889	5,566,902	5,568,145	5,567,150		5,566,560	5,568,508
5,566,679	5,567,238	5,568,208	5,567,203		5,566,561	5,568,509
5,567,541	5,567,447	5,568,275	5,567,234		5,566,607	5,568,522
5,567,644	5,567,925	5,568,318	5,567,289		5,566,618	5,568,526
5,567,946	5,568,405	5,568,361	5,567,332		5,566,687	5,568,538
5,568,435	5,568,537	5,568,391	5,567,444		5,566,730	5,568,541
5,568,512	5,568,645	5,568,415	5,567,510		5,566,806	5,568,542
5,568,641	5,566,464	5,568,438	5,567,650		5,566,830	5,568,570
5,566,398	5,566,518	5,568,470	5,567,703		5,566,894	5,568,631
5,566,399	5,566,535	5,568,554	5,567,765		5,566,931	5,568,648
5,566,406	5,567,609	5,568,555	5,568,027		5,567,037	5,568,652
5,566,439	5,567,907	5,568,624	5,568,384		5,567,046	5,568,652
5,566,452	5,568,058	5,568,627	5,567,026	28 :	5,567,050	5,566,424
5,566,470	5,568,358	5,568,651	5,567,950		5,567,072	5,566,433
5,566,484	5,568,560	5,566,418	5,568,026		5,567,080	5,566,610
5,566,506	5,568,629	5,566,450	5,566,409	29 :	5,567,120	5,566,648
5,566,511	5,566,438	5,566,454	5,566,432		5,567,129	5,566,696
5,566,520	5,566,486	5,566,533	5,566,490		5,567,145	5,566,926
5,566,549	5,566,595	5,566,546	5,566,667		5,567,153	5,566,964
5,566,600	5,567,144	5,566,581	5,566,809		5,567,202	5,567,053
5,566,660	5,567,745	5,566,585	5,566,848		5,567,211	5,567,109
5,566,682	5,567,836	5,566,589	5,566,885		5,567,262	5,567,147
5,566,729	5,567,875	5,566,594	5,567,212		5,567,263	5,567,168
5,566,823	5,568,033	5,566,623	5,567,213		5,567,274	5,567,185
5,566,836	5,566,412	5,566,632	5,567,252		5,567,279	5,567,187
5,566,846	5,566,715	5,566,662	5,567,356		5,567,300	5,567,256
5,566,866	5,567,126	5,566,663	5,567,424		5,567,304	5,567,400
5,566,873	5,567,760	5,566,664	5,567,881		5,567,344	5,567,474
5,566,991	5,567,805	5,566,665	5,566,538	30 :	5,567,387	5,567,774
5,567,029	5,568,449	5,566,672	5,566,765		5,567,406	5,568,088
5,567,056	5,566,478	5,566,703	5,567,194		5,567,445	5,568,181
5,567,083	5,566,408	5,566,717	5,567,386	31 :	5,567,468	5,568,398
5,567,101	5,566,465	5,566,720	5,567,415		5,567,473	5,568,477

	5,568,511	5,567,170	5,567,691	5,566,554	5,567,976	5,567,548
	5,568,513	5,567,198	5,567,717	5,566,555	5,567,993	5,567,800
	5,568,525	5,567,323	5,567,719	5,566,636	5,568,061	5,568,370
	5,568,605	5,567,754	5,567,731	5,566,683	5,568,064	5,568,471
38 :	5,566,934	5,566,391	5,567,740	5,566,712	5,568,065	5,568,496
39 :	5,566,413	5,566,427	5,567,763	5,566,731	5,568,067	5,568,532
	5,566,419	5,566,532	5,567,766	5,566,749	5,568,073	5,566,407
	5,566,523	5,566,971	5,567,767	5,566,752	5,568,084	5,566,473
	5,566,579	5,567,066	5,567,768	5,566,753	5,568,134	5,566,578
	5,566,631	5,567,111	5,567,770	5,566,757	5,568,210	5,566,645
	5,566,640	5,567,220	5,567,781	5,566,758	5,568,330	5,566,674
	5,566,697	5,567,381	5,567,783	5,566,759	5,568,359	5,566,675
	5,566,721	5,567,411	5,567,810	5,566,761	5,568,360	5,566,678
	5,566,724	5,568,100	5,567,831	5,566,762	5,568,378	5,566,747
	5,566,788	5,568,172	5,567,838	5,566,763	5,568,380	5,566,913
	5,566,815	5,568,262	5,567,847	5,566,764	5,568,383	5,566,960
	5,566,820	5,568,613	5,567,853	5,566,766	5,568,401	5,567,028
	5,566,850	5,568,620	5,567,891	5,566,769	5,568,431	5,567,091
	5,566,860	Re 35,355	5,567,903	5,566,772	5,568,433	5,567,096
	5,566,862	5,566,481	5,567,930	5,566,779	5,568,443	5,567,499
	5,566,878	5,566,489	5,568,011	5,566,781	5,568,482	5,567,554
	5,566,930	5,566,493	5,568,053	5,566,842	5,568,493	5,567,584
	5,566,942	5,566,500	5,568,055	5,566,877	5,568,495	5,567,704
	5,566,962	5,566,508	5,568,094	5,566,891	5,568,514	5,567,728
	5,567,008	5,566,609	5,568,200	5,566,916	5,568,608	5,567,948
	5,567,031	5,566,622	5,568,528	5,566,939	5,568,610	5,568,123
	5,567,074	5,566,633	5,568,581	5,566,945	5,568,616	5,568,215
	5,567,118	5,566,691	5,566,746	5,566,984	5,568,621	5,568,399
	5,567,131	5,566,694	5,566,919	5,566,985	5,568,649	5,568,540
	5,567,159	5,566,702	5,566,434	5,567,039	5,566,395	5,567,640
	5,567,174	5,566,735	5,566,625	5,567,048	5,566,492	5,567,529
	5,567,215	5,566,745	5,566,723	5,567,086	5,566,543	5,567,793
	5,567,224	5,566,751	5,566,793	5,567,146	5,566,923	5,568,009
	5,567,254	5,566,807	5,566,795	5,567,161	5,566,949	5,566,416
	5,567,260	5,566,845	5,566,901	5,567,221	5,566,973	5,566,423
	5,567,339	5,566,853	5,567,247	5,567,245	5,566,975	5,566,455
	5,567,364	5,566,861	5,567,265	5,567,295	5,567,287	5,566,458
	5,567,394	5,566,872	5,567,306	5,567,299	5,567,624	5,566,497
	5,567,398	5,566,908	5,567,477	5,567,334	5,567,863	5,566,531
	5,567,428	5,566,924	5,567,533	5,567,385	5,567,905	5,566,570
	5,567,432	5,567,025	5,568,161	5,567,396	5,568,521	5,566,616
	5,567,472	5,567,045	5,566,479	5,567,435	Re 35,358	5,566,624
	5,567,488	5,567,110	5,566,821	5,567,440	5,566,992	5,566,712
	5,567,489	5,567,166	5,566,936	5,567,457	5,567,149	5,566,732
	5,567,742	5,567,169	5,566,961	5,567,507	5,567,653	5,566,780
	5,567,757	5,567,205	5,567,087	5,567,528	5,567,654	5,566,849
	5,567,814	5,567,226	5,567,192	5,567,550	5,567,984	5,567,016
	5,567,815	5,567,227	5,567,210	5,567,604	5,568,302	5,567,020
	5,567,821	5,567,235	5,567,511	5,567,636	5,568,410	5,567,042
	5,567,902	5,567,277	5,567,527	5,567,641	5,566,456	5,567,107
	5,567,937	5,567,281	5,567,585	5,567,775	5,566,513	5,567,113
	5,567,944	5,567,298	5,567,761	5,567,795	5,566,515	5,567,307
	5,568,137	5,567,328	5,567,897	5,567,856	5,566,573	5,567,326
	5,568,177	5,567,330	5,568,209	5,567,887	5,566,637	5,567,452
	5,568,357	5,567,351	5,568,582	5,567,906	5,566,644	5,567,538
	5,568,366	5,567,352	5,566,392	5,567,914	5,566,771	5,567,862
	5,568,356	5,567,353	5,566,393	5,567,916	5,566,817	5,567,994
	5,568,385	5,567,407	5,566,465	5,567,927	5,566,998	5,568,377
	5,566,755	5,567,448	5,566,477	5,567,958	5,567,345	5,568,544
	5,566,756	5,567,482	5,566,499	5,567,963	5,567,439	5,566,855
	5,565,760	5,567,586	5,566,534	5,567,966	5,567,498	5,566,995
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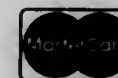
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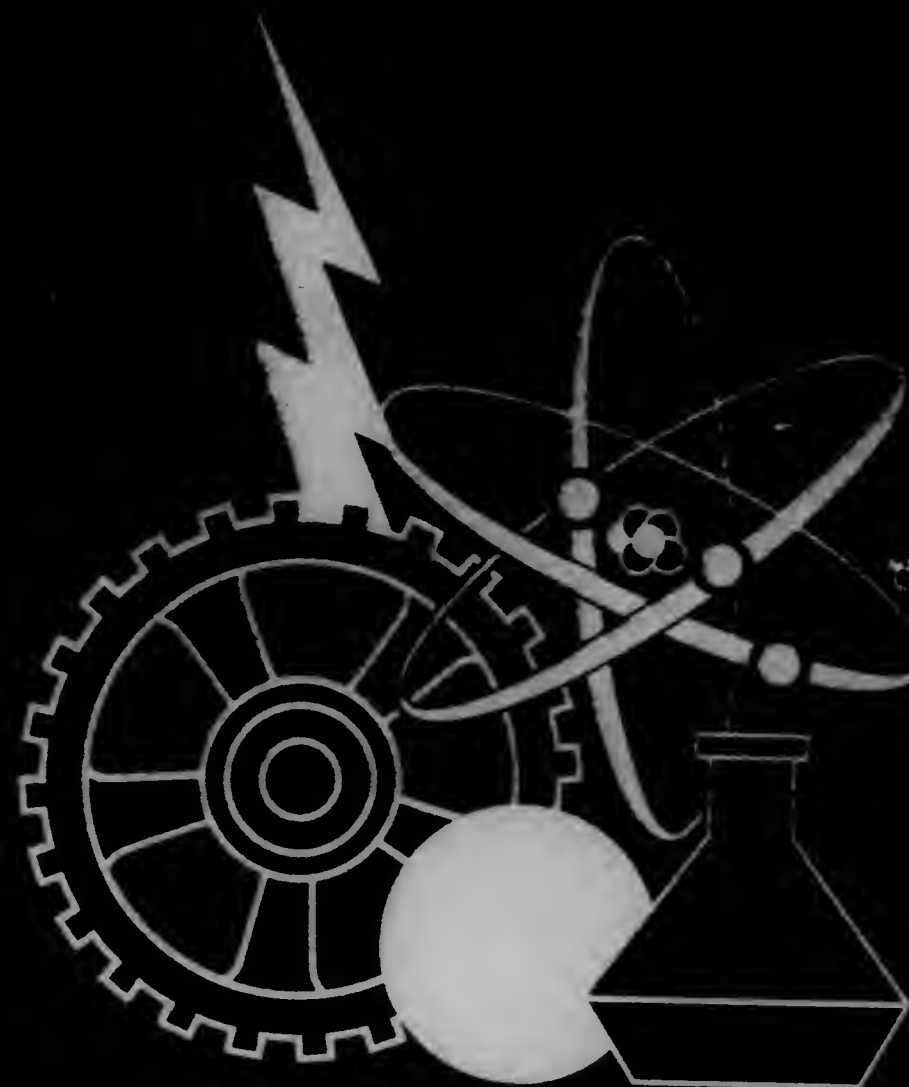
Vol. 1191 Number 5

# OFFICIAL GAZETTE

of the  
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

October 29, 1996



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the  
UNITED STATES PATENT AND TRADEMARK OFFICE  
October 29, 1996 Volume 1191 Number 5

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1191 OG 157
Notice of Maintenance Fees Payable	1191 OG 157
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee	1191 OG 158
Reissue Applications Filed	1191 OG 165
Requests for Reexaminations Filed	1191 OG 165
Notice of Expiration of Trademark Registrations Due to Failure to Renew	1191 OG 166
Service by Publication	1191 OG 168
Disclaimers	1191 OG 168
Changes Implementing Nucleotide and/or Amino Acid Sequence Listing	1191 OG 168
Patent Certificates of Corrections	1191 OG 184
Extension of the Payor Number Practice (through "Customer Numbers") to Matters Involving Pending Patent Applications	1191 OG 187
Summary of Final Decisions Issued by the Trademark Trial and Appeal Board	1191 OG 196
Special Boxes for Mail	1191 OG 197
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1191 OG 199
Patent Examining Corps	1191 OG 201
Condition of Trademark Applications	1191 OG 202
Reexaminations	3143
Reissue Patents Granted (35,361)	3149
Plant Patents Granted (9,672)	3153
Patents Granted	
General and Mechanical (5,568,656)	3155
Chemical (5,569,309)	3383
Electrical (5,569,835)	3529
Design Patents Granted (374,967)	3741
Index of Patentees	PI 1
Indices of Reissue, Reexaminations, Design and Plant Patents	PI 81
Classification of	
Patents (Including Reissues and Reexaminations)	PI 89
Designs and Plants Applications	PI 93
Geographical Index of Residence of Inventors	
Patents (Including Reissues and Reexaminations)	PI 95
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# PATENT AND TRADEMARK OFFICE NOTICES

## Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1190 O.G. 3, on September 3, 1996.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective July 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1187 O.G. 73, on June 25, 1996.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1996, and were announced in the *Official Gazette* at 1189 O.G. 62, on August 20, 1996.

The schedule of PCT fees (in U.S. dollars), effective October 1, 1996, is as follows:

## International Application (PCT Chapter I) fees:

Transmittal fee.....	230.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed.....	680.00
— Corresponding prior U.S. national application filed.....	440.00
— Supplemental search fee, per additional invention (payable only upon invitation).....	200.00
European Patent Office as ISA.....	1585.00
International fees	
Basic fee.....	677.00
Basic supplemental fee (for each page over 30).....	13.00
Designation fee per country or region	
— For the first 11 national or regional offices designated.....	164.00
— For each designation in excess of 11 offices.....	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee.....	164.00
— Confirmation fee.....	82.00

## International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:

Handling fee.....	207.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I.....	480.00

— Additional examination fee, per additional invention (payable only upon invitation).....	140.00
— USPTO was not ISA in PCT Chapter I	730.00
— Additional examination fee, per additional invention (payable only upon invitation).....	260.00

## U.S. National Stage Fees

	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4).....	48.00	96.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4).....	350.00	700.00
USPTO was ISA but not IPEA.....	385.00	770.00
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office.....	520.00	1040.00
— Search report has been prepared by the European Patent Office or the Japanese Patent Office.....	455.00	910.00

## Other National fees

— For each independent claim in excess of 3.....	40.00	80.00
— For each claim in excess of 20.....	11.00	22.00
— For each application containing a multiple dependent claim.....	130.00	260.00
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1).....	65.00	130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1).....	130.00	130.00

Sept. 10, 1996

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

## Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on October 26, 1993 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,255,390 through 5,257,416  
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on October 24, 1989 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,875,235 through 4,876,744  
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on October 22, 1985 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,547,903 through 4,549,314  
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1996, which are reproduced below:

#### 37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$510.00  
By other than a small entity .....\$1,020.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$1,025.00  
By other than a small entity .....\$2,050.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$1,540.00  
By other than a small entity .....\$3,080.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) .....\$65.00  
By other than a small entity .....\$130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable .....\$680.00  
(2) unintentional .....\$1,600.00

#### Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

#### PATENTS WHICH EXPIRED August 21, 1996 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,182 (4,466,862)	06/710,596 (06/467,333)	06/17/86 (08/21/84)
Re. 32,556 (4,466,950)	06/889,904 (06/512,926)	12/08/87 (08/21/84)
4,466,135	06/428,924	08/21/84
4,466,143	06/470,989	08/21/84
4,466,147	06/334,917	08/21/84
4,466,149	06/409,506	08/21/84
4,466,153	06/424,952	08/21/84
4,466,158	06/368,982	08/21/84
4,466,159	06/452,498	08/21/84
4,466,160	06/227,125	08/21/84
4,466,165	06/377,554	08/21/84
4,466,166	06/266,202	08/21/84
4,466,174	06/334,948	08/21/84
4,466,181	06/446,346	08/21/84
4,466,195	06/445,683	08/21/84
4,466,202	06/473,030	08/21/84
4,466,204	06/424,102	08/21/84
4,466,207	06/320,480	08/21/84
4,466,213	06/505,284	08/21/84
4,466,221	06/309,933	08/21/84
4,466,229	06/322,429	08/21/84
4,466,250	06/343,815	08/21/84
4,466,254	06/413,437	08/21/84
4,466,256	06/377,667	08/21/84
4,466,272	06/382,905	08/21/84
4,466,284	06/363,183	08/21/84
4,466,287	06/439,310	08/21/84
4,466,306	06/403,803	08/21/84
4,466,312	06/267,558	08/21/84
4,466,313	06/490,844	08/21/84
4,466,326	06/483,202	08/21/84
4,466,328	06/349,552	08/21/84
4,466,331	06/501,444	08/21/84
4,466,340	06/442,548	08/21/84
4,466,342	06/468,235	08/21/84
4,466,346	06/329,662	08/21/84
4,466,356	06/227,122	08/21/84
4,466,357	06/363,388	08/21/84
4,466,362	06/354,459	08/21/84
4,466,366	06/465,795	08/21/84
4,466,368	06/370,123	08/21/84
4,466,370	06/340,729	08/21/84
4,466,380	06/456,935	08/21/84
4,466,383	06/541,394	08/21/84
4,466,384	06/472,943	08/21/84
4,466,394	06/369,025	08/21/84
4,466,398	06/400,358	08/21/84
4,466,400	06/451,848	08/21/84
4,466,402	06/532,401	08/21/84
4,466,406	06/282,193	08/21/84
4,466,412	06/338,335	08/21/84
4,466,423	06/429,923	08/21/84
4,466,424	06/329,655	08/21/84
4,466,425	06/338,147	08/21/84
4,466,430	06/391,369	08/21/84
4,466,431	06/376,161	08/21/84
4,466,433	06/327,552	08/21/84

Patent Number	Serial Number	Issue Date	4,466,722	06/425,307	08/21/84
4,466,441	06/404,246	08/21/84	4,466,727	06/343,197	08/21/84
4,466,449	06/442,008	08/21/84	4,466,728	06/375,458	08/21/84
4,466,460	06/378,374	08/21/84	4,466,730	06/448,141	08/21/84
4,466,462	06/546,080	08/21/84	4,466,732	06/392,964	08/21/84
4,466,463	06/429,395	08/21/84	4,466,734	06/536,144	08/21/84
4,466,464	06/430,897	08/21/84	4,466,737	06/420,816	08/21/84
4,466,465	06/431,535	08/21/84	4,466,738	06/410,515	08/21/84
4,466,466	06/432,053	08/21/84	4,466,744	06/448,336	08/21/84
4,466,470	06/341,195	08/21/84	4,466,748	06/383,442	08/21/84
4,466,475	06/439,556	08/21/84	4,466,749	06/368,891	08/21/84
4,466,476	06/506,856	08/21/84	4,466,755	06/292,634	08/21/84
4,466,480	06/375,217	08/21/84	4,466,758	06/343,337	08/21/84
4,466,482	06/325,415	08/21/84	4,466,768	06/359,885	08/21/84
4,466,489	06/354,223	08/21/84	4,466,769	06/389,882	08/21/84
4,466,491	06/393,614	08/21/84	4,466,773	06/337,441	08/21/84
4,466,493	06/331,650	08/21/84	4,466,774	06/413,029	08/21/84
4,466,500	06/430,354	08/21/84	4,466,776	06/457,941	08/21/84
4,466,504	06/463,403	08/21/84	4,466,780	06/229,153	08/21/84
4,466,517	06/346,520	08/21/84	4,466,785	06/442,603	08/21/84
4,466,522	06/283,342	08/21/84	4,466,789	06/545,668	08/21/84
4,466,524	06/361,296	08/21/84	4,466,792	06/440,252	08/21/84
4,466,530	06/359,166	08/21/84	4,466,794	06/420,645	08/21/84
4,466,533	06/431,321	08/21/84	4,466,801	06/381,988	08/21/84
4,466,538	06/485,203	08/21/84	4,466,804	06/305,381	08/21/84
4,466,540	06/507,482	08/21/84	4,466,812	06/404,034	08/21/84
4,466,547	06/381,230	08/21/84	4,466,815	06/374,516	08/21/84
4,466,553	06/299,982	08/21/84	4,466,820	06/514,718	08/21/84
4,466,558	06/407,846	08/21/84	4,466,830	06/442,955	08/21/84
4,466,560	06/424,511	08/21/84	4,466,831	06/423,911	08/21/84
4,466,568	06/416,567	08/21/84	4,466,837	06/446,305	08/21/84
4,466,569	06/311,636	08/21/84	4,466,840	06/404,260	08/21/84
4,466,570	06/418,997	08/21/84	4,466,844	06/533,092	08/21/84
4,466,579	06/418,212	08/21/84	4,466,847	06/492,361	08/21/84
4,466,580	06/378,112	08/21/84	4,466,853	06/247,055	08/21/84
4,466,581	06/466,524	08/21/84	4,466,874	06/537,060	08/21/84
4,466,582	06/418,602	08/21/84	4,466,876	06/356,720	08/21/84
4,466,585	06/404,717	08/21/84	4,466,878	06/457,509	08/21/84
4,466,586	06/453,682	08/21/84	4,466,880	06/419,497	08/21/84
4,466,587	06/332,893	08/21/84	4,466,884	06/453,290	08/21/84
4,466,592	06/381,362	08/21/84	4,466,886	06/425,440	08/21/84
4,466,594	06/281,581	08/21/84	4,466,890	06/331,260	08/21/84
4,466,600	06/441,438	08/21/84	4,466,892	06/343,660	08/21/84
4,466,603	06/263,070	08/21/84	4,466,893	06/369,389	08/21/84
4,466,606	06/301,597	08/21/84	4,466,896	06/518,335	08/21/84
4,466,608	06/344,473	08/21/84	4,466,899	06/336,709	08/21/84
4,466,610	06/281,067	08/21/84	4,466,901	06/387,623	08/21/84
4,466,613	06/361,404	08/21/84	4,466,907	06/428,719	08/21/84
4,466,614	06/406,106	08/21/84	4,466,913	06/410,299	08/21/84
4,466,615	06/412,949	08/21/84	4,466,916	06/388,209	08/21/84
4,466,628	06/325,622	08/21/84	4,466,918	06/274,586	08/21/84
4,466,636	06/379,828	08/21/84	4,466,919	06/403,218	08/21/84
4,466,646	06/469,646	08/21/84	4,466,923	06/450,318	08/21/84
4,466,653	06/419,577	08/21/84	4,466,924	06/364,290	08/21/84
4,466,655	06/418,989	08/21/84	4,466,926	06/352,538	08/21/84
4,466,659	06/389,918	08/21/84	4,466,928	06/398,119	08/21/84
4,466,661	06/445,763	08/21/84	4,466,933	06/402,410	08/21/84
4,466,663	06/388,425	08/21/84	4,466,937	06/568,151	08/21/84
4,466,668	06/479,483	08/21/84	4,466,945	06/425,615	08/21/84
4,466,669	06/448,297	08/21/84	4,466,952	06/506,178	08/21/84
4,466,670	06/286,618	08/21/84	4,466,955	06/457,384	08/21/84
4,466,672	06/307,126	08/21/84	4,466,967	06/386,820	08/21/84
4,466,673	06/483,852	08/21/84	4,466,970	06/402,182	08/21/84
4,466,680	06/333,785	08/21/84	4,466,973	06/535,467	08/21/84
4,466,683	06/396,502	08/21/84	4,466,979	06/463,062	08/21/84
4,466,684	06/331,728	08/21/84	4,466,981	06/459,847	08/21/84
4,466,685	06/265,434	08/21/84	4,466,984	06/437,063	08/21/84
4,466,687	06/380,169	08/21/84	4,466,991	06/430,442	08/21/84
4,466,692	06/520,741	08/21/84	4,467,006	06/462,996	08/21/84
4,466,696	06/362,703	08/21/84	4,467,012	06/538,835	08/21/84
4,466,697	06/320,576	08/21/84	4,467,018	06/503,414	08/21/84
4,466,699	06/341,923	08/21/84	4,467,020	06/288,913	08/21/84
4,466,700	06/259,733	08/21/84	4,467,023	06/459,841	08/21/84
4,466,701	06/397,214	08/21/84	4,467,028	06/523,311	08/21/84
4,466,705	06/432,409	08/21/84	4,467,032	06/397,659	08/21/84
4,466,706	06/356,823	08/21/84	4,467,038	06/371,906	08/21/84
4,466,713	06/299,456	08/21/84	4,467,042	06/326,109	08/21/84
4,466,714	06/365,982	08/21/84	4,467,045	06/343,082	08/21/84
				06/428,927	08/21/84



Patent Number	Serial Number	Issue Date	4,763,367	07/103,520	08/16/88
4,467,060	06/460,424	08/21/84	4,763,368	07/071,869	08/16/88
4,467,070	06/431,467	08/21/84	4,763,371	06/870,544	08/16/88
4,467,074	06/409,084	08/21/84	4,763,373	06/899,340	08/16/88
4,467,076	06/352,589	08/21/84	4,763,382	07/148,522	08/16/88
4,467,090	06/425,152	08/21/84	4,763,383	07/001,812	08/16/88
4,467,093	06/402,487	08/21/84	4,763,386	07/082,819	08/16/88
4,467,097	06/426,388	08/21/84	4,763,394	07/141,143	08/16/88
4,467,102	06/553,644	08/21/84	4,763,396	06/926,404	08/16/88
4,467,107	06/385,421	08/21/84	4,763,397	06/943,121	08/16/88
4,467,108	06/498,834	08/21/84	4,763,404	07/023,839	08/16/88
4,467,110	06/466,651	08/21/84	4,763,406	06/847,280	08/16/88
4,467,111	06/515,796	08/21/84	4,763,412	06/878,903	08/16/88
4,467,114	06/420,187	08/21/84	4,763,416	07/054,834	08/16/88
4,467,116	06/323,595	08/21/84	4,763,417	07/020,553	08/16/88
4,467,123	06/459,738	08/21/84	4,763,418	06/943,607	08/16/88
4,467,126	06/515,001	08/21/84	4,763,423	07/070,289	08/16/88
4,467,131	06/493,841	08/21/84	4,763,426	07/029,815	08/16/88
4,467,132	06/463,433	08/21/84	4,763,428	06/795,450	08/16/88
4,467,133	06/390,087	08/21/84	4,763,429	06/901,532	08/16/88
4,467,141	06/415,445	08/21/84	4,763,430	06/915,419	08/16/88
4,467,151	06/449,048	08/21/84	4,763,433	07/085,326	08/16/88
4,467,157	06/433,493	08/21/84	4,763,436	07/058,571	08/16/88
4,467,169	06/364,345	08/21/84	4,763,438	06/944,767	08/16/88
4,467,170	06/387,666	08/21/84	4,763,441	07/054,767	08/16/88
4,467,173	06/357,301	08/21/84	4,763,443	06/840,842	08/16/88
4,467,176	06/455,712	08/21/84	4,763,444	07/068,258	08/16/88
4,467,177	06/471,194	08/21/84	4,763,449	07/110,623	08/16/88
4,467,181	06/411,458	08/21/84	4,763,450	07/037,714	08/16/88
4,467,182	06/301,732	08/21/84	4,763,452	07/032,533	08/16/88
4,467,183	06/330,981	08/21/84	4,763,454	07/099,065	08/16/88
4,467,191	06/344,449	08/21/84	4,763,470	07/008,988	08/16/88
4,467,193	06/302,201	08/21/84	4,763,481	06/870,388	08/16/88
4,467,196	06/393,258	08/21/84	4,763,484	07/053,095	08/16/88
4,467,210	06/379,712	08/21/84	4,763,487	07/045,534	08/16/88
4,467,220	06/477,591	08/21/84	4,763,488	07/076,989	08/16/88
4,467,223	06/370,706	08/21/84	4,763,490	06/899,280	08/16/88
4,467,230	06/439,032	08/21/84	4,763,494	07/009,077	08/16/88
4,467,241	06/342,994	08/21/84	4,763,495	06/868,102	08/16/88
4,467,255	06/357,954	08/21/84	4,763,498	07/088,032	08/16/88
4,467,256	06/426,316	08/21/84	4,763,499	07/035,591	08/16/88
4,467,261	06/397,031	08/21/84	4,763,500	06/889,414	08/16/88
4,467,269	06/436,870	08/21/84	4,763,504	07/076,791	08/16/88
4,467,271	06/340,882	08/21/84	4,763,506	07/025,725	08/16/88
4,467,272	06/368,402	08/21/84	4,763,508	06/915,530	08/16/88
4,467,274	06/264,200	08/21/84	4,763,519	06/890,595	08/16/88
4,467,276	06/366,209	08/21/84	4,763,521	06/846,529	08/16/88
4,467,277	06/345,739	08/21/84	4,763,523	07/089,748	08/16/88
4,467,285	06/333,238	08/21/84	4,763,524	06/943,413	08/16/88
4,467,286	06/439,944	08/21/84	4,763,525	06/852,608	08/16/88
4,467,291	06/324,232	08/21/84	4,763,527	07/006,125	08/16/88
4,467,297	06/373,142	08/21/84	4,763,528	07/002,758	08/16/88
4,467,308	06/226,370	08/21/84	4,763,533	06/942,848	08/16/88
4,467,321	06/373,569	08/21/84	4,763,534	06/696,695	08/16/88
4,467,324	06/403,356	08/21/84	4,763,544	06/609,235	08/16/88
4,467,325	06/317,688	08/21/84	4,763,565	07/039,517	08/16/88
4,467,337	06/374,703	08/21/84	4,763,572	07/037,933	08/16/88
4,467,354	06/320,406	08/21/84	4,763,577	07/001,391	08/16/88
4,467,357	06/381,087	08/21/84	4,763,582	07/001,666	08/16/88
4,467,371	06/484,300	08/21/84	4,763,583	07/020,812	08/16/88
4,467,373	06/309,304	08/21/84	4,763,584	07/107,190	08/16/88
4,467,378	06/321,797	08/21/84	4,763,589	07/136,194	08/16/88
4,467,380	06/348,328	08/21/84	4,763,591	06/925,791	08/16/88
4,467,385	06/398,467	08/21/84	4,763,593	07/018,518	08/16/88
4,467,395	06/469,553	08/21/84	4,763,599	07/018,617	08/16/88
4,467,397	06/293,788	08/21/84	4,763,602	06/934,355	08/16/88
4,467,399	06/332,138	08/21/84	4,763,606	06/932,525	08/16/88
4,467,400	06/378,023	08/21/84	4,763,609	06/917,088	08/16/88
4,467,426	06/279,419	08/21/84	4,763,610	07/008,712	08/16/88
4,467,428	06/285,533	08/21/84	4,763,613	06/942,337	08/16/88
4,467,431	06/353,717	08/21/84	4,763,617	07/033,786	08/16/88
4,467,433	06/288,117	08/21/84	4,763,618	07/079,739	08/16/88
4,467,448	06/327,307	08/21/84	4,763,640	07/089,165	08/16/88
4,467,453	06/470,122	08/21/84	4,763,645	07/034,531	08/16/88
4,467,454	06/334,927	08/21/84	4,763,657	06/898,235	08/16/88
4,467,469	06/435,196	08/21/84	4,763,659	07/024,919	08/16/88
4,467,471	06/326,705	08/21/84	4,763,661	06/828,954	08/16/88
4,763,365	07/038,500	08/16/88	4,763,666	06/854,694	08/16/88
			4,763,668	06/792,093	08/16/88

Patent Number	Serial Number	Issue Date	4,763,958	06/889,940	08/16/88
4,763,676	07/004,840	08/16/88	4,763,965	06/886,025	08/16/88
4,763,681	07/013,652	08/16/88	4,763,969	06/411,929	08/16/88
4,763,684	07/038,146	08/16/88	4,763,971	06/931,460	08/16/88
4,763,686	07/146,995	08/16/88	4,763,986	06/934,391	08/16/88
4,763,695	07/076,269	08/16/88	4,763,991	07/083,155	08/16/88
4,763,699	07/077,223	08/16/88	4,764,001	07/127,256	08/16/88
4,763,703	07/019,106	08/16/88	4,764,007	06/831,909	08/16/88
4,763,706	07/037,549	08/16/88	4,764,012	06/579,284	08/16/88
4,763,707	07/110,518	08/16/88	4,764,015	06/948,365	08/16/88
4,763,718	06/841,973	08/16/88	4,764,018	07/050,478	08/16/88
4,763,723	07/035,768	08/16/88	4,764,020	06/940,952	08/16/88
4,763,725	07/074,302	08/16/88	4,764,022	06/817,887	08/16/88
4,763,726	06/641,474	08/16/88	4,764,024	07/045,960	08/16/88
4,763,727	06/940,083	08/16/88	4,764,026	06/882,798	08/16/88
4,763,728	07/074,156	08/16/88	4,764,029	07/069,355	08/16/88
4,763,729	07/048,562	08/16/88	4,764,031	07/008,115	08/16/88
4,763,730	07/081,976	08/16/88	4,764,037	07/036,628	08/16/88
4,763,735	07/098,311	08/16/88	4,764,039	06/904,405	08/16/88
4,763,741	07/040,833	08/16/88	4,764,043	07/012,129	08/16/88
4,763,745	06/865,337	08/16/88	4,764,044	06/947,937	08/16/88
4,763,746	06/943,487	08/16/88	4,764,049	06/830,193	08/16/88
4,763,747	07/007,364	08/16/88	4,764,051	07/075,399	08/16/88
4,763,750	07/041,044	08/16/88	4,764,052	07/047,793	08/16/88
4,763,769	06/914,876	08/16/88	4,764,059	06/924,287	08/16/88
4,763,773	06/904,767	08/16/88	4,764,062	06/748,814	08/16/88
4,763,781	06/875,858	08/16/88	4,764,073	07/040,940	08/16/88
4,763,782	06/863,313	08/16/88	4,764,074	07/020,514	08/16/88
4,763,785	07/106,528	08/16/88	4,764,079	06/879,611	08/16/88
4,763,786	07/037,424	08/16/88	4,764,081	06/526,347	08/16/88
4,763,791	07/120,240	08/16/88	4,764,083	06/895,738	08/16/88
4,763,794	06/892,126	08/16/88	4,764,084	07/124,301	08/16/88
4,763,798	06/893,385	08/16/88	4,764,088	07/040,858	08/16/88
4,763,802	07/029,574	08/16/88	4,764,091	07/002,307	08/16/88
4,763,805	07/003,718	08/16/88	4,764,095	06/938,208	08/16/88
4,763,809	07/000,010	08/16/88	4,764,099	07/062,441	08/16/88
4,763,810	06/943,738	08/16/88	4,764,100	06/904,689	08/16/88
4,763,813	06/927,800	08/16/88	4,764,101	07/094,298	08/16/88
4,763,814	07/043,026	08/16/88	4,764,112	07/107,167	08/16/88
4,763,819	06/921,555	08/16/88	4,764,114	06/818,484	08/16/88
4,763,824	07/028,864	08/16/88	4,764,116	07/093,771	08/16/88
4,763,831	07/075,895	08/16/88	4,764,119	07/045,575	08/16/88
4,763,841	07/035,856	08/16/88	4,764,122	07/013,318	08/16/88
4,763,845	07/009,185	08/16/88	4,764,127	07/055,236	08/16/88
4,763,846	06/599,129	08/16/88	4,764,128	06/921,356	08/16/88
4,763,849	07/038,372	08/16/88	4,764,129	06/785,557	08/16/88
4,763,851	06/912,115	08/16/88	4,764,138	06/367,536	08/16/88
4,763,855	07/011,153	08/16/88	4,764,141	07/138,921	08/16/88
4,763,858	06/826,513	08/16/88	4,764,143	06/839,624	08/16/88
4,763,863	07/124,169	08/16/88	4,764,144	06/892,277	08/16/88
4,763,868	06/920,333	08/16/88	4,764,145	06/881,616	08/16/88
4,763,869	06/841,449	08/16/88	4,764,149	07/097,663	08/16/88
4,763,878	07/057,353	08/16/88	4,764,153	07/025,877	08/16/88
4,763,882	06/933,293	08/16/88	4,764,157	07/036,349	08/16/88
4,763,887	06/943,774	08/16/88	4,764,160	07/039,043	08/16/88
4,763,888	07/004,560	08/16/88	4,764,161	06/557,532	08/16/88
4,763,896	07/021,623	08/16/88	4,764,165	07/066,347	08/16/88
4,763,897	06/904,690	08/16/88	4,764,170	07/002,381	08/16/88
4,763,898	07/067,279	08/16/88	4,764,173	06/680,445	08/16/88
4,763,908	06/766,201	08/16/88	4,764,181	06/821,416	08/16/88
4,763,909	07/062,593	08/16/88	4,764,184	07/001,007	08/16/88
4,763,910	06/895,941	08/16/88	4,764,187	07/012,300	08/16/88
4,763,912	06/918,080	08/16/88	4,764,188	07/027,394	08/16/88
4,763,920	07/071,027	08/16/88	4,764,192	06/889,565	08/16/88
4,763,921	07/048,007	08/16/88	4,764,193	07/105,778	08/16/88
4,763,923	07/020,399	08/16/88	4,764,195	07/052,019	08/16/88
4,763,925	06/755,567	08/16/88	4,764,197	07/047,074	08/16/88
4,763,926	06/883,074	08/16/88	4,764,198	07/115,561	08/16/88
4,763,927	06/742,397	08/16/88	4,764,199	06/896,394	08/16/88
4,763,928	07/086,286	08/16/88	4,764,208	07/125,466	08/16/88
4,763,938	06/924,243	08/16/88	4,764,209	07/092,679	08/16/88
4,763,940	07/077,029	08/16/88	4,764,210	07/003,047	08/16/88
4,763,943	06/930,563	08/16/88	4,764,217	07/129,577	08/16/88
4,763,947	07/066,942	08/16/88	4,764,218	06/882,591	08/16/88
4,763,948	06/882,242	08/16/88	4,764,219	06/923,245	08/16/88
4,763,950	06/946,192	08/16/88	4,764,220	06/717,187	08/16/88
4,763,951	06/885,792	08/16/88	4,764,223	06/765,102	08/16/88
4,763,957	06/926,340	08/16/88	4,764,226	06/783,722	08/16/88
			4,764,228	06/935,981	08/16/88

Patent Number	Serial Number	Issue Date	4,764,588	07/023,318	08/16/88
4,764,232	06/912,441	08/16/88	4,764,589	07/054,451	08/16/88
4,764,243	06/917,647	08/16/88	4,764,594	07/031,823	08/16/88
4,764,245	07/019,367	08/16/88	4,764,595	06/946,558	08/16/88
4,764,247	07/027,422	08/16/88	4,764,598	07/025,703	08/16/88
4,764,254	07/052,398	08/16/88	4,764,599	06/913,376	08/16/88
4,764,263	07/050,666	08/16/88	4,764,601	06/788,822	08/16/88
4,764,271	07/014,895	08/16/88	4,764,603	06/764,240	08/16/88
4,764,277	07/033,804	08/16/88	4,764,608	07/072,050	08/16/88
4,764,285	07/000,050	08/16/88	4,764,609	06/845,916	08/16/88
4,764,294	07/066,608	08/16/88	4,764,610	06/911,420	08/16/88
4,764,298	07/123,134	08/16/88	4,764,611	06/693,077	08/16/88
4,764,300	06/865,121	08/16/88	4,764,613	07/088,875	08/16/88
4,764,306	06/899,335	08/16/88	4,764,626	06/722,544	08/16/88
4,764,307	06/871,478	08/16/88	4,764,630	07/127,764	08/16/88
4,764,310	06/911,925	08/16/88	4,764,634	06/900,948	08/16/88
4,764,312	06/915,040	08/16/88	4,764,635	06/896,461	08/16/88
4,764,316	06/903,003	08/16/88	4,764,638	06/896,116	08/16/88
4,764,317	06/578,653	08/16/88	4,764,655	07/091,478	08/16/88
4,764,318	07/023,052	08/16/88	4,764,657	07/023,819	08/16/88
4,764,323	06/929,428	08/16/88	4,764,660	06/790,028	08/16/88
4,764,326	07/064,438	08/16/88	4,764,661	07/018,824	08/16/88
4,764,327	07/003,344	08/16/88	4,764,665	07/020,306	08/16/88
4,764,329	07/066,589	08/16/88	4,764,668	06/934,878	08/16/88
4,764,331	07/042,901	08/16/88	4,764,675	07/111,383	08/16/88
4,764,337	06/906,723	08/16/88	4,764,681	07/058,208	08/16/88
4,764,339	06/942,102	08/16/88	4,764,682	06/917,094	08/16/88
4,764,340	06/925,766	08/16/88	4,764,695	07/015,732	08/16/88
4,764,342	06/706,074	08/16/88	4,764,699	06/945,649	08/16/88
4,764,344	06/781,705	08/16/88	4,764,702	07/021,544	08/16/88
4,764,351	06/675,169	08/16/88	4,764,705	07/065,354	08/16/88
4,764,355	07/042,947	08/16/88	4,764,707	07/071,768	08/16/88
4,764,356	06/685,153	08/16/88	4,764,713	06/943,744	08/16/88
4,764,357	07/047,096	08/16/88	4,764,714	07/138,733	08/16/88
4,764,363	06/874,266	08/16/88	4,764,716	07/027,864	08/16/88
4,764,370	06/650,282	08/16/88	4,764,718	06/855,539	08/16/88
4,764,371	06/797,538	08/16/88	4,764,719	06/901,595	08/16/88
4,764,372	06/714,790	08/16/88	4,764,727	06/918,269	08/16/88
4,764,376	06/621,415	08/16/88	4,764,731	07/094,201	08/16/88
4,764,384	06/847,644	08/16/88	4,764,732	07/110,279	08/16/88
4,764,385	07/013,064	08/16/88	4,764,738	07/031,525	08/16/88
4,764,389	07/105,477	08/16/88	4,764,739	07/096,249	08/16/88
4,764,395	06/925,016	08/16/88	4,764,740	07/083,247	08/16/88
4,764,397	06/814,917	08/16/88	4,764,741	06/768,852	08/16/88
4,764,398	06/847,248	08/16/88	4,764,744	07/134,267	08/16/88
4,764,401	07/007,706	08/16/88	4,764,746	07/052,943	08/16/88
4,764,407	07/048,885	08/16/88	4,764,748	06/917,265	08/16/88
4,764,412	07/119,756	08/16/88	4,764,760	06/943,397	08/16/88
4,764,420	07/148,393	08/16/88	4,764,763	06/808,919	08/16/88
4,764,421	07/061,700	08/16/88	4,764,778	07/042,406	08/16/88
4,764,429	07/103,207	08/16/88	4,764,791	07/084,872	08/16/88
4,764,433	06/897,001	08/16/88	4,764,792	07/089,405	08/16/88
4,764,439	06/627,877	08/16/88	4,764,795	07/042,847	08/16/88
4,764,448	06/847,409	08/16/88	4,764,803	07/026,873	08/16/88
4,764,463	06/924,964	08/16/88	4,764,805	07/057,596	08/16/88
4,764,465	06/913,638	08/16/88	4,764,806	06/923,292	08/16/88
4,764,470	06/826,378	08/16/88	4,764,811	07/046,118	08/16/88
4,764,473	06/926,861	08/16/88	4,764,816	06/907,708	08/16/88
4,764,475	06/936,460	08/16/88	4,764,823	06/899,072	08/16/88
4,764,492	06/872,776	08/16/88	4,764,825	06/940,896	08/16/88
4,764,499	06/639,438	08/16/88	4,764,826	06/850,723	08/16/88
4,764,502	06/912,445	08/16/88	4,764,827	06/809,700	08/16/88
4,764,513	06/907,261	08/16/88	4,764,831	07/070,951	08/16/88
4,764,516	06/806,071	08/16/88	4,764,836	06/763,933	08/16/88
4,764,519	07/045,106	08/16/88	4,764,842	07/000,844	08/16/88
4,764,523	06/905,379	08/16/88	4,764,844	07/022,228	08/16/88
4,764,525	07/018,680	08/16/88	4,764,855	07/047,366	08/16/88
4,764,528	07/026,993	08/16/88	4,764,869	06/900,987	08/16/88
4,764,533	06/626,589	08/16/88	4,764,871	06/768,095	08/16/88
4,764,534	06/631,665	08/16/88	4,764,875	06/822,309	08/16/88
4,764,539	07/125,036	08/16/88	4,764,881	06/827,407	08/16/88
4,764,544	06/766,781	08/16/88	4,764,882	06/601,643	08/16/88
4,764,544	07/055,839	08/16/88	4,764,883	06/868,656	08/16/88
4,764,566	07/046,813	08/16/88	4,764,896	06/750,797	08/16/88
4,764,568	06/885,612	08/16/88	4,764,903	06/594,194	08/16/88
4,764,576	07/089,232	08/16/88	4,764,905	06/940,843	08/16/88
4,764,583	07/024,087	08/16/88	4,764,906	07/099,344	08/16/88
4,764,587	06/799,951	08/16/88	4,764,912	06/915,529	08/16/88
			4,764,916	06/836,399	08/16/88

Patent Number	Serial Number	Issue Date	5,138,999	07/783,007	08/18/92
4,764,917	06/878,155	08/16/88	5,139,008	07/687,558	08/18/92
4,764,925	06/620,736	08/16/88	5,139,013	07/251,319	08/18/92
4,764,927	06/909,336	08/16/88	5,139,015	07/780,007	08/18/92
4,764,932	06/808,862	08/16/88	5,139,016	07/458,991	08/18/92
4,764,952	07/027,534	08/16/88	5,139,017	07/709,697	08/18/92
4,764,961	06/927,927	08/16/88	5,139,034	07/613,013	08/18/92
4,764,969	07/007,092	08/16/88	5,139,036	07/779,072	08/18/92
4,764,977	07/016,657	08/16/88	5,139,038	07/676,291	08/18/92
4,764,978	07/087,674	08/16/88	5,139,040	07/743,177	08/18/92
4,764,979	07/057,746	08/16/88	5,139,048	07/775,006	08/18/92
4,764,983	07/061,553	08/16/88	5,139,055	07/826,275	08/18/92
4,764,984	06/897,443	08/16/88	5,139,059	07/716,111	08/18/92
5,138,715	07/735,862	08/18/92	5,139,061	07/783,340	08/18/92
5,138,716	07/487,795	08/18/92	5,139,064	07/672,031	08/18/92
5,138,726	07/461,927	08/18/92	5,139,070	07/605,933	08/18/92
5,138,728	07/425,014	08/18/92	5,139,079	07/557,829	08/18/92
5,138,731	07/775,116	08/18/92	5,139,081	07/745,546	08/18/92
5,138,736	07/738,836	08/18/92	5,139,088	07/577,984	08/18/92
5,138,738	07/649,916	08/18/92	5,139,094	07/648,956	08/18/92
5,138,739	07/582,086	08/18/92	5,139,102	07/381,211	08/18/92
5,138,745	07/587,682	08/18/92	5,139,116	07/650,011	08/18/92
5,138,748	07/747,149	08/18/92	5,139,118	07/630,980	08/18/92
5,138,750	07/699,045	08/18/92	5,139,119	07/684,138	08/18/92
5,138,753	07/546,929	08/18/92	5,139,128	07/500,029	08/18/92
5,138,754	07/796,876	08/18/92	5,139,129	07/677,522	08/18/92
5,138,756	07/698,217	08/18/92	5,139,130	07/761,937	08/18/92
5,138,768	07/654,486	08/18/92	5,139,132	07/756,676	08/18/92
5,138,772	07/714,834	08/18/92	5,139,142	07/625,953	08/18/92
5,138,776	07/634,081	08/18/92	5,139,148	07/559,090	08/18/92
5,138,781	07/641,765	08/18/92	5,139,155	07/587,215	08/18/92
5,138,790	07/760,581	08/18/92	5,139,160	07/667,281	08/18/92
5,138,792	07/521,250	08/18/92	5,139,170	07/578,749	08/18/92
5,138,794	07/501,638	08/18/92	5,139,172	07/789,950	08/18/92
5,138,796	07/604,187	08/18/92	5,139,173	07/652,656	08/18/92
5,138,798	07/458,732	08/18/92	5,139,175	07/739,523	08/18/92
5,138,800	07/693,613	08/18/92	5,139,177	07/667,869	08/18/92
5,138,802	07/550,074	08/18/92	5,139,180	07/821,916	08/18/92
5,138,804	07/723,239	08/18/92	5,139,182	07/634,708	08/18/92
5,138,811	07/721,401	08/18/92	5,139,185	07/636,218	08/18/92
5,138,828	07/572,228	08/18/92	5,139,186	07/831,489	08/18/92
5,138,830	07/768,110	08/18/92	5,139,189	07/737,315	08/18/92
5,138,841	07/517,712	08/18/92	5,139,194	07/792,960	08/18/92
5,138,845	07/682,242	08/18/92	5,139,198	07/645,564	08/18/92
5,138,847	07/558,805	08/18/92	5,139,205	07/729,362	08/18/92
5,138,853	07/765,023	08/18/92	5,139,206	07/662,771	08/18/92
5,138,860	07/667,627	08/18/92	5,139,214	07/660,941	08/18/92
5,138,862	07/750,208	08/18/92	5,139,216	07/697,629	08/18/92
5,138,874	07/723,982	08/18/92	5,139,219	07/677,293	08/18/92
5,138,881	07/654,946	08/18/92	5,139,231	07/514,975	08/18/92
5,138,883	07/589,533	08/18/92	5,139,233	07/693,447	08/18/92
5,138,884	07/579,554	08/18/92	5,139,238	07/671,984	08/18/92
5,138,886	07/588,736	08/18/92	5,139,239	07/745,248	08/18/92
5,138,887	07/691,447	08/18/92	5,139,258	07/830,370	08/18/92
5,138,891	07/481,961	08/18/92	5,139,259	07/745,143	08/18/92
5,138,892	07/524,049	08/18/92	5,139,262	07/633,042	08/18/92
5,138,893	07/712,576	08/18/92	5,139,263	07/785,017	08/18/92
5,138,897	07/746,004	08/18/92	5,139,264	07/761,670	08/18/92
5,138,900	07/669,398	08/18/92	5,139,266	07/772,567	08/18/92
5,138,901	07/819,075	08/18/92	5,139,267	07/669,029	08/18/92
5,138,904	07/532,528	08/18/92	5,139,268	07/704,172	08/18/92
5,138,911	07/772,742	08/18/92	5,139,269	07/800,123	08/18/92
5,138,917	07/735,545	08/18/92	5,139,272	07/756,513	08/18/92
5,138,921	07/717,666	08/18/92	5,139,273	07/488,224	08/18/92
5,138,929	07/707,953	08/18/92	5,139,278	07/751,515	08/18/92
5,138,938	07/786,209	08/18/92	5,139,281	07/667,788	08/18/92
5,138,939	07/529,812	08/18/92	5,139,283	07/633,374	08/18/92
5,138,941	07/723,195	08/18/92	5,139,289	07/680,653	08/18/92
5,138,945	07/744,276	08/18/92	5,139,295	07/774,327	08/18/92
5,138,947	07/704,371	08/18/92	5,139,298	07/747,606	08/18/92
5,138,962	07/730,976	08/18/92	5,139,299	07/681,472	08/18/92
5,138,963	07/736,429	08/18/92	5,139,301	07/704,881	08/18/92
5,138,964	07/709,114	08/18/92	5,139,306	07/541,014	08/18/92
5,138,965	07/548,495	08/18/92	5,139,316	07/571,168	08/18/92
5,138,969	07/636,113	08/18/92	5,139,324	07/578,193	08/18/92
5,138,977	07/772,576	08/18/92	5,139,325	07/645,896	08/18/92
5,138,978	07/764,533	08/18/92	5,139,326	07/583,191	08/18/92
5,138,998	07/687,908	08/18/92	5,139,331	07/692,945	08/18/92
		08/18/92	5,139,335	07/571,716	08/18/92



Patent Number	Serial Number	Issue Date	5,139,744	07/698,414	08/18/92
5,139,337	07/576,985	08/18/92	5,139,749	07/542,325	08/18/92
5,139,350	07/721,044	08/18/92	5,139,750	07/690,920	08/18/92
5,139,353	07/768,467	08/18/92	5,139,756	07/825,764	08/18/92
5,139,355	07/775,218	08/18/92	5,139,767	07/635,426	08/18/92
5,139,359	07/358,710	08/18/92	5,139,774	07/283,840	08/18/92
5,139,360	07/804,408	08/18/92	5,139,777	07/351,295	08/18/92
5,139,367	07/650,420	08/18/92	5,139,787	07/630,494	08/18/92
5,139,374	07/802,483	08/18/92	5,139,803	07/653,940	08/18/92
5,139,377	07/734,473	08/18/92	5,139,816	07/736,860	08/18/92
5,139,383	07/652,043	08/18/92	5,139,818	07/710,864	08/18/92
5,139,384	07/541,594	08/18/92	5,139,827	07/538,658	08/18/92
5,139,386	07/682,467	08/18/92	5,139,835	07/647,882	08/18/92
5,139,398	07/789,377	08/18/92	5,139,838	07/555,304	08/18/92
5,139,401	07/670,118	08/18/92	5,139,843	07/439,997	08/18/92
5,139,405	07/401,881	08/18/92	5,139,846	07/536,684	08/18/92
5,139,407	07/651,866	08/18/92	5,139,848	07/645,781	08/18/92
5,139,408	07/515,230	08/18/92	5,139,854	07/795,319	08/18/92
5,139,409	07/578,588	08/18/92	5,139,855	07/713,849	08/18/92
5,139,420	07/685,821	08/18/92	5,139,857	07/624,055	08/18/92
5,139,433	07/524,849	08/18/92	5,139,858	07/608,950	08/18/92
5,139,452	07/683,613	08/18/92	5,139,859	07/239,282	08/18/92
5,139,457	07/724,666	08/18/92	5,139,864	07/805,021	08/18/92
5,139,466	07/555,446	08/18/92	5,139,876	07/488,984	08/18/92
5,139,470	07/820,803	08/18/92	5,139,883	07/349,538	08/18/92
5,139,475	07/567,289	08/18/92	5,139,889	07/676,488	08/18/92
5,139,476	07/691,992	08/18/92	5,139,890	07/767,764	08/18/92
5,139,477	07/691,993	08/18/92	5,139,891	07/724,241	08/18/92
5,139,479	07/692,198	08/18/92	5,139,892	07/654,876	08/18/92
5,139,480	07/570,907	08/18/92	5,139,895	07/732,964	08/18/92
5,139,487	07/619,232	08/18/92	5,139,898	07/610,027	08/18/92
5,139,496	07/630,532	08/18/92	5,139,905	07/592,175	08/18/92
5,139,502	07/465,122	08/18/92	5,139,924	07/438,409	08/18/92
5,139,505	07/542,083	08/18/92	5,139,926	07/601,534	08/18/92
5,139,511	07/654,813	08/18/92	5,139,927	07/601,533	08/18/92
5,139,512	07/599,476	08/18/92	5,139,934	07/528,526	08/18/92
5,139,517	07/737,823	08/18/92	5,139,939	07/219,364	08/18/92
5,139,523	07/729,171	08/18/92	5,139,947	07/414,368	08/18/92
5,139,526	07/597,375	08/18/92	5,139,948	07/506,311	08/18/92
5,139,530	07/645,439	08/18/92	5,139,956	07/663,791	08/18/92
5,139,546	07/709,894	08/18/92	5,140,003	07/455,074	08/18/92
5,139,552	07/622,731	08/18/92	5,140,005	07/152,181	08/18/92
5,139,555	06/777,455	08/18/92	5,140,010	07/665,532	08/18/92
5,139,560	07/402,704	08/18/92	5,140,011	07/501,694	08/18/92
5,139,561	07/733,955	08/18/92	5,140,014	07/431,582	08/18/92
5,139,563	07/529,368	08/18/92	5,140,018	07/696,662	08/18/92
5,139,569	07/814,235	08/18/92	5,140,022	07/672,726	08/18/92
5,139,592	07/570,623	08/18/92	5,140,030	07/569,257	08/18/92
5,139,595	07/552,713	08/18/92	5,140,032	07/591,684	08/18/92
5,139,605	07/553,961	08/18/92	5,140,035	07/629,284	08/18/92
5,139,615	07/290,739	08/18/92	5,140,042	07/580,972	08/18/92
5,139,618	07/631,690	08/18/92	5,140,045	07/656,563	08/18/92
5,139,635	07/628,434	08/18/92	5,140,046	07/567,159	08/18/92
5,139,650	07/646,637	08/18/92	5,140,047	07/695,115	08/18/92
5,139,653	07/599,642	08/18/92	5,140,051	07/861,681	08/18/92
5,139,654	07/601,531	08/18/92	5,140,054	07/756,715	08/18/92
5,139,660	07/691,560	08/18/92	5,140,057	07/615,180	08/18/92
5,139,661	07/639,870	08/18/92	5,140,058	07/813,898	08/18/92
5,139,663	07/669,667	08/18/92	5,140,070	07/708,958	08/18/92
5,139,675	07/564,790	08/18/92	5,140,071	07/630,097	08/18/92
5,139,679	07/840,207	08/18/92	5,140,077	07/660,368	08/18/92
5,139,680	07/713,382	08/18/92	5,140,078	07/756,711	08/18/92
5,139,689	07/660,832	08/18/92	5,140,089	07/649,415	08/18/92
5,139,690	07/703,086	08/18/92	5,140,115	07/659,655	08/18/92
5,139,691	07/702,990	08/18/92	5,140,124	07/476,445	08/18/92
5,139,692	07/678,164	08/18/92	5,140,132	07/715,059	08/18/92
5,139,695	07/653,932	08/18/92	5,140,133	07/435,604	08/18/92
5,139,706	07/588,289	08/18/92	5,140,136	07/623,976	08/18/92
5,139,708	07/771,896	08/18/92	5,140,151	07/572,125	08/18/92
5,139,719	07/439,125	08/18/92	5,140,153	07/605,705	08/18/92
5,139,725	07/756,623	08/18/92	5,140,155	07/599,007	08/18/92
5,139,732	07/676,078	08/18/92	5,140,189	07/749,837	08/18/92
5,139,733	07/693,841	08/18/92	5,140,202	07/362,114	08/18/92
5,139,735	07/679,784	08/18/92	5,140,213	07/699,088	08/18/92
5,139,736	07/629,567	08/18/92	5,140,216	07/200,028	08/18/92
5,139,738	07/457,263	08/18/92	5,140,223	07/412,249	08/18/92
5,139,741			5,140,233	07/621,042	08/18/92
			5,140,234	07/621,366	08/18/92
			5,140,241	07/543,959	08/18/92

Patent Number	Serial Number	Issue Date	Requests for Reexaminations Filed
5,140,245	07/587,190	08/18/92	Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).
5,140,249	07/457,807	08/18/92	In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).
5,140,251	07/571,773	08/18/92	4,618,947, Reexam. No. 90/004,381, Sept. 23, 1996, Cl. 365/236, DYNAMIC MEMORY WITH IMPROVED ADDRESS COUNTER FOR SERIAL MODES, Bao G. Iran, et. al., Owner of Record: Texas Instruments, Inc., Dallas, Tex., Attorney or Agent: Robert N. Rountree, Texas Instruments, Inc., Dallas, Tex., Ex. Gp.: 2511, Requester: Owner
5,140,254	07/597,201	08/18/92	5,029,567, Reexam. No. 90/004,382, Sept. 23, 1996, Cl. 123/425, INTERNAL COMBUSTION ENGINE IGNITION SYSTEM AND CLEANING DEVICE, John A. Mc Dougal, deceased, et. al., Owner of Record: The estate of John A. Mc Dougal; Janet A. Mc Dougal, Grosse Pointe Park, Mich., Attorney or Agent: Michael T. Raggio, Dinnin & Dinnin, Troy, Mich., Ex. Gp.: 3402, Requester: Owner
5,140,255	07/692,376	08/18/92	5,095,770, Reexam. No. 90/004,391, Sept. 30, 1996, Cl. 074/551.1, STEERING BEARING ASSEMBLY FOR WHEELED VEHICLE, Homer J. Rader, III, Owner of Record: Inventor, Attorney or Agent: David L. Mc Combs, Haynes & Boone, Dallas, Tex., Ex. Gp.: 3502, Requester: Bruce H. Troxell, Bacon & Thomas, Alexandria, Va.
5,140,258	07/629,613	08/18/92	5,128,755, Reexam. No. 90/004,389, Sept. 27, 1996, Cl. 348/143, WIRELESS REAL TIME VIDEO SYSTEM AND METHOD OF MAKING THE SAME, Philip D. Fancher, Owner of Record: Wireless Technology, Inc., Las Vegas, Nev., Attorney or Agent: Lewis M. Dalgurn, Los Angeles, Calif., Ex. Gp.: 2615, Requester: Owner
5,140,260	07/640,827	08/18/92	5,151,444, Reexam. No. 90/004,384, Sept. 25, 1996, Cl. 514/530, OCULAR HYPOTENSIVE AGENTS, Ryuzo Ueno, et. al., Owner of Record: R-Tech Ueno, Ltd., Osaka-Shi, Japan, Attorney or Agent: Louis Gubinsky, Shugrue Mion Zinn MacPeak & Seas, Washington, D.C., Ex. Gp.: 1205, Requester: Owner
5,140,282	07/681,233	08/18/92	5,172,338, Reexam. No. 90/004,387, Sept. 27, 1996, Cl. 365/185.03, MULTI-STATE EEPROM READ AND WRITE CIRCUITS AND TECHNIQUES, Sanjay Mehrotra, et. al., Owner of Record: Sundisk Corp., Santa Clara, Calif., Attorney or Agent: Majestic, Parsons, Siebert & Hsue, San Francisco, Calif., Ex. Gp.: 2511, Requester: Samsung Electronics Co., Ltd., c/o Howrey & Simon, Washington, D.C.
5,140,287	07/678,988	08/18/92	5,197,731, Reexam. No. 90/004,388, Sept. 27, 1996, Cl. 273/073C, STRING SUSPENSION AND FRAME CONSTRUCTION FOR SPORTS RACKETS, Rodney Svoma, et. al., Owner of Record: Athletic Alternatives, Inc., Phoenix, Ariz., Attorney or Agent: James Speros, Phoenix, Ariz., Ex. Gp.: 3304, Requester: James Speros, Phoenix, Ariz.
5,140,294	07/716,797	08/18/92	5,320,662, Reexam. No. 90/004,385, Sept. 26, 1996, Cl. 075/645, PROCESS FOR CONTINUOUS COPPER SMELTING, Moto Goto, et. al., Owner of Record: Mitsubishi Materials Corp., Tokyo, Japan, Attorney or Agent: Oblon Spivak McClelland Maier & Neustadt, Arlington, Va., Ex. Gp.: 1304, Requester: Ralph A. Dowell, Dowell & Dowell, Arlington, Va.
5,140,303	07/549,852	08/18/92	5,350,766, Reexam. No. 90/004,383, Sept. 23, 1996, Cl. 514/561, METHOD FOR THE PREVENTION AND/OR PALLIATION OF THE COMPLICATIONS OF DIABETES USING N-ALPHA ORIGININE ACETYL, Gerardo Suarez, Owner of Record: New York Medical College, Valhalla, N.Y., Attorney or Agent: James V. Castigan, Hedman, Gibson & Castigan, New York, N.Y., Ex. Gp.: 1205, Requester: Alcon, Inc., c/o David A. Jackson, Klauber & Jackson, Hackensack, N.J.
5,140,304	07/155,169	08/18/92	
5,140,307	07/631,994	08/18/92	
5,140,311	07/641,841	08/18/92	
5,140,318	07/684,639	08/18/92	
5,140,332	07/793,211	08/18/92	
5,140,333	07/749,054	08/18/92	
5,140,335	07/603,345	08/18/92	
5,140,336	07/576,351	08/18/92	
5,140,338	07/740,348	08/18/92	
5,140,352	07/606,741	08/18/92	
5,140,370	07/493,292	08/18/92	
5,140,376	07/323,785	08/18/92	
5,140,388	07/673,703	08/18/92	
5,140,394	07/343,696	08/18/92	
5,140,418	07/670,825	08/18/92	
5,140,420	07/593,456	08/18/92	
5,140,427	07/450,628	08/18/92	
5,140,443	07/557,612	08/18/92	
5,140,448	07/602,505	08/18/92	
5,140,463	07/489,942	08/18/92	
5,140,469	07/816,793	08/18/92	
5,140,472	07/580,149	08/18/92	
5,140,474	07/712,166	08/18/92	
5,140,476	07/440,260	08/18/92	
5,140,493	07/260,834	08/18/92	
5,140,495	07/424,684	08/18/92	
5,140,498	07/687,647	08/18/92	
5,140,519	07/352,392	08/18/92	
5,140,533	07/497,235	08/18/92	
5,140,534	07/555,346	08/18/92	
5,140,538	07/290,529	08/18/92	
5,140,540	07/559,795	08/18/92	
5,140,549	07/716,484	08/18/92	
5,140,564	07/600,583	08/18/92	
5,140,567	07/475,277	08/18/92	
5,140,586	07/616,083	08/18/92	
5,140,624	07/680,869	08/18/92	
5,140,630	07/694,144	08/18/92	
5,140,645	07/106,066	08/18/92	
5,140,654	07/656,491	08/18/92	
5,140,670	07/417,728	08/18/92	
5,140,690	07/759,643	08/18/92	
5,140,692	07/533,829	08/18/92	
5,140,701	07/684,086	08/18/92	
5,140,705	07/537,958	08/18/92	

## Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

5,055,423, Re. S.N. 08/473,812, June 7, 1996, Cl. 437/187, PLANORIZED SELECTIVE TUNGSTEN METALLIZATION SYSTEM, Gregory C. Smith, et. al., Owner of Record: Inventors, Attorney or Agent: Douglas A. Sorensen, Ex. Gp.: 1109

5,376,294, Re. S.N. 08/627,025, April 3, 1996, Cl. 252/78, ELECTRO HEOLOGICAL FLUID, Izuho Okada, et. al., Owner of Record: Nippon Shokubai Co., Ltd., Osaka, Japan, Attorney or Agent: Omri M. Behr, Esq., Ex. Gp.: 1105

5,398,915, Reexam. No. 90/004,386, Sept. 26, 1996, Cl. 266/213, APPARATUS FOR CONTINUOUS COPPER SMELTING, Moto Goto, et. al., Owner of Record: *Mitsubishi Materials, Corp., Tokyo, Japan*, Attorney or Agent: Oblon Spivak McClelland Maier & Neustadt, Arlington, Va., Ex. Gp.: 1308, Requester: Ralph A. Dowell, Dowell & Dowell, Arlington, Va.

5,407,708, Reexam. No. 90/004,373, Sept. 20, 1996, Cl. 427/493, METHOD AND APPARATUS FOR APPLYING RADIATION CURABLE INKS IN A FLEXOGRAPHIC PRINTING SYSTEM, Joseph Lovin, et. al., Owner of Record: *W R Grace & Co.—Conn., Duncan, S.C.*, Attorney or Agent: Thomas C. Lagaly, W R Grace & Co.—Conn., Duncan, S.C., Ex. Gp.: 1112, Requester: Owner

5,455,359, Reexam. No. 90/004,390, Sept. 27, 1996, Cl. 548/341.1, METAL ION BINDING MONOMER AND POLYMER, J. Thomas Ippoliti, et. al., Owner of Record: *Research Corp. Technologies, Inc., Tuscon, Ariz.*, Attorney or Agent: Scully, Scott, Murphy & Presser, Garden City, N.Y., Ex. Gp.: 1201, Requester: Owner

5,467,994, Reexam. No. 90/004,380, Sept. 20, 1996, Cl. 473/354, GOLF BALL, Keiji Moriyama, et. al., Owner of Record: *Sumitomo Rubber Industries Ltd., Hyogo, Japan*, Attorney or Agent: Birch Stewart Kolasch & Birch, Falls Church, Va., Ex. Gp.: 3304, Requester: J. Warren Lytle, Jr., Olney, Md.

#### Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

#### TRADEMARK REGISTRATIONS WHICH EXPIRED JUNE 24, 1996 DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
328,066	71/365,844	09/17/1935
328,081	71/335,922	09/17/1935
328,085	71/345,946	09/17/1935
328,095	71/356,041	09/17/1935
328,111	71/349,700	09/17/1935
328,115	71/365,301	09/17/1935
328,122	71/365,145	09/17/1935
328,166	71/363,931	09/17/1935
328,171	71/363,745	09/17/1935
328,183	71/359,595	09/17/1935
328,212	71/364,440	09/17/1935
612,375	71/643,233	09/20/1955
612,377	71/654,130	09/20/1955
612,386	71/670,118	09/20/1955
612,388	71/670,952	09/20/1955
612,390	71/672,787	09/20/1955
612,392	71/674,222	09/20/1955
612,393	71/674,437	09/20/1955
612,397	71/649,900	09/20/1955
612,398	71/653,395	09/20/1955
612,401	71/659,972	09/20/1955
612,425	71/678,167	09/20/1955
612,444	71/670,618	09/20/1955
612,446	71/674,450	09/20/1955
612,455	71/660,273	09/20/1955
612,456	71/662,689	09/20/1955

612,462	71/643,455	09/20/1955
612,466	71/645,232	09/20/1955
612,471	71/667,316	09/20/1955
612,472	71/674,497	09/20/1955
612,476	71/664,789	09/20/1955
612,478	71/668,998	09/20/1955
612,488	71/675,368	09/20/1955
612,489	71/675,476	09/20/1955
612,494	71/676,810	09/20/1955
612,497	71/673,043	09/20/1955
612,500	71/675,638	09/20/1955
612,502	71/677,583	09/20/1955
612,504	71/678,162	09/20/1955
612,518	71/670,216	09/20/1955
612,521	71/674,612	09/20/1955
612,527	71/644,611	09/20/1955
612,532	71/670,244	09/20/1955
612,541	71/637,956	09/20/1955
612,553	71/682,640	09/20/1955
612,559	71/644,486	09/20/1955
612,564	71/665,540	09/20/1955
612,565	71/665,541	09/20/1955
612,570	71/673,091	09/20/1955
612,573	71/675,227	09/20/1955
612,574	71/675,232	09/20/1955
612,582	71/676,791	09/20/1955
612,583	71/677,405	09/20/1955
612,585	71/677,898	09/20/1955
612,589	71/672,310	09/20/1955
612,600	71/656,314	09/20/1955
612,601	71/657,665	09/20/1955
612,611	71/667,357	09/20/1955
612,617	71/669,755	09/20/1955
612,619	71/670,487	09/20/1955
612,622	71/673,659	09/20/1955
612,624	71/674,335	09/20/1955
612,629	71/675,031	09/20/1955
612,642	71/677,092	09/20/1955
612,657	71/678,769	09/20/1955
612,665	71/654,141	09/20/1955
612,668	71/662,018	09/20/1955
612,671	71/668,389	09/20/1955
612,673	71/669,187	09/20/1955
612,674	71/669,263	09/20/1955
612,678	71/669,571	09/20/1955
612,688	71/676,478	09/20/1955
612,690	71/677,159	09/20/1955
612,695	71/654,613	09/20/1955
612,704	71/673,865	09/20/1955
612,710	71/648,373	09/20/1955
612,713	71/654,241	09/20/1955
612,715	71/656,297	09/20/1955
612,724	71/664,147	09/20/1955
612,728	71/666,772	09/20/1955
612,729	71/667,037	09/20/1955
612,731	71/670,696	09/20/1955
612,733	71/671,745	09/20/1955
612,737	71/672,484	09/20/1955
612,739	71/673,280	09/20/1955
612,744	71/675,055	09/20/1955
612,750	71/673,718	09/20/1955
612,753	71/661,284	09/20/1955
612,771	71/673,925	09/20/1955
612,772	71/676,462	09/20/1955
612,774	71/677,325	09/20/1955
612,778	71/678,527	09/20/1955
612,779	71/678,528	09/20/1955
612,783	71/672,921	09/20/1955
612,784	71/678,584	09/20/1955
612,791	71/674,680	09/20/1955
612,796	71/665,266	09/20/1955
612,797	71/656,581	09/20/1955
612,806	71/605,189	09/20/1955
612,807	71/635,721	09/20/1955
612,811	71/666,602	09/20/1955
612,815	71/654,060	09/20/1955
612,819	71/677,902	09/20/1955
612,820	71/677,683	09/20/1955
612,823	71/634,778	09/20/1955

Reg. Number	Serial Number	Reg. Date	1,020,447	73/021,630	09/16/1975
1,004,355	73/016,207	02/11/1975	1,020,455	73/012,575	09/16/1975
1,010,253	73/039,647	05/13/1975	1,020,457	73/020,086	09/16/1975
1,015,926	73/037,364	07/15/1975	1,020,462	73/024,069	09/16/1975
1,017,550	73/037,365	08/05/1975	1,020,465	73/025,243	09/16/1975
1,020,253	73/012,736	09/16/1975	1,020,471	73/043,061	09/16/1975
1,020,257	73/033,257	09/16/1975	1,020,475	73/025,110	09/16/1975
1,020,258	73/033,839	09/16/1975	1,020,476	73/031,258	09/16/1975
1,020,259	73/034,312	09/16/1975	1,020,480	73/043,325	09/16/1975
1,020,260	73/034,369	09/16/1975	1,020,481	73/043,930	09/16/1975
1,020,261	73/034,680	09/16/1975	1,020,490	73/007,167	09/16/1975
1,020,262	73/035,878	09/16/1975	1,020,492	73/009,639	09/16/1975
1,020,263	73/036,413	09/16/1975	1,020,496	73/014,407	09/16/1975
1,020,265	73/036,415	09/16/1975	1,020,500	73/024,297	09/16/1975
1,020,266	73/036,478	09/16/1975	1,020,501	73/024,491	09/16/1975
1,020,267	73/037,217	09/16/1975	1,020,510	73/030,882	09/16/1975
1,020,273	73/024,560	09/16/1975	1,020,512	73/034,623	09/16/1975
1,020,274	73/025,442	09/16/1975	1,020,514	73/036,883	09/16/1975
1,020,276	73/027,841	09/16/1975	1,020,516	73/032,142	09/16/1975
1,020,279	73/032,552	09/16/1975	1,020,525	73/034,082	09/16/1975
1,020,282	73/035,642	09/16/1975	1,020,532	73/036,617	09/16/1975
1,020,283	73/036,048	09/16/1975	1,020,534	73/008,341	09/16/1975
1,020,291	73/029,341	09/16/1975	1,020,537	73/027,914	09/16/1975
1,020,293	73/032,894	09/16/1975	1,020,540	73/032,738	09/16/1975
1,020,301	73/007,690	09/16/1975	1,020,541	73/044,009	09/16/1975
1,020,302	81/020,302	09/16/1975	1,020,543	73/013,094	09/16/1975
1,020,306	73/008,765	09/16/1975	1,020,546	73/015,552	09/16/1975
1,020,315	73/028,611	09/16/1975	1,020,547	73/022,341	09/16/1975
1,020,316	73/028,612	09/16/1975	1,020,548	81/020,548	09/16/1975
1,020,317	73/028,614	09/16/1975	1,020,553	73/027,377	09/16/1975
1,020,318	73/028,675	09/16/1975	1,020,555	73/027,019	09/16/1975
1,020,319	73/029,628	09/16/1975	1,020,557	73/009,125	09/16/1975
1,020,322	73/030,734	09/16/1975	1,020,560	73/036,044	09/16/1975
1,020,323	73/031,078	09/16/1975	1,020,563	73/010,658	09/16/1975
1,020,325	73/031,694	09/16/1975	1,020,564	73/013,264	09/16/1975
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1,020,344	73/035,632	09/16/1975	1,020,567	73/019,850	09/16/1975
1,020,345	73/035,693	09/16/1975	1,020,568	73/019,998	09/16/1975
1,020,351	73/036,327	09/16/1975	1,020,570	73/020,364	09/16/1975
1,020,352	73/036,364	09/16/1975	1,020,572	73/023,919	09/16/1975
1,020,355	73/012,247	09/16/1975	1,020,577	73/034,285	09/16/1975
1,020,356	73/013,636	09/16/1975	1,020,579	73/034,410	09/16/1975
1,020,357	73/013,995	09/16/1975	1,020,581	73/035,261	09/16/1975
1,020,360	73/016,195	09/16/1975	1,020,587	73/025,424	09/16/1975
1,020,363	73/020,657	09/16/1975	1,020,591	73/015,891	09/16/1975
1,020,364	73/024,087	09/16/1975	1,020,593	73/016,182	09/16/1975
1,020,366	73/024,562	09/16/1975	1,020,594	73/016,923	09/16/1975
1,020,368	73/025,242	09/16/1975	1,020,595	73/016,924	09/16/1975
1,020,369	73/026,945	09/16/1975	1,020,596	73/016,927	09/16/1975
1,020,370	73/027,770	09/16/1975	1,020,597	73/016,931	09/16/1975
1,020,372	73/029,345	09/16/1975	1,020,602	73/025,049	09/16/1975
1,020,374	73/032,259	09/16/1975	1,020,607	73/031,391	09/16/1975
1,020,376	73/034,217	09/16/1975	1,020,615	73/037,375	09/16/1975
1,020,381	73/036,801	09/16/1975	1,020,622	73/041,649	09/16/1975
1,020,382	73/038,268	09/16/1975	1,020,625	73/014,656	09/16/1975
1,020,384	73/040,700	09/16/1975	1,020,626	73/019,861	09/16/1975
1,020,389	73/031,053	09/16/1975	1,020,627	73/024,286	09/16/1975
1,020,390	73/036,340	09/16/1975	1,020,628	73/028,962	09/16/1975
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1,020,699	73/026,665	09/16/1975
1,020,701	73/028,659	09/16/1975
1,020,703	73/030,285	09/16/1975
1,020,705	73/031,828	09/16/1975
1,020,708	73/018,475	09/16/1975
1,020,709	73/025,644	09/16/1975
1,020,713	73/012,710	09/16/1975
1,020,715	73/029,888	09/16/1975
1,020,717	73/005,938	09/16/1975
1,020,723	73/002,922	09/16/1975
1,020,725	73/005,883	09/16/1975
1,020,728	73/008,552	09/16/1975
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1,020,731	73/011,395	09/16/1975
1,020,746	73/031,775	09/16/1975
1,020,747	73/035,437	09/16/1975
1,020,748	73/036,633	09/16/1975
1,020,749	73/037,497	09/16/1975
1,020,751	72/381,812	09/16/1975
1,020,754	72/460,989	09/16/1975
1,020,756	72/328,266	09/16/1975
1,020,759	72/407,016	09/16/1975
1,020,761	72/447,555	09/16/1975
1,020,762	72/458,345	09/16/1975
1,020,764	72/445,795	09/16/1975
1,020,768	72/329,833	09/16/1975
1,020,770	72/417,335	09/16/1975
1,020,772	72/459,333	09/16/1975
1,020,776	72/452,705	09/16/1975
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1,020,784	72/466,812	09/16/1975
1,020,786	72/427,044	09/16/1975
1,020,791	72/454,214	09/16/1975
1,020,793	72/455,969	09/16/1975
1,020,797	72/460,685	09/16/1975
1,020,806	72/465,471	09/16/1975
1,020,811	72/443,794	09/16/1975
1,020,815	72/460,764	09/16/1975
1,020,816	72/466,005	09/16/1975
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## Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Gobi-Primak, Inc., East Brunswick, N.J., Reg. No. 1,653,404, for the mark "NAIL TECHNIQUES", Canc. No. 25,181.

Harold D. Tattershall dba The Harold Martin Group, Carmichael, Calif., Reg. No. 1,080,330, for the mark "POCKET

CADDY", Canc. No. 25,247.

D.W. Porter & Associates, Inc., Bloomfield Hills, Mich., Reg. No. 1,793,509, for the mark "VAULTLINK (STYLIZED)", Canc. No. 25,178.

Turboair, Inc., Costa Mesa, Calif., Reg. No. 1,722,911, for the mark "STEALTH12" [STYLIZED], Canc. No. 25,170.

The Conran Stores Inc., New York, N.Y., Reg. No. 1,116,494, for the mark "CONRAN'S", Canc. No. 25,165.

JEAN BROWN  
Technical Support Manager,  
Trademark Trial  
and Appeal Board, for  
ROBERT M. ANDERSON  
Deputy Assistant Commissioner  
for Trademarks

## Disclaimers

4,848,336 — Kenneth R. Fox, Arlington Va.; A. Arthur Coster, Alexandria, Va. APPARATUS FOR LASER TREATMENT OF BODY LUMENS. Patent dated July 18, 1989. Disclaimer filed March 30, 1993, by the assignee, Pilco Limited Partnership.

The term of this patent shall not extend beyond the expiration date of Patent Number 4,784,132.

5,203,910 — Larry D. Areaux, Nathrop, Colorado; Brian Klenoski, Vicksburg, Michigan. MOLTEN METAL CONVEYING MEANS AND METHOD OF CONVEYING MOLTEN METAL FROM ONE PLACE TO ANOTHER IN A METAL-MELTING FURNACE. Patent dated April 20, 1993. Disclaimer filed June 14, 1996, by the assignee, Premelt Pump, Inc.

Hereby enters this disclaimer to claim 50 of said patent.

Department of Commerce  
Patent and Trademark Office

37 CFR Part 1  
[Docket No: 960828235-6235-01]  
RIN: 0651-AA88

Changes Implementing Nucleotide and/or  
Amino Acid Sequence Listings

Agency: Patent and Trademark Office, Commerce.

Action: Notice of Proposed Rulemaking and Request for Comments.

Summary: The Patent and Trademark Office (PTO) is proposing to amend the rules for submitting nucleic acid or amino acid sequences in computer readable form (CRF) for patent applications to simplify the requirements of the rules, to rearrange portions of the rules for better understanding and to establish consistent rules to permit a single internationally acceptable computer readable form. The Sequence Listing will be presented in an international, language neutral format using numeric identifiers rather than the current subject headings and the paper Sequence Listing will be a separately numbered section of the patent application. Sequences which contain fewer than four (4) specifically identified nucleotides or amino acids will no longer be required to be submitted in computer readable form.

Date: Written comments must be received by December 3, 1996.

Addresses: Address written comments to: Box Comments - Patents, Assistant Commissioner for Patents, Washington, DC 20231, Attention: Esther M. Kepplinger or by Fax to (703) 305-3601 to her attention. Comments may be sent by mail message over the Internet addressed to seqrule@uspto.gov. The written comments will be available for public inspection in Suite 520, Crystal Park One, 2011 Crystal Drive, Arlington, Virginia.

For Further Information Contact: Esther M. Kepplinger, by

telephone at (703) 308-2339 or by mail addressed to: Box Comments - Patents, Assistant Commissioner for Patents, Washington, DC 20231 marked to her attention or by Fax to (703) 305-3601 or by electronic mail at ekepplin@uspto.gov. Supplemental Information: The existing sequence rules (37 CFR 1.821-1.825) provide a standardized format for the description of nucleotide and amino acid sequence data in patent applications and require the submission of such sequences in computer readable form (CRF). The existing sequence rules have provided the following benefits to the PTO: (1) improved search capabilities; (2) improved interference detection; (3) more efficient examination; (4) cost savings for the input of the sequence data; (5) more efficient and accurate printing of sequences in patents; (6) exchange of the sequence data with other patent offices electronically and (7) improved public access to the sequences electronically.

In an effort to streamline and reduce the procedural requirements of the existing rules and to respond to the needs of our customers while establishing an internationally acceptable standard, the PTO proposes to modify the current rules requiring the submission of computer readable forms for nucleotide and amino acid sequences.

To decrease the burden on applicants who file applications containing nucleotide and amino acid sequence information under the Patent Cooperation Treaty (PCT), the PTO entered into discussions at the PCT Meeting of International Authorities (MIA) in November 1994 on changing the applicable rules for submission and transfer of Sequence Listings. Under the current PCT rules, each International Searching Authority and national Office may set the standard for submission of the paper and electronic Sequence Listing information. This may impose a burden on applicants of providing several different formats of Sequence Listings in different languages during the international and national phases of the PCT procedure.

Under the current PCT practice, the applicant serves as the data repository for requests during each stage of the PCT practice for new electronic copies of the Sequence Listings.

Under national practice, a Sequence Listing may be required to be translated into the national language at considerable cost and posing the danger that the data could be inadvertently altered.

At the November 1994 MIA to address these problems, rule changes were proposed to require a language neutral Sequence Listing submission which would suffice for PCT and national stage sequence information processing. Initial Trilateral meetings and correspondence suggest that such a sequence submission would be acceptable under European Patent Office (EPO) and Japanese Patent Office (JPO) procedures, thus further lessening the burden on applicants.

These sequence rules are proposed to be revised in concert with World Intellectual Property Organization (WIPO) International Standards ST.23 and ST.24 for the paper and electronic submission of sequence information in patent applications, as well as PCT requirements. This should result in an applicant having to produce a single Sequence Listing that would satisfy the filing requirements in all countries, as well as permitting an applicant to submit only a single electronic Sequence Listing in PCT applications.

In an effort to profit from the experiences of the nucleotide database information providers which pioneered the electronic submission of sequence information, the PTO discussed with them the possible simplification of the PTO sequence submission rules. In response to their advice (which confirmed the PTO experience), the number of mandatory data elements is proposed to be reduced.

Thus, the proposed rule changes include:

- (1) use of numeric identifiers to replace the language subject headings within the submission;
- (2) elimination of unnecessary and confusing data elements;
- (3) movement of the paper Sequence Listing to the end of the application as a section with separately numbered pages;
- (4) modification of 37 CFR § 1.77 to include the paper Sequence Listing as a part of the specification and to provide a place for the paper Sequence Listing in the printed patent;
- (5) elimination of the requirement to provide a submission for sequences with fewer than four specifically defined nucleotides or amino acids;
- (6) use of lower-case one-letter codes for nucleotide bases;

(7) rearrangement of portions of the rules to improve their context; and

(8) clarification and simplification of the rules to aid in understanding of the requirements that they set forth.

## Request For Comments:

The PTO is particularly interested in receiving comments on three queries. Currently sequences containing D-amino acids need not be provided in the "Sequence Listing", but the PTO has accepted voluntary submissions of sequences containing D-amino acids.

The commercially available sequence searching software used to search prior art databases is not capable of discerning D-amino acids since they do not have distinct designators. It is for this reason that the rules do not require a computer readable form for the disclosure of sequences which contain D-amino acids.

Those seeking to volunteer the information in accordance with these rules might be seeking assurance that a machine search of the closest prior art will be conducted by the PTO or they consider the information useful and wish it to be in the database. If the PTO does not accept voluntary submissions, that would exclude information from the databases that at least some applicants believe to be valuable information.

The potential conflict created by accepting these D-amino acid-containing sequences is that the published database will contain sequences with D-amino acids and those using the published database may be operating on the assumption that it does not, given the indication in § 1.821(a)(2) that D-amino acid-containing sequences are not intended to be included. For this reason, there may be an advantage to having the D-amino acids indicated by Xaa to alert the user that the Feature section must be consulted. A disadvantage of voluntary submissions is that they will result in the generation of a database which is incomplete and cannot be relied upon to provide a complete search of the U.S. patent literature including sequences containing D-amino acids.

The PTO seeks comments on the following query:

(1) Should the PTO accept voluntary submissions of computer readable forms and Sequence Listings where a D-amino acid is contained in the sequence? If such voluntary submissions are accepted, should there be a restriction on the choice of identifying a D-amino acid by an Xaa or by its L-amino acid counterpart abbreviation?

Section 1.821(c) will continue to require that all sequence information contained in a disclosure, including in the specification, drawings or claims, be presented in the Sequence Listing in accordance with §§ 1.821 - 1.825. This provision does not discriminate between prior art sequences and "new" sequences. The PTO has received comments in the past and is seeking additional comments on this issue. The suggestion has been made that sequences which are prior art, and/or are contained in a database at the time of filing, need not be provided to the PTO in computer readable form since the sequence information is obtainable by other means. Responsive to these public comments, the PTO is considering amending the rules to permit omission of some sequences from the Sequence Listing if these sequences are admitted prior art to applicant and are in a publicly available, electronic, sequence database and the database accession number is supplied.

The suggestion to exclude prior art sequences was made when §§ 1.821 - 1.825 were originally adopted. 55 FR 18230, 18237 (1990). The final rules, however, required the submission of all sequence information in computer readable form. The reasons for that decision include: 1) the assessment of whether a particular sequence falls within the requirements of the current rules is simple; 2) the general public is assured that all patents which contain any sequence information contain all of the sequence information in the Sequence Listing and all sequences are available in a computer accessible form; 3) as a publication, the contextual association of new and old information is potentially unique to the patent and very valuable to anyone assessing the state of the art at the time of a patented invention, and thus are desirable to be present in electronic form in association with that patent; and 4) these rules do not require any information to be disclosed in the form of a sequence, but rather require a



particular format whenever information is presented in the form of a sequence. These reasons continue to be relevant.

The PTO is concerned about how such a provision would be drafted without creating difficult questions. A provision which excludes sequences whenever a sequence is prior art and has previously been included in a publicly available, electronic, sequence database appears to be straightforward; however, many technical and legal issues would result. What constitutes a publicly available, electronic, sequence database? Would the USPTO and the other patent offices which have similar rules be required to produce a list of internationally accepted databases? What would be the criteria for such acceptance? An additional issue would exist involving electronic records maintenance: is there any assurance that once information is contained in a database that it will be retained and available indefinitely without alteration? Changes to the information in nucleic acid sequence databases resulting from the discovery of sequencing errors are well-known. Does the mere existence of the sequence information in such a record constitute reasonable means of retrieval? Would not one need some text basis or other identifier to retrieve the information?

Concerns have been voiced that the redundancy of including old sequences in the PTO database creates electronic searching problems, such as increased cost and reduced speed. Upon investigation, it has been found that requiring all disclosed sequences to be included in the Sequence Listing does not cause search processing problems at the PTO or incur increased costs.

The PTO seeks comments on the following query:

(2) Should the provisions of 37 CFR 1.821(c) be altered to exclude some prior art sequences from inclusion in the Sequence Listing even though they are presented in a patent application disclosure as sequences? Should the reference to an accession number of an admitted prior art sequence in a publicly available, electronic, sequence database suffice and exclude that sequence from the requirements of the sequence rules?

At the November 1994 MIA, it was proposed that the Sequence Listings submitted in an international application filed under the PCT would no longer be published on paper. It was suggested that the Sequence Listings be published electronically and be available in the electronic form from several sequence repositories throughout the world. These repositories would have the Sequence Listings available in electronic form at the time of publication of the PCT pamphlet.

The PTO seeks comments on the following query:

(3) Should Sequence Listings filed in an international application filed under the PCT be published only electronically and made available for retrieval electronically by an accession number from several sequence repositories?

Written comments will be available for public inspection and will be available on the Internet (address: www.uspto.gov). Commentators should note that since their comments will be made publicly available, information that is not desired to be made public, such as the address and phone number of the commentator, should not be included in the comments. A public hearing will not be conducted.

#### Discussion of Specific Rules

Section 1.77 is proposed to be amended by revising paragraph (g), which would provide for a reference to a Sequence Listing Annex, if any exists. In the application as filed, on a separate page immediately before the claims, reference would be made to a Sequence Listing Annex and the Sequence Listing would be provided as a separately numbered section or Annex to the application. In a printed patent the Sequence Listing would appear immediately before the claims.

Section 1.77 is proposed to be amended to redesignate existing paragraphs (g) - (j) as paragraphs (h) - (k) and add an additional paragraph (l) Sequence Listing Annex. In the application as filed, the Sequence Listing would be provided by applicants as a separately numbered section or Annex of the application. The pages of the Sequence Listing Annex should be numbered independently from the specification using

sequential integers preceded by "A" to identify them as a part of the Annex and to prevent any confusion which might arise from using numbers already used in the specification. In a printed patent the Sequence Listing would be printed immediately before the claims. In cases where the Sequence Listing is voluminous, the files are difficult to handle. This change would permit easier storage of very large Sequence Listings apart from the main part of the application during pendency. The presentation of the Sequence Listing as a separate Annex would also facilitate compliance with PCT requirements and other national patent office rules.

Sections 1.821(a)(1) and (2) are proposed to be amended by referring to sections in World Intellectual Property Organization (WIPO) Handbook on Industrial Property Information and Documentation, Standard ST.23, paragraphs 8 through 12, April 1994, herein incorporated by reference, rather than to paragraphs in § 1.822. The WIPO Standard ST. 23 (April 1994) is consistent with § 1.822 except for certain corrections which are noted herein and the requirement of the use of the lower case for the one-letter code for nucleotide bases. The proposed rule states that the incorporation has been approved. This language is required by the Federal Register. This incorporation by reference will be reviewed by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51 before any Final Rule is adopted. Copies may be obtained from the World Intellectual Property Organization; 34 chemin des Colombettes; 1211 Geneva 20 Switzerland. Copies may be inspected at the Patent Search Room; Crystal Plaza 3, Lobby Level; 2021 South Clark Place; Arlington, VA 22202; or at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC 20408.

Section 1.821(a) is proposed to be amended so that sequences with fewer than four specifically defined amino acids or nucleotides would be expressly excluded from this rule. "Specifically defined" means those amino acids other than "Xaa" and those nucleotide bases other than "N" defined in accordance with WIPO Standard ST.23.

This change is being proposed to reduce the burden on applicants for those sequences that contain only a minimal amount of sequence information. For example, if an amino acid sequence is disclosed as being entirely "Xaa" residues, the 1990 version of the sequence rules would require this sequence to be submitted in computer readable form. However, this sequence has no value as sequence information because each of the positions is represented as a "wild card." Such low-information sequences are not very useful in any sequence matching and alignment algorithm. In order to minimize the inclusion of such low-information-value sequence data in the database and to relieve the burden on applicants to submit low-information-value sequences, the Office proposes this change to the sequence rules. If applicants should wish to voluntarily submit a CRF for such sequences, they would be accepted and entered in the PTO's database.

It is not necessary that any of the non-N or non-Xaa residues be adjacent to any other non-N or non-Xaa residue in order for a sequence to be subject to § 1.821(a).

Sections 1.821(a)(2) and 1.822(b) are proposed to be amended by changing "elsewhere in the 'Sequence Listing'" to "in the Feature section." The purpose of this change is to enhance clarity of the rule. The only place in the "Sequence Listing" where additional information is permitted is in the Feature section. The current language implies that there are other acceptable portions of the "Sequence Listing" appropriate for additional information and thus is ambiguous and misleading.

Section 1.821(a)(2) will continue to indicate that sequences containing D-amino acids need not comply with the provisions of §§ 1.822 - 1.825. To date, the PTO has accepted voluntary submissions of sequences which contain D-amino acids. The sequence information has either indicated an Xaa at each occurrence of a D-amino acid or has indicated the amino acid (or imino acid) by abbreviation as if it were an L-amino acid (or imino acid) and explained the existence of the D-amino acid in the Feature section associated with that sequence.

Section 1.821(c) is proposed to be amended by clarifying and establishing a language neutral format sequence listing. Specifically, the use of integer identifiers is proposed for identifying sequences. Where a sequence integer identifier is inten-

tionally omitted, it must be noted by applicant to avoid confusion in the published document.

Section 1.821(d) is proposed to be amended by changing "assigned identifier" to "integer identifier" to be consistent with the term used in § 1.821(c).

Section 1.821(d) is proposed to be amended by adding the phrase, "preceded by 'SEQ ID NO:'". This change is necessitated by the change to § 1.821(c). Since the integer identifier in the "Sequence Listing" would be defined now as a numeral only, it is necessary that any reference to a particular sequence in the specification and claims be preceded by "SEQ ID NO:". It is not acceptable to use only a numeric identifier, such as "4200" or "4400" - see infra Sequence Listing table, in the description or the claims because one reading a patent may not reasonably be presumed to be familiar with the meanings of numeric identifiers.

Section 1.821(e) is proposed to be amended by setting forth the procedure for transferring an accepted computer readable Sequence Listing from one application to a subsequently filed application. The existing rules did not adequately describe the process of transferring a computer readable Sequence Listing into a new application if an identical CRF was previously accepted by the PTO for another application. A further description of the intended procedures has been added for purposes of clarity. This section is intended to describe that if a computer readable Sequence Listing is identical to one that is error-free and already on file at the PTO, an applicant has two options. A new diskette may be submitted, or an applicant may submit a statement clearly directing the PTO to use the previously submitted CRF since they are identical, and that the paper copy of the Sequence Listing in the new application is identical to the disk in the previous application.

Section 1.821(g) is proposed to be amended by correcting the reference to 35 U.S.C. 111(a) applications. Section 1.821(h) is proposed to be amended by clarifying that this rule applies to all international applications searched and examined by the PTO. In addition to international applications filed in the United States Receiving Office, the United States is a competent International Searching Authority (ISA) for applications filed in receiving Offices of, or acting for, Brazil, Israel, Mexico, and Trinidad and Tobago. The United States is also a competent ISA for applications filed in the International Bureau where at least one of the applicants is a resident or national of the United States or a resident or national of Barbados. In addition, the United States acts as an International Preliminary Examining Authority for certain applications searched in the EPO. The language change regarding the time limit for compliance and statement accompanying the submission are necessary to conform with the language found in PCT Rule 13<sup>W</sup>.1.

Section 1.822 is proposed to be revised for clarity and better organization and to accommodate an international request for the use of lower case one-letter codes for nucleotide bases.

Section 1.822 (b) is proposed to be amended to refer to WIPO Standard ST.23 (April 1994) and incorporate the information therein. The reorganization groups all nucleotide and all amino acid formats together.

Section 1.822 (c)(1) is proposed to be amended by requiring the use of lower case one-letter code for the nucleotide bases. This change would put the PTO requirements in conformance with most large databases. Additionally, the use of lower case letters in a sequence makes the confusion of "g" for "c" and vice versa less likely.

Current paragraph (d) is proposed to be redesignated as a part of paragraph (c)(3) and current paragraph (e) is proposed to be deleted with the substance of the paragraph being incorporated into (d)(1). Current paragraph (f) is proposed to be redesignated as paragraph (c)(2); current paragraph (g) is proposed to be redesignated as paragraph (c)(3) and amended to incorporate current paragraph (d). Current paragraph (h) is proposed to be redesignated as paragraph (d)(2). Current paragraphs (i) and (j) are proposed to be redesignated as (c)(4) and (c)(5). Current paragraph (k) is proposed to be redesignated as (d)(3). Current paragraph (l) is proposed to be redesignated as (c)(6) and current paragraph (m) is proposed to be redesignated as (d)(4). Current paragraph (n) is proposed to be redesignated as (c)(7) and amended to delete a sentence, the substance of which is incorporated into (d)(4).

Paragraph (d)(1) is proposed to be added to include a reference to WIPO Standard ST.23 (April 1994). Paragraphs (d)(2-

4) incorporate the material from current paragraphs (h), (k), (m) and a sentence of (n). Paragraph (d)(5) is proposed to be added to clarify that the use of terminator symbols is not acceptable in amino acid sequences either as "internal" terminator symbols or following the carboxy terminal amino acid of a peptide or polypeptide.

Current paragraph (o) is proposed to be redesignated as paragraph (e) and amended to recite integer identifier to be consistent with § 1.821 (c) and to permit the language neutral submission.

Current paragraph (p) is proposed to be deleted.

The lists of nucleic acid and amino acid abbreviations and the lists of modified base controlled vocabulary and the modified and unusual amino acids would be replaced by reference to WIPO Standard ST.23 RECOMMENDATION FOR THE PRESENTATION OF NUCLEOTIDE AND AMINO ACID SEQUENCE LISTINGS IN PATENT APPLICATIONS AND IN PUBLISHED PATENT DOCUMENTS (April 1994) to simplify and shorten the rules. This information will also appear in an appropriate section of the Manual of Patent Examining Procedure to assist applicants in preparing Sequence Listings. For purposes of facilitating review of these proposed rule changes, appropriate corrected excerpts of paragraphs 8, 9, 11 and 12 of WIPO Standard ST.23 are provided below.

WIPO Standard ST.23, paragraph 8, provides that the bases of a nucleotide sequence should be represented using the following one-letter code for nucleotide sequence characters.

Symbol	Meaning	Origin of designation
A	A	Adenine
G	G	Guanine
C	C	Cytosine
T	T	Thymine
U	U	Uracil
R	G or A	puRine
Y	T/U or C	pyRimidine
M	A or C	aMino
K	G or T/U	Keto
S	G or C	Strong interactions
W	A or T/U	3H-bonds
B	G or C or T/U	Weak interactions
D	A or G or T/U	2H-bonds
H	A or C or T/U	not A
V	A or G or C	not C
N	(A or G or C or T/U) or (unknown or other)	not G
		not T, not U
		aNy

WIPO Standard ST.23, paragraph 9, provides: Modified bases may be represented as the corresponding unmodified bases in the sequence itself if the modified base is one of those listed below and the modification is further described elsewhere in the Sequence Listing. The codes from the list below may be used in the description or the Sequence Listing but not in the sequence itself.

Symbol	Meaning
ac4c	4-acetylcytidine
chm5u	5-(carboxyhydroxymethyl)uridine
cm	2'-O-methylcytidine
cmnm5s2u	5-carboxymethylaminomethyl-2-thiouridine
cmnm5u	5-carboxymethylaminomethyluridine
d	dihydrouridine
fm	2'-O-methylpseudouridine
gal q	*beta, D-galactosylguanosine
gm	2'-O-methylguanosine
i	inosine
i6a	N6-isopentenyladenosine
m1a	1-methyladenosine
m1f	1-methylpseudouridine
m1g	1-methylguanosine
m1i	1-methylinosine



Symbol	Meaning
m22g	2,2-dimethylguanosine
m2a	2-methyladenosine
m2g	2-methylguanosine
m3c	3-methylcytidine
m5c	5-methylcytidine
m6a	N6-methyladenosine
m7g	7-methylguanosine
mam5u	5-methylaminomethyluridine
mam5s2u	5-methoxycarbonylmethyl-2-thiouridine
man q	*beta, D-mannosylqueosine
mcm5s2u	5-methoxycarbonylmethyl-2-thiouridine
mcm5u	5-methoxycarbonylmethyluridine
mo5n	5-methoxyuridine
ms2i6a	2-methylthio-N6-isopentenyladenosine
ms2t6a	N-((9-beta-D-ribofuranosyl-2-methylthiopurine-6-yl) carbamoyl) threonine
mt6a	N-((9-beta-D-ribofuranosylpurine-6-yl)N-methylcarbamoyl) threonine
mv	uridine-5-oxyacetic acid-methylester
o5u	uridine-5-oxyacetic acid (v)
osyw	wybutosine
p	pseudouridine
q	*queosine
s2c	2-thiocytidine
s2t	2-methyl-2-thiouridine
s2u	2-thiouridine
s4u	4-thiouridine
t	5-methyluridine
t6a	N-((9-beta-D-ribofuranosylpurine-6-yl)-carbamoyl)threonine
tm	2'-O-methyl-5-methyluridine
um	2'-O-methyluridine
yw	wybutosine
x	3-(3-amino-3-carboxy-propyl)uridine, (acp3)u

\* Indicates a correction of minor typographical errors.

WIPO Standard ST.23, paragraph 11, provides that the amino acids should be represented using the following three-letter code with the first letter as a capital.

Symbol	Meaning
Ala	Alanine
Cys	Cysteine
Asp	Aspartic Acid
Glu	Glutamic Acid
Phe	Phenylalanine
Gly	Glycine
His	Histidine
Ile	Isoleucine
Lys	Lysine
Leu	Leucine
Met	Methionine
Asn	Asparagine
Pro	Proline
Gln	Glutamine
Arg	Arginine
Ser	Serine
Thr	Threonine
Val	Valine
Trp	Tryptophan
Tyr	Tyrosine
Asx	Asp or Asn
Glx	Glu or Gln
Xaa	unknown or other

WIPO Standard ST.23, paragraph 12, provides: Modified and unusual amino acids may be represented as the corresponding unmodified amino acids in the sequence itself if the modified amino acid is one of those listed below and the modification is further described elsewhere in the Sequence Listing. The codes from the list below may be used in the description or the Sequence Listing but not in the sequence itself.

Symbol	Meaning
Aad	2-Aminoadipic acid
bAad	3-aminoadipic acid
bAla	beta-Alanine, beta-Aminopropionic acid
Abu	2-Aminobutyric acid
4Abu	4-Aminobutyric acid, piperidinic acid
Acp	6-Aminocaproic acid
Ahe	2-Aminoheptanoic acid
Aib	2-Aminoisobutyric acid
bAib	3-Aminoisobutyric acid
Apm	2-Aminopimelic acid
Dbu	*2,4-Diaminobutyric acid
Des	Desmosine
Dpm	2,2'-Diaminopimelic acid
Dpr	2,3-Diaminopropionic acid
EtGly	N-Ethylglycine
EtAsn	N-Ethylasparagine
Hyl	Hydroxylysine
aHyl	allo-Hydroxylysine
3Hyp	3-Hydroxyproline
4Hyp	4-Hydroxyproline
Ide	Isodesmosine
*alle	allo-Isoleucine
MeGly	N-Methylglycine, sarcosine
*Melle	N-Methylisoleucine
MeLys	6-N-Methyllysine
MeVal	N-Methylvaline
Nva	Norvaline
Nle	Norleucine
Orn	Ornithine

\* Indicates a correction of a minor typographical error.

Section 1.823(a) is proposed to be amended to provide for a reference to a Sequence Listing Annex in the application immediately before the claims and to provide the paper Sequence Listing as an Annex, which is a separately numbered section of the application. This is an internationally desired change and also would facilitate easier storage of very large Sequence Listings separate from the main part of the file during pendency of the application.

Section 1.823(b) is proposed to be amended to insert a table to depict items of information (data elements) which are to be included in the Sequence Listing and to indicate whether they are mandatory or optional. The proposed revisions reflect the change to a language neutral submission. The English language data elements headings would be replaced by numeric identifiers. The numeric identifiers are similar to INID codes ("Internationally agreed Numbers for the Identification of Data" as per WIPO Standard ST.9, December 1990) already utilized internationally in patent documents. This change would facilitate a single international standard which would eliminate the need for translations into non-English languages. Large portions of Section 1.823(b) are proposed to be deleted to lessen the burden on applicants and to eliminate collections of material which is of limited use to the Office. The following items are typical of material which would be deleted:

- (1)(vi)(C) CLASSIFICATION;
- (2)(i)(C) STRANDEDNESS;
- (2)(ii) MOLECULE TYPE through (2)(vii)(C) UNITS; and
- (2)(ix)(C) IDENTIFICATION METHOD.

In order to clarify the rule, the proposed change would identify specifically those items which can be enumerated once in a Sequence Listing.

It is proposed that the recommended designation be eliminated, leaving only mandatory and optional elements. Accordingly, it is proposed to change element <140> Correspondence Address and elements <150> through <154> from mandatory to optional. Elements <100> General Information, <200> Information for SEQ ID NO, and <400> Sequence Description: SEQ ID NO have been clarified as mandatory. In element <193>, it is proposed to change TELEX to Electronic mail address to be current with technology.

It is proposed to eliminate Strandedness because the information is of limited use to the Office. It is proposed to limit the response for Topology to linear or circular because any other

response does not permit an adequate search. Because it is essential to the search to know whether the sequence is circular, providing one of these two responses to this data element is mandatory in the Sequence Listing. Consistent with the international desire for eliminating language in the Sequence Listing, Topology would be identified as L (linear) or C (circular), and sequence Type would be N (nucleotide) or A (amino acid).

It is proposed to change Feature from a recommended to a mandatory element if the sequence contains "N", "Xaa", a modified or unusual L-amino acid or a modified base. This change would highlight the presence of an unusual residue in the sequence which is important to anyone using Sequence Listing information.

Section 1.824 is proposed to be amended by revising the current paragraphs (a) through (h) into paragraphs (a) through (c).

Specifically, the following changes are proposed for § 1.824:

Current § 1.824, paragraph (a), is proposed to be redesignated as paragraph (a)(1). In addition, the term "series of diskettes" would be added to indicate the acceptability of receiving numerous disks for large submissions. Current paragraph (b) is proposed to be redesignated as paragraph (a)(2). Current paragraph (c) is proposed to be redesignated as paragraph (a)(3). Current paragraph (d) is proposed to be deleted because it is incorporated into paragraph (a)(1). Current paragraph (e) is proposed to be deleted since the PTO has not found it to be necessary and feels it should not be a requirement placed on the applicant, although the applicant may optionally continue the practice of using write-protection if desired. In proposed paragraph (a)(4), a "compressed file" format would be introduced as an acceptable means to submit a large sequence listing, and in proposed paragraph (a)(5), directions on suppressing page numbering on the computer readable form version would be added for clarity.

The text of current paragraph (f) is proposed to be deleted, but the list of computer readable files is proposed to be redesignated as paragraphs under new (b) and (c). In proposed paragraph (b), the explanation for "pagination" is proposed to be revised to reflect the correct format required. Proposed paragraph (b)(1) is proposed to be revised by deleting diskettes from PS/2 operating system as an accepted format. In proposed paragraph (c), the diskette requirements are proposed to be rearranged so that the most common diskette size used for submissions is at the top of the list. Also in proposed paragraph (c)(2), "format" is proposed to be amended to accommodate the current PTO equipment, and in proposed new paragraphs (c)(3), (4), and (5), additional items would be added to the list of acceptable media types due to the changes in available equipment at the PTO.

Current paragraph (g) is proposed to be redesignated as paragraph (d).

Current paragraph (h) is proposed to be deleted because the text is proposed to be incorporated into paragraph (a)(6). The label requirements would be rewritten more concisely than with the previous rules. In addition, fewer items would be required to be placed on the label under this proposed paragraph because the other items are no longer deemed necessary by the PTO.

Current Appendix A is proposed to be rewritten to reflect the correct format of a Sequence Listing. The proposed Appendix A is presented to provide a sample listing in the correct format as described in the Table of amended § 1.823(b). This sample includes the use of numeric identifiers which reflect the change to a language neutral submission. Current Appendix B is proposed to be deleted as the information it presents is no longer valid under changes in this proposed rule.

#### Review Under the Paperwork Reduction Act of 1995

This proposed rule change contains information collection requirements which are subject to review by the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995, 44 U.S.C. 3501, *et seq.* The title, description and respondent description of the information collection is shown below with an estimate of the annual reporting burdens. Included in the estimate is the time for reviewing instructions, gathering and maintaining the data needed, and completing and reviewing the collection of information.

With respect to the following collection of information, the PTO invites comments on: (1) whether the proposed collection of information is necessary for the proper performance of the PTO's functions, including whether the information will have practical utility; (2) the accuracy of the PTO's estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions used; (3) ways to enhance the quality, utility, and clarity of the information to be collected; and (4) ways to minimize the burden of the collection of information on respondents, including through the use of automated collection techniques, when appropriate, and other forms of information technology.

Notwithstanding any other provision of law, no person is required to respond to nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB control number.

OMB Number: 0651-0024

Title: Requirements for Patent Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosures

Form Numbers: None

Type of Review: Revision of currently approved collection

Affected Public: Individuals or households, business or other for-profit institutions, not-for-profit institutions, and Federal Government

Estimated Number of Respondents: 4,600

Estimated Time Per Response: 80 minutes

Estimated Total Annual Burden Hours: 6,133

Needs and Uses: The PTO requires biotechnology patent

applicants to submit sequence information to enable the PTO to properly examine and process their applications.

As required by the Paperwork Reduction Act of 1995, 44 U.S.C. 3507(d), the PTO has submitted a copy of this proposed rulemaking to OMB for its review of this information collection. Interested persons are requested to send comments regarding these information collections, including suggestions for reducing this burden, to the Office of Information and Regulatory Affairs of OMB, New Executive Office Bldg., 725 17th Street, N.W., Room 10235, Washington, D.C. 20503, Attn: Desk Officer for the Patent and Trademark Office.

OMB is required to make a decision concerning the collection of information in these proposed regulations between 30 and 60 days after the publication of this document in the Federal Register. Therefore, a comment to OMB is best assured of having its full effect if OMB receives it within 30 days of publication. This does not affect the deadline for the public to comment to the PTO on the proposed regulations.

#### Other Considerations

This proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Order 12612, and the Paperwork Reduction Act of 1995, 44 U.S.C. 3501 *et seq.* It has been determined that this proposed rule is not significant for the purposes of Executive Order 12866.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that this proposed rule change would not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*). The principal effect of this rule change is to simplify and clarify the rules governing the submission of Sequence Listings for patent applications containing nucleic acid and/or amino acid sequences.

The PTO has also determined that this proposed rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

#### List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Reporting and record-keeping requirements, Small businesses.



For the reasons set forth in the preamble and under the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, the PTO proposes to amend 37 CFR Part 1 as set forth below. Removals are indicated by brackets ([]) and additions indicated by arrows (▶◀).

#### Part 1 - Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. Section 1.77 is proposed to be amended by redesignating current paragraphs (g) through (j) as paragraphs (h) through (k) and by adding new paragraphs (g) and (l) to read as follows:

#### § 1.77 Arrangement of application elements.

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- ▶(g) Reference to Sequence Listing Annex.▶
- [(g)]▶(h)▶ Claim or claims.
- [(h)]▶(i)▶ Abstract of the disclosure.
- [(i)]▶(j)▶ Signed oath or declaration.
- [(j)]▶(k)▶ Drawings.
- ▶(l) Sequence Listing Annex.▶

3. Section 1.821 is proposed to be amended by revising paragraphs (a) and (c)-(h) to read as follows:

#### § 1.821 Nucleotide and/or amino acid sequence disclosures in patent applications.

(a) Nucleotide and/or amino acid sequences as used in §§ 1.821 through 1.825 are interpreted to mean an unbranched sequence of four or more amino acids or an unbranched sequence of ten or more nucleotides. Branched sequences are specifically excluded from this definition. ▶Sequences with fewer than four specifically defined nucleotides or amino acids are specifically excluded from this rule. "Specifically defined" means those amino acids other than "Xaa" and those nucleotide bases other than "N" defined in accordance with the World Intellectual Property Organization (WIPO) Handbook on Industrial Property Information and Documentation, Standard ST.23: Recommendation for the Presentation of Nucleotide and Amino Acid Sequence Listings in Patent Applications and in Published Patent Documents, paragraphs 8 through 12, April 1994, herein incorporated by reference. (Hereinafter "WIPO Standard ST.23 (April, 1994)"). This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of ST.23 may be obtained from the World Intellectual Property Organization; 34 chemin des Colombettes; 1211 Geneva 20 Switzerland. Copies of ST.23 may be inspected at the Patent Search Room; Crystal Plaza 3, Lobby Level; 2021 South Clark Place; Arlington, VA 22202; or at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, D.C. ▶Nucleotides and amino acids are further defined as follows:

(1) Nucleotides are intended to embrace only those nucleotides that can be represented using the symbols set forth in [§ 1.822(b)(1)] ▶WIPO Standard ST.23 (April 1994), paragraph 8▶. Modifications, e.g., methylated bases, may be described as set forth in [§ 1.822(b)] ▶WIPO Standard ST.23 (April 1994), paragraph 9▶, but shall not be shown explicitly in the nucleotide sequence.

(2) Amino acids are those L-amino acids commonly found in naturally occurring proteins and are listed in [§ 1.822(b)(2)] ▶WIPO Standard ST.23 (April 1994), paragraph 11▶. Those amino acid sequences containing D-amino acids are not intended to be embraced by this definition. Any amino acid sequence that contains post-translationally modified amino acids may be described as the amino acid sequence that is initially translated using the symbols shown in [§ 1.822(b)(2)] ▶WIPO Standard ST.23 (April 1994), paragraph 11▶ with the modified positions; e.g., hydroxylations or glycosylations, being described as set forth in [§ 1.822(b)] ▶WIPO Standard ST.23 (April 1994), paragraph 12▶, but these modifications shall not be shown explicitly in the amino acid sequence. Any

peptide or protein that can be expressed as a sequence using the symbols in [§ 1.822(b)(2)] ▶WIPO Standard ST.23 (April 1994), paragraph 11▶ in conjunction with a description [elsewhere in the "Sequence Listing"] ▶in the Feature section▶ to describe, for example, modified linkages, cross links and end caps, non-peptidyl bonds, etc., is embraced by this definition.

(b) ▶▶▶

(c) Patent applications which contain disclosures of nucleotide and/or amino acid sequences must contain, as a separate part of the disclosure on paper copy, hereinafter referred to as the "Sequence Listing," a disclosure of the nucleotide and/or amino acid sequences and associated information using the symbols and format in accordance with the requirements of §§ 1.822 and 1.823. Each sequence disclosed must appear separately in the "Sequence Listing." Each sequence set forth in the "Sequence Listing" shall be assigned a separate ▶integer▶ identifier [written as SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, etc.]. ▶The integer identifiers shall begin with 1 and increase sequentially by integers. If no sequence is present for an integer identifier, the words "This sequence omitted" shall appear following the integer identifier.▶

(d) Where the description or claims of a patent application discuss a sequence listing that is set forth in the "Sequence Listing" in accordance with paragraph (c) of this section, reference must be made to the sequence by use of the [assigned] ▶integer▶ identifier, ▶preceded by "SEQ ID NO:"▶ in the text of the description or claims, even if the sequence is also embedded in the text of the description or claims of the patent application.

(e) A copy of the "Sequence Listing" referred to in paragraph (c) of this section must also be submitted in computer readable form in accordance with the requirements of § 1.824. The computer readable form is a copy of the "Sequence Listing" and will not necessarily be retained as a part of the patent application file. If the computer readable form of a new application is to be identical with the computer readable form of another application of the applicant on file in the Office, reference may be made to the other application and computer readable form in lieu of filing a duplicate computer readable form in the new application ▶if the computer readable form in the other application was compliant with all of the requirements of these rules▶. The new application shall be accompanied by a letter making such reference to the other application and computer readable form, both of which shall be completely identified. ▶In the new application, applicant must also request the use of the compliant computer readable "Sequence Listing" that is already on file for the other application and must state that the paper copy of the "Sequence Listing" in the new application is identical to the computer readable copy filed for the other application.▶

(f) In addition to the paper copy required by paragraph (c) of this section and the computer readable form required by paragraph (e) of this section, a statement that the content of the paper and computer readable copies are the same must be submitted with the computer readable form. Such a statement must be a verified statement if made by a person not registered to practice before the Office.

(g) If any of the requirements of paragraphs (b) through (f) of this section are not satisfied at the time of filing under 35 U.S.C. 111 ▶(a)▶ or at the time of entering the national stage under 35 U.S.C. 371, applicant has one month from the date of a notice which will be sent requiring compliance with the requirements in order to prevent abandonment of the application. Any submission in response to a requirement under this paragraph must be accompanied by a statement that the submission includes no new matter. Such a statement must be a verified statement if made by a person not registered to practice before the Office.

(h) If any of the requirements of paragraphs (b) through (f) of this section are not satisfied at the time of filing [in the United States Receiving Office,] an international application under the Patent Cooperation Treaty (PCT) [applicant has one month from the date of a notice which] ▶, which application is to be searched by the United States International Searching Authority or examined by the United States International Preliminary Examining Authority, applicant▶ will be sent ▶a notice▶ requiring compliance with the requirements [or such other time as may be set by the Commissioner, in which to comply] ▶within a prescribed time period▶. Any submission

in response to a requirement under this paragraph must be accompanied by a statement that the submission does not include [new] matter [or go] ▶which goes▶ beyond the disclosure in the international application as filed. Such a statement must be a verified statement if made by a person not registered to practice before the Office. If applicant fails to timely provide the required computer readable form, the United States International Searching Authority shall search only to the extent that a meaningful search can be performed ▶and the United States International Preliminary Examining Authority shall examine only to the extent that a meaningful examination can be performed▶.

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4. Section 1.822 is proposed to be revised to read as follows:

#### § 1.822 Symbols and format to be used for nucleotide and/or amino acid sequence data.

(a) The symbols and format to be used for nucleotide and/or amino acid sequence data shall conform to the requirements of paragraphs (b) through [(p)] ▶(e)▶ of this section.

(b) The code for representing the nucleotide and/or amino acid sequence characters shall conform to the code set forth in the tables in [paragraphs (b)(1) and (b)(2) of this section] ▶WIPO Standard ST.23 (April 1994), paragraphs 8 and 11. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of ST.23 may be obtained from the World Intellectual Property Organization; 34 chemin des Colombettes; 1211 Geneva 20 Switzerland. Copies of ST.23 may be inspected at the Patent Search Room; Crystal Plaza 3, Lobby Level; 2021 South Clark Place; Arlington, VA 22202; or at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC ▶. No code other than that specified in [this section] ▶these sections▶ shall be used in nucleotide and amino acid sequences. A modified base or ▶modified or unusual▶ amino acid may be presented in a given sequence as the corresponding unmodified base or amino acid if the modified base or ▶modified or unusual▶ amino acid is one of those listed in [paragraphs (p)(1) or (p)(2) of this section] ▶WIPO Standard ST.23 (April 1994), paragraphs 9 and 12▶ and the modification is also set forth [elsewhere in the Sequence Listing (for example, FEATURES § 1.823(b)(2)(ix))] ▶in the Feature section▶. Otherwise, all bases or amino acids not appearing in paragraphs [(b)(1) or (b)(2) of this section] ▶8 and 11 of the WIPO Standard ST.23 (April 1994)▶ shall be listed in a given sequence as "N" or "Xaa," respectively, with further information, as appropriate, given [elsewhere in the Sequence Listing] ▶in the Feature section▶.

#### (1) Base codes:

Symbol	Meaning
A	A; adenine
C	C; cytosine
G	G; guanine
T	T; thymine
U	U; uracil
M	A or C
R	A or G
W	A or T/U
S	C or G
Y	C or T/U
K	G or T/U
V	A or C or G; not T/U
H	A or C or T/U; not G
D	A or G or T/U; not C
B	C or G or T/U; not A
N	(A or C or G or T/U) or (unknown or other)

#### (2) Amino acid three-letter abbreviations:

Abbreviation	Amino acid name
Ala	Alanine
Arg	Arginine
Asn	Asparagine
Asp	Aspartic Acid
Asx	Aspartic Acid or Asparagine
Cys	Cysteine
Glu	Glutamic Acid
Gln	Glutamine
Glx	Glutamine or Glutamic Acid
Gly	Glycine
His	Histidine
Ile	Isoleucine
Leu	Leucine
Lys	Lysine
Met	Methionine
Phe	Phenylalanine
Pro	Proline
Ser	Serine
Thr	Threonine
Trp	Tryptophan
Tyr	Tyrosine
Val	Valine
Xaa	Unknown or other ]

#### (c) ▶Format representation of nucleotides:

(1)▶▶ A nucleotide sequence shall be listed using the ▶lower-case letter for representing the▶ one-letter code for the nucleotide bases[ as] ▶set forth▶ in [paragraph (b)(1) of this section] ▶WIPO Standard ST.23 (April 1994), paragraph 8▶.

[(d) The amino acids corresponding to the codons in the coding parts of a nucleotide sequence shall be typed immediately below the corresponding codons. Where a codon spans an intron, the amino acid symbol shall be typed below the portion of the codon containing two nucleotides.]

(e) The amino acids in a protein or peptide sequence shall be listed using the three-letter abbreviation with the first letter as an upper case character, as in paragraph (b)(2) of this section.]

[(f) ▶(2)▶ The bases in a nucleotide sequence (including introns) shall be listed in groups of 10 bases except in the coding parts of the sequence. Leftover bases, fewer than 10 in number, at the end of noncoding parts of a sequence shall be grouped together and separated from adjacent groups of 10 or 3 bases by a space.]

[(g) ▶(3)▶ The bases in the coding parts of a nucleotide sequence shall be listed as triplets (codons). ▶The amino acids corresponding to the codons in the coding parts of a nucleotide sequence shall be typed immediately below the corresponding codons. Where a codon spans an intron, the amino acid symbol shall be typed below the portion of the codon containing two nucleotides.▶

[(h) A protein or peptide sequence shall be listed with a maximum of 16 amino acids per line, with a space provided between each amino acid.]

[(i) ▶(4)▶ A nucleotide sequence shall be listed with a maximum of 16 codons or 60 bases per line, with a space provided between each codon or group of 10 bases.]

[(j) ▶(5)▶ A nucleotide sequence shall be presented, only by a single strand, in the 5' to 3' direction, from left to right.]

[(k) An amino acid sequence shall be presented in the amino to carboxy direction, from left to right, and the amino and carboxy groups shall not be presented in the sequence.]

[(l) ▶(6)▶ The enumeration of nucleotide bases shall start at the first base of the sequence with number 1. The enumeration shall be continuous through the whole sequence in the direction 5' to 3'. The enumeration shall be marked in the right margin, next to the line containing the one-letter codes for the bases, and giving the number of the last base of that line.]

[(m) The enumeration of amino acids may start at the first amino acid of the first mature protein, with the number 1. The amino acids preceding the mature protein, e.g., pre-sequences, pro-sequences, pre-pro-sequences and signal sequences, when presented, shall have negative numbers, counting backwards starting with the amino acid next to number 1. Otherwise, the enumeration of amino acids shall start at the first amino acid at the amino terminal as number 1. It shall be marked below the sequence every 5 amino acids.]



[(n)] ▶(7)◀ For those nucleotide sequences that are circular in configuration, the enumeration method set forth in paragraph [(1)] ▶(c)(6)◀ of this section remains applicable with the exception that the designation of the first base of the nucleotide sequence may be made at the option of the applicant. [The enumeration method for amino acid sequences that is set forth in paragraph (m) of this section remains applicable for amino acid sequences that are circular in configuration.]

▶(d) Representation of amino acids:

(1) The amino acids in a protein or peptide sequence shall be listed using the three-letter abbreviation with the first letter as an upper case character, as in WIPO Standard ST.23 (April 1994), paragraph 11.

(2) A protein or peptide sequence shall be listed with a maximum of 16 amino acids per line, with a space provided between each amino acid.

(3) An amino acid sequence shall be presented in the amino to carboxy direction, from left to right, and the amino and carboxy groups shall not be presented in the sequence.

(4) The enumeration of amino acids may start at the first amino acid of the first mature protein, with the number 1. The amino acids preceding the mature protein, e.g., pre-sequences, pro-sequences, pre-pro-sequences and signal sequences, when presented, shall have negative numbers, counting backwards starting with the amino acid next to number 1. Otherwise, the enumeration of amino acids shall start at the first amino acid at the amino terminal as number 1. It shall be marked below the sequence every 5 amino acids. The enumeration method for amino acid sequences that is set forth in this section remains applicable for amino acid sequences that are circular in configuration.

(5) An amino acid sequence that contains internal terminator symbols, e.g., "Ter", "n", or ":", etc., may not be represented as a single amino acid sequence, but shall be presented as separate amino acid sequences.

(e)▶[(o)] A sequence with a gap or gaps shall be presented as a plurality of separate sequences, with separate [sequence] ▶integer◀ identifiers, with the number of separate sequences being equal in number to the number of continuous strings of sequence data. A sequence that is made up of one or more noncontiguous segments of a larger sequence or segments from different sequences shall be presented as a separate sequence.

[(p)] The code for representing modified nucleotide bases and modified or unusual amino acids shall conform to the code set forth in the tables in paragraphs (p)(1) and (p)(2) of this section. The modified base controlled vocabulary in paragraph (p)(1) of this section and the modified and unusual amino acids in paragraph (p)(2) of this section shall not be used in the nucleotide and/or amino acid sequences; but may be used in the description and/or the "Sequence Listing" corresponding to, but not including, the nucleotide and/or amino acid sequence.

(1) Modified base controlled vocabulary:

Abbreviation	Modified base description
ac4c	4-acetylcytidine.
chm5u	5-(carboxyhydroxymethyl)uridine.
cm	2'-O-methylcytidine.
cmnm5s2u	5-carboxymethylaminomethyl-2-thiouridine.
cmnm5u	5-carboxymethylaminomethyluridine.
d	dihydrouridine.
fm	2'-O-methylpseudouridine.
galq	beta-D-galactosylqueosine.
gm	2'-O-methylguanosine.
i	inosine.
i6a	N6-isopentenyladenosine.
m1a	1-methyladenosine.
m1f	1-methylpseudouridine.
m1g	1-methylguanosine.
m1l	1-methylinosine.
m22g	2,2-dimethylguanosine.
m2a	2-methyladenosine.
m2g	2-methylguanosine.
m3c	3-methylcytidine.
m5c	5-methylcytidine.
m6a	N6-methyladenosine.
m7g	7-methylguanosine.
mam5u	5-methylaminomethyluridine.

Abbreviation	Modified base description
mam5s2u	5-methoxyaminomethyl-2-thiouridine.
manq	beta-D-mannosylqueosine.
mcm5s2u	5-methoxycarbonylmethyluridine.
mo5u	5-methoxyuridine.
ms2i6a	2-methylthio-N6-isopentenyladenosine.
ms2i6a	N-((9-beta-D-ribofuranosyl-2-methylthiopurine-6-yl)carbamoyl)threonine.
mt6a	N-((9-beta-D-ribofuranosylpurine-6-yl)N-methylcarbamoyl)threonine.
mv	uridine-5-oxyacetic acid methylester.
o5u	uridine-5-oxyacetic acid (v).
osyw	wybutosine.
p	pseudouridine.
q	queosine.
s2c	2-thiocytidine.
s2t	5-methyl-2-thiouridine.
s2u	2-thiouridine.
s4u	4-thiouridine.
t	5-methyluridine.
t6a	N-((9-beta-D-ribofuranosylpurine-6-yl)carbamoyl)threonine.
tm	2'-O-methyl-5-methyluridine.
um	2'-O-methyluridine.
yw	wybutosine.
x	3-(3-amino-3-carboxypropyl)uridine, (acp3)u.

(2) Modified and unusual amino acids:

Abbreviation	Modified and unusual amino acid
Aad	2-Aminoadipic acid.
bAad	3-aminoadipic acid.
bAla	beta-Alanine, beta-Aminopropionic acid.
Abu	2-Aminobutyric acid.
4Abu	4-Aminobutyric acid, piperidinic acid.
Acp	6-Aminocaproic acid.
Ahe	2-Aminoheptanoic acid.
Aib	2-Aminoisobutyric acid.
bAib	3-Aminoisobutyric acid.
Apm	2-Aminopimelic acid.
Dbu	2,4-Diaminobutyric acid.
Des	Desmosine.
Dpm	2,2'-Diaminopimelic acid.
Dpr	2,3-Diaminopropionic acid.
ErGly	N-Ethylglycine.
EtAsn	N-Ethylasparagine.
Hyl	Hydroxylysine.
aHyl	allo-Hydroxylysine.
3Hyp	3-Hydroxyproline.
4Hyp	4-Hydroxyproline.
Ide	Isodesmosine.
alle	allo-Isoleucine.
MeGly	N-Methylglycine, sarcosine.
Melle	N-Methylisoleucine.
MeLys	N-Methylvaline.
Nva	Norvaline.
Nle	Norleucine.
Orn	Ornithine. ]

5. Section 1.823 is proposed to be revised to read as follows:

§ 1.823 Requirements for nucleotide and/or amino acid sequences as part of the application papers.

(a) The "Sequence Listing" required by § 1.821(c), setting forth the nucleotide and/or amino acid sequences, and associated information in accordance with paragraph (b) of this section, must begin on a new page and be titled "Sequence Listing" [and appear] ▶. On a separate page of the application specification, immediately prior to the claims [ ], there shall be a reference to the presence of the "Sequence Listing" in a "Sequence Listing Annex." The "Sequence Listing" shall appear in the "Sequence Listing Annex," which is numbered

independently of the numbering of the remainder of the application and shall be placed in the application file. Upon printing the application as a patent, the "Sequence Listing Annex" containing the paper "Sequence Listing" shall be printed immediately before the patented claims. ▶ Each page of the "Sequence Listing" shall contain no more than 66 lines and each line shall contain no more than 72 characters. A fixed-width font shall be used exclusively throughout the "Sequence Listing."

(b) The "Sequence Listing" shall, except as otherwise indicated, include, in addition to and immediately preceding the actual nucleotide and/or amino acid sequence, the [following items of information.] ▶ numeric identifiers and their accompanying information as shown in the following table. The numeric identifier shall be used only in the "Sequence Listing." ▶ The order and presentation of the items of information in the "Sequence Listing" shall conform to the arrangement given below [except that parenthetical explanatory information following the headings (identifiers) is to be omitted]. Each item of information shall begin on a new line [ ], enumerated with the number/numeral/letter in parentheses as shown below, with the heading (identifier) in upper case characters, followed by a colon, and then followed by the information provided] ▶ beginning with the numeric identifier enclosed in angle brackets as shown ▶. Except as allowed below, no item of information shall occupy more than one line. [Those items of information that are applicable for all sequences shall only be set forth once in the "Sequence Listing."] The submission of those items of information designated with an "M" is mandatory. [The submission of those items of information designated with an "R" is recommended, but not required.] The submission of those items of information designated with an "O" is optional. ▶ Numeric identifiers ▶100▶ through ▶193▶ shall only be set forth at the beginning of the "Sequence Listing." ▶ Those items designated with "rep" may have multiple responses and, as such, the item may be repeated in the "Sequence Listing."

[(1) GENERAL INFORMATION (Application, diskette/tape and publication information):

(i) APPLICANT (maximum of first ten named applicants; specify one name per line: SURNAME comma OTHER NAMES and/or INITIALS - M/rep):

(ii) TITLE OF INVENTION (title of the invention, as elsewhere in application, four lines maximum - M):

(iii) NUMBER OF SEQUENCES (number of sequences in the "Sequence Listing" (M):

(iv) CORRESPONDENCE ADDRESS (M):

(A) ADDRESSEE (name of applicant, firm, company or institution, as may be appropriate):

(B) STREET (correspondence street address, as elsewhere in application, four lines maximum):

(C) CITY (correspondence city address, as elsewhere in application):

(D) STATE (correspondence state, as elsewhere in application):

(E) COUNTRY (correspondence country, as elsewhere in application):

(F) ZIP (correspondence zip or postal code, as elsewhere in application):

(v) COMPUTER READABLE FORM (M):

(A) MEDIUM TYPE (type of diskette/tape submitted):

(B) COMPUTER (type of computer used with diskette/tape submitted):

(C) OPERATING SYSTEM (type of operating system used):

(D) SOFTWARE (type of software used to create computer readable form):

(vi) CURRENT APPLICATION DATA (M, if available):

(A) APPLICATION NUMBER (U.S. application number, including a series code, a slash and a serial number, or U.S. PCT application number, including the letters PCT, a slash, a two-letter code indicating the U.S. as the Receiving Office, a two-digit indication of the year, a slash and a five-digit number, if available):

(B) FILING DATE (U.S. or PCT application filing date, if available; specify as dd-MMM-yyyy):

(C) CLASSIFICATION (IPC/US classification or F-term designation, where F-terms have been developed, if assigned, specify each designation, left justified, within an eighteen-position alpha numeric field - rep, to a maximum of ten classification designations):

(vii) PRIOR APPLICATION DATA (prior domestic, foreign priority or international application data, if applicable - M/rep):

(A) APPLICATION NUMBER (application number; specify as two-letter country code and an eight-digit application number; or if a PCT application, specify as the letters PCT, a slash, a two-letter code indicating the Receiving Office, a two-digit indication of the year, a slash and a five-digit number):

(B) FILING DATE (document filing date, specify as dd-MMM-yyyy):

(viii) ATTORNEY/AGENT INFORMATION (O):

(A) NAME (attorney/agent name; SURNAME comma OTHER NAMES and/or INITIALS):

(B) REGISTRATION NUMBER (attorney/agent registration number):

(C) REFERENCE/DOCKET NUMBER (attorney/agent reference or docket number):

(ix) TELECOMMUNICATION INFORMATION (O):

(A) TELEPHONE (telephone number of applicant or attorney/agent):

(B) TELEFAX (telefax number of applicant or attorney/agent):

(C) TELEX (telex number of applicant or attorney/agent):

(2) INFORMATION FOR SEQ ID NO: X (rep):

(i) SEQUENCE CHARACTERISTICS (M):

(A) LENGTH (sequence length, expressed as number of base pairs or amino acid residues):

(B) TYPE (sequence type, i.e., whether nucleic acid or amino acid):

(C) STRANDEDNESS (if nucleic acid, number of strands of source organism molecule, i.e., whether single-stranded, double-stranded, both or unknown to applicant):

(D) TOPOLOGY (whether source organism molecule is circular, linear, both or unknown to applicant):

(ii) MOLECULE TYPE (type of molecule sequenced in SEQ ID NO: X (at least one of the following should be included with subheadings, if any, in Sequence Listing - R)):

- Genomic RNA;
- Genomic DNA;
- mRNA
- tRNA;
- rRNA;
- srRNA;
- scRNA;
- preRNA;
- cDNA to genomic RNA;
- cDNA to mRNA;
- cDNA to tRNA;
- cDNA to rRNA;
- cDNA to srRNA;
- cDNA to scRNA;
- Other nucleic acid;
- (A) DESCRIPTION (four lines maximum):
- protein and
- peptide.

(iii) HYPOTHETICAL (yes/no - R):

(iv) ANTI-SENSE (yes/no - R):

(v) FRAGMENT TYPE (for proteins and peptides only, at least one of the following should be included in the Sequence Listing - R):

- N-terminal fragment;
- C-terminal fragment and
- internal fragment.

(vi) ORIGINAL SOURCE (original source of molecule sequenced in SEQ IDNO: X - R):

(A) ORGANISM (scientific name of source organism):

(B) STRAIN:

(C) INDIVIDUAL ISOLATE (name/number of individual isolate):

(D) DEVELOPMENTAL STAGE (give developmental stage of source organism and indicate whether derived from germ-line or rearranged developmental pattern):

(E) HAPLOTYPE:

(F) TISSUE TYPE:

(G) CELL TYPE:

(H) CELL LINE:

(I) ORGANELLE:

(vii) IMMEDIATE SOURCE (immediate experimental source of the sequence in SEQ ID NO: X - R):

- (A) LIBRARY (library -type, name):  
 (B) CLONE (clone(s)):  
 (viii) POSITION IN GENOME (position of sequence in SEQ ID NO:X in genome - R):  
 (A) CHROMOSOME/SEGMENT (chromosome/segment - name/number):  
 (B) MAP POSITION:  
 (C) UNITS (units for map position, i.e., whether units are genome percent, nucleotide number or other/specify):  
 (ix) FEATURE (description of points of biological significance in the sequence in SEQ ID NO:X -R/rep):  
 (A) NAME/KEY (provide appropriate identifier for feature - four lines maximum):  
 (B) LOCATION (specify location according to syntax of DDBJ/EMBL/GenBank Feature Tables Definition, including whether feature is on complement of presented sequence; where appropriate state number of first and last bases/amino acids in feature - four lines maximum):  
 (C) IDENTIFICATION METHOD (method by which the feature was identified, i.e., by experiment, by similarity with known sequence or to an established consensus sequence, or by similarity to some other pattern - four lines maximum):  
 (D) OTHER INFORMATION (include information on phenotype conferred, biological activity of sequence or its product, macromolecules which bind to sequence or its product, or other relevant information - four lines maximum):  
 (x) PUBLICATION INFORMATION (Repeat section for each relevant publication - O/rep):

Numeric Identifier	Definition	Comments and Format	Mandatory (M) or Optional (O)
◀100▶	General Information	Leave blank after ▶100▶	M
◀110▶	Applicant	Max. of 10 names; one name per line; use format: Surname, Other Names and/or Initials; rep	M
◀120▶	Title of Invention	Four lines maximum	M
◀130▶	Number of Sequences	Use an integer as a response	M
◀140▶	Correspondence Address	◀140▶ must be present if subheadings ▶141▶-▶146▶ are used	O
◀141▶	Addressee		O
◀142▶	Street	Four lines maximum	O
◀143▶	City		O
◀144▶	State or Province		O
◀145▶	Country		O
◀146▶	Zip or Postal Code		O
◀150▶	Computer Readable Form	Leave blank after ▶150▶	O
◀151▶	Medium Type	Type of diskette/tape submitted	O
◀152▶	Computer	Type of computer used to create diskette/tape	O
◀153▶	Operating System	Type of operating system on computer	O
◀154▶	Software	Type of software used to create computer readable form	O
◀160▶	Current Application Data	Leave blank after ▶160▶; ▶160▶ must be present if subheadings ▶161▶ & ▶162▶ are used	M, if available
◀161▶	Application Number	Specify as: US 07/999,999 or PCT/US96/99999	M, if available
◀162▶	Filing Date	Specify as: dd-MMM-yyyy	M, if available
◀170▶	Prior Application Data	Insert heading/subheadings only if applicable; leave blank after ▶170▶; ▶170▶ must be present if subheadings ▶171▶ & ▶172▶ are used; rep.	M, if applicable
◀171▶	Application Number	Specify as: US 07/999,999 or PCT/US96/99999	M, if applicable
◀172▶	Filing Date	Specify as: dd-MMM-yyyy	M, if applicable

- (A) AUTHORS (maximum of first ten named authors of publication; specify one name per line: SURNAME comma OTHER NAMES and/or INITIALS - rep):  
 (B) TITLE (title of publication):  
 (C) JOURNAL (journal name in which data published):  
 (D) VOLUME (journal volume in which data published):  
 (E) ISSUE (journal issue number in which data published):  
 (F) PAGES (journal page numbers in which data published):  
 (G) DATE (journal date in which data published; specify as dd-MMM-yyyy, MMM-yyyy or Season-yyyy):  
 (H) DOCUMENT NUMBER (document number, for patent type citations only; specify as two-letter country code, eight-digit document number (right justified), one letter and as appropriate, one number or a space as a document type code; or if a PCT application specify as the letters PCT, a slash, a two-letter code indicating the Receiving Office, a two-digit indication of the year, a slash and a five-digit number; or if a PCT publication, specify as the two letters WO, a two-digit indication of the year, a slash and a five-digit publication number):  
 (I) FILING DATE (document filing date, for patent-type citations only; specify as dd-MMM-yyyy):  
 (J) PUBLICATION DATE (document publication date; for patent-type citations only, specify as dd-MMM-yyyy):  
 (K) RELEVANT RESIDUES In SEQ ID NO:X (rep): FROM (position) TO (position)  
 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:X:]

Numeric Identifier	Definition	Comments and Format	Mandatory (M) or Optional (O)
◀180▶	Attorney/Agent Information	Leave blank after ▶180▶	O
◀181▶	Name	Use format: Surname, Other Names and/or Initials	O
◀182▶	Registration Number		O
◀183▶	File Reference/Docket Number		O
◀190▶	Telecommunication Information	Leave blank after ▶190▶	O
◀191▶	Telephone		O
◀192▶	Telefax		O
◀193▶	Electronic mail address		O
◀200▶	Information for SEQ ID NO:#:	Response shall be an integer representing the SEQ ID NO shown; rep.	M
◀210▶	Sequence Characteristics	Leave blank after ▶210▶	M
◀211▶	Length	Respond with an integer expressing the number of bases or amino acid residues	M
◀212▶	Type	Whether presented sequence molecule is nucleotide or amino acid, indicated by N or A	M
◀214▶	Topology	Whether presented sequence molecule is linear or circular, indicated as L or C	M
◀290▶	Feature	Description of points of biological significance in the sequence; leave blank after ▶290▶; rep.	M, if "N", "Xaa", or a modified or unusual L-amino acid or modified base was used in the sequence
◀291▶	Name/Key	Provide appropriate identifier for feature; four lines maximum	M, if "N", "Xaa", or a modified or unusual L-amino acid or modified base was used in the sequence
◀292▶	Location	Specify location within sequence; where appropriate state number of first and last bases/amino acids in feature; four lines maximum	M, if "N", "Xaa", or a modified or unusual L-amino acid or modified base was used in the sequence
◀294▶	Other Information	Other relevant information; four lines maximum	M, if "N", "Xaa", or a modified or unusual L-amino acid or modified base was used in the sequence
◀300▶	Publication Information	Leave blank after ▶300▶; rep.	O
◀301▶	Authors	Maximum of ten named authors of publication; specify one name per line; use format: Surname, Other Names and/or Initials	O
◀302▶	Title		O
◀303▶	Journal		O
◀304▶	Volume		O
◀305▶	Issue		O
◀306▶	Pages		O
◀307▶	Date	Journal date in which data published; specify as dd-MMM-yyyy, MMM-yyyy or Season-yyyy	O
◀308▶	Patent Document Number	Document number; for patent-type citations only	O
◀309▶	Filing Date	Document filing date, for patent-type citations only; specify as dd-MMM-yyyy	O
◀310▶	Publication Date	Document publication date, for patent-type citations only; specify as dd-MMM-yyyy	O



Numeric Identifier	Definition	Comments and Format	Mandatory (M) or Optional (O)
311	Relevant Residues	FROM (position) TO (position)	O
400	Sequence Description: SEQ ID NO:#	Response shall be an integer representing the SEQ ID NO shown; rep.	M

6.

Section 1.824 is proposed to be revised to read as follows:

**§ 1.824 Form and format for nucleotide and/or amino acid sequence submissions in computer readable form.**

(a) The computer readable form required by § 1.821(c) shall contain a printable copy of the "Sequence Listing," as defined in §§ 1.821(c), 1.822 and 1.823, recorded as] meet the following specifications:

(1) The computer readable form shall contain a single [file on] "Sequence Listing" as either a diskette, [or a magnetic tape] series of diskettes, or other permissible media outlined in § 1.824(c). [The computer readable form shall be encoded and formatted such that a printed copy of the "Sequence Listing" may be recreated using the print commands of the computer/operating-system configurations specified in paragraph (f) of this section.]

(b) (i) The [file] "Sequence Listing" in paragraph (a) of this section shall be [encoded in a subset of the] submitted in American Standard Code for Information Interchange (ASCII) text. [This subset shall consist of all printable ASCII characters including the ASCII space character plus line-termination, pagination and end-of-file characters associated with the computer/operating-system configurations specified in paragraph (f) of this section.] No other [characters] formats shall be allowed.

(c) (i) The computer readable form may be created by any means, such as word processors, nucleotide/amino acid sequence editors or other custom computer programs; however, it shall [be readable by one of the computer/operating-system configurations specified in paragraph (f) of this section, and shall] conform to [the] all specifications [in paragraphs (a) and (b) of] detailed in this section.

(d) The entire printable copy of the "Sequence Listing" shall be contained within one file on a single diskette or magnetic tape unless it is shown to the satisfaction of the Commissioner that it is not practical or possible to submit the entire printable copy of the "Sequence Listing" within one file on a single diskette or magnetic tape.

(e) The submitted diskette or tape shall be write-protected such as by covering or uncovering diskette holes, removing diskette write tabs or removing tape write rings.

(f) As set forth in paragraph (c), above, any means may be used to create the computer readable form, as long as the following conditions are satisfied. A submitted diskette shall be readable on one of the computer/operating-system configurations described in paragraphs (1) through (3), below. A submitted tape shall satisfy the format specifications described in paragraph (4), below.]

(4) File compression is acceptable when using diskette media, so long as the compressed file is in a self-extracting format that will decompress on one of the systems described in paragraph (b) of this section.

(5) Page numbering shall not appear within the computer readable form version of the "Sequence Listing" file.

(6) All computer readable forms shall have a label permanently affixed thereto on which has been hand-printed or typed: the name of the applicant, the title of the invention, the name and type of computer and operating system used, and application serial number and filing date, if known.

(b) Computer readable form files submitted must meet these format requirements:

(1) Computer: IBM PC/XT/AT, or compatibles [ IBM PS/2 or compatibles] or Apple Macintosh;

(i) Operating System: [PC-DOS or] MS-DOS [(Versions 2.1 or above)], Unix or Macintosh;

(ii) Line terminator: ascii carriage Return plus ASCII Line Feed;

(iii) (4) (i) Pagination: [ASCII Form Feed or Series of Line Terminators] Continuous file (no "hard page break" codes permitted);

(iv) End-of-File: ASCII SUB (Ctrl-Z);

(v) Media:

(c) Computer readable form files submitted may be in any of the following media:

(A) Diskette - 5.25 inch, 360 Kb storage;  
(B) Diskette - 5.25 inch, 1.2 Mb storage;  
(C) Diskette - 3.50 inch, 720 Kb storage;  
(D) Diskette - 3.5 inch, 1.44 Mb storage;

(1) Diskette: 3.50 inch, 1.44 Mb storage;  
3.50 inch, 720 Kb storage;  
5.25 inch, 1.2 Mb storage;  
5.25 inch, 360 Kb storage;

(vi) Print Command: PRINT filename.extension;

(2) Computer: IBM PC/XT/AT, IBM PS/2 or compatibles;

(i) Operating system: Xenix;

(ii) Line Terminator: ASCII Carriage Return;

(iii) Pagination: ASCII Form Feed or Series of Line Terminators;

(iv) End-of-File: None;

(v) Media:

(A) Diskette - 5.25 inch, 360 Kb storage;  
(B) Diskette - 5.25 inch, 1.2 Mb storage;  
(C) Diskette - 3.50 inch, 720 Kb storage;  
(D) Diskette - 3.5 inch, 1.44 Mb storage;

(vi) Print Command: lpr filename;

(3) Computer: Apple Macintosh;

(i) Operating System: Macintosh;

(ii) Macintosh File Type: text with line termination

(iii) Line Terminator: Pre-defined by text type file;

(iv) Pagination: Pre-defined by text type file;

(v) End-of-File: Pre-defined by text type file;

(vi) Media:

(A) Diskette - 3.50 inch, 400 Kb storage;  
(B) Diskette - 3.50 inch, 800 Kb storage;  
(C) Diskette - 3.50 inch, 1.4 Mb storage;

(vii) Print Command: Use PRINT command from any Macintosh Application that processes text files, such as Mac-Write or TeachText;

(4) Magnetic tape: 0.5 inch, up to 2400 feet;

(i) Density: 1600 or 6250 bits per inch, 9 track;

(ii) Format: raw, unblocked;

(iii) Line Terminator: ASCII Carriage Return plus optional ASCII Line Feed;

(iv) Pagination: ASCII Form Feed or Series of Line Terminators;

(v) Print Command (Unix shell version given here as sample response -mt/dev/rmt0; lpr/dev/rmt0);

(2) Magnetic tape: 0.5 inch, up to 24000 feet;

Density: 1600 or 6250 bits per inch, 9 track;

Format: Unix tar command; specify blocking factor (not "block size")

Line Terminator: ASCII Carriage Return plus ASCII Line Feed;

(3) 8mm Data Cartridge;

Format: Unix tar command; specify blocking factor (not "block size")

Line Terminator: ASCII Carriage Return plus ASCII Line Feed;

(4) CD-ROM;

Format: ISO 9660 or High Sierra Format

(5) Magneto Optical Disk;

Size/Storage Specifications: 5.25 inch, 640 Mb

(g) (d) computer readable forms that are submitted to the Office will not be returned to the applicant.

(h) All computer readable forms shall have a label permanently affixed thereto on which has been hand-printed or typed, a description of the format of the computer readable form as well as the name of the applicant, the title of the invention,

the date on which the data were recorded on the computer readable form and the name and type of computer and operating system which generated the files on the computer readable form. If all this information cannot be printed on a label affixed to the computer readable form, by reason of size or otherwise, the label shall include the name of the applicant and the title of the invention and a reference number, and the additional information may be provided on a container for the computer readable form with the name of the applicant, the title of the invention, the reference number and the additional information affixed to the container. If the computer readable form is submitted after the date of filing under 35 U.S.C. 111, after the date of entry in the national stage under 35 U.S.C. 371 or after the time of filing, in the United States Receiving Office, an international application under the PCT, the labels mentioned herein must also include the date of the application number, including series code and serial number.]

7. Section 1.825 is proposed to be amended by revising paragraphs (a), (b) and (d) to read as follows:

**§ 1.825 Amendments to or replacement of sequence listing and computer readable copy thereof.**

(a) Any amendment to the paper copy of the "Sequence Listing" (§ 1.821(c)) must be made by the submission of substitute sheets. Amendments must be accompanied by a statement that indicates support for the amendment in the application, as filed, and a statement that the substitute sheets include no new matter. Such a statement must be a verified statement if made by a person not registered to practice before the Office.

(b) Any amendment to the paper copy of the "Sequence Listing," in accordance with paragraph (a) of this section, must be accompanied by a substitute copy of the computer readable form (§ 1.821(e)) including all previously submitted data with the amendment incorporated therein, accompanied by a statement that the copy in computer readable form is the same as the substitute copy of the "Sequence Listing." Such a statement must be a verified statement if made by a person not registered to practice before the Office.

(c) \* \* \*

(d) If, upon receipt, the computer readable form is found to be damaged or unreadable, applicant must provide, within such time as set by the Commissioner, a substitute copy of the data in computer readable form accompanied by a statement that the substitute data is identical to that originally filed. Such a statement must be a verified statement if made by a person not registered to practice before the Office.

8. Appendix A to Subpart G is proposed to be revised to read as follows:

Appendix A To Subpart G Of Part 1 - Sample Sequence Listing

(1) GENERAL INFORMATION:

(i) APPLICANT: Doe, Joan X, Doe, John Q

ATCGGGATAG TACTGGTCAA GACCGGTGGA CACCGGTAA CCCCAGTTAA GTACCGGTTA 60

TAGGCCATTT CAGGCCAAAT GTGCCCAACT ACGCCAATTG TTTTGCCAAC GGCCAACGTT 120

ACGTTTCGTAC GCACGTATGT ACCTAGGTAC TTACGGACGT GACTACGGAC ACTTCCGTAC 180

GTACGTACGT TTACGTACCC ATCCCAACGT AACCACAGTG TGGTCGCAGT GTCCCAAGTGT 240

ACACAGACTG CCAGACATTC TTCACAGACA CCCC ATG ACA CCA CCT GAA CGT CTC 295  
Met Thr Pro Pro Glu Arg Leu  
-30

TTC CTC CCA AGG GTG TGT GGC ACC ACC CTA CAC CTC CTC CTT CTG GGG 343  
Phe Leu Pro Arg Val Cys Gly Thr Thr Leu His Leu Leu Leu Gly  
-25 -20 -15

CTG CTG CTG GTT CTG CTG CCT GGG GCC CAT GTGAGGCAGC AGGAGAATGG 393  
Leu Leu Leu Val Leu Leu Pro Gly Ala His  
-10 -5

GGTGGCTCAG CCAAACCTTG AGCCCTAGAG CCCCCTCAA CTCTGTCTC CTAG GGG Gly 450

(ii) TITLE OF INVENTION: Isolation and Characterization of a Gene Encoding a Protease from *Paramecium sp.*

(iii) NUMBER OF SEQUENCES: 2

(iv) CORRESPONDENCE ADDRESS:

(A) ADDRESSEE: Smith and Jones

(B) STREET: 123 Main Street

(C) CITY: Smalltown

(D) STATE: Anystate

(E) COUNTRY: USA

(F) ZIP: 12345

(v) COMPUTER READABLE FORM:

(A) MEDIUM TYPE: Diskette, 3.50 inch, 800 Kb storage

(B) COMPUTER: Apple Macintosh

(C) OPERATING SYSTEM: Macintosh 5.0

(D) SOFTWARE: MacWrite

(vi) CURRENT APPLICATION DATA:

(A) APPLICATION NUMBER: 09/999,999

(B) FILING DATE: 28-FEB-1989

(C) CLASSIFICATION: 999/99

(vii) PRIOR APPLICATION DATA:

(A) APPLICATION NUMBER: PCT/US88/99999

(B) FILING DATE: 01-MAR-1988

(viii) ATTORNEY/AGENT INFORMATION:

(A) NAME: Smith, John A

(B) REGISTRATION NUMBER: 00001

(C) REFERENCE/DOCKET NUMBER: 01-0001

(ix) TELECOMMUNICATIONS INFORMATION:

(A) TELEPHONE: (909) 999-001

(B) TELEFAX: (909) 999-0002

(2) INFORMATION FOR SEQ ID NO: 1:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 954 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: genomic DNA

(iii) HYPOTHETICAL: yes

(iv) ANTI-SENSE: no

(v) ORIGINAL SOURCE:

(A) ORGANISM: *Paramecium sp.*

(C) INDIVIDUAL/ISOLATE: XY22

(G) CELL TYPE: unicellular organism

(vii) IMMEDIATE SOURCE:

(A) LIBRARY: genomic

(B) CLONE: Para-XY22/36

(x) PUBLICATION INFORMATION:

(A) AUTHORS: Doe, Joan X, Doe, John Q

(B) TITLE: Isolation and Characterization of a Gene

Encoding a Protease from *Paramecium sp.*

(C) JOURNAL: Fictional Genes

(D) VOLUME: I

(E) ISSUE: 1

(F) PAGES: 1-20

(G) DATE: 02-MAR-1988

(K) RELEVANT RESIDUES IN SEQ ID NO: 1: FROM

1 TO 954

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 1:

CTC ATG CAT CTT GCC CAC AGC AAC CTC AAA CCT GCT GCT CAC CTC ATT 498  
Leu Met His Leu Ala His Ser Asn Leu Lys Pro Ala Ala His Leu Ile  
1 5 10 15  
GTAAACATCC ACCTGACCTC CCAGACATGT CCCCACCAGC TCTCCTCTA CCCCTGCCTC 558  
AGGAACCCAA GCATCCACCC CTCTCCCCA ACTTCCCCA CGCTAAAAA AACAGAGGGA 618  
GCCACTCCT ATGCTCCCC CTGCCATCCC CCAGGAACTC AGTTGTTCAG TGCCCACTTC 678  
TAC CCC AGC AAG CAG AAC TCA CTG CTC TGG AGA GCA AAC ACG GAC CGT 726  
Tyr Pro Ser Lys Gln Asn Ser Leu Leu Trp Arg Ala Asn Thr Asp Arg  
20 25 30  
GCC TTC CTC CAG GAT GGT TTC TCC TTG AGC AAC AAT TCT CTC CTG GTC 774  
Ala Phe Leu Gln Asp Gly Phe Ser Leu Ser Asn Asn Ser Leu Leu Val  
35 40 45  
TAGAAAAAAT AATTGATTTC AAGACCTTCT CCCCATTCTG CCTCCATTCT GACCATTTC 834  
GGGGTCGTCA CCACCTCTCC TTTGGCCATT CCAACAGCTC AAGTCTTCCC TGATCAAGTC 894  
ACCGGAGCTT TCAAGAAGG AATTCTAGGC ATCCAGGGG ACCACACCT CCCTGAACCA 954

## (2) INFORMATION FOR SEQ ID NO: 2:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 82 amino acids  
(B) TYPE: amino acid  
(C) TOPOLOGY: linear  
(ii) MOLECULE TYPE: protein  
(ix) FEATURE:  
(A) NAME/KEY: signal sequence  
(B) LOCATION: -34 to -1  
(C) IDENTIFICATION METHOD: similarity to other signal sequences, hydrophobic  
(D) OTHER INFORMATION: expresses protease

## (x) PUBLICATION INFORMATION:

- (A) AUTHORS: Doe, Joan X, Doe, John Q  
(B) TITLE: Isolation and Characterization of a Gene Encoding a Protease from *Paramecium* sp.  
(C) JOURNAL: Fictional Genes  
(D) VOLUME: I  
(E) ISSUE: 1  
(F) PAGES: 1-20  
(G) DATE: 02-MAR-1988  
(H) RELEVANT RESIDUES IN SEQ ID NO:2: FROM -34 TO 48  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 2:

Met Thr Pro Pro Glu Arg Leu Phe Leu Pro Arg Val Cys Gly Thr Thr  
-30 -25 -20  
Leu His Leu Leu Leu Leu Gly Leu Leu Leu Val Leu Leu Pro Gly Ala  
-15 -10 -5  
His Gly Leu Met His Leu Ala His Ser Asn Leu Lys Pro Ala Ala His  
1 5 10  
Leu Ile Tyr Pro Ser Lys Gln Asn Ser Leu Leu Trp Arg Ala Asn Thr  
15 20 25 30  
Asp Arg Ala Phe Leu Gln Asp Gly Phe Ser Leu Ser Asn Asn Ser Leu  
35 40 45  
Leu Val ]

## &lt;100&gt;

- <110> Doe, Joan X, Doe, John Q  
<120> Isolation and Characterization of a Gene Encoding a Protease from *Paramecium* sp.  
<130> 2  
<140>  
<141> Smith and Jones  
<142> 123 Main Street  
<143> Smalltown  
<144> Anystate  
<145> USA  
<146> 12345  
<150>  
<151> Floppy disk  
<152> IBM PC compatible  
<153> PC-DOS/MS-DOS  
<154> PatentIn Release #2.00  
<160>  
<161> 09/999,999  
<162> 28-FEB-1989  
<170>  
<171> PCT/US/88/99999

## &lt;172&gt; 01-MAR-1988

## &lt;180&gt;

## &lt;181&gt; Smith, John A

## &lt;182&gt; REGISTRATION NUMBER: 00001

## &lt;183&gt; 01-0001

## &lt;190&gt;

## &lt;191&gt; (909) 999-0001

## &lt;192&gt; (909) 999-0002

## &lt;200&gt; 1

## &lt;210&gt;

## &lt;211&gt; 954 base pairs

## &lt;212&gt; N

## &lt;214&gt; L

## &lt;290&gt;

## &lt;291&gt; CDS

## &lt;292&gt; join(275..373, 448..498, 679..774)

## &lt;290&gt;

## &lt;291&gt; mat\_peptide

## &lt;292&gt; join(451..498, 679..774)

## &lt;300&gt;

## &lt;301&gt; Doe, Joan X, Doe, John Q

<302> Isolation and Characterization of a Gene Encoding a Protease from *Paramecium* sp.

## &lt;303&gt; Fictional Genes

## &lt;304&gt; 1

## &lt;305&gt; 1

## &lt;306&gt; 1-20

## &lt;307&gt; 02-MAR-1988

## &lt;308&gt; FROM 1 TO 957

## &lt;400&gt; 1

atcgggatag tactgtcaa gaccgtgga caccgttaa ccccggttaa gtaccgtta 60  
taggccattt caggccaaat gtgccaaact acgccaatig ttigccaac ggccaacgtt 120  
acgttcgtac gcacgtatgt acctaggtac ttacggacgt gactacggac attccgtac 180  
gtacgtacgt ttacgtaccc atcccaacgt aaccacagt tggtcgcagt gtccacgtt 240  
acacagactg ccagacatic ttacagaca cccc atg Met aca cca cct Thr Pro Pro gaa cgt Glu Arg -30 292  
ctc ttc ctc cca agg gtg tgt ggc acc acc cta cac ctc ctc ctt ctc 340  
Leu Phe Leu Pro Arg Val Cys Gly Thr Thr Leu His Leu Leu Leu -15  
ggg ctc ctc ctc gtt ctc ctc cct ggg gcc cat gtgaggcagg aggagaatgg 393  
Gly Leu Leu Leu Val Leu Leu Pro Gly Ala His  
ggtggtcag ccaaacctg agccctagag ccccccctaa ctctgtctc ctg ggg Gly 450  
ctc atg cat ctt gcc cac agc aac ctc aaa cct gct gct cac ctc att 498  
Leu Met His Leu Ala His Ser Asn Leu Lys Pro Ala Ala His Leu Ile  
1 5 10 15  
gtaaacatcc acctgacct ccagacatgt cccaccagc tctcctcta cccctgctc 558  
aggaacccaa gcatccacc ctctcccca actcccca cgtcaaaaa aacagaggga 618  
gcccactct atgctctccc ctgccatccc ccaggaactc agttgtcag tgccacttc 678  
tac ccc agc aag cag aac tca ctc ctc tgg aga gca aac acg gac cgt 726  
Tyr Pro Ser Lys Gln Asn Ser Leu Leu 25 Trp Arg Ala Asn Thr Asp Arg  
goc ttc ctc cag gat ggt ttc tcc ttg agc aac aat tct ctc ctc gtc 774  
Ala Phe Leu Gln Asp Gly Phe Ser Leu 40 Ser Asn Asn Ser Leu Val  
35 45  
tagaaaaaat aattgatttc aagacctct cccattctg ctccattct gaccattica 834  
ggggctgca ccacctctc ttggccatt ccaacagctc aagtctccc tgncaagtc 894  
accggagctt tcaagaagg aattctaggc atccagggg acccacact cctgaacca 954

## &lt;200&gt; 2

## &lt;210&gt;

## &lt;211&gt; 82 amino acids

## &lt;212&gt; A

## &lt;214&gt; L

## &lt;400&gt; 2

Met Thr Pro Pro Glu Arg Leu Phe Leu Pro Arg Val Cys Gly Thr Thr  
-30 -25 -20  
Leu His Leu Leu Leu Leu Gly Leu Leu Leu Val Leu Leu Pro Gly Ala  
-15 -10 -5  
His Gly Leu Met His Leu Ala His Ser Asn Leu Lys Pro Ala Ala His  
1 5 10  
Leu Ile Tyr Pro Ser Lys Gln Asn Ser Leu Leu Trp Arg Ala Asn Thr  
15 20 25 30  
Asp Arg Ala Phe Leu Gln Asp Gly Phe Ser Leu Ser Asn Asn Ser Leu  
35 40 45  
Leu Val <



9. Appendix B to Subpart G is proposed to be removed.  
[Appendix B To Subpart G of Part 1- Headings For Information Items In § 1.823]

## (1) GENERAL INFORMATION:

- (i) APPLICANT:
- (ii) TITLE OF INVENTION:
- (iii) NUMBER OF SEQUENCES:
- (iv) CORRESPONDENCE ADDRESS:
  - (A) ADDRESSEE:
  - (B) STREET:
  - (C) CITY:
  - (D) STATE:
  - (E) COUNTRY:
  - (F) ZIP:

## (v) COMPUTER READABLE FORM:

- (A) MEDIUM TYPE:
- (B) COMPUTER:
- (C) OPERATING SYSTEM:
- (D) SOFTWARE

## (vi) CURRENT APPLICATION DATA:

- (A) APPLICATION NUMBER:
- (B) FILING DATE:
- (C) CLASSIFICATION:

## (vii) PRIOR APPLICATION DATA:

- (A) APPLICATION NUMBER:
- (B) FILING DATE:

## (viii) ATTORNEY/AGENT INFORMATION:

- (A) NAME:
- (B) REGISTRATION NUMBER:
- (C) REFERENCE/DOCKET NUMBER:
- (ix) TELECOMMUNICATIONS INFORMATION:
  - (A) TELEPHONE:
  - (B) TELEFAX:
  - (C) TELEX:

## (2) INFORMATION FOR SEQ ID NO: X:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH:
- (B) TYPE:
- (C) STRANDEDNESS:
- (D) TOPOLOGY:

## (ii) MOLECULE TYPE:

- Genomic RNA;
- Genomic DNA;
- mRNA;
- tRNA;
- rRNA;
- snRNA;
- scRNA;
- preRNA;
- cDNA to genomic RNA;
- cDNA to mRNA;
- cDNA to tRNA; - cDNA to rRNA;
- cDNA to snRNA;
- cDNA to scRNA;
- Other nucleic acid;

## (A) DESCRIPTION:

- protein and
- peptide.

## (iii) HYPOTHETICAL:

## (iv) ANTI-SENSE:

## (v) FRAGMENT TYPE:

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM:
- (B) STRAIN:
- (C) INDIVIDUAL ISOLATE:
- (D) DEVELOPMENTAL STAGE:
- (E) HAPLOTYPE:
- (F) TISSUE TYPE:
- (G) CELL TYPE:
- (H) CELL LINE:
- (I) ORGANELLE:

## (vii) IMMEDIATE SOURCE:

- (A) LIBRARY:
- (B) CLONE:

## (viii) POSITION IN GENOME:

- (A) CHROMOSOME/SEGMENT:
- (B) MAP POSITION:
- (C) UNITS:

## (ix) FEATURE:

- (A) NAME/KEY:
- (B) LOCATION:
- (C) IDENTIFICATION METHOD:
- (D) OTHER INFORMATION:
- (x) PUBLICATION INFORMATION:

- (A) AUTHORS:
- (B) TITLE:
- (C) JOURNAL:
- (D) VOLUME:
- (E) ISSUE:
- (F) PAGES:
- (G) DATE:
- (H) DOCUMENT NUMBER:
- (I) FILING DATE:
- (J) PUBLICATION DATE:
- (K) RELEVANT RESIDUES:
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:X: ]

September 23, 1996

BRUCE A. LEHMAN

Assistant Secretary of Commerce and  
Commissioner of Patents and TrademarksCertificate of Correction  
For Week of October 29, 1996

B1 4,884,331	5,423,333	5,476,873	5,504,868
Re. 35,093	5,423,334	5,477,003	5,505,817
D. 353,255	5,424,463	5,477,447	5,506,357
D. 365,263	5,425,692	5,477,625	5,507,436
D. 372,685	5,427,863	5,477,840	5,507,571
D. 373,371	5,428,146	5,478,047	5,507,991
4,814,470	5,428,565	5,478,710	5,508,382
4,872,813	5,432,838	5,479,296	5,508,527
5,043,809	5,433,482	5,482,529	5,508,736
5,095,918	5,433,713	5,482,906	5,509,122
5,111,227	5,436,057	5,482,912	5,509,134
5,116,595	5,436,352	5,483,219	5,509,429
5,144,352	5,437,032	5,483,274	5,509,907
5,153,607	5,438,302	5,484,100	5,510,055
5,173,411	5,443,454	5,484,349	5,510,159
5,184,173	5,443,531	5,484,351	5,510,223
5,185,267	5,445,525	5,484,883	5,510,453
5,186,829	5,445,939	5,484,928	5,510,858
5,194,375	5,446,593	5,485,250	5,511,134
5,249,762	5,449,508	5,485,285	5,511,156
5,280,788	5,450,440	5,485,404	5,511,516
5,292,602	5,450,714	5,485,545	5,511,759
5,292,608	5,452,166	5,485,844	5,512,286
5,303,207	5,453,727	5,485,891	5,512,378
5,314,478	5,454,071	5,487,140	5,512,416
5,321,852	5,454,141	5,487,822	5,512,577
5,336,251	5,455,953	5,487,897	5,512,663
5,338,529	5,456,085	5,487,942	5,512,679
5,347,404	5,456,310	5,488,164	5,512,929
5,363,335	5,456,526	5,489,259	5,513,382
5,364,844	5,458,453	5,489,726	5,513,515
5,367,684	5,461,662	5,490,057	5,513,584
5,370,811	5,461,987	5,490,983	5,513,717
5,370,992	5,463,181	5,491,063	5,514,691
5,371,383	5,464,754	5,493,415	5,515,555
5,376,653	5,465,265	5,494,540	5,516,894
5,385,911	5,465,307	5,495,109	5,516,953
5,388,233	5,466,476	5,495,113	5,517,005
5,388,828	5,468,247	5,495,170	5,517,133
5,392,186	5,468,494	5,496,109	5,517,295
5,398,244	5,468,614	5,496,168	5,517,480
5,399,291	5,468,769	5,496,498	5,517,589
5,399,413	5,469,269	5,496,925	5,517,802
5,405,629	5,469,300	5,497,291	5,517,993
5,409,171	5,471,435	5,498,990	5,518,198
5,409,822	5,472,218	5,500,731	5,518,528
5,412,901	5,472,372	5,501,902	5,519,002
5,416,569	5,473,871	5,502,251	5,519,114
5,417,399	5,473,994	5,502,462	5,519,418
5,418,959	5,474,676	5,502,609	5,519,566
5,419,922	5,475,090	5,504,693	5,519,757
5,422,990	5,476,167	5,504,756	5,520,243

5,520,627	5,524,371	5,527,792	5,530,282	5,533,171	5,536,351	5,540,640	5,544,781
5,520,905	5,524,502	5,527,868	5,530,470	5,533,694	5,536,986	5,540,757	5,545,888
5,521,006	5,524,628	5,528,020	5,530,519	5,533,900	5,537,178	5,540,914	5,546,859
5,522,024	5,525,075	5,528,115	5,530,583	5,533,924	5,537,586	5,541,153	5,546,949
5,522,154	5,525,195	5,528,166	5,530,792	5,534,041	5,537,936	5,541,183	5,547,051
5,522,202	5,525,541	5,528,271	5,531,470	5,534,120	5,538,413	5,541,227	5,547,325
5,522,832	5,525,697	5,528,532	5,532,029	5,534,150	5,538,798	5,541,453	5,547,567
5,522,871	5,525,788	5,528,663	5,532,101	5,534,335	5,538,876	5,541,560	5,547,648
5,523,446	5,526,019	5,528,666	5,532,250	5,534,340	5,539,019	5,542,227	5,547,734
5,523,530	5,526,123	5,528,703	5,532,260	5,534,354	5,539,074	5,542,367	5,548,593
5,523,533	5,526,379	5,529,137	5,532,287	5,534,488	5,539,180	5,542,994	5,549,104
5,523,833	5,526,403	5,529,380	5,532,431	5,535,061	5,539,758	5,543,758	5,550,073
5,523,857	5,526,524	5,529,864	5,532,729	5,535,512	5,539,900	5,544,324	5,550,436
5,524,071	5,526,932	5,529,873	5,532,799	5,535,625	5,539,911	5,544,587	5,550,929
5,524,075	5,526,977	5,530,118	5,532,945	5,535,997	5,539,930	5,544,643	5,551,053
5,524,088	5,527,545	5,530,224	5,532,950	5,536,281			

3510-16

## DEPARTMENT OF COMMERCE

## Patent and Trademark Office

[Docket #: 950411100-6267-02]

RIN 0651-XX01

**Extension of the Payor Number Practice  
(through "Customer Numbers") to Matters Involving  
Pending Patent Applications**

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Notice of Change in Procedure.

**SUMMARY:** The Patent and Trademark Office (PTO) is extending the Payor Number practice to matters involving pending patent applications. Payor Numbers are currently used to establish a "fee address" for receipt of maintenance fee correspondence. Through the use of "Customer Numbers," the PTO will extend the Payor Number practice to matters involving patent applications. Under this Customer Number practice, an applicant (or patentee) will be able to use a Customer Number to: (1) designate the address associated with the Customer Number as the correspondence address for an application (or patent); (2) designate the address associated with the Customer Number as the fee address (37 CFR 1.363) for a patent; and (3) submit a power of attorney in the application (or patent) to the registered practitioners associated with the Customer Number. The change of either the address or practitioners having a power of attorney in multiple patent applications through a single paper directed to the Customer Number should result in savings to the attorney, agent, or law firm, as well as the PTO.

**EFFECTIVE DATE:** November 1, 1996. Any request to change the correspondence address of a pending application to the address associated with a currently assigned Payor Number filed before November 1, 1996 will not be effective until November 1, 1996.

**FOR FURTHER INFORMATION CONTACT:** Robert W. Bahr by telephone at (703) 305-9285 or by facsimile at (703) 308-6916, or by mail addressed to Box Comments-Patents, Assistant Commissioner for Patents, Washington, D.C. 20231.

**SUPPLEMENTARY INFORMATION**

Payor Numbers are currently used to establish a "fee address" for receipt of maintenance fee correspondence. Such Payor Numbers permit, *inter alia*, an attorney, agent or law firm to file a single change of address paper for the Payor Number, and this change of address is effective for every patent designating the address associated with the Payor Number as the correspondence address for the patent. This Payor Number practice avoids the filing of a separate change of address paper for every patent affected by the change of address.

In a Notice entitled "Extension of the Use of Payor Numbers to Matters Involving Pending Patent Applications" (Payor Number Notice), published in the Federal Register at 60 FR 26026-28 (May 16, 1995), and in the PTO Official Gazette at 1175 Off. Gaz. Pat. Office 14-15 (June 6, 1995), the PTO proposed to extend the current



Payor Number practice to matters involving pending patent applications. In view of the comments received in response to the Payor Number Notice, the PTO is adopting the following "Customer Number" practice.

Currently assigned "Payor Numbers" will be redesignated as "Customer Numbers" to avoid requiring persons or organizations currently assigned a Payor Number to request a "new" Customer Number. Thus, persons or organizations currently assigned a "Payor Number" should not request a new "Customer Number." Persons or organizations not currently assigned a Payor Number can request assignment of "new" Customer Numbers.

The PTO has created a box designation for correspondence related to a Customer Number ("Box CN"), and all correspondence related to a Customer Number (e.g., requests for a Customer Number) should be addressed to this box designation.

The PTO will provide standard forms to: (1) request a Customer Number (PTO/SB/125); (2) request a change in the data (address or list of practitioners) associated with an existing Customer Number (PTO/SB/124); (3) change the correspondence address of an individual application (PTO/SB/122) or patent (PTO/SB/123) to the address associated with a Customer Number; or (4) change the correspondence address of a list of applications or patents to the address associated with a Customer Number (PTO/SB/121). The PTO is also modifying its current standard forms (e.g., the declaration form) to permit: (1) the designation of the address associated with the Customer Number as the correspondence address for an application; (2) designation of the address associated with the Customer Number as the fee address for a patent; and (3) the submission of a power of attorney in the application to the practitioners associated with the Customer Number. The forms provided by the Office may be obtained by contacting the Customer Service Center of the Office of Initial Patent Examination at (703) 308-1214. Also, many standard forms have been loaded on the PTO's Internet Website and may be electronically copied via the Internet through anonymous file transfer protocol (ftp) (address: ftp.uspto.gov). While use of the standardized forms provided by the PTO is encouraged, it is not mandatory.

This notice of change in procedure contains a collection of information subject to the Paperwork Reduction Act of 1995, 44 U.S.C. 3501 *et seq.* This collection of information is currently approved by the Office of Management and Budget under Control No. 0651-0035. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Office of System Quality and Enhancement, Data Administration Division, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503 (ATTN: Paperwork Reduction Act Project 0651-0035).

Notwithstanding any other provision of law, no person is required to respond to nor shall any person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB control number.

The PTO will also accept requests submitted electronically via a computer-readable diskette to: (1) change the correspondence address of a list of applications or patents or the fee address for a list of patents to the address associated with a Customer Number; and (2) submit a power of attorney in a list of applications or patents to the registered practitioners associated with the Customer Number. Persons electronically

submitting such a request must submit an IBM-compatible diskette containing a Microsoft Excel spreadsheet, or a comma separated text file which can be imported into Microsoft Excel spreadsheet, formatted as follows: (1) row 1, column B containing the six-digit Customer Number; (2) row 2 being blank; (3) rows 3 through 9 containing the address associated with the Customer Number; (4) rows 10 through 15 being blank; and (5) row 16 starting with the list of patents or applications with column A containing the patent number (if appropriate), column B containing the application number, column C containing the patent date (if appropriate), column D containing the application filing date, column E indicating "YES" or "NO" to designate assignment of the address associated with the Customer Number as the correspondence address of the application or patent, column F indicating "YES" or "NO" to designate assignment of the registered practitioners associated with the Customer Number as the list of persons having a power of attorney in the applications or patents, and column G indicating "YES" or "NO" to designate assignment of the address associated with the Customer Number as the fee address of the patent.

The patent number (if appropriate), application number, patent date (if appropriate), and application filing date are being required as redundant identifiers to avoid changing the correspondence or fee address or entering a power of attorney in the wrong patent or application due to a typographical error in the patent or application number. The PTO will enter a change in correspondence or fee address or power of attorney in a listed application or patent only if the following identifiers are provided: (1) the patent number and the corresponding application number; (2) the patent number and the corresponding patent date; (3) the application number and the corresponding filing date; (4) the patent number and the corresponding application filing date; and (5) the application number and the corresponding patent date.

A sample spreadsheet is included as an Appendix A to this notice of change in procedure. The phrase "Customer Number" in row 1, column A, and "Requester (Attorney/Firm) Information" in row 3, as well as the information provided in rows 10 through 15, are provided on the sample spreadsheet for explanatory purposes only, and should not be included on any spreadsheet submitted to the PTO.

The diskette must be accompanied by a paper copy of the spreadsheet and a cover letter requesting entry of the changes contained on the spreadsheet into PTO records for the listed applications or patents. In addition, for any application or patent listed on such spreadsheet, the cover letter must be signed by the applicant or patentee, assignee in compliance with 37 CFR 3.73(b), or registered practitioner of record in the patent or application. The PTO will issue a written confirmation of the list of applications or patents indicating the change(s) entered into PTO records.

Through the use of "Customer Numbers," the PTO is extending the "fee address" practice to matters involving pending patent applications to permit: (1) the designation of the correspondence address of a patent application by a Customer Number such that the correspondence address for the patent application would be the address associated with the Customer Number; (2) the designation of the fee address of a patent by a Customer Number such that the fee address for the patent would be the address associated with the Customer Number; and (3) the submission of a list of practitioners by a Customer Number such that an applicant may in a Power of Attorney appoint those practitioners associated with the Customer Number. While this notice discusses this new Customer Number practice as it regards patent applications and applicants, it will apply equally to patents and patentees.

The designation in a patent application of a specific Customer Number as the correspondence address for such application will permit an attorney, agent or law firm to file a single paper containing a change of address, rather than a separate paper in each application, and this change of address paper will be applicable to all applications designating the Customer Number as the correspondence address for such application. The designation of a Customer Number as the correspondence address for a patent application is optional, in that any application not designating a Customer Number as the correspondence address will not be affected by a change of address filed for a Customer Number, even if the correspondence address provided for such application is that of an attorney, agent, or law firm associated with a Customer Number. The change of address in multiple patent applications through a single paper directed to the Customer Number, rather than through individual letters directed to each application, will result in savings to the attorney, agent or law firm, as well as the PTO.

This new Customer Number practice will not affect the current practice of permitting a patentee to provide a "fee address" for the receipt of maintenance fee correspondence. A patentee will be able to designate a "fee address" for the receipt of maintenance fee correspondence, and a different address for the receipt of all other correspondence. The designation of a "fee address" by reference to a Customer Number will not affect or be affected by the designation of a correspondence address by reference to another Customer Number, in that the PTO will send maintenance fee correspondence to the address associated with the Customer Number designated as the "fee address" and will send all other correspondence to the address associated with the Customer Number designated as the correspondence address.

The association of a list of practitioners with a Customer Number will permit an applicant to appoint all of the practitioners associated with the Customer Number merely by reference to the Customer Number in the Power of Attorney (i.e., without individually listing the practitioners in the Power of Attorney). The addition and/or deletion of a practitioner from the list of practitioners associated with a Customer Number will result in the addition or deletion of such practitioner from the list of persons authorized to represent any applicant who appointed all of the practitioners associated with such Customer Number. This will avoid the necessity for the filing of additional papers in each patent application affected by a change in the practitioners of the law firm prosecuting the application. The appointment of practitioners associated with a Customer Number will be optional, in that any applicant may continue to individually name those practitioners to represent the applicant in a patent application.

Currently, the PTO must individually enter into the Patent Application Location and Monitoring (PALM) system the registration number for each practitioner appointed to represent the applicant in a patent application. The change of persons authorized to represent applicants in multiple patent applications through a single paper directing the PTO to change its records concerning the Customer Number will require only a single entry into the PALM system, where the change of persons authorized to represent applicants in multiple patent applications through individual letters directed to each application require a separate entry into the PALM system for each affected application. Thus, the use of Customer Numbers in a Power of Attorney will significantly reduce the amount of data which must be entered into the PALM system, and would thus result in savings to the PTO. In addition, permitting a change of persons authorized to represent applicants in multiple patent applications through a single paper directing the PTO to change its records concerning the Customer Number would result in similar savings to the attorney, agent, or law firm.

As the PTO will not recognize more than one correspondence address (37 CFR 1.34(c)), any inconsistencies between the correspondence address resulting from a Customer Number being provided in an application for the correspondence address and any other correspondence address provided in that application would be resolved in favor of the address of the Customer Number. Where an applicant appoints all of the practitioners associated with a Customer Number as well as a list of individually named practitioners, such action would be treated as only an appointment of all of the practitioners associated with a Customer Number due to the potential for confusion and data entry errors in entering registration numbers from plural sources.

The following are examples of language effective to provide as the correspondence address the address of, and appoint those practitioners associated with, a Customer Number:

1. The following language would be effective to appoint those practitioners individually listed, and provide as the correspondence address the address of Customer Number 99,999:

I hereby appoint the following practitioners to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

John Doe, Registration No. 99,991, Jane Doe, Registration No. 99,992 and Richard Doe, Registration No. 99,993.

Address all correspondence to: Customer Number 99,999.

2. The following language would be effective to appoint those practitioners associated with, and provide as the correspondence address the address of, Customer Number 99,999:

I hereby appoint the practitioners associated with the Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and direct that all correspondence be addressed to that Customer Number:

Customer Number 99,999.

#### Response to Comments

Eleven comments were received in response to the Payor Number Notice. The written comments have been analyzed, and responses to the comments follow.

**Comment (1):** Ten comments supported the proposed extension of use of the Payor Number practice to matters involving pending patent applications.

**Response:** In view of the positive response to this proposed extension of use of the Payor Number practice to matters involving pending patent applications, the PTO is extending the Payor Number practice to matters involving pending patent applications.

**Comment (2):** One comment opposed combining the maintenance fee Payor Number with the practitioner responsible for the application or patent. The comment argued that, in many instances, a client instructs a practitioner that a particular service organization is responsible for the payment of maintenance fees, and, while the practitioner continues as counsel of record and receives correspondence unrelated to maintenance fees (e.g., reexamination or interference notices), the client advises that



the practitioner is no longer responsible for payment of the maintenance fees or even reminding the client of the due date for paying such fees.

**Response:** As discussed *supra*, the implemented "Customer Number" practice will not affect the current practice of providing a "fee address" for correspondence relating to the payment of maintenance fees. While the current "Payor Numbers" will be redesignated as "Customer Numbers," a patentee will be permitted to specify a "fee address" by reference to one Customer Number (e.g., the Customer or Payor Number of a maintenance fee service organization) and a correspondence address by reference to another Customer Number (e.g., the Customer Number of the attorney or agent of record). Designating a "fee address" for maintenance fee payment purposes, by Customer Number or otherwise, will not affect the correspondence address for correspondence unrelated to maintenance fees, regardless of whether the correspondence address is also specified by a Customer Number. Likewise, providing a "fee address" for maintenance fee payment purposes, by Customer Number or otherwise, will not affect any previous appointments of practitioners.

**Comment (3):** One comment cautioned that sufficient safeguards be built into the system to avoid errors. Specifically, the comment cautioned that: (1) a data entry error in the Customer Number in one application (a key field error) would result in correspondence for that application being sent to an entirely different address; (2) a single error in the look-up data base would result in correspondence for every application designating a particular Customer Number being sent to an entirely different address; and (3) an indexing or programming error affecting the entire look-up data base could result in correspondence for every application designating any Customer Number being sent to an entirely different address.

**Response:** Currently, the application number is entered into the PALM data base to look-up the actual address (i.e., the application number is a key field). Thus, the risk of error in the improper entry of a Customer Number is no greater than the current risk of error in the improper entry of an application number. Nevertheless, the PTO endeavors to reduce such errors by requiring that employees check the returned application data.

To avoid errors in information associated with a Customer Number, the PTO will double enter the Customer Number anytime there is a change to the information associated with the Customer Number. In addition, the PTO is in the process of developing Customer Number bar code labels for use on incoming requests for changes to the information associated with a Customer Number to permit scanning and reduce data entry errors.

In any event, errors in the look-up data base would result in correspondence for every application designating a particular Customer Number being sent to an entirely different address, and indexing or programming errors affecting the entire look-up data base could result in correspondence for every application designating any Customer Number being sent to an entirely different address. These errors would result in mismailings of such magnitude that it would be readily apparent to the attorney, agent or law firm of the Customer Number, if not the PTO, that an error has occurred.

**Comment (4):** Three comments suggested that registration numbers be used as Customer Numbers.

**Response:** The suggestion has not been adopted. The PTO currently has a data base of addresses (i.e., fee addresses) associated with the current Payor Numbers that

will be redesignated as "Customer Numbers." To avoid an adverse impact on the current fee address practice, the Customer Number practice is being implemented using the existing fee address data base. Thus, the PTO cannot use registration numbers as Customer Numbers since newly assigned Customer Numbers must be compatible with the existing Payor Numbers.

**Comment (5):** One comment suggested that a Power of Attorney be permitted to include the practitioners associated with a Customer Number and no more than one additional practitioner. The comment argued that clients will desire to name a responsible person in the Power of Attorney, and that this would also be helpful in the event that a practitioner withdraws from a law firm and the client continues with that practitioner. The comment cautioned that if this is not permitted, each practitioner will establish his or her own Customer Number, resulting in the appointment of a large number of Customer Numbers.

**Response:** The comment is adopted only to the extent indicated. To accommodate the desire of a client to see the responsible person mentioned by name in the Power of Attorney, a Power of Attorney appointing the practitioners associated with a specific Customer Number may also specifically mention any of the practitioners associated with such Customer Number. This mention may designate the responsible practitioner(s) as the principal attorney(s) or agent(s) in the application. In a Power of Attorney appointing those practitioners associated with a Customer Number, the specific mentioning of practitioner(s) will be ineffective to appoint a practitioner not associated with the Customer Number.

As discussed *supra*, the entry of a single Customer Number, rather than the individual registration number of each practitioner, into the PALM system is a primary benefit of permitting the appointment of a list of practitioners by Customer Number. As the individually listed practitioner is ostensibly among those practitioners associated with the Customer Number provided in the Power of Attorney, requiring the PTO to enter the individual registration numbers of a list of practitioners associated with a Customer Number, as well as the Customer Number, would frustrate this benefit. Thus, the PTO will treat such an appointment as an appointment of only those practitioners associated with the Customer Number.

Customer Numbers are designed to serve the dual purpose of providing a correspondence address, and providing the list of practitioners appointed with a power of attorney. Due to the prohibition against dual correspondence (37 CFR 1.33(a)), an applicant will be permitted to provide only a single number at a time as the Customer Number, and thus correspondence address, for the application. In an instance in which an applicant provides more than one Customer Number, the last provided Customer Number is controlling. Thus, the appointment of a plurality (much less a large number) of Customer Numbers will result in the PTO recognizing only the last mentioned Customer Number. Applicants are strongly cautioned not to attempt to appoint more than one Customer Number in a single communication, as such action will not have a cumulative effect.

**Comment (6):** Three comments suggested that in this new context, the term "Payor Number" could cause confusion, and would be demeaning to applicants and their representatives.

**Response:** In view of these comments, the term "Customer Number" has been used to describe the number having an address or a list of practitioners associated with such number. The term "Payor Number" was used in the Payor Number Notice as this term

had a specific meaning with regard to the "fee address" for maintenance fee correspondence, and thus served to provide a frame of reference for the extension of such practice.

**Comment (7):** One comment suggested that the form of appointment refer to registered practitioners, rather than attorneys and agents.

**Response:** The PTO does not require any specific form of appointment (*i.e.*, the forms of appointment in the Payor Number Notice were merely exemplary). Nevertheless, the phrase "practitioner" is defined in 37 CFR 10.1(r), and "registered practitioners" is considered preferable to "attorneys or agents" or "attorneys and agents." As such, the PTO will change its standardized forms of appointment to refer to "registered practitioners."

**Comment (8):** One comment questioned the form and effect of an appointment of all practitioners associated with a Customer Number. The comment specifically questioned whether the practitioner would have to obtain a new power of attorney in a situation in which: (1) a practitioner is associated with the Customer Number of a law firm, and is thus appointed in every application appointing the practitioners associated with that Customer Number; (2) the practitioner subsequently leaves the law firm; and (3) an applicant in an application appointing the practitioners associated with the law firm's Customer Number continues with the practitioner leaving the law firm.

**Response:** The practitioner should obtain a new power of attorney to continue to have a power of attorney in the application. An appointment in an application of the practitioners associated with a particular Customer Number is the appointment of each of the practitioners associated with that Customer Number at the time any practitioner associated with such Customer Number seek to act for the applicant. With such an appointment, a practitioner is of record until removed from the Customer Number (*i.e.*, until the practitioner is no longer associated with the Customer Number). As the practitioner's former law firm should promptly remove such practitioner from the list of practitioners associated with the law firm's Customer Number, a new power of attorney will be necessary for the practitioner to continue to have a power of attorney in the application.

In an instance in which a particular practitioner in a law firm has a significant number of clients who are clients of the practitioner rather than the law firm (*i.e.*, clients who would prefer to be represented by the practitioner, rather than the law firm, in the event that the practitioner left the law firm), such practitioner should consider establishing a Customer Number separate from the law firm's Customer Number. This would permit the clients of the practitioner to appoint a power of attorney to the practitioners associated with the practitioner's, rather than the law firm's, Customer Number. The practitioner can list any or all of the practitioners in the law firm as practitioners associated with the Customer Number, and can change the practitioners associated with the Customer Number in the event that the practitioner left the law firm. This would avoid the necessity for a new power of attorney in the event that the practitioner leaves the law firm.

**Comment (9):** One comment suggested that the proposed practice be extended to trademark applications.

**Response:** The suggestion has been forwarded to the Assistant Commissioner for Trademarks for consideration.

**Comment (10):** One comment suggested that procedures be adopted such that this number could be utilized informally to identify the source of documents such as drawings, certified copies, *etc.*, by including this number on the back of the document.

**Response:** There is no prohibition against using a Customer Number on the back of a document to informally identify the source of the document. That is, while 37 CFR 1.52(b) and 1.84(e) provide that the application papers contain writing or drawings only on one side of a sheet, these provisions are directed to the writing and drawings forming the application papers. Thus, the inclusion of identifying information on the back of a sheet simply results in that information not being considered part of the application papers. However, the inclusion of a Customer Number to informally identify the source of a document is not a substitute for the inclusion on the document of the application number to which the document is directed. In addition, a telephone number should also be provided on such document, as the Customer Number will not provide the telephone number (but only the address) of the source of the document.

**Comment (11):** One comment suggested that the PTO update the address of all registered practitioners in the Office of Enrollment and Discipline (OED) index by a change in the Customer Number address.

**Response:** The suggestion has been forwarded to OED for consideration.

Dated: October 15, 1996

Bruce A. Lehman  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks



▼ MISC87 163506 23:09:06 15-OCT-96

Summary of Final Decisions  
Issued by the  
Trademark Trial and Appeal Board  
August 19-23, 1996

Date Issued	Type of Case <sup>(1)</sup>	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Pritioner's Mark and Goods/Services	Applicant's/Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
8-19	EX	74/330,564	U.S. Healthcare, Inc.	2(d)	Refusal Affirmed		"HEALTHY EATING LIFESTYLE PROGRAM" [health care services, namely, individualized consultation in the field of diet and nutrition, excluding psychiatric and psychological consultation for eating disorders, provided to members of applicant's health care plans]	"HEALTHY EATING LIFESTYLE PROGRAM" [psychiatric and psychological counselling services for the treatment of individuals with eating disorders]	No
8-20	EX (R)	74/393,436	BC Int'l. Cosmetic & Image Services, Inc.	2(e)(1)	Request for Reconsideration Denied (Refusal Affirmed)		"BODY GLUE" [adhesives to affix clothing to the skin]		No
8-20	EX	74/472,582	Friedman's Inc.	2(d)	Refusal Affirmed		"REGENCY JEWELERS" [retail jewelry stores]	"THE HELBROS REGENCY" [watches]	No
8-21	EX	74/298,034	Sport Fun, Inc.	2(d)	Refusal Affirmed		"FUTURE PRO" [volleyball sets, hockey sticks for hockey, punching bags and floor stands for punching bags]	"FUTURE PRO" [golf clubs]	No
8-21	EX	74/356,809	Eidetics Int'l.	2(e)(1)	Refusal Reversed		"VIRTUAL RADAR" [flight training software]		No
8-21	EX	74/480,441	Progressive Games, Inc.	whether the matter asserted for registration functions as a service mark or, rather, only as a telephone number; whether the matter asserted for registration is used to identify and distinguish the services recited in the registration; 2(e)(1)	Refusal Affirmed		"1-800-759-GAME" [casino gaming services]		No

(1) EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SI)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION

## SPECIAL BOXES FOR PATENT MAIL

Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

Please address mail as follows:

Box \_\_\_\_\_  
Assistant Commissioner for Patents  
Washington, D.C. 20231

Box Designations	Explanation
Box 7 Box 12 Box 313b	Reissue applications for patents involved in litigation and subsequently filed related papers. Contributions to the Examiner Education Program. Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF Box Comments Patents Box DAC	Expedited procedure for processing amendments and other responses after final rejection. Public comments regarding patent related regulations and procedures.
Box DD Box FWC Box Interference Box Issue Fee	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees. Disclosure Documents or materials related to the Disclosure Document Program. Requests for File Wrapper Continuation Applications (under 37 CFR 1.62). Communications relating to interferences and applications and patents involved in interference. All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box Missing Parts Box MPEP Box Non-Fee Amendment Box PATENT APPLICATION Box Patent Ext. Box PCT Box Provisional Patent Application Box Reconstruction Box Reexam Box Sequence Box SN	Response to the Notice to File Missing Parts of Application and associated papers and fees. Submissions concerning the Manual of Patent Examining Procedures. Non-fee amendments to patent applications. (Use Box AF for responses after final rejection). New patent applications and associated papers and fees. Applications for patent term extension and any communications relating thereto. Mail related to applications filed under the Patent Cooperation Treaty. The filing of all provisional patent applications and any communications relating thereto. Correspondence pertaining to the reconstruction of lost patent files. Requests for Reexamination for original request papers only. Submission of diskette for biotechnical application. For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications prior to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

## SPECIAL BOXES FOR TRADEMARK MAIL

Special box designations should be used to allow forwarding of particular types of trademark mail to the appropriate areas as quickly as possible. In addition to these box designations, filers are encouraged to indicate whether the contents of the envelope contain a fee. Envelopes containing a fee should be marked "FEE;" envelopes not containing a fee should be marked "NO FEE." Box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document.

Please address mail as follows:

Box \_\_\_\_\_  
FEE (or NO FEE)  
Assistant Commissioner for Trademarks  
2900 Crystal Drive  
Arlington, Virginia 22202-3513

Box Designations	Explanation
Box NEW APP FEE Box ITU FEE Box TTAB FEE Box TTAB NO FEE Box STATUS NO FEE Box POST REG FEE Box RESPONSES NO FEE	New trademark applications and fees. Statements of Use (SOU) and extension requests. Oppositions, cancellation petitions, and ex parte appeals. Interferences, motions, and extension requests. Written status inquiries. Affidavits, renewals, corrections and amendments. Responses to Examining Attorneys' Office actions and Post Registration actions.

## SPECIAL BOXES APPLICABLE TO BOTH PATENT AND TRADEMARK MAIL

The following special box designations are applicable to both patent and trademark related mail, and the recommendations for "Special Boxes for Patent Mail" (above) should be followed for the types of mail listed below.

Please address mail as follows:

Box _____ Commissioner of Patents and Trademarks Washington, D.C. 20231	
Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor <i>except</i> communications relating to <i>pending litigation and disciplinary proceedings</i> ; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box M Fee	Correspondence regarding patent maintenance fees and related matter.
Box OED	Mail for the Office of Enrollment and Discipline.

Reference Collections of U.S. Patents and Trademarks  
Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs have both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

State	Name of Library	Telephone Contact
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4500
	Sunnyvale Center for Innovation, Invention and Ideas	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6249
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
Iowa	West Lafayette Siegesmund Engineering Library, Purdue University	(317) 494-2872
Kansas	Des Moines: State Library of Iowa	(515) 281-4118
Kentucky	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Louisiana	Louisville Free Public Library	(502) 574-1611
	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
Michigan	Boston Public Library	(617) 536-5400 Ext. 265
	Ann Arbor: Media Union Library, University of Michigan	(313) 647-5735
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit: Great Lakes Patent and Trademark Center	(313) 833-3379
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	(601) 359-1036
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
Montana	St. Louis Public Library	(314) 241-2288 Ext. 390
	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6500 Ext. 257
New Hampshire	Concord: New Hampshire State Library	(603) 271-2239
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-5355
	Buffalo and Erie County Public Library	(716) 858-7101



## Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries—(continued)

State	Name of Library	Telephone Contact
North Carolina North Dakota Ohio	New York Public Library (The Research Libraries) .....	(212) 592-7000
	Raleigh: D.H. Hill Library, North Carolina State University.....	(919) 515-3280
	Grand Forks: Chester Fritz Library, University of North Dakota.....	(701) 777-4888
	Akron - Summit County Public Library.....	(303) 643-9075
	Cincinnati and Hamilton County, Public Library of.....	(513) 369-6936
	Cleveland Public Library .....	(216) 623-2870
	Columbus: Ohio State University Libraries .....	(614) 292-6175
Oklahoma	Toledo/Lucas County Public Library .....	(419) 259-5212
	Stillwater: Oklahoma State University Center for International Trade Development .....	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College .....	(503) 768-6786
Pennsylvania	Philadelphia: The Free Library of .....	(215) 686-5331
	Pittsburgh: Carnegie Library of .....	(412) 622-3138
Puerto Rico Rhode Island South Carolina South Dakota	University Park: Pattee Library, Pennsylvania State University .....	(814) 865-4861
	Mayaguez General Library, University of Puerto Rico .....	(787) 832-4040 Ext. 3459
	Providence Public Library.....	(401) 455-8027
	Clemson University Libraries .....	(803) 656-3024
Tennessee	Rapid City: Devereaux Library, South Dakota .....	(605) 394-6822
	School of Mines and Technology .....	(605) 394-6822
Texas	Memphis & Shelby County Public Library and Information Center .....	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University .....	(615) 322-2775
	Austin: McKinney Engineering Library, University of Texas at Austin .....	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University .....	(409) 845-3826
	Dallas Public Library .....	(214) 670-1468
Utah Virginia	Houston: The Fondren Library, Rice University .....	(713) 527-8101 Ext. 2587
	Lubbock: Texas Tech University .....	Not Yet Operational
	Salt Lake City: Marriott Library, University of Utah.....	(801) 581-8394
	Richmond: James Branch Cabell Library, Virginia Commonwealth University .....	(804) 828-1104
Washington West Virginia Wisconsin	Seattle: Engineering Library, University of Washington.....	(206) 543-0740
	Morgantown: Evansdale Library, West Virginia University .....	(304) 293-2510
	Madison: Kurt F. Wendt Library, University of Wisconsin .....	(608) 262-6845
	Milwaukee Public Library.....	(414) 286-3051
Wyoming	Casper: Natrona County Public Library .....	(307) 237-4935

## PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner  
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents  
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents  
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100— JOHN E. KITTLE, Director .....	308-0661	11/10/94
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director.....	308-1235	07/25/94
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director .....	308-0651	09/22/94
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director .....	308-2351	02/02/95
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director .....	308-0196	08/19/94
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director .....	308-1782	10/25/94
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director .....	308-0511	02/28/95
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300— BOBBY R. GRAY, Director .....	305-9600	11/11/93
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director .....	305-3800	08/29/94
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500— JANICE A. HOWELL, Director .....	308-0956	03/03/95
TELECOMMUNICATIONS, GROUP 2600—NICHOLAS P. GODICI, Director .....	305-4700	01/20/95
DESIGN, GROUP 2900—JOHN E. KITTLE, Director .....	308-0661	02/27/95
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director .....	308-1113	06/07/94
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director .....	308-1148	11/17/94
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director .....	308-0858	07/03/95
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director .....	308-0861	06/02/95
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director .....	308-1021	11/07/94

\*A communication from the examiner should have been received in most applications filed prior to this date.

## Patents will Expire as Follows:

- (1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
  - (2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
  - (3) All design patents are granted for a term of 14 years from the date of the grant.
- However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

## TRADEMARK OPERATION

Bruce A. Lehman, Commissioner  
 Phillip G. Hampton, II, Assistant Commissioner  
 Robert M. Anderson, Deputy Assistant Commissioner  
 David E. Bucher, Director, Trademark Examining Office  
 Condition of Trademark Applications as of September 1, 1996

	Oldest Date	
	New*	Amendment Filed
Law Office		
Law Office 101—Ron Williams, Managing Attorney, (703) 308-9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	10/29/96	07/01/96
Law Office 102—Myra Kurzbar, Managing Attorney, (703) 308-9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	02/15/96	03/14/96
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308-9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	03/04/96	07/15/96
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308-9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	03/07/96	06/03/96
Law Office 105—Thomas Howell, Managing Attorney, (703) 308-9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	03/28/96	06/03/96
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308-9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	03/07/96	03/25/96
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308-9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	03/19/96	04/15/96
Law Office 108—David Shallant, Managing Attorney, (703) 308-9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	04/15/96	04/19/96
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308-9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	05/14/96	06/10/96
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—Teron Simms, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126 Affidavits Under Sections 8 & 15 (All Classes)..... Renewals (All Classes)..... Section 12(c) Publications (All Classes).....	02/20/96 07/08/96 03/20/96	—0— —0— —0—

1. \*\* Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305-8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. \* These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

## REEXAMINATIONS

OCTOBER 29, 1996

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in *italics* indicates additions made by reexamination.

B1 3,911,138 (3031st)  
**ARTIFICIAL BLOOD AND METHOD FOR SUPPORTING OXYGEN TRANSPORT IN ANIMALS**  
 Leland C. Clark, Jr., Cincinnati, Ohio, assignor to Children's Hospital Medical Center, Cincinnati, Ohio  
 Reexamination Request Nos. 90/001,811, Jul. 21, 1989 and 90/002,928, Dec. 24, 1992.  
 Reexamination Certificate for , issued Oct. 7, 1975, Ser. No. 335,454, Feb. 26, 1973.  
 Int. Cl.<sup>6</sup> A61K 31/025

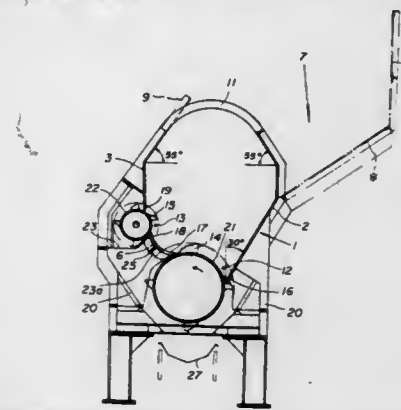
U.S. Cl. 514—746  
 AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 11-12 is confirmed.

Claims 1-10 and 13-19 are cancelled.

11. The method of claim 8 further comprising the step of exposing the animal lungs to an outside environment comprising a perfluorocyclocarbon vapor.

B1 4,691,750 (3032nd)  
**BARKING MACHINE**  
 Junichi Nakajima, Shizuoka, Japan, assignor to Fuji Kogyo Kabushiki Kaisha, Fujieda, Japan  
 Reexamination Request No. 90/003,633, Nov. 14, 1994.  
 Reexamination Certificate for Patent 4,691,750, issued Sep. 8, 1987, Ser. No. 889,923, Jul. 25, 1986.  
 Claims priority, application Japan, Dec. 25, 1985, 60-296587  
 Int. Cl.<sup>6</sup> B27C 9/00  
 U.S. Cl. 144—208.9



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 2, 3 and 7 are cancelled.

Claims 1, 4 and 6 are determined to be patentable as amended.

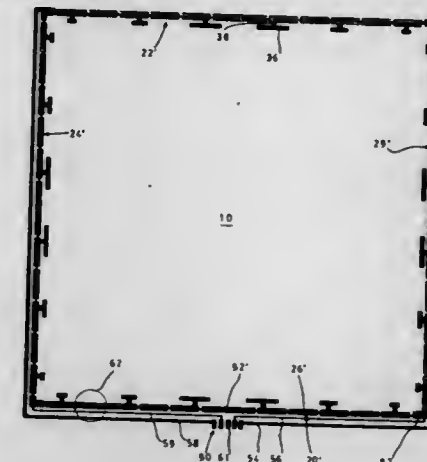
Claims 5 and 8 dependent on an amended claim, are determined to be patentable.

New claims 9, 10 and 11 are added and determined to be patentable.

1. A barking machine for removing bark from logs, comprising a container for receiving said logs to be debarked, having a lengthwise opening a width of which is formed [and at] from a lower portion to a side portion thereof,

said lengthwise opening continuously extending from a log-infeeding side of said container to a log-outfeeding side thereof,  
 a transfer guide plate disposed in said opening and having lengthwise sides extending from said log-infeeding side to said log-outfeeding side,  
 a plurality of notches formed on both lengthwise sides of said opening and said lengthwise sides of said transfer guide plate, a cylindrical lower rotor [and a side rotor, each said rotor] having a circumferential surface which extends from said log-infeeding side to said log-outfeeding side and has a plurality of protruding barking blades [which pass through said notches,] formed thereon,  
 a cylindrical side rotor extending along said lower rotor, and having a circumferential surface which continuously extends from said log-infeeding side to said log-outfeeding side and has a plurality of barking blades formed thereon,  
 said [rotors] lower rotor and said side rotor being partially inserted from the outside of said container into said opening on opposite sides of said transfer guide plate, a longitudinal portion of said circumferential surface of said side rotor continuously projecting into said container through said opening from said log-infeeding side to said log-outfeeding side,  
 said respective barking blades of said lower rotor and said side rotor passing through corresponding said notches,  
 said lower rotor being rotated so that its barking blades move said logs toward said transfer guide plate, and  
 said side rotor being rotated so that said barking blades move upwardly  
 wherein rotation of said side rotor within said container precludes jamming of the logs between the plurality of barking blades on said side rotor.

B1 4,731,508 (3033rd)  
**ELECTROGRAPHIC TOUGH SENSOR HAVING REDUCED BOW OF EQUIPOTENTIAL FIELD LINE THEREIN**  
 William A. Gibson, Knox County; John E. Talmage, Jr., and John W. T. Dabbs, both of Anderson County, all of Tenn., assignors to Elographics, Inc., Anderson, Tenn.  
 Reexamination Request No. 90/004,005, Oct. 16, 1995.  
 Reexamination Certificate for Patent 4,731,508, issued Mar. 15, 1988, Ser. No. 870,848, Jun. 5, 1986.  
 Continuation-in-part of Ser. No. 685,348, Dec. 24, 1984, Pat. No. 4,661,655.  
 Int. Cl.<sup>6</sup> G08C 21/00  
 U.S. Cl. 178—18





AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-23 is confirmed.

1. A position touch sensor having resistive electrodes which provides a linear output response over an enhanced proportion of the surface area of said sensor by reducing the bow of equipotential lines along edges of said sensor, which comprises:

a resistive layer having a selected substantially uniform resistivity throughout said layer, said resistive layer defining perimeter edges;

a resistance element positioned proximate each of said perimeter edges of said resistive layer for providing orthogonal electrical fields to said resistive layer, each of said resistance elements having opposite ends joined to proximate ends of adjoining resistance elements, each of said resistance elements comprising a plurality of substantially identical discontinuous units in electrical contact with said resistive layer, each of said units formed by at least one line of conductive material spaced from a line of conductive material of an adjacent unit to define a separation gap of a selected width and length whereby said width and length of said gap and said resistivity of said resistive layer establish a unit resistance value for said units;

a plurality of electrodes positioned on, and electrically connected to, said layer along a preselected symmetrical path proximate each perimeter edge of said layer, said electrodes each being electrically connected to selected positions along said resistance elements and having a selected center-to-center spacing and each electrode having an effective length along said path, said length and spacing of said electrodes, and said positions of connection of said resistance elements selected to produce a selected voltage gradient along said path of said electrodes to compensate for any voltage drop along said resistance element during operation of said sensor when said orthogonal fields are introduced into said resistive layer whereby said bow is reduced; and means for deriving output signals corresponding to coordinates of a selected point on said resistive layer.

B1 4,831,230 (3034th)

#### SURFACE SHAPING AND FINISHING APPARATUS AND METHOD

Jerome H. Lemelson, Metuchen, N.J., assignor to Bankers Trust Company, New York, N.Y.

Reexamination Request No. 90/003,065, May 24, 1993.

Reexamination Certificate for Patent 4,831,230, issued May 16, 1989, Ser. No. 936,484, Nov. 26, 1986.

Continuation of Ser. No. 647,897, Sep. 6, 1984, abandoned, which is a continuation of Ser. No. 571,188, Apr. 24, 1975, abandoned, which is a continuation of Ser. No. 163,203, Jul. 16, 1971, abandoned, which is a continuation of Ser. No. 849,013, Aug. 11, 1969, abandoned, which is a continuation-in-part of Ser. No. 422,875, Nov. 25, 1964, Pat. No. 3,461,347, and a continuation-in-part of Ser. No. 710,517, Mar. 5, 1968, and a continuation-in-part of Ser. No. 501,395, Oct. 22, 1965, Pat. No. 3,371,404, and a continuation-in-part of Ser. No. 421,897, Dec. 29, 1964, Pat. No. 3,504,063.

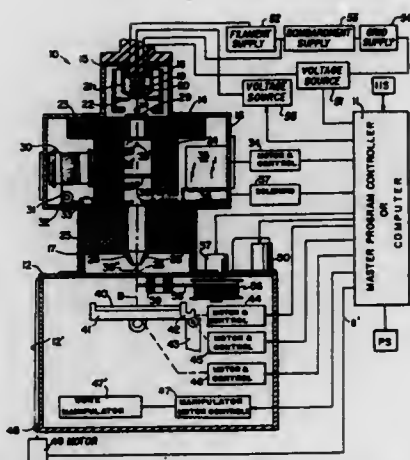
Int. Cl. B23K 15/00; H01J 37/06

U.S. Cl. 219-121.12  
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 4-7, 16, 21, 32, 34-36 and 38 is confirmed.

Claims 1, 2, 17-20, 22-31, 33 and 37 are cancelled.

Claims 3, 8, 9, 11, 13, 15 and 39 are determined to be patentable as amended.



Claims 10, 12 and 14, dependent on an amended claim, are determined to be patentable.

New claims 40 and 41 are added and determined to be patentable.

5. An apparatus in accordance with claim 1, including means for generating and directing a flow of gas molecules parallel to the radiant energy beam formed by said first means as it is directed against said substrate.

B2 4,861,270 (3035th)

#### FIRE FIGHTING TRAINER

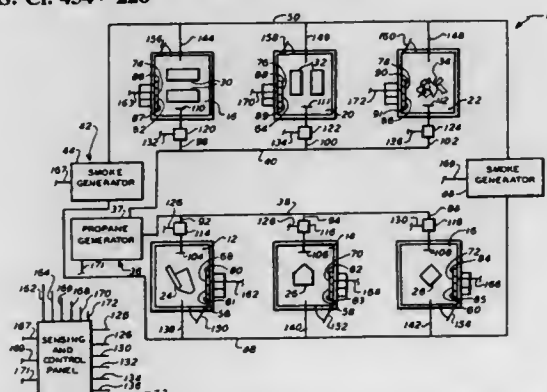
James Ernst, Livingston; Steven Williamson, Haledon; George Rogers, Linden, and Dominick Musto, Middlesex, all of N.J., assignors to Symtron Systems, Inc., Fair Lawn, N.J.

Reexamination Request No. 90/003,809, Apr. 25, 1995.

Reexamination Certificate for Patent 4,861,270, issued Aug. 29, 1989, Ser. No. 238,453, Aug. 30, 1988.

Int. Cl. G09B 9/00

U.S. Cl. 434-226



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-7 is confirmed.

1. A fire fighting trainer comprising:  
a plurality of chambers having respective contents including items chosen from a group of items including furniture and fixtures and equipment;  
a smoke generating means having a plurality of outlets disposed in the respective chambers;  
a flame generating means having a plurality of outlets disposed in the respective chambers; and  
a sensing and control means having a plurality of sensor assemblies disposed in the respective chambers and each sensor assembly connecting to a main control panel, wherein each said sensor assembly includes a multi-agent sensor unit comprising:

a collection funnel for receiving an extinguishing medium portion;  
a separation means for separating out foam from the extinguishing medium portion;  
a foam chute connecting to the collection funnel;  
a sonic beam source and detector mounted inside the foam chute for sensing the presence of foam in the chute;  
an outlet pipe connecting to the collection funnel with an outlet opening disposed below the separation means;  
a magnetostrictive fluid sensor unit mounted on and extending into the outlet pipe above the outlet opening for sensing the presence of water in the outlet pipe; and  
an infrared source and detector mounted inside the collection funnel for sensing the presence of a cloud of power in the collection funnel.

7. A method of training and testing fire fighters and recording during the test decisions made by the fire fighters for extinguishing a fire including:

providing at least one training chamber, choosing a selected item or items from a group of items of furniture, fixtures and equipment; placing the selected item or items in said at least one chamber; introducing propane gas flames and simulated smoke into the chamber next to the selected items; introducing fire fighters into the chamber to simulate extinguishing the fire using one of a group of extinguishing agents; sensing which one of the extinguishing agents is being used by the fire fighters in the chamber; simultaneously with the application of the extinguishing agent regulating and setting a level of flame of the fire and a level of smoke in the chamber corresponding to the amount of extinguishing agent being used; and recording the test results of time and decisions of the fire fighters.

B1 4,880,005 (3036th)

#### PACEMAKER FOR DETECTING AND TERMINATING A TACHYCARDIA

Benjamin D. Pless, Palo Alto, and Michael B. Sweeney, Mountain View, both of Calif., assignors to Intermedics, Inc., Angleton, Tex.

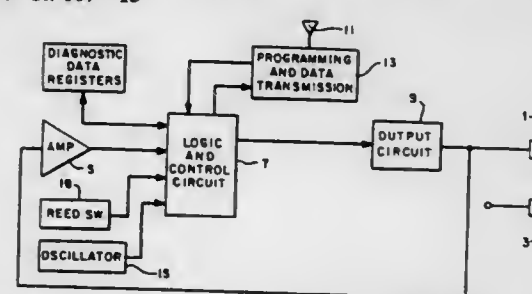
Reexamination Request No. 90/003,758, Mar. 16, 1995.

Reexamination Certificate for Patent 4,880,005, issued Nov. 14, 1989, Ser. No. 198,614, May 23, 1988.

Continuation of Ser. No. 765,047, Aug. 12, 1985, abandoned.

Int. Cl. A61N 1/362

U.S. Cl. 607-15



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-38 is confirmed.

18. The antitachycardia pacemaker of claim 10, further including means for selectively decrementally scanning the initial values of said start delay time and burst cycle interval by selected decrements for a selected number of steps from burst to burst.

B1 4,963,882 (3037th)  
PRINTING OF PIXEL LOCATIONS BY AN INK JET PRINTER USING MULTIPLE NOZZLES FOR EACH PIXEL OR PIXEL ROW

Mark S. Hickman, Escondido, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Reexamination Request No. 90/003,768, Mar. 24, 1995.

Reexamination Certificate for Patent 4,963,882, issued Oct. 16, 1990, Ser. No. 290,543, Dec. 27, 1988.

Int. Cl. B41J 2/01; 2/05

U.S. Cl. 347-41



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 3, 8, 10 and 13 are determined to be patentable as amended.

Claims 2, 4-7, 9, 11, 12 and 14-16, dependent on an amended claim, are determined to be patentable.

New claims 17-23 are added and determined to be patentable.

1. A process for depositing two dots of a single colorant onto a printing medium at a single selected pixel location, comprising the steps of:

furnishing a print head including two colorant delivery nozzles that each deposit colorant of the same selected color, including a first colorant delivery nozzle and a second colorant delivery nozzle, the [two nozzles] print head being located on a traversing mechanism that traverses across the printing medium parallel to its surface;

depositing a first droplet of colorant onto the printing medium at the selected pixel location, from the first colorant delivery nozzle; and

depositing a second droplet of colorant of the same color onto the printing medium at the same selected pixel location, from the second colorant delivery nozzle, the step of depositing a second droplet being accomplished on a different traverse across the printing medium than the step of depositing a first droplet.

B1 5,019,450 (3038th)

#### FIBRE REINFORCED COMPOSITIONS AND METHODS FOR PRODUCING SUCH COMPOSITIONS

Frederic N. Gogswill, Welwyn Garden City; David J. Hezzell, Biggleswade, and Peter J. Williams, Barton-le-Clay, all of England, assignors to Imperial Chemical Industries Plc, Millbank, London, England

Reexamination Request No. 90/003,975, Sep. 25, 1995.

Reexamination Certificate for Patent 5,019,450, issued May 28, 1991, Ser. No. 401,488, Aug. 30, 1989.

Continuation of Ser. No. 133,237, Dec. 14, 1987, abandoned, which is a continuation of Ser. No. 804,114, Dec. 3, 1985, abandoned, which is a division of Ser. No. 537,713, Sep. 30, 1983, Pat. No. 4,559,262, which is a continuation of Ser. No. 341,186, Jan. 20, 1982, abandoned.

Int. Cl. B32B 5/08

U.S. Cl. 428-402

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 3 is cancelled.

Claims 1, 2 and 4-7 are determined to be patentable as amended.

New claims 8-10 are added and determined to be patentable.

1. Pellets of reinforced [thermoplastics] thermoplastic material containing at least 30% by volume of parallel, aligned reinforcing

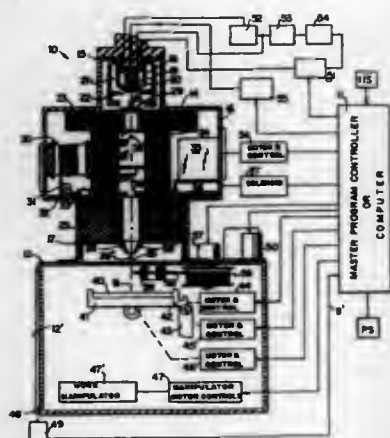
filaments between 2 and 100 mm in length, the filaments extending through the length of the pellets, the pellets having been cut from a continuous reinforced product prepared by melt pultrusion in which the filaments have been substantially completely wetted by a molten thermoplastic material, and which pellets can be injection [moulded] molded into an article in which the [fibres] filaments are present in the form of randomly dispersed individual filaments at least 50% by weight of the filaments of the pellets retaining a length of greater than 2 mm in the [molded] molded article.

**B1 5,064,989 (3039th)**

**SURFACE SHAPING AND FINISHING APPARATUS AND METHOD**

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840  
Reexamination Request Nos. 90/003,066, May 24, 1993 and 90/003,519, Aug. 5, 1994.  
Reexamination Certificate for Patent 5,064,989, issued Nov. 12, 1991, Ser. No. 351,650, May 15, 1989.  
Int. Cl.<sup>6</sup> B23K 15/00

U.S. Cl. 219—121.12



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-10, 13, 17-27 and 28 are cancelled.

Claims 11, 12, 14, 15, and 16 are determined to be patentable as amended.

New claims 29-36, 37 and 38 are added and determined to be patentable.

11. A method in accordance with claim 10 wherein said radiation beam is employed to form particles of said solid matter and directed at the substrate to deposit said particles onto said substrate.

**B1 5,080,712 (3040th)**

**OPTIMIZED DOUBLE PRESS-DOUBLE SINTER POWDER METALLURGY METHOD**

William B. James, Cinnaminson; Robert J. Causton, Delran, and John J. Fulmer, Mt. Laurel, all of N.J., assignors to Hoeganaes Corporation, Riverton, N.J.  
Reexamination Request Nos. 90/002,675, Mar. 16, 1992 and 90/003,031, Apr. 15, 1993.  
Reexamination Certificate for Patent 5,080,712, issued Jan. 14, 1992, Ser. No. 525,254, May 16, 1990.  
Int. Cl.<sup>6</sup> B22F 1/00; 3/00

U.S. Cl. 75—229

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-19 are cancelled.

1. A method for preparing a sintered component from an iron-based powder mixture comprising:

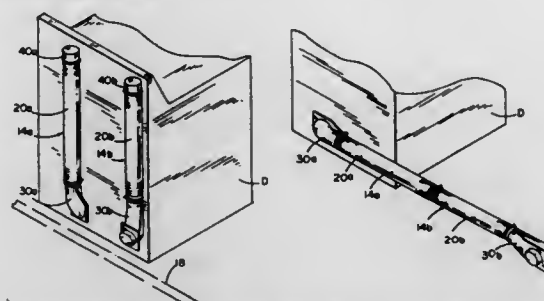
- providing an iron-based powder mixture including: atomized, prealloyed, iron-based powder comprising iron and an effective amount of at least one alloying element selected from the group, consisting of molybdenum, manganese, nickel and chromium; and graphite in an amount of about 0.2 to about 1 wt. %;
- compacting said powder mixture in a die set at a pressure of at least about 25 tsi to produce a green compact;
- presintering said green compact at a temperature of about 1100°-1600° F. (593°-870° C.) for a time of at least about 5 minutes to produce a presintered preform;
- compacting said presintered preform at a pressure of at least about 25 tsi to produce a double-pressed, presintered preform; and
- sintering said double-pressed, presintered preform at a temperature of at least about 1830° F. (1000° C.) for at least about 5 minutes to produce said sintered components having a density that is at least about 93.1% of theoretical density.

**B1 5,121,948 (3041st)**

**DRYER DUCT AND VENT ASSEMBLY INCLUDING A FLEXIBLE DUCT PORTIONS**

Charles B. Anderson, Jacksonville, Tex., and Charles R. Kendrick, Spring Lake, Mich., assignors to Builder's Pride, Inc., Fort Worth, Tex.  
Reexamination Request No. 90/004,008, Oct. 23, 1995.  
Reexamination Certificate for Patent 5,121,948, issued Jun. 16, 1992, Ser. No. 621,757, Dec. 4, 1990.  
Int. Cl.<sup>6</sup> F16L 27/00; F24F 13/00

U.S. Cl. 285—168



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-5 is confirmed.

Claims 6 and 7 are cancelled.

New claims 8 and 9 are added and determined to be patentable.

- A metal dryer exhaust duct assembly comprising: first and second elbow connectors, each comprising a first sleeve defining a first opening to fit with a dryer discharge pipe and a wall outlet opening respectively, and a second sleeve defining a second opening for attachment to a flexible duct; a first flexible metal duct having one end attached to said second sleeve of said first connector; a second flexible metal duct having one end attached to said second sleeve of said second connector; said flexible ducts being of thin corrugated metal having a self supporting characteristic capable of linear extension and capable of lateral reorientation to orient said duct second ends in desired directions; said first and second ducts both having second ends telescopically interfittable with each other to complete a flow path through the ducts.

**B1 5,213,889 (3042nd)**

**FIBRE-REINFORCED COMPOSITIONS AND METHODS FOR PRODUCING SUCH COMPOSITIONS**

Frederic N. Cogswell, Welwyn Garden City; David J. Hezzell, Biggleswade, and Peter J. Williams, Barton-le-Clay, all of England, assignors to Kawasaki Chemical Holding Co., Inc., Wilmington, Del.

Reexamination Request No. 90/003,976, Sep. 25, 1995.  
Reexamination Certificate for Patent 5,213,889, issued May 25, 1993, Ser. No. 811,224, Dec. 20, 1991.  
The portion of the term of this patent subsequent to Dec. 17, 2002, has been disclaimed.  
Int. Cl.<sup>6</sup> B32B 5/16; 5/00

U.S. Cl. 428—332

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1 and 2 are determined to be patentable as amended.

Claim 3, dependent on an amended claim, is determined to be patentable.

New claims 4-6 are added and determined to be patentable.

1. A molded article formed from a fibre reinforced thermoplastic composition in a process which includes the step of melting and homogenizing a composition containing at least 30% by weight of [fiber] fibre reinforced pellets between 2 mm and 100 mm long which pellets have filaments extending the length of the pellet, characterized in that the molded article contains reinforcing filaments in the form of individual filaments and at least 50% by weight of the filaments in the pellets being present in the molded article at a length of greater than 2 mm, the pellets having been cut from a structure of continuous, parallel, aligned, reinforcing filaments which have been substantially completely wetted by a molten thermoplastic in a melt pultrusion process.

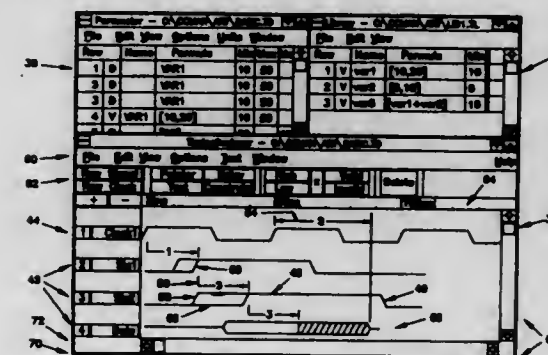
**B1 5,381,524 (3043rd)**

**AUTOMATED DEVELOPMENT OF TIMING DIAGRAM FOR ELECTRICAL CIRCUITS**

Lawrence E. Lewis, Kirkland, and Michael S. Meredith, Redmond, both of Wash., assignors to Chronology Corporation, Redmond, Wash.

Reexamination Request No. 90/003,820, May 4, 1995.  
Reexamination Certificate for Patent 5,381,524, issued Jan. 10, 1995, Ser. No. 791,794, Nov. 12, 1991.  
Int. Cl.<sup>6</sup> G06F 17/50

U.S. Cl. 395—161



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-42 is confirmed.

1. An apparatus for constructing timing diagrams on a computer having a monitor to model electrical circuits, comprising:

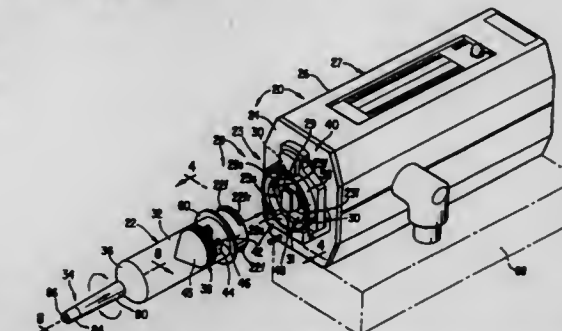
- parameter spreadsheet means, performed by the computer, for accepting one or more parameters defining a timing diagram into a spreadsheet displayed on the monitor, wherein the spreadsheet comprises one or more intersecting rows and columns, each of the rows comprises one of the parameters, and the columns identify a minimum value for the parameter and a maximum value for the parameter; and
- timing diagram window means, performed by the computer, for displaying the timing diagram on the monitor of the computer in response to the parameters accepted into the spreadsheet displayed on the monitor, wherein the spreadsheet and the timing diagram are linked so that changes in the spreadsheet are reflected in the timing diagram.

**B1 5,383,858 (3044th)**

**FRONT-LOADING MEDICAL INJECTOR AND SYRINGE FOR USE THEREWITH**

David M. Reilly, Glenshaw; Joseph B. Havrilla; Eugene A. Gelblum, both of Pittsburgh, and Daniel Kazousky, Trafford, all of Pa., assignors to Medrad, Inc., Pittsburgh, Pa.  
Reexamination Request No. 90/003,860, Jun. 13, 1995.  
Reexamination Certificate for Patent 5,383,858, issued Jan. 24, 1995, Ser. No. 929,926, Aug. 17, 1992.  
Int. Cl.<sup>6</sup> A61M 1/00

U.S. Cl. 604—152



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-5 and 7-20 is confirmed.

Claim 6 is cancelled.

1. An injector for injecting a liquid from a syringe, said syringe having a plunger, said injector comprising:

- a housing having a front wall;
- readily releasable mounting means on said housing front wall for supporting the syringe for an injection operation, said readily releasable mounting means including retaining means for releasably engaging a retaining portion on the syringe, slot means of said readily releasable mounting means for receiving therethrough the retaining portion on the syringe, inner surface means of said readily releasable mounting means for engaging the retaining portion on the syringe when the syringe is inserted into and rotated in said readily releasable mounting means;
- drive means in said housing movable through said housing front wall for controlling the movement of the plunger in the syringe; and
- annular sealing means on the front wall of said housing for engaging annular sealing means on the syringe, for perpendicularly aligning the plunger and the drive means and for minimizing slack between the syringe and the slot means.



# REISSUES

OCTOBER 29, 1996

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,361

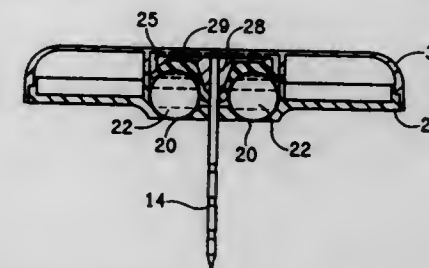
## EXPULSION OF DETRIMENTAL SUBSTANCE FROM THEFT-DETERRENT DEVICE

Dennis L. Hogan, St. Petersburg; John L. Lynch, Hollday, and Lincoln H. Charlot, Jr., St. Petersburg, all of Fla., assignors to Security Tag Systems, Inc., Boca Raton, Fla.  
Original No. 5,054,172, dated Oct. 8, 1991, Ser. No. 602,818, Oct. 24, 1990. Application for reissue Sep. 30, 1992, Ser. No. 954,905

Int. Cl.<sup>6</sup> A44B 9/00

U.S. Cl. 24—704.1

25 Claims



21. A detrimental-substance-containing component of a device for deterring theft of a protected article, the device comprising means for attaching the device to the article, with said attaching means being embodied in two components that are adapted to be locked together on opposite sides of a portion of said article to prevent unauthorized removal of the device from the article, wherein the attaching means include a pin having a head that is anchored within the detrimental-substance-containing component and a clutch contained in the other component for grasping the pin to provide a predetermined retaining force for resisting separation of the components by prying or pulling the components apart, wherein the detrimental-substance-containing component includes a surface through which the pin passes for engagement with the other component, wherein said surface contains at least the opening; wherein the detrimental-substance-containing component includes at least one fragile vial that fractures when at least a predetermined pressure is applied thereto, with said vial being disposed adjacent said at least one opening and containing a detrimental substance that would damage an article attached to the device if the vial were to be fractured and the detrimental substance were to be released from the fractured vial through said at least one opening onto the attached article; wherein the detrimental-substance-containing component defines a head space for enabling limited axial movement of the pinhead; wherein the pinhead includes a surface for applying more than said predetermined pressure against the vial in response to the pinhead being moved in response to application to the two components of at least a predetermined threshold separation force that is nevertheless less than that required to overcome said predetermined retaining force, to thereby fracture the vial and release the substance contained therein before the components are separated by prying or pulling the components apart; and wherein the detrimental-substance-containing component includes a pliable seal disposed between the pinhead and the vial for preventing the detrimental substance that is released from the fractured vial from entering the head space and for expelling the released detrimental substance through said at least one opening in response to pressure applied against the seal by the pinhead by said movement of the pinhead that results in the vial being fractured.

Re. 35,362

## APPARATUS AND METHOD FOR CONTROLLING THE INTRODUCTION OF CHEMICAL FOAMANT INTO A WATER STREAM IN FIRE-FIGHTING EQUIPMENT

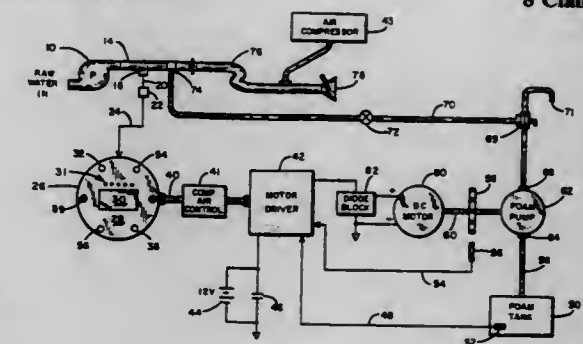
Lawrence C. Arvidson, New Brighton, and Robert S. Horeck, Fridley, both of Minn., assignors to Hypro Corporation, New Brighton, Minn.

Original No. 5,232,052, dated Aug. 3, 1993, Ser. No. 15,003, Feb. 9, 1993. Application for reissue May 18, 1995, Ser. No. 444,226

Int. Cl.<sup>6</sup> A62C 31/00

U.S. Cl. 169—13

8 Claims



1. In a fire extinguishing system of the type including a water supply means for normally delivering water at varying flow rates through a hose member, means for monitoring [the flow of] water flow through said hose member and producing an electrical signal related to [the rate of water flow] a characteristic of the water flowing through said hose member, a supply tank for containing a supply of a liquid chemical foamant, positive displacement pump means having an input port coupled to said supply tank, an output port coupled to said hose member, and pump speed sensing means for sensing [the] a speed at which said pump means is being driven and generating a corresponding output signal, a variable speed electrical drive motor for driving said pump means at a speed determined by a control signal applied [thereto] to said drive motor, computing means coupled to receive said electrical signal [relating to flow] and [a] said output signal from said pump speed sensing means, said computing means determining the determined speed at which said drive motor should be driven to introduce a metered quantity of said chemical foamant into said hose member, depending on the rate of flow of water through said hose member, the improvement comprising:

(a) motor drive means coupled to said computing means for generating said control signal for said drive motor, said [motor drive means producing] control signal comprising a pulse width modulated signal of a predetermined frequency whose duty cycle is determined by said computing means for varying the speed of said drive motor between a maximum and a lower intermediate speed; and

(b) burst width modulating means for turning said pulse width modulated signal on and off at predetermined time intervals determined by said computing means for varying the speed of said drive motor between said lower intermediate speed and a predetermined minimum speed whereby [the] a flow rate of said [liquid concentrate] chemical foamant into said hose member is controllable over an extended range.





## PLANT PATENTS

GRANTED OCTOBER 29, 1996

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

**9,672**  
**HYBRID TEA ROSE PLANT NAMED 'OLJKROFT'**  
Huibert W. Olij, De Kwakel, Netherlands, assignor to The  
Conard-Pyle Company, West Grove, Pa.  
Filed Oct. 17, 1995, Ser. No. 544,392  
Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Pkt.—11

1. A new and distinct variety of Hybrid Tea rose plant characterized by the following combination of characteristics:

- (a) forms in abundance attractive bicolored blossoms that are light yellow and lightly edged with red,
- (b) exhibits an erect growth habit,
- (c) is well suited for cut flower production under greenhouse growing conditions, and
- (d) exhibits good disease resistance;

sustantially as herein shown and described.

**9,675**  
**KALANCHOE PLANT NAMED MERIT**  
Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio  
Filed Jun. 13, 1995, Ser. No. 490,840  
Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Pkt.—87.15

1. A new and distinct cultivar of Kalanchoe plant named Merit, as illustrated and described.

**9,676**  
**WATER LILY, PLANT NAME: 'PEACHES AND CREAM'**  
Perry D. Slocum, 1831 Leatherman Gap Rd., Franklin, N.C.  
28734

Filed Feb. 20, 1996, Ser. No. 605,555

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Pkt.—87.16

1. A new and distinct variety of water lily plant substantially as herein shown and described.

**9,673**  
**PEACH TREE 'ZEE DIAMOND'**  
Chris F. Zaiger, 929 Grimes Ave.; Leith M. Gardner, 1207 Grimes Ave.; Gary N. Zaiger, 1907 Elm Ave., and Grant G. Zaiger, 4005 California Ave., all of Modesto, Calif. 95358  
Filed Jul. 10, 1995, Ser. No. 499,409  
Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Pkt.—43.1

1. A new and distinct variety of peach tree, substantially as illustrated and described, characterized by its large size, vigorous, semi-upright growth and by being a productive and regular bearer of large, firm, yellow flesh, clingstone fruit with an attractive red skin color; the fruit is further characterized by having good eating, keeping and shipping qualities and in comparison to the commercial peach variety Spring Lady (U.S. Plant Pat. No. 4,661), which matures in the same maturity season, the new variety bears larger size fruit with heavier production.

**9,677**  
**SPATHIPHYLLUM PLANT 'S8'**  
Marian W. Osiecki, Marianna, Fla., assignor to Oglesby Plant Laboratories, Inc., Altha, Fla.  
Filed Sep. 6, 1995, Ser. No. 525,433  
Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Pkt.—88.1

1. A new and distinct cultivar of Spathiphyllum plant named 'S8' as illustrated and described.

**9,678**  
**VRIESEA PLANT NAMED WERNER RAUH**  
Herbert H. Hill, Jr., Lithia, Fla., assignor to Twyford International, Inc., Santa Paula, Calif.  
Filed Jun. 15, 1995, Ser. No. 490,812  
Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Pkt.—88.8

1. A plant of a new and distinct cultivar of Vriesea plant named 'Werner Rauh' as illustrated and described.

**9,674**  
**KALANCHOE PLANT NAMED CHIVALRY**  
Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio  
Filed Jun. 13, 1995, Ser. No. 490,013  
Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Pkt.—87.15

1. A new and distinct cultivar of Kalanchoe plant named Chivalry, as illustrated and described.

**9,679**  
**FICUS PLANT NAMED CURLY**  
Wim V. D. Knaap, Oudecampsweg 10, 2678 KN, De Lier, Netherlands  
Filed Jun. 29, 1995, Ser. No. 496,292  
Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Pkt.—88.9

1. A new and distinct cultivar of *Ficus benjamina* plant named Curly, as illustrated and described.

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**PATENTS**  
**GRANTED October 29, 1996**

**ERRATA**

For CLASS	See PATENT NO.
081-171 .....	5,568,757
192-009 .....	5,568,850
463-037 .....	5,568,928
404-101 .....	5,568,992
431-007 .....	5,569,020
250-208 .....	5,569,390
250-208 .....	5,569,390
508-547 .....	5,569,404
508-192 .....	5,569,405
508-431 .....	5,569,406
508-454 .....	5,569,407
508-462 .....	5,569,408
510-202 .....	5,569,410
510-383 .....	5,569,411
427-585 .....	5,569,439
422-174 .....	5,569,455
429-162 .....	5,569,520
073-861 .....	5,569,865
073-862 .....	5,569,866
280-728 .....	5,569,959
296-547 .....	5,570,145
396-429 .....	5,570,147
396-182 .....	5,570,148
396-085 .....	5,570,149
396-324 .....	5,570,150
399-052 .....	5,570,151
396-515 .....	5,570,152
396-531 .....	5,570,153
396-568 .....	5,563,154



# ERRATA-CONTINUED

For CLASS	See PATENT NO.
396-082	5,570,155
396-051	5,570,156
396-232	5,570,157
396-051	5,570,158
386-001	5,570,196
386-046	5,570,197
386-046	5,570,198
386-095	5,570,198
386-095	5,570,199
386-044	5,570,200
360-104	5,570,261
355-202	5,570,451

## PATENTS

GRANTED OCTOBER 29, 1996

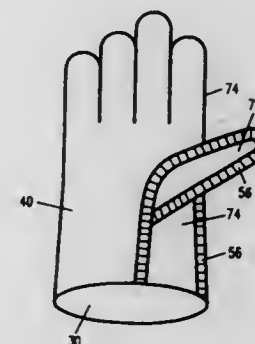
### GENERAL AND MECHANICAL

**5,568,656**  
**METHOD AND APPARATUS FOR AN IMPROVED**  
**WATERPROOF GLOVE LINER**  
 Joo-In Kim, 250-3 Nonhyun-Dong, (Hyundai Billa B-5)  
 Kangnam-ku, Seoul, Rep. of Korea  
 Filed Mar. 30, 1995, Ser. No. 413,250  
 Claims priority, application Rep. of Korea, Jul. 14, 1994,  
 1994-17015

Int. Cl.<sup>6</sup> A41D 19/00

U.S. Cl. 2—164

21 Claims

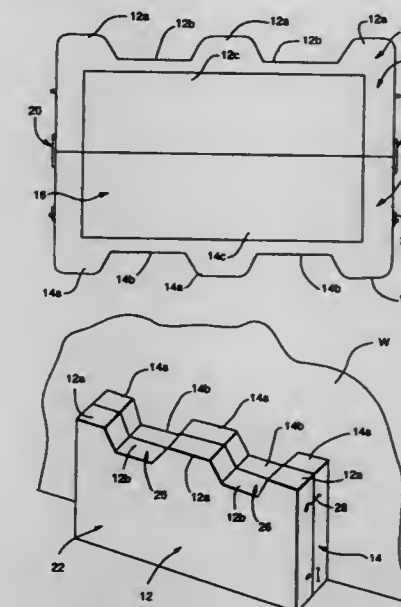


1. A glove liner comprising:  
 a first hand-shaped piece of cloth laminated to a membrane material having substantially the same shape, said first hand piece being the shape of the back of a hand including a finger section;  
 a second hand-shaped piece of cloth laminated to a membrane material having substantially the same shape, said second hand piece being the shape of the front of a hand including a finger section and a palm section, said palm section having an opening for a thumb;  
 the outer edges of said first hand piece being welded to the outer edges of said second hand piece;  
 a thumb piece of cloth in the shape of a thumb laminated to a membrane material having substantially the same shape, said thumb piece sewn onto said palm section to fill in said opening; and  
 tape attached to and covering said sewn seam between said second hand piece and said thumb piece.

**5,568,658**  
**CONVERTIBLE BED-CHAIR ASSEMBLY**  
 Jennifer M. Madden, 8601 Glen Myrtle, Apt. 212, Norfolk, Va.  
 23505  
 Filed Jul. 18, 1995, Ser. No. 503,864  
 Int. Cl.<sup>6</sup> A47C 13/00; 19/12

U.S. Cl. 5—174

3 Claims



1. A convertible bed-chair assembly comprising first and second assembly members having side walls and end walls and first and second opposed substantially parallel, substantially planar surfaces, said first planar surfaces of said members each including a cavity therein which is formed by an internal wall of the corresponding member and is unbounded at a first sidewall of said corresponding member, said assembly members each including at least one recess in a side wall thereof opposite said first sidewall, first securing means for connecting said members together in a first, bed configuration wherein the first sidewalls of said members are in abutment and said cavities cooperate to form a concavity for receiving a futon or mattress and second securing means for connecting said members together in a second, chair configuration wherein said first planar surfaces are in abutment and said first and second cavities form an internal storage space and the recesses of said members are aligned to form a seat.

**5,568,657**  
**CUT RESISTANT PROTECTIVE GLOVE**  
 David S. Cordova, Midlothian; Gene C. Weedon, Richmond;  
 Robert C. W. Hofer, Richmond; Mark B. Boone, Richmond;  
 Kevin M. Kirkland, Richmond, all of Va.; Charles P. Weber,  
 Jr., Monroe, N.C., and Gregory J. LaCasse, Lancaster, Pa.,  
 assignors to AlliedSignal Inc., Morristown, N.J.  
 Division of Ser. No. 931,126, Aug. 17, 1992, Pat. No.  
 5,418,977, which is a continuation of Ser. No. 798,983, Nov.  
 29, 1991, abandoned, which is a continuation of Ser. No.  
 462,249, Jan. 9, 1990, abandoned. This application Mar. 16,  
 1995, Ser. No. 405,330  
 Int. Cl.<sup>6</sup> A41D 19/00

U.S. Cl. 2—167

13 Claims

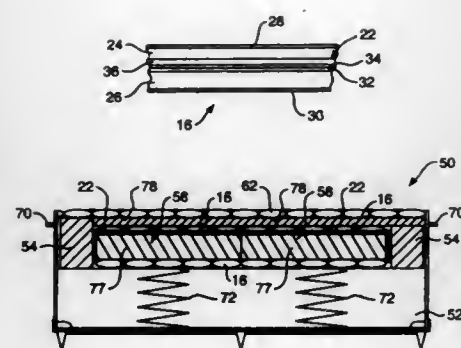
1. A flexible, uncoated glove made from a layer comprising cut resistant fibrous material adhered to a surface of an elastomeric glove without being fully encapsulated thereby, said glove being characterized by: being cut resistant over some portion thereof by enduring without cutting through at least 5 cycles of an impact cam cut test; and being compliant and offering a high degree of tactility.

**5,568,659**  
**MATTRESS HAVING INTEGRATED THERMAL LAYER**  
**FOR REFLECTING BODY HEAT**  
 Isaac Fogel, 8214 Wellmoor Ct., Jessup, Md. 20794  
 Filed Jul. 29, 1994, Ser. No. 282,283  
 Int. Cl.<sup>6</sup> A47C 31/02

U.S. Cl. 5—737

18 Claims

1. A mattress comprising, in combination:  
 a resilient body support section having opposed sleep surfaces and a side surface; and  
 a cover enveloping the resilient body support section, the cover including a pair of quilted ticking panels joined by a fabric side panel and arranged such that the ticking panels are respectively positioned against the opposed sleep surfaces and the fabric side panel is positioned against the side surface of the resilient body support section, one of the ticking panels including:  
 a fabric outer sheet,  
 a fabric inner sheet,



a thermal layer situated between the inner and outer sheets and including a plastic sheet adhesively laminated to a resilient sheet and a heat reflective film coating one surface of the plastic sheet, and quilting stitches maintaining the inner and outer sheets and the thermal layer in sandwiched relation.

5,568,660

## WHEELCHAIR CUSHION AND COVER

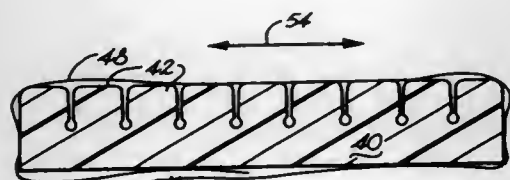
Richard W. Raburn, Mauldin, and Fred T. Wickis, Jr., Greer, both of S.C., assignors to Span-America Medical Systems, Inc., Greenville, S.C.

Continuation of Ser. No. 903,790, Jun. 24, 1992, Pat. No. 5,459,896. This application Jun. 1, 1995, Ser. No. 457,619

Int. Cl.<sup>6</sup> A47C 27/14; 31/02

U.S. Cl. 5—652.1

22 Claims



1. A patient support, comprising:

a body of resilient foam material having a predetermined thickness substantially in a range of about 6 to 9 centimeters, a density of at least about 2.5 pounds per cubic foot, a 25 percent indentation load deflection rating of at least about 50 pounds, and defining at least one main patient support surface thereon, said surface defining a plurality of independent support segments with respective separations therebetween and adjacent relatively rounded upper edges with a predetermined radius of curvature; and

a stretchable covering for said body inclusive of said one main patient support surface thereof, said covering defining a base layer of woven fabric comprised of elastic synthetic fibers and a water resistant coating layer on said base layer, which is stretchable with said base layer so that said stretchable covering can stretch into separations between said independent support segments so as to permit independent action thereof whenever said patient support receives a patient on said body main patient support surface.

5,568,661  
ARTICULATED BED WITH FRAME MOUNTED POWER MODULE

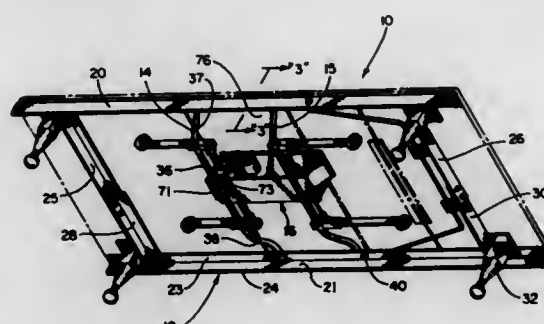
Leeland M. Bathrick, Crystal Lake, Ill.; Michael W. Chizek, Racine, Wis., and Glenn Brittain, McHenry, Ill., assignors to C.E.B. Enterprises, Inc., Mundelein, Ill.

Filed Sep. 19, 1994, Ser. No. 308,412

Int. Cl.<sup>6</sup> A47B 7/02

U.S. Cl. 5—618

10 Claims



1. An articulated bed with a frame mounted replaceable power module, comprising: a general rectangular bed frame having side rails and legs to support the frame above the floor, the upper surface of the frame lying in a reference plane, an articulated mattress support mounted on the frame having at least one pivotally mounted panel, said mattress support being coplanar with the reference plane in a retracted position thereof, said mattress support including a plurality of removable panels support and directly engaging the upper surface of the frame, a removable cross frame connected to the frame side rails, an independent power module having a drive housing releasably connected to the cross frame and extending completely below the reference plane, at least one rocker shaft extending outwardly from the housing and supported by the housing without any direct connection to the side rails and without being supported on cross members connected to the side rails, and a rocker arm driven by the rocker shaft for pivoting the pivotally mounted mattress panel, whereby the cross frame can be easily installed on the side rails and the power module can be easily attached to the cross frame.

5,568,662

## SPINAL/CERVICAL IMMOBILIZATION DEVICE AND METHOD

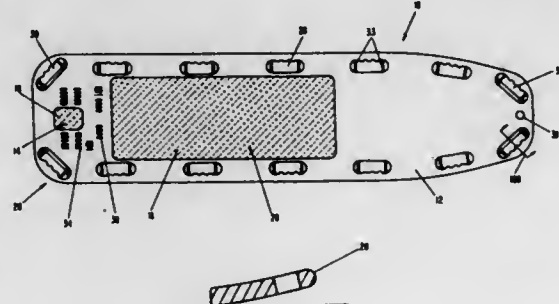
Robert M. Gougelet, 165 Wagner La., Corrales, N.M. 87048

Filed Apr. 8, 1994, Ser. No. 225,055

Int. Cl.<sup>6</sup> A61G 1/00

U.S. Cl. 5—625

57 Claims



11. A spinal immobilization apparatus comprising a board on which a body of a patient is placed comprising a resin transfer molded, unitary fiber-reinforced composite, having a thickness of 1.75" or less and a weight of nine pounds or less.

5,568,663

## DISPOSABLE RESCUE MATTRESS

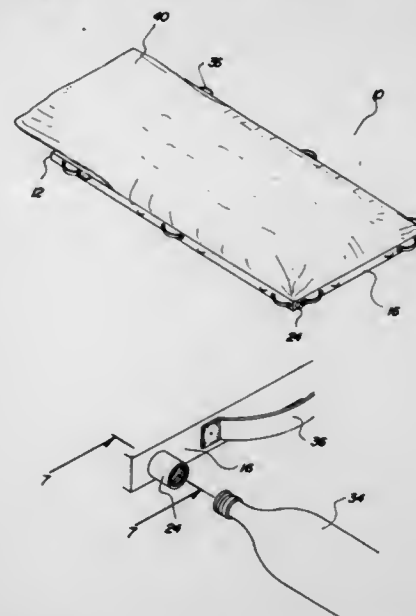
David T. Brown, 18 The Meadows, Gillingham, Dorset, England

Filed Jul. 14, 1995, Ser. No. 502,477

Int. Cl.<sup>6</sup> A47C 27/08; A61G 1/00

U.S. Cl. 5—628

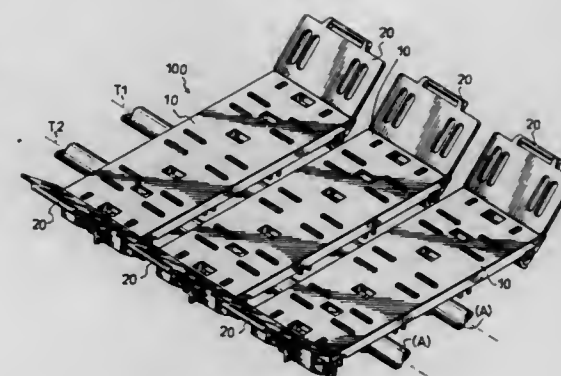
5 Claims



1. A disposable rescue mattress for providing stable support and insulation from a ground area for an injured person comprising, in combination:

a mattress being comprised of an upper sheet and a lower sheet, the upper sheet and lower sheet being secured together along peripheral edges thereof to form an upper edge, a lower edge, and two side edges, the lower edge having an air intake valve extending therethrough into the inner surface of the mattress, the air intake valve further comprising an internally threaded cylindrical stem protruding outwardly of the lower edge of the mattress, the stem terminating at a wall within the lower edge of the mattress, the wall having a needle extending therethrough into the stem, the wall having a plurality of apertures formed therethrough leading into the inner surface of the mattress, the internally threaded cylindrical stem being adapted for the receipt of a bottle of gas therein;

a blanket having an upper edge, a lower edge, and two side edges, the lower edge and two side edges secured to the corresponding lower edge and two side edges of the mattress with the upper edge extending upwardly beyond the upper edge of the mattress.



5,568,665

## PAINT CAN RIM PUNCHING TOOL AND BOTTLE OPENER

Joseph C. Fick, 25399 The Old Rd., Unit 2204, Newhall, Calif. 91321

Filed Apr. 17, 1995, Ser. No. 422,809

Int. Cl.<sup>6</sup> B44C 7/00

U.S. Cl. 7—105

2 Claims



1. In combination with a paint can having an annular rim groove, said paint can having a lid, said lid having an annular rim located at the periphery of said lid, said annular rim to be located within said annular groove, a tool usable in conjunction with said annular rim groove and said annular rim, said tool comprising: an elongated rigid housing having a front end and a back end, said front end being formed into a lineal extending section which includes a plurality of sharply pointed ends, said sharply pointed ends having an inclination relative to said extending section, said sharply pointed ends are to be located underneath said annular rim of said lid with said sharply pointed ends being directed against said annular rim due to said inclination of said sharply pointed ends and upon application of manual force of sufficient size against said housing.

5,568,664

## MODULAR PAD ASSEMBLY

Huei-Kan Lin, Taipei Hsien, Taiwan, assignor to Young Band Co., Ltd., Tu-Cheng, Taiwan

Filed Aug. 1, 1994, Ser. No. 284,317

Int. Cl.<sup>6</sup> A47C 20/02

U.S. Cl. 5—652

7 Claims

1. A modular pad assembly comprising:

at least two elongated plate members, each having a longitudinal axis, each of said plate members having two opposed ends, and upper and lower faces, each of said lower faces of said elongated plate members having two longitudinally spaced retaining rings formed thereon, said two retaining rings each having an axis and being aligned with one another and being parallel with the longitudinal axis of one of the elongated plate members, each of said retaining rings of said elongated plate members having an L-shaped support rod mounted rotatably thereto, each of said L-shaped support rods having a first



in a downward direction said annular rim of said lid will be moved to be disengaged from said annular rim groove, said tool can be repositioned so said sharply pointed ends are located in said annular rim groove and upon application of a sharp blow to said back end said sharply pointed ends will penetrate said annular rim groove forming openings permitting flow of paint from said annular rim groove into said paint can, said inclination being constant and within the range of fifteen to twenty degrees which facilitates usage of said sharply pointed ends to remove said lid from said paint can.

5,568,666

## GAMING TABLE CLOTH

Gilbert E. Selbert, 771 Main St., Ashley, Ill. 62808

Filed Jun. 5, 1995, Ser. No. 462,808

Int. Cl.<sup>6</sup> D06B 1/10

U.S. Cl. 8—149.1

6 Claims

1. A method for treating a cloth for gaming and pool tables comprising:

providing a fibrous synthetic material having a denier within a range of about 70 to 100, the fibrous synthetic material having a top surface with free fiber ends and a bottom patterned surface;

preparing a mixture of dye and a gel to make a gelled dye; applying the gelled dye to the fibrous synthetic material in a manner effective to dye the top surface while leaving the bottom surface free of dye; and

curing the dye treated fibrous synthetic material with wet steam from boiling water at 212° to 235° F.

5,568,667

## STRUCTURE TO INTERCONNECT TWO BRANCHES OF A SUSPENSION BRIDGE FRAMEWORK IN CORRESPONDENCE OF A PIER SUPPORTING THE CATENARY

William Brown, Kensington Highst, United Kingdom, assignor to Stretto Di Messina S.p.A., Rome, Italy

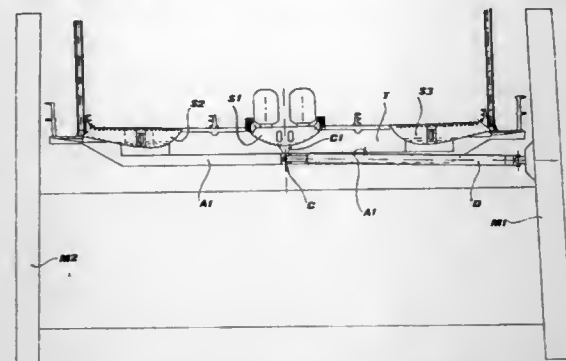
Filed May 26, 1995, Ser. No. 428,084

Claims priority, application Italy, Oct. 28, 1992, MI92A2468

Int. Cl.<sup>6</sup> E01D 2/04; 19/02

U.S. Cl. 14—20

6 Claims



1. A suspension bridge having end piers from which a bridge is suspended, the bridge comprising a substantially fixed stiff horizontal branch (P1) and a substantially flexible horizontal branch (P2), each bridge branch (P1, P2) comprising three horizontal parallel longitudinally extending mutually spaced box-like bodies comprising a central body (S1) and two lateral bodies (S2, S3), transverse ledgers (T) located at regular intervals along the bridge and interconnecting said bodies, there being a gap between the two bridge branches (P1, P2) and in the gap there being a central body section (S1') fixedly interconnecting the central longitudinal bodies (S1) of the two bridge branches (P1, P2); also in the gap there being two lateral body sections (S') extending between and slidable relative to said lateral bodies (S2, S3) of the two bridge

branches (P1, P2); and in the gap a vertical hinge joint interconnecting said bridge branches (P1, P2) and lying on a central longitudinal axis of the bridge.

5,568,668

## PUSH BROOM HANDLE

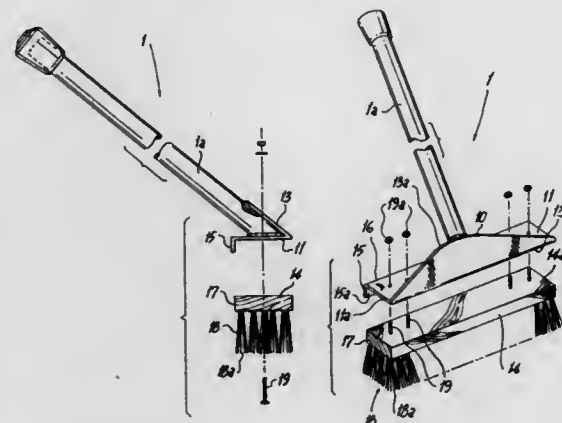
Michael Margolin, 2 Autumn Dr., East Northport, N.Y. 11731

Filed Jul. 25, 1995, Ser. No. 506,808

Int. Cl.<sup>6</sup> A46B 15/00

U.S. Cl. 15—176.3

7 Claims



1. A broom and handle combination comprising:

(a) an elongated rod handle portion having a distal end;

(b) a broom head portion comprising a block portion having a top portion and a bottom portion which has a plurality of bristles extending therefrom, the block portion further including a vertical face extending along the block portion and between the top and bottom portions;

(c) a fastener for connecting said handle and said broom head portion, said fastener comprising:

(i) a substantially planar mid plate portion having opposed edges along opposite sides thereof;

(ii) a first substantially planar pleat member extending above and from said mid plate portion along one of said edges, said first pleat member and said mid plate portion defining an acute angle therebetween in which the distal end of the handle is secured;

(iii) a second substantially planar pleat member extending below and from said mid plate portion along the other edge thereof and oriented substantially perpendicular to the mid plate portion; and

(d) wherein the top portion of the broom head portion is secured to a bottom portion of said mid plate portion and said vertical face of the broom head portion contacts at least a portion of said second pleat member.

5,568,669

## LOTION APPLICATOR

Terry T. Godown, 200 Strawberry Ridge La., Irmo, S.C. 29063-9017

Filed May 26, 1995, Ser. No. 451,138

Int. Cl.<sup>6</sup> A45D 40/26

U.S. Cl. 15—143.1

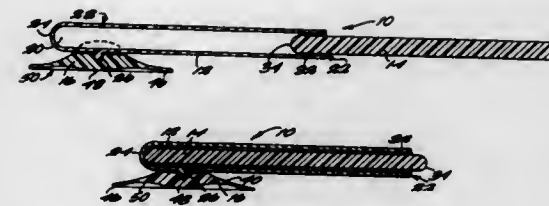
12 Claims

1. An applicator for use in applying lotion, said applicator comprising:

a housing having an interior and an open end;

a handle receivable in said interior of said housing, said handle having a first end and an opposing second end;

means earned by said first end of said handle for securing said first end of said handle to said open end of said housing so that said handle can be secured to said housing either when



said second end of said handle is in said interior of said housing or when said second end of said handle is exterior to said housing; and

an applicator pad carried by said housing said applicator pad having a surface on which said lotion is applied, said surface having an annular depression formed therein.

5,568,670

## WIPER BLADE WITH WIRE ELASTIC RESPONSE MEMBER THEREIN

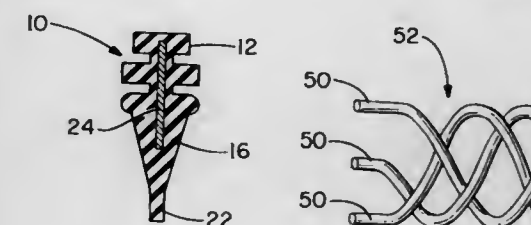
Timothy W. Samples, 4338 State St., and C. Robert Samples, 465 Barr Ct., both of Akron, Ohio 44319

Continuation-in-part of Ser. No. 905,839, Jun. 29, 1992, abandoned. This application May 20, 1994, Ser. No. 245,604

Int. Cl.<sup>6</sup> B60S 1/38

U.S. Cl. 15—250.48

10 Claims



9. A wiper blade insert for a wiper blade carrier arm comprises: a base portion for attaching the wiper blade insert into said wiper blade carrier arm;

a shank portion with a longitudinal axis and a first and a second edge therealong, comprising an elastic response member formed from wire embedded in a matrix of natural rubber to provide said shank portion with an elastic response frequency that is at least 1.2 times faster than that of a shank portion of identical thickness and identical width made of only the identical natural rubber, with the first edge thereof affixed to said base portion; and

a tip portion comprising a flexible abrasion resistant vulcanized natural rubber material suitable for wiping, said tip portion attached along the second edge of said shank portion.

wherein the elastic response member is formed by braiding at least three lengths of wire to form a flat elongate ribbon.

5,568,671

## CASTER ASSEMBLY WITH INTEGRAL PLASTIC STEM AND HORN AND WITH REMOVABLE AXLE LOCK CAP

Charles A. Harris, and Robert J. Simonsen, both of Evansville, Ind., assignors to FKI Industries, Inc., Fairfield, Conn.

Continuation-in-part of Ser. No. 347,902, Dec. 1, 1994. This application Apr. 10, 1995, Ser. No. 419,368

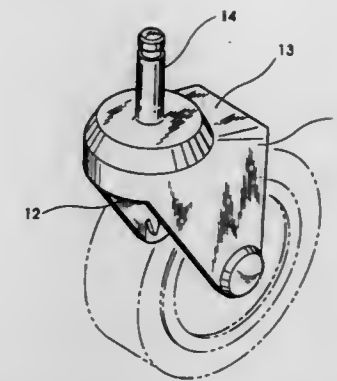
Int. Cl.<sup>6</sup> B60B 3/00

U.S. Cl. 16—18 R

27 Claims

1. In a caster assembly including a stem, a horn having two legs and a bridge between the legs, a wheel and an axle supporting the horn on the wheel, each of the legs having an outside surface, the improvement characterized in that:

the axle has a retainer on one end engaged with the outside surface of one leg of the horn,



the axle has a groove adjacent its other end and outside the outside surface of the other leg, an axle cap covers the other end of the axle and includes a slot receiving a portion of the other end of the axle and having a slot-defining flange received in the axle groove, and a detent boss and detent boss receiver in the cap and other leg of the horn resist removal of the cap from the other end of the axle.

5,568,672

## SUPPORT BRACKET AND TRACK ASSEMBLY FOR SECTIONAL OVERHEAD DOORS

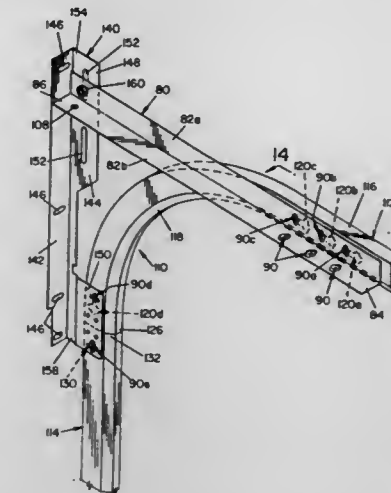
Willis Mullet, Pensacola Beach, Fla.; Thomas B. Bennett, III, Wooster, and Roger L. Dague, Millersburg, both of Ohio, assignors to Wayne-Dalton Corp., Mt. Hope, Ohio

Continuation of Ser. No. 56,991, May 3, 1993, Pat. No. 5,408,724. This application Apr. 24, 1995, Ser. No. 427,143

Int. Cl.<sup>6</sup> E05D 15/00

U.S. Cl. 16—94 R

14 Claims



1. A support bracket and track assembly for the support of sectional overhead doors comprising:

track means for supporting the overhead door sections;

horizontal support bracket means attached to said track means for supporting said track means;

flag bracket means attached to said track means and said horizontal support bracket means for mounting said track means and said horizontal support bracket means to a structural support; and

tab means for attaching said track means to said horizontal support bracket means and said flag bracket means.

5,568,673

## PIVOT PIN ASSEMBLY FOR FOLDING DOOR

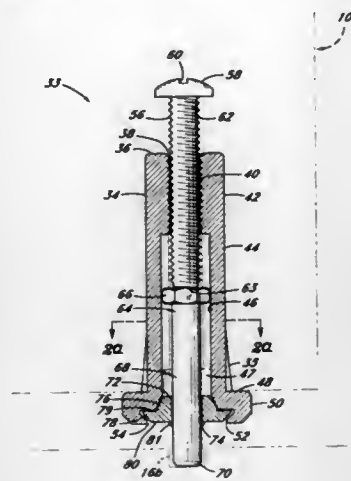
William F. Ryzek, Covina, Calif., assignor to Arthur Cox & Sons, Inc., Clty of Industry, Calif.

Filed Oct. 27, 1994, Ser. No. 330,334

Int. Cl.<sup>6</sup> E05D 7/04

U.S. Cl. 16—244

19 Claims



1. A pivot pin assembly for a folding door comprising:
  - a sleeve to be mounted in the lower end of the folding door, said sleeve including an upper portion having a threaded interior and a lower portion having an interior section of non-circular shaped cross-section;
  - a bolt having a threaded shaft which threads into said upper portion;
  - a pin in said lower portion, the pin being aligned below the bolt and having a head which engages said non-circular shaped section of the sleeve in a manner to prevent relative rotation of the pin in the sleeve while permitting longitudinal motion of the pin head along substantially the entire length of said non-circular shaped section, the pin having a lower end which protrudes below the sleeve and the lower end of the folding door.

5,568,674

## SLIDER FOR SLIDE FASTENER

Jiro Harada, Tsutomu Tomita, and Hideo Takabatake, all of Toyama-ken, Japan, assignors to YKK Corporation, Tokyo, Japan

Filed Nov. 29, 1995, Ser. No. 563,941

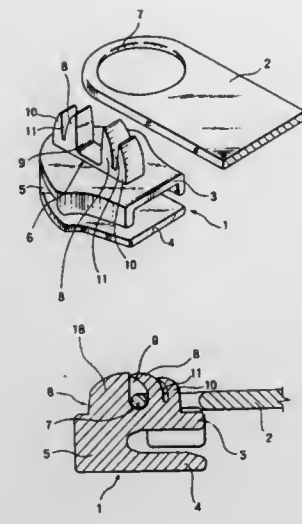
Claims priority, application Japan, Nov. 30, 1994, 6-296242

Int. Cl.<sup>6</sup> A44B 19/00

U.S. Cl. 24—429

16 Claims

1. A slide fastener slider comprising:
  - (a) a slider body;
  - (b) a pull tab pivotally attached to said slider body and having a pintle; and
  - (c) a pull tab attaching lug projecting from a surface of said slider body and having a recess adapted to receive said pintle of said pull tab, a first support projection adapted to be bent toward said recess, a second support projection, and at least a first reinforcing projection extending parallel to said first support projection and adapted to be bent against said first support projection, said first support projection and said second projection being situated facing each other with said recess defined therebetween.



5,568,675

## TWO-PIECE CLIP

Goro Asami, Tsuyoshi Kato, and Hideo Konishi, all of Utsunomiya, Japan, assignors to Nifco Inc., Yokohama, Japan

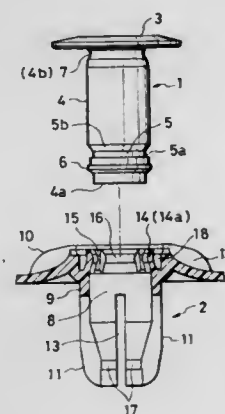
Filed Feb. 14, 1995, Ser. No. 388,440

Claims priority, application Japan, Mar. 29, 1994, 6-094051

Int. Cl.<sup>6</sup> F16B 13/04

U.S. Cl. 24—453

7 Claims



1. A clip comprising:
  - a male member comprising a head portion, a shaft vertically descending from an underside of the head portion, and an engaging recess formed around a periphery of a lower end of the shaft; and
  - a female member comprising a cylindrical body having a hole into which the male member is inserted, legs formed by dividing a lower end portion of the cylindrical body, a flange extending outward from a peripheral surface at an upper end portion of the cylindrical body, and an expanded engaging portion formed substantially entirely around an inner surface at an upper end of the hole in the cylindrical body, said engaging portion being located radially inward of the flange of the female member and engaging with the engaging recess of the male member at an inner peripheral surface of the flange of the female member as well as provisionally maintaining the male and female members in a provisionally assembled state.

5,568,676

## END RELEASE BUCKLE

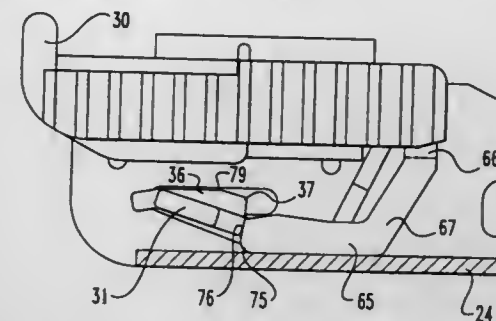
Keith H. Freeman, Cicero, Ind., assignor to Indiana Mills and Manufacturing, Inc., Westfield, Ind.

Filed Mar. 8, 1995, Ser. No. 400,360

Int. Cl.<sup>6</sup> A44B 11/25

U.S. Cl. 24—641

17 Claims



1. An end release seat belt buckle lockable with a tongue comprising:
  - a main frame with a bottom wall and side walls integrally joined together and forming an entrance to receive said tongue;
  - a pawl movably mounted atop said bottom wall and including an upwardly projecting lock lockable with said tongue and a rearwardly projecting extension;
  - a first spring positioned between said pawl and said bottom wall and normally operable to urge said pawl to move positioning said pawl in an upward position but yieldable to allow said pawl to move positioning said pawl in a downward position, said pawl when in said upward position forming a space between said pawl and said bottom wall;
  - an end release button slidably mounted to said main frame and having an outer position when said pawl is locked with said tongue and an inward position when said pawl is unlocked with said tongue with said button contacting said extension when moving from said outer position to said inward position and moving said pawl positioning said pawl in said downward position;
  - an ejector frame fixedly mounted to said main frame;
  - a second spring positioned between said ejector frame and said button operable to normally force said button to said outer position but yieldable to allow said button to move to said inward position;
  - a tongue ejector slidably mounted to said ejector frame; and,
  - a member having a main body slidably upon said bottom wall and including a proximal end connected to said button and movable therewith and a distal end movable into said space between said pawl and said bottom wall when said button is in said outer position limiting movement of said pawl toward said bottom wall but movable out of said space and apart from said pawl when said button is in said inward position.

5,568,677

## ENVIRONMENTALLY SAFE AND ECONOMICAL BURIAL CASKET

Robert A. Tobin, 1842 Turk Hill Rd., Fairport, N.Y. 14450

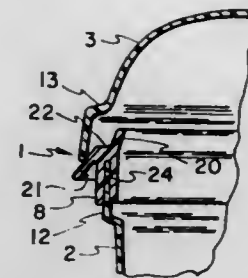
Filed Sep. 2, 1993, Ser. No. 114,636

Int. Cl.<sup>6</sup> A61G 17/00

U.S. Cl. 27—17

9 Claims

1. A Casket for a cadaver, said casket having an open position and a closed position, said casket having an interior that is adapted to be hermetically sealed from the exterior of said casket, said casket having parts and components fabricated from a polymer in order to eliminate or minimize the degradation of said casket due to corrosion and/or rotting, said parts and said components being fabricated by various manufacturing methods including but not limited to injection molding, extruding and vacuum forming, said casket having a configuration of a pressure vessel in order to withstand substantially elevated internal and external pressure



while maintaining its original form and structural integrity, said casket being able to be used for transporting, viewing embalmed, viewing unembalmed, cremating, burying in a vault, burying without a vault and entombing in a mausoleum, cadavers with only minor modifications to said casket, said casket being substantially strong enough structurally to be interred without a burial vault, said casket providing substantial structural strength while maintaining an aesthetically pleasing traditional appearance, said casket comprising:

- a seamless unitary polymeric container adapted to hold said cadaver, said container having combinations of structural configurations including rounded ends, curved sides, a flange substantially at right angle to the adjacent part of said container around substantially the entire periphery of the opening and a substantially planar bottom reinforced with ribs, to provide stability when said casket is resting on a substantially flat surface, that would allow said casket when assembled to withstand substantial deformation due to internal gas pressure and to withstand substantial deformation due to external pressure of the burial dirt with the additional help of said internal gas pressure thus requiring a minimal amount of said polymer in said container;
- a seamless unitary polymeric cover adapted to fit on said container to place said casket in said closed position with said cover substantially spanning said container to encompass substantially all of said interior of said casket, said cover having combinations of structural configurations including an elongated dome and a flange at substantially right angles to the adjacent part of said cover around substantially all of the entire periphery of the opening;
- a gasket that is continuous of a substantially low durometer, resilient polymer that can be bonded to said container around its entire periphery and having a substantially outwardly and upwardly extended lip that would start to seal said casket as said cover started to be lowered on said container-gasket assembly, said gasket being located between the overlapping parts of said cover and said container so any pressure, internal and external, compresses said gasket, said cover centering itself on said container-gasket assembly, said lip being compressed at a substantially right angle to the direction of said cover as it was being put on said container-gasket assembly and the substantially increased friction between said gasket and said cover would hold said cover on said container-gasket assembly.

5,568,678

## APPARATUS FOR NEEDLING A NONWOVEN WEB ALONG A CIRCULAR PATH

Ernst Fehrer, Auf der Gugl 28, A-4020 Linz, Austria

Filed Jun. 1, 1995, Ser. No. 456,931

Claims priority, application Austria, Jun. 27, 1994, 1261/94

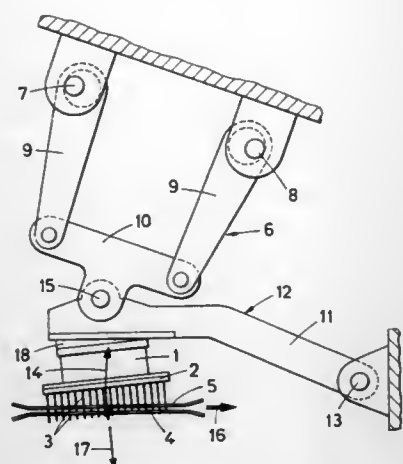
Int. Cl.<sup>6</sup> D04H 18/00

U.S. Cl. 28—115

2 Claims

1. An apparatus for needling a nonwoven web as it moves in a direction of travel, which comprises
  - (a) a needle board carrying needles,
  - (b) web-guiding means adapted to guide the nonwoven web in the direction of travel, the web guiding means comprising
    - (1) a web support facing the needle board and





- (2) a stripper extending between the web support and the needle board,
- (c) a rocker pivotal about an axis,
- (1) the needle board being secured to the rocker,
- (d) a slider-crank mechanism, the rocker being linked to the mechanism and being reciprocable about the axis by the mechanism through a stroke having a mid-point whereby the needle board and needles move along a circular path centered on the axis during reciprocation, and the needles are caused to penetrate the nonwoven web between the web support and stripper along circular penetration paths having a predetermined mean inclination relative to the direction of travel, and
- (e) means for positioning the needle board relative to the rocker so that the needle board extends perpendicularly to the mean inclination of the penetration paths at the midposition of the stroke.

5,568,679

# METHOD OF MANUFACTURING LAMINATED PIEZOELECTRIC ACTUATOR HAVING CAVITY

Kazumasa Ohya; Masako Inagawa, and Masahiro Miyauchi, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

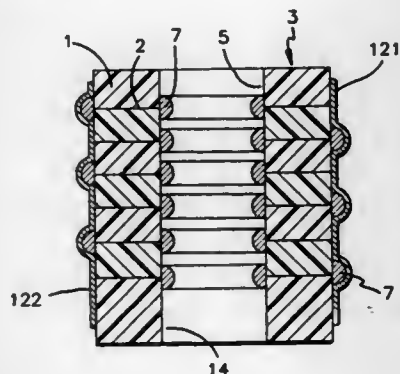
Filed Dec. 20, 1994, Ser. No. 360,112

Claims priority, application Japan, Dec. 20, 1993, 5-320661

Int. Cl.<sup>6</sup> H04R 17/00

U.S. Cl. 29—25.35

8 Claims



1. A method of manufacturing a piezoelectric actuator comprising steps of:
- forming a laminated body by alternately laminating a plurality of piezoelectric ceramic layers and internal electrode layers such that end parts of every other internal electrode layers are exposed on one surface of a pair of opposing side surfaces of said laminated body;

providing a cavity in said laminated body, said cavity extending across said plurality of piezoelectric ceramic layers and internal electrode layers;

forming a first insulator on selected exposed ends of internal electrode layers on outside surfaces of said laminated body; and

forming a second insulator on exposed ends of said internal electrode on an internal surface of said cavity by using an electrophoretic process.

5,568,680

# METHOD FOR MAKING A REFLECTOR FOR A LUMINAIRE

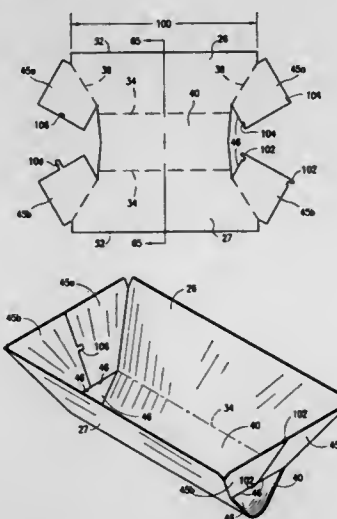
Andrew J. Parker, Chapel Hill, N.C., assignor to Regent Lighting Corporation, Burlington, N.C.

Filed Jan. 26, 1995, Ser. No. 378,630

Int. Cl.<sup>6</sup> B23P 13/04

U.S. Cl. 29—557

4 Claims



1. A method of making a luminaire reflector comprising a trough-shaped body adapted to receive a lamp and end walls at opposite ends of the trough-shaped body, the trough-shaped body comprising spaced-apart arms and a bight joining said arms at one end of the arms, the arms at their opposite ends defining an opening through which light from said lamp is projected by said reflector, the method comprising:

- (a) providing a sheet of metal having two generally parallel edges and a mid-plane extending perpendicular to said edges,
- (b) cutting from said sheet a blank that comprises (i) two primary portions each in the shape of a geometric figure having a major base extending along one of said edges of said sheet, a minor base spaced from said major base, and side edges extending between ends of said major and minor bases via generally convergent paths, (ii) a junction portion interconnecting said minor bases, and (iii) end-paneling portions at opposite sides of said mid-plane, each end-paneling portion comprising a plurality of spaced-apart sections, one joined to a side edge of one of said primary portions and another joined to a side edge of the other of said primary portions,
- (c) bending said blank into a U-shaped form wherein said primary portions constitute the arms of said trough-shaped body of said reflector and said junction portion constitutes the bight of said body of the reflector, and
- (d) bending said blank at each of said side edges where an end-paneling section is joined to a primary portion so that the sections of end paneling at each side of said mid-plane meet to form one of said end walls of said reflector, and in which:
- (e) bending of the blank into said U-shaped form produces a rounded configuration of said bight, and
- (f) each of said sections that form one of said end walls has a rounded edge that abuts said rounded bight when the blank is

bent to form said trough-shaped body and said end walls, said rounded edges being spaced from said junction portion before the blank is bent.

5,568,681

# METHOD FOR MANUFACTURING A ROTOR FOR AN ELECTRIC MACHINE

Peter Chudi, Enebyberg; Åke Jönsson, Västerås, and Leif Ånger, Hallstahammar, all of Sweden, assignors to Asea Brown Boveri AB, Västerås, Sweden

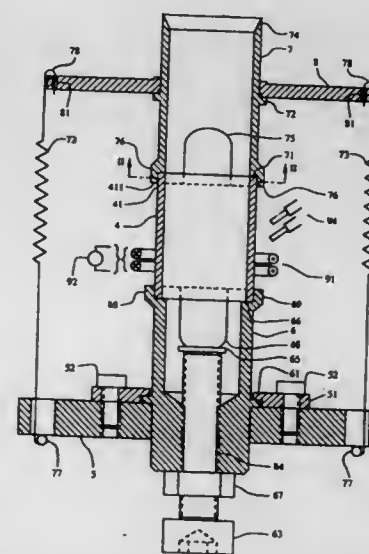
Filed Jul. 14, 1994, Ser. No. 274,810

Claims priority, application Sweden, Aug. 13, 1993, 9302629

Int. Cl.<sup>6</sup> H02K 15/02

U.S. Cl. 29—598

7 Claims



1. A method for manufacturing a rotor for an electric machine, said rotor comprising an inner part which constitutes a rotor body and which comprises a magnetic body and at least one end piece attached to the magnetic body, said rotor body being at least partly formed as a frustum of a cone with circular cross section, and an outer part which comprises a metallic capsule tube providing an envelope surface which is at least partly formed to constitute a limiting surface for a frustum of a cone with essentially the same conicity as that of the rotor body, the capsule tube in the finished rotor surrounding at least parts of the rotor body and under normal operating conditions being fixed thereto by a shrinkage fit, said method comprising the steps of (a) fixing a first of said inner and outer parts relative to a counter-support such that a central axis therethrough extends in an essentially vertical direction, (b) positioning a second of said inner and outer parts above said first part such that an axis thereof essentially coincides with said axis of said first part, (c) causing said second part to fall by gravity within said first part, and (d) shrinking said outer part to fit against and join with said inner part.

5,568,682

# ORTHOGONAL GRID CIRCUIT INTERCONNECT METHOD

Louis E. Gates, Jr., Westlake Village, and Richard M. Port, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

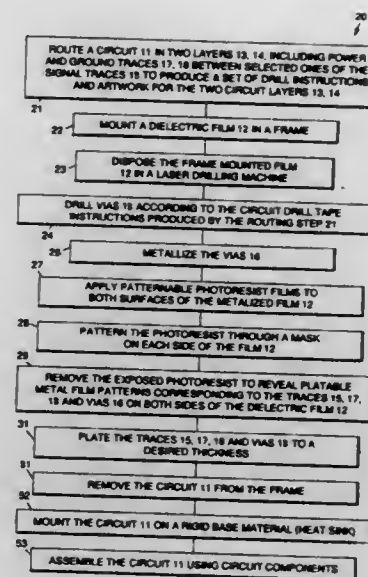
Filed Oct. 31, 1994, Ser. No. 332,158

Int. Cl.<sup>6</sup> H05K 3/06

U.S. Cl. 29—831

11 Claims

1. An orthogonal grid circuit interconnection method for fabricating a circuit, said method comprising the steps of:



- routing the circuit in two layers, including power and ground traces between selected signal traces to produce a set of circuit drill tape instructions and artwork for the two circuit layers;
- mounting a dielectric film, said dielectric film comprising seed metallization layers on both sides of said dielectric film, in a frame;
- disposing the frame mounted film in a laser drilling machine;
- drilling vias in said frame mounted film according to the set of circuit drill tape instructions produced by the routing step;
- metallizing the vias;
- metallizing the surfaces of the dielectric film to produce a metallized film;
- applying patternable photoresist films to both surfaces of the metallized dielectric film;
- patterning the photoresist through a mask on each side of the film;
- removing exposed photoresist from the metallized dielectric film to reveal platable metal film patterns corresponding to the signal traces and vias on both sides of the metallized dielectric film;
- plating the signal traces and the vias to a desired thickness to form a plated circuit;
- removing the remaining photoresist from the plated circuit to expose the seed metallization layers;
- removing the seed metallization layers disposed between the signal traces by immersing the plated circuit on the metallized dielectric film in its frame in an etching tank to remove the seed metallization layers disposed between the signal traces;
- removing the plated circuit from the frame;
- mounting the plated circuit on a rigid base material; and
- assembling circuit components on the plated circuit, thereby forming said fabricated circuit.

5,568,683

# METHOD OF COOLING A PACKAGED ELECTRONIC DEVICE

Chok J. Chia, Campbell; Manian Alagaratnam; Qwai H. Low, both of Cupertino, and Seng-Soo Lim, San Jose, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

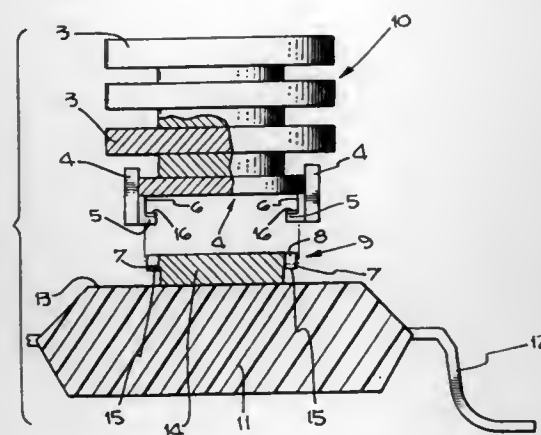
Continuation of Ser. No. 317,968, Oct. 4, 1994, Pat. No. 5,463,529, which is a continuation of Ser. No. 23,981, Feb. 26, 1993, Pat. No. 5,353,193. This application Jun. 7, 1995, Ser. No. 472,320

Int. Cl.<sup>6</sup> H05K 3/30

U.S. Cl. 29—832

28 Claims

1. A method of cooling a packaged electronic device, comprising the steps of:



- (a) providing the packaged electronic device;
- (b) providing a heatsink assembly, including:
- a removable heatsink unit having at least one fin and a coupling collar; and
  - a heatsink having a platform, at least one tab and an inner collar, said platform being attached to said inner collar and said tab being disposed along the periphery of said platform;
- (c) mounting said heatsink on the packaged electronic device such that said heatsink is in thermal contact with the packaged electronic device; and
- (d) removably coupling said heatsink unit to said heatsink such that said heatsink receives a portion of said coupling collar of said heatsink unit within said tab, and when said heatsink unit is turned, said coupling collar removably engages said platform of said heatsink;
- whereby said heatsink assembly radiates heat away from the packaged electronic device, and the packaged electronic device is thereby cooled.

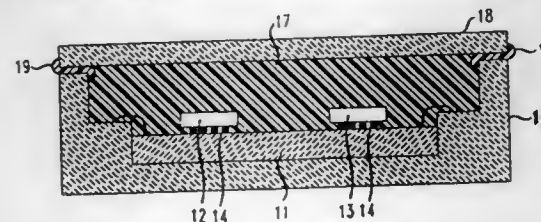
5,568,684

## METHOD OF ENCAPSULATING AN ELECTRONIC DEVICE

Ching-Ping Wong, Lawrenceville, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.  
Division of Ser. No. 936,445, Aug. 28, 1992, Pat. No. 5,317,196. This application Jan. 14, 1994, Ser. No. 181,072  
Int. Cl. B29C 45/14; 70/70

U.S. Cl. 29—840

2 Claims



1. A method for encapsulating an electronic device comprising the steps of:
- bonding the electronic device to a substrate;
  - inserting the substrate in a bottom of a container;
  - substantially filling the container with a fluid encapsulant;
  - said fluid encapsulant consisting essentially of a silicone resin and a catalyst selected from the group consisting of platinum and tin;
  - the silicone resin selected from the group consisting of polydimethylsiloxane, polymethylphenylsiloxane and polydimethyldiphenylsiloxane;
  - said silicone resin comprising molecules terminated in vinyl components and hydride components, the molar ratio of vinyl components to hydride components being in a range of 10:1 to 20:1;

and heating the fluid encapsulant to cause molecular cross-linking therein while keeping the encapsulant in a fluid state.

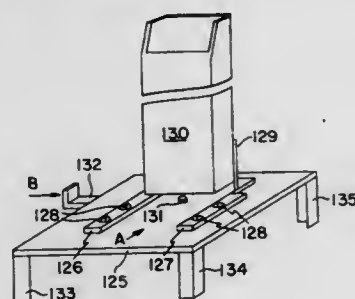
5,568,685

## MANUALLY ACTUATED APPARATUS FOR ASSEMBLING HANGERS WITH INDEXING CAPS

David J. Marshall, Victoria, Australia; Stanley Gouldson, Northport, N.Y.; Olaf Olk, Haupague, and Robert Maiorca, Syosset, both of N.Y., assignors to Spotless Plastics Pty. Ltd., Victoria, Australia  
Division of Ser. No. 173,905, Dec. 27, 1993, Pat. No. 5,507,086, which is a division of Ser. No. 670,963, May 2, 1991, Pat. No. 5,272,806, which is a continuation-in-part of Ser. No. 287,985, Dec. 20, 1988, abandoned. This application Jun. 7, 1995, Ser. No. 484,480  
Int. Cl. B23Q 7/10

U.S. Cl. 29—809

6 Claims



1. A manual means for assembly of hangers and indexing caps at the time clothing is hung from said hangers, each of said hangers having a hook member and each of said indexing caps defining a recess for receiving a portion of said hook member of one of said hangers, each of said indexing caps further defining an aperture through which a plastic ribbon is inserted to hold said indexing caps in a stack, a releasable clamp being attached to the plastic ribbon at one end of said stack to secure said indexing caps in a stacked bundle, said manual means comprising:
- means for receiving a bundle of stacked caps;
  - means for removing said releasable clamp from said plastic ribbon; and
  - alignment means for aligning one of said hangers with one of said indexing caps to assist an operator in inserting said portion of said hook member of one of said hangers into said recess of one of said indexing caps.

5,568,686

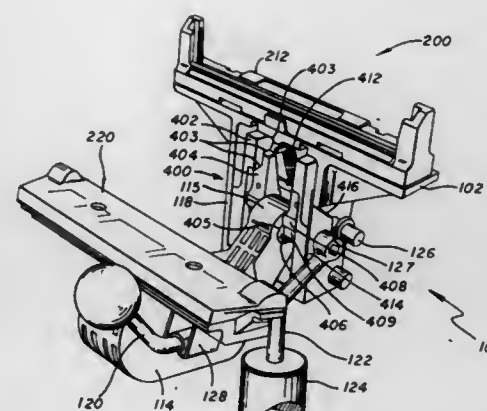
## TOOL FOR ASSEMBLING WIRE CONNECTORS

Wilson E. Suarez, Burbank, Calif., assignor to PSI Telecommunications, Inc., Burbank, Calif.  
Filed Feb. 28, 1994, Ser. No. 203,462  
Int. Cl. H01R 43/04; B23P 19/00

U.S. Cl. 29—861

26 Claims

1. A method for using a tool for assembling a wire connector so as to connect a plurality of wire pairs together, the tool including a housing, a base plate supported by the housing and adapted to receive a removable wire connector holder, a T-bar pivotally connected at a first end thereof with said housing, and an upper support connected with a second end of the housing and adapted to receive a removable force applicator, said method comprising the steps of:
- selecting a first type of removable wire connector holder in accordance with a first type of wire connector to be assembled;
  - selecting a first type of removable force applicator in accordance with at least one of a type of wire connector to be assembled and said selected first type of removable wire connector holder;



- securing said first type of removable wire connector holder to said base plate;
- securing said first type of removable force applicator to said upper support; and
- controlling at least a range of vertical movement of said T-bar so as to cause said first type of removable force applicator to apply a downward force against said first type of removable wire connector holder.
4. An apparatus for assembling a wire connector so as to connect a plurality of wire pairs together, said apparatus comprising:
- a housing;
  - a base plate, disposed on said housing, adapted to receive a removable wire connector holder;
  - a T-bar, pivotally connected at a first end thereof with said housing, said T-bar being moveable relative to said housing;
  - an upper support, disposed at a second end of said T-bar, adapted to receive a removable force applicator;
  - a cam mechanism, disposed in said housing and movably connected with said T-bar, for controlling a range of vertical movement of said T-bar; and
  - a force application lever movably connected with said cam mechanism, for causing said force applicator to apply a downward force against said removable wire connector holder.

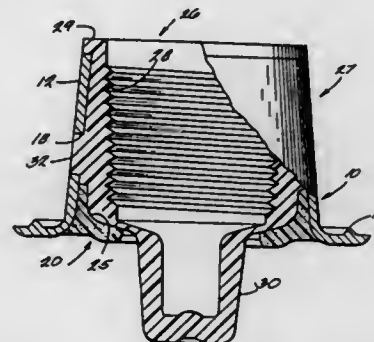
5,568,687

## METHOD OF FABRICATING A TANK AND METHOD OF FABRICATING A TANK CONNECTOR THEREFOR

Rodney R. Syler, Franklin; Rolf E. Faber, Clarksville, and D. Kent Lindahl, Pleasant View, all of Tenn., assignors to State Industries, Inc., Ashland City, Tenn.  
Filed Oct. 13, 1994, Ser. No. 322,625  
Int. Cl. B23P 15/00

U.S. Cl. 29—890.14

16 Claims



1. A method of fabricating a tank and a tank connector therefor comprising the steps of:
- (i) forming a pair of top and bottom half members by deep drawing;

- (ii) fastening at least one tank connector assembly in an opening in one of said half members by welding, said tank connector assembly fabricated by the following steps:
  - (a) providing a metal connector member (10) having a tubular wall and a welding projection means at one end thereof;
  - (b) positioning an insert member (20) of non-metallic, non-corrosive material in said one end of said metal connector member;
  - (c) forming a connector sleeve (26) inside the assembly of parts described in steps (a) and (b) by injection molding, said connector sleeve member having an internally threaded tubular wall portion, said connector sleeve member being made of a polymer material having "low creep" characteristics;
- (iii) fastening the top and bottom half members together by welding to form an outer shell having an internal surface;
- (iv) charging one half member of the outer shell with a non-corrosive polymer material before said welding step;
- (v) subjecting the tank to a rotational movement in the presence of heat to thus cause the polymer material to be uniformly distributed over the internal surface of the outer shell to thereby form an inner shell of non-corrosive material inside the outer shell wherein the inner shell provides a substantially leak-tight liner for the outer shell to thus prevent contact between the contents of the tank and the outer shell, said outer shell serving as a mold for the inner shell wherein said mold becomes a permanent part of the completed tank.

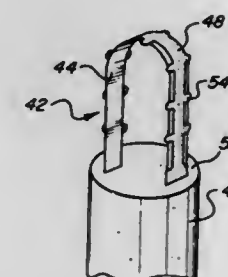
5,568,688

## HAIR SHAVING DEVICE WITH CURVED RAZOR BLADE STRIP

Edward A. Andrews, 6835 Beach Rd., Troy, Mich. 48098  
Filed Jun. 7, 1995, Ser. No. 473,473  
Int. Cl. B26B 21/56; 21/08

U.S. Cl. 30—29.5

32 Claims



1. A manually operated, finger-manipulatable non-electric nose hair trimming device, comprising:
- a head structure sized to fit within a person's nose cavity and arranged to support a flexible razor blade strip having a base portion and a curved guard portion extending from said base portion, said curved guard portion having first and second ends which are attached to said base portion; and
  - a finger grip portion having an end connected to the base portion of said head structure;
- wherein said head structure includes a thin, elongated narrow razor blade strip formed from a strip of flexible flat razor blade material and bent in a central section thereof to provide a substantially semi-circular curved section disposed in between first and second substantially straight sections on either side thereof that terminate respectively at first and second ends, said razor blade strip being arranged to extend substantially along the curved guard portion of the head structure and having a sharpened first edge disposed between the first and second ends, the first and second ends being attached at spaced locations to said base portion of said razor head.



5,568,689

## UTILITY KNIFE WITH IMPROVED HAND GRIP STRAP

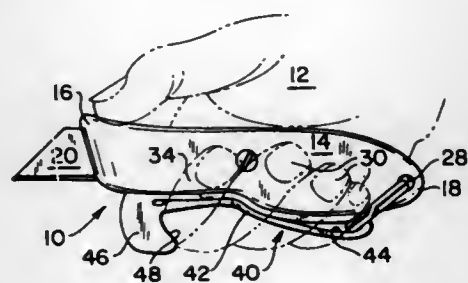
Peter Gold, 465 N. Wood Rd., Rockville Centre, N.Y. 11570

Filed Dec. 11, 1995, Ser. No. 570,610

Int. Cl.<sup>6</sup> B26B 29/02

U.S. Cl. 30—295

2 Claims



1. An improved hand grip device for a utility knife, said knife having a body with a proximal end and an opposite distal end, and a blade projecting from said body proximal end, said hand grip device comprising:

- a spring ring having a circular opening and connected to said knife body adjacent to said distal end;
- a closed loop strap attached to said spring ring and having an operative position extending lengthwise along an underside of said knife body; and
- a selected shape integrally formed on an exterior of said closed loop strap adjacent said proximate end; whereby said shape serves as a stop against inadvertent sliding movement of user's fingers holding said knife body toward said blade.

5,568,690

## DRAFTING INSTRUMENT

Hiroshi Kayama, Yokohama, Japan, assignor to Yugen Kaisha Frontier Engineering, Kanagawa-ken, Japan

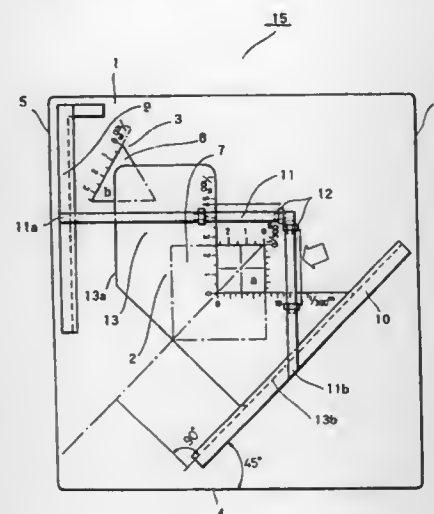
Filed Jan. 5, 1995, Ser. No. 368,883

Claims priority, application Japan, Dec. 6, 1994, 6-302276

Int. Cl.<sup>6</sup> B43L 13/00

U.S. Cl. 33—565

1 Claim



1. A drafting instrument comprising:

- a base board having a central area, an upper left area, a left side, and a right side, said base board having a square opening in said central area and said base board having a regular triangular opening in the upper left area;
- a first guide rail mounted adjacent the left side of said base board;

- a second guide rail mounted at an incline of 45 degrees with respect to the right side of said base board;
- a joint member formed of two legs extending in right-angled direction with each other for connecting said first and second guide rails;
- first and second retainer members respectively attached to each leg of said joint member; and
- a slide member placed on said base board, and retained and released by means of said retainer members, whereby said slide member is capable of being positioned over one of said square opening and said regular triangular opening to obtain a geometrical figure having a desired dimension.

5,568,691

## HAIR DRYER APPARATUS ADAPTED FOR MULTI-FUNCTIONAL USAGE

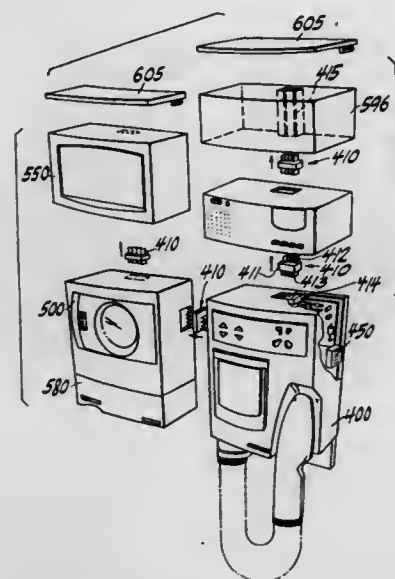
Richard H. Rubin, Donvale, Australia, assignor to Secajo, Ltd., Rarotonga, Cook Islands

Continuation-in-part of Ser. No. 949,470, Sep. 23, 1992, Pat. No. 5,351,417. This application Oct. 4, 1994, Ser. No. 318,046

Int. Cl.<sup>6</sup> F26B 19/00

U.S. Cl. 34—98

30 Claims



1. Apparatus adapted for multi-functional use with selected base and accessory units comprising

- a base unit including a housing attachable to a wall, circuit means in said housing for connection to an electrical supply means, said circuit means providing an electrical outlet connection externally of said housing,
- means in said housing connected to said circuit means for producing a flow of heated air from said housing when the circuit means is connected to said electrical supply means,
- a plurality of modular accessory units at least one of which is operable by the heated air from said housing and at least a second of which is electrically operated, and
- means for detachable connection of a selected modular accessory unit to said housing, said at least second modular accessory unit including an electrical interconnection means which electrically connects the second modular accessory unit to said circuit means when the second modular accessory unit is detachably attached to said base unit, said at least one modular accessory unit being operated by the heated air from said base unit when detachably attached to said base unit.

5,568,692

## PAINT DRYING OVEN WITH RADIANT ENERGY FLOOR

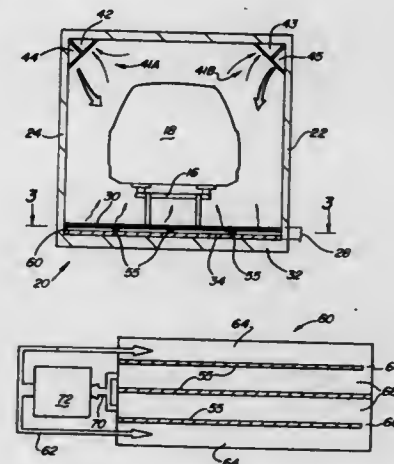
David W. Crompton, Ann Arbor; Gregory M. Still, Plymouth, and Anthony R. Gore, Farmington Hills, all of Mich., assignors to Durr Industries, Inc., Plymouth, Mich.

Filed Nov. 9, 1994, Ser. No. 336,483

Int. Cl.<sup>6</sup> F26B 3/34

U.S. Cl. 34—270

15 Claims



5,568,695

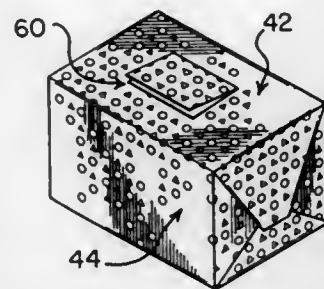
## CUSTOM DECORATED CARDS

James W. Kough, 4280 E. Iowa Ave., Suite 310, Denver, Colo. 80222

Filed Nov. 15, 1993, Ser. No. 151,872  
Int. Cl.<sup>6</sup> G09F 1/04

U.S. Cl. 40—124.1

12 Claims



1. A custom card for use in design coordination with any specific item, container, or wrapping material, said custom card comprising:

base material in the form of a sheet, said sheet having a body which carries an outer surface and an inner surface, said inner surface including a written or writable portion, and wherein said base material further includes a single fold line to form said base material into first and second inner surface sections and into first and second outer surface sections, said fold line adapted to allow said first and second inner surface sections of said base material to be folded together about said fold line in a manner which allows said written or writable portion of said inner surface to remain accessible;

adherent means distributed over and attached to at least a portion of both said first and second outer surface sections of said body of said base material; and

decorative sheet material selected to be design coordinated with any specific item, container, or wrapping material, said decorative sheet material sized to overlay at least said first outer surface section of said base material and a contiguous portion of said second outer surface section of said base material of said adherent means attached to said outer surface of said body of said base material, said decorative sheet material being secured to said portion of said outer surface of said base material by said adherent means, and having at least a portion of said second outer surface section of said base material not covered with said decorative sheet material, wherein said portion of said adherent means distributed over said second outer surface section which is not covered with said decorative sheet material is available for use in securing said custom card flatwise to any specific item, container, or wrapping material.

5,568,696

## REDUCED CAPACITY MAGAZINE FOR REPEATER FIREARM

Ernst Mauch, Dunningen; Helmut Weldle, Oberndorf-Beffendorf; Johannes-August Bantle, Bödingen, and Erwin Epp, Dornhan, all of Germany, assignors to Heckler &amp; Koch GmbH, Oberndorf/Neckar, Germany

Filed Oct. 11, 1994, Ser. No. 320,851

Claims priority, application Germany, Sep. 9, 1994, 44 32 192.9

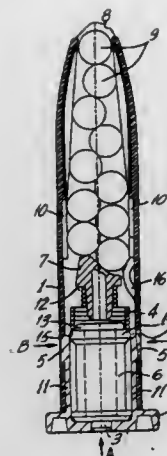
Int. Cl.<sup>6</sup> F41A 9/71

U.S. Cl. 42—49.02

15 Claims

1. A magazine for an automatic pistol, comprising: a spacer for reducing the usable capacity of the magazine while preserving substantially the external dimensions of the magazine;

a magazine tube, including a magazine spring, a feeder, and a magazine base.



wherein the spacer is disposed inside the magazine tube between the magazine base and the magazine spring, and wherein the magazine spring, in the absence of the spacer, does not exert a force on the feeder to advance the last cartridge to the end of the magazine tube, and wherein the spacer is designed to interact with the magazine base so that in the absence of the spacer, and when the magazine is loaded with more cartridges than permitted, the magazine base is at least partly detached from its mounting on the other end of the magazine tube.

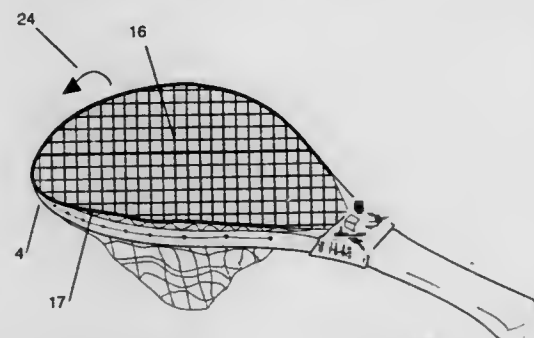
5,568,697

## NET-HANDLE SEINE

Steven S. Schwartz, 3123 S. Boston, Denver, Colo. 80231  
Filed Aug. 29, 1995, Ser. No. 520,597Int. Cl.<sup>6</sup> A01K 77/00

U.S. Cl. 43—14

8 Claims



1. A seine net which attaches to a landing net, said landing net including a handle and an oval frame comprising:

a circular strap of material;

a fastening means to attach said strap to said net handle;

a section of seine netting attached to said strap large enough to encompass said oval frame of said landing net, and

a compartment attached to said strap wherein said seine netting can be stored and transported in a compacted manner.

5,568,698

## MULTIPURPOSE FISHING TOOL

Raymond W. Harding, and Kelly M. Harding, both of 901 N. Chaparral, Corpus Christi, Tex. 78401

Filed Nov. 29, 1994, Ser. No. 346,000

Int. Cl.<sup>6</sup> A01K 97/00

U.S. Cl. 43—53.5

10 Claims

1. A multipurpose fishing tool comprising

5,568,700

## STAND-OFF DEVICE FOR YIELDINGLY SUPPORTING A TREE TO A TREE SUPPORT STAKE

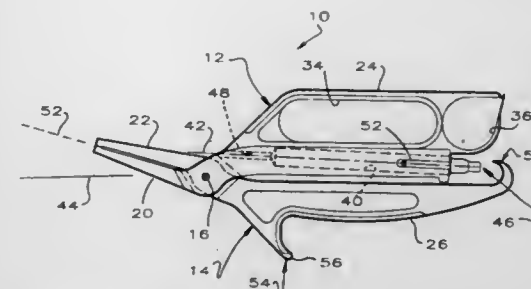
Michael Veneziano, 1332 Shattuck Ave., #15, Berkeley, Calif. 94709, and Mark Icanberry, 2436 Spaulding Ave., Berkeley, Calif. 94703

Continuation of Ser. No. 184,988, Jan. 24, 1994. This application Jun. 7, 1995, Ser. No. 478,888

Int. Cl.<sup>6</sup> A01G 7/00

U.S. Cl. 47—43

21 Claims

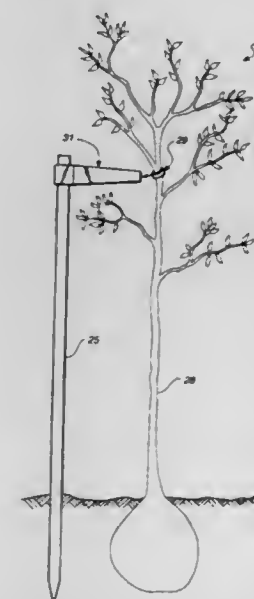


first and second plier members pivoted intermediate opposite ends thereof providing first and second handle sections having free ends and first and second gripping sections mounted for opening and closing movement in response to movement of the handle sections;

a flashlight on one of the handle sections aimed at the first and second gripping sections;

a fish immobilizer rigid with the first handle section adjacent the free end thereof at a location adjacent the free end of the second handle section in a closed position of the handle sections; and

means, on the free end of one of the handle sections, for receiving a tape measure therein.



5,568,699

## FINGERED FABRIC INSECT SWATTER

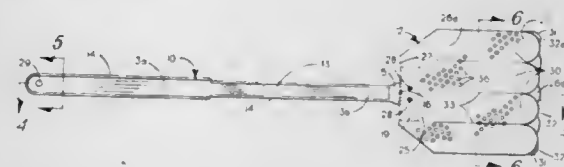
LeGrande D. Wadsworth, Rte. #1, Box 168, St. Ignace, Mont. 59865

Filed Jun. 5, 1995, Ser. No. 462,233

Int. Cl.<sup>6</sup> A01M 3/02

U.S. Cl. 43—137

4 Claims



4. In a swatter for insects having an elongate handle member with fastening means at a first forward end to connect a fastening yoke having first fastening means to interconnect with the fastening means of the handle member and second fastening means to interconnect a swatting member, the invention comprising, in combination:

a swatting member having two similar adjacent swatting elements interconnected to the yoke and extending spacedly therefrom in a direction distal from the handle member, each said swatting element having similar areal extent,

being interconnected to the yoke to extend in adjacency from the yoke in a direction distal from the handle member,

being formed of entangled felted fiber material with an outer surface distal from the other swatting element formed by a plurality of spaced nubbins with indentations therebetween, and

defining plural, spacedly adjacent fingers with slits therebetween in an outer part of each said swatting member distal from the yoke and with the fingers of one said swatting element overlying slits between the fingers of the adjacent swatting element.

5,568,701

## MEANS AND METHOD FOR AUTOMATIC, SELF-DISPENSING, TIMED-RELEASE, CONSTANT FEEDING OF POTTED PLANTS

John C. Haigler, 4420 N. Buckskin Way, Tucson, Ariz. 85715  
Filed Feb. 27, 1995, Ser. No. 395,460Int. Cl.<sup>6</sup> A01G 29/00

U.S. Cl. 47—48.5

4 Claims

1. An automatic, self-dispensing constant delivery plant food dispenser system comprising a generally hollow bottle unit pre-filled with liquid fertilizer further comprising a cylindrically shaped hollow lower section and a conically shaped upper neck section from which the frustum has been removed to provide a fluid passage between the interior of the bottle and the exterior thereof, an elongated cap having an indentation or score mark near the closed end thereof to facilitate the easy removal of the closed end of said cap without removing the cap from the upper neck section of the bottle unit, said cap having a capillary tube having a predetermined essentially constant flow rate integrally molded therein so that a first portion of said capillary tube extends above said indentation or score mark and a second portion of said capillary tube extends, into said fluid passage of said upper neck





section of said bottle, said cap being fixedly and sealingly attached to said upper neck portion of said bottle.

5,568,702

## VENT AND TILT ROOF WINDOW

Karl-Heinz Frank, Waldenbuch; Johann Schneider, and Volker Wöhrn, both of Leinfelden-Echterdingen, all of Germany, assignors to Roto Frank AG, Leinfelden-Echterdingen, Germany

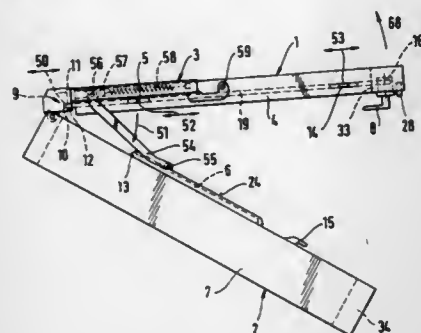
Filed Apr. 26, 1995, Ser. No. 429,123

Claims priority, application Germany, Apr. 26, 1994, 9406930 U

Int. Cl.<sup>6</sup> E05D 15/48

U.S. Cl. 49—153

11 Claims



1. A hinged, swinging skylight comprising:

- (a) a sash having upper and lower ends and a pair of side rails extending therebetween;
- (b) a casement in which said sash is disposed and having a pair of side members;
- (c) a pair of arms pivotally connected at one end to said casement and at the other end to said side rails of said sash;
- (d) spindles on said sash between the middle and said upper end of said sash on said rails thereof and movably seated in channels in said side members of said casement, said spindles being movable between a first position in which they are firmly connected to said arms and in which said spindles are seated in the end of said channels adjacent said upper end of said sash in the hinged position of said sash and a second position in which they are slidably seated in said channels of said side members in the swinging position of said sash; and
- (e) a handle movably mounted on said lower end of said sash and operatively connected to said spindles for movement thereof; and

- (f) coupling elements movable by said handle, between a first hinged position in which they connect said sash firmly to said arms, and a second swinging position in which they are disconnected from said arms.

5,568,703

## ROOF WINDOW

Karl-Heinz Frank, Waldenbuch; Johann Schneider, and Volker Wöhrn, both of Leinfelden-Echterdingen, all of Germany, assignors to Roto Frank AG, Leinfelden-Echterdingen, Germany

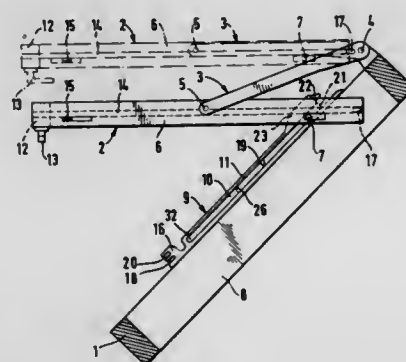
Filed Apr. 26, 1995, Ser. No. 429,205

Claims priority, application Germany, Apr. 26, 1994, 9406929 U

Int. Cl.<sup>6</sup> E05D 15/48

U.S. Cl. 49—153

6 Claims



1. A skylight comprising:

- (a) a sash having side rails and upper and lower cross members;
- (b) a casement having side members and upper and lower cross members;
- (c) carrier arms mounting the sash on the casement, said carrier arms being mounted at one end on a hinge bearing attached to the upper end of said casement and at the other end in the center of said sash on pivot bearings on said side rails of said sash, said sash having spindles on each side rail between pivot bearings and its upper cross member, said spindles being slidable in a runner that is U-shaped in cross section and is disposed on said side member of said casement;
- (d) a cover plate on said sash and extending over a groove in said runner and over said spindles when said sash is in the pivoting position and, when said sash is in the closed position and the swinging position, the spindle is outwardly of the upper end of said cover plate; and
- (e) a handle (13) attached to said lower cross member of said sash when said sash is opened and said carrier arms are coupled with said sash, said sash tilting on the hinged bearings and, when opened with said sash uncoupled from said carrier arms, said spindles move in said grooves of said runner toward the lower cross member of said casement and said pivot bearing on the sash side of said casement is lifted off and said sash swings open, said spindles being positioned on said side rail of said sash and movable longitudinally when said spindles are seated in individual settings by movement of said handle.

5,568,704

## CLUTCHLESS SCREW DRIVE DOOR OPERATOR

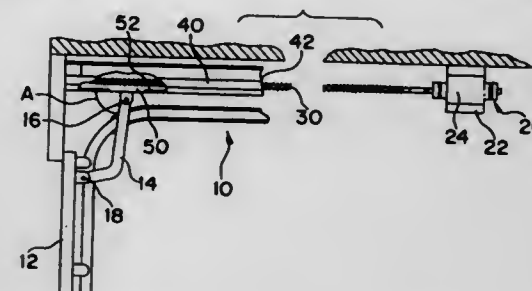
Gregory E. Williams, Minerva; James A. White, Louisville; Nicholas A. Dragomir, Alliance, and James W. Stottsberry, Massillon, all of Ohio, assignors to GMI Holdings, Inc., Alliance, Ohio

Filed Mar. 24, 1995, Ser. No. 409,425

Int. Cl.<sup>6</sup> E05F 11/34

U.S. Cl. 49—362

19 Claims



1. A garage door operator comprising: a motor having a stator and a rotor, said rotor having a shaft which transmits torque developed by said motor; a threaded screw having an end portion; a guide rail for at least partially containing said screw, said guide rail having a terminal end portion; coupling means for coupling said screw to said rotor shaft and absorbing thrust transmitted along said screw toward said motor when said coupling means couples said screw and said motor, said coupling means including a first coupling and a second coupling, said first coupling including a unitary coupling member which has opposing recesses for receiving each of said rotor shaft and said screw end portion therein to connect said screw to said motor for transmission of torque from said motor to said screw, and said second coupling including thrust containment means supported by said screw and means disposed intermediate said thrust containment means and said guide rail terminal end portion.

5,568,705

## EARTHQUAKE RESISTANT MOUNTS FOR BUILDINGS AND CONSTRUCTIONS

Patrice Bellavista, BP 2022, 84023 Avignon Cedex 7, France

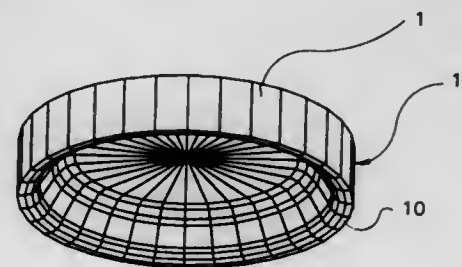
Filed Dec. 22, 1994, Ser. No. 368,273

Claims priority, application France, Jun. 23, 1992, 92 07991

Int. Cl.<sup>6</sup> E04H 9/02

U.S. Cl. 52—167.1

19 Claims



1. An earthquake resistant mount for buildings and constructions comprising two monoblock elements of a hard rotproof material possessing great resistance to abrasion, and being secured respectively to the infrastructure and to the superstructure of the building, one of these elements being formed of a preferably circular horizontal rubbing plate including a cone frustum at its center,

the second element having the shape of a circular cap with a flat blind end which caps the first element so that said blind end of the concavity is in contact with the horizontal plane situated at the top of the cone frustum, and the horizontal peripheral edge in contact with the rubbing plate, an annular space between the internal lateral wall of the circular cap and the lateral wall of the cone frustum allowing relative lateral displacement;

at least one damping ring secured or not secured to the internal lateral wall of the circular cap and/or to the lateral wall of the cone frustum, filling all or some of said annular space; and single or multiple layers of a resilient polymer which resists crushing, making it possible to absorb low-amplitude tremors before the monoblock elements slip, are interposed horizontally at any level through the entire thickness of the material of said elements, it being further possible for these layers of resilient polymer to be or not to be of the same thickness over an identical level in the two elements.

5,568,706

## RIDGE AND/OR EDGE COVERING AND PROCESS FOR THE PRODUCTION OF A RIDGE AND/OR EDGE COVERING

Manfred Gerhing, Hermann-Hesse-Str. 23, D-72250, Freudenstadt, and Hermann Schollmeyer, Heddesheim, both of Germany, assignors to Manfred Gerhing, Freudenstadt, Germany

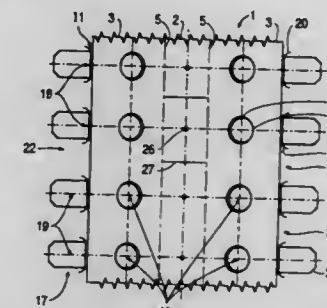
Filed Dec. 7, 1994, Ser. No. 350,689

Claims priority, application Germany, Dec. 10, 1993, 43 42 206.3; Sep. 30, 1994, 94 15 765

Int. Cl.<sup>6</sup> F24F 7/02

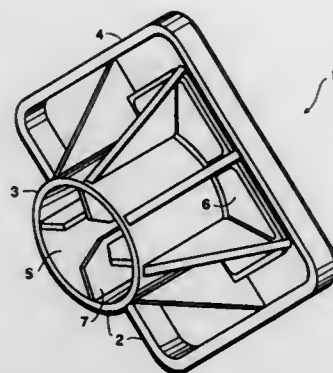
U.S. Cl. 52—198

25 Claims



1. A covering for ridge ventilation comprising: a cap having openings, a first inner portion made from a material which is permanently elastically deformable and having first and second opposed sides, a pair of second inner portions made from a material which is permanently elastically deformable and each having first and second opposed sides and a pair of outer portions, a first side of one of the pair of second inner portions being joined to the first side of the first inner portion with a fold and being bent downward relative to the first inner portion and a side of one of the pair of outer portions being joined to a second side of the one of the pair of second inner portions and being bent upward relative to the one of the second inner portions to define an overflow area, a first side of another of the pair of second inner portions being joined to the second side of the first inner portion with a fold and being bent downward relative to the first inner portion and a side of another of the pair of outer portions being joined to a second side of the another of the pair of second inner portions and being bent upward relative to the another of the second inner portions to define an overflow area, each outer

portion being comprised of an inner part, an intermediate part and an outer part with the intermediate part of each outer portion being a sealing element in a transition area between the second inner portion and the inner part and the outer part of each outer portion angling outwards relative to the inner part, the inner part and the outer part comprising a plurality of elastic plates with intermediate spaces being defined by a space between the elastic plates functioning as overflow areas and a cross section of the overflow areas tapering outward and downward extending from the inner part.



5,568,707

## SOLARIUM STRUCTURE

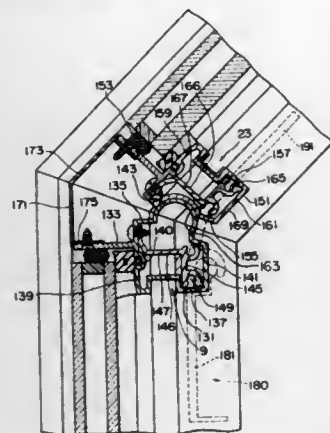
Masayoshi Ishikawa, and Edward T. Fitzhenry, Jr., both of Dublin, Ga., assignors to YKK Corporation of America, Lyndhurst, N.J.

Filed Jan. 23, 1995, Ser. No. 377,010

Int. Cl.<sup>6</sup> E04B 7/18

U.S. Cl. 52—200

5 Claims



1. A solarium structure comprising a vertical wall frame; a sloped roof frame mounted thereon; the vertical wall frame including two mullions, each having an upper end and a lower end, and a head having opposed ends joined with sides of the upper ends of the mullions, the head having a first circular-arc surface; the sloped roof frame including two rafters, each having an upper end and an opposed lower end, and a bottom purlin having opposed ends joined with sides of the lower ends of the rafters, the bottom purlin having second circular-arc surface; the lower ends of the rafters being mitered to the upper ends of the mullions; the bottom purlin being placed on the head with the second circular-arc surface coming into surface-to-surface engagement with the first circular-arc surface so that the head and bottom purlin can be angularly adjusted to each other and so that draft and light can be prevented from passing between the sloped roof frame and the vertical wall frame; and joining means for joining the lower ends of the rafters and the upper ends of mullions so as to be angularly adjusted to each other.

5,568,708

## PROTECTIVE COVER FOR COVERING AN END OF A CONCRETE REINFORCING BAR

Vasken Kassardjian, Newport Beach, and Patrick J. Wilson, Dove Canyon, both of Calif., assignors to Don De Cristo Concrete Accessories, Inc., Irvine, Calif.

Division of Ser. No. 322,160, Oct. 13, 1994, Pat. No. 5,523,043, which is a division of Ser. No. 245,018, May 18, 1994, Pat. No. 5,381,636. This application Feb. 6, 1996, Ser. No. 591,836

Int. Cl.<sup>6</sup> E04H 12/00; E05B 1/00

U.S. Cl. 52—301

9 Claims

1. A protective cover for covering an end of a concrete reinforcing bar so as to prevent injuries to an individual caused by coming

into contact with the end of the concrete reinforcing bar, said protective cover comprising:

a cylindrical collar, said cylindrical collar being dimensioned to receive the end of concrete reinforcing bars of varying sizes and at least a portion of said collar having inwardly-extending and off-center fins for releasably securing the end of the concrete reinforcing bar to the protective cover;

a cap, said cap having an exposed top surface and exposed sides which are constructed so as to prevent injury to any individual coming into contact with the exposed top surface and sides and said cap having an underside which is attached perpendicularly to said collar and at least a portion of said cap including reinforcing ribs extending to at least a portion of the collar; and

a metal seat, said metal seat being disposed adjacent and beneath the underside of said cap,

whereby, in the event that an individual comes into contact with the protective cover, the individual will not be gouged, scraped or impaled by the end of the reinforcing bar.

5,568,709

## SIMULATED DECORATIVE ARCHITECTURAL COLUMNS AND METHOD OF MAKING THE SAME

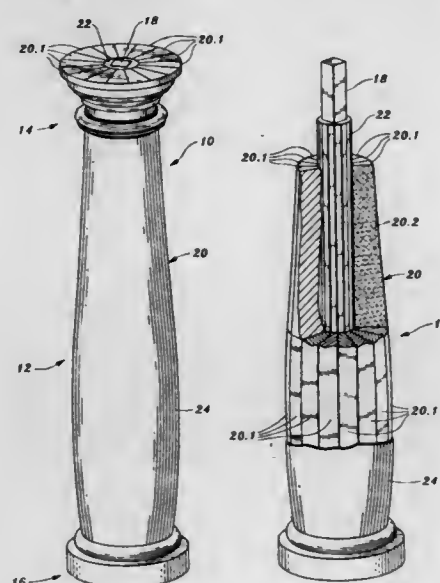
Richard D. Steckler, 1808 Channing Way, Berkeley, Calif. 94703

Filed Jul. 28, 1995, Ser. No. 508,815

Int. Cl.<sup>6</sup> F04H 12/00

U.S. Cl. 52—309.8

12 Claims



1. A simulated decorative architectural column including one or more of a shaft portion, a base portion and a capital portion, comprising:

an axial member; and  
a jacket surrounding said axial member;  
said jacket being comprised of a plurality of elongated jacket wedge members, each of which jacket wedge members is of truncated wedge-shaped cross-section, has an elongated outer face the profile of which is substantially identical to the intended profile of at least a shaft portion of the column, has two opposed major faces of greater area than any of the other faces thereof, and is formed from rigid foam material; and each of said jacket wedge members being substantially parallel to the axis of said axial member.

5,568,710

## CONCRETE FORMING SYSTEM WITH EXPANDED METAL TIE

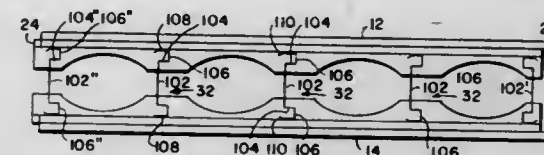
Charles S. Smith, Omaha, and Jay D. Williamson, Papillion, both of Nebr., assignors to I.S.M., Inc., Paola, Kans.

Filed Jul. 1, 1994, Ser. No. 269,485

Int. Cl.<sup>6</sup> E04B 2/40

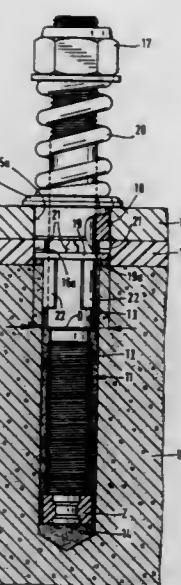
U.S. Cl. 52—426

15 Claims



1. In a concrete form comprising first and second laterally spaced-apart sidewalls for presenting a cavity therebetween, at least one improved form tie comprising:

a first web extending between the sidewalls with first and second laterally spaced-apart ends embedded in a respective sidewall;  
a first flange embedded in each respective sidewall in extension away from each of said first web ends;  
a second web in each respective sidewall and extending from each of said first flanges and towards an exterior surface of each respective sidewall;  
a second flange in each respective sidewall and extending away from each second web, said form tie resisting forces acting on the form to maintain a desired laterally spaced-apart relationship between the sidewalls.



extending transversely of the axial direction and facing toward said anchoring region, and said sealing surface is axially displaceable towards said centering sleeve (8, 18), said sealing element (9, 19) comprises a sealing ring spaced axially from said centering sleeve (8, 18) by rated breaking webs (21).

5,568,712

## REFRIGERATOR DOOR CONSTRUCTION

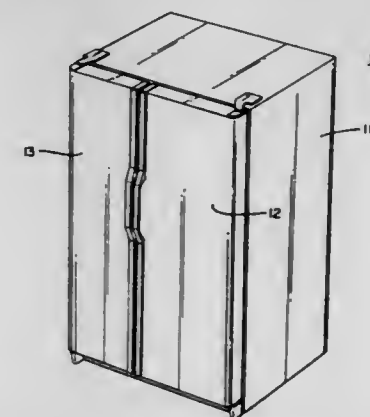
Thomas E. Jenkins, and Duane Jubenville, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Mar. 21, 1995, Ser. No. 407,861

Int. Cl.<sup>6</sup> E04C 2/08; 2/30; A47B 96/04

U.S. Cl. 52—782.1

9 Claims



1. A refrigerator door formed of a unitary sheet of metal, including:

a generally rectangular front wall having top, bottom and side edges;  
top, bottom and side walls projecting rearward from said top, bottom and side edges respectively of said front wall;  
said top and bottom walls having indented end portions;  
said side walls having top and bottom edges with tabs projecting laterally therefrom and overlapping respective ones of said top and bottom wall indented end portions; and  
mechanical interlocks connecting said overlapping end portions and tabs.

5,568,711

## ATTACHMENT ANCHOR ASSEMBLY

Franz Popp, Buchloe, and Andreas Sedlmeier, Ummendorf, both of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Germany

Filed Mar. 23, 1995, Ser. No. 409,552

Claims priority, application Germany, Apr. 20, 1994, 44 13 743.5

Int. Cl.<sup>6</sup> E04C 5/12

U.S. Cl. 52—704

8 Claims

1. An attachment anchor assembly for securing a component (5, 15) to a base material (U), said attachment anchor assembly comprising an axially extending anchor rod (1, 11) having a leading end and a trailing end with an axially extending anchoring region (2, 12) extending from the leading end and insertable into a borehole filled with a hardenable mass (4, 14) in the base material (U) and an axially extending trailing end region arranged to extend out of the borehole in the base material (U) with the component having a through opening (5a, 15a) through which the trailing end region can extend, a force engagement means (7, 17) located on said trailing end region, a centering sleeve (8, 18) laterally enclosing said trailing-end region between said force engagement means (7, 17) and said anchoring region (2, 12), wherein the improvement comprises an annular sealing element (9, 19) laterally enclosing said anchor rod (1, 11) in a sealing manner and located between said centering sleeve (8, 18) and said anchoring region (2, 12), said sealing element comprises an annular sealing surface (9a, 19a)

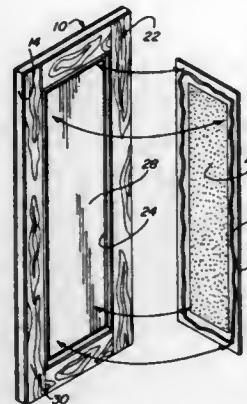


5,568,713

**MIRROR DOOR AND METHOD OF MAKING SAME**  
Robert J. Cagne, Glastonbury; William J. Plein, II, South Windsor, both of Conn., and Kenneth Carson, Shannon, Miss., assignors to The Stanley Works, New Britain, Conn.  
Filed Jan. 24, 1996, Ser. No. 590,787  
Int. Cl.<sup>6</sup> E06B 3/72

U.S. Cl. 52—785.1

12 Claims



1. A mirror door comprising:

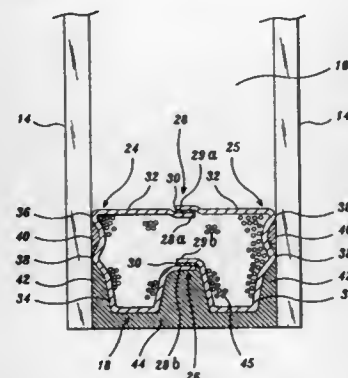
- (a) a door having opposed faces, one of which has a recess therein;
- (b) a mirror seated in said recess and cooperatively dimensioned therewith to locate its periphery adjacent the periphery of said recess, said mirror having a light reflective front face and a rear face disposed against said door;
- (c) a first rigid adhesive disposed between the peripheral portions of said rear face of said mirror and said door recess; and
- (d) a second adhesive disposed between said mirror and door inwardly of said peripheral portions, said first and second adhesives securing said mirror in said recess of said door, said first adhesive being relatively rigid in comparison to said second adhesive to mount said mirror on said door in a fixed position, and said second adhesive being relatively flexible to accommodate differential expansion between said door and mirror and to dampen impact forces acting between said door and mirror.

5,568,714

**SPACER-FRAME BAR HAVING INTEGRAL THERMAL BREAK**  
Wallace H. Peterson, Burnaby, Canada, assignor to Alumet Manufacturing Inc., Coquitlam, Canada  
Filed May 17, 1995, Ser. No. 443,117  
Int. Cl.<sup>6</sup> E06B 7/00

U.S. Cl. 52—786.13

25 Claims



1. An elongate tubular spacer-frame bar for use in an insulated glass panel, comprising:

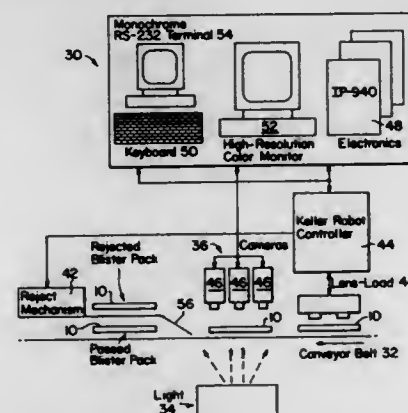
- (a) a spacer-frame bar having first and second sides, each side having a side surface having first and second elongate edges, extending therefrom the first and second elongate edges of the first side corresponding to the first and second nonwelded elongate edges of the second side, respectively;
- (b) first and second nonweld seams running along the elongate dimension of the spacer-frame bar between the corresponding first edges of said first and second sides and second edges of said first and second sides, respectively, such that in at least one of said first and second seams the corresponding edges of said first and second sides overlap each other to form the at least one of said first and second seams so as to provide structural strength between said first and second sides; and
- (c) means for thermally insulating said first side from said second side along said first and second seams.

5,568,715

**AUTOMATED INSPECTION SYSTEM WITH TRANSPORT AND EJECTOR CONVEYOR**  
James A. Ebel, and Michael F. Widman, both of Jacksonville, Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.  
Filed May 31, 1994, Ser. No. 251,474  
Int. Cl.<sup>6</sup> B65B 57/10; G01N 21/90

U.S. Cl. 53—54

21 Claims



1. A transport and ejector conveyor for an automated inspection system comprising:

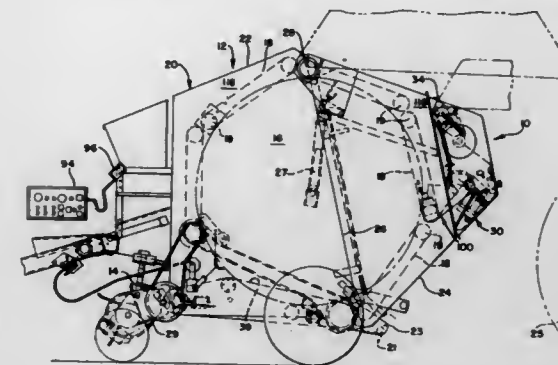
- a. an optical inspection station at which a package array comprising connected individual package bases, each base having a product therein, is optically inspected to verify that the product is present in each package base;
  - i. wherein the optical inspection station comprises a plurality of video cameras, each of which optically inspects a given number of package bases;
  - ii. wherein the video cameras are mounted on a support which is independently adjustable by separate x, y and z adjustor mechanisms for translation along x, y and z axes to precisely position the video cameras relative to the package bases;
- b. a package conveyor system for conveying the package bases by the optical inspection station;
- c. an ejector system, selectively switchable between a first position in which the package bases are passed on the package conveyor system by the ejector system and a second position in which the ejector system transfers packages that are determined by the optical inspection station not to have a product therein from the package conveyor system to the ejector system.

5,568,716

**ROUND BALE WRAPPING**  
Leroy Kluver, Celina, and Donald E. Line, Coldwater, both of Ohio, assignors to AGCO Corporation, Duluth, Ga.  
Continuation of Ser. No. 53,914, Apr. 27, 1993, Pat. No. 5,433,059. This application Apr. 19, 1995, Ser. No. 425,348  
Int. Cl.<sup>6</sup> B65B 13/04; 63/04

U.S. Cl. 53—399

29 Claims



- 3. A method of forming a bale in a round baler and wrapping the bale thus formed with bale wrap material while the bale rotates within the round baler, the method comprising the steps of:
  - providing a round baler with a bale wrap advancement and severance assembly having a bale wrap cut-off member, the cut-off member having a cutting orientation and a pre-cutting orientation;
  - introducing cut forage material into a baling chamber of the round baler and forming the cut forage material into a generally round bale;
  - providing a supply of bale wrap material having a free end, the supply of bale wrap material being external of the baling chamber;
  - advancing the free end of said supply of bale wrap material toward a bale wrap receiving opening of said baling chamber; said advancing step effecting movement of a feed member toward the bale wrap receiving opening in order to guide the bale wrap material through the bale wrap receiving opening; engaging the free end of said supply of bale wrap material with said bale and rotating said bale to provide a wrapped bale;
  - detecting and feeding back to a controller the quantity of bale wrap material deployed during said bale wrap advancing step until a preselected quantity is deployed;
  - moving the cut-off member from its pre-cutting orientation to its cutting orientation, while ceasing said advancing of said supply of bale wrap material and severing a portion of said supply of bale wrap material including the bale wrap material of the wrapped bale; and
  - said moving step effecting further movement of the feed member, which movement is away from the bale receiving opening.

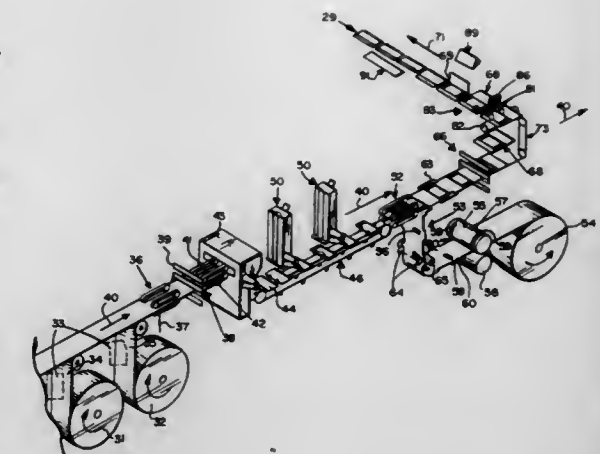
5,568,717

**FORMING AN ENVELOPE AROUND INSERTS**  
Jimmie A. Harrod, Grand Island, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.  
Filed Mar. 30, 1993, Ser. No. 40,034  
Int. Cl.<sup>6</sup> B65B 11/18; 11/26; 11/48; 43/00

U.S. Cl. 53—429

30 Claims

- 1. A method of automatically forming a mailing envelope with a plurality of contained insert sheets from at least one insert web of paper and an envelope web of paper, comprising the steps of continuously and automatically:
  - (a) forming at least one insert from the at least one insert web of paper, including by cutting the insert from the web, and folding the insert, to produce a formed insert;
  - (b) forming a plurality of interconnected envelope blanks from the envelope web of paper;



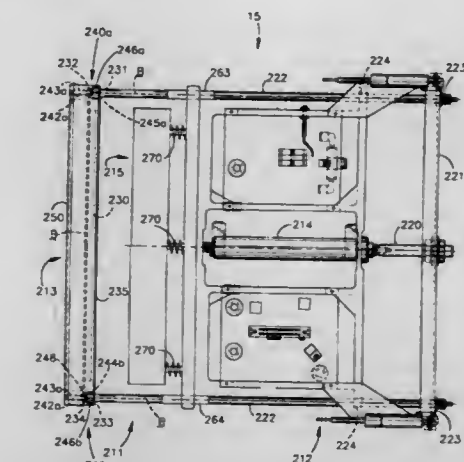
- (c) collecting and placing a plurality of insert sheets, including the formed insert, on each of the plurality of interconnected envelope blanks while they are interconnected, in web form; and then
- (d) while conveying the interconnected blanks in web form, severing the interconnected envelope blanks from each other to produce individual blanks, and forming each individual blank around the inserts placed thereon to produce a final mailing envelope containing a plurality of insert sheets.

5,568,718

**PACKAGING MACHINE AND METHOD**  
Bernard Lerner, Aurora; William M. Cronauer, Tallmadge, and Rick S. Wehrmann, Hudson, all of Ohio, assignors to Automated Packaging Systems, Inc., Streetsboro, Ohio  
Division of Ser. No. 298,786, Aug. 31, 1994, Pat. No. 5,499,485, which is a division of Ser. No. 954,378, Sep. 30, 1992, Pat. No. 5,394,676. This application Mar. 7, 1996, Ser. No. 612,292  
Int. Cl.<sup>6</sup> B65B 57/08

U.S. Cl. 53—75

15 Claims



- 1. A process of packaging with a bagging machine for sequentially delivering end ones of a chain of interconnected preopened bags to a loading and sealing station, the machine having a seal bar and a reciprocatably mounted seal pad assembly including a pad and a coacting housing, the pad being for pressing top portions of a loaded bag to be sealed against the bar, the method comprising:
  - a) positioning a bag to be loaded at the station;
  - b) opening the positioned bag and inserting contents to be packaged;
  - c) moving the assembly along a path of travel toward the seal bar;

- d) sensing lost motion movement of at least a selected one of the pad and housing relative to other parts of the assembly;
- e) determining whether the sensed lost motion movement was during an early or a late portion of the assembly movement along the path and toward the seal bar;
- f) stopping the assembly movement toward the seal bar when it is determined that the sensed lost motion movement was during the early portion;
- g) allowing the assembly movement to continue toward the seal bar when it is determined the lost motion movement was in the late portion; and,
- h) continuing the assembly movement until said top portions are pressed together to effect a seal;
- i) separating the loaded bag from the chain by pulling the chain away from the load station as the loaded bag is being sealed; and,
- j) separating the assembly from the seal bar whereby to release the loaded and now sealed bag from the machine.

5,568,719

**COMPOSITE YARN INCLUDING A STAPLE FIBER COVERING A FILAMENT YARN COMPONENT AND CONFINING THE FILAMENT YARN COMPONENT TO A SECOND THICKNESS THAT IS LESS THAN A FIRST THICKNESS OF THE FILAMENT IN A RELAXED STATE AND A PROCESS FOR PRODUCING THE SAME**

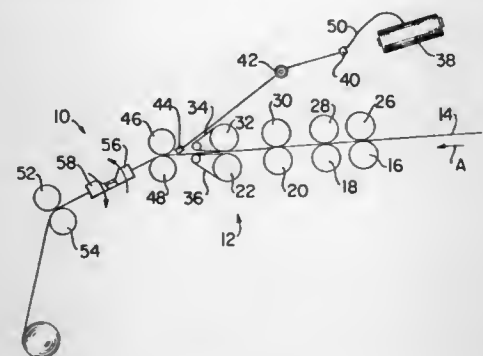
Charles W. Proctor, Greensboro, N.C., assignor to ProSpin Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 896,819, Jun. 11, 1992, Pat. No. 5,383,331. This application Dec. 12, 1994, Ser. No. 354,279

Int. Cl.<sup>6</sup> D02G 3/36; 3/02

U.S. Cl. 57—225

19 Claims



8. A method of co-spinning a continuous stretch textured filament yarn and staple fibers in a spinner to produce a composite yarn, said method comprising the steps of:

- feeding a sliver or roving of said staple fibers through a drafting apparatus to prepare a continuous bundle of staple fibers;
- pretensioning said filament yarn to stretch said filament yarn to a second thickness that is less than a first thickness of said filament yarn in a relaxed state such that said texture is temporarily substantially removed;
- combining said continuous bundle of staple fibers and said filament yarn downstream of said drafting apparatus;
- feeding said combined continuous bundle and said filament yarn into said spinner; and
- releasing said filament yarn from tension such that said bundle of staple fibers substantially covers the filament yarn and confines the filament yarn to said second thickness.

5,568,720

**APPARATUS FOR SERVICING A MULTI-POSITION YARN WINDING MACHINE**

Udo Teich, Sprockhovel, and Ludger A. Deters, Remscheid, both of Germany, assignors to Barmag AG, Remscheid, Germany

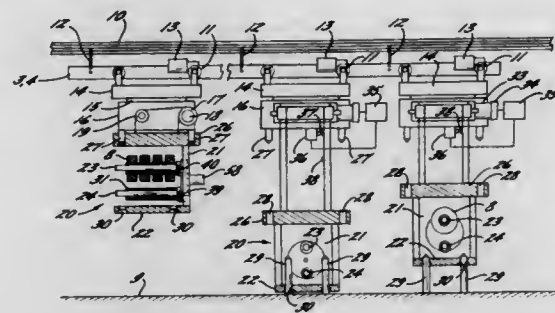
Filed Sep. 19, 1994, Ser. No. 308,583

Claims priority, application Germany, Sep. 17, 1993, 43 31 597.6; Oct. 6, 1993, 43 34 020.2; Mar. 3, 1994, 44 06 994.4

Int. Cl.<sup>6</sup> D01H 9/10; 9/14

U.S. Cl. 57—281

16 Claims



1. An apparatus for servicing a multiposition textile processing machine and comprising an overhead track which is positioned along a front side of the textile machine,
- a transport unit mounted for movement along said track,
- a pivotable carousel,
- means for mounting said carousel to the underside of said transport unit wherein the carousel is selectively pivotable about a vertical axis with respect to said transport unit,
- a carrying frame which mounts at least one horizontally disposed mandrel,
- hoisting means interconnecting the carrying frame to the carousel and so that the carrying frame is selectively lifted and lowered with respect to the carousel between a raised position adjacent the carousel and a lowered position, and
- means interengaging the carousel and the carrying frame so as to prevent relative lateral movement therebetween when the carrying frame is in said raised position.

5,568,721

**SYSTEM FOR SUPPLYING FUEL TO AND COOLING A FUEL INJECTOR OF A DUAL HEAD COMBUSTION CHAMBER**

Jean-Paul D. Alary, Saint Maur des Fosses; Michel A. A. Desautly, Vert Saint Denis; Denis J. M. Sandelis, Nangis, and Pierre M. V. E. Schroer, Brunoy, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation S.N.E.C.M.A., Paris Cedex, France

Filed Jun. 30, 1995, Ser. No. 492,567

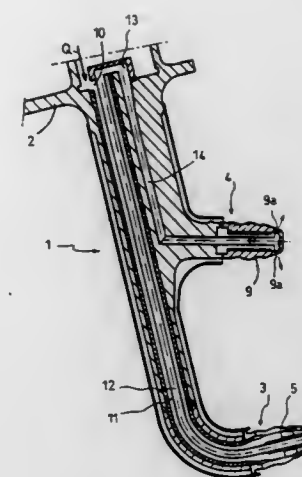
Claims priority, application France, Jun. 22, 1994, 94 07623

Int. Cl.<sup>6</sup> F02C 7/228

U.S. Cl. 60—39.03

9 Claims

1. A method for supplying fuel to and cooling a fuel injector assembly of a gas turbine engine wherein the fuel injector assembly has a low power injector and a high power injector with fuel injection orifices, the high power injector being operable only during selected operational modes of the gas turbine engine comprising the steps of: supplying a total fuel flow (Q) to the fuel injector assembly such that at least a portion of the total fuel flow circulates through the high power injector during all operational modes of the gas turbine engine; providing valve means in the high power injector to control the amount of fuel passing through the fuel injection orifices, the amount being variable between zero flow and a maximum flow; and, evacuating unused fuel from the high power injector.



5,568,722

**EMISSION PROBE FOR THE REMOVAL OF EXHAUST GAS FROM THE COMBUSTION CHAMBER OF A GAS TURBINE**

Philipp Brunner, Hunzenschwil, and Rudolf Tresch, Seon, both of Switzerland, assignors to ABB Management AG, Baden, Switzerland

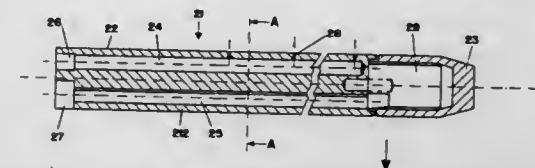
Filed Mar. 31, 1995, Ser. No. 414,743

Claims priority, application Germany, Jun. 22, 1994, 44 21 807.9

Int. Cl.<sup>6</sup> F02C 7/00

U.S. Cl. 60—39.33

7 Claims



1. An emission probe for the removal of exhaust gas from the combustion chamber of a gas turbine, comprising a one-piece probe tube having an outer tube wall and a longitudinal axis, and being formed with an interior emission passage extending along the longitudinal axis and two interior cooling passages extending parallel to the emission passage and adjacent to one another, wherein, in transverse cross section, the cooling passages at least partially surround the emission passage, and wherein a thickness of the tube wall enclosing the cooling passages is approximately constant over a majority of the tube circumference, and wherein a plurality of cooling ribs project from the tube wall into the cooling passages.

5,568,723

**LONG LIFE CATALYTIC GAS GENERATOR FOR SPACE PROPULSION APPLICATIONS**

William K. Burke, deceased, late of Bellevue; Charles R. Roberts, Woodinville, and Freely R. Schwam, Bellevue, all of Wash., assignors to Olin Corporation, Redmond, Wash.

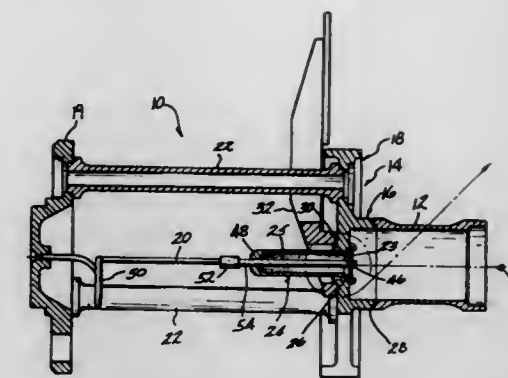
Filed Sep. 8, 1992, Ser. No. 941,620

Int. Cl.<sup>6</sup> F02K 1/100

U.S. Cl. 60—203.1

7 Claims

1. A catalytic gas generator for an electrothermal thruster comprising:
- a gas generating chamber containing a catalytic bed;
- a propellant feed tube adapted to provide a flow of propellant fluid to said catalytic bed;
- an injector portion adapted to receive one end of said feed tube communicating with said gas generating chamber, said injector



5,568,724

**TURBOFAN ENGINE WITH MEANS TO SMOOTH INTAKE AIR**

Ernst Lindner, Tübingen; Guido W. Trittler, Unterschleißheim, and Klaus Britz, Olching, all of Germany, assignors to MTU Motoren-und Turbinen Union München GmbH, München, Germany

PCT No. PCT/EP92/02274, § 371 Date Jun. 27, 1994, § 102(e) Date Jun. 27, 1994, PCT Pub. No. WO93/08397, PCT Pub. Date Apr. 29, 1993

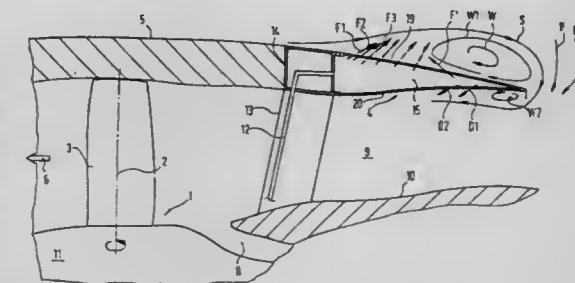
PCT Filed Oct. 1, 1992, Ser. No. 211,798

Claims priority, application Germany, Oct. 15, 1991, 41 34 051.5

Int. Cl.<sup>6</sup> F02K 1/64

U.S. Cl. 60—204

22 Claims



1. A turbofan engine having an engine and a fan and comprising a shroud surrounding the engine and defining therewith a secondary channel containing said fan for flow of air therethrough from front to rear during normal forward flight to produce forward thrust and from rear to front during braking to produce reverse thrust, said fan having blades with variable pitch for reversing the flow of air through said secondary channel, said shroud having a leading end with an inlet lip thereat and a trailing end of pointed shape forming a part of a nozzle for discharge of air during forward flight, said leading end and said trailing end having a fixedly arranged contour to produce an airflow pattern thereon corresponding to aerodynamic flow requirements during cruise flight operating conditions and means at least at one of said ends of said shroud for changing said air flow pattern at said at least one of said shroud ends during engine operating conditions differing from said cruise flight operating conditions for diverting, from outer ambient air flow, a partial intake air flow into said shroud to produce a substantially smooth, non-turbulent flow of the complete engine intake air into said shroud at said at least one end thereof, wherein said means for changing said air flow pattern comprises means for blowing air under pressure at the outside surface of said shroud.



5,568,725

# **APPARATUS AND METHOD FOR CONTROLLING THE AIR-FUEL RATIO OF AN INTERNAL COMBUSTION ENGINE**

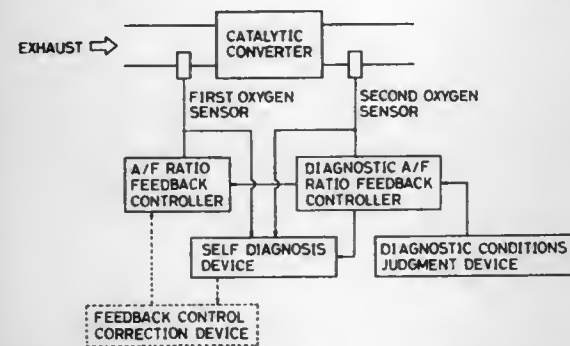
Akira Uchikawa, Atsugi, Japan, assignor to Unisia Jecs Corporation, Atsugi, Japan

Filed Jul. 21, 1994, Ser. No. 277,273

Claims priority, application Japan, Jul. 26, 1993, 5-184157  
Int. Cl.<sup>6</sup> F01N 3/20

U.S. Cl. 60—274

14 Claims



1. An apparatus for controlling the air-fuel ratio of an internal combustion engine, said apparatus comprising:  
an exhaust purification catalytic converter arranged in an exhaust passage of the engine;  
a first oxygen sensor provided upstream of said exhaust purification catalytic converter, for detecting oxygen concentration in the exhaust gas, air-fuel ratio feedback control means for feedback control of an air-fuel ratio of the engine intake mixture to a target air-fuel ratio, based on detection results of the first oxygen sensor;  
a second oxygen sensor provided downstream of said exhaust purification catalytic converter, for detecting oxygen concentration in the exhaust gas, diagnostic condition judgment means for judging a diagnostic condition of said first oxygen sensor;  
diagnostic air-fuel ratio feedback control means for stopping air-fuel ratio feedback control with said air-fuel ratio feedback control means when judged by said diagnostic condition judgment means that a diagnostic condition has been realized, and instead carrying out feedback control of the air-fuel ratio of the engine intake mixture to a target air-fuel ratio, based only on output values of said second oxygen sensor;  
self diagnosis means for comparing respective output characteristics of said first and second oxygen sensors in the situation of feedback control by said diagnostic air-fuel ratio feedback control means, and diagnosing deterioration of said first oxygen sensor based on results of the comparison.

5,568,726

# **EXHAUST PIPE STRUCTURE FOR A MOTORCYCLE**

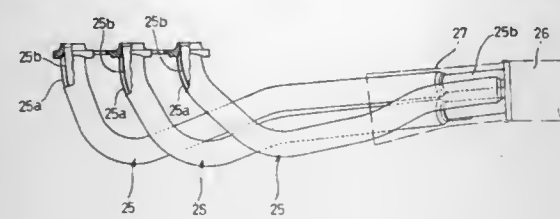
Hajime Yamada, and Ryoji Nakajima, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1995, Ser. No. 473,968

Claims priority, application Japan, Jul. 13, 1994, 6-161504  
Int. Cl.<sup>6</sup> F01N 7/10

U.S. Cl. 60—323

20 Claims



1. A cover for an exhaust pipe construction for a motorcycle comprising:  
a plurality of exhaust pipes each having an inner pipe and an outer pipe forming a double-pipe construction extending for a predetermined distance, individually, from each cylinder of a multi-cylinder engine;  
a cover mounted at a portion of a motorcycle adjacent to an area where the feet of an operator are disposed;  
said plurality of exhaust pipes extending inside said covers; and  
at least one of said exhaust pipes extending inside said cover continues as a double-pipe construction and each of the remaining exhaust pipes disposed inside said cover continues as a single-pipe construction.

5,568,727

# **STRAIGHT TRAVELLING APPARATUS FOR HEAVY CONSTRUCTION EQUIPMENT**

Dae S. Chung, Pusan, Rep. of Korea, assignor to Samsung Heavy Industries Co., Ltd., Seoul, Rep. of Korea

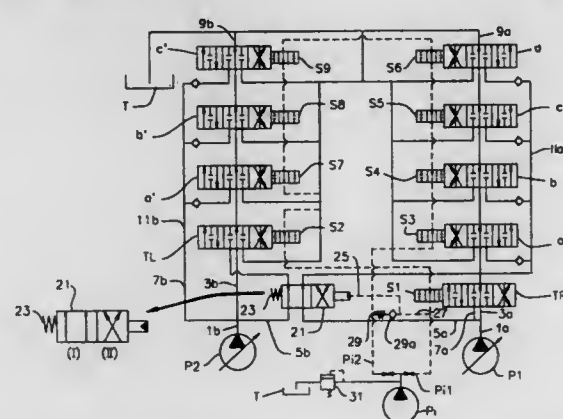
Filed Jun. 30, 1995, Ser. No. 497,130

Claims priority, application Rep. of Korea, Oct. 29, 1994, 94-28044

Int. Cl.<sup>6</sup> F16D 31/02

U.S. Cl. 60—421

7 Claims



1. A straight travelling apparatus for heavy construction equipment, connected to a hydraulic system of the heavy construction equipment, the hydraulic system including a pilot pump, first and second hydraulic pumps both having the same displacement, right and left travel motors activated by the hydraulic pumps, and a plurality of actuators of a working system, comprising:  
a straight travel valve disposed in both lines respectively branching from the first and second hydraulic pumps and switched between a first state at which a fluid delivered from the first hydraulic pump is supplied to the right travel motor and a part of the actuator of the working system while a fluid delivered from second hydraulic pump is supplied to the left travel motor and the remaining part of the actuators of the working system and a second state at which the fluid delivered from the first hydraulic pump is supplied to both the right and left travel motors while the fluid delivered from the second hydraulic pump is supplied to all actuators of the working system;  
a valve spring adapted to always urge the straight travel valve toward the first state;  
first and second pilot fluid lines both branching from the pilot pump, the first pilot fluid line draining its pilot fluid via selector valves directly connected to respective control valves of the right and left travel motors, and the second pilot fluid line draining its pilot fluid via selector valves directly connected to respective control valves of all actuators of the working system;  
a connecting fluid line adapted to communicate the first and second pilot fluid lines with each other;

5,568,728

# **FILAMENT COOLER**

Gary S. Sapsford, Herts, United Kingdom, assignor to Northern Telecom Limited, Montreal, Canada

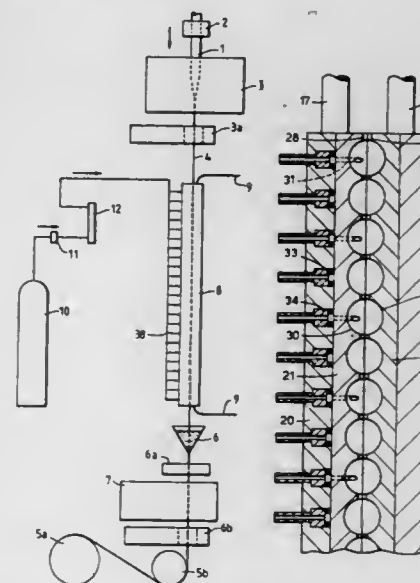
Filed Feb. 13, 1995, Ser. No. 388,151

Claims priority, application United Kingdom, Mar. 5, 1994, 9404290

Int. Cl.<sup>6</sup> F25D 13/06; C03B 25/00

U.S. Cl. 62—63

20 Claims



1. A method of cooling a filament, which method includes the step of passing the filament downwardly through an encircling refrigerated body member, in which body member the filament passes in succession through a series of chambers in each of which, by means of gas flow through a tangentially communicating orifice, a cyclonic flow of gas is maintained for the extraction of heat from the filament to the body member.

5,568,729

# **MACHINE AND METHOD FOR MAKING HARDENED CONFECTIONS HAVING COMPLEMENTARY PARTS JOINED IN A UNIT**

David B. Heinrich, Battle Creek, Mich., and Jack D. Spencer, Westerville, Ohio, assignors to Nestec, Ltd., Vevey, Switzerland

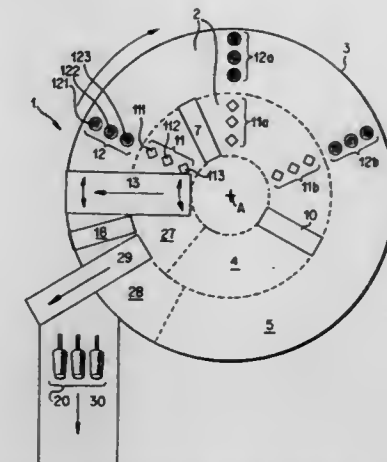
Continuation-in-part of Ser. No. 206,388, Mar. 4, 1994, Pat. No. 5,435,143, and Ser. No. 226,494, Apr. 12, 1994, Pat. No. 5,447,036. This application May 26, 1995, Ser. No. 452,148

Int. Cl.<sup>6</sup> A23G 9/26

U.S. Cl. 62—75

19 Claims

1. A machine for making hardened confections of complementary parts comprising:  
at least two groups of complementary molds, the groups including a group of first molds for producing a solidified physical



- shape which fits within the molds in a group of second molds, the groups of molds being cooperatively arranged on a rotary table;  
at least one solidifying section through which the groups of first molds and second molds are advanced;  
at least one filling unit for introducing a quantity of first product to fill the first molds, and introducing a quantity of a second product to fill the second molds in an amount predetermined approximately by the volume of the second molds less the volume of the first filled molds, the filling unit being located at a position on the machine whereby the first molds are filled at a time that is at least one of before and during the advance of the first molds into and through the solidifying section, the filling unit further being disposed to fill the second molds at a time that is at least one of before, during and after the transfer of solidified product from the first molds into the second molds;  
a stick inserter for inserting a stick into the first product in the first molds; and  
at least one withdrawing and transfer mechanism for withdrawing solidified product from the first molds and for transferring the withdrawn product into the second molds, and for withdrawing the confections from the second molds after the second product solidifies and transferring the confections from the machine.

5,568,730

# **DEODORIZING DEVICE FOR REFRIGERATOR**

Ho C. Kim, and Sang B. Kim, both of Kyungsangnam-Do, Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 8, 1994, Ser. No. 335,920

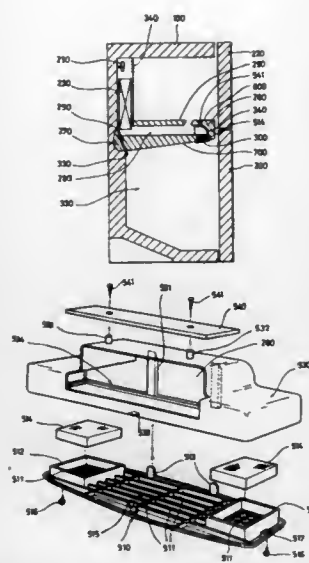
Claims priority, application Rep. of Korea, Nov. 26, 1993, 25208/1993; Dec. 30, 1993, 30992/1993

Int. Cl.<sup>6</sup> F24F 3/16; A62B 7/08

U.S. Cl. 62—78

3 Claims

1. A deodorizing device for a refrigerator comprising:  
a cooling air return passage defined between an upper insulating wall and a lower insulating wall of the refrigerator, said insulating walls dividing the interior of the refrigerator into a freezing chamber and a cooling chamber, and said cooling air return passage communicating an evaporator, and the freezing chamber and the cooling chamber with each other;  
a first cooling air return port formed between the cooling air return passage and the freezing chamber so as to connect the return passage to the freezing chamber, said first cooling air return port introducing cooling air of the freezing chamber to the return passage;  
a second cooling air return port formed between the cooling air return passage and the cooling chamber so as to connect the cooling air return passage to the cooling chamber, said second cooling air return port introducing cooling air of the cooling chamber to the return passage;



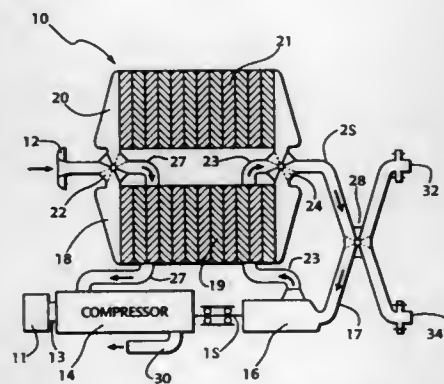
- a deodorizing unit for deodorizing and sterilizing the cooling air, said deodorizing unit being detachably mounted to the second cooling air return port;
- a cooling air grille detachably mounted in said second cooling air return port and provided with a plurality of cooling air through-holes;
- a deodorant container provided on each side of an inner surface of said cooling air grille, each said deodorant, container removably receiving deodorant therein;
- a guide cover detachably coupled to said cooling air grille for guiding the cooling air to the cooling air return passage; and
- a fixing plate for fixing said guide cover to an inner case of the freezing chamber so as to mount the deodorizing unit to the second cooling air return port, said fixing plate being provided on the top of said guide cover.

5,568,731  
**AMBIENT AIR FREEZING SYSTEM AND PROCESS  
 THEREFOR**

**Michael Reali, Old Brookville, N.Y., assignor to Crumb Rubber Technology, Inc., Jamaica, N.Y.**  
**Filed Feb. 28, 1995, Ser. No. 395,431**  
**Int. Cl.<sup>6</sup> F25D 9/00; F25B 9/00**

U.S. Cl. 62-87

## 8 Claims



1. An ambient air freezing system for connection to a cooling chamber having an input and a return, the ambient air freezing system comprising:  
an ambient air inlet and a chilled air output;  
first control means connected to the ambient air input for controlling the input flow of air;  
second control means connected to the chilled air output for controlling the output flow of air into the input of the cooling chamber;

regenerator means coupled to said first and second control means for cooling the input ambient air;  
a compressor having an input connected with said first control means and said regenerator means and an output, said compressor having a central axis shaft;  
an expander having an input coupled with the cooling chamber return and an output coupled with said second control means and said regenerator means, said expander being disposed along the same central axis shaft of said compressor; and  
an electric motor connected with said compressor for providing power to the system.

5,568,732

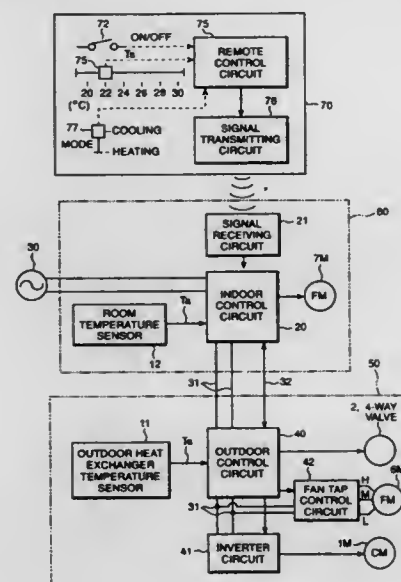
AIR CONDITIONING APPARATUS AND METHOD OF CONTROLLING SAME

Masao Isshiki; Yukio Kiguchi; Takashi Sato, and Yasuhiro Kageyama, all of Shizuoka-ken, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 12, 1995, Ser. No. 420,776  
Claims priority, application Japan, Apr. 12, 1994, 6-073071  
Int. Cl.<sup>6</sup> F25B 49/02

U.S. Cl. 62-129

## 24 Claims



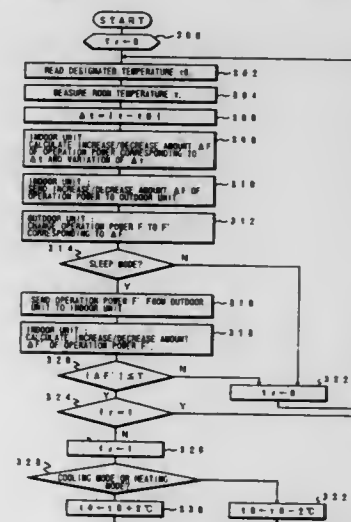
1. Air conditioner apparatus comprising:  
a refrigerating circuit including a variable capacity compressor,  
an indoor heat exchanger, an expansion device, and an outdoor heat exchanger;  
a variable speed outdoor fan for circulating outside air through the outdoor heat exchanger;  
means for detecting the temperature of the outdoor heat exchanger;  
means for estimating an outside air temperature from the detected outdoor heat exchanger temperature, the capacity of the variable capacity compressor and the speed of the variable speed outdoor fan; and  
means for controlling at least one of the fan and variable capacity compressor in response to the estimated outside air temperature.

5,568,733  
AIR CONDITIONER  
Mitsuru Toyota, Gunma-ken; Hajime Takada, Saitama-ken;  
Katsuhiro Ohkubo, and Hiroyuki Nunokawa, both of  
Gunma-ken, all of Japan, assignors to Sanyo Electric Co.,  
Ltd., Osaka, Japan

Filed Sep. 29, 1995, Ser. No. 536,440  
Claims priority, application Japan, Oct. 5, 1994, 6-241386  
Int. Cl.<sup>6</sup> F24F 3/14; F25B 1/00  
U.S. Cl. 62—228.4

U.S. Cl. 62-228.4

## 20 Claims



1. An air conditioner for varying an air conditioning power and for causing a room temperature to approach a designated temperature, comprising:  
determining means for determining whether or not the current air conditioning power is approaching a predetermined range of the air conditioning power required for maintaining the designated temperature and for generating a corresponding signal; and  
compensating means for changing the designated temperatures in accordance with the signal that is generated by said determining means.

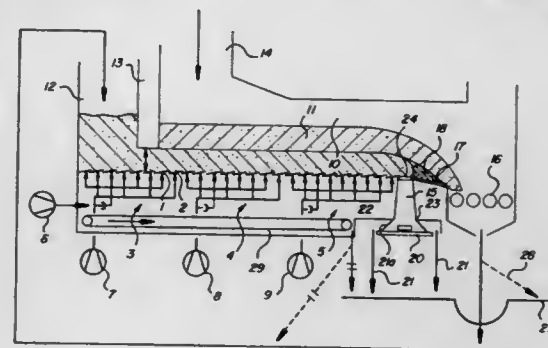
5,568,734  
**DOUBLE LAYER COOLER**  
Hermann Niemerg, Ennigerloh; Ralf Osburg, Beckum; Arthur  
Berger, Ennigerloh; Bernd Nienaber, Ahlen, and Manfred  
Strohbusch, Ennigerloh, all of Germany, assignors to Krupp  
Polysius AG, Beckum, Germany

Filed May 19, 1995, Ser. No. 444,569  
Claims priority, application Germany, Jun. 6, 1994, 44 19  
728.4

U.S. Cl. 62—378

Int. Cl.<sup>6</sup> F25D 25/00

## 10 Claims



1. Apparatus for cooling bulk material comprising: a movable conveyor having a material-supporting surface for transporting

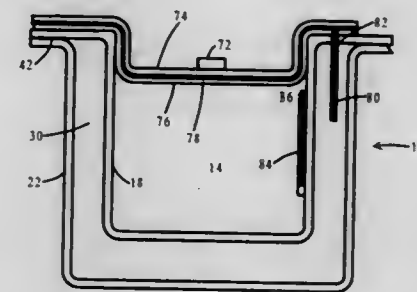
bulk material from an inlet end of said conveyor to an outlet end thereof; a first material inlet adjacent said inlet end of said conveyor for depositing relatively cool material on said surface of said conveyor to form a first layer of said relatively cool material on said surface; a second material inlet downstream of said first material inlet for depositing relatively hot material on said first layer to establish a second layer of such relatively hot material atop said first layer, said conveyor having cooling gas openings extending therethrough from beneath said conveyor; means for directing cooling gas upwardly through said openings and through said layers of material to cool said material; and baffle means between said first and second material inlets having a leveling edge spaced a predetermined distance above said surface for limiting the thickness of said first layer.

5,568,735  
FOOD CONTAINER  
J. Michael Newkirk, Round Rock, Tex., and David C. Overton,  
16917 Dashwood Creek, Pflugerville, Tex. 78660, assignors to  
David C. Overton, Pflugerville, Tex.

Filed Jun. 13, 1994, Ser. No. 259,452  
Int. Cl.<sup>6</sup> F25D 3/08

U.S. Cl. 62-457,7

### 17 Claims



1. A container adapted to maintain food or beverage at temperatures lower than ambient temperature for relatively long periods of time during use, comprising:
  - a) an inner layer shaped to form a food or beverage receptacle area, the inner layer comprising a first bottom portion connected to a first wall, the first wall comprising a first top portion, and the first top portion being connected to a first flange extending outwardly from the receptacle area;
  - b) an outer layer substantially surrounding the inner layer, the outer layer comprising a second bottom portion connected to a second wall, the outer layer being spaced apart from inner layer to form a cavity, and the second wall comprising a second top portion, the second top portion being connected to a second flange extending outwardly from the receptacle area, the first and second flanges being adjacent one another;
  - c) a refrigerant material disposed in the cavity during use, the refrigerant material being adapted to, when subjected to temperatures less than ambient temperature, maintain food placed in the container at a temperature less than ambient temperature;
  - d) an adhesive placed between the first and second flanges and coupling the two flanges together to form a liquid impervious seal; and
  - e) a thermometer well in the cavity, the well being proximate to the refrigerant material.





# 5,568,741 CONCEALED HANDCUFF KEY AND PEN COMBINATION

Kevin L. Parsons, Appleton, Wis., assignor to Armament Systems and Procedures, Inc., Appleton, Wis.  
Division of Ser. No. 109,763, Aug. 20, 1993, Pat. No. 5,460,022. This application May 26, 1995, Ser. No. 450,897.  
Int. Cl.<sup>6</sup> A47G 29/10

U.S. Cl. 70—456 R

7 Claims



1. A pen and concealable handcuff key combination comprising a pen of the type having:
  - a. a hollow, cylindrical housing including an upper section and a lower section, said upper section comprising a removable cap and said lower section having a tapered, conical-shaped end with an opening;
  - b. an elongated cartridge in the housing, said cartridge being rotatable relative to the housing for actuating axial movement of the cartridge relative to the housing;
  - c. wherein said cartridge is received into a liner within the housing, said liner having an inner spiral thread and being adapted for receiving said cartridge and rotating the liner relative to the cartridge; said cartridge further including a tip at one end of the cartridge which is shaped to be extended and retracted through the opening at the tapered end of the housing;
  - d. the handcuff key having a cylindrical body with opposite ends, one end including a flat, rectangular latch tab adapted to release a handcuff lock and the other end being secured within the cylindrical housing whereby the handcuff key is stored and concealed within the cylindrical housing and cap and is exposed for use by removing said cap; and
  - e. a cylindrical shaft including an upper section and a lower section, the upper section being attached to one end of the handcuff key and having a first diameter and the lower section having a second diameter which is smaller than the first diameter, said lower section having a threaded exterior whereby the lower section is threadably secured within the liner, wherein the cylindrical shaft is attached to the interior of the liner, the liner and handcuff key being contained and concealed within the pen when the removable cap is secured to the upper section of the cylindrical housing.

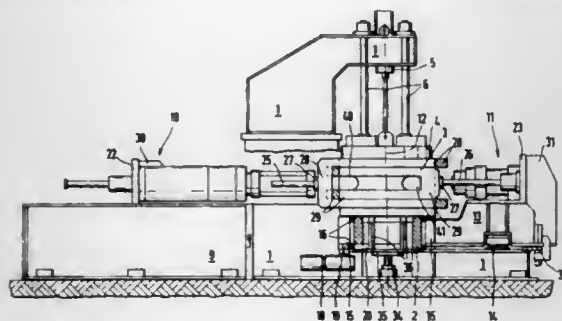
# 5,568,742 APPARATUS FOR INTERNAL HIGH-PRESSURE FORMING

Anton Bauer, Schwalbach, Germany, assignor to Huber & Bauer GmbH, Dillingen, Germany  
Filed Jan. 19, 1995, Ser. No. 375,590  
Claims priority, application Germany, Jan. 29, 1994, 44 02 673.0

Int. Cl.<sup>6</sup> B21D 26/02; 39/00

U.S. Cl. 72—61

6 Claims



1. An apparatus for molding particularly a tubular blank of a ductile metal with internal high pressure comprising:

- a pot having a vertical axis and a circular cross section in a horizontal plane and a cavity defined therein in which the blank is placed;
  - a first base;
  - a pressure-medium connection, advanceable from said first base and capable of being applied tightly against a first end of the tubular blank;
  - a first pair of tie rods extending from said first base;
  - a first yoke coupled to said first pair of tie rods and having an arcuate portion placed about said pot;
  - a second base;
  - a seal advanceable from said second base and capable of being applied tightly against the other end of the tubular blank;
  - a second pair of tie rods extending from said second base; and
  - a second yoke coupled to said second pair of tie rods and having an arcuate portion placed about said pot;
- wherein one of said two bases is movable along an arc about the vertical axis of said pot and capable of being fixed at a selected one of a plurality of places around the circumference of said pot.

# 5,568,743 AXIAL THREAD ROLLING HEAD

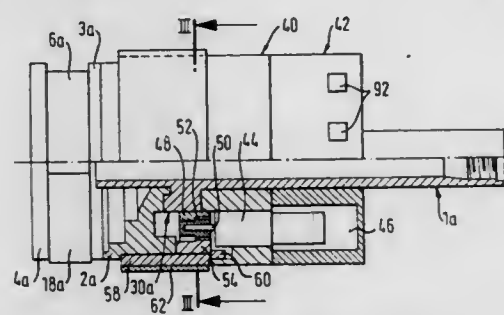
Klaus Oppelt, Lauenburg, Germany, assignor to Wilhelm Fette GmbH, Schwarzenbek, Germany  
Filed Sep. 2, 1994, Ser. No. 300,412

Claims priority, application Germany, Sep. 3, 1993, 9313282

Int. Cl.<sup>6</sup> B21H 3/04; B21D 3/02

U.S. Cl. 72—121

11 Claims



1. An axial thread rolling head constructed and arranged to be mounted in a chuck of a tool machine, said axial thread rolling head comprising:
  - a plurality of thread rollers;
  - a bearing unit including the thread rollers and rotatably supporting said thread rollers by means of eccentric shafts;
  - an axial shank being axially movable with respect to said bearing unit and, in a first axial relative position, cooperating with a claw clutch portion of said bearing unit by means of a second claw clutch portion to connect both portions so as to be resistant to torsional strength;
  - a first gear between said shank and said eccentric shafts;
  - a helical spring between said shank and said bearing unit being so provided that in a second axial relative position, in which said claw clutch portions are out of mesh, said helical spring, upon displacement of said bearing unit into a first direction of rotation with respect to said shank, is tensioned or, respectively, said tensioned helical spring displaces said bearing unit into a second direction of rotation relative to said shank;
  - spring means which tension said shank and said bearing unit into the first axial relative position towards each other; and
  - mechanical switching means which, when contacting a work-piece, causes said shank and said bearing unit to move into the second axial relative position, wherein a power-operated drive (44) is arranged on said shank (1a) which is connected to said bearing unit (LE) via a second gear (52, 54, 68) for displacing said bearing unit (LE) into the first direction of

rotation by a preset angle of rotation, with said shank (1a) and said bearing unit (LE) being in the second axial relative position.

# 5,568,744 METHOD AND ARRANGEMENT FOR MANUFACTURING ROLLED WIRE OR ROUND STEEL SECTIONS IN COILS FROM CARBON STEELS AND/OR HIGH-GRADE STEELS

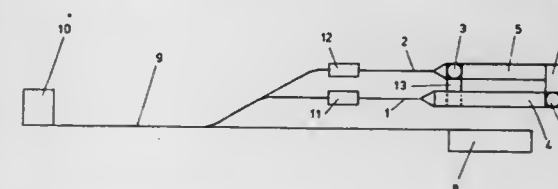
Johann Grotepass, Ratingen, Germany, assignor to SMS Schloemann-Siemag AG, Düsseldorf, Germany  
Filed Mar. 19, 1992, Ser. No. 853,793

Claims priority, application Germany, Mar. 19, 1991, 41 08 941.3

Int. Cl.<sup>6</sup> B21B 1/16

U.S. Cl. 72—201

12 Claims



1. An arrangement for manufacturing rolled wire sections and round steel sections in coils from carbon steels of high-grade steels, comprising:
  - a common billet supply line including a billet furnace;
  - a wire production line including a wire mill and branching from said common billet line;
  - a round steel production line including a round steel mill and branching from said common billet production line, said round steel production line being arranged adjacent to said wire steel production line; and
  - an aftertreatment unit common for said wire production line and said round steel production line, said aftertreatment station comprising:
    - a coil transporting and slow cooling device, arranged downstream of the round steel production line;
    - a first coil forming device located upstream of said coil transporting and cooling device and adapted to form both round steel coils and wire steel coils;
    - a first transfer device for connecting said first coil forming device with said wire section production line;
    - a Stelmor line arranged downstream of said wire section production line;
    - a second coil forming device located at an end of said Stelmor line remote from said wire section production line for forming wire section coils; and
    - a second transfer device for connecting said second coil forming device with said coil transporting and cooling device.

# 5,568,745 METHOD AND APPARATUS FOR MAKING DISC WHEELS AND WHEELS MADE THEREBY

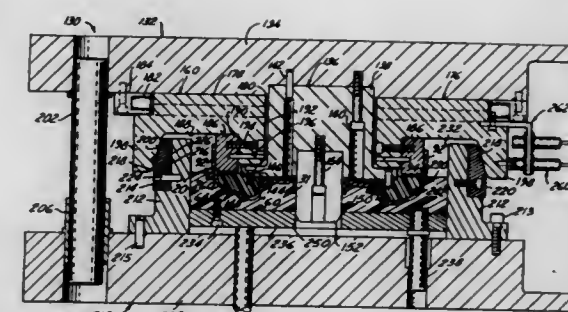
Anwar R. Daudi, East Lansing, Mich., assignor to Motor Wheel Corporation  
Division of Ser. No. 133,888, Oct. 12, 1993, Pat. No. 5,388,330.  
This application Sep. 26, 1994, Ser. No. 311,955

Int. Cl.<sup>6</sup> B21D 21/00

U.S. Cl. 72—353.4

8 Claims

1. Apparatus for final forming a one-piece sheet metal wheel disc of the type having a central bolt-circle mounting portion for fastening onto a vehicle wheel mounting part, a peripheral outer annular flange portion extending generally axially of said wheel disc to an inboard free edge of the disc and adapted for telescopic mounting into a mating wheel rim, and an intermediate annular window vent portion integrally joining the disc central and flange



- portions, said apparatus having press tooling adapted to receive a disc preform workpiece having an unfinished outer peripheral annular preform flange portion corresponding in shape generally to but slightly diametrically smaller than the disc flange portion, the disc preform central portion being in finished form with a circle of wheel mounting bolt holes, a center wheel mounting pilot opening and wheel mounting pads defining a mounting plane of the disc, the disc preform intermediate portion also being in finished form containing window vent openings, said apparatus press tooling comprising means adapted for fixturing the disc preform by locating on the disc preform center pilot opening and disc preform mounting plane pads to thereby hold the disc preform in position for a final cold working flange sizing operation, said press tooling also comprising means adapted for radially expanding the preform flange to circumferentially stretch the same beyond the yield point of the blank metal sufficiently to cause the preform flange to take a permanent set into a final predetermined expanded and finished shape adapted for precision telescopic mounting into a mating wheel rim, and wherein said radially expanding means further comprises a press containing a radially expansible segmental die tooling set-up including a plurality of expand die segments disposed in a circular array about a central axis of said press tooling, and wherein said fixturing means is adapted for orienting the mounting plane of the disc preform perpendicular to the press axis, said fixturing means including a centering pilot adapted for centering the disc preform by insertion of said centering pilot into the center pilot opening of the disc preform, said radially expansible segmental die tooling set-up being adapted for causing said permanent deformation expansion of the disc preform flange by radially expanding said die segments against a radially inwardly facing surface of the disc preform flange portion after the disc preform is centered by said pilot, and wherein said radially expansible segmental die set-up comprises punch tooling and die tooling movable relative to one another for travel between open and closed portions along a central axis of said tooling, said means for radially expanding the disc preform flange comprising a circular array of die holders supported on said punch tooling adapted for movement radially of the disc preform flange portion between retracted and expanded positions, said die holders having radially spaced axially protruding first and second legs oriented with said first legs adapted to be axially aligned with the inboard surface of the disc preform intermediate portion and said second legs adapted for encircling in radially outwardly spaced relation the disc preform flange portion so as to leave the outer periphery of the same unrestrained during the tooling movement, each said first leg carrying an associated segmental expand die and each said second leg carrying a holder expansion cam, a circular array of cam die means supported on said die tooling and adapted to be oriented exteriorly and also spaced radially outwardly of the disc preform flange and aligned for simultaneous radial expansion actuating engagement with said holder expansion cams during a last portion of closing travel of said punch and die tooling to cause simultaneous radial expansion of said segmental expand dies through a precision working stroke distance wherein the array of dies radially expand against the radially inwardly facing surface of the disc preform flange and thence further expand to circumferentially



stretch the preform flange beyond the yield point of the blank metal while the preform flange is unrestrained on its outer periphery to thereby cause the aforementioned permanent stretched set of the disc flange into the final predetermined expanded and prevision finished shape.

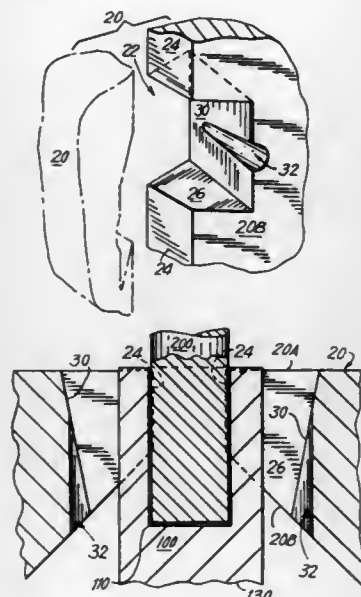
5,568,746

# SURGICAL NEEDLE-SUTURE ATTACHMENT FOR CONTROLLED SUTURE RELEASE

Francis D. Colligan, Waterbury; Richard P. Carpentiere, Plantsville; Ronald H. Belcourt, Jr., Meriden, and Giuseppe Giordano, Ansonia, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.  
Division of Ser. No. 71,653, Jun. 2, 1993, Pat. No. 5,383,902.  
This application Oct. 20, 1994, Ser. No. 326,554  
Int. Cl.<sup>6</sup> B21D 41/04; B21G 1/00

U.S. Cl. 72-416

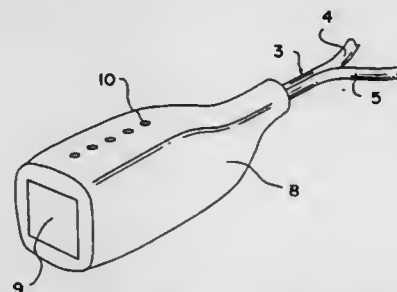
16 Claims



1. Apparatus for attaching two members, at least a first member having a generally cylindrical outer end portion and defining an elongated aperture having a generally circular cross-section and a second member including a generally elongated end portion of generally circular cross-section corresponding in dimension to the elongated aperture of the first member, which comprises a pair of dies, each die including a die face having an inner die surface portion dimensioned to accommodate at least the end portion of the first member, each said inner die surface portion including a substantially planar inner swaging surface defining a plane which is angularly offset relative to a plane defined by said die face, said swaging surface having a generally arcuate concavity formed therein and extending along at least a portion of said swaging surface, said dies being positioned about the end portion of the first member such that said planar swaging surfaces are angularly offset relative to a longitudinal axis defined by the elongated aperture of the first member, wherein the application of inward force to said dies toward each other causes at least portions of said swaging surfaces of said dies to engage the end portion of the first member and transmit inward swaging forces thereto at an angle offset to the longitudinal axis of the elongated aperture so as to attach the members, whereby said concavities define relief zones which permit deformed material of the first member to collect therein.

5,568,747  
MOISTURE SENSOR  
Robert H. Lloyd, 13, Ranmore Road, Dorking, Surrey RH4 1H3, Great Britain  
PCT No. PCT/GB93/00024, § 371 Date Sep. 12, 1994, § 102(e)  
Date Sep. 12, 1994, PCT Pub. No. WO93/14395, PCT Pub. Date Jul. 22, 1993  
PCT Filed Jan. 8, 1993, Ser. No. 256,342  
Claims priority, application United Kingdom, Jan. 13, 1992, 9200583

Int. Cl.<sup>6</sup> G01N 25/56; G01R 27/08  
U.S. Cl. 73-73 12 Claims

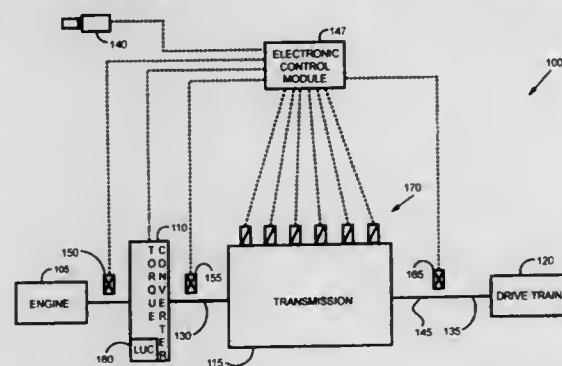


1. A moisture sensor for sensing the moisture level of an environment, comprising:
  - a) an element of moisture absorbent material having two opposed side faces, said opposed side faces being provided with electrically conductive material, said element having a resistivity that varies with the moisture content therein to provide an indication of the moisture level of the environment;
  - b) a cable having two conductors disposed respectively on said opposed side faces and connected to said electrically conductive material; and
  - c) an electrically insulating sleeve encapsulating said element such that an end face of said element is exposed, said sleeve including a plurality of apertures exposing at least part of said element.

5,568,748  
METHOD FOR MODIFYING THE SHIFTPOINTS OF AN AUTOMATIC TRANSMISSION  
Douglas A. Carlson, Morton, and Todd D. Creger, Metamora, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.  
Filed Jan. 11, 1995, Ser. No. 371,236  
Int. Cl.<sup>6</sup> B60K 41/10

U.S. Cl. 74-336 R

14 Claims



1. A method of effecting transmission shifts in a vehicle having an automatic transmission including a plurality of transmission gear ratios and a transmission actuator for automatically establishing a particular gear ratio in response to a transmission control signal, the method comprising the steps of:
  - storing an upshift and downshift shiftpoint for each transmission gear ratio;

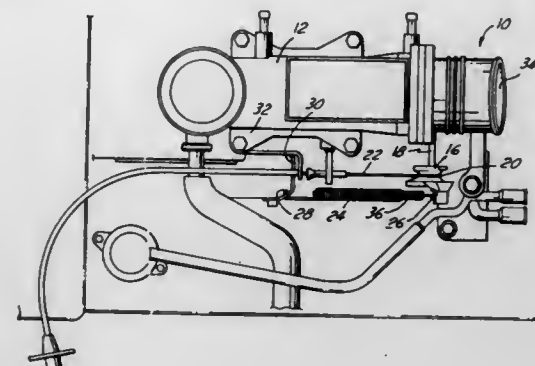
determining the wheel power of the vehicle before and after a transmission upshift operation;  
determining the difference in wheel power before and after the transmission upshift operation;  
modifying the upshift shiftpoint associated with the upshift operation to achieve a desired change in wheel power; and  
modifying the desired change in wheel power magnitude in response to a shift cycling condition.

# 5,568,749 AUTOMOTIVE ACCELERATOR RETURN SPRING DAMPER

Lawrence J. Liposky, Allen Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.  
Filed Apr. 6, 1995, Ser. No. 417,558  
Int. Cl.<sup>6</sup> F16F 13/04; F02D 11/04

U.S. Cl. 74-513

10 Claims



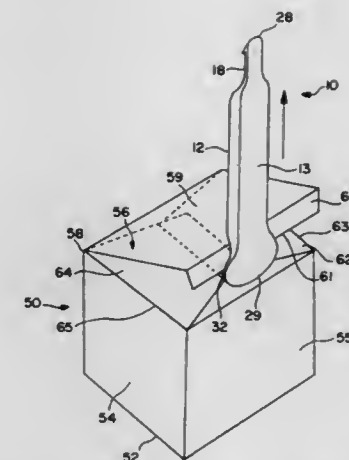
1. An accelerator return spring assembly for biasing an automotive throttle valve of an internal combustion engine to a predetermined position, the assembly comprising:
  - a tension coil spring having a first end attached to a throttle cable of the throttle valve and a second end attached to the engine, the coil spring defining an internal space therewithin; and
  - a generally cylindrical damping member within the internal space of the coil spring for damping vibrations thereof, the damping member having at least one variable diameter segment which forms a friction fit with the inner diameter of the spring, at least one small segment with an outer diameter less than the inner diameter of the coil spring, and four circumferentially spaced longitudinally extending slits defining four tangentially spaced fingers.

5,568,750  
LID LIFTER  
Larry A. Galen, 37 Michelle La., St. Peters, Mo. 63376  
Filed Jun. 12, 1995, Ser. No. 489,320  
Int. Cl.<sup>6</sup> B67B 7/04

U.S. Cl. 81-3.49

9 Claims

1. A tool for opening boxes containing items comprising:
  - a handle or gripping portion located at the mid portion of the tool;
  - a transition portion extending outwardly and downwardly on each side of said gripping portion from said gripping portion;
  - a box engagement portion extending outwardly from each of said transition portions and each box engagement portion having a transverse extent;
  - said box engagement portion terminating at a distal end of each end of the tool;
  - a locking portion extending upwardly from each said box engagement portion;
  - said locking portion being adapted to engage downwardly extending lids of said boxes;



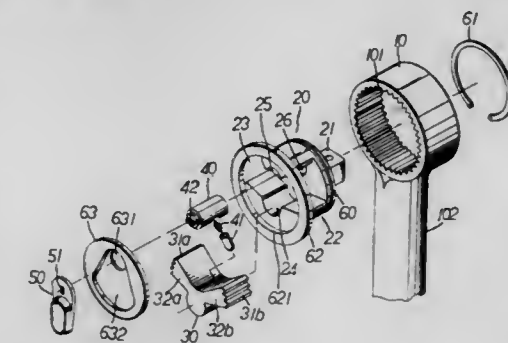
5,568,751  
REVERSIBLE RATCHET WRENCH AND REVERSIBLE RATCHET MECHANISM THEREOF  
Chang C. Lee, 429-6, Chung Cheng Road, Tsaotun, Nantou, Taiwan

Filed Aug. 2, 1995, Ser. No. 510,416

Int. Cl.<sup>6</sup> B25B 13/46

U.S. Cl. 81-63

4 Claims



1. A reversible ratchet mechanism comprising:
  - a cylindrical head of a hollow construction and having axially a center hole provided on an inner wall surface thereof with a plurality of teeth extending axially;
  - a torsion transmitting element provided at one end thereof with a driving rod and at another end thereof with a cylindrical body disposed rotatably in said center hole of said cylindrical head such that said driving rod is extended vertically from one side of said cylindrical head, said cylindrical body provided axially with a V-shaped slot having radially at a bottom thereof an arcuate recess, said V-shaped slot further having on two top ends thereof two openings spaced at an interval and located at a periphery of said cylindrical body;
  - a pawl of a V-shaped construction and having two arms which form an angle smaller than said V-shaped slot and which are provided respectively on a top end thereof with one or more pawl teeth, said pawl being fastened pivotally in said V-shaped slot such that said pawl teeth are located in said openings of said V-shaped slot; and
  - a round rod provided at the midsegment of a longitudinal axis thereof with a spring-biased pin, said round rod being fastened pivotally and axially to said cylindrical body at a location between said two arms of said pawl such that said pin

presses radially against an inner side of said pawl, wherein said round rod is capable of being rotated so as to cause said pin to press against either one of said two arms of said pawl, thereby resulting in the engagement of said pawl teeth of said pressed arm with said teeth of said center hole of said cylindrical head.

5,568,752

## ADJUSTABLE SPANNER

Larry A. G. Alford, Coolbellup, Australia, assignor to Kwik Wrench Pty Ltd., O'Connor, Australia  
PCT No. PCT/AU93/00262, § 371 Date Jan. 25, 1995, § 102(e)  
Date Jan. 25, 1995, PCT Pub. No. WO93/25350, PCT Pub. Date Dec. 23, 1993

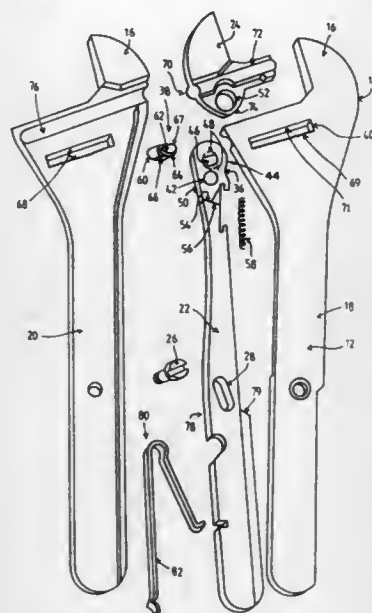
PCT Filed Jun. 3, 1993, Ser. No. 351,246

Claims priority, application Australia, Jun. 8, 1992, PL2813

Int. Cl.<sup>6</sup> B25B 13/12

U.S. Cl. 81—126

12 Claims



1. An adjustable spanner comprising:  
a handle provided with a first jaw at one end;  
a lever having a second jaw coupled thereto at one end, the lever being directly pivotally connected to the handle and juxtaposed so that pivotal movement of the lever relative to the handle effects movement of the second jaw relative to the first jaw whereby the first and second jaws can grip an article placed therebetween;  
locking means having a free state in which the jaws are able to move relative to each other and a locking state in which the jaws are locked against movement away from each other, said locking means cooperating with said lever so as to remain in said free state until the lever is pivoted in a first direction relative to the handle to a position where the jaws grip an article placed between the first and second jaws, whereby, upon further movement in said first direction the lever operates to change the state of the locking means to the locking state, thereby locking said jaws against movement away from each other;  
said locking means comprising first and second mutually engageable elements and a link having a first pivot connection to said one end of said lever and a second pivot connection to said second jaw thereby coupling said second jaw to said lever, said first element being carried in a slot provided in said link, the slot shaped to substantially prevent rotation of the first element within the slot, and  
said elements being disengaged when the locking means is in said free state and being engaged when the locking means is in said locking state, said first element associated with the

lever so that upon said further movement, said lever operates to effect engagement of said first and second elements.

5,568,753

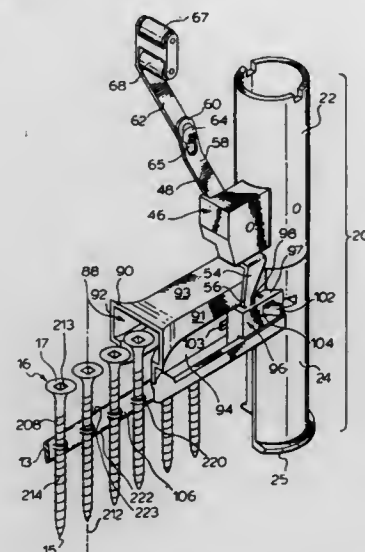
## SCREW DRIVER WITH REPLACEABLE NOSE FOR COLLATED SCREWS

G. Lyle Habermehl, 436 Calvert Dr., Gallatin, Tenn. 37066, and Paul T. Scherer, Lexington, Ky., assignors to C. Lyle Habermehl, Gallatin, Tenn.

Continuation-in-part of Ser. No. 233,909, Apr. 28, 1994, which is a continuation-in-part of Ser. No. 198,129, Feb. 17, 1994, Pat. No. 5,469,767, which is a continuation-in-part of Ser. No. 18,897, Feb. 17, 1993, Pat. No. 5,337,635. This application Aug. 7, 1995, Ser. No. 511,945

Int. Cl.<sup>6</sup> B25B 23/06

24 Claims



1. An apparatus for driving with a power driver a screwstrip comprising threaded fasteners such as screws or the like, which are joined together in a strip comprising:  
housing means;  
elongate drive shaft means for operative connection to a power driver for rotation thereby and defining a longitudinal axis;  
slide body means coupled to the housing means for displacement parallel to the axis of the drive shaft means between an extended position and a retracted position;  
spring means biasing said body means forwardly relative to the housing means parallel the axis to the extended position;  
the slide body means having a rear portion and a forward nose portion, the nose portion removably coupled to the rear portion;  
the nose portion having:  
(a) guide channel means for said screwstrip extending through said nose portion,  
(b) guide means to locate successive of the screws advanced via the guide channel means to be axially in alignment with said drive shaft means for engagement in driving of the screws from the guide means by the drive shaft means, and  
(c) screw feed advance means carried by the nose portion to engage the screwstrip and successively, incrementally advance screws on the screwstrip through the guide channel means,  
screw feed activation means coupled between the rear portion of the slide body means and the housing means and, when the nose portion is coupled to the rear portion, rearwardly coupling with the screw feed advance means whereby displacement of the slide body means relative to the housing means between the extended position and the retracted position activates the screw feed activation means to move the screw feed advance means and thereby advance successive screws;

wherein the nose portion removably couples to and is removable from the rear portion for replacement with other nose portions adapted to receive the same or different sized screwstrips and/or screws; and

wherein on the nose portion coupling to or being removed from coupling with the rear portion, the screw feed advance means correspondingly removably coupling to or being removed from coupling with the screw feed activation means.

5,568,754

## SERVO CONTROLLED RIGHT ANGLE SHEAR PRESS

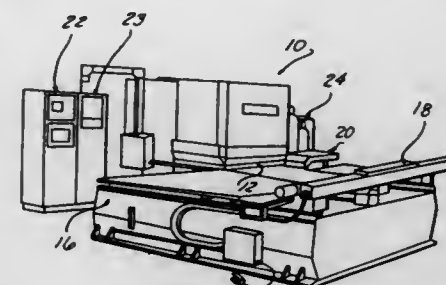
Victor L. Chun, Charlotte, N.C., assignor to Murata Machinery, Ltd., Japan

Filed Jan. 14, 1993, Ser. No. 4,759

Int. Cl.<sup>6</sup> B26D 5/12

U.S. Cl. 83—13

2 Claims



1. A method of shearing a sheet material workpiece into individual rectangular pieces of varying size using a right angle shear having upper shear blades able to be vertically cyclically moved by an actuator from a fully retracted to a fully extended position of said actuator, said method including the step of cycling said actuator to move said upper shear blades from an initial partially retracted park position to a partially extended position and back to said partially retracted park position for pieces not requiring said full stroke of said upper shear blades from said fully retracted to said fully extended position to cut out said pieces.

in a fluid from the pump discharge line into the cutter blade assembly, said tube having a larger upstream end and a smaller downstream end for insertion into the inlet of the cutter blade assembly, said tube being formed of a resilient material;

an upstream sealing flange attached to and circumventing the upstream end of said tube for sealed attachment to the outlet of the pump discharge line, said upstream sealing flange being formed of a resilient material;

a downstream sealing flange, having an upstream surface and a downstream surface, and attached to and normally circumventing said tube near the downstream end for sealed attachment to the inlet of the cutter blade assembly, said downstream sealing flange being formed of a resilient material;

a circular sealing ring positioned adjacent to the upstream surface of the downstream flange of the tube;

a yoke shaped lever bar having at one end a pair of yoke arms for engagement with diametrically opposing points on the upstream surface of the circular ring, and at the other end, a pressure bearing surface, and between the two ends, a fulcrum pivot pin;

means for rotatably holding the fulcrum pivot pin;

means for selectively applying leverage pressure to the pressure bearing surface to rotate said yoke shaped lever bar into compressive engagement with the upstream surface of the circular ring; and

means for sealing the upstream flange to the outlet of the pump discharge line.

5,568,756

## SUPPORT MEANS FOR A SAW MACHINE

Carl J. Peterson, Twist Road, Ngakura, New Zealand

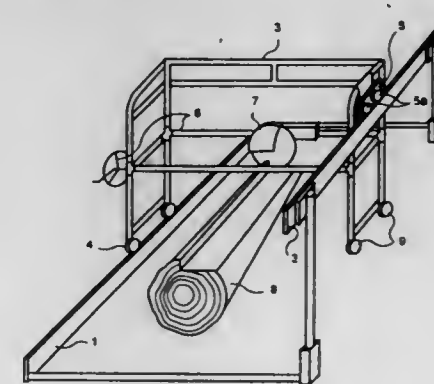
Filed Aug. 29, 1994, Ser. No. 297,638

Claims priority, application New Zealand, Aug. 31, 1993, 248548; Feb. 25, 1994, 250983

Int. Cl.<sup>6</sup> B27B 7/00

U.S. Cl. 83—471.2

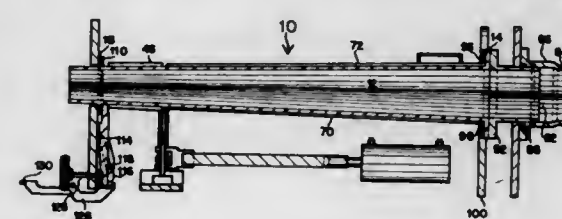
8 Claims



1. An accelerator tube assembly for use in a hydraulic food cutting system, said system having a food pump for pumping a pressurized suspension of food products in a fluid into a pump discharge line, a pump discharge line having an outlet, and a cutter blade assembly having an inlet for receiving a pressurized suspension of food products in a fluid, in which the accelerator tube assembly comprises:  
a frusto conical shaped tube defining a passageway therethrough for the passage of a pressurized suspension of food products

U.S. Cl. 83—402

4 Claims



1. A saw support means having a carriage and first and second track elements, the carriage having first and second bearing elements spaced apart along a length of the carriage, the first bearing element bears upon, and travels along the first track element, the second bearing element bears upon, and travels along the second track element, the carriage including saw attachment means affixed thereto for holding a saw at a location between the spaced bearing elements, the carriage further including adjustment means by which the saw attachment means may be moved up and down and



side to side relative to the carriage, the first track being on or immediately adjacent the ground, the second track element being erected in an elevated position vertically higher than the saw, whereby a log could be rolled underneath the second track element and into a position to be cut by the saw.

5,568,757

## SOCKET WRENCH ADAPTER

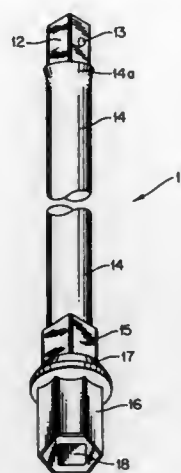
Kenneth J. Lewis, Rte. 4 311 Ave. B, Brazoria, Tex. 77422

Filed Jan. 3, 1995, Ser. No. 367,831

Int. Cl.<sup>6</sup> B25B 23/16

U.S. Cl. 81—177.2

1 Claim



1. A unitary socket wrench adapter comprising a first end portion and a second end portion in axial and opposing alignment to form a unitary body, said first end and second end portions concentrically aligned along the axis, with all the parts of the unitary body in fixed position relative to each other,

said first end portion having a four-sided projection, one of which sides contains a detent, said projection operable for insertion into a socket wrench for applying turning force thereto,

said second end portion having a hexagonal projection containing a four-sided bore extending therein to a depth suitable for receiving a crank, the sides of said four-sided bore being parallel to the sides of the said hexagonal projection,

said hexagonal projection of the second end portion operable to receive the cranking force of a wrench applied to the external surface thereof,

further characterized by an extender section between the first end portion and the second end portion and by a flared circumference where the extender section connects with the said first end portion,

and further characterized by a square section in concentric axial alignment on the extender section where the extender section connects to the second end portion.

5,568,758

## COMPOUND MITER JIG APPARATUS

Danny Moore, Box 2050, Halley, Id. 83333

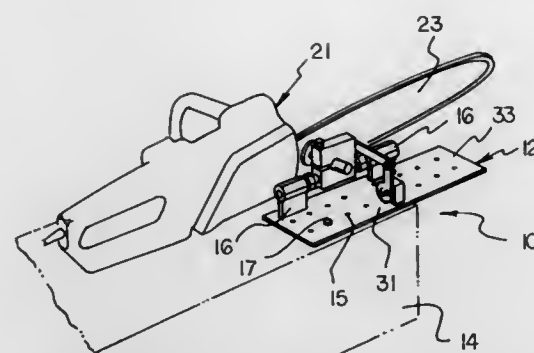
Filed Jun. 8, 1995, Ser. No. 488,759

Int. Cl.<sup>6</sup> B27B 17/08; 27/08

U.S. Cl. 83—745

11 Claims

1. A compound miter jig apparatus, comprising:  
a base unit,  
a plurality of connecting means for connecting said base unit to an article to be cut,  
a pair of pivot support assemblies connected to said base unit, wherein said pivot support assemblies are spaced apart from



each other on said base unit, wherein said pivot support assemblies include longitudinally adjustable first pivot elements,

a bearing block assembly supported by said first pivot elements and located between said first pivot elements, wherein said bearing block assembly includes a pair of second pivot elements in contact with said first pivot elements, wherein said bearing block assembly includes a shaft bearing assembly,

a shaft assembly supported by said shaft bearing assembly, wherein said shaft assembly includes a chain-saw-connector assembly, and

an adjustable tilt-lock assembly supported by said base unit and connected to said bearing block assembly for locking said bearing block assembly at a predetermined angular tilt.

5,568,759

## HYDRAULIC CIRCUIT HAVING DUAL ELECTROHYDRAULIC CONTROL VALVES

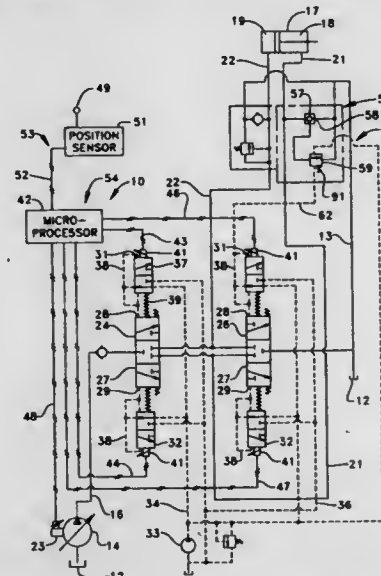
James A. Aardema, Joliet, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Jun. 7, 1995, Ser. No. 473,626

Int. Cl.<sup>6</sup> F15B 11/08; 13/044

U.S. Cl. 91—461

5 Claims



1. A control system for a hydraulic circuit having a pump, a supply tank, a source of pilot fluid and a hydraulic cylinder having rod end and head end chambers comprising:

a first electrohydraulic control valve connected to the pump and to the rod end and head end chambers and being movable from a neutral position in a first direction to establish pump-to-cylinder fluid communication between the pump and the rod end chamber and in a second direction to establish pump-to-cylinder fluid communication between the pump and the head end chamber;

a second electrohydraulic control valve connected to the tank and to the rod and head end chambers and being movable in a first direction from a neutral position to establish cylinder-to-tank fluid communication between the rod end chamber and the tank and in a second direction to establish cylinder-to-tank communication between the head end chamber and the tank, each of the control valves including a pilot operated valve member having first and second ends and a pair of proportional valves connected to the source of pilot fluid and disposed to modulatably control fluid pressure at the ends of the valve member; and

a pilot operated vent valve having a closed position blocking communication between the rod end chamber and the tank and an open position establishing communication between the tank and the rod end chamber, the vent valve being moved to the second position in response to the second control valve being moved in the first direction.

5,568,760

## FLUID POWER CYLINDER WITH POSITION INDICATOR

Johannes Volzer, Heroldstatt, Germany, assignor to Festo KG, Essling, Germany

Filed Apr. 28, 1995, Ser. No. 431,406

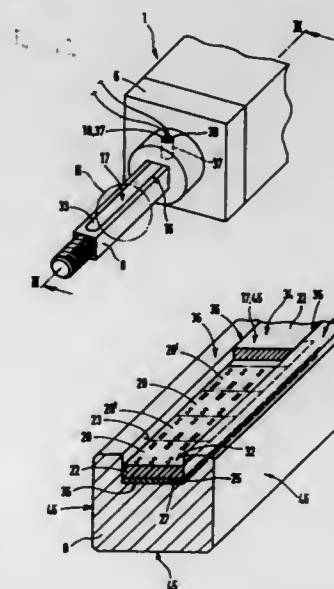
Claims priority, application Germany, Aug. 2, 1994, 9412435

U

Int. Cl.<sup>6</sup> F01B 25/26

U.S. Cl. 92—5 R

20 Claims



1. A fluid power cylinder comprising a housing, a piston in said cylinder adapted to move axially therein, a piston rod, said piston rod being connected with said piston and extending from at least one end of the cylinder, said piston rod possessing on the external periphery thereof, at least one surface section extending in the axial direction and having the form of a flat, a longitudinal groove being provided in said flat surface section, and a measuring scale received in said groove and being capable of being scanned by a sensor device integral with the housing, wherein said measuring scale is embodied in the form of a magnetic strip which comprises a plurality of magnetic zones arranged in alternating succession and magnetized with axially alternating poles, which may be sensed by the sensor device without contact and wherein the magnetic strip is covered by a relatively thin cover band fixed to the piston rod and consisting of a material allowing the passage of a magnetic field, whose external surface facing away from the magnetic strip constitutes at least a part of the surface section of the piston rod having the form of a flat and further wherein the magnetic strip has a relatively wide upper surface in comparison to

the flat surface section of the piston rod to produce a strong magnetic field able to be readily sensed by the sensor device.

18. A fluid power cylinder comprising:

a housing having an internal working space;

a piston adapted to be axially movable within the working space; and

a piston rod connected to said piston and extending from at least one end of the housing; wherein the piston rod includes at least one planar surface, a longitudinal groove being provided therein, and a measuring scale in the form of a magnetic strip being positioned in the groove, the magnetic strip comprising a plurality of alternating magnetic zones arranged longitudinally thereon, and a sensor device for contactless sensing of a position of the piston rod, the magnetic strip being relatively wide in respect to the planar piston rod surface and further being closely positioned to a top surface of the planar piston rod surface to produce a strong magnetic field to be sensed by the sensor device.

5,568,761

## PNEUMATIC JACK

Dominique Legendre, Le Mans, France, assignor to Corea S.A., Spay, France

PCT No. PCT/FR93/00555, § 371 Date Jan. 11, 1995, § 102(e)

Date Jan. 11, 1995, PCT Pub. No. WO93/25817, PCT Pub.

Date Dec. 23, 1993

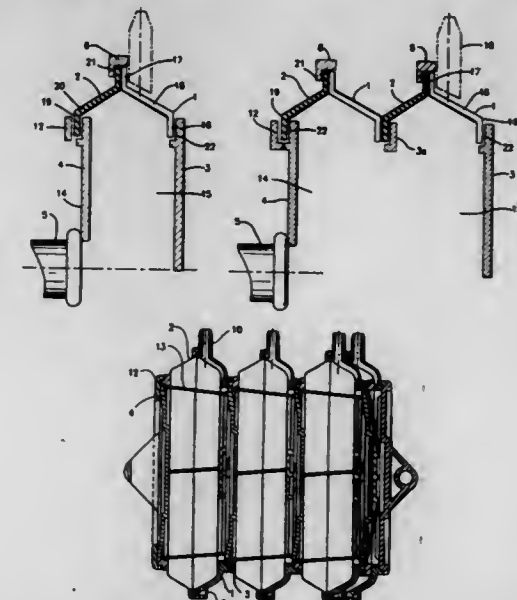
PCT Filed Jun. 10, 1993, Ser. No. 351,425

Claims priority, application France, Jun. 10, 1992, 93/06970

Int. Cl.<sup>6</sup> F01B 19/00

U.S. Cl. 92—46

12 Claims



1. Pneumatic jack comprising a rigid jack body secured to an external edge of a deformable membrane so as to limit with said membrane a chamber of variable volume adapted to be subjected either to atmospheric pressure or to negative pressure, by means of an air inlet provided in said chamber, the body and the membrane each having an opening substantially centrally disposed, and a disk for at least partially closing each opening, each disk having a contour identical to but of a size slightly greater than the opening, said membrane having the general shape of a basin forming a bottom which is provided with a substantially central opening closed at least partially by the disk secured to the periphery of the opening, said disk coacting with the membrane so as to come into abutment against the bottom of the basin when the chamber is subjected to negative pressure, and a jack shaft sealingly secured in an opening of the disk secured to the membrane for directly transmitting the movement of the membrane to a member to be actuated.

12. Pneumatic jack comprising a rigid jack body secured to an external edge of a deformable membrane so as to limit with said membrane a chamber of variable volume adapted to be subjected either to atmospheric pressure or to negative pressure, by means of an air inlet provided in said chamber, the body and the membrane each having an opening substantially centrally disposed, and a disk for at least partially closing each opening, each disk having a contour identical to but of a size slightly greater than the opening, and restraining means for connecting the disk closing the membrane with the rigid body of the jack, said restraining means being movably mounted on the disk closing the membrane and on the bottom of the body, said restraining means collapsing when the chamber is placed under negative pressure and limiting the path of the disk closing the membrane when said chamber is placed under atmospheric pressure.

5,568,762

# STABILIZING DEVICE FOR VARIABLE DISPLACEMENT AXIAL PISTON PUMPS

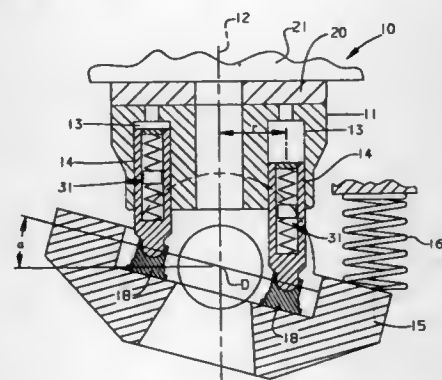
Noah D. Manning, Roland, Iowa, assignor to Caterpillar Inc., Peoria, Ill.

Filed Apr. 12, 1995, Ser. No. 421,584

Int. Cl.<sup>6</sup> F01B 29/00; 3/00

U.S. Cl. 92—143

5 Claims



1. A variable displacement axial piston pump comprising:

- a rotatable cylinder barrel having a plurality of circumferentially arranged piston bores therein;
- a plurality of pistons disposed for oscillatory movement within the piston bores, each of the pistons including a cylindrical body having a chamber defined therein; and a vibration absorber disposed within the chamber.

5,568,763

# CONTROLLING MEANS FOR AN AUTOMATIC COFFEE MACHINE

Bernhard Künzler, Zürich, Switzerland, assignor to HGZ Maschinenbau AG, Dällikon, Switzerland

Filed Sep. 14, 1994, Ser. No. 306,171

Claims priority, application Germany, Sep. 14, 1993, 43 31 164.4

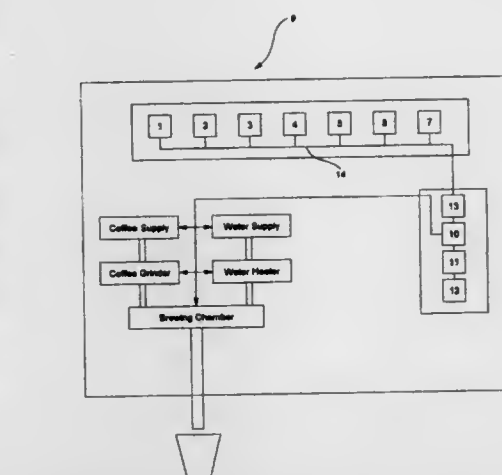
Int. Cl.<sup>6</sup> A47J 31/00

U.S. Cl. 99—280

13 Claims

1. A method of controlling an automatic coffee machine, the coffee machine having a supply of coffee beans, a coffee bean grinding device, a water heating device, a brewing chamber, and a dispenser for brewed coffee, the coffee machine also including at least one coffee selector switch in electronic communication with a control processor for operating the coffee machine, comprising the steps of:

- a) actuating the selector switch a first time to enable the start of a coffee brewing cycle having a first set of brewing parameters;



- b) starting the grinding of an amount of coffee beans in response to actuating the selector switch for the first time;
- c) monitoring the selector switch for a predetermined period of time after the selector switch is actuated for the first time;
- d) delaying the start of the brewing of coffee in response to the actuation of the selector switch for a second time within said predetermined time period; and
- grinding an additional amount of coffee beans and resuming the coffee brewing cycle using a second set of brewing parameters in response to the actuation of the selector for the second time.

5,568,764

# AUTOMATIC BREADMAKER WITH INTERIOR LAMP

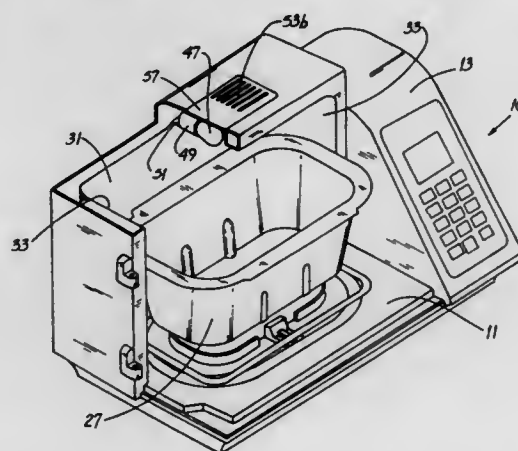
David C. Belongia, West Bend, and Annette T. Kruepke, Jackson, both of Wis., assignors to The West Bend Company, West Bend, Wis.

Filed Jun. 5, 1995, Ser. No. 463,721

Int. Cl.<sup>6</sup> A47J 27/00

U.S. Cl. 99—341

8 Claims



- 1. In an automatic breadmaker of the type having an oven chamber for baking bread, the chamber formed by a door, a floor and wall members, including top, front, rear and side wall members, and a pan in the oven chamber for containing a bread product, the improvement wherein:
  - the door is mounted for movement with respect to the top wall member; and
  - a lamp is secured away from the door and in a fixed position with respect to the rear wall member, whereby light is directed downwardly to illuminate the bread product during baking.

5,568,765

# MICROWAVE FRYER

Yuzi Andoh, Yamatokoriyama; Masaki Katabe, Fujiidera, and Hiromi Suenaga, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

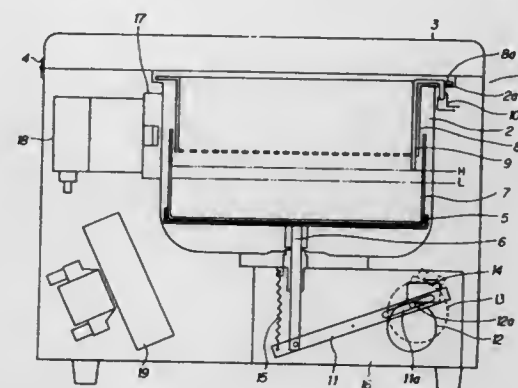
Filed Jun. 5, 1995, Ser. No. 463,243

Claims priority, application Japan, Sep. 28, 1994, 6-232652; Nov. 22, 1994, 6-287644; Dec. 27, 1994, 6-326101; Apr. 3, 1995, 7-077799

Int. Cl.<sup>6</sup> A47J 37/12

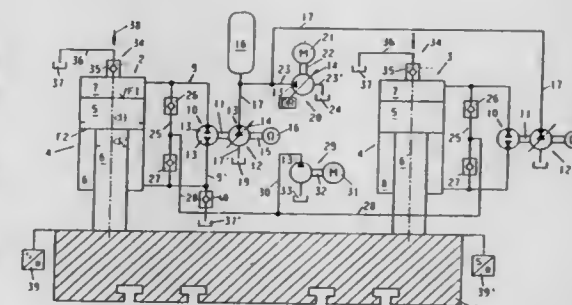
U.S. Cl. 99—403

28 Claims



1. A microwave fryer comprising:

- a heating chamber;
- an oil vessel, disposed inside said heating chamber, holding a cooking oil;
- a frying container, disposed in said heating chamber, holding foodstuffs;
- a door for opening and closing a portion of said heating chamber, the door closing the portion of the heating chamber subsequent to foodstuffs being placed into the frying container and prior to the frying container being immersed in the cooking oil;
- lifting means for moving one of said frying container and said oil vessel relative to the other;
- microwave-heating means for heating the cooking oil in said oil vessel with irradiation of microwaves; and
- temperature detecting means for detecting a temperature of the cooking oil, the lifting means moving one of said frying container and said oil vessel relative to the other, to immerse the frying container in the cooking oil, upon the temperature detecting means detecting that the cooking oil has reached a predetermined temperature.



- (1) allowing the press ram to move downward to drive the piston;
- (2) forcing a hydraulic medium to flow from the first cylinder chamber, through a first hydraulic device, and into the second cylinder chamber using the piston;
- (3) operating the first hydraulic device as a first hydraulic motor using the hydraulic medium forced therethrough;
- (4) driving a second hydraulic device using the first hydraulic motor to cause the second hydraulic device to pump additional hydraulic medium into an accumulator unit to charge the accumulator unit so that the potential energy associated with the downward movement of the unloaded press ram is stored; and
- (5) further charging the accumulator unit with the additional hydraulic medium using a hydraulic pump;
- (C) driving the hydraulic pump using an electric motor;
- (D) controlling a pressure of the hydraulic medium using an adjustable swivel angle of the hydraulic pump; and
- (E) utilizing a subsequent shaping or machining phase, comprising the steps of:
  - (1) using the charge within the accumulator unit to at least partially cause the additional hydraulic medium therein to flow through the second hydraulic device, and causing the second hydraulic device to operate as a second hydraulic motor; and
  - (2) driving the first hydraulic device using the second hydraulic motor to cause the first hydraulic device to pump the hydraulic medium into the second cylinder chamber, whereby the piston effects an additional pressure actuation on the press ram.

5,568,767

# METHOD AND DEVICE FOR MAINTAINING PRINT TO CUT REGISTER

Dale H. Jackson, Newmarket, N.H., assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany, and Heidelberg Harris, Inc., Dover, N.H.

Filed Apr. 27, 1995, Ser. No. 430,511

Int. Cl.<sup>6</sup> B41F 13/56

U.S. Cl. 101—226

12 Claims

1. A method for maintaining the register of images on a running web with a web processing device of the machine comprising the steps of:

- measuring a position of each image on the web;
- generating a reference signal corresponding to a desired position of each image on the web;
- creating a registration error data stream corresponding to the difference between the measured image positions and the reference signals;
- continuously sending control commands to the web processing device based on at least the registration error data stream;
- creating a speed command data stream by calculating changes in the registration error data stream and sending control commands to the web processing device based on the speed command data stream; and
- creating a torque command data stream by calculating changes in the speed command data stream and sending control commands to the web processing device based on the torque command data stream.

5,568,766

# METHOD FOR CONTROLLING THE DRIVE FOR A HYDRAULIC PRESS HAVING A PLURALITY OF OPERATING PHASES

Carsten Otremba, Esslingen; Guenther Schaich, Kirchheim-Teck, and Joachim Beyer, Ravensburg, all of Germany, assignors to Maschinenfabrik Mueller-Weingarten AG, Weingarten, Germany

Filed Aug. 30, 1994, Ser. No. 297,889

Claims priority, application Germany, Sep. 2, 1993, 43 29 480.4

Int. Cl.<sup>6</sup> B30B 15/16; 15/24

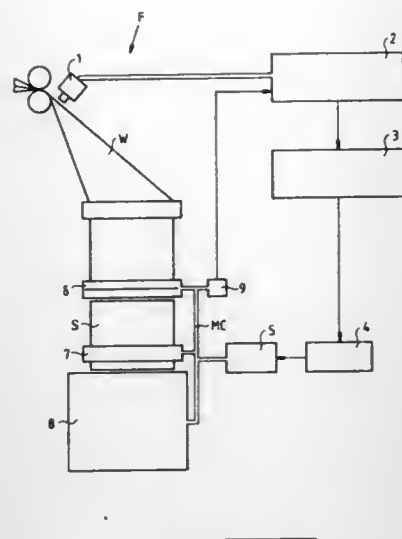
U.S. Cl. 100—35

19 Claims

1. A method for controlling the drive of a hydraulic press, comprising the steps of:

- (A) providing a piston/cylinder unit having a piston connected to a press ram, a first cylinder chamber located below the piston, and a second cylinder chamber acted upon by the piston;
- (B) utilizing an operating phase in which potential energy associated with a raised, unloaded press ram is stored, the operating phase including the steps of:





5,568,768

## CLEANING APPARATUS FOR OFFSET PLATES

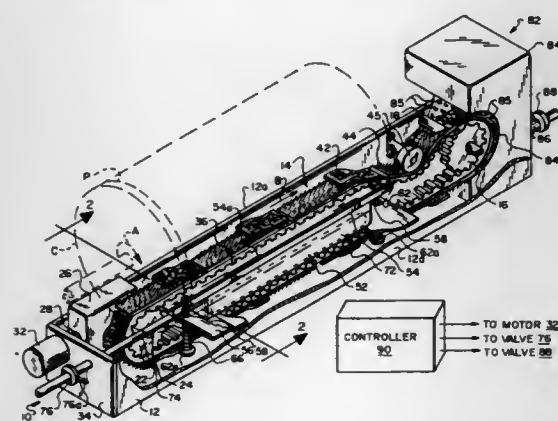
David Wolfe, Amherst, and Samuel D. Zerillo, Hillsboro, both of N.H., assignors to Presstek, Inc., Hudson, N.H.

Filed May 4, 1995, Ser. No. 433,987

Int. Cl.<sup>6</sup> B41F 35/00; B41L 41/00

U.S. Cl. 101—425

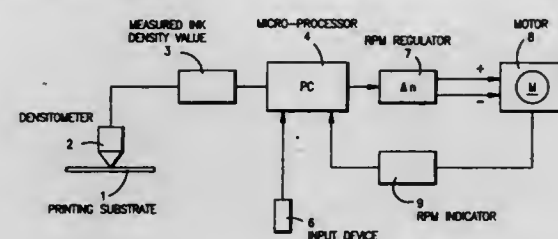
15 Claims



9. Cleaning apparatus for cleaning a lithographic plate mounted to a rotary plate cylinder, said apparatus comprising support means; a pair of aligned rotary pulleys supported by the support means at spaced apart locations thereon; an endless belt loop stretched between said pulleys, said loop having an outer surface and an operative stretch between said pulleys located in front of said support means parallel to and opposite said cylinder; a multiplicity of plate cleaning means anchored to the outer surface of the belt loop; drive means for rotating at least one of the pulleys; an inflatable bladder positioned between the operative stretch of the belt loop and the support means and which extends substantially the entire length of said belt loop stretch; means for venting gas from the bladder, and control means for controlling the filling and venting of said bladder so that when the bladder is filled with gas it inflates and exerts substantially uniform pressure against substantially the entire length of said operative stretch of the belt loop so as to urge said multiplicity of cleaning means thereon with uniform force against a plate mounted to the plate cylinder while the cylinder rotates and when said bladder is vented, said operative stretch of the belt loop is spaced from the plate cylinder.

5,568,769  
PROCESS FOR INFLUENCING THE OPTICAL DENSITY OF A PRINTING INK LAYER ON A PRINT CARRIER  
Dietrich R. K. Leuerer, Würzburg, Germany, assignor to Koenit & Bauer Aktiengesellschaft, Würzburg, Germany  
PCT No. PCT/DE93/01083, § 371 Date May 9, 1995, § 102(e) Date May 9, 1995, PCT Pub. No. WO94/11192, PCT Pub. Date May 26, 1994  
PCT Filed Nov. 12, 1993, Ser. No. 424,468  
Claims priority, application Germany, Nov. 14, 1992, 42 38 557.1

Int. Cl.<sup>6</sup> B41F 7/24; G01B 11/00  
U.S. Cl. 101—450.1 3 Claims



1. A process for affecting the ink density or colorimetric value of a printing ink layer on a printing substrate including the steps of: providing a plurality of ink density or colorimetric value and position defining set value measuring spots of acceptable values; determining the ink density or colorimetric value for a coloration for each selected one of said plurality of set value measuring spots; providing a microprocessor having an input device and outputs and a memory; storing said ink density or colorimetric value for each of said selected ones of said set value measuring spots as set values in said microprocessor; producing a plurality of ink density or colorimetric value and position defining production value measuring spots on an ink carrying substrate which is to be checked; measuring said ink density or colorimetric value for each of said production value measuring spots as production values; entering said production values in said microprocessor and comparing said production values with said set values; determining in said microprocessor if continuous rows of several adjoining production value measuring spots with ink density or colorimetric values which deviate from said set values have been formed; providing a moistener device with a controllable electric motor; and generating an electronic signal to said moistening device in response to said determination that said production values deviate from said set values to change an amount of moistener introduced by said moistener device.

5,568,770  
TANK TRANSPORTATION SYSTEM AND PRODUCTION UTILIZING THE SAME

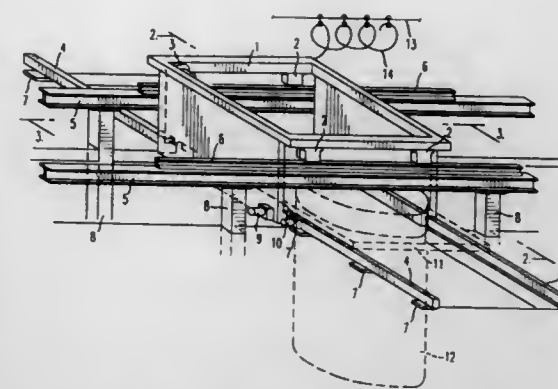
Hidekazu Ito, Okayama; Ryoichi Morimoto, Akaiwa-gun, and Hidemitsu Miura, Kurashiki, all of Japan, assignors to Kuraray Engineering Co., Ltd., Kurashiki, Japan

Filed May 8, 1995, Ser. No. 436,729

Claims priority, application Japan, May 25, 1994, 6-136400; Dec. 27, 1994, 6-340519

Int. Cl.<sup>6</sup> B61J 3/00 4 Claims

1. A tank transportation system used for producing flowable composites, the tank transportation system comprising: a conveying truck suspended and movably mounted on rails so as to be movable on the rails between a plurality of stations provided adjacent to said rails;



a movable tank comprising a tank body with a tank supporting base integrated on a side wall of the tank body, said conveying truck comprising means for receiving and suspending the movable tank by supporting the tank supporting base; first means for moving the movable tank to a position below said suspended conveying truck so as to be suspended from said suspended conveying truck; and second means for moving the conveying truck with the tank suspended thereon based on a procedure pre-set by a computer program to deliver the tank to said stations to perform a prescribed operation at each of said stations.

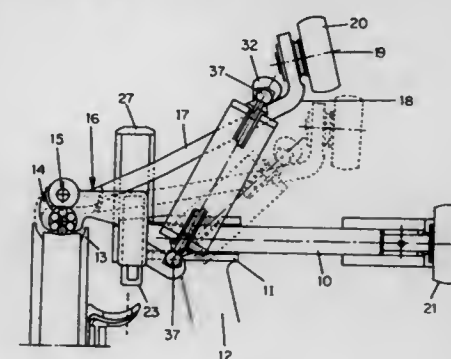
5,568,771  
DETACHABLE GRIP FOR COUPLING CARS OR CHAIRS OF A GONDOLA LIFT OR CHAIRLIFT  
Max Brochand, Noyarey, France, assignor to Pomagalski S.A., France

Filed Aug. 23, 1995, Ser. No. 518,491

Claims priority, application France, Sep. 8, 1994, 94 10936  
Int. Cl.<sup>6</sup> B61B 7/00

U.S. Cl. 104—206

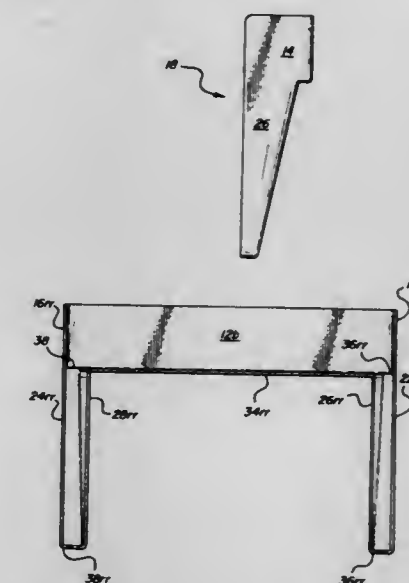
5 Claims



1. A detachable grip for coupling loads to a cable of an aerial monorail transport installation, comprising: a grip body for supporting a load hanger; cable clamping jaws including a fixed jaw secured to the grip body and a moveable jaw pivotally mounted with respect to the fixed jaw; a grip control mechanism including an operating lever having a first end portion secured to the moveable jaw to control opening and closing of the cable clamping jaws, and a free, second end portion, said operating lever being pivotal in a first plane which passes through the grip body; and first and second compression coil springs symmetrically disposed on lateral sides of the first plane, said compression coil springs extending between the second end portion of the operating lever and the grip body, said first and second compression coil springs extending along first and second axes, respectively, said first and second axes (i) lying in a second plane which is perpendicular to said first plane and which is inclined with respect to a direction of extension of

the grip body, and (ii) being nonparallel and approaching each other toward said operating lever.

5,568,772  
SHOWER DOOR SHELF  
Bradley C. Carson, 1412 Country Rd., Troy, Mich. 48098  
Filed May 24, 1995, Ser. No. 447,535  
Int. Cl.<sup>6</sup> A47B 37/00  
U.S. Cl. 108—42 17 Claims



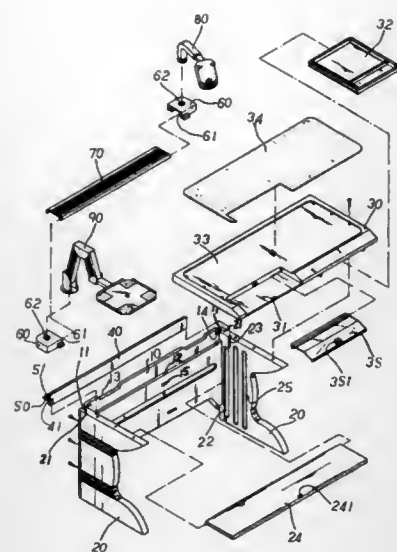
1. A shelf mounting between shower door and handle or bar mounted on said door, said shelf being an integrally molded body comprising: a compartment having (a) a tray with a front edge, a rear edge, a first edge and a second edge, said front edge being between said first edge and said second edge, (b) a front extending above said tray along said front edge and having a first end and a second end and (c) a first side integral said first end and a second side integral said second end, said first side spaced from said tray along said first edge and said second side spaced from said tray along said second edge; a first, wedge shaped, hollow leg and a second, wedge shaped hollow leg, said first hollow leg having a first leg inner side and a first leg outer side and said second hollow leg having a second leg inner side and a second leg outer side, said first leg outer side depending beneath said first side and said second leg outer side depending beneath said second side, said first leg inner side depending beneath said tray under said first edge, and said second leg inner side depending beneath said tray under said second edge.

5,568,773  
MULTIFUNCTIONAL COMPUTER DESK  
Hung Wang-Ho, No. 73, Sec. 1, Yen-Hai Rd., Hsien-Hsi Hsiang, Changhua Hsien, Taiwan  
Filed Jul. 19, 1995, Ser. No. 504,069  
Int. Cl.<sup>6</sup> A47B 83/00; 46/00

U.S. Cl. 108—50

20 Claims

1. A multifunctional computer desk, comprising a rear board, two lateral boards, a face board, a longitudinal partitioning board, a transverse partitioning board, two corner insertion blocks and a pivotable board, wherein: the rear board is formed with stepped channels on two sides for engaging with corresponding stepped channels formed on rear sides of the lateral boards, the two sides of the rear board being formed with thread holes for screws to pass there-



through to lock the rear board with the lateral boards, the face board being mounted on the lateral boards by screws, a wider stepped channel being formed on an inner upper edge of the rear board and two recesses being formed on two sides thereof, a vertical wire channel being formed on an inner rear edge of each lateral board, a small vertical channel being formed beside the wire channel, whereby each end of the longitudinal partitioning board is inserted in the small vertical channel, a transverse insertion groove being formed on a lower edge of the longitudinal partitioning board, whereby one side of the transverse partitioning board is inserted in the groove, while the other side thereof is fitted in the wider stepped channel of the rear board, a plurality of separating plates being disposed on the transverse partitioning board for guiding wires of business machines;

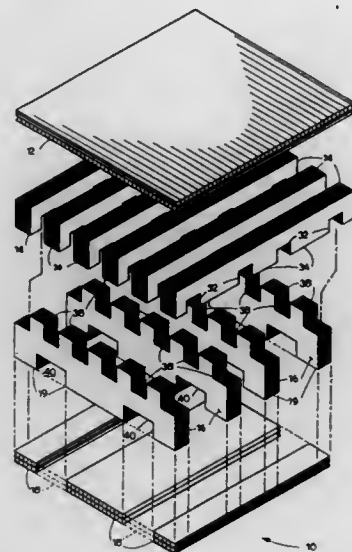
a support board is pivotably disposed between the lateral boards under the face board, the support board being pivotable upward to attach to the rear board or pivotable downward to be horizontally located on two bosses on inner surfaces of the lateral boards for placing articles thereon;

two insertion slots are formed on upper edges of two sides of the rear board, whereby the corner insertion blocks can be inserted therein and mounted on two corners of the rear board, each corner insertion block having a projecting post on an inner side for pivotally mounting the pivotable board on a rear side of the face board above the transverse partitioning board, each corner insertion block being formed with an insertion socket for inserting a telephone stand and a rotary crank arm with a platform therein, whereby a telephone and a computer monitor can be placed on the telephone stand and the platform respectively, a keyboard receptacle being formed on one side of a front edge of the face board and a drawer being disposed under the other side thereof, a transparent cover with a lock seat being pivotally disposed on the keyboard receptacle, whereby the transparent cover can be locked to prevent the keyboard from being unauthorizedly touched, the transparent cover serving as a document rest when pivoted upward; and the wires of the business machines are placed in the wire channels of the lateral boards and extend along the transverse partitioning board and extend out from the recesses of the rear board to connect with the business machines on the desk, the pivotable board being pivotable for checking or adjusting the wires, the telephone stand and the rotary crank arm being spaced from the face board of the desk and being freely movable without occupying any area of the face board.

5,568,774  
**PALLETS OF CORRUGATED SHEET MATERIAL WITH INTERLOCKING COMPONENTS**  
 Joel P. Hutchison, San Antonio, Tex., assignor to Miriam M. Benson, San Antonio, Tex.  
 Continuation-in-part of Ser. No. 178,835, Jan. 7, 1994. This application Jun. 3, 1994, Ser. No. 253,300  
 Int. Cl.<sup>6</sup> B65D 19/00

U.S. Cl. 108—51.3

14 Claims



1. A shipping pallet constructed of multiple laminates of corrugated sheets and formed of components comprising:

a plurality of spaced apart elongate stringers each having a rectangular cross section, an upper surface with a plurality of notches formed therein, and an opposite lower surface;

a plurality of spaced apart elongate deck boards each having a rectangular cross section, a lower surface with a plurality of notches formed therein, and an opposite upper surface;

said stringer notches and said deck board notches being formed to cooperate and interlock with one another so that said deck boards are adhesively and interlockingly secured perpendicularly across and atop said stringers, with each said upper and lower surfaces of said stringers and said deck boards being mutually coplanar when interlockingly assembled;

a top sheet comprising corrugated sheets laminated together and adhesively secured to said coplanar upper surfaces of said deck boards and said stringers, with said top sheet having opposite first and third edges disposed parallel to said elongate deck boards and opposite second and fourth edges disposed parallel to said elongate stringers;

a bottom sheet comprising corrugated sheets laminated together and adhesively secured to said coplanar lower surfaces of said deck boards and said stringers, with said bottom sheet having opposite first and third edges disposed parallel to said stringers and opposite second and fourth edges disposed parallel to said elongate deck boards, and;

at least said stringers and said deck boards each being constructed of plural reverse laminations of corrugated sheets, said corrugated sheets each having a first wall, a second wall, and a plurality of corrugation flutes disposed therebetween, said first wall of each of said corrugated sheets being of a heavier weight than said second wall, with said first wall of one of said corrugated sheets being adhesively attached to said first wall of another of said corrugated sheets to provide a reverse lamination, whereby;

at least said stringers and said deck boards of said pallet are substantially free from warps or curvature by means of said reverse lamination of said corrugated sheets used in the construction of said pallet and substantial strength is achieved by means of said plural reverse laminations of corrugated sheets and said interlocking of said deck boards and said stringers.

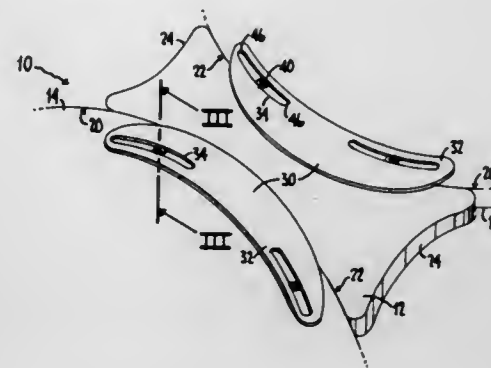
5,568,775  
**ARTICULATING TABLE CONNECTION**  
 John J. Rizzi, Weston, Conn., and Walter C. Mrotz, III, North Muskegon, Mich., assignors to Knoll, Inc., East Greenville, Pa.

Filed Jan. 23, 1995, Ser. No. 376,989

Int. Cl.<sup>6</sup> A47B 57/20

U.S. Cl. 108—64

11 Claims



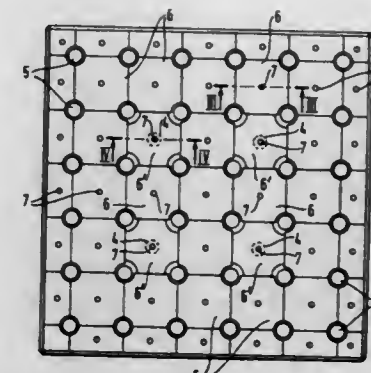
1. A table arrangement comprising:

at least two tables having a first table and a second table, each table including a top having an upper surface, said first table having an edge defining a curved arc segment over a part of a periphery of the top of said first table;

an in-fill piece having one edge portion shaped to complement the edge of said first table along the arc segment, and an opposite edge portion shaped to complement an edge of the second table wherein the in-fill piece has an upper surface and wherein the upper surfaces of said first table, said second table and said in-fill piece occupy a common plane;

bracket means for connecting the in-fill piece and the first and second tables together such that the in-fill piece spans a gap between the tables and abuts the edges of the tables;

said bracket means including articulating means for coupling said first table and the in-fill piece together for relative movement while in abutment, said articulating means comprising a flange extending from the in-fill piece to lap the edge of said first table, the flange having curved openings for receiving spaced guide pins mounted to said first table to couple the first table and the in-fill piece together for relative movement through a limited range of complementary alignments.



5,568,777  
**SPLIT FLAME BURNER FOR REDUCING NO<sub>x</sub> FORMATION**

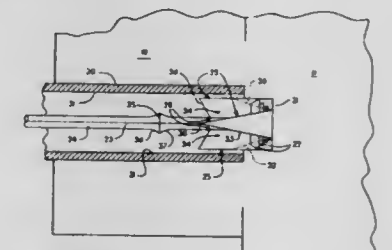
Bernard P. Breen, Pittsburgh; John P. Bionda, Jr., Coraopolis, both of Pa.; James E. Gabrielson, Plymouth, Minn., and Anthony Hallo, Springdale, Pa., assignors to Duquesne Light Company, and Energy Systems Associates, both of Pittsburgh, Pa.

Filed Dec. 20, 1994, Ser. No. 359,800

Int. Cl.<sup>6</sup> F23C 1/10

U.S. Cl. 110—261

21 Claims



1. An improved coal burner for the reduction of NO<sub>x</sub> emissions from furnaces that are fired with pulverized coal, said coal burner comprising:

(a) a primary-air/coal pipe;

(b) a diffuser positioned where said primary-air/coal pipe discharges a mixture of air and coal into a furnace; and

(c) a plurality of fuel splitters defining a plurality of partially open areas and a plurality of blocked areas of said diffuser such that said plurality of fuel splitters divide said mixture of air and coal into a plurality of streams passing through said plurality of partially open areas into said furnace for combustion under initially fuel rich conditions.

13. A method for reducing the formation of NO<sub>x</sub> in a pulverized coal-fired furnace comprising the steps of:

(a) placing a diffuser where a primary-air/coal pipe discharges a mixture of air and coal into a furnace;

(b) positioning a plurality of fuel splitters to define a plurality of partially open areas and a plurality of blocked areas of said diffuser; and

(c) dividing said mixture of air and coal into a plurality of streams of air and coal to pass through said plurality of

5,568,776  
**FLUIDIZED BED HEARTH FLOOR**  
 Sylvestre Suraniti, Paris; Jean-Xavier Morin, Neuville Aux Bois, and Frédéric Maillot, Clamart, all of France, assignors to GEC Alsthom Stein Industrie, Vélizy-Villacoublay, France  
 Filed Jun. 7, 1995, Ser. No. 477,236  
 Claims priority, application France, Jun. 13, 1994, 94 07184  
 Int. Cl.<sup>6</sup> F23G 5/00

U.S. Cl. 110—245

9 Claims

1. A fluidized bed hearth floor, comprising:

a supporting metal sheet of refractory metal, said sheet having a plurality of fluidization gas injection nozzles; and

a coating of refractory material covering said metal sheet, said coating comprising a plurality of flat elements made of refractory metal, each flat element being welded to the supporting sheet in a localized zone.



partially open areas into said furnace for combustion under initially fuel rich conditions.

5,568,778

# APPARATUS FOR FEEDING A WORKPIECE INCLUDING A ROTOR AND ENDLESS BELTS

Johannes Sahl, Tannenweg 17, A-4501 Neuhausen a.d. Krems, Austria

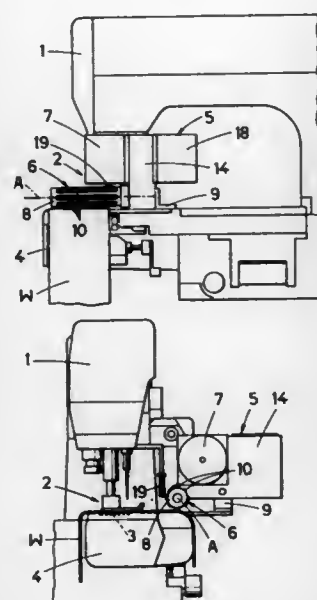
Filed Jan. 10, 1995, Ser. No. 371,032

Claims priority, application Austria, Jan. 19, 1994, A 88/94

Int. Cl.<sup>6</sup> D05B 27/10

U.S. Cl. 112—306

8 Claims



1. In an apparatus for feeding at least one workpiece in a machine tool along a guideway, comprising
  - a main conveyor for conveying in a predetermined feeding direction a workpiece along the guideway at a controlled speed, and
  - an auxiliary conveyor for aligning said workpiece by moving the workpiece transversely to said feeding direction while the workpiece is conveyed in said direction, which auxiliary conveyor is spaced from, and mounted independently of, said main conveyor and comprises at least one conveying mechanism, which comprises conveying elements selectively engageable with said workpiece and movable transversely to said feeding direction, and an adjusting drive for driving said conveying elements transversely to said feeding direction, the improvement of the auxiliary conveyor comprising
    - a generally cylindrical rotor mounted for rotation about an axis of rotation which is normal to said feeding direction and parallel to said guideway, and means for rotating said rotor about said axis of rotation at a surface speed which corresponds to said controlled speed of said main conveyor, said rotor having a peripheral surface and being selectively movable to engage said peripheral surface with the workpiece conveyed along said guideway,
    - said conveying mechanism comprising said rotor and said conveying elements consisting of a plurality of endless conveyor belts, which are regularly distributed around said axis of rotation and are adapted to revolve in the direction of said axis of rotation and have outer courses which constitute parts of said peripheral surface of said rotor, and
    - said adjusting drive being operable to drive said conveyor belts independently of the rotation of said rotor at speeds different from said controlled speed.

5,568,779

# PUCKER FREE GARMENT SEAM AND METHOD OF MANUFACTURE

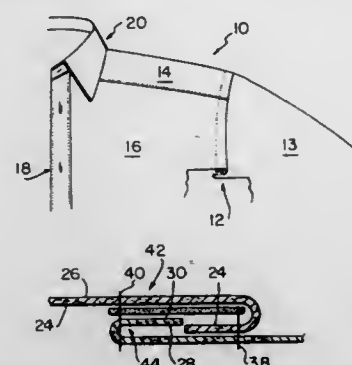
John Wong, Montreal, Canada, assignor to Tal Apparel Ltd., Hong Kong

Filed May 17, 1994, Ser. No. 245,122

Int. Cl.<sup>6</sup> D05B 1/18; A41D 27/10; B32B 7/08; 7/12

U.S. Cl. 112—441

31 Claims



1. A method of manufacturing a smooth garment seam between first and second garment components comprising the steps:
  - (a) placing the first garment component in an adjacent relationship to the second garment component so as to define a seam;
  - (b) placing a bonding element having at least a thermal adhesive component along the seam such that a lower surface of the bonding element abuts an upper surface of the first garment component;
  - (c) sewing the first and second garment components and the bonding element together by a first set stitch running along the seam;
  - (d) folding the first garment component over the bonding element such that the upper surface of the first garment component is folded over and abuts an upper surface of the bonding element;
  - (e) folding a portion of the second garment component such that a lower surface of the second garment component abuts the lower surface of the bonding element;
  - (f) sewing the first and second garment components and the bonding element together by a second stitch running along said seam; and
  - (g) applying sufficient heat and pressure to said bonding element to cause said thermal adhesive to melt such that said adhesive flows onto said surfaces of the first and second garment components to provide a bond along the seam such that the bonded components will effectively reduce a tendency of the seam to pucker during laundering.

5,568,780

# COMBINING CONVEYOR SYSTEM WITH COMBINING FIXTURE

Marvin Menzin, Lexington; Donald E. Burt, Danvers, and Henry R. Cofek, Groton, all of Mass., assignors to Design Technology Corporation, Billerica, Mass.

Filed Jan. 19, 1994, Ser. No. 183,499

Int. Cl.<sup>6</sup> D05B 39/00

U.S. Cl. 112—470.18

102 Claims

1. A combining conveyor system for combining a first fabric piece and a second fabric piece to form a combined fabric piece, said system comprising:
  - (a) a combining fixture having means for holding said first fabric piece and said second fabric piece;
  - (b) a conveyor for transporting said combining fixture;
  - (c) at least one work station having means for combining said first and second fabric pieces; and
  - (d) a transfer station for removing said combining fixture from said conveyor, wherein said transfer station includes: (i)

5,568,782

# BI-MODAL ELASTOMERIC EJECTOR

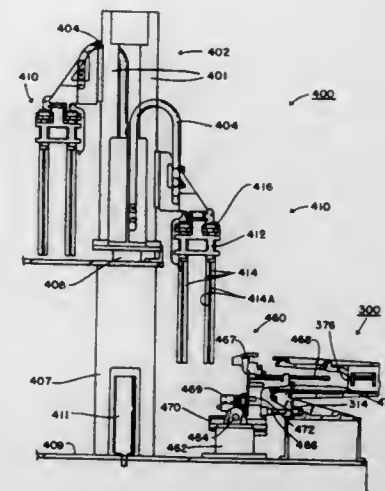
Paul E. Moody, Barrington, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 31, 1995, Ser. No. 505,714

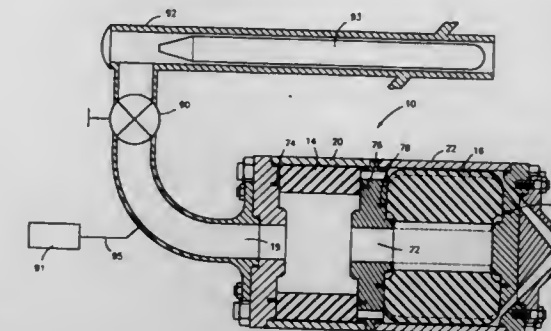
Int. Cl.<sup>6</sup> B63B 1/00

U.S. Cl. 114—238

12 Claims



- engaging means for engaging said combining fixture; (ii) a tilt actuator for selectively moving said engaging means; and (iii) means for removing said combined fabric piece from said combining fixture.



1. A device for providing fluid to an article guide comprising:
  - a housing having an aperture therein;
  - at least two elastomeric devices positioned within said housing and in communication with said aperture, each said elastomeric device being adapted to store different amounts of energy;
  - a fluid for provision under pressure to said housing aperture for causing at least one elastomeric device to store elastomeric energy; and
  - a valve joined to said aperture and to said article guide for controllably allowing said at least one elastomeric device to release elastomeric energy whereby said fluid receives the elastomeric energy, and travels through said housing aperture, and said valve to said article guide.

5,568,781

# INDUCED FLOW UNDERSEA VEHICLE MOTOR COOLING JACKET

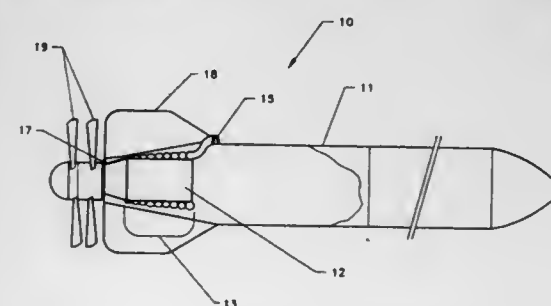
John J. Vaillancourt, Tiverton, and James E. Mulherin, Portsmouth, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 17, 1995, Ser. No. 394,082

Int. Cl.<sup>6</sup> F02G 3/02

U.S. Cl. 114—20.2

14 Claims



1. An induced flow motor cooling jacket for a propeller-driven underwater vehicle comprising:
  - a self-priming inlet;
  - a heat exchanger comprising heat conductive tubing having a cross-section shaped to provide an increasing heat transfer coefficient as said tubing extends through the heat exchanger, wherein said tubing is wound around and in physical contact with a vehicle motor and connected to said self-priming inlet; and
  - a coolant discharge nozzle attached to said heat exchanger and located in a region in front of said vehicle propeller.

5,568,783

# PERSONAL WATER SURFACE TOWING DEVICE

Ronald G. Ditchfield, 2, Fairways, Thornbury Road, Isleworth, Middlesex TW7/4NS, England

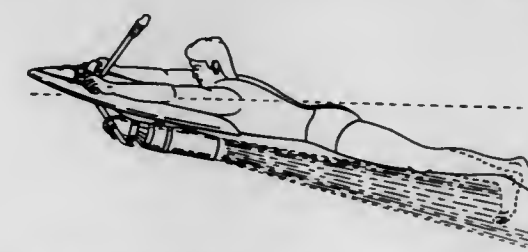
Continuation of Ser. No. 105,684, Aug. 13, 1993, Pat. No. 5,388,543. This application Feb. 10, 1995, Ser. No. 386,506

Claims priority, application United Kingdom, Sep. 1, 1992, 9309131

Int. Cl.<sup>6</sup> B63B 21/56

U.S. Cl. 114—242

16 Claims



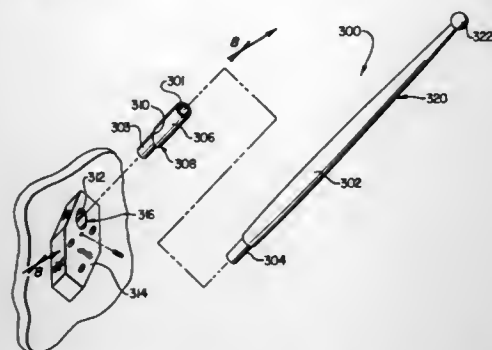
1. A buoyant water surface towing device for towing a person through and across a water surface comprising:
  - a body having a lower underside surface that is a hydrodynamically streamlined hull and a top surface deck that is a means to solely, contact and support said person, substantially said persons outstretched arms only, said outstretched arms lying along and on top of said deck;
  - a means at rear end of said body, continuous from the rear end of said top surface deck, being an area adapted and appropriately shaped to moot and abut up against said persons chest area in a compatible mating manner;

a means for holding with the hands said towing device, positioned at the front portion of said towing device, and at least partly above said top surface deck; and so that the placement of said means of holding relative to said top surface deck and said means at the rear end of said body, is a means whereby in use of said towing device, said persons arms can be fully extended, lying positioned over and on top of said top surface deck, with said persons chest area accommodated against said means at the rear end of said body, so that most of said persons body from substantially the chest down is essentially in the surrounding water.

5,568,784

## FLAG SUPPORT SYSTEM

Tucker Willis, 4525 Bluffview Blvd., Dallas, Tex. 75209, and James Cinquemani, Jr., 2412 Hardwick, Dallas, Tex. 75208  
Continuation-in-part of Ser. No. 276,068, Jul. 15, 1994. This application May 15, 1995, Ser. No. 440,757  
Int. Cl.<sup>6</sup> G09F 17/00; F16M 13/00  
U.S. Cl. 116—173 12 Claims



1. An improved flag staff assembly of the type wherein an elongate flag staff is disposed at an angle relative to a generally vertical surface and is disposed above a ground region, wherein the improvement comprises:

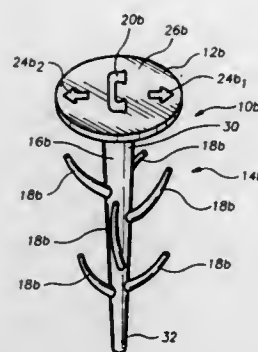
a base member adapted for securement to said vertical surface in support of said flag staff therefrom, said base member being formed with a female aperture therein adapted for securement of said flag staff in a first angled position therefrom; and means for mounting said flag staff to said base member in a select position, said means for mounting including a mounting shaft having first and second ends, said first end comprising a male member adapted for receipt into said female aperture and said second end comprising a female member for receipt of said flag staff therein, said mounting shaft also includes a mounting lip positioned between said first and second ends and constructed in an axially eccentric, circular configuration adapted for facilitating flush engagement with said base member for securement thereagainst when said male member is within said female aperture.

5,568,785

## UTILITY MARKING DEVICE

Hallie W. Hazen, 1812 Vista Bonita Dr., E. Mobile, Ala. 36609  
Filed Aug. 3, 1995, Ser. No. 510,606  
Int. Cl.<sup>6</sup> E04H 13/00  
U.S. Cl. 116—209 1 Claim

1. A utility marking device comprising:  
a substantially disk shaped indicating member having at least one substantially planar surface, said indicating member including integrally formed utility indicia indicating at least one type of utility and integrally formed direction indicia indicating a direction of travel with respect to said indicating member, said indicating member being at least three times broader in a first direction than said indicating member is



thick in a second direction, said second direction being orthogonal to said first direction; and a positioning member rigidly secured to said indicating member and extending from a center of a side surface of said indicating member, said positioning member including a conically shaped stake member, oriented perpendicularly with respect to said substantially planar surface, said stake member having six stabilizing members extending therefrom that each have a curve along the entire length thereof having a radius of curvature of about eight inches, said stabilizing members each curving away from a tip of said stake member, said stabilizing members being constructed from a material having sufficient resilience to allow each said stabilizing member to flex while said stake member is inserted into soil located above a utility line.

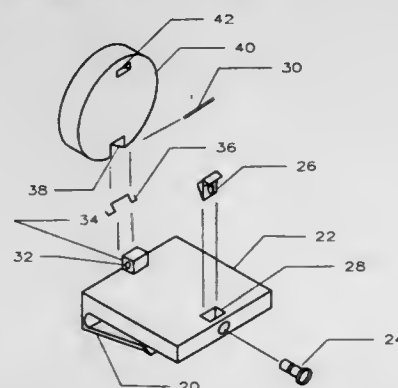
5,568,786

## CHECKMATE COMMUNICATION SYSTEM

Patrick J. Lynch, 104 Whitman Ave., Islip, N.Y. 11751, and Eugene Charles, 306 11th St., Huntington Beach, Calif. 92648  
Filed Jan. 25, 1995, Ser. No. 377,860  
Int. Cl.<sup>6</sup> G08B 5/00

U.S. Cl. 116—303

1 Claim



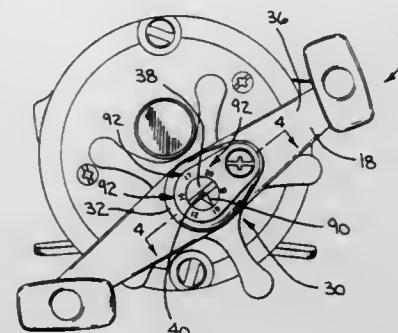
1. A communications device comprising:  
a clipping or clasp device having the flexibility to clasp onto various thicknesses of materials;  
a visual attractant for obtain the attention of humans;  
a platform having a pre-determined cross-sectional shape used as a base for pivotally mounting said visual attractant;  
means for adhering said platform to said clipping or clasp device;  
means for pivotally mounting said visual attractant to said platform;  
constant pressure means mounted between said visual attractant and said platform for biasing said visual attractant toward an erect position;  
latch means on said platform for releasably retaining said visual attractant in a closed position; and

coupling means on said visual attractant for cooperating with said latch means to releasably retain said visual attractant in said closed position.

5,568,787

## LINE TYPE INDICATOR FOR FISHING REEL

Robert L. Forslund, Catoosa, Okla., assignor to Zebco Division of Brunswick Corporation, Tulsa, Okla.  
Continuation of Ser. No. 294,625, Aug. 23, 1994, abandoned.  
This application Nov. 16, 1995, Ser. No. 558,387  
Int. Cl.<sup>6</sup> G09F 9/40; A01K 89/00  
U.S. Cl. 116—307 16 Claims



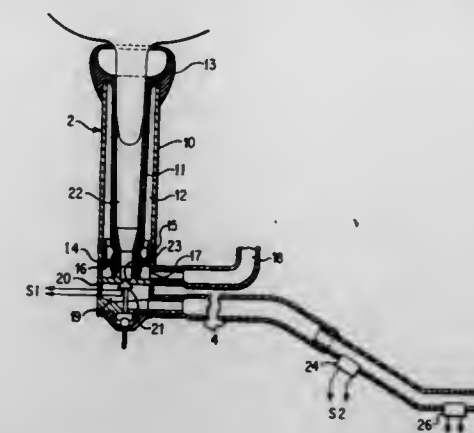
6. An apparatus for giving the user of a fishing reel a visual indication of a type of fishing line on a spool on fishing reel, the apparatus comprising:

a first member;  
means for mounting the first member to a portion of the fishing reel for guided movement relative to the portion of the fishing reel to which the first member is mounted selectively between first and second positions;  
means to facilitate movement of the first member between the first and second positions by the user;  
an indicating mark on one of (a) the first member and (b) the mounting means; and  
a plurality of additional marks on one of (a) the first member and (b) the mounting means, each indicative of a type of fishing line on the fishing reel to which the apparatus is mounted, whereby with the first member in the first position the indicating mark aligns with one of the additional marks which is indicative of a first type of fishing line, and with the first member in the second position the indicating mark aligns with another of the additional marks which is indicative of a second type of fishing line, whereby a user can put one of (a) a supply of the first type of line and (b) a supply of the second type of line on the fishing reel and move the first member to one of the first and second positions to give a visual indication to the user of which of the first and second type of fishing lines is on the reel, thereby obviating the need to have a user physically inspect a line to identify its type, wherein the means for mounting the first member includes a body and means cooperating between the body and the portion of the fishing reel for captively holding the first member against the portion of the fishing reel.

5,568,788

## IMPLEMENT FOR AND A METHOD OF MILKING ANIMALS AUTOMATICALLY

Karel van den Berg, Bleskensgraaf, and Rene Fransen, Vlaardingen, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands  
PCT No. PCT/NL92/00162, § 371 Date Aug. 22, 1994, § 102(e) Date Aug. 22, 1994, PCT Pub. No. WO93/05647, PCT Pub. Date Apr. 1, 1993  
Continuation-in-part of Ser. No. 916,728, Jul. 22, 1992, Pat. No. 5,275,124, which is a continuation of Ser. No. 818,764, Jan. 13, 1992, Pat. No. 5,195,456, which is a continuation-in-part of Ser. No. 485,579, Feb. 27, 1990, Pat. No. 5,080,040.  
This PCT application Sep. 24, 1992, Ser. No. 66,056  
Claims priority, application Netherlands, Sep. 17, 1991, 9101636  
Int. Cl.<sup>6</sup> A01J 5/011  
U.S. Cl. 119—14.02 23 Claims



1. An implement for automatically milking animals, such as cows, comprising a line system which comprises a plurality of milk lines that each extend from a teat cup to a junction formed where said plurality of milk lines from said teat cups join; at least one sensor selected from the group consisting essentially of a vacuum-sensitive sensor, a flow-sensitive sensor, a temperature-sensitive sensor and an electrical conductivity sensor in said line system; and a computer for processing and reproducing information provided thereto by said at least one sensor.

5,568,789

## SQUIRREL-RESISTANT BIRD FEEDER

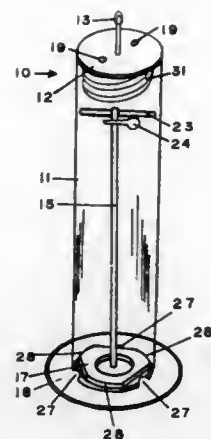
Eldo C. Koenig, 35005 Fairview Rd., Oconomowoc, Wis. 53066, and Evan F. Koenig, 9022 Church Rd., Dallas, Tex. 75231  
Filed May 19, 1995, Ser. No. 444,552  
Int. Cl.<sup>6</sup> A01K 39/01 5 Claims

U.S. Cl. 119—57.9

5 Claims

1. A wild-bird feeder comprising in combination,  
a) an axially vertical tubular body configured with a smooth outside wall and a bottom wall,  
b) a removable cap for said tubular body,  
c) at least one feed port opening in said tubular body, said at least one opening located with at least a portion of a lip of said at least one opening disposed in said bottom wall of said tubular body,  
d) at least one elastic band supported at its upper end within the confine of said tubular body and with its lower extremity portion passed through said bottom wall,  
e) a perch underlying said tubular body wherein at least a portion of said perch extends radially beyond said outside wall, said perch being affixed to said lower extremity portion of said at least one elastic band whereby said perch is caused to be upset when a weight in excess of that of song birds is applied to the peripheral extremity of said perch.





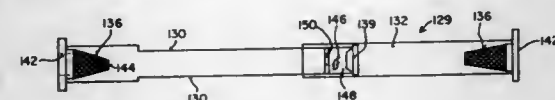
5,568,790

**WORM TRAP FOR A BREEDING TANK ASSEMBLY**  
 Gary Musgrave, 267 27th St., San Francisco, Calif. 94131  
 Continuation of Ser. No. 335,516, Nov. 7, 1994, abandoned,  
 which is a continuation of Ser. No. 129,906, Sep. 30, 1993,  
 abandoned, which is a division of Ser. No. 898,062, Jun. 12,  
 1992, Pat. No. 5,297,513. This application Sep. 18, 1995, Ser.  
 No. 529,377

Int. Cl.<sup>6</sup> A01K 63/00

U.S. Cl. 119—217

4 Claims



1. A breeding tank comprising:  
 a tank having an inner chamber for housing water; and  
 a worm trap positioned within the inner chamber under the water, the worm trap comprising:  
 a tube assembly having a pair of removable, telescoping tubes, each tube having an open end, one of the tubes having a pair of spaced end walls for housing a food morsel, the spaced end walls having holes for allowing the aroma of the food morsel to pass therethrough, the holes being smaller than the food morsel; and  
 first and second fittings attached to the open ends of the tubes, the fittings having a hole forming a passage of limited size for allowing the water in the tank to flow through the tubes and for allowing a worm to pass into the tubes.

5,568,791

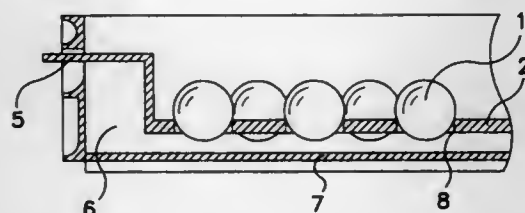
**INCUBATION METHOD AND APPARATUS THEREFOR**  
 Rainer Dratt, Am Kolk 3, D-39626 Bismark, Germany  
 Filed Mar. 6, 1995, Ser. No. 398,857

Claims priority, application Germany, Mar. 5, 1994, 44 07 407.7

Int. Cl.<sup>6</sup> A01K 41/06

U.S. Cl. 119—300

20 Claims



1. A method of incubating poultry eggs of any kind, comprising the steps of:

depositing a plurality of eggs in openings of substantially egg-shaped contour provided in egg support means with said eggs protruding slightly through said openings and being in peripheral contact with the margins thereof;  
 securing said egg support means in hatching bin means provided with bottom surface means such that said eggs are spaced from said bottom surface means by a predetermined distance;  
 moving said egg support means toward said bottom surface means to free said eggs from their peripheral contact with said margins and to cause peripheral point contact between said eggs and said bottom surface means;  
 subjecting said eggs to an incubation process;  
 periodically imparting rotary movement to said eggs;  
 terminating said incubation process by ceasing said rotary movement and causing said eggs to hatch without removal from said bin means.

5,568,792

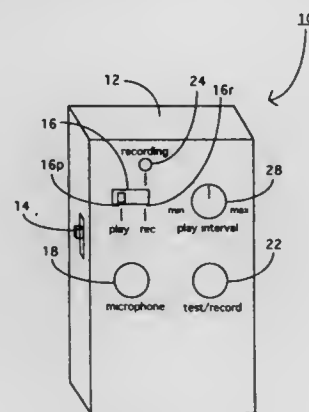
**BIRD TRAINING DEVICE**

James K. Lynch, 3 Hansen Ter., Revere, Mass. 02151  
 Filed Oct. 19, 1994, Ser. No. 326,089

Int. Cl.<sup>6</sup> A01K 29/00

U.S. Cl. 119—713

5 Claims



1. A training device for teaching a bird to recite words, sounds or music, said device comprising:  
 a digital recording and playback device that records and plays a desired message;  
 a pattern generator that controls the playing of the desired message for a predetermined number of times at predetermined intervals, and  
 a controller that variably adjusts the time between playing intervals and the number of times the desired message is played at each playing interval.

5,568,793

**STEAM GENERATOR**

Georg Ziegler, Winterthur, Switzerland, assignor to ABB Management AG, Baden, Switzerland  
 Filed Jan. 10, 1995, Ser. No. 370,785

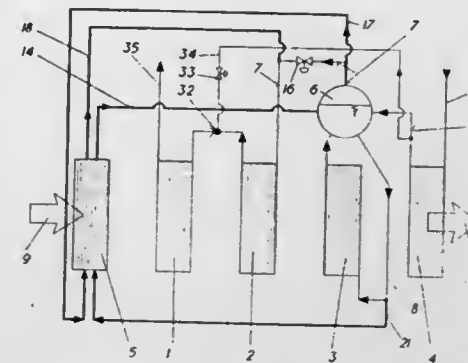
Claims priority, application Switzerland, Jan. 14, 1994, 120/94

Int. Cl.<sup>6</sup> F22G 3/00

U.S. Cl. 122—460

7 Claims

1. A steam generator, the steam generator generating steam with heat from flue gas from a furnace chamber and being arranged downstream of the furnace chamber, the steam generator comprising:  
 a final superheater having an inlet and an outlet;  
 a pre-superheater having an inlet and an outlet;  
 an evaporator having an inlet and an outlet;  
 an economizer having an inlet and an outlet;



fluid flow lines including portions between the inlet of the final superheater and the outlet of the pre-superheater, the inlet of the pre-superheater and the outlet of the evaporator, and the inlet of the evaporator and the outlet of the economizer;  
 the final superheater, the pre-superheater, the evaporator, and the economizer being disposed in a path of flue gas from a furnace chamber;

a steam drum having an inlet connected along the portion of the fluid flow lines from the outlet of the economizer, the steam drum having an outlet for water and an outlet for steam, the fluid flow lines including portions leading from the outlet for water of the steam drum to the inlet of the evaporator and from the outlet for steam of the steam drum to the inlet of the pre-superheater;

a contact heat exchanger disposed in the path of flue gas from the furnace chamber, the contact heat exchanger having a plurality of tube banks and an inlet and an outlet, the contact heat exchanger being arranged in the path of flue gas from the furnace chamber upstream of the final superheater, the fluid flow lines including portions leading from the outlet for water of the steam drum to the inlet of the contact heat exchanger and from the outlet for steam of the steam drum to the inlet of the contact heat exchanger, and from the outlet of the contact heat exchanger to the inlet of the pre-superheater and from the outlet of the contact heat exchanger to the steam drum; and

shut off valves disposed in the fluid flow lines to alternately permit fluid flow from the water outlet of the steam drum to the contact heat exchanger and from the steam outlet of the steam drum to the contact heat exchanger to alternately operate the contact heat exchanger as an evaporator and a superheater.

5,568,794

**ELECTRIC CIRCUIT DEVICE PROVIDED ON COMPONENTS NECESSARY FOR CONTROLLING ENGINE OF VEHICLE**

Kenji Tabuchi, Hitachinaka, and Yasushi Sasaki, Urizuramachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 21, 1995, Ser. No. 426,382

Claims priority, application Japan, Apr. 28, 1994, 6-091061

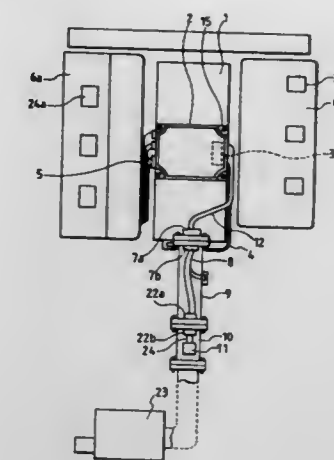
Int. Cl.<sup>6</sup> F02F 7/00

U.S. Cl. 123—195 E

18 Claims

1. An electric connector attached to a component necessary for controlling an engine and being disposed in an engine compartment having a wiring harness connector mounted on a surface of said engine compartment facing said component, wherein:

a further harness connector is mounted on a surface of said component facing said electric connector, and a wiring harness is connected to said further harness connector provided on a connected surface facing said connecting surface of said component, whereby connection of the electric connector to said wiring harness is performed when said connectors are simultaneously connected upon attaching of said electric connector to said component.



5,568,795

**SYSTEM AND METHOD FOR MODE SELECTION IN A VARIABLE DISPLACEMENT ENGINE**

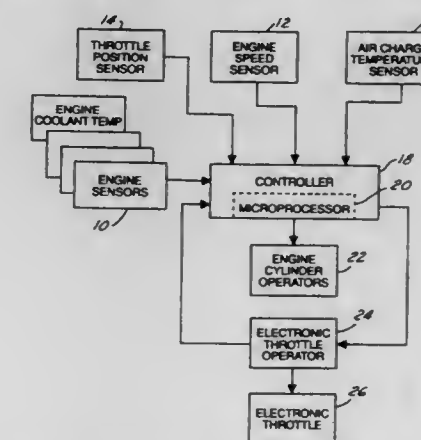
Jerry D. Robichaux, Lincoln Park, and Bradley J. Hieb, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 18, 1995, Ser. No. 444,165

Int. Cl.<sup>6</sup> F02B 77/00

U.S. Cl. 123—198 F

6 Claims



1. A system for determining a number of cylinders to operate in an internal combustion variable displacement engine, the system comprising:

a processor, coupled to said engine, for determining whether the variable displacement engine should be operated on a fractional number of cylinders, with said processor inferring a desired fractional manifold vacuum for a half displacement mode when said engine is in any displacement mode; generating a vacuum recommendation signal representative of the variable displacement engine operating on the fractional number of cylinders, with the desired fractional manifold vacuum representing a vacuum that would produce a desired torque and desired emissions as if the variable displacement engine were operating on the fractional number of cylinders; inferring a desired mass air flow and a desired exhaust gas recirculation flow; and, generating a flow recommendation signal representative of the variable displacement engine operating on the fractional number of cylinders, with the desired mass air flow representing a mass air flow that would produce the desired torque and the desired emissions as if the variable displacement engine were operating on the fractional number of cylinders, and with the desired exhaust gas recirculation flow representing an exhaust gas recirculation flow that would produce the desired torque and the desired emissions as if the variable displacement engine were operating on the fractional

number of cylinders; wherein said processor controls the operation of the variable displacement engine responsive to said vacuum recommendation signal and said flow recommendation signal both being within predetermined ranges for enabling the operation on the fractional number of cylinders.

5,568,796

# ROTARY COMPRESSOR AND ENGINE MACHINE SYSTEM

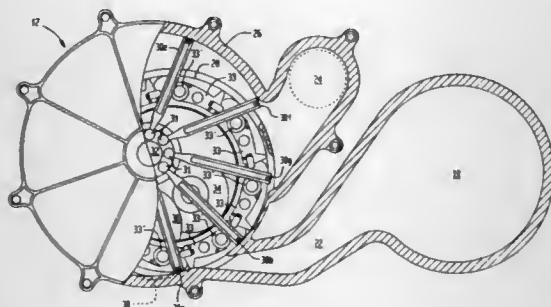
William R. Palmer, Melbourne, Fla., assignor to Spread Spectrum, Melbourne, Fla.

Continuation of Ser. No. 940,446, Sep. 4, 1992; Pat. No. 5,427,068. This application Aug. 13, 1994, Ser. No. 298,659. The portion of the term of this patent subsequent to Jun. 27, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> F02B 53/00

U.S. Cl. 123—204

9 Claims



## 1. A rotary expansion device comprising:

- an outer housing containing a gas expansion chamber having an interior surface which surrounds a first axis;
- an outer hub assembly, disposed inside said gas expansion chamber of said outer housing and surrounding a second axis, which is offset from said first axis;
- an inner hub, disposed inside said outer hub assembly, and surrounding said first axis;
- a plurality of blades, each of which is pivotally coupled with said inner hub and extends radially therefrom, passing through said outer hub assembly to said interior surface of said gas expansion chamber, thereby forming a plurality of gas expansion compartments between said interior surface of said gas expansion chamber, said outer hub assembly, and respective pairs of blades, with the volumes of said gas expansion compartments varying as a function of rotative position of said blades about said first axis;
- a combustor external to said outer housing and being operative to produce a combustion gas which is supplied through an expansion gas inlet port to said gas expansion chamber for expansion in said plurality of compartments, so that said combustion gas is fed to successively adjacent ones of said compartments during rotation of said compartments about said first axis, and wherein said gas expansion chamber further includes an exhaust port from which an expanded combustion gas is vented subsequent to rotation of said compartments about said first axis from said expansion gas inlet port to said exhaust port; and
- a pressure vent provided between successively adjacent ones of said compartments and being operative to allow pressure in one of said successively adjacent ones of said compartments to be vented to another of said successively adjacent ones of said compartments.

## 5,568,797 POWER CONTROL ASSISTANCE DEVICE FOR MOTOR VEHICLES

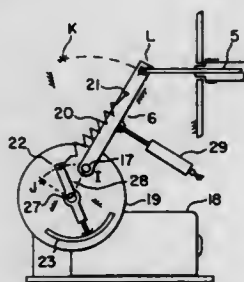
Alain Landerretche, 109 rue du Bois Hardy, Nantes, France  
PCT No. PCT/FR92/01208, § 371 Date Sep. 22, 1994, § 102(e)  
Date Sep. 22, 1994, PCT Pub. No. WO93/12949, PCT Pub. Date Jul. 8, 1993

PCT Filed Dec. 18, 1992, Ser. No. 256,110

Claims priority, application France, Dec. 26, 1991, 91 16350  
Int. Cl.<sup>6</sup> F02D 7/00

U.S. Cl. 123—396

17 Claims



1. A power control assistance device for an engine having a power control member that is directly under operator control, said device comprising:
  - a control unit providing a control signal in response to signals provided to said control unit;
  - a speed sensor providing a speed signal to said control unit;
  - a set point selector providing a set point signal to said control unit; and
  - an actuator mechanically connected to the power control member to provide a direct controlled return force to the power control member, in a direction opposite to the direction of force exerted by the operator, in response to said control signal.

## 5,568,798 PLASTIC FUEL RAIL HAVING INTEGRATED ELECTRICAL WIRING

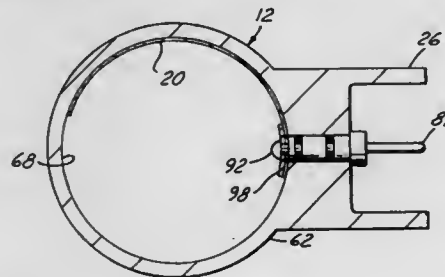
Jack R. Lorraine, Newport News, Va., assignor to Siemens Automotive Corporation, Auburn Hills, Mich.

Filed Jun. 8, 1995, Ser. No. 488,670

Int. Cl.<sup>6</sup> F02M 41/00

U.S. Cl. 123—456

7 Claims



1. A fuel supply system for use with a plurality of fuel injectors, the fuel supply system comprising:
  - a fuel rail having an interior surface and an exterior surface;
  - a plurality of fuel injector attachments coupled to said fuel rail for mechanically receiving the fuel injectors;
  - an electrical connector disposed on said exterior surface of said fuel rail; and
  - an electrical connector strip comprised of a flat non-conductive strip having conductive surfaces having a plurality of connector fingers, said electrical connector strip adjacent said interior surface of said fuel rail and electrically coupled to said electrical connector, said connector fingers being disposed in said fuel injector attachments for electrical coupling with the

fuel injectors, said electrical connector is coupled to said electrical connector strip via a rivet disposed through an O-ring, the O-ring being disposed between said interior and exterior surfaces.

5,568,799

# FUEL INJECTION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

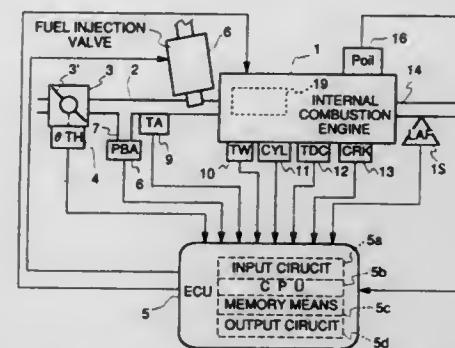
Shusuke Akazaki, and Yoichi Nishimura, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1995, Ser. No. 495,026

Claims priority, application Japan, Jul. 6, 1994, 6-177664  
Int. Cl.<sup>6</sup> F02D 41/04

U.S. Cl. 123—480

26 Claims



1. A fuel injection control system for an internal combustion engine having an intake passage, a crankshaft, and at least one cylinder, comprising:
  - fuel injection means for injecting fuel into said intake passage;
  - fuel injection amount-calculating means for calculating an amount of fuel to be injected by said fuel injection means in a manner carrying out fuel transfer delay-dependent correction based on a delay of transfer of fuel injected from the time said fuel is injected into said intake passage to the time said fuel is drawn into a corresponding one of said at least one cylinder, with a predetermined calculating repetition period during which said crankshaft rotates through predetermined angle smaller than a crank angle corresponding to one stroke of said engine, and for outputting a result of said calculation; and
  - fuel injection-instructing means responsive to said result of said calculation output by said fuel injection amount-calculating means, for causing said fuel injection means to execute said fuel injection during a fuel injection-permitting time period set to allow at least part of said amount of fuel injected by said fuel injection means to be drawn into said corresponding one cylinder during an intake stroke of a present operating cycle of said corresponding one cylinder, wherein said fuel injection-instructing means corrects said amount of fuel to be injected by said fuel injection means during execution of said fuel injection, based on a newest value of said result of said calculation output by said fuel injection amount-calculating means during said execution of said fuel injection.

5,568,800

## FUEL COMBUSTION ENHANCER

Luis E. Einaudi, Albino Mireles No. 2608, Col. Zarco C.P. 31020, Chihuahua, and Carlos Dominguez, Laguna De Asencion 3500, V Etapa San Felipe, both of Mexico

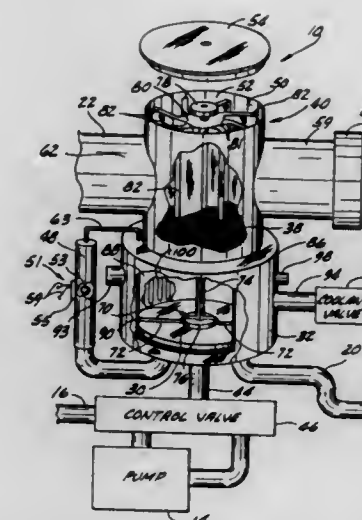
Filed Nov. 6, 1995, Ser. No. 554,193

Claims priority, application Mexico, Jan. 24, 1995, 950628  
Int. Cl.<sup>6</sup> F02M 31/00

U.S. Cl. 123—546

20 Claims

1. A device for enhancing the combustion of fuel in an internal combustion engine, the device comprising:



- an evaporation chamber adapted to contain a volume of liquid fuel and to facilitate evaporation of at least some of the volume of fuel, the evaporation chamber having an inlet for receiving the liquid fuel from a reservoir of liquid fuel; the evaporation chamber being adapted for communication with an airstream in the internal combustion engine travelling toward a combustion chamber of the internal combustion engine so that fuel vapor formed in the evaporation chamber may pass into the combustion chamber by operation of the internal combustion engine;
- a fuel agitator mounted for motion at a location in the evaporation chamber in which the fuel agitator is immersed in the volume of liquid fuel contained in the evaporation chamber, the fuel agitator being capable of agitating the liquid fuel to promote vaporization of the fuel in the evaporation chamber; an actuator for actuating movement of the fuel agitator in response to the demand for fuel by the internal combustion engine.

5,568,801

## PLASMA ARC IGNITION SYSTEM

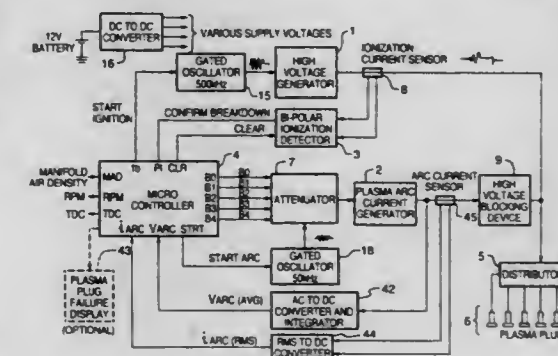
John Paterson, Robert Kaldenbach, and John Unsworth, all of Ontario, Canada, assignors to Ortech Corporation, Ontario, Canada

Filed May 20, 1994, Ser. No. 255,754

Int. Cl.<sup>6</sup> F02P 9/00; 5/00

U.S. Cl. 123—598

12 Claims



1. An ignition system for igniting an air/fuel mixture within an engine, said system comprising:
  - a) at least one ignition plug disposed in said engine, said ignition plug having a pair of electrodes;
  - b) high voltage generator means connected to said ignition plug for applying a gated high high frequency AC signal across a



- pair of electrodes so as to initiate ionization of said air/fuel mixture and create an infant plasma channel between said pair of electrodes;
- c) plasma arc current generator means connected to said ignition plug for generating a predetermined amplitude of alternating current for a predetermined duration so as to sustain said plasma channel and ignite said air/fuel mixture;
- d) controller means for selectively enabling and disabling said high voltage generator means and said plasma arc current generator means at predetermined times by adaptively controlling said predetermined amplitude and predetermined duration of said alternating current generated by said plasma arc current generator in accordance with more than one engine operation parameter; and
- e) a high voltage blocking circuit for isolating said plasma arc current generator means from said high voltage generator, wherein said high voltage blocking circuit comprises at least three cascaded LC filter sections.

5,568,802

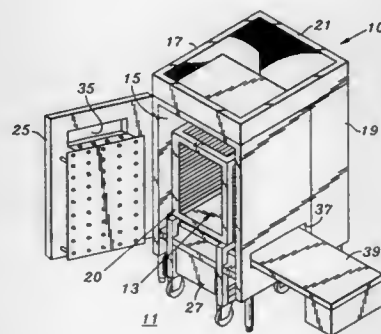
## VERTICAL OVEN

Gene Buday, 23902 Taranto Bay, Laguna Niguel, Calif. 92677; David L. Baron, 546 Rosemont Ave., Pasadena, Calif. 91103, and Jonathan D. Martin, 12033 N. Organ Pipe Ck., Fountain Hills, Ariz. 85268

Filed Nov. 18, 1994, Ser. No. 342,177  
Int. Cl.<sup>6</sup> F24C 15/32

U.S. Cl. 126—21 A

22 Claims



1. A conveyerized oven for heating products as they traverse vertically within the oven comprising:
- an oven housing having a first open end, side walls and a rear wall;
  - an access door secured to the housing at the housing first open end;
  - a perimeter ducting system formed within said housing, defining an interior heating chamber, said ducting system having a first portion disposed about and extending inwardly from said housing side walls and said rear wall, and a second portion disposed upon and extending inwardly from said access door;
  - a combustion chamber disposed within the housing below the interior heating chamber; and
  - a heat circulation fan disposed within the housing above the interior heating chamber, said heat circulation fan being operative to draw heated air from the combustion chamber upward through the heating chamber and downward between the ducting system and the housing, exterior to the heating chamber.

5,568,803  
RELATING TO GASEOUS FUEL BURNER ASSEMBLIES  
AND TO APPLIANCES INCORPORATING SUCH  
BURNER ASSEMBLIES

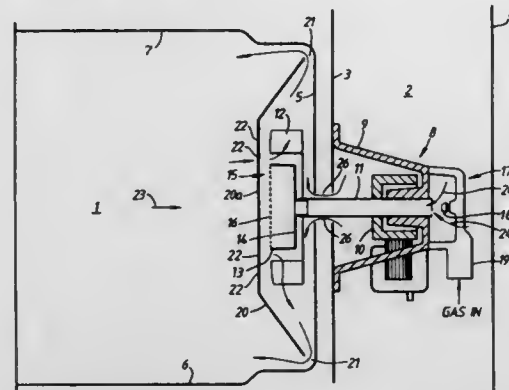
Geoffrey J. E. Brown, 9 Trentham Close, Widnes, Cheshire WA8 9RH, United Kingdom

Filed Apr. 4, 1995, Ser. No. 416,159

Int. Cl.<sup>6</sup> F24C 15/32

U.S. Cl. 126—21 A

27 Claims



1. A gaseous fuel burner assembly for heating a space defined in part by walls extending transversely from an end wall; comprising a baffle supported within said space to permit airflow at its periphery between said baffle and said transversely extending walls; said baffle having at least one aperture therein; a gaseous fuel burner including a burner head supported between said end wall and said baffle to confront a central area of the baffle, a motor having a rotor shaft drivably coupled with said burner head; said rotor shaft providing a gaseous fuel supply conduit communicating with said burner head; and fan blades located around the burner head and coupled with said rotor shaft for rotation to withdraw air from the space to be heated via said at least one aperture in the baffle and to return that air between the periphery of the baffle and said transversely extending walls to the space to be heated.

5,568,804

## SEALED COMBUSTION RANGE

Anthony L. P. Joseph, Etobicoke; John C. K. Overall, Scarborough; Christopher Runciman, Whitby, and Colin Wright, Jackson's Point, all of Canada, assignors to Canadian Gas Research Institute, Toronto, Canada

Filed Jan. 26, 1994, Ser. No. 187,336

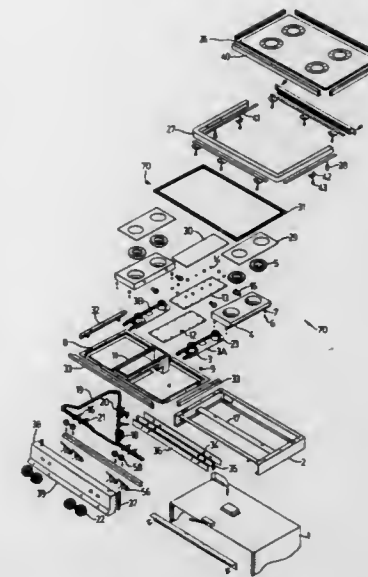
Claims priority, application European Pat. Off., Oct. 25, 1993, 93308488

Int. Cl.<sup>6</sup> F24C 3/00

U.S. Cl. 126—39 K

19 Claims

1. A hob assembly for sealed combustion comprising:
- (a) a solid heat transfer surface for supporting cooking vessels and transferring heat thereto;
  - (b) at least one burner located beneath said heat transfer surface, (said) each burner being adapted to combust a gaseous fuel;
  - (c) means for supplying a gaseous fuel to each burner;
  - (d) a combustion air inlet for supplying fresh combustion air to each burner;
  - (e) exhaust means for exhausting the combustion products from each burner;
  - (f) a first surface located adjacent each burner and below the heat transfer surface, each first surface having an exhaust vent connected to the exhaust means; and
  - (g) a thin layer of insulating material separating each first surface from said heat transfer surface, said layer of insulating material having an aperture around each burner, wherein, for each burner, a heat transfer passageway is defined between the first surface adjacent the burner and the heat transfer surface, which heat transfer passageway



extends from the burner to the exhaust vent and has a breadth substantially greater than the height thereof.

5,568,805

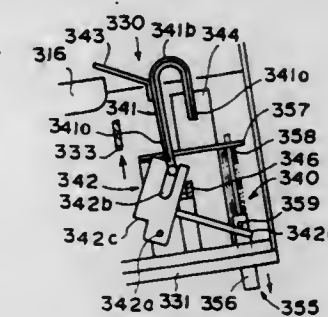
SAFETY DEVICE FOR USE WITH PORTABLE HEATER  
Tomio Nitta; Hideo Mifune; Masato Seki; Yosimitu Kaga, and Noriyuki Serizawa, all of Shizuoka-ken, Japan, assignors to Tokai Corporation, Shizuoka-ken, Japan

Division of Ser. No. 170,225, Dec. 28, 1993, Pat. No. 5,462,044. This application Jul. 26, 1995, Ser. No. 506,896  
Claims priority, application Japan, May 1, 1992, 4-112553; Jun. 17, 1992, 4-158044; Jun. 17, 1992, 4-158137; Jul. 22, 1992, 4-216352; Oct. 2, 1992, 4-264655; Nov. 12, 1992, 4-302178; Mar. 31, 1993, 5-73627

Int. Cl.<sup>6</sup> A47G 23/04

U.S. Cl. 126—262

4 Claims



1. A portable heater having a safety device comprising a combustion cylinder, a burner disposed at a bottom of the combustion cylinder, a container to be heated which is disposed in an upper part of the combustion cylinder for storing contents to be heated when the heater is in use, a fuel tank for storing fuel gas to be supplied to the burner, an ignition means having an igniter and an ignition lever for actuating the igniter which causes the ignition of fuel in the burner, a bimetal member which is deformed upon sensing a rise in temperature as a result of combustion in the burner; a regulation member that moves in accordance with thermal deformation of the bimetal member as a result of combustion in the burner and is engaged with a part of the ignition lever, thereby regulating return movement of the ignition lever, and that allows the movement of the ignition lever when the burner is in an extinguished state; and a flame extinguishing operation member that causes the regulation member when engaged with the ignition lever to be displaced in a disengaging direction with respect to the ignition lever.

5,568,806

## TRANSCUTANEOUS SENSOR INSERTION SET

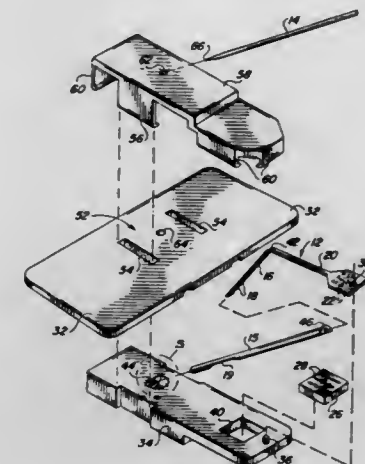
Paul S. Cheney, II, Beverly Hills; John J. Mastrototaro, Los Angeles; Nannette M. Schnabel; Peter C. Lord, both of Valencia; William P. Van Antwerp, Los Angeles, and Raymond D. Clark, Valencia, all of Calif., assignors to MiniMed Inc., Sylmar, Calif.

Filed Feb. 16, 1995, Ser. No. 393,159

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 128—635

18 Claims



14. A transcutaneous sensor insertion set, comprising:
- a mounting base adapted for placement onto a patient's skin and having an open part formed therein;
  - a flexible sensor having a proximal segment carried by said mounting base, a distal segment protruding downwardly from said mounting base and having a tip end with at least one sensor electrode thereon; p1 a hollow cannula having one end supported by said mounting base and protruding therefrom with said sensor distal segment therein; p1 cooperative mount means on said cannula and said mounting base for orienting said cannula in a predetermined orientation relative to said mounting base, said cannula having at least one window formed therein for exposing said sensor electrode to patient body fluid; and
  - an insertion needle slidably receivable through an open port formed in said mounting base to extend through said cannula whereby said sensor distal segment is supported between said needle and an interior wall surface of said cannula; p1 said insertion needle being positioned to pierce a patient's skin to carry said cannula and said sensor distal segment therein to an insertion position within the patient upon placement of said mounting base onto the patient's skin, said insertion needle being slidably withdrawable from the patient's skin and said mounting base to leave said cannula with said sensor distal segment therein at the insertion position.

5,568,807

## AIR-FLOW CONTROL FOR AN INHALER

Mark B. Mecikalski, M.D., 7580 N. Calle Sin Desengano, Tucson, Ariz. 85718

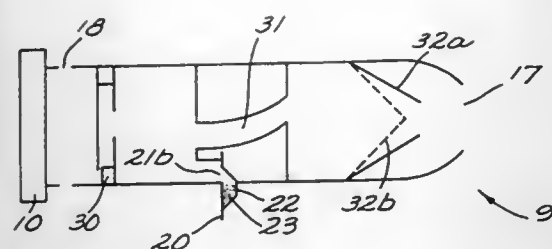
Continuation of Ser. No. 258,743, Jun. 10, 1994. This application Jul. 13, 1995, Ser. No. 501,931

Int. Cl.<sup>6</sup> A61M 15/00

U.S. Cl. 128—203.21

16 Claims

1. An inhaler for the application of respiratory medicine to a patient comprising:
- a) a substantially hollow body member having a mouthpiece for patient applied suction and an inlet opening for communication of ambient air to said patient via said mouth piece; and
  - b) a first valve means interposed between said mouth piece and said inlet opening, said first valve means having an orifice for



communication of an airflow and a flexible membrane being deformable by said airflow and positioned to obstruct said orifice during deformation thereof.

#### 5,568,808 NOSE FILTERS

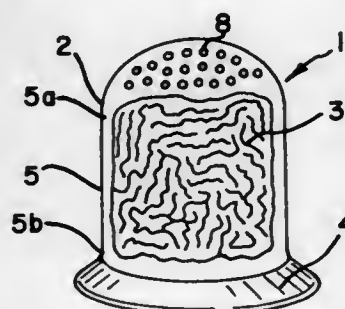
Ronald J. Rimkus, Flossmoor, Ill., assignor to Amtec Products, Incorporated, Flossmoor, Ill.

Filed Aug. 8, 1995, Ser. No. 512,468

Int. Cl.<sup>6</sup> A62B 23/06

U.S. Cl. 128—206.11

11 Claims



1. A nose filter for insertion into a nostril, the nostril having a diameter and including an inner wall and an external lower portion, the nose filter comprising:

- a flexible housing having an open bottom end, a top end having at least one air passageway, a deformable side wall having a top portion and a bottom portion, and a cavity located between the top end and the bottom end of the housing;
- a filter component disposed in the housing cavity, the filter component having a top portion and a bottom portion; and,
- a valve having a diameter larger than the diameter of the nostril and extending radially outwardly from the filter component, upon insertion of the nose filter into the nostril, the valve being partially exposed from the nostril;
- upon inhalation, the valve forms a seal with the lower external portion of the nostril forcing air to travel through the filter component and preventing air from passing between the housing and the inner wall of the nostril; and,
- upon exhalation, the seal formed between the valve and the lower external portion of the nostril is broken.

#### 5,568,809

#### APPARATUS AND METHOD FOR INTRABODY MAPPING

Shlomo Ben-haim, Haifa, Israel, assignor to Biosense, Inc., Orangeburg, N.Y.

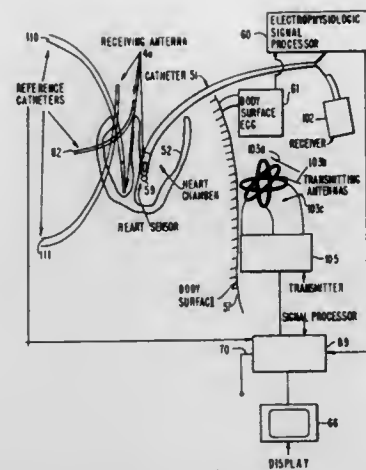
Continuation of Ser. No. 311,598, Sep. 23, 1994, abandoned, which is a division of Ser. No. 94,539, Jul. 20, 1993, Pat. No. 5,391,199. This application Jul. 12, 1995, Ser. No. 490,122

Int. Cl.<sup>6</sup> A61M 25/095

U.S. Cl. 128—656

58 Claims

1. A method for intrabody mapping, which comprises the steps of:



- (a) positioning the distal tip of each of one or more catheters at a site adjacent to or within an organ or bodily structure;
- (b) sensing location information at the site using a non-ionizing field;
- (c) sensing local information at the site;
- (d) processing sensed information from steps (b) and (c) to create one or more data points;
- (e) repeating steps (a), (b), (c), and (d) one or more times to create sufficient data points for a map; and
- (f) transmitting said data points from step (e) to a receiving means.

#### 5,568,810

#### ULTRASOUND COUPLING MEDIUM WARMER AND STORAGE MEANS

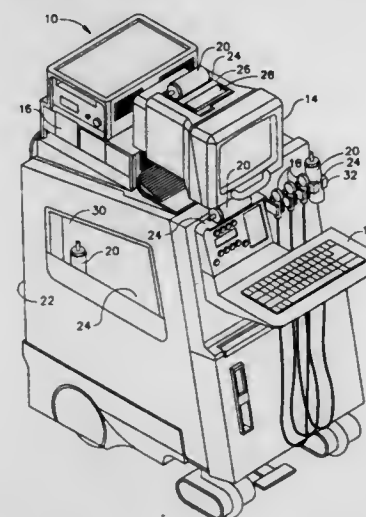
Timothy F. Hamers, Windlake; Lawrence E. Murphy, Shorewood, and Wayne R. Vohnoutka, Waukesha, all of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 28, 1995, Ser. No. 563,414

Int. Cl.<sup>6</sup> A61B 8/00

U.S. Cl. 128—660.01

4 Claims



1. A method for storing a container of ultrasound coupling medium used in conjunction with an ultrasound imaging system having a monitor for visually outputting data to a sonographer, the method comprising the steps of:

- identifying at least one location on the ultrasound imaging system having a predetermined thermal profile; and
- storing the container at the at least one identified location to maintain the coupling medium at a desired temperature.

#### 5,568,811 METHOD FOR MOTION ENCODING OF TISSUE STRUCTURES IN ULTRASONIC IMAGING

Björn Olstad, Ranheim, Norway, assignor to Vingmed Sound A/S, Horten, Norway

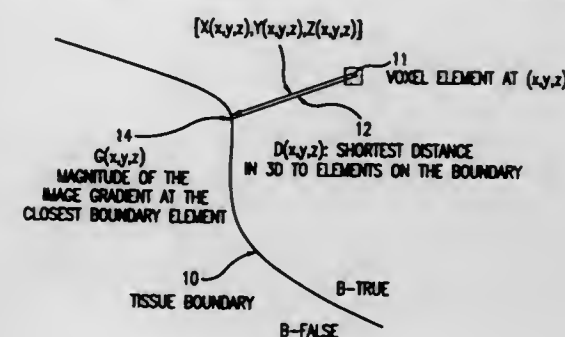
Filed Jan. 13, 1995, Ser. No. 372,116

Claims priority, application Norway, Oct. 4, 1994, 943696

Int. Cl.<sup>6</sup> A61B 8/00

U.S. Cl. 128—660.07

16 Claims



- 1. A method for motion encoding of structures in ultrasonic imaging comprising the steps of:
- obtaining data sets by ultrasonic measurements covering a selected region within a body;
- localizing at least one structure within said selected region, from said data sets;
- measuring the movement of said at least one structure within said selected region by correlating said at least one structure between at least two instants of time, thereby providing at least one correlated structure;
- computing from said data sets, with respect to said at least one correlated structure a local motion characteristic estimate including local spatial displacement defining local velocity, local acceleration, and local phase; and
- visualizing said at least one structure as well as said motion characteristic estimate.

#### 5,568,812 DIAGNOSTIC ULTRASOUND APPARATUS

Masaru Murashita; Hiroyuki Kawada, and Toshiyuki Matsunaka, all of Mitaka, Japan, assignors to Aloka Co., Ltd., Japan

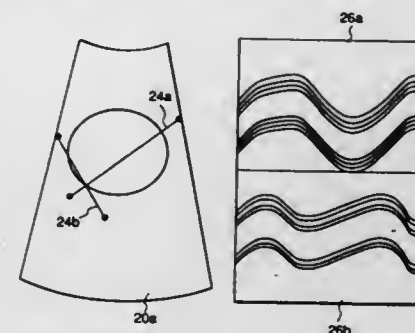
Filed Jan. 24, 1995, Ser. No. 377,327

Claims priority, application Japan, Jan. 25, 1994, 6-006624

Int. Cl.<sup>6</sup> A61B 8/00

U.S. Cl. 128—660.04

13 Claims



- 1. A diagnostic ultrasound apparatus, comprising:
- an ultrasound probe for transmitting and receiving ultrasound beams to and from an object to be observed;
- a frame memory for storing two-dimensional ultrasound image data of the object obtained from said ultrasound beams received by said ultrasound probe;

a monitor for displaying at least a two-dimensional ultrasound image of the object formed on the basis of said two-dimensional ultrasound data stored in said frame memory; means for freely setting desired course and range of at least one data sampling line for said two-dimensional ultrasound image displayed on said monitor, said data sampling line being set so as to pass at least two selected points irrespective of the forward direction of said ultrasound beams which form said two-dimensional ultrasound image;

read-out means for selectively reading out, from said ultrasound image data stored in said frame memory, ultrasound image data corresponding to said at least one data sampling line; and means for displaying an ultrasound image corresponding to said data sampling line on said monitor on the basis of said ultrasound image data which has been read out by said read-out means.

#### 5,568,813

#### METHOD FOR COMBINING ULTRASOUND VECTOR DATA FROM MULTIPLE FIRINGS TO IMPROVE IMAGE QUALITY

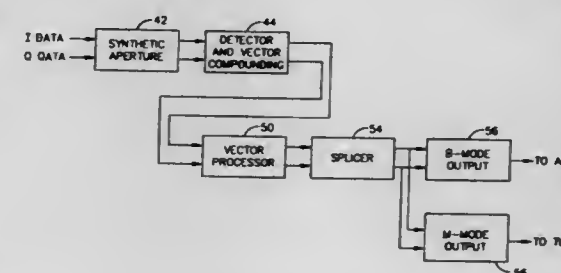
Thomas L. Deitrich, Durham, N.C., and Rowland F. Saunders, Hartland, Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 23, 1994, Ser. No. 344,054

Int. Cl.<sup>6</sup> A61B 8/00

U.S. Cl. 128—661.01

17 Claims



- 1. An ultrasound imaging system comprising:
- means for transmitting ultrasound beams along a scan line, wherein said transmitting means transmit a first ultrasound beam having a first range of maximum focus and a second ultrasound beam having a second range of maximum focus different than said first range of maximum focus;
- means for transducing received echoes from said ultrasound beams, wherein said transducing means form first and second sets of vector data in response to echoes from said first and second ultrasound beams respectively;
- means for splicing vector data derived from said first and second vector data sets to form a single output vector data set in accordance with a weighting function that splices vector data from said first vector data set for said first range of maximum focus and vector data from said second vector data set for said second range of maximum focus with a transition region therebetween, said vector data derived from said first and second vector data sets being combined in said transition region; and
- means for displaying pixel data corresponding to said single output vector data set, wherein said weighting function is a piecewise linear weighting function.

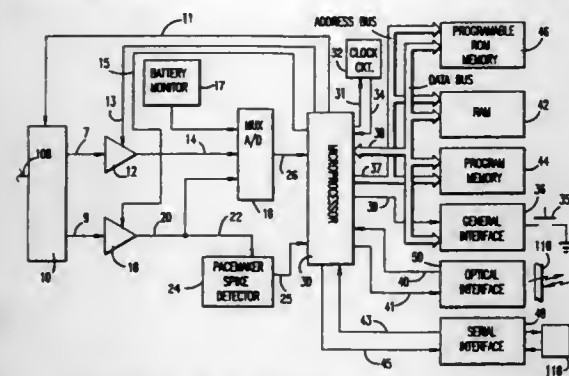


5,568,814

**AMBULATORY PATIENT MONITORING SYSTEM**  
 Stuart L. Gallant, Owings Mills; Paul R. Caron, Laurel, and Walter E. Palmer, Catonsville, all of Md., assignors to Protocol Systems, Inc., Beaverton, Ore.  
 Continuation of Ser. No. 790,500, Nov. 12, 1991, Pat. No. 5,238,001. This application Jun. 20, 1994, Ser. No. 262,925  
 Int. Cl.<sup>6</sup> A61B 5/04

U.S. Cl. 128—672

9 Claims



3. An ambulatory patient monitoring system for measuring and storing a plurality of blood pressure values useful for clinical evaluation of a patient, comprising:

an ambulatory patient monitoring device including a portable power source and means for noninvasively monitoring and measuring the patient's blood pressure by an auscultatory method and an oscillometric method, and means for selectively calculating such blood pressure values by the auscultatory method and the oscillometric method;

microprocessor means coupled to said portable power source for controlling the measurement and storage of said diagnostic parameter values;

memory means coupled to said microprocessor means for storing said plurality of diagnostic parameter values;

means for stopping and starting operation of said microprocessor means to thereby conserve power from said portable power source, said stopping and starting means including clock means for generating a periodic interrupt signal to restart said microprocessor means;

signal conditioning means coupled to said microprocessor means for providing said diagnostic parameters thereto; and input means coupled to a patient for sensing diagnostic parameters therefrom, said input means having an output coupled to said signal conditioning means.

5,568,815

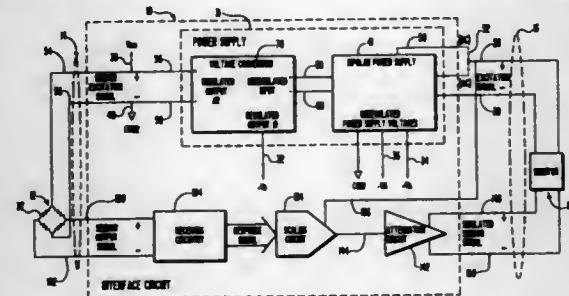
**SELF-POWERED INTERFACE CIRCUIT FOR USE WITH A TRANSDUCER SENSOR**  
 John W. Raynes, Sandy, Utah, and Gary Altman, Kirkland, Wash., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Nov. 21, 1994, Ser. No. 342,498

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 128—672

42 Claims



1. An interface circuit for use in a system which measures a physiological condition within a patient, the interface circuit comprising:

a physiological sensor device;

bipolar supply means for electrically receiving an excitation power signal generated by an excitation source, and for deriving therefrom at least one unregulated power supply voltage, the at least one unregulated supply voltage having a magnitude that is proportional to the magnitude of said excitation power signal;

voltage conversion means, responsive to said at least one unregulated power supply voltage, for providing at least one fixed output supply voltage and a sensor excitation signal for use as an excitation signal for said physiological sensor device; and

bypass means for selectively operating the interface circuit in either an A.C. operating mode when the excitation power signal is A.C., or in a D.C. bypass mode when the excitation power signal is D.C.

5,568,816

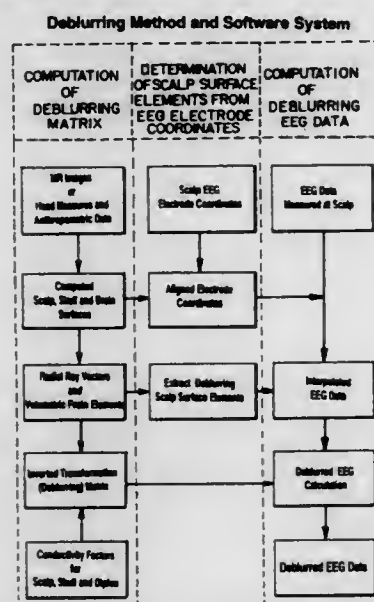
**EKG DEBLURRING METHOD AND SYSTEM FOR IMPROVED SPATIAL DETAIL**

Alan S. Gevins, San Francisco, and Jian Le, San Mateo, both of Calif., assignors to Sam Technology, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 868,724, Apr. 14, 1992, Pat. No. 5,331,970, which is a continuation-in-part of Ser. No. 578,880, Sep. 7, 1990, Pat. No. 5,119,816. This application Jul. 18, 1994, Ser. No. 276,700  
 Int. Cl.<sup>6</sup> A61B 5/0476

U.S. Cl. 128—731

17 Claims



1. A method of improving the resolution of data recorded from a plurality of electroencephalograph (EEG) electrodes removably and electrically connected to the scalp of a subject including the steps of:

(a) amplifying brain waves detected at the electrodes, converting the amplified brain waves into digital data and entering the data into a computer system means to analyze the data;

(b) in the computer system means forming a finite element transformation matrix based upon an imaginary division of the subject's head into three dimensional finite elements, the matrix being calculated based upon data regarding the subject's head shape, size and tissue thicknesses;

(c) determining the conductivity of each finite element based upon the thickness of each finite element and conductivity values for relevant portions of a head;

(d) measuring physical locations of the electrodes on the subject; and  
 (e) entering the electrode locations measured in (d) and conductivities determined from (c) into the computer system means to analyze the recorded brain wave data and to provide a computation of outer brain surface electrical potential distribution.

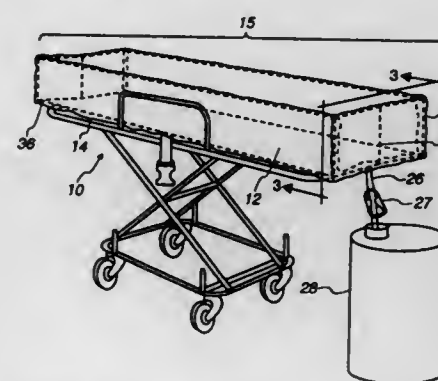
5,568,817

**COMPACT DEVICE FOR CONTROLLING RUNOFF OF FLUID**

Robert D. Harty, 11416 S. Homan, Chicago, Ill. 60655  
 Filed May 31, 1995, Ser. No. 456,191  
 Int. Cl.<sup>6</sup> A61B 19/00

U.S. Cl. 128—849

19 Claims



1. A compact device for confining runoff of hazardous fluid comprising:  
 a.) a fluid impermeable liner;  
 b.) a rigid, reusable frame adapted to removably receive said liner so as to conform the liner into a container, said container adapted to receive the fluid;  
 c.) a means for removing the fluid from the container; and  
 d.) a means for removing the liner from the frame after use.

5,568,818

**METHOD AND DEVICE FOR DETERMINING THE DENSITY OF A STREAM OF FIBROUS MATERIAL ON A CIGARETTE MANUFACTURING MACHINE**

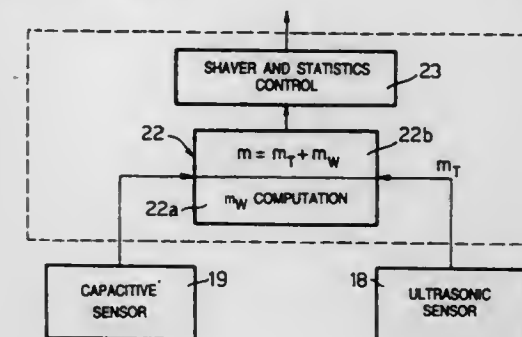
Armando Neri, Bologna; Giancarlo Santin, San Lazzaro Di Savena, and Giovanni Squarzon, Argelato, all of Italy, assignors to G.D. Società Per Azioni, Bologna, Italy

Filed Dec. 2, 1994, Ser. No. 349,080

Claims priority, application Italy, Dec. 3, 1993, B093A0487  
 Int. Cl.<sup>6</sup> A24C 5/14; 5/39

U.S. Cl. 131—84.4

11 Claims



1. A method of determining the density of a stream of fibrous material (17) on a cigarette manufacturing machine (1), said stream

of fibrous material (17) comprising a dry component and a liquid in varying unknown proportions; said method comprising the steps of:

effecting a first capacitive measurement for obtaining a first signal indicating a quantity which may be expressed as a function of the density of the dry component and of the density of the liquid in said stream of fibrous material;

effecting a second ultrasonic measurement for obtaining a second signal correlated to the density of the dry component in said stream of fibrous material; and

generating, on the basis of said first and second signals, a third signal indicating the density of said stream of fibrous material.

5,568,819

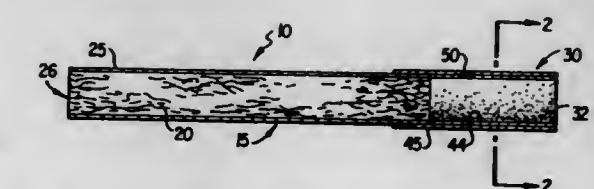
**CIGARETTE FILTER**

Jeffery S. Gentry, Pfafftown; Karen M. Womble, Winston-Salem; Chandra K. Banerjee; Richard L. Blakley, both of Pfafftown; Russell D. Barnes, Belevs Creek; Donald A. Callison, Winston-Salem, and Henry T. Ridings, Lewisville, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation-in-part of Ser. No. 76,711, Jun. 11, 1993, Pat. No. 5,404,890. This application Jun. 22, 1994, Ser. No. 264,217

Int. Cl.<sup>6</sup> A24D 3/00; 1/02  
 U.S. Cl. 131—342

19 Claims



1. A cigarette having a charge of smokable material including tobacco cut filler wrapped in a circumscribing wrapping material to form a smokable rod; the cigarette comprising a filter element positioned adjacent one end of the smokable rod; the filter element including filter material having a plurality of longitudinal grooves therein and circumscribed by a carbon-containing paper material.

5,568,820

**COMPACT CASE HAVING A 360 DEGREES ROTATABLE COVER**

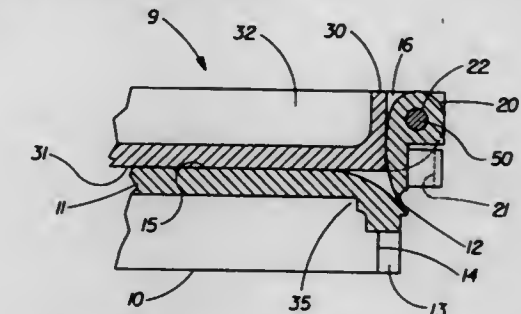
Robert S. Dirksing, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 25, 1995, Ser. No. 547,858

Int. Cl.<sup>6</sup> A45D 27/22; B65D 43/14

U.S. Cl. 132—315

3 Claims



1. A compact case comprising:

a) a base having a base notch and a lower surface;

b) a cover portion including a cover integrally joined to a hinge link by a flexible hinge strap, said cover having a cover notch, and an upper surface;

c) a single pin rotatably attaching said hinge link of said cover portion in said base notch of said base, said compact case having an initial show shade condition wherein said upper surface of said cover abuts said lower surface of said base, and wherein said cover may be rotated 360° about said hinge pin and said hinge strap to a closed condition.

5,568,821

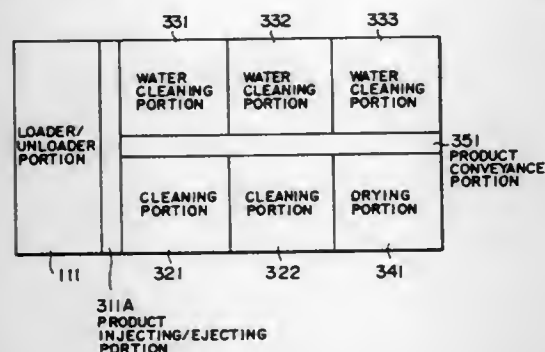
# SEMICONDUCTOR CLEANING APPARATUS AND WAFER CASSETTE

Masashi Ohmori; Hiroshi Tanaka; Akira Nishimoto; Hiroshi Sasai, all of Itami; Naohiko Fujino, and Satoru Kotob, both of Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
Division of Ser. No. 123,244, Sep. 20, 1993, Pat. No. 5,445,171.  
This application Jul. 17, 1995, Ser. No. 502,891  
Claims priority, application Japan, Sep. 25, 1992, 4-256827; Sep. 10, 1993, 5-225611

Int. Cl. B08B 3/04

U.S. Cl. 134—61

7 Claims



1. A semiconductor cleaning apparatus comprising:  
a cassette loader/unloader for accommodating a product cassette;  
a shifting portion for loading a wafer into and unloading a wafer from said the product cassette in the cassette loader/unloader;  
a cleaning portion for cleaning a wafer unloaded from said product cassette in said shifting portion;  
a water cleaning portion for cleaning with water a wafer that has been cleaned in said cleaning portion;  
a drying portion for drying said wafer that has been cleaned with water in said water cleaning portion; and  
a conveyance for sequentially conveying a wafer unloaded from said the product cassette in said shifting portion to said cleaning portion, said water cleaning portion, and said drying portion, wherein said loader/unloader and said shifting portion are disposed along a widthwise direction of said cleaning apparatus, said conveyance is disposed centrally in said cleaning apparatus, and said cleaning portion, said water cleaning portion, and said drying portion are disposed on both sides of said conveyance.

5,568,822

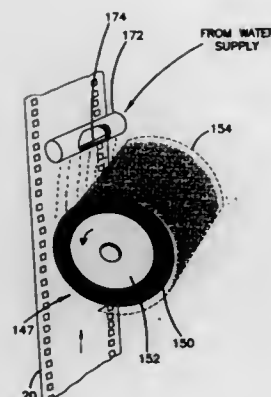
# FILM CLEANING SYSTEM AND METHOD FOR PHOTOGRAPHIC FILM

Manfred G. Michelson, 4396 Park Vicente, Calabasas, Calif. 91302  
Continuation-in-part of Ser. No. 103,285, Sep. 10, 1993, abandoned. This application Dec. 22, 1994, Ser. No. 362,208  
Int. Cl. B08B 3/10

U.S. Cl. 134—64 P

12 Claims

3. A system for cleaning film at high rates of speed comprising:  
a film transport system including means for supplying and collecting film;



means disposed along the path of the film for directing thin sheet water flows substantially spanning the film width and substantially along the plane of the film in directions substantially downstream relative to the direction of film travel;  
water removal means disposed along the path of the film subsequent and adjacent to the means for directing sheet water flows for extracting surface and adsorbed water from the film, said water removal means comprising at least two series of closely spaced air nozzles, each disposed adjacent a different side of the film, the nozzles providing alternate negative and positive pressure air flows, and each series providing a low net force on the film;  
and wherein the system further includes film guide rollers closely spaced adjacent each series of air nozzles, the rollers supporting the film along only the edges thereof, and wherein the different series of air nozzles are each disposed along a circumferential arc relative to the adjacent roller, and dry box means disposed along the film path between the water removal means and the means for collecting film for extracting water absorbed by the film.

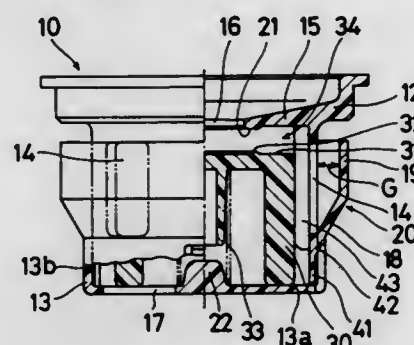
5,568,823

# FUEL CONTROL VALVE LOCATED IN A FUEL TANK

Yosuke Tateishi, Anjo city, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya City, Japan  
Filed Mar. 30, 1995, Ser. No. 413,227  
Claims priority, application Japan, Mar. 31, 1994, 6-062719  
Int. Cl. F16K 31/22

U.S. Cl. 137—202

4 Claims



1. A fuel control valve comprising:  
a housing;  
a vapor inlet formed on a wall of the housing;  
a vapor outlet formed on the housing and located higher than the vapor inlet;  
a liquid inlet formed on a bottom of the housing;  
a float located in the housing and positionable for opening and closing communication between said vapor and liquid inlets and said vapor outlet;

a wrapper connected at a bottom end thereof with an outside of the housing, and an upper end of the wrapper being at least as high as an upper end of the vapor inlet; and  
an opening formed at the upper end of the wrapper and communicated with the vapor inlet.

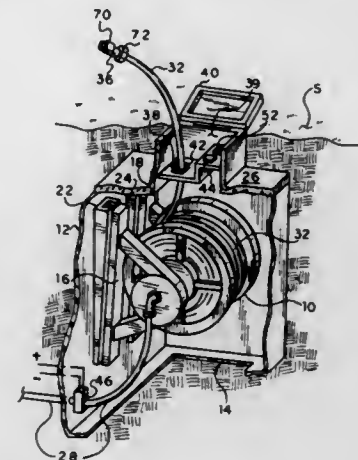
5,568,824

# HOSE REEL

Michael P. Cordrey, Rte. 1, Box 4066A, Delmar, Del. 19940  
Filed Sep. 19, 1995, Ser. No. 530,445  
Int. Cl. B65H 75/34

U.S. Cl. 137—355.27

14 Claims



6. An underground hose reel, comprising:  
a stationary, enclosed hose reel housing permanently installed completely beneath the surface of the ground;  
a hose reel having a horizontally disposed axis and installed within said housing;  
a hose extendibly wound upon said hose reel, with said hose having a reel attachment and a water inlet end secured directly to a water supply line and an opposite distal water outlet end;  
a surface mounted hose access and control panel extending from said housing, said access and control panel at least including a passage therethrough providing for the retractable extension of at least a substantial portion of said hose therefrom, and;  
an automatic retraction means for said hose, wherein said automatic retraction means comprises an elastic cord, whereby; said hose is extended from said hose access and control panel from said hose reel within said underground housing as desired, and retracted through said hose access and control panel and upon said hose reel for protected storage of said hose when use of said hose is completed.

5,568,825

# AUTOMATIC LEAK DETECTION AND SHUT-OFF SYSTEM

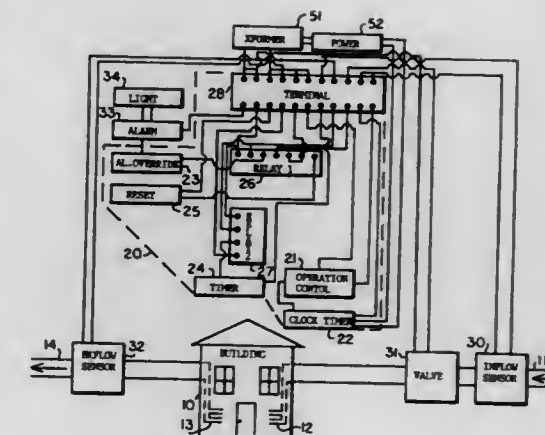
John W. Faulk, 1111 Wards Pl., Jacksonville, Fla. 32259  
Filed Dec. 11, 1995, Ser. No. 570,618  
Int. Cl. F17D 3/01; E03B 7/04

U.S. Cl. 137—624.11

8 Claims

1. A system for detecting leaks or unwanted flow in a water supply system for a building having a supply conduit and a discharge conduit, and for preventing inflow of water when a leak is detected, comprising:

(A) flow sensor means incorporated into the supply conduit of the water supply system to detect flow within said supply conduit and relay signals to a control means, said flow sensor means capable of detecting flow rates as low as 0.05 ounces per second,



(B) valve means incorporated into the supply conduit of the water supply system, said valve means capable of completely sealing said supply conduit to prevent flow of water through said supply conduit,  
(C) control means to operate said valve means and seal said supply conduit in response to signals received from said flow sensor means, said control means comprising override timer means to provide a preset time period, whereby said control means operates said valve means to seal said supply conduit only when flow is detected by said flow sensor means for a period of time in excess of said preset time period, and  
(D) backflow sensor means incorporated into the discharge conduit of the water supply system to detect backflow within said discharge conduit and relay signals to said control means, whereby said control means operates said valve means and seals said supply conduit in response to signals received from said backflow sensor means.

5,568,826

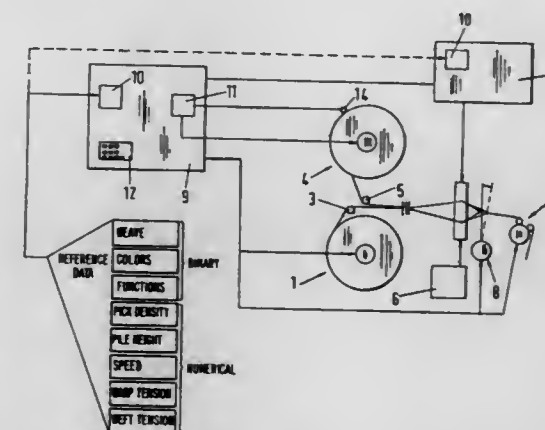
# PILE WRAP DISPENSING IN ADVANCE OF BEAT-UP IN A TERRY LOOM

Rudolf Vogel, Grüt; Klaus Berkold, Rüti, both of Switzerland, and Hüsnü Evren, Erenköy/Istanbul, Turkey, assignors to Sulzer Rueti AG, Rueti, Switzerland  
Filed May 5, 1995, Ser. No. 437,094  
Claims priority, application European Pat. Off., May 10, 1994, 94810279

U.S. Cl. 139—25

Int. Cl. D03D 39/22

13 Claims



1. A method for weaving terry cloth with alternating partial and



full beat-ups of a pile warp yarn against a terry cloth fell to thereby form pile warp yarn loops comprising the steps of determining a desired length of pile warp yarn required for each pile warp yarn beat-up against a fell; dispensing from a pile warp yarn supply a desired length of pile warp yarn for a given pile warp yarn beat-up in advance of the given beat-up; maintaining constant tension in at least a portion of the pile warp yarn between the fell and the pile warp yarn supply; sensing a difference between the desired length of pile warp yarn to an actual length of pile warp yarn dispensed for the given beat-up; and compensating for any sensed difference by adjusting the dispensing step so that the desired pile warp yarn is dispensed for the given beat-up and made available for terry weaving a plurality of beat-ups prior to the given beat-up while tension in the pile warp yarn upstream of the fell is maintained constant.

5,568,827

# WEAVING LOOM WITH SLEY ASSOCIATED DEVICE FOR POSITIONING A WEFT CUTTER

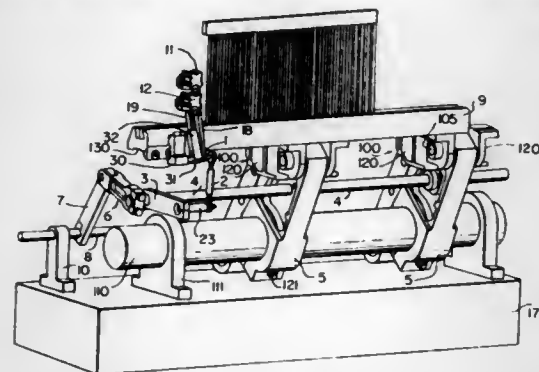
Johnny Debaes, Wenduine, and Ferdi Dejaegere, Dadizele, both of Belgium, assignors to N. V. Michel van de Wiele, Kortrijk-Marke, Belgium

Filed Sep. 27, 1994, Ser. No. 312,793

Claims priority, application Belgium, Jul. 29, 1993, 09300792 Int. Cl.<sup>6</sup> D03D 47/36

U.S. Cl. 139-450

16 Claims



1. In a weaving loom including a sley and a device for positioning at least one weft cutter relative to a sley of the weaving loom in a specific direction, the improvement comprising:

a holder for carrying said at least one weft cutter, a bearing piece for accommodating the holder said bearing piece fixed immovably on the sley, said sley has at least one sley leg, a first end of which is rotatably connected to the sley by coupling elements, the holder mounted inside the bearing piece for sliding movement within said bearing piece in a specific direction with respect to said sley.

5,568,828

# FUEL-DELIVERY CONTROL SYSTEM

Robert S. Harris, Connersville, Ind., assignor to Stant Manufacturing Inc., Connersville, Ind.

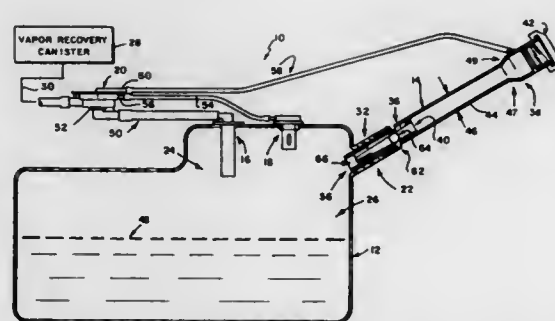
Filed Nov. 30, 1994, Ser. No. 346,785

Int. Cl.<sup>6</sup> B65B 1/04; B67C 3/00

U.S. Cl. 141-348

30 Claims

1. A fuel-delivery control system for a fuel tank, the system comprising a housing module formed to include a fuel-delivery channel, and a check valve assembly positioned to lie in the fuel-delivery channel, the check valve assembly including a support base appended to the housing module and formed to include a guide passageway, a valve member including a guide stem extending into the guide passageway for axial movement therein along a longitudinal axis and a closure member



appended to the guide stem for axial movement with the guide stem along the longitudinal axis between a channel-closing position engaging the housing module and a channel-opening position disengaging the housing module, said guide stem moving in said guide passageway as said closure member moves between said channel-opening position and channel-closing positions, and a spring yieldably urging the valve member toward its channel-closing position, the support base including a spring mount engaging one end of the spring and a stop flange, the valve member further including means for engaging the stop flange to limit axial movement of the valve member relative to the support base in a channel-opening direction.

5,568,829

# BOOM CONSTRUCTION FOR SLIDING BOOM DELIMBERS

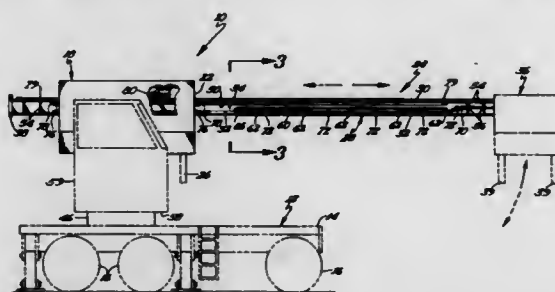
Richard H. Crawford, Brad A. Sintek, and Gary M. Hamilton, Rapid City, all of S. Dak., assignors to Lake Shove, Inc., Iron Mountain, Mich.

Filed Dec. 16, 1994, Ser. No. 357,110

Int. Cl.<sup>6</sup> B27C 1/00; A01G 23/00

U.S. Cl. 144-24.13

20 Claims



1. An improved boom for a sliding boom delimiter having a tunnel of a size and shape for slideably receiving the boom, with the delimiter including a grapple head, comprising, in combination: an I beam including a first flange having first and second edges, a second flange having first and second edges, and an interconnecting web integrally formed with and extending generally perpendicular between the first and second flanges intermediate their first and second edges, with the I beam including a forward end and a rear end, with the grapple head being securable to the forward end of the I beam; and a stop secured to the rear end of the I beam to prevent withdrawal of the boom from the tunnel.

5,568,830

# PNEUMATIC TIRE AND RIM

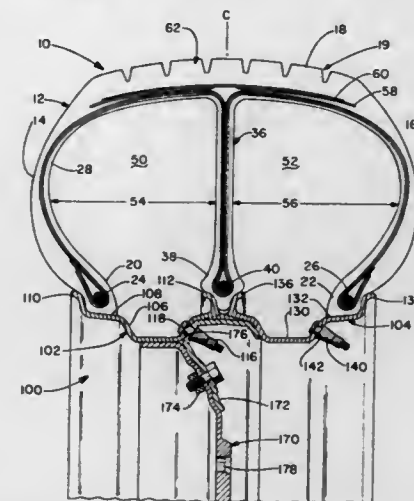
Vincenzo V. Polsinelli, 79 Coons Road, Richmond Hill, Ontario, Canada, and Edmund Daniel, 2004 Ardleigh Road, Oakville, Ontario, Canada

Filed Apr. 3, 1995, Ser. No. 415,452

Int. Cl.<sup>6</sup> B60B 21/10; B60C 5/22

U.S. Cl. 152-404

10 Claims



1. In combination, a two-compartment pneumatic tire, and a rim therefor, said rim comprising first and second axially spaced outer bead seats each terminating in a rim flange, and a pair of axially inner, spaced rim flanges between said first and second bead seats, each axially inner rim flange curving toward a respective tire-compartment and forming a portion of a third bead seat, said tire comprising first and second sidewalls terminating in beads seated, respectively, on said first and second bead seats, and a third, central wall terminating in a central bead seated on said portions of said bead seat.

6. A rim for a two-compartment pneumatic tire comprising first and second axially spaced outer bead seats each terminating in a rim flange, and a pair of axially inner, spaced rim flanges between said first and second bead seats, each said axially inner rim flange curving toward a respective tire compartment, and forming a third bead seat.

5,568,831

# MULTI-SCENE SASH FRAME

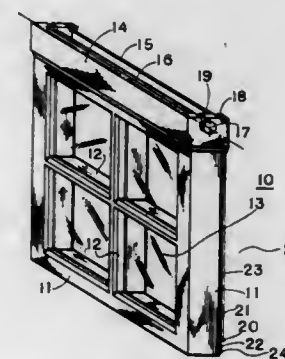
Chadwick C. Blackwell, Rte. 2, Box 935, Grottoes, Va. 24441

Filed May 15, 1995, Ser. No. 441,051

Int. Cl.<sup>6</sup> A47H 1/00

U.S. Cl. 160-98

2 Claims



1. A moveable, hangable sash frame assembly comprising:

a sash frame including first and second vertical members each having a first end and a second end, a bottom horizontal member having a first end secured to the second end of said first vertical member and a second end secured to the second end of said second vertical member, an upper horizontal member having a first end secured to the first end of said first vertical member and a second end secured to the first end of said second vertical member; a plurality of interior members disposed within said sash frame.

5,568,832

# SKYLIGHT SHADE

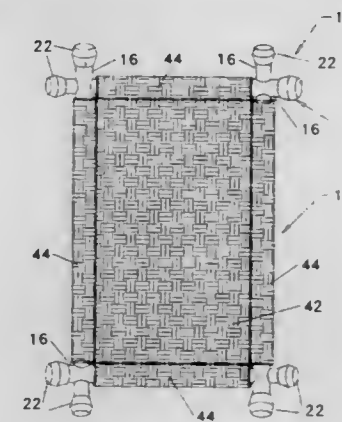
Zonell Eddy, 5138 Ashdown Pl., Midland, Tex. 79705

Filed Oct. 18, 1994, Ser. No. 325,032

Int. Cl.<sup>6</sup> E06B 9/24

U.S. Cl. 160-374

9 Claims



1. A shade for engagement with sides of a skylight opening or similar opening for emitting daylight therethrough, comprising: a frame engageable with the sides of the opening, said frame comprising: a plurality of four rods, each of said rods having first and second ends; means for adjusting a length of each of said rods whereupon each of said rods spans one of the sides of the opening with said rod ends engaging opposed sides of the opening; means for coupling a first end of one of said rods with a second end of another of said rods, said means comprising an aperture in said second end of each of said rods for normal extension of said first end of one of said other rods therethrough, whereupon said coupled rods define said frame, the sides of the opening bounding said frame; a sheet extending between said rods and being supported by said frame for filtering the daylight passing through said opening.

5,568,833

# METHOD AND APPARATUS FOR DIRECTIONAL SOLIDIFICATION OF INTEGRAL COMPONENT CASTING

Donald J. Frasier, Greenwood, Ind., assignor to Allison Engine Company, Inc., Indianapolis, Ind.

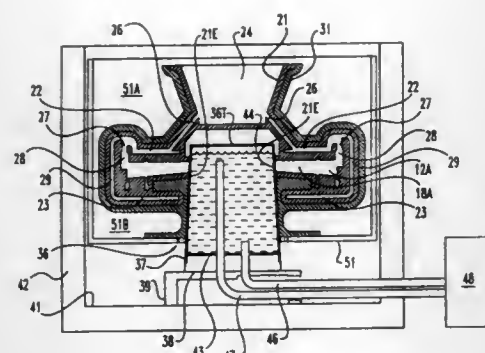
Filed Jun. 7, 1995, Ser. No. 478,459

Int. Cl.<sup>6</sup> B22D 27/04

U.S. Cl. 164-128

11 Claims

1. A method of casting a molten material to form a product having an aperture therein, the method comprising the steps of: providing a mold with a cavity therein to receive therein and shape the molten material for later solidification in the cavity shape; installing in the mold a thin walled container and locating the container to position an outer surface of the container in contact with a surface of the mold adjacent the cavity;



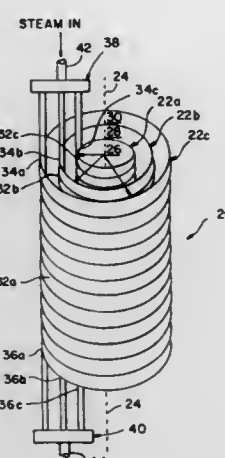
providing in the container a heat transfer medium in fluid form;  
placing the molten material in the cavity;  
cooling the placed material in the cavity by heat transfer from the material through the container wall to the heat transfer medium;  
keeping the heat transfer medium at a temperature below the liquid-to-solid phase change temperature of the placed material; and  
deforming the container wall surface by means of the shrinkage of the placed material during cooling phase change of the placed material from liquid to solid.

**5,568,835**  
**CONCENTRIC HEAT EXCHANGER HAVING HYDRAULICALLY EXPANDED FLOW CHANNELS**  
Dale F. LaCount, and George B. Watson, both of Alliance, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 25, 1995, Ser. No. 506,672  
Int. Cl.<sup>6</sup> F28D 7/10

U.S. Cl. 165—140

9 Claims



1. A cylindrical hydraulically expanded heat exchanger assembly, comprising:

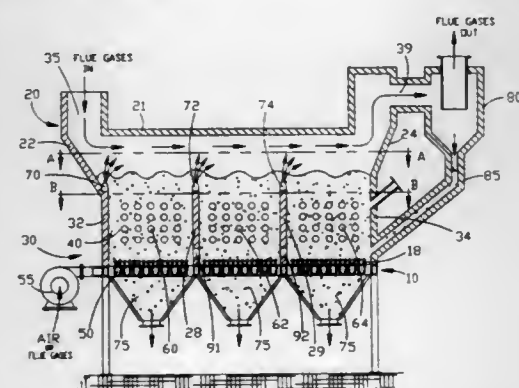
at least a pair of cylindrical heat exchangers, each having a bulge formed spiral passageway along the circumference thereof to allow a heat exchange fluid to pass therethrough, each of said cylindrical heat exchangers defining a containment wall for isolating a series of annular flow passages, said series of annular flow passages formed by the containment wall of each of said cylindrical heat exchangers being constructed to pass a fluid therethrough to establish heat transfer between the fluid passing through said series of flow passages and the heat exchange fluid in the bulge formed passageway of each cylindrical heat exchanger; and  
means for supplying the heat exchange fluid through each of said cylindrical heat exchangers.

**5,568,834**  
**HIGH TEMPERATURE HEAT EXCHANGER**  
Jacob Korenberg, York, Pa., assignor to Donlee Technologies, Inc., York, Pa.

Filed Feb. 1, 1995, Ser. No. 382,191  
Int. Cl.<sup>6</sup> F28D 13/00

U.S. Cl. 165—104.16

26 Claims



17. A method for exchanging heat, comprising the steps of:  
guiding fluid over an upper surface of a fluidized bed in a heat exchanger;  
forcing solid particulates from the fluidized bed into the fluid by blowing gas toward the fluid from a series of nozzles located proximate to and below the upper surface;  
removing heat from the fluidized bed;  
separating particulates from the fluid; and  
returning separated particulates to the fluidized bed.

**5,568,836**  
**RELEASE DEVICE FOR RELEASABLY COUPLING A FIRST OBJECT TO A SECOND OBJECT**  
Michael A. Reid, Aberdeen, Scotland, assignor to Well-Equip Limited, Aberdeen

Filed Jun. 5, 1995, Ser. No. 464,389

Claims priority, application United Kingdom, Jun. 6, 1994, 9411270

Int. Cl.<sup>6</sup> E21B 34/10

U.S. Cl. 166—65.1

12 Claims

1. A release device for releasably coupling a first object to a second object, the release device comprising a first member adapted to be coupled to the first object, a second member adapted to be coupled to the second object, a latch mechanism to releasably couple the first member to the second member, and a time delay mechanism permitting the latch mechanism to decouple the first and second members only after a time interval has elapsed from the initiation of the decoupling of the first and second members.



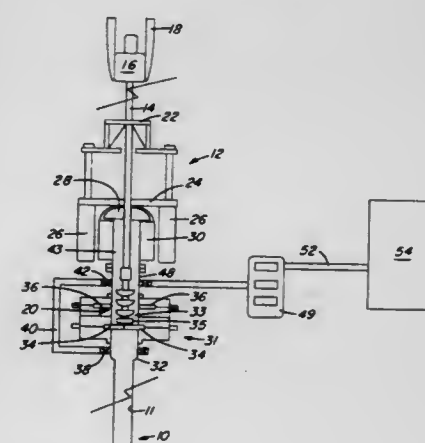
**5,568,837**  
**METHOD OF INSERTING TUBING INTO LIVE WELLS**  
Kelly Funk, 301 Mount Royal Place, Nanaimo, British Columbia, Canada

Filed Jun. 28, 1995, Ser. No. 495,897

Int. Cl.<sup>6</sup> E21B 23/08

U.S. Cl. 166—383

9 Claims



1. A method of inserting tubing into a live well bore, comprising the steps of:

attaching a resilient piston to a lower end of said tubing;  
lowering said piston into a passage at a well head to locate said piston in a position above a closure which prevents the escape of fluid from the well bore through the passage;  
sealing said passage around said tubing above said piston;  
opening a path of communication between the well bore below said closure and a portion of said passage above said piston to equalize the hydraulic pressure above said piston with that below said closure;  
opening said closure; and  
pumping fluid from a fluid reservoir into said passage above said piston to force said piston and said tubing downwardly in said well bore; and  
subsequently allowing said piston and said tubing to descend under gravity while fluid flows upwardly in said well bore past said piston by deformation of said piston by the pressure of said fluid.

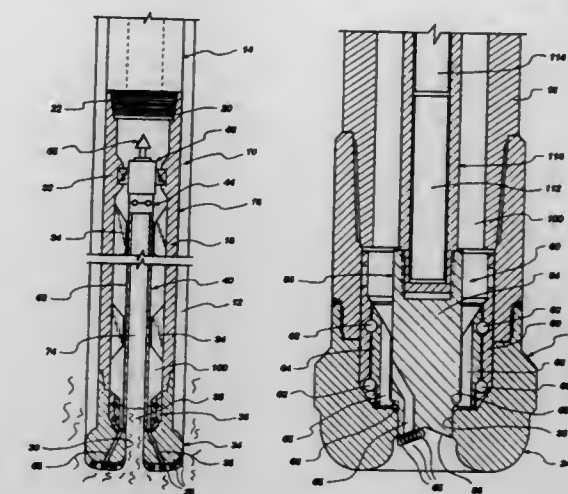
**5,568,838**  
**BIT-STABILIZED COMBINATION CORING AND DRILLING SYSTEM**  
Barry W. Struthers, Humble, and Pierre E. Collee, Kingwood, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Sep. 23, 1994, Ser. No. 311,118

Int. Cl.<sup>6</sup> E21B 10/02; 25/02; 47/00; 47/12

U.S. Cl. 175—246

20 Claims



1. An apparatus for alternately coring and drilling of a subterranean formation without tripping of a drill string to which said apparatus is secured, comprising:

an outer barrel assembly including a tubular outer barrel having means at the top thereof for securing the apparatus to the end of a drill string, a latch coupling on the upper interior thereof, and a PDC core bit having a throat and secured to the lower end thereof;  
an inner tube assembly configured for placement on the interior of said outer barrel assembly, including coupling means at the top thereof for releasable engagement of a wireline retrieval assembly, a latch assembly for releasable engagement of said latch coupling, a rotational bearing assembly below said latch assembly for permitting mutual rotation between the segments of the inner tube assembly above and below the latch assembly, and an inner tube for receiving a core cut by said core bit; and  
a center plug assembly configured for placement on the interior of said outer barrel assembly, including coupling means at the top thereof for releasable engagement of a wireline retrieval assembly, a latch assembly for releasable engagement of said latch coupling, a center bit plug at the lowermost end thereof for disposition in said core bit throat, said bit plug having a plug face including PDC cutters disposed thereon and internal passages for receiving drilling fluid from the interior of said outer barrel and directing said drilling fluid to said plug face; said inner tube assembly and said center plug assembly being interchangeable in said outer barrel assembly to permit, respectively, alternate coring and drilling of said subterranean formation.

**5,568,839**  
**REINFORCED BORING ROD ASSEMBLY AND METHOD OF FORMING SAME**  
Sammy Campbell, 541 Buffalo Shoals Rd., Statesville, N.C. 28677

Filed Mar. 7, 1995, Ser. No. 399,559

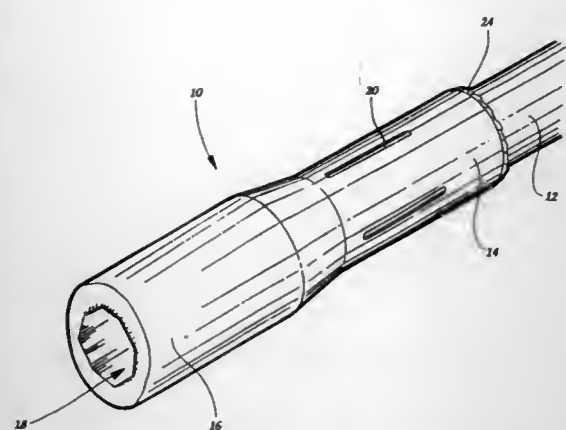
Int. Cl.<sup>6</sup> E21B 17/00

U.S. Cl. 175—320

14 Claims

1. A method for producing a reinforced boring rod assembly comprising the steps of:





providing a rod for horizontal earth boring, the rod having means for mounting a rod end thereto;  
 providing a rod end for mounting to said boring rod;  
 placing a generally elongate annular collar telescopically around said boring rod adjacent said mounting means;  
 mounting a rod end to said boring rod adjacent said collar using said mounting means;  
 welding said rod end to said collar;  
 creating a plurality of longitudinally extending crimps in said collar at predetermined circumferentially spaced locations around the collar with said crimps deforming at least a portion of said boring rod and defining a plurality of circumferentially spaced indentations around the collar; and  
 filling said indentations to a collar surface with a weld bead.

5,568,840

## STEP FLOOR FOR A SMALL SNOWMOBILE

Tadaaki Nagata, Takao Kouchi, and Yoshinobu Itani, all of Saltama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

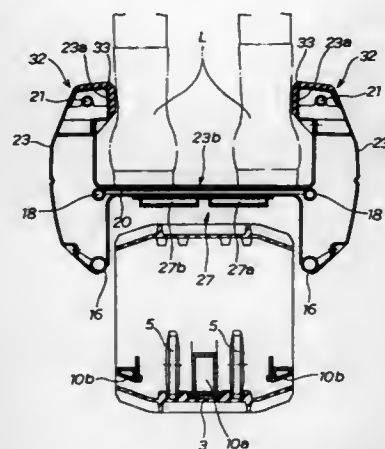
Filed Jun. 7, 1995, Ser. No. 478,807

Claims priority, application Japan, Sep. 26, 1994, 6-229763

Int. Cl.<sup>6</sup> B62M 27/02

U.S. Cl. 180—190

14 Claims



1. A snowmobile having a step floor, said step floor comprising:  
 a floor portion having a predetermined width on which feet of an operator of said snowmobile may be placed; and  
 a pair of upright portions on right and left sides of said floor portion, said upright portions each having an inwardly directed resilient pad at an upper end thereof, said resilient pads being spaced apart a distance less than said predetermined width, said resilient pads providing an engagement surface for legs of said operator, thereby improving the stability of said operator on said snowmobile.

5,568,841  
REAR FRAME FOR CENTER PIVOT STEERED CONSTRUCTION MACHINERY

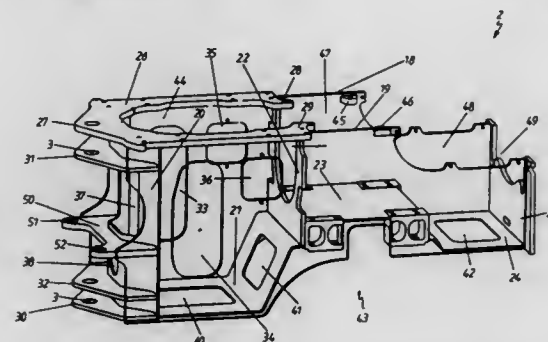
Thomas Weissbach, Aurburg, Germany, assignor to O&K Orenstein & Koppel Aktiengesellschaft, Berlin, Germany  
 Filed Dec. 5, 1994, Ser. No. 353,267

Claims priority, application Germany, Dec. 3, 1993, 43 41 286.6

Int. Cl.<sup>6</sup> B62D 21/00

U.S. Cl. 180—311

19 Claims



1. A rear frame for center pivot steered construction machinery, said frame, for receiving adjacent machine parts or subassemblies, being formed of first components which extend in the longitudinal direction of the frame and which are connected with each other via further transversely extending components which extend at least transversely to the first components; and wherein the longitudinally extending first components as well as the further components extending transversely to the first components are respective first and second surface elements which result in a basic structure having a linear integration of the structural parts in the form of a box having at least three contiguous sides and a bottom, the box being closable by at least one of the machinery parts and adjoining subassemblies.

5,568,842

## OIL CONTROL UNIT FOR HIGH-PERFORMANCE VEHICLES

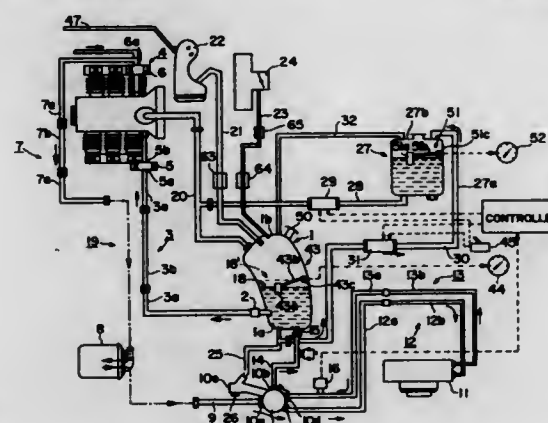
Akesama Otani, Prestiga Nishiazsbu, 4-22-10 Nishiazsbu, Kinatu-ku, Tokyo, 106, Japan

Filed Sep. 2, 1994, Ser. No. 300,463

Int. Cl.<sup>6</sup> F01M 5/00

U.S. Cl. 184—6.22

10 Claims



1. A control unit for circulating lubricating oil to vehicle engine parts comprising:  
 (a) a main oil sump for collecting said lubricating oil;  
 (b) a hydraulic circuit for supplying the oil to the engine parts and returning the oil to the main oil sump;  
 (c) an oil pump provided in the hydraulic circuit for circulating the oil therein;

- (d) at least one sub-oil sump which is capable of holding an optimum amount of lubricating oil;
- (e) at least one hydraulic tube which connects the sub-oil sump and the hydraulic circuit;
- (f) means for transferring the oil from the sub-oil sump to the hydraulic circuit and from the hydraulic circuit to the sub-oil sump;
- (g) means for cooling the lubricating oil;
- (h) a cooling bypass for diverting the lubricating oil from the hydraulic circuit to the oil cooling means and for transferring the oil from the cooling means to the hydraulic circuit;
- (i) a thermostat for regulating the path of the lubricating oil in accordance with its temperature, said thermostat having a first position where the oil circulates only through the hydraulic circuit and a second position where the lubricating oil circulates through the hydraulic circuit and cooling bypass;
- (j) means for detecting the pressure of the lubricating oil flowing through the cooling bypass; and,
- (k) means for controlling the transfer means in response to changes in the pressure of the lubricating oil detected by the pressure detecting means.

5,568,843

## PRECISION LINEAR MECHANICAL LOCK

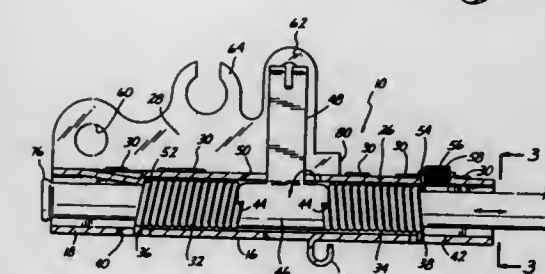
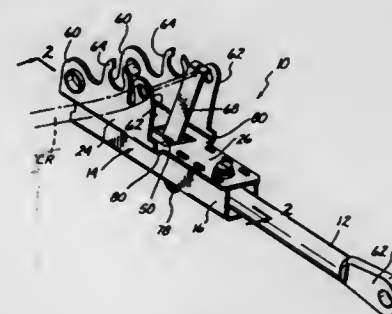
Clyde R. Porter, Los Angeles, and Calvin R. Stringer, Saugus, both of Calif., assignors to P. L. Porter Co., Woodland Hills, Calif.

Continuation of Ser. No. 446,384, May 22, 1995, abandoned, which is a continuation of Ser. No. 74,041, Jun. 8, 1993, abandoned. This application Nov. 16, 1995, Ser. No. 558,201

Int. Cl.<sup>6</sup> B65H 59/10

U.S. Cl. 188—67

37 Claims



1. A mechanical lock comprising:  
 a channel shaped first housing element having opposite open ends and a side opening extending between said open ends, a rod axially movable between said open ends in said first housing element, two coils springs wound on said rod, a second housing element secured to said first housing element for closing said side opening, said first and second housing elements together defining a tubular housing open at opposite ends, said springs axially contained between axial bearing means supported only on said second housing element, said springs having a normal inside diameter for locking said rod against movement through said housing, said springs having opposite ends and end tangs at said opposite ends, said tangs circumferentially fixed in openings defined in one of said housing elements, and release means engaged to inner ends of

5,568,844

## BRAKING APPARATUS OPERATED VIA RESILIENT DEFORMATION OF CONED DISK SPRINGS

Yuji Matsuki, Sayama, and Seiji Hirohashi, Tokyo, both of Japan, assignors to Kabushiki Kaisha SG, Japan

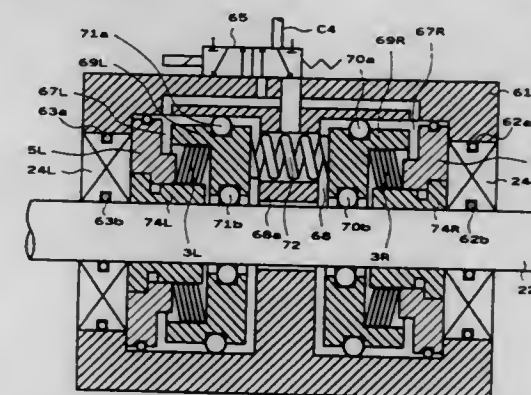
Filed Jan. 10, 1994, Ser. No. 179,269

Claims priority, application Japan, Jan. 11, 1993, 5-017889

Int. Cl.<sup>6</sup> F16D 63/00

U.S. Cl. 188—68

3 Claims



1. A braking apparatus comprising:  
 a substantially columnar rod;  
 a brake bush having a cylindrical shape and provided around said rod, said brake bush being capable of moving relative to said rod axially along an outer surface of said rod and also causing a frictional braking force between said brake bush and said rod by being pressed radially inwardly against said rod;  
 coned disk springs each being bottomless-dish shaped and also having outer and inner radial recesses extending radially from outer and inner peripheral edges thereof, respectively, said outer and inner recesses being arranged in an alternating fashion along a circumference of said spring, said coned disk springs being provided in such a manner that the inner peripheral edge of each of said springs contacts an outer peripheral surface of said brake bush;  
 a brake piston having an inner surface defining a cylindrical hole for providing therein said coned disk springs in such a manner that the outer peripheral edge of each of said springs contacts the inner peripheral surface of said brake piston, said brake piston being capable of moving relative to said rod axially along the outer surface of the rod to axially press said coned disk springs so that each of said springs is axially deformed into a flatter disk shape with the inner peripheral edge thereof compressed radially inwardly, to thereby press said brake bush radially inwardly against said rod;  
 a cylinder block capable of moving relative to said rod axially along the outer surface of the rod with said coned disk springs and brake piston held by said cylinder block and also allowing compressed air supplied from outside to act on said brake piston so that said brake piston is allowed to move axially along an inner surface of said cylinder block; and  
 a holding member for holding said brake bush in such a manner that said brake bush is displaceable in a radial direction toward and away from said rod within said cylinder block, wherein each of said inner radial recesses in each of said springs has an increased radial length relative to a radial length of each of said outer radial recesses in each of said

springs so as to achieve a reduced axial spring constant without changing a wall thickness of said spring, and that at least three or more said coned disk springs are provided around said brake bush so as to obtain a predetermined total spring constant.

5,568,845

## PNEUMATICALLY OPERATED DISK BRAKE

Hans Baumgartner, Moosburg; Dieter Bieker, Munich, and Johann Iraschko, Reisdorf, all of Germany, assignors to Knorr Bremse AG, Munich, Germany

Continuation of Ser. No. 295,420, Aug. 25, 1994, abandoned.

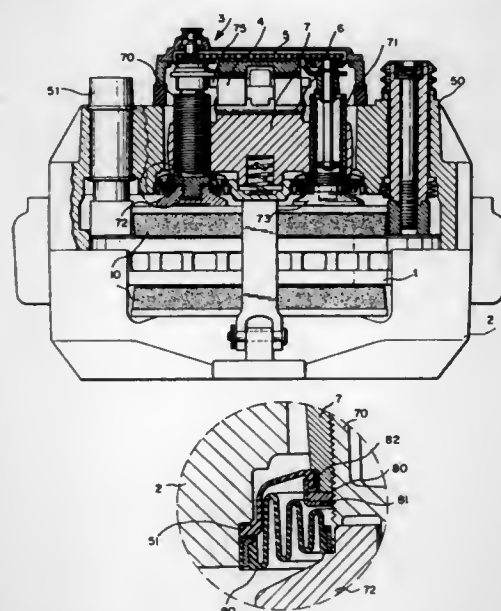
This application Nov. 6, 1995, Ser. No. 553,829

Claims priority, application Germany, Oct. 13, 1993, 43 34 914.5

Int. Cl.<sup>6</sup> F16D 65/52

U.S. Cl. 188—71.9

5 Claims



1. A pneumatically operated disk brake comprising:  
a caliper having a pair of brakes on each side of a brake disk;  
an application device on a first side of said brake disk operable connected to by a lever to a traverse member which is slidably guided with respect to the brake disk;  
two adjusting spindles adjustably screwed to the traverse member and acting upon a brake shoe which is displaceably disposed with respect to the brake disk in the caliper on the first side;  
an adjusting device acting upon at least one of the adjusting spindles to maintain the ventilating play essentially constant;  
a synchronization device, separate of said adjusting device, for synchronizing adjusting rotation movement of said adjusting spindle; and  
a device for locking the synchronization device in the released condition of the brake to prevent rotating of the adjusting spindles.

5,568,846  
WHEEL HUB AND BRAKE DISK ARRANGEMENT FOR HEAVY TRUCKS

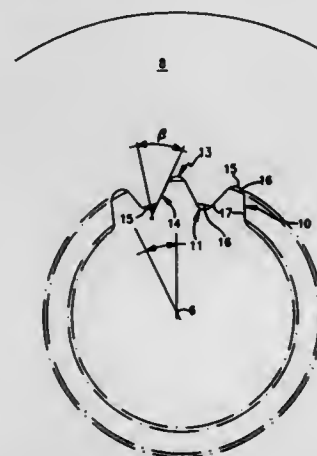
Ingemar Dagb, Hisingsbacka, and Jan-Olof Bodin, Alingsås, both of Sweden, assignors to AB Volvo, Gothenburg, Sweden  
PCT No. PCT/SE93/00043, § 371 Date Sep. 14, 1994, § 102(e)  
Date Sep. 14, 1994, PCT Pub. No. WO93/14945, PCT Pub. Date Aug. 5, 1993

PCT Filed Jan. 22, 1993, Ser. No. 256,797

Claims priority, application Sweden, Jan. 24, 1992, 9200202  
Int. Cl.<sup>6</sup> B60B 27/02; F16D 65/12

U.S. Cl. 188—218 XL

11 Claims



1. In a wheel hub and brake disc arrangement for a vehicle wheel, comprising a hub rotatably carried on a shaft portion and presenting an outwardly facing region on non-circular cross-section, and a brake disc which is carried by said region on the hub, said brake disc having a central hole, the shape of which is adapted to the shape of said non-circular cross-section to thereby provide a mutually non-rotatable attachment of the brake disc to the hub; the improvement wherein said non-circular region of the hub comprises closely spaced V-shaped ridges (10) and troughs (11), the ridges have flank surfaces, and the central hole of the brake disc is provided with corresponding V-shaped troughs (13) and ridges (14) which are so adapted in relation to the ridges and troughs on the hub that a slip fit between the hub and disc is achieved, the bottoms of the troughs of one of the disc or hub being spaced from the tops of the ridges of the other of the disc or hub when the entire flank surfaces of the ridges are in contact with the troughs.

5,568,847  
DEVICE FOR PROVIDING A RIGID MECHANICAL LINK WITH FREQUENCY CUT-OFF

Jean-Claude Guilloud, Plaisir; Daniel Trouchet, Paris; Michel Lapautre, Ville-d'Avray, and Marc Lepretre, Bois-Colombes, all of France, assignors to Bertin & Cie, Plaisir, France

PCT No. PCT/FE93/00332, § 371 Date Oct. 5, 1994, § 102(e)  
Date Oct. 5, 1994, PCT Pub. No. WO93/21460, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 2, 1993, Ser. No. 313,309

Claims priority, application France, Apr. 10, 1992, 92 04405  
Int. Cl.<sup>6</sup> F16F 5/00

U.S. Cl. 188—313

11 Claims

1. A device for providing a rigid mechanical link with frequency cut-off between at least two structures, the device comprising a tie-rod of high stiffness having ends secured to the structures for transmitting static forces between the structures, the device further comprising a cylinder-piston assembly in parallel with the tie-rod, said cylinder-piston assembly comprising a piston secured to one of said structures and a cylinder secured to the other of said structures, and means for generating inertia instantaneously opposing the displacement of the piston in the cylinder in response to a



a forward surface connecting said top and bottom surfaces;  
first rolling means projecting from said bottom surface and disposed proximate said transverse edge for rolling engagement with an underlying support surface when the article is forwardly tilted relative thereto substantially about said transverse edge;

handle means secured to said forward surface for grasping by a user of the article and having a graspable portion and an elongated portion, said graspable portion being operatively movable between a retracted position and an extended position relative to said forward surface;

an elongated leg structure pivotally mounted to said forward surface for pivotal movement of said leg structure relative to said forward surface between a retracted position and an extended supporting position in which said article, when forwardly tilted substantially about said transverse edge, is simultaneously supported by said extended elongated leg structure and said first rolling means; and

linkage means operatively coupling said handle means and said leg structure for synchronizing retraction and extension of said handle means and said leg structure.

5,568,849

## CLUTCH MECHANISM IN POWER DRIVEN SCREWDRIVER

Katsuhiko Sasaki, and Yoshinori Shibata, both of Anjo, Japan, assignors to Makita Corporation, Anjo, Japan

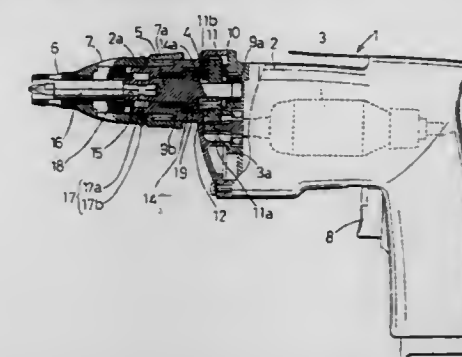
Filed Feb. 2, 1995, Ser. No. 382,797

Claims priority, application Japan, Feb. 3, 1994, 6-011813

Int. Cl.<sup>6</sup> B25B 21/00

U.S. Cl. 192—34

12 Claims

5,568,848  
LATERALLY MOVABLE SUITCASE WITH WHEELED, PIVOTABLE LEG

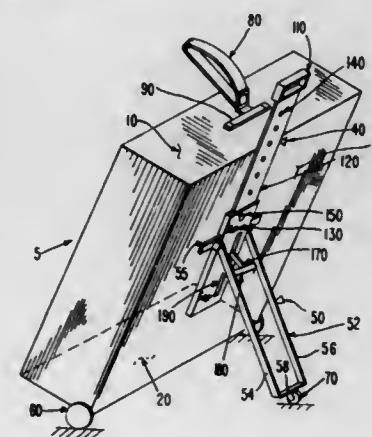
Joseph Liang, P.O. Box 1060, Alpine, N.J. 07620

Filed Jul. 1, 1994, Ser. No. 270,176

Int. Cl.<sup>6</sup> A45C 5/14; 13/28

U.S. Cl. 190—18 A

10 Claims



1. An article of luggage for rolling movement along an underlying support surface in a user-selectable direction, comprising:  
a top surface;  
a bottom surface having a transverse edge;

1. In a power driven screwdriver including a housing, a spindle rotatably and axially movably disposed within the housing, and a motor for driving the spindle, a clutch mechanism interposed between the motor and the spindle comprising:

a drive clutch member rotatably driven by a motor and movable in an axial direction of the spindle between a first position and a second position positioned forwardly of said first position;  
a driven clutch member rotatable with the spindle; and

drive clutch shifting means operable to move said drive clutch member from said first position to said second position spaced from said first position in a forward direction relative to said driven clutch member when said driven clutch member is brought to engage said drive clutch member, said drive clutch shifting means being also operable to move said drive clutch member from said second position to said first position when said driven clutch member is brought to be disengaged from said drive clutch member;

drive clutch shifting means includes biasing means and at least one pin having a longitudinal axis;



said pin being mounted on said drive clutch member and being movable between a vertical position and an inclined position, said longitudinal axis of said pin at said vertical position being substantially in parallel to an axis of the spindle, and said longitudinal axis of said pin at said inclined position being inclined relative to the axis of the spindle in the rotational direction of said drive clutch member;

said biasing means normally maintaining said pin at said vertical position and maintaining said drive clutch member at said first position;

said pin being movable from said vertical position to said inclined position against the biasing force of said biasing means so as to move said drive clutch member from said first position to said second position when said pin abuts on said driven clutch member in the rotational direction of said drive member; and

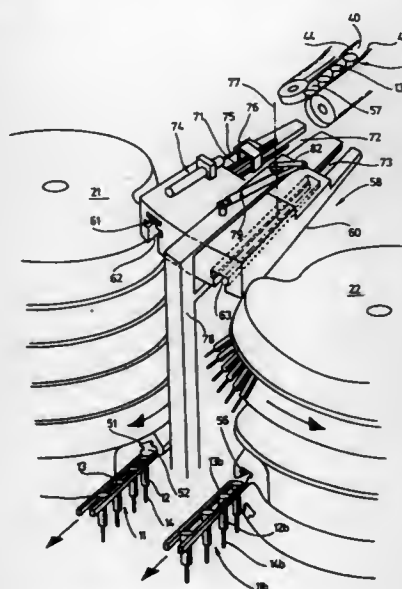
said driven clutch member has a rear surface confronting said drive clutch member and having a plurality of clutch teeth formed thereon, said pin at said inclined position serves as a clutch tooth engageable with the clutch teeth of said driven clutch member for transmitting rotation of said drive clutch member to said driven clutch member.

5,568,850

**CONVEYING APPARATUS FOR ELONGATED OBJECTS**  
Fritz Neber, Schwaebisch Hall, Germany, assignor to Groninger & Co GmbH, Crailsheim, Germany  
Filed Feb. 15, 1995, Ser. No. 388,748

Claims priority, application Germany, Sep. 3, 1994, 9414323 U

U.S. Cl. 198—347.1 Int. Cl. B65G 1/00 49 Claims



1. Conveying apparatus for transporting a plurality of elongated objects, each of said objects having a radially protruding flange, said conveying apparatus comprising means for conveying said objects (11, 11a, 11b) in a conveying direction including two conveying tracks (18, 19) over which said objects (11) are movable in a suspended position on bearing surfaces of the conveying tracks with said flanges (13) contacting said bearing surfaces;

at least one vertical buffer storage device (21, 22) each comprising a vibrating conveyor having at least one substantially spiral guideway (51, 52, 56) for conveying said objects substantially vertically downward; and/or

at least one adjustable connecting guide device (20), one of said at least one connecting guide devices (20) being arranged between opposing ends of the two conveying tracks (18, 19)

and including means for conveying said objects (11, 11a, 11b) around a curved path between the two conveying tracks (18, 19).

5,568,851

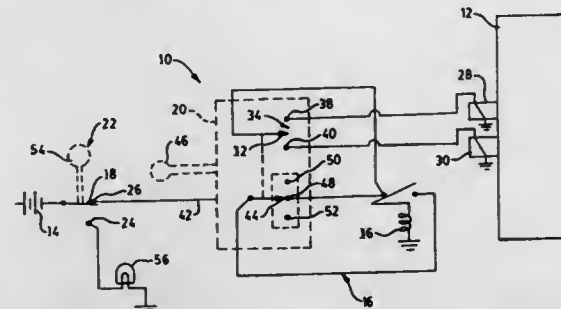
**TRANSMISSION ACTIVATING AND NEUTRALIZING SYSTEM**

Richard J. Maes, Raleigh, N.C., assignor to Caterpillar Inc., Peoria, Ill.

Filed Jan. 20, 1995, Ser. No. 377,521

Int. Cl. B60K 41/26

U.S. Cl. 192—9 10 Claims



1. A system for activating and neutralizing a power transmission of a machine, comprising:

- a source of electrical power;
- first and second electrically controlled actuators;
- an electrical circuit having a movable connector having a neutral position, a latching relay and first and second active contacts connected respectively to said first and second electrically controlled actuators, said circuit being connectable to said electrical power source;
- a switch having first and second positions and connected between said electrical power source and said electrical circuit;
- a transmission shifting mechanism for shifting said movable connector from said neutral position and into contact with one of said first and second active contacts; and
- means for moving said switch between said first and second positions, said moving means selectively activating the latching relay to an open position and said transmission shifting mechanism selectively activating the latching relay to a closed position.

5,568,852

**CLUTCH COVER ASSEMBLY HAVING CLUTCH DISK WEAR COMPENSATION MEANS**

Naoki Tomiyama, Settsu, Japan, assignor to Kabushiki Kaisha Dalkin Seisakusho, Osaka, Japan

Filed May 24, 1995, Ser. No. 448,953

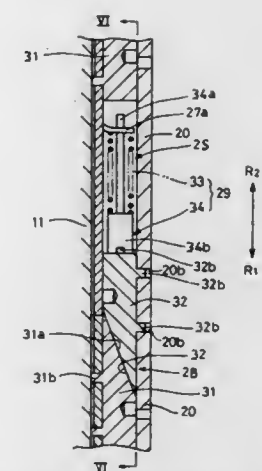
Claims priority, application Japan, May 31, 1994, 6-118822

Int. Cl. F16D 13/54 30 Claims

U.S. Cl. 192—70.25

1. A clutch cover assembly comprising:

- a clutch cover connected to a flywheel;
- a pressure plate disposed within said cover having a radially extending friction face formed on a first side thereof for engagement with a clutch disk disposed between said pressure plate and said flywheel;
- a support element coupled to said pressure plate for rotation therewith and with axial displacement relative to said pressure plate;
- a diaphragm spring biasing said pressure plate towards a flywheel via said support element;
- an urging mechanism disposed between said pressure plate and said support element, having a plate element, urging elements supported by said plate element for biasing said support



element towards said diaphragm spring, and guide elements which are detachably mounted on said plate element and at least partially retain said urging elements; and

a restraining mechanism which allows for axial movement of said support element with respect to said pressure plate towards said diaphragm spring in response to wear of said clutch disk;

wherein said plate element engages said pressure plate and is formed with engagement portions which extend away from said pressure plate, and

said guide elements have one end in engagement with said engagement portions.

5,568,853

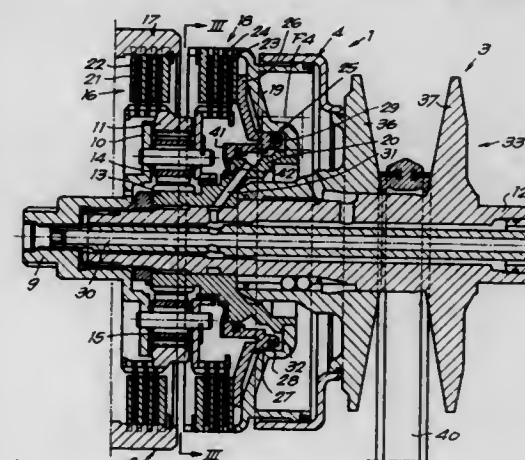
**TRANSMISSION UNIT FOR MOTOR VEHICLES**  
Frank C. M. Adriessens, Bertem, Belgium, assignor to VCST, naamloze vennootschap, Sint-Truiden, Belgium

Filed Jul. 13, 1995, Ser. No. 501,876

Claims priority, application Belgium, Jul. 13, 1994, 09400654

Int. Cl. F16D 25/0638; F16H 9/00

U.S. Cl. 192—85 AA 13 Claims



1. A transmission unit for a motor vehicle comprising:

- a continuously variable transmission having a first rotatable drive member;
- a reversing unit;
- a clutch selectively coupling said reversing unit to said drive member for rotation with said drive member in a first direction of rotation; and
- a hydraulic pressure unit for controlling the clutch, said hydraulic pressure unit including a cylinder adapted to receive a hydraulic medium and being rotatable with said drive member, a piston movably mounted in said cylinder and separating said cylinder into first and second chambers and an elastic

sealing ring located between said piston and said cylinder, said sealing ring including a passage situated to allow the hydraulic medium to travel between said first and second chambers under the influence of centrifugal force caused by the rotation of said cylinder.

5,568,854

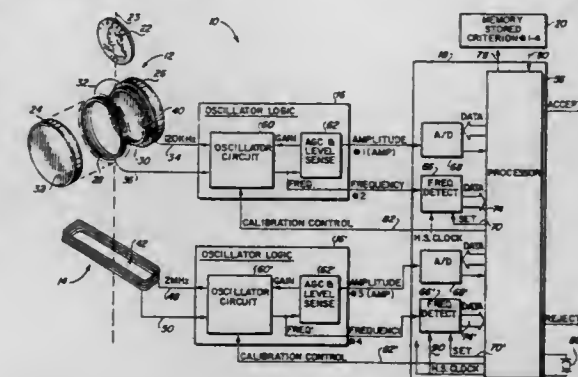
**COIN DISCRIMINATION METHOD**

Stephen J. Hayes, Swansea, England, and Patrick R. Gorman, Lakeland, Fla., assignors to Protel, Inc., Lakeland, Fla.

Continuation-in-part of Ser. No. 27,363, Mar. 8, 1993, Pat. No. 5,351,798, which is a division of Ser. No. 722,480, Jun. 28, 1991, Pat. No. 5,191,957. This application Oct. 4, 1994, Ser. No. 317,796

Int. Cl. G07D 5/08

U.S. Cl. 194—318 4 Claims



1. A coin detection method comprising the steps of:

- establishing a magnetic flux across a coin path by providing an oscillating signal;
- passing a coin under test along the path;
- detecting the change in energy loss caused by the movement of the coin under test along the path;
- utilizing the change for the detection of an amplitude characteristic of the coin under test;
- determining the change of the amplitude characteristic with time of the coin under test;
- storing into memory a statistical variable determined from measurements of the amplitude-time characteristics of a plurality of coins of the same type as the coin under test;
- determining for the coin under test a deviation value in relation to the stored statistical variable; and
- providing a signal indicating acceptability of the coin under test if the deviation value is within a predetermined acceptable range.

5,568,855

**COIN DETECTOR AND IDENTIFIER APPARATUS AND METHOD**

Kirk D. Hoffman, Yorkville; Joe Ferrantelli, Orland Park, and Robert Huizenger, Woodridge, all of Ill., assignors to Coin Mechanisms, Inc., Glendale Heights, Ill.

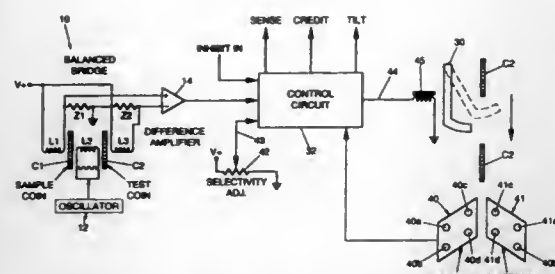
Filed Oct. 2, 1995, Ser. No. 537,971

Int. Cl. G07D 5/08

U.S. Cl. 194—318 20 Claims

1. A coin detector and identifier for a coin operated device comprising:

- field generating means for generating an alternating magnetic field, the magnetic field having a central, concentrated region and a disperse region outside the central region, the field generating means being disposed in the central region;
- first and second field detection means for detecting the magnitude of the magnetic field, the first and second field detection means being symmetrically disposed about the field generat-



ing means and being electrically connected in a balanced bridge configuration to substantially eliminate electromagnetic interference from external sources of electromagnetic radiation;

comparing means responsive to the first and second field detection means for comparing the magnitude of the magnetic fields detected by the first and second field detection means; means for disposing a sample coin between the field generating means and the first field detection means, the sample coin being operative to alter the magnitude of the magnetic field detected by the first field detection means by an amount defined by the physical characteristics of the sample coin; means for disposing a test coin between the field generating means and the second field detection means, the test coin being operative to alter the magnitude of the magnetic field detected by the second field detection means by an amount defined by the physical characteristics of the test coin; and coin directing means responsive to the comparing means for directing the test coin, the directing means being operative to accept test coins that match the sample coin and to reject test coins not matching the sample coin.

5,568,856

# DEVICE FOR TRANSPORTING AND STORING CIGARETTES

Robert G. Colley, Arnold, United Kingdom, and Harald Gosebruch, Verden, Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Germany

PCT No. PCT/EP93/03569, § 371 Date Jun. 14, 1995, § 102(e) Date Jun. 14, 1995, PCT Pub. No. WO94/13161, PCT Pub. Date Jun. 23, 1994

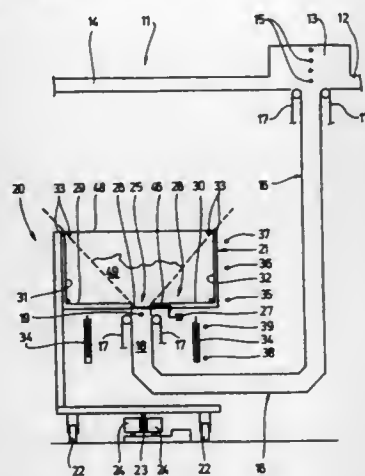
PCT Filed Dec. 15, 1993, Ser. No. 464,767

Claims priority, application United Kingdom, Dec. 15, 1992, 9226117

Int. Cl.<sup>6</sup> B65G 1/00

U.S. Cl. 198—347.2

13 Claims



1. Device for transporting and storing cigarettes, having a storage unit (20) comprising a plurality of containers (21) which are arranged one beside the other and are connected fixedly to one

another, having an interior (49) for receiving the cigarettes, which interior is bounded by a large-surface-area front wall (47), a large-surface-area rear wall (48), narrow side walls (31, 32) and a bottom wall (28), and in which the cigarettes can be stored with their longitudinal axes transverse to the plane of the front wall (47), and having a conveyor (16) for feeding the cigarettes, in particular, from a cigarette-making machine and conveying away the cigarettes, in particular, to a packaging machine, it being possible for the individual containers (21) to be filled or emptied one after the other in a filling station (18) by the conveyor (16), characterized in that the bottom wall (28) is mounted pivotally in the region of the filling opening (25) and can be pivoted from an essentially horizontal normal position into an oblique position, sloping down to the filling opening (25), by means of at least one leg (29, 30) which slopes down to the filling opening (25).

5,568,857

# LIFTABLE ROLLER CONVEYER

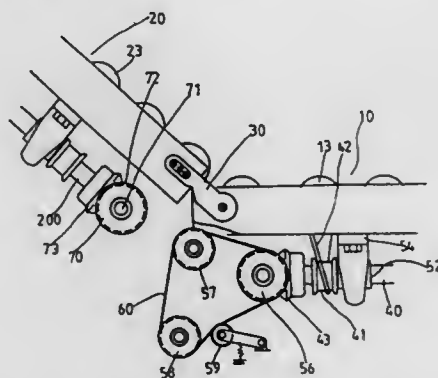
Kuan-Chou Chen, Hsin Ying, and Duen-Jyh Shyr, Chutung, both of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu Hsien, Taiwan

Filed Jul. 31, 1995, Ser. No. 488,798

Int. Cl.<sup>6</sup> B65G 21/10

U.S. Cl. 198—592

9 Claims



1. A roller conveyor for conveying objects comprising:  
a fixed conveyor section having first parallel frames supported on upright stands and a plurality of first parallel rollers mounted between said first parallel frames of said fixed conveyor section;  
a power drive for rotating said first parallel rollers of said fixed conveyor section when conveying objects;  
a liftable conveyor section having second parallel frames and a plurality of second parallel rollers mounted between said second parallel frames of said liftable conveyor section;  
said liftable conveyor section having a fixed end pivoted to one end of said fixed conveyor section, a free end, a transmission mechanism mounted on said liftable conveyor section for rotating said second parallel rollers of said liftable conveyor section, a clutch means mounted on said liftable conveyor section to couple said transmission mechanism with said power drive, and a plurality of gas spring levers and springs respectively mounted on said liftable conveyor section to provide resistance to said liftable conveyor section when said liftable conveyor section is down-lifted;

wherein said transmission mechanism is coupled to said power drive by said clutch means when said liftable conveyor section is not lifted, and said transmission mechanism is disconnected from said power drive when said liftable conveyor section is lifted from said fixed conveyor section.

5,568,858

# POWER DRIVE UNIT FOR AIRCRAFT CARGO HANDLING SYSTEMS

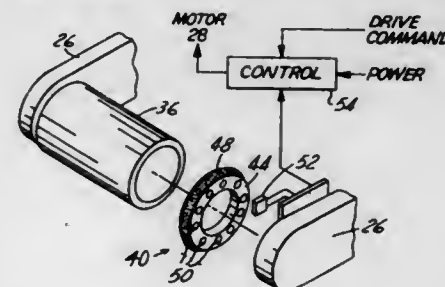
James R. Thompson, Middleville, Mich., assignor to Vickers, Incorporated, Maumee, Ohio

Filed Oct. 20, 1994, Ser. No. 326,213

Int. Cl.<sup>6</sup> B65G 13/06

U.S. Cl. 198—781.06

21 Claims



1. A power drive unit for aircraft cargo handling systems comprising:  
an electric motor responsive to application of electrical power for rotating a motor output shaft,  
a drive roller mounted for rotation about an axis parallel to said motor output shaft and carried for engagement with cargo to be driven by said unit,  
gear means coupling said motor output shaft to said drive roller for rotating said drive roller responsive to application of electrical power to said motor, and  
scrub sensing means for modulating application of electrical power to said motor when said drive roller is scrubbing against cargo engaged by said scrub sensing means.

5,568,859

# FOLDABLE FOOT SWITCH

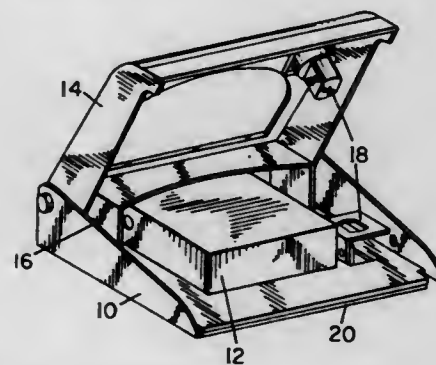
Uri Levy, Rehovot; Ofer Braude, Ramat-Gan; Yitzhak Rozenberg, Tel-Aviv, and Yotam Zimmerman, Hadera, all of Israel, assignors to Laser Industries, Limited, Tel Aviv, Israel

Filed Aug. 8, 1995, Ser. No. 512,387

Int. Cl.<sup>6</sup> H01H 3/14

U.S. Cl. 200—43.01

15 Claims



1. A foot switch comprising:  
a base;  
a foot actuated signal generator coupled to said base and operative to generate signals in response to foot actuation;

a cover pivotally connected to said base to rotate between an open position that permits access to said foot actuated signal generator from between said cover and said base and a closed position that blocks access to said foot actuated signal generator from between said cover and said base; and sidewalls interposed between said cover and said base and arranged to prevent said cover from reaching said foot actuated signal generator in a manner that would actuate said foot actuated signal generator as said cover rotates from said open position into said closed position, said foot actuated signal generator being situated between said sidewalls while said cover is in said closed position and being free of actuation from said cover.

5,568,860

# PIVOT POINT CONTACT WITH SCRUBBING ACTION SWITCH

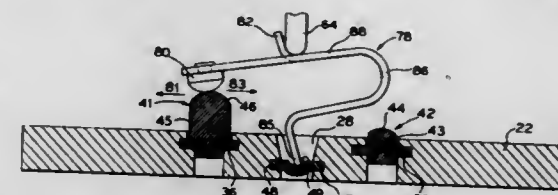
Roderick W. Stringwell, Keokuk, Iowa, and Gregory P. Van Vooren, Macomb, Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

Filed Jun. 23, 1994, Ser. No. 264,730

Int. Cl.<sup>6</sup> H01H 1/60

U.S. Cl. 200—242

15 Claims



1. An electrical switch comprising:  
a) a battery rivet mounted on a floor of said switch and having a mating surface positioned above an upper surface of said floor;  
b) a contact rivet having a mating surface;  
c) means for sliding said mating surface of said contact rivet on and off of said mating surface of said battery rivet, said sliding means comprising:  
i) a resilient wiping arm having a first end, said contact rivet mounted onto said wiping arm;  
ii) means for moving said wiping arm about said battery rivet mating surface; and  
iii) a pocket contact positioned within a groove in said floor and thereby entirely disposed below said upper surface of said floor, said pocket contact having a slot and said first end of said wiping arm pivotally mounted within said slot.

5,568,861

# ELECTRICAL SWITCH WITH A ROCKER KEY AND A SPILLWAY FOR THE EXTERNAL DISCHARGE OF WATER

Silvano Lamberti, Roncadelle, Italy, assignor to SLBE.R.s.r.l., Brescia, Italy

Filed Feb. 6, 1995, Ser. No. 383,890

Claims priority, application Italy, Apr. 1, 1994, BS9400023

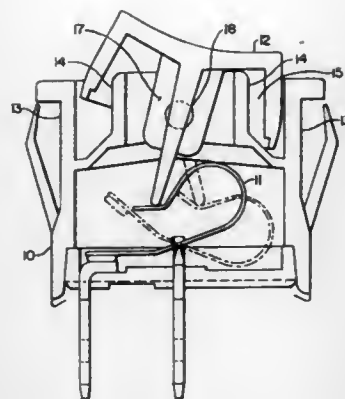
Int. Cl.<sup>6</sup> H01H 19/06

U.S. Cl. 200—302.003

9 Claims

1. An electrical switch with a horizontally pivoting key, having a body [10] defining a front and back that has a continuous perimeter wall [13] comprised of four sides and, internally, at the front of the body, a continuous inner wall [14] comprised of four sides that are parallel to respective sides of the perimeter wall [13] and that in conjunction with the perimeter wall defines a continuous channel [15] for the collection and discharge of water or condensation, the horizontally pivoting key being partially located within the channel and the sides of the continuous inner wall extend beyond the sides of the continuous perimeter wall [13] of the body of the switch.





5,568,862

# PACKAGE FOR WOOD CONNECTORS AND METHOD FOR FORMING SAME

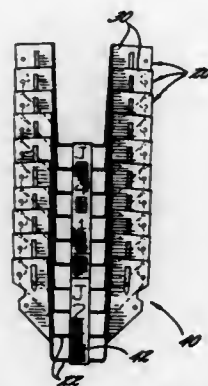
William H. Black, Jr., Edenton, N.C., assignor to Tee-Lok Corporation, Edenton, N.C.

Filed Mar. 27, 1995, Ser. No. 411,294

Int. Cl.<sup>6</sup> B65D 71/02

U.S. Cl. 206—338

27 Claims



1. A bundle of wood connectors, comprising:
  - a plurality of wood connectors, wherein each wood connector has a pair of substantially planar and generally parallel side panels, a pair of substantially planar and generally coplanar lateral panels, each of which is attached to be generally perpendicular to a respective one of said pair of side panels, and a generally planar connecting panel, with an end portion of each of said side panels being attached to a respective end portion of said connecting panel, the side panels extending from their corresponding connecting panel in a first direction, and with said wood connectors being arranged in nested relationship, with the side panels of adjacent wood connectors being in generally parallel relationship, and with the lateral panels of adjacent wood connectors being in generally parallel relationship, wherein at least one of said side panels and said lateral panels includes a plurality of apertures sized and positioned to receive nails; and
  - connecting means cooperating with said plurality of nested wood connectors for effecting unitization thereof.

12. A bundle of wood connectors, comprising:
  - a plurality of wood connectors, wherein each wood connector has a pair of substantially planar and generally parallel side panels, a pair of substantially planar and generally coplanar lateral panels, each of which is attached to a respective one of said pair of side panels, and a generally planar connecting panel that is generally perpendicular to said side panels and said lateral panels, with an end portion of each of said side panels being attached to a respective end portion of said connecting panel, and with the side panels extending from their corresponding connecting panel in a first direction, said

wood connectors being arranged in nested relationship, with the side panels of adjacent wood connectors being in generally parallel contacting relationship, and with the lateral panels of adjacent wood connectors being in generally parallel and contacting relationship; and

connecting means cooperating with said plurality of nested wood connectors for effecting unitization thereof.

18. A stack of wood connector bundles, comprising:
  - a plurality of connector bundles, each of said connector bundles comprising:

- a plurality of wood connectors, wherein each wood connector has a pair of substantially planar and generally parallel side panels, a pair of substantially planar and generally coplanar lateral panels, each of which is attached to be generally perpendicular to a respective one of said pair of side panels, and a generally planar connecting panel, with an end portion of each of said side panels being attached to a respective end portion of said connecting panel, the side panels extending from their corresponding connecting panel in a first direction, and with said wood connectors being arranged in nested relationship, with the side panels of adjacent wood connectors being in generally parallel relationship, and with the lateral panels of adjacent wood connectors being in generally parallel relationship; and
- connecting means cooperating with said plurality of nested wood connectors for effecting unitization thereof;

said bundles being arranged in layers, each of said layers comprising a plurality of connector bundles, and at least some of said layers being separated by a sheet material, wherein said bundles are oriented so that said lateral panels of said wood connectors are generally horizontal.

23. A package of wood connector bundles, comprising:
  - a plurality of connector bundles, each of said connector bundles comprising:

- a plurality of wood connectors, wherein each wood connector has a pair of substantially planar and generally parallel side panels, a pair of substantially planar and generally coplanar lateral panels, each of which is attached to be generally perpendicular to a respective one of said pair of side panels, and a generally planar connecting panel, with an end portion of each of said side panels being attached to a respective end portion of said connecting panel, the side panels extending from their corresponding connecting panel in a first direction, and with said wood connectors being arranged in nested relationship, with the side panels of adjacent wood connectors being in generally parallel relationship, and with the lateral panels of adjacent wood connectors being in generally parallel relationship; and
- connecting means cooperating with said plurality of nested wood connectors for effecting unitization thereof;

said bundles being arranged in layers, each of said layers comprising a plurality of connector bundles, and at least some of said layers being separated by a sheet material, wherein said bundles are oriented so that said lateral panels of said wood connectors are generally horizontal; and

a pallet underlying said wood connector bundle stack.

5,568,863

# CASSETTE ALBUM BOX WITH SPINE WINDOW

Mark W. Weavers, Little Canada, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

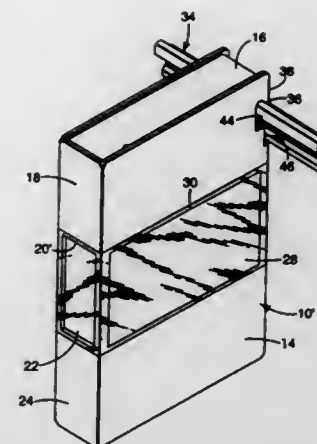
Filed Jul. 31, 1995, Ser. No. 509,126

Int. Cl.<sup>6</sup> B65D 85/67; 85/575

U.S. Cl. 206—387.1

18 Claims

1. A box for storing a cassette which has a spine and a door at least one of which can receive a label, wherein the box comprises:
  - a base;
  - a cover;
  - a plurality of side walls connected to at least one of the base and the cover and including a spine side wall, wherein the spine side wall has a window formed as an opening in the wall that permits access to the inside of the box and permits viewing a



label on at least one of the spine and the door of the cassette when the cassette is oriented in the box with the label adjacent the spine side wall of the box; and

a transparent external pocket which wraps around at least part of the spine side wall and at least part of at least one of the base and cover, wherein the transparent external pocket completely covers the window in the spine side wall, is the only physical barrier to prevent access to the inside of the box at the window, and permits viewing the label on the cassette.

5,568,864

# SPOOL AND HOLDER FOR A ROLL DISPENSING BOX

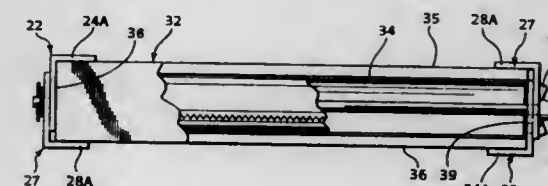
Andrew R. Nathan, 51 Calvin Ave., Syosset, N.Y. 11791

Filed Jun. 5, 1995, Ser. No. 461,107

Int. Cl.<sup>6</sup> B65D 85/671

U.S. Cl. 206—408

4 Claims



1. A device adapted for retaining a roll of sheeting material in a box having two end walls and side walls comprising:
  - a rod mean having a first threaded end, a cooperatively threaded nut, and a spaced opposite second end, said rod being adapted to extend through the roll and the box end walls; and
  - adjustable retaining means comprising a pair of L-shaped brackets coupled to each end of said rod, each L-shaped bracket having one leg adapted for placing adjacent a box end wall with an opening formed therein for receiving said rod and another leg adapted for engaging one of the box side walls, wherein said nut is adapted to tighten said L-shaped brackets against the box end and side walls to prevent the box from splitting while dispensing the sheeting material.

5,568,865

# SURGICAL CABLE PACKAGING APPARATUS

Joseph C. Mase, Warsaw, Ind., and Douglas E. Foos, Barrington, Ill., assignors to DePuy Inc., Warsaw, Ind.

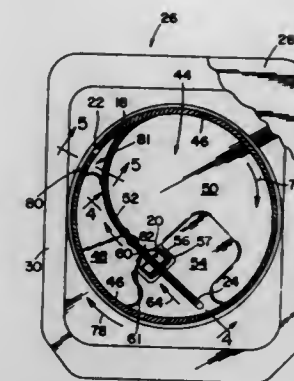
Filed Jul. 28, 1994, Ser. No. 281,823

Int. Cl.<sup>6</sup> A61B 17/06

U.S. Cl. 206—438

19 Claims

1. A tray for storing a surgical cable, the tray comprising:
  - a body portion configured to define a track for receiving the cable; and



a lead-in channel configured to guide the cable into the track, the lead-in channel being formed to include means for holding the cable within the channel.

5,568,866

# SAMPLE PACKAGE

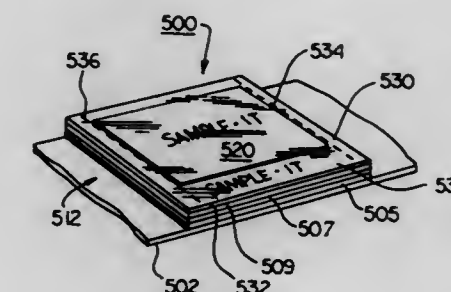
Carl W. Treleven, Greensboro, N.C.; Glenn Grosskopf, Lake Zurich, and James Hennessey, Chicago, both of Ill., assignors to Westlake Ventures, L.L.C., Greensboro, N.C.

Filed Dec. 30, 1994, Ser. No. 368,275

Int. Cl.<sup>6</sup> B65D 75/26

U.S. Cl. 206—466

13 Claims



1. An article of manufacture for affixing a fluid or powder sample to a card or carton, comprising:
  - a. a patch member having an upper surface and a lower surface, said patch member having a coating of adhesive on the lower surface thereof;
  - b. a pliable pouch affixed to the upper surface of said patch member and containing the sample; and
  - c. wherein said pouch is affixed to said patch member by a laminate cover, and wherein said patch member includes a tab which extends beyond the perimeter of said pouch, and wherein said pouch is secured to the up, per surface of said patch member by said laminate cover, said laminate cover covering a portion of said pouch and secured to said tab by adhesive.
4. A package product for carrying sample pouches of fluid or powder, comprising:
  - a. a support web of indeterminate length, comprising:
    - i. a plurality of base patches, each having an upper surface and a lower surface, said lower surface coated with a layer of self-adhesive,
    - ii. a release liner having an upper surface,
    - iii. said patches releasably secured at spaced points along the upper surface of said release liner by said self-adhesive;
  - b. at least one pliable pouch containing the fluid or powder sample secured to the upper surface of each of said patches; and
  - c. wherein each of said patches includes tabs, each of said tabs extending beyond the perimeter of a respective pouch, wherein said respective pouch is secured to the upper

surface of said patch by a laminate cover, said laminate cover covering a portion of said respective pouch and secured to said tab by adhesive.

7. A package product for carrying sample pouches of fluid or powder, comprising:

- a plurality of patches formed from a web of double coated tape, said double coated tape including a release liner having an upper surface, each of said patches positioned at spaced points along said release liner and including:
  - a carrier having a thickness of between 0.5 mil and 4.5 mils and an upper surface and a lower surface,
  - said lower surface of said carrier coated with a first adhesive layer and said upper surface of said carrier coated with a second adhesive layer, and
  - said carrier releasably secured to said upper surface of said release liner by said first adhesive layer;
- at least one pliable pouch containing the fluid or powder sample and having a lower face secured to said upper surface of each of said patches by said second adhesive layers; and
- wherein each of said pouches is covered by a laminate cover and wherein each of said laminate covers is secured to the upper surface of a respective patch by said second adhesive layer.

9. A package product for carrying sample pouches of fluid or powder samples, comprising:

- a web of transfer tape, said web including a release liner having an upper surface and a plurality of adhesive patches thereon, said patches positioned at spaced points along said release liner;
- at least one pliable pouch secured to each of said upper surfaces of said patches, each of said pouches containing the fluid or powder sample and having a lower face;
- each of said patches interposed between said upper surface of said release liner and said lower face of said respective pouch;
- wherein each of said pouches is releasably secured to said upper surface of said release liner by said respective patch; and
- wherein each of said pouches is covered by a laminate cover and wherein each of said laminate covers is secured to said upper surface of said release liner by said respective patch.

11. A package product for carrying sample pouches of fluid or powder, comprising:

- a plurality of patches formed from a web of double coated tape, said double coated tape including a release liner having an upper surface, each of said patches positioned at spaced points along said release liner and including:
  - a carrier having a thickness of between 0.5 mil and 4.5 mils and an upper surface and a lower surface,
  - said lower surface of said carrier permanently coated with a first pressure sensitive adhesive layer and said upper surface of said carrier permanently coated with a second pressure sensitive adhesive layer, and
  - said carrier releasably secured to said upper surface of said release liner by said first pressure sensitive adhesive layer; and
- at least one pliable pouch containing the fluid or powder sample and having a lower face secured to said upper surface of each of said patches by said second pressure sensitive adhesive layers.

5,568,867

## PAPER CUSHIONING PRODUCT

Michael J. Lencoski, Claridon Township, Ohio, assignor to Ranpak Corp., Concord Township, Ohio

Continuation of Ser. No. 956,116, Oct. 5, 1992, abandoned.

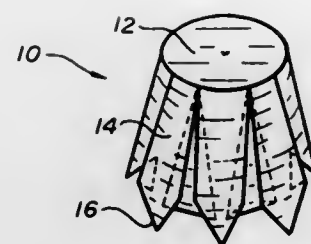
This application Nov. 17, 1994, Ser. No. 341,480

Int. Cl.<sup>6</sup> B65D 81/02

U.S. Cl. 206—584

17 Claims

1. A package comprising a container, an article positioned in the



container, and a plurality of cushioning products positioned in the container and substantially surrounding the article, said cushioning products each being formed from a piece of sheet-like material and comprising a tubular wall and an end wall closing one end of said tubular wall, said tubular wall having portions folded over on themselves and having at its other end opposite said one end a circumferential edge which is jagged in an axial direction.

5,568,868

## GULL-WING IC CARRIER SYSTEM

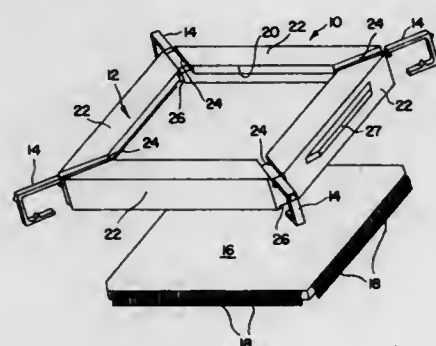
Rex W. Keller, Phoenix; Robert Harlock, Cave Creek; Robert W. Hooley, Scottsdale, and Patrick Harper, Phoenix, all of Ariz., assignors to Precision Connector Designs, Inc., Peabody, Mass.

Filed Aug. 18, 1995, Ser. No. 516,531

Int. Cl.<sup>6</sup> B65D 73/02

U.S. Cl. 206—724

13 Claims



1. An integrated circuit carrier system comprising:

- a carrier frame made up of a plurality of juxtaposed sides, said sides having an interior configuration sized to matingly engage an integrated circuit package;
  - at least one pair of said juxtaposed sides forming a corner;
  - a top channel formed in the top surface of said corner and a bottom channel formed in the bottom surface of said channel, said top and bottom channels being substantially aligned with each other and being diagonally disposed with respect to said frame; and
  - a locking clip configured to matingly engage said top and bottom channel, said locking clip having means thereon for engaging said channels adjacent said corner;
- whereby, when said locking clip is in position within said top and bottom channels in said frame it secures said integrated circuit package within said frame.

5,568,869

## METHODS AND APPARATUS FOR MAKING CONTINUOUS MAGNETIC SEPARATIONS

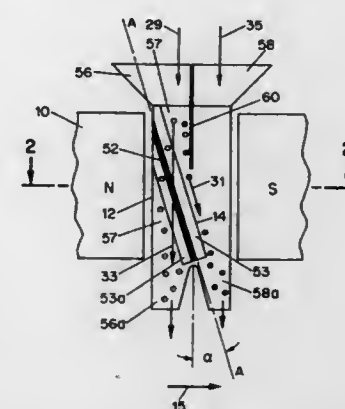
Alexander M. Turkenich; Yevgeny S. Lapshin, both of Dnepropetrovsk; Raphael S. Ulubabov, Lugansk; Vladimir I. Dudnik, Dnepropetrovsk, all of Ukraine, and Jens Dahl, Browns Mills, N.J., assignors to S.G. Frantz Company, Inc., Trenton, N.J.

Filed Dec. 6, 1994, Ser. No. 349,896

Int. Cl.<sup>6</sup> B03C 1/00

U.S. Cl. 209—212

48 Claims



1. Apparatus for separating a flowable mixture of particles into magnetic and nonmagnetic fractions, comprising:

- a magnetic circuit for generating a magnetic field of substantially uniform intensity throughout a region sufficient to accommodate at least one array of elongated ferromagnetic bodies;

- a separation chamber comprised at least in part of nonmagnetic material located in said region, a first end of said chamber being at one end of said region and a second end of said chamber being at the other end of said region;

- at least one particle feed channel adjacent the first end of the separation chamber for introducing a mixture to be separated into the separation chamber;

- at least one array of ferromagnetic bodies forming part of or disposed within the separation chamber and extending between the first and second ends of the separation chamber, said array comprising (1) a plurality of elongated ferromagnetic bodies aligned in parallel, spaced apart relation on the same side of a common plane that is oriented substantially perpendicular to the direction of the magnetic field and at an acute angle to the direction of particle feed to the separation chamber through said at least one particle feed channel, and (2) an elongated nonmagnetic member adjoining each ferromagnetic body at least on the side thereof that faces the particle feed for guiding the mixture into the space between adjacent ferromagnetic bodies;

- said orientation of the ferromagnetic bodies in the magnetic field giving rise to repulsive magnetic forces in the space between adjacent ferromagnetic bodies, a component of which acts in the direction of the magnetic field;

- at least one discharge channel adjacent the second end of the separation chamber for collecting nonmagnetic particles, said at least one nonmagnetic particle discharge channel being located on the opposite side of said common plane from said at least one particle feed channel; and

- at least one discharge channel adjacent the second end of the separation chamber for collecting magnetic particles, said at least one magnetic particle discharge channel being located on the same side of said common plane as said at least one particle feed channel;

whereby nonmagnetic particles fed towards the ferromagnetic body array pass through the space between adjacent ferromagnetic bodies and enter the discharge channel for nonmagnetic particles while magnetic particles are deflected by said repul-

sive magnetic forces along the plane of the ferromagnetic bodies and enter the discharge channel for the magnetic particles.

5,568,870

## DEVICE FOR TESTING AND SORTING SMALL ELECTRONIC COMPONENTS

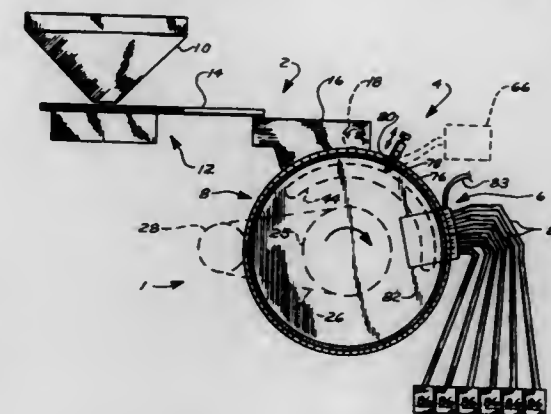
Klaus Utech, Mesa, Ariz., assignor to Testec, Inc., Chandler, Ariz.

Filed Aug. 18, 1994, Ser. No. 293,011

Int. Cl.<sup>6</sup> B07C 5/344

U.S. Cl. 209—573

24 Claims



1. A device for testing and sorting electrical components, said device comprising:

- a feed station, said feed station having an inlet, an outlet and adapted to receive bulk quantities of electrical components;
- a rotatably mounted transport wheel, said wheel having an outer rim portion that includes a plurality of separate, spaced-apart compartments adapted to receive electrical components from the feed station whereby each of said compartments has a central axis that is oriented perpendicular to the axis of the wheel;

- a test station that includes a fixed first electrical contact and a second electrical contact that is movable in a direction away from said wheel and wherein when an electrical component is located within the test station, the first and second contacts will automatically become connected to the component;

testing apparatus operatively connected to the first and second electrical contacts of the test station;

a cam means attached to said wheel;

- a cam engagement means connected to said second contact and engaged to said cam means whereby rotation of said wheel causes the cam means to move and thereby cause a movement of the cam engagement means whereby said movement of the cam engagement means causes movement of the second contact;

- a sorting station operatively connected to the testing apparatus whereby an electrical component that is within the sorting station can be directed by a transfer means into one of at least two receiving means based on the testing performed at the test station; and

wherein when an electrical component is located in one of the compartments of the wheel, said component is transported from the feed station to the test station and then to the sorting station while remaining in said compartment.



**5,568,871**  
**DOOR AND CHUTE FOR SEPARATED WASTE CONTROL**

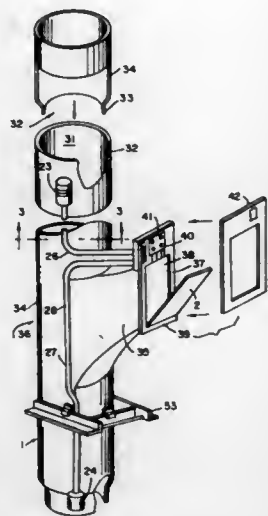
Mark D. Shantzis, 6061 Collins Ave., #6F, Miami Beach, Fla. 33147

Filed Jan. 16, 1996, Ser. No. 585,643

Int. Cl.<sup>6</sup> B07C 7/04

U.S. Cl. 209—703

26 Claims



1. In a system for selective, separated collection of waste in a plurality of waste collection receptacles in a building having a plurality of floors having a chute with access door at each floor from which waste is to be collected, a receptacle mover for moving a selected one of a plurality of receptacles beneath the chute to receive a particular category of waste deposited through an access door, remote door lock means connected to each door to controllably prevent access to the chute, door sensing means for determining when a door is closed, waste category selection means at each access door for selecting a category of waste to be received by a receptacle, and means for controlling the receptacle mover to move a receptacle beneath the chute suitable for a selected waste category while locking access door as required, the improvement comprising:

a modular chute assembly section which can be joined with other sections to form a multistory gravity conveyor chute for wastes the section comprising:

A) a sidewall having basically a tubular shape with a vertical axial bore which guides waste items falling through the bore thereof, said section having an upstream end opening for venting and for receiving items dropped into said section from above, a downstream end opening for discharging items passing through the bore, at least one of the ends being selectively engagable with an adjacent section on another floor to form a conveyor chute longer than a single section;

B) a radially outward distention of the sidewall at a position intermediate the upstream and downstream ends forming a protuberance, the protuberance provided with a substantially vertical portal through which items can be dropped into the bore of the section, the portal provided with a rigid frame assembly having a first edge and other edges;

C) a self-closing access door pivotally attached to said first edge; and

D) a housing attached to an edge other than said first edge, said housing provided with:

- i) an electrically powered door lock means for selectively preventing access to the portal;
- ii) waste category selection means for selectively controlling a category of waste to be received;
- and iii) signal means for conveying operating condition information.

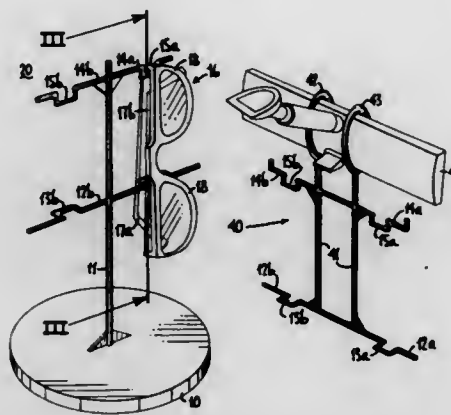
**5,568,872**  
**EYEGLASS HOLDER**

Wayne M. Hinnant, Sr., 534 S. Conestoga St., Philadelphia, Pa. 19143

Continuation-in-part of Ser. No. 305,196, Sep. 13, 1994, abandoned. This application May 30, 1995, Ser. No. 453,218

Int. Cl.<sup>6</sup> A47F 7/00

16 Claims



1. An eyeglass holder, for supporting at least one pair of eyeglasses, the eyeglasses having a lens frame and two earpieces which are coupled to respective hinges, the hinges being spaced a distance apart and coupled to the lens frame, the earpieces being hingable between an open and closed position, the holder comprising:

at least one vertical support piece;

at least one upper horizontal arm fixed to said at least one vertical support piece, said at least one upper horizontal arm being dimensioned to fit between the lens frame and an upper-hinged one of the earpieces adjacent a respective upper one of the hinges such that the eyeglasses hang from the upper horizontal arm;

at least one lower horizontal arm fixed to said at least one vertical support piece below said upper horizontal arm, said at least one lower horizontal arm being disposed vertically below said at least one upper horizontal arm and providing an abutment against which a lower-hinged one of the earpieces rests, said upper and lower horizontal arms being spaced by a distance less than the distance between the hinges, whereby the lower-hinged one of the earpieces is prevented from falling into the open position by the abutment without interfering with placing and removing the eyeglasses from the holder; and,

further comprising at least one notch formed in at least one of the upper horizontal arm and the lower horizontal arm, said notch retaining the eyeglasses against lateral displacement relative to the at least one vertical support.

**5,568,873**  
**HEIGHT EXPANDABLE RACK FOR COMPACT DISCS**  
H. Thomas Gloscia, 137 Water Mill Towd Rd., Water Mill, N.Y. 11976

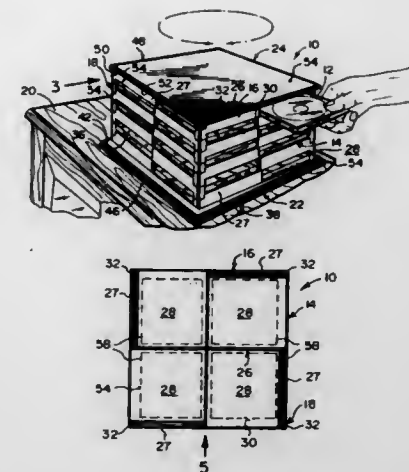
Filed Mar. 10, 1995, Ser. No. 402,474

Int. Cl.<sup>6</sup> A47F 7/00

U.S. Cl. 211—40

8 Claims

1. A height expandable rack for compact discs comprising:  
a) a plurality of plates, each said plate being square shaped;  
b) means for storing a plurality of the compact discs in a horizontal plane on each said plate, said storing means including a cross framework with bent arms at right angles in the same direction, having four compartments on a top surface of each said plate, with each said compartment extending inwardly from one side of said plate, whereby said bent arms



of said stacked cross frameworks are in alternate clockwise and counterclockwise extending directions on said plates;

c) means for stacking said plates together in an interconnected manner in a limited area space on a flat horizontal surface, said stacking means including each said cross framework having four recessed corners, and each said plate having four feet, whereby each said foot extends from a corner on a bottom surface to fit into each said recessed corner on said cross framework below, in which said bent arms are in the alternate extending direction

d) means for rotating said plates on the flat horizontal surface, so that there is easy access to any compact disc stored within said storing means on said plates; and

e) means for covering said uppermost plate to complete the configuration of said rack.

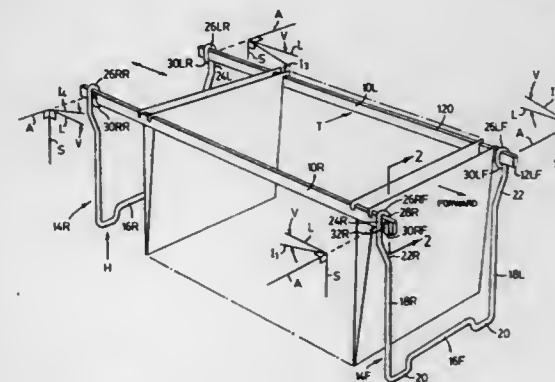
**5,568,874**  
**HANGING FILE FRAME**  
Calford E. Robinson, 100 Leander St., Bramalea Ontario, Canada

Filed Jan. 26, 1995, Ser. No. 378,711

Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 211—46

12 Claims



1. Horizontal file rack comprising:  
a pair of longitudinal members shaped to define, in use, a section of predetermined larger height and smaller thickness along longitudinal extents at each end, said height being defined between upper and lower edges, a pair of slightly resiliently deformable transverse members having the general shape of a U when viewed in the longitudinal direction, whereby each transverse member terminates in a pair of spaced uprights, each upright terminating in a first hairpin turn connected, at its upper end, to a first, downwardly extending length connected

at its lower end by a second hairpin turn to a second, upwardly extending length, the connection between said upright and said first length defining a downwardly open bight and the connection between said first length and said second length defining an upwardly open bight,

said bights defining, when viewed in the longitudinal direction, the upper and lower bounds of a first profile of a passage, the separation of said bounds being slightly less than said height, said bights defining an insertion direction, at a small vertical angle about an axis perpendicular to the upright and the longitudinal members, rotationally displaced in a predetermined sense from said longitudinal direction, the upper and lower bounds of a second profile of said passage dimensioned to slidably receive the end of a longitudinal member, said bights being arranged to define said passage so that the insertion direction is displaced through an opposite sense from the longitudinal direction at opposite uprights of the same transverse member.

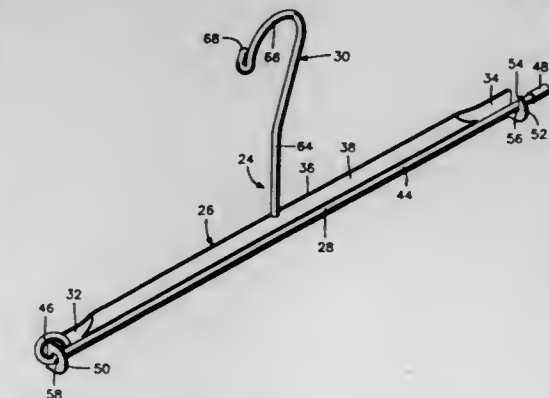
**5,568,875**  
**BULK BALLOON HANGER**  
J. Edward Johnson, 5205 15th St., Lubbock, Tex. 79416, and Tom Gabhart, Huntington, Ind., assignors to J. Edward Johnson, Lubbock, Tex.

Filed May 15, 1995, Ser. No. 441,456

Int. Cl.<sup>6</sup> A47F 5/01

U.S. Cl. 211—113

13 Claims



1. A bulk balloon hanger comprising an elongated bar, an elongated clamping rod oriented for contact with the longitudinal extent of the bar, means hingedly connecting one end of the rod to one end of the bar, means detachably connecting the other end of the rod to the other end of the bar, a support on a central portion of the bar for engagement with a supporting member, said bar including a central portion bowed toward said rod for clampingly receiving a plurality of uninflated mylar balloons securely gripped between the bowed curved bar and said rod.

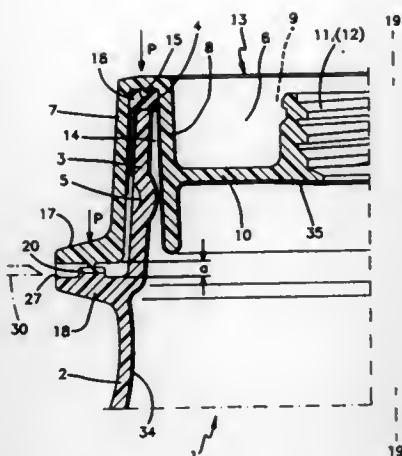
**5,568,876**  
**REUSABLE BARREL OF SYNTHETIC RESIN**  
Udo Schutz, Ruckersteg 4, 56242 Selters, Germany  
Filed Dec. 15, 1993, Ser. No. 166,843  
Claims priority, application Germany, Dec. 16, 1992, 42 42 370.8

Int. Cl.<sup>6</sup> B65D 51/18

U.S. Cl. 220—254

3 Claims

1. In a reusable barrel of synthetic resin, with a blow-molded barrel body having a solid border projecting radially toward the outside from a barrel wall at a spacing below a barrel opening, an injection-molded plastic lid with an outer rim encompassing a barrel neck and an inner rim dipping into the barrel neck and projecting beyond the lid bottom below the barrel opening, and a



sealing ring disposed between the lid outer rim and the lid inner rim, said sealing ring being urged by closure of the lid against an opening rim of the barrel neck; said barrel having a bung hole lid comprising a filling and emptying bung hole, and an aerating and venting bung hole, said outer rim terminating with a lid flange which defines with the barrel border a spacing between each other, the improvement comprising means to sealingly yet removably secure the lid and the barrel body disposed within said spacing, said means comprising a removable continuous sealing web coaxial to a barrel axis welding said lid flange to said barrel border, said removable sealing web spanning said spacing axially and being recessed radially inwardly from an inner and outer periphery of the lid flange and the barrel border.

5,568,877

# METHOD OF MANUFACTURE FOR CONTAINER FOR HOT FOOD

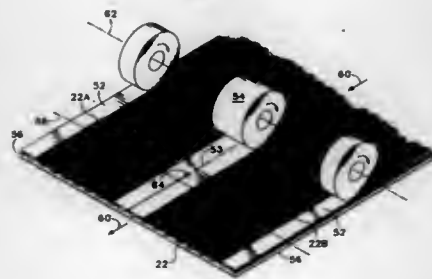
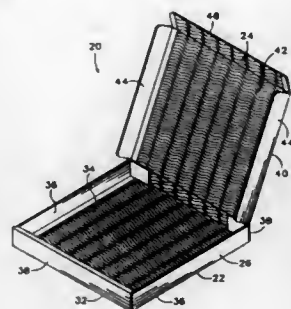
Frederick A. Rench, Boise, Id., assignor to Boise Cascade Corporation, Boise, Id.

Continuation-in-part of Ser. No. 308,294, Sep. 19, 1994. This application Feb. 3, 1995, Ser. No. 383,525

Int. Cl.<sup>6</sup> B32B 3/16; B65D 5/56

U.S. Cl. 220-441

19 Claims



1. A method of making a hot food container, comprising the steps of:

- (a) providing a continuous length sheet of single-face corrugated material having opposite side edge portions;

- (b) affixing a tape having a first width onto exposed corrugations of the sheet along the length of each of the two opposed side edge portions;
- (c) cutting the sheet transversely thereby forming discrete pieces each having a length suitable for fabrication into a single hot food container, each piece having double-face taped side edge portions and exposed corrugations extending between the taped side edge portions; and
- (d) bending the double-face side edge portions to a position substantially orthogonal to the exposed corrugations for forming a container from the blank having double-face side walls and a single-face bottom wall.

5,568,878

# FILAMENT WOUND PRESSURE VESSEL HAVING A REINFORCED ACCESS OPENING

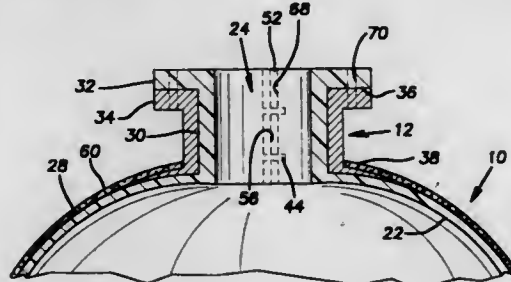
Edward T. LeBreton, Mentor, Ohio, assignor to ESSEF Corporation, Chardon, Ohio

Filed Jan. 11, 1996, Ser. No. 605,261

Int. Cl.<sup>6</sup> B65D 1/16

U.S. Cl. 220-465

5 Claims



1. A filament-wound pressure vessel having a reinforced access opening comprising a blow-molded one piece liner having an outer surface defined by a cylindrical sidewall and oblate ellipsoidal ends, said liner defining at least one access opening into the vessel, said access opening having a cylindrical neck portion and a liner flange extending radially outwardly from an open distal end of said neck portion, and a cylindrical reinforcement member surrounding said cylindrical neck portion and having a supporting flange at one end thereof engaging an annular face of said liner flange, said reinforcement member having a radially extending supporting foot at another end thereof contacting the outer surface of said liner, said reinforcement member comprising a plurality of separate arcuate segments and a resin-impregnated filament winding covering said liner and said supporting foot.

5,568,879

# VERSATILE AND UNIVERSAL PAINT CAN ATTACHMENT

Narong Kovathana, 930 W. Winona Ave., #410, Chicago, Ill. 60640-3219

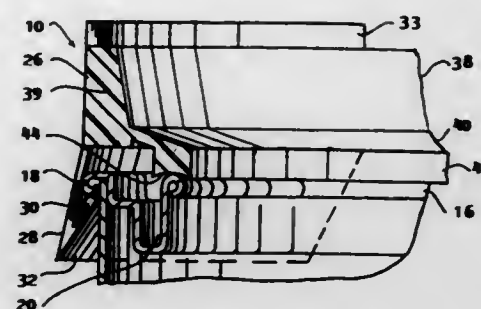
Continuation-in-part of Ser. No. 176,108, Dec. 30, 1993, abandoned. This application Feb. 20, 1996, Ser. No. 602,496

Int. Cl.<sup>6</sup> B65D 25/42

U.S. Cl. 220-697

10 Claims

1. A paint can attachment for a paint can, said paint can having a generally right-circular-cylindrical side wall, a generally circular paint can top attached to said paint can side wall at the uppermost right section of said paint can side wall, a paint can bottom attached to said paint can side wall across the lowermost right section of said paint can side wall, and an original paint can lid removably attached to said paint can top ending at an inner radius less than an outer radius of said paint can side wall, said paint can top having an outer peripheral bead around said outer radius and an inner peripheral bead around said inner radius, said paint can



holding paint, and when said original paint can lid is removed, paint can be taken out from said paint can, said paint can attachment comprising:

- an annular ring which can be removably attached to said paint can, said annular ring having an outer wall which is generally concentric with said paint can side wall, said annular ring having an inner wall generally concentric with said annular ring outer wall;
- a generally conical portion of said annular ring inner wall, said conical portion having an inner radius less than said original paint can lid outer radius, said conical portion for receiving and supporting said original paint can lid when said original paint can lid is removably disposed on said conical portion;
- an annular ledge developing a generally circular, downward and radially inward, lowest portion of said annular ring inner wall, said annular ledge extending to a smallest radius less than said paint can top inner radius, said annular ledge having an annular ledge bottom extending radially outward from said smallest radius, said annular ledge bottom for removably sealing said annular ring against said inner peripheral bead when said annular ring is removably attached to said paint can, said annular ledge being resilient and able to adjust to make a sealing contact with said inner peripheral bead when said annular ring is removably attached to said paint can, said annular ledge bottom having a wide sealing surface so that said annular ledge bottom can adjust to size variations of said paint can top to make a sealing contact with said inner peripheral bead; and
- a pouring spout connected to said annular ring, said pouring spout for pouring paint from said paint can.

5,568,880

# COMPARTMENTALIZED VITAMIN DISPENSING SYSTEM

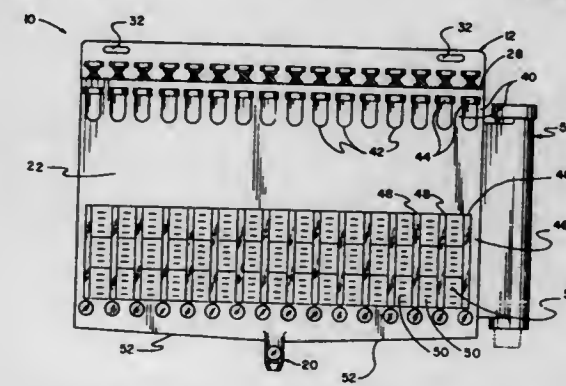
Ronnie C. DiBartolomeo, P.O. Box 408, Monterey, Calif. 93942

Filed Jul. 31, 1995, Ser. No. 509,433

Int. Cl.<sup>6</sup> B65G 59/00

U.S. Cl. 221-131

6 Claims



1. A new and improved compartmentalized vitamin dispensing system for use in association with vitamins and minerals in either liquid or powdered form, the apparatus comprising, in combination:

a housing unit formed as a hollow generally rectangular shaped box with a front wall, a rear wall, two side walls, an upper wall and a lower wall, the rear wall having a greater height than the front wall and including two hanging slots positioned adjacent to its uppermost extent, the hollow interior of the housing unit being divided into a plurality of dispensing columns, adjacent dispensing columns being separated by vertical dividers, the front wall having an upper region including a plurality of insertion tubes extending within the dispensing columns, each tube including a removable cap, the insertion tubes permitting the placement of liquid or powdered vitamins and minerals into each dispensing column, the lower region of the front wall including a plurality of elongated transparent windows and incremental markers, the lower wall being angled in a downward direction from each side edge to the approximate centerpoint thereof, one side wall including a generally cylindrical shaped cup dispenser, the dispenser adapted to retain and dispense disposable cups therefrom;

a plurality of, dispensing tubes, each formed in an elongated cylindrical configuration, each dispensing tube being positioned through the upper wall and secured in a dispensing column, each dispensing tube including an upper section, a lower section and a central section therebetween, each upper section being formed contiguously with an insertion tube to permit the replenishment of vitamins and minerals residing in the lower section of each dispensing tube, the lowermost extent of the lower section including an aperture;

a plurality of plunger devices, each comprising a head, a knob having resilient means and a cylindrical rod therebetween, a plunger device being positioned axially within the upper and central sections of each dispensing tube with the head located at the approximate centerpoint thereof, the plunger adapted to be pushed downward to force fluid and powder positioned within the dispensing tubes in a downward direction, the resilient means forcing the plunger back to its original position after depression;

a plurality of dispensing knobs, each including a valve rotatably coupled below the dispensing tubes of the apparatus, the valves including means to retain and dispense materials residing in the dispensing tubes upon turning of the knobs, a rounded trough being positioned below the valves and affixed to the downwardly angled lower wall, the trough causing materials deposited therein to roll toward the centerpoint of the lower wall, the knob including means to preset the amount of vitamins and minerals to be dispensed upon turning of the knob; and

a dispensing spout formed in a cylindrical configuration and extending vertically from the approximate centerpoint of the lower wall, the spout including an axial aperture with a valve positioned therein, the valve being rotatably coupled within the spout and including a handle extending through the spout, the valve including means to retain and dispense vitamins and minerals upon turning of the handle.

5,568,881

# PIPETTE TIP DISPENSER

Wen Y. Chi, 1310 Funston Ave., San Francisco, Calif. 94122

Filed Jul. 31, 1995, Ser. No. 509,454

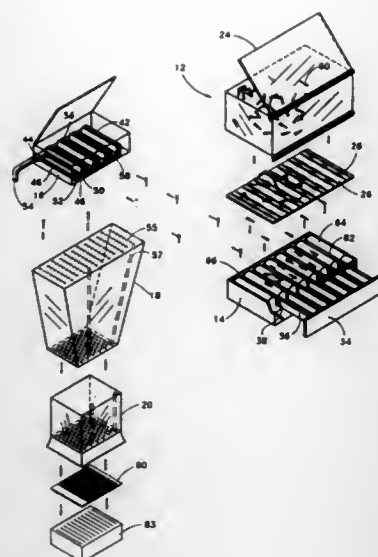
Int. Cl.<sup>6</sup> B65G 59/00

U.S. Cl. 221-175

9 Claims

1. A dispensing system for pipette tips comprising: a hopper for receiving a bulk supply of pipette tips; a separator means for lining the tips in organized rows; a sieve positioned between the hopper and separator for orienting tips before they enter the separator; means for organizing and spacing the tips; means for moving the tips from the separator to the organizer; means for storing the tips; means for moving the tips from the organizer to the means for storing, and means for ejecting the tips from the storing means to a means for holding the tips ready for use.





5,568,882

## PRECISE VOLUME FLUID DISPENSER

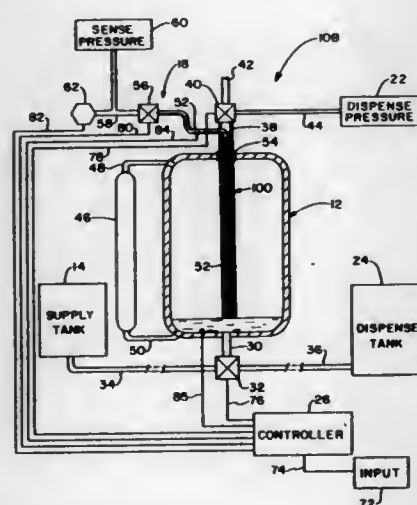
Gregory W. Takacs, Hudson, Ohio, assignor to ABC Techcorp, Akron, Ohio

Filed Feb. 3, 1995, Ser. No. 383,445

Int. Cl.<sup>6</sup> B67D 5/08

U.S. Cl. 222-61

14 Claims



1. A fluid dispenser for measuring precise volumes of a fluid, comprising:

- a pressure vessel for receiving a fluid supplied from a supply tank; a sense pressure supply
- a bubbler tube received within said pressure vessel and connected to said sense pressure supply, said sense pressure supply continually exerting a pressure through said bubbler tube while said pressure vessel is receiving said fluid from said supply tank;
- a controller in communication with said bubbler tube for controlling the inflow and outflow of said fluid through said pressure vessel; and
- a pressure transducer connected to said controller and in communication with said bubbler tube, said pressure transducer monitoring a pressure within said bubbler tube, said controller correlating said pressure to a volume of said fluid in said pressure vessel and stopping said inflow of said fluid when said pressure reaches a predetermined level.

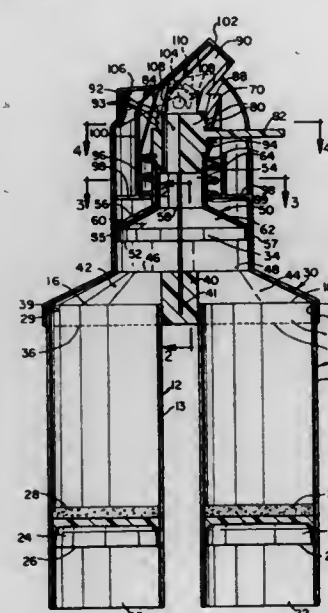
5,568,883  
APPARATUS FOR DISPENSING TWO FLOWABLE  
SUBSTANCES IN A USER SELECTABLE RATIO  
Ralph J. Cataneo, Brooklyn, N.Y., and Robert J. Tannebaum,  
Freehold, N.J., assignors to Innvision Services, Inc., Clifton,  
N.J.

Filed Apr. 10, 1995, Ser. No. 419,316

Int. Cl.<sup>6</sup> B67D 5/52

U.S. Cl. 222-136

18 Claims



1. An apparatus for dispensing two flowable substances in a user selectable ratio comprising:

- a first container for receiving a first flowable substance, the first container having a uniform cross section and including a first, generally open dispensing end and a second end which initially includes a piston which is movable only toward the dispensing end as the flowable substance flows out of the dispensing end;
- a second container for receiving a second flowable substance, the second container having a uniform cross section and including a first, generally open dispensing end and a second end which initially includes a piston which is movable only toward the dispensing end as the second flowable substance flows out of the dispensing end;
- a manifold member having an inlet end and an outlet end, the inlet end having a pair of inlet openings for removably receiving the dispensing ends of the first and second containers, the manifold member being internally divided by a divider into two chambers, a first chamber being in fluid communication with the dispensing end of the first container, for receiving the first flowable substance, and a second chamber being in fluid communication with the dispensing end of the second container, for receiving the second flowable substance, the outlet end having a pair of outlet openings corresponding to the inlet openings so that the first and second flowable substances from the first and second containers flow into their respective inlet opening, through the respective chambers and out of the respective outlet openings of the manifold member;
- a pump member having an inlet end in fluid communication with the first and second manifold chambers and having an outlet end the pump member being movable with respect to the manifold member;
- a selector member in fluid communication with the outlet end of the manifold member, the selector member having a single opening of a predetermined size and a predetermined shape extending therethrough, the selector member being selectively rotatable with respect to the outlet end of the manifold member from a first position, in which the selector member opening is in fluid communication with the outlet of the first chamber of the manifold member with the outlet of the second

chamber of the manifold member being blocked by the selector member, through a plurality of intermediate positions, in which the opening of the selector member is in fluid communication with portions of the outlets of both of the manifold member chambers with the remaining portions of the outlets of both of the manifold member chambers being blocked by the selector member, to a second position, in which the opening of the selector member is in fluid communication with the outlet of the second chamber of the manifold member and the outlet of the first chamber of the manifold member is blocked by the selector member; and

- a single dispenser outlet opening in communication with the selector member whereby, upon movement of the pump member by a user in a first direction with respect to the manifold member from an initial, rest position, a predetermined measure of flowable substance is dispensed from the apparatus with the ratio of the flowable substance which constitutes the predetermined measure being selectively variable by the user from one hundred percent of the first flowable substance and zero percent of the second flowable substance when the selector member is in the first position to zero percent of the first flowable substance and one hundred percent of the second flowable substance when the selector member is in the second position to any desired ratio therebetween when the selector member is in an intermediate position and wherein when, upon movement of the pump member in a second direction with respect to the manifold member opposite to the first direction, one or both of the pistons are moved to cause one or both flowable substances to flow into the respective manifold member chambers to thereby fill both of the manifold member chambers with the respective flowable substances.

a supply (3) of said substance;

feed means (5, 6) adapted to displace a measured quantity of said substance from the supply (3) into the ejection channel (4) when the actuator member (2) is displaced from its rest position to its actuated position; and

an air pump (7) having a pump chamber (8) provided with a displaceable wall (9) secured to the actuator member (2) and adapted to compress the pump chamber (2) when the actuator member is displaced from its rest position to its actuated position, said pump chamber (8) having an inlet valve (10, 11) which communicates with the atmosphere, and an outlet valve (12, 13, 14) which communicates with the ejection channel (4), the outlet valve being constituted by a shutter member (12) which co-operates with an outlet opening (14), said shutter member (12) isolating the outlet opening (14) from the pump chamber (8) so long as the actuator member (2) is not in the immediate vicinity of its actuated position, said shutter member (12) opening communication between the pump chamber (8) and the outlet opening (14) when the actuator member (2) is in the immediate vicinity of its actuated position;

the device being characterized in that the outlet valve is constituted by a valve piston (12) constrained to move with the actuator member (2) and sliding in sealed manner in a valve cylinder (13) having a top end (13a), said cylinder having a lateral outlet orifice (14) which communicates with the ejection channel (4), said valve cylinder having its top end in communication with the pump chamber (8), said lateral outlet orifice being positioned sufficiently far from said top end of the valve cylinder for the valve piston (12) to isolate the lateral outlet orifice (14) from the pump chamber so long as the actuator member (2) is not in the immediate vicinity of its actuated position.

5,568,884  
PORTABLE DEVICE FOR PROJECTING MEASURED  
QUANTITIES OF A FLUID SUBSTANCE BY MEANS OF A  
PUFF OF COMPRESSED AIR

Pascal Bruna, Rouen, France, assignor to Valois S.A., Le Neubourg, France

PCT No. PCT/FR94/00035, § 371 Date Sep. 13, 1995, § 102(e) Date Sep. 13, 1995, PCT Pub. No. WO94/15716, PCT Pub. Date Jul. 21, 1994

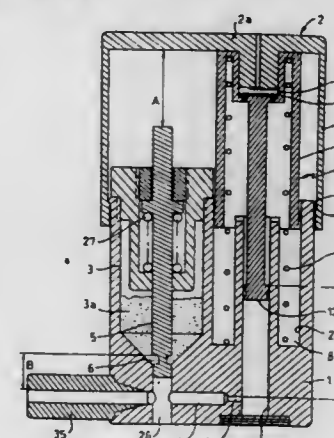
PCT Filed Jan. 12, 1994, Ser. No. 491,927

Claims priority, application France, Jan. 14, 1993, 93 00309

Int. Cl.<sup>6</sup> B67D 5/58

U.S. Cl. 222-189.09

7 Claims



1. A device for projecting measured quantities of a fluid substance by means of a puff of compressed air, said device comprising:

- a body (1) having an ejection channel (4);
- an actuator member (2) displaceable relative to the body (1) between a rest position and an actuated position;
- a resilient return member (19) for the actuator member, urging the actuator member (2) towards its rest position;

5,568,885

## AGITATOR FOR LIQUID PUMP

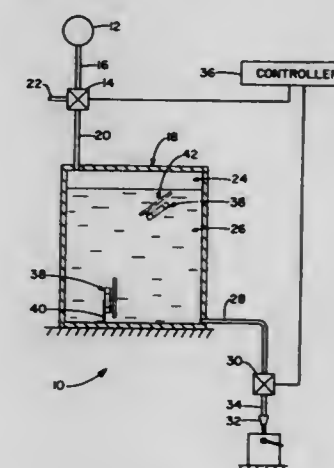
Thomas S. Green, Atwater, Ohio, assignor to ABC Techcorp, Akron, Ohio

Filed Mar. 13, 1995, Ser. No. 403,178

Int. Cl.<sup>6</sup> B65D 88/54

U.S. Cl. 222-318

20 Claims



10. A liquid dispensing system for dispensing a liquid requiring agitation while at rest, the system comprising:

- a pump containing a liquid and a gas, said pump having at least a first and second opening, said liquid normally covering said second opening;
- a source of pressurized gas connected to said first opening;
- a first valve means for regulating fluid flow between said source of pressure and said pump, and for regulating fluid flow between said pump and the atmosphere;
- an outlet tube connected to said second opening;

a second valve means for regulating fluid flow from said pump through said outlet tube;  
control means for selectively controlling said first valve means to create and exhaust a pressure head in said pump, and for selectively controlling said second valve means to dispense said liquid from said pump; and  
an agitator located in said liquid in said pump, said agitator comprising a housing having a chamber maintaining a portion of said liquid, said chamber developing a pressure head when said control means creates a pressure head in said pump, said pressure head in said chamber forcing said portion of said liquid from said chamber when said control means exhausts said pressure heads.

5,568,886

## COMBINED TURRET AND CLOSURE SEAL

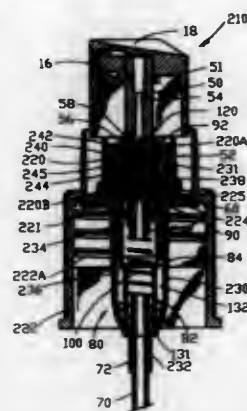
Michael G. Knickerbocker, Crystal Lake, Ill., assignor to AptarGroup, Inc., Cary, Ill.

Filed Jul. 15, 1994, Ser. No. 275,367

Int. Cl. B65D 88/54

U.S. Cl. 222—321.9

20 Claims



1. A combined turret and closure seal for a hand operated dispensing device having a substantially rigid pump body for dispensing a fluid from a container, the improvement comprising:
  - a resilient turret having a resilient tubular portion and a resilient gasket portion;
  - said resilient tubular portion of said resilient turret engaging the substantially rigid pump body;
  - a boss disposed on one of said tubular portion of said turret and the pump body;
  - a closure being securable to the container; and
  - said closure having a closure shoulder for cooperating with said boss for interlocking said pump body to said closure with said resilient turret interposed therebetween to secure the pump body to the container with said resilient gasket portion of said turret providing a seal therebetween.

5,568,887

## CEILING INSTALLER TOOL HOLDER

Charles Golluhue, and Brenda Golluhue, both of 169A Center St., P.O. Box 418, Seville, Ohio 44273

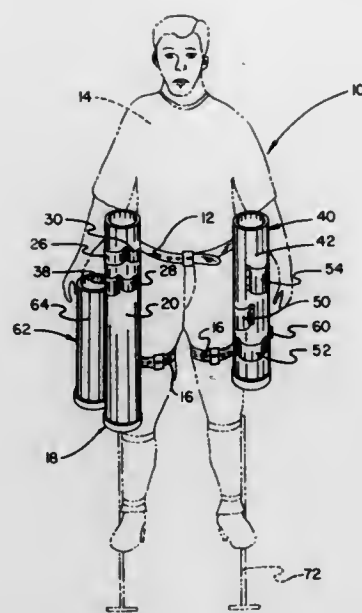
Filed May 26, 1994, Ser. No. 249,705

Int. Cl. A45F 3/00

U.S. Cl. 224—661

7 Claims

2. A new ceiling installer tool holder comprising:
  - a waist strap securable about a waist of an individual;
  - a first leg strap securable about a thigh portion of a leg of an individual;
  - a first rigid cylinder coupled to said waist strap and said first leg strap, said first cylinder having a first cylinder longitudinal axis and a first length with said first cylinder longitudinal axis being vertically oriented;



- a plurality of loops secured to an exterior of said first cylinder for holding tools related to ceiling installation;
- a second leg strap securable about a thigh portion of the other leg of said individual;
- a second rigid cylinder coupled to said waist strap and said second leg strap, said second cylinder having a second cylinder longitudinal axis and a second length with said second cylinder longitudinal axis being vertically oriented, wherein said first length of said first cylinder is greater than said second length of said second cylinder;
- a plurality of pouches secured to an exterior of said second cylinder for holding tools related to ceiling installation;
- a rigid waste cylinder coupled to said first cylinder, said waste cylinder having a waste cylinder longitudinal axis with said waste cylinder longitudinal axis being vertically oriented.

5,568,888

## COMPOSITE MOLDED KNIFE SHEATH

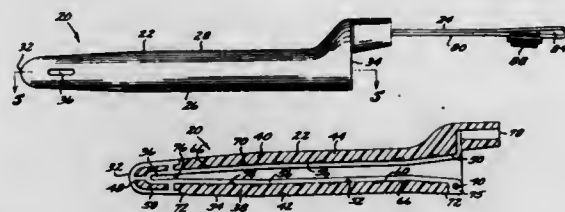
Brett P. Seber, Escondido, Calif., assignor to Buck Knives, Inc., El Cajon, Calif.

Filed Jan. 18, 1995, Ser. No. 374,433

Int. Cl. F41B 13/04

U.S. Cl. 224—232

19 Claims



1. A knife sheath comprising a knife receptacle including:
  - a skeleton made of a first material, the skeleton comprising an elongated skeleton housing having a front side, an oppositely disposed back side, two oppositely disposed narrow edges, a generally closed lower end, and an open upper end;
  - a liner made of a second material, the liner covering at least a portion of an interior of the skeleton housing; and
  - a coating made of a third material, the coating covering at least a portion of an exterior of the skeleton housing,
 wherein the first material is a plastic, the second material is an elastomer, and the third material is an elastomer.

5,568,889

## TOOL HOLDER

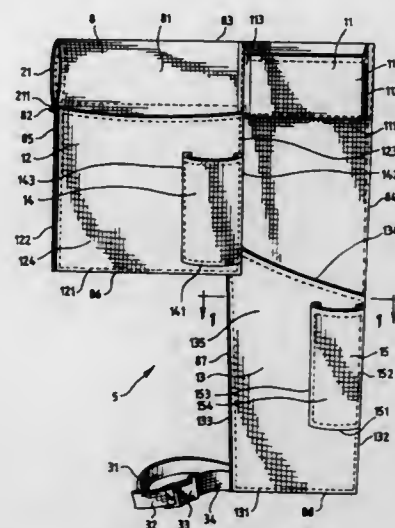
Leon F. Holloway, Jr., 4700 W. 185th St., Country Club Hills, Ill. 60478, and Jesse L. Davis, Jr., 7 E. 113th Pl., Chicago, Ill. 60628

Filed Mar. 31, 1995, Ser. No. 414,940

Int. Cl. B25B 29/00

U.S. Cl. 224—661

8 Claims



1. A tool holder comprising:
  - a flexible, inverted-L-shaped support having a first side, a second side, a top edge, a front edge substantially normal to the top edge, an upper rear edge substantially normal to the top edge, the upper rear edge extending downward to a position intermediate to the ends of the front edge, an upper bottom edge substantially normal to the upper rear edge, the upper bottom edge extending laterally from the bottom of the upper rear edge to a position intermediate to the ends of the top edge, a lower rear edge substantially normal to the upper bottom edge, the lower rear edge extending downward from the upper bottom edge to a position normal to the bottom of the front edge, and a lower bottom edge substantially normal to the front edge, the lower bottom edge forming a substantially right angle with the lower rear edge;
  - a first pocket having a bottom wall attached to the first side of the support, the bottom wall of the first pocket extending outward from the first side of the support, side walls attached to the first side of the support, the side walls of the first pocket extending upward from the bottom wall, and a front wall extending upward from the bottom wall, the bottom wall extending laterally from the front edge of the support to a position intermediate to the ends of the top edge of the support, the side walls extending downward from the top edge of the support to a position intermediate to the ends of the upper rear edge of the support;
  - a second pocket having a front side, a bottom edge attached to the first side of the support, the bottom edge of the second pocket being coextensive with the upper bottom edge of the support, a first side edge attached to the upper rear edge of the support, and a second side edge attached to the first side of the support, the second side edge of the second pocket being substantially collinear with the lower rear edge of the support, the side edges of the second pocket extending upward from the bottom edge of the second pocket to a position intermediate to the ends of the upper rear edge of the support;
  - a third pocket for holding elongated substantially cylindrical objects, the third pocket having a bottom edge attached to the lower bottom edge of the support, the bottom edge of the third pocket being coextensive with the lower bottom edge of the support, a first side edge attached to the front edge of the support, a second side edge attached to the lower rear edge of the support, and a top edge inclined upwardly from the first side edge of the third pocket, the side edges of the third

- pocket extending upward from the bottom edge of the third pocket to a position intermediate to the ends of the front edge of the support;
- a fourth pocket for holding an oblong tool, the fourth pocket having a first side edge attached to the first side edge of the second pocket, a second side edge attached to the front side of the second pocket, and a bottom edge attached to the front side of the second pocket;
- a fifth pocket for holding an elongated cylindrical writing instrument, the fifth pocket having a first side edge attached to the first side edge of the third pocket, a second side edge attached to the front side of the third pocket, a substantially circular bottom wall attached to the first side of the support, the bottom wall of the third pocket extending outward from the front side of the third pocket, and a substantially cylindrical front wall extending upward from the bottom wall of the fifth pocket;
- a flap member having a bottom edge, the flap member extending downward from the top edge of the support to an upper portion of the second side of the support, the bottom edge of the flap member being attached to the second side of the support to receive the belt of a user; and
- a means for fastening the bottom edge of the support to the thigh of the user.

5,568,890

## VEHICLE STORAGE CABINET

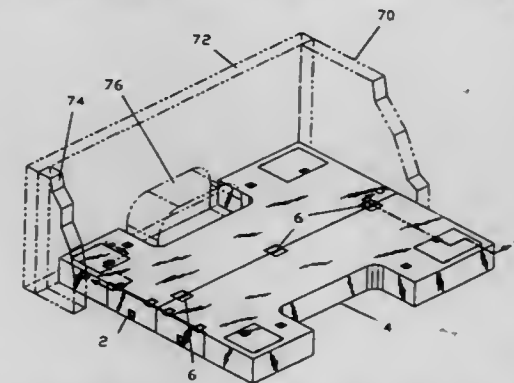
Jack C. Magee, 622 N. Highland, Pierre, S. Dak. 57501, and George Thompson, 215 E. 31st St., Sioux Falls, S. Dak. 57105

Filed Aug. 21, 1995, Ser. No. 517,478

Int. Cl. B60R 7/00

U.S. Cl. 224—539

6 Claims



1. A vehicle storage cabinet for a utility vehicle wherein the vehicle includes a cargo compartment having a floor space having a right side and a left side, opposed side walls which define a height of the cargo compartment, opposed wheel wells and a cargo compartment door at a rear of the utility vehicle; said vehicle storage compartment comprising:
  - a left section adapted to rest on the floor space of the cargo compartment of a utility vehicle having the general shape of a flat box and having a top wall, a bottom wall, a front wall, a back wall, and an outside wall, and an inside wall; the left section being slightly smaller than half the floor space of the cargo compartment of a utility vehicle; the half being the left side of the utility vehicle looking from the rear of the vehicle toward a front of the vehicle; said left section being of a height less than half the height of the cargo compartment; and the front wall of said left section being the wall closest to the cargo compartment door of the utility vehicle;
  - a right section adapted to rest on the floor space of the cargo compartment of a utility vehicle being identical to said left section, but the right section being a mirror image of said left section taken along an inner face of the inside wall of said left section; the inner face of the inside wall of said left section being the face closest to a plane taken through a center of the vehicle perpendicular to the plane of the wheels;

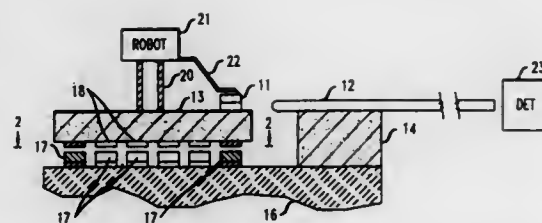


a plurality of hinges affixed to and connecting said left section and said right section; the hinges being affixed to the top wall of said left section and to the top wall of said right section such that said left section and said right section may be rotated upon said hinges until the top walls of said left and right sections are in close proximity to each other;

a left opening adapted to face the cargo compartment door of the utility vehicle in the front wall of said left section; and

a right opening adapted to face the cargo compartment door of the utility vehicle in the front wall of said right section;

whereby the vehicle storage cabinet may be folded upon said hinges and placed upon the floor of the cargo compartment of a utility vehicle and then unfolded to cover the floor of the cargo compartment and whereby articles may be placed upon the top wall of the vehicle storage cabinet for storage or transport and other articles may be inserted through the openings in the front walls of said left section and said right section and safely and securely stored or transported within said left section and said right section; and whereby said left section and said right section may be folded upon said hinges and removed from the vehicle.



solder elements, the first group comprising one or more of the solder elements, and then cooling said first group, thereby to tack the first device to the substrate;

second, reducing stresses on said substrate by thereafter reflowing only a second group of said plurality of solder elements, the second group comprising one or more of the plurality of solder elements that are not part of the first group, and cooling the second group, thereby to provide a more secure bond between the first device and the substrate without interfering with the alignment of the first device.

5,568,891

#### MAKING A FRACTURED POWDER METAL CONNECTING ROD

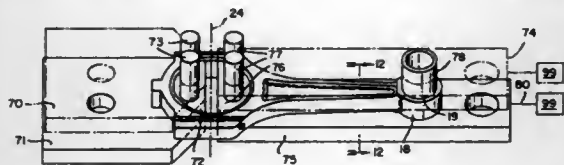
Peter Y. Hoag, 320 Scott's Hill Rd., Milford, Mich. 48042, and David A. Yeager, 9650 Pino Ct., Plymouth, Mich. 48170  
Division of Ser. No. 916,567, Jul. 20, 1992, Pat. No. 5,353,500, which is a continuation of Ser. No. 640,717, Jan. 14, 1991, Pat. No. 5,131,577, which is a division of Ser. No. 194,750, May 17, 1988, Pat. No. 4,993,134. This application May 2, 1994, Ser. No. 203,122

The portion of the term of this patent subsequent to Jan. 14, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B26F 3/00

U.S. Cl. 225-93

2 Claims



1. An apparatus for fracturing a powder metal bearing support having stress risers to initiate cracking along a predetermined cracking plane, comprising:

- a fixture assembly for holding one internal side of said bearing stationary, said one internal side being on one side of said cracking plane; and
- means for fracturingly pulling a second internal side of said bearing away from said one internal side along a track in a direction substantially perpendicular to said cracking plane and without reacting against said one internal side.

5,568,892

#### ALIGNMENT AND BONDING TECHNIQUES

Nagesh R. Basavanahally, Trenton, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jun. 16, 1994, Ser. No. 260,860

Int. Cl.<sup>6</sup> H05K 3/34

U.S. Cl. 228-180.22

9 Claims

1. A method for aligning and soldering a first device to a substrate comprising the steps of: providing a plurality of solder elements between the first device and the substrate; aligning the first device; reflowing and cooling the solder elements to bond the first device to the substrate while holding the first device in substantial alignment; wherein the improvement comprises:

- first, maintaining alignment between said first device and said substrate by reflowing only a first group of said plurality of

5,568,893

#### INTERNAL WELDING FIXTURE

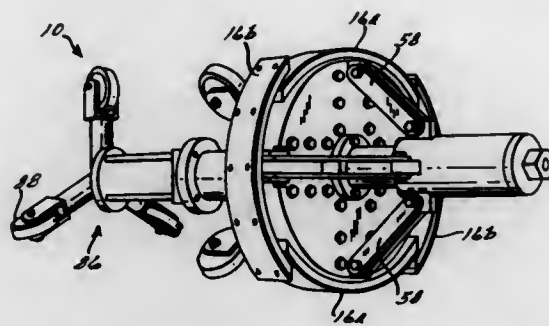
Warren B. Depperman, Lugoff, S.C., assignor to Cogsdill Tool Products, Inc., Camden, S.C.

Filed Oct. 31, 1994, Ser. No. 332,241

Int. Cl.<sup>6</sup> B23K 37/053

U.S. Cl. 228-44.5

20 Claims



1. An internal welding fixture for use in joining two tubular workpieces, the fixture comprising:

- a plurality of shoe assemblies including a first group of shoe assemblies and a second group of shoe assemblies, each shoe assembly of said plurality of shoe assemblies being radially arranged about an axis and each shoe assembly of said plurality of shoe assemblies further being radially moveable between a contracted position and an extended position;
  - a drive arrangement including a single piston rod operatively interconnected to each shoe assembly of said plurality of shoe assemblies for moving each shoe assembly of said plurality of shoe assemblies between said contracted position and said extended position; and
  - a delay mechanism for mechanically delaying the initiation of retraction of each shoe assembly of said second group of shoe assemblies such that during a first interval of time said drive arrangement partially retracts said shoe assemblies of said first group of shoe assemblies while said shoe assemblies of said second group of shoe assemblies are radially stationary and during a second subsequent interval of time said drive arrangement fully retracts each shoe assembly of said plurality of shoe assemblies;
- whereby said shoe assemblies of said plurality of shoe assemblies cooperate to form a substantially continuous backup about an internal joint formed between the two tubular workpieces when said shoe assemblies are each in said extended position.

5,568,894

#### APPLYING FLUX TO A SOLDER WAVE FOR WAVE SOLDERING AN ELEMENT

John H. Gileta, Chateaugay, Canada, assignor to Electrovert Ltd., La Prairie, Canada

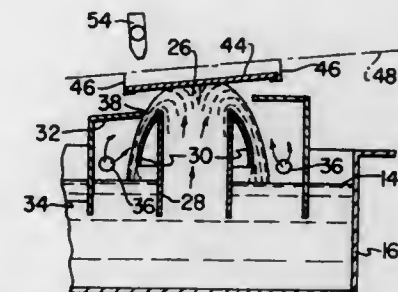
Continuation-in-part of Ser. No. 72,568, Jun. 4, 1993, abandoned. This application Nov. 30, 1994, Ser. No. 347,606

Int. Cl.<sup>6</sup> B23K 35/36; 35/38; 31/02

U.S. Cl. 228-219

22 Claims

U.S. Cl. 241-24.29



1. A process for wave soldering an element comprising the steps of:

- forming a solder wave above a solder reservoir;
- providing a shield gas to blanket the solder wave using a shield gas delivery means;
- applying a flux from a flux applicator separate from said shield gas delivery means, the flux applicator directing the flux onto the solder wave; and
- conveying the element through at least a portion of the solder wave.

5,568,895

#### TREATMENT OF WASTE MATERIALS FOR DISPOSAL

Stephen Webb, and Richard J. Lear, both of Cairns, Australia, assignors to Matrix Technology Pty. Ltd., Mooroolbark, Australia

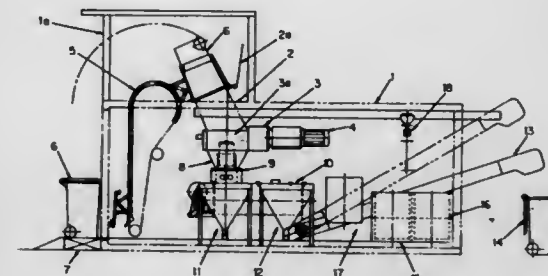
PCT No. PCT/AU93/00268, § 371 Date Dec. 9, 1994, § 102(e) Date Dec. 9, 1994, PCT Pub. No. WO93/25329, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 7, 1993, Ser. No. 351,366

Claims priority, application Australia, Jun. 9, 1992, PL2810 Int. Cl.<sup>6</sup> B02C 9/04; 21/02; 23/18

U.S. Cl. 241-16

17 Claims



1. A method for treatment of waste materials comprising the steps of:

- shredding a waste material to obtain a finely divided particulate material;
- wetting said waste material with an oxidizing solution;
- said shredding and wetting steps treating said waste material with an alkaline earth oxide or hydroxide; and
- mixing the alkaline earth oxide or hydroxide treated waste material with an absorbent material to absorb excess liquid, the resultant treated waste material comprising a moist particulate disinfected mass.

5,568,896

#### METHODS FOR PREPARING PULPWOOD FOR DIGESTION

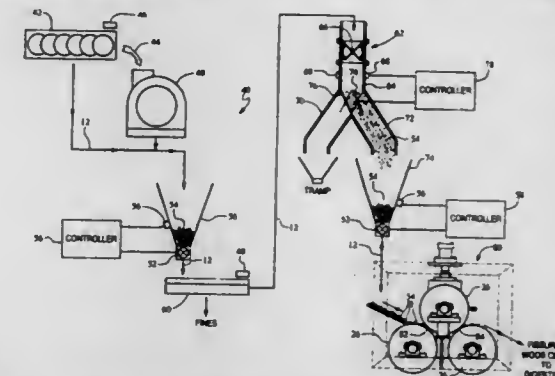
James E. Adams, Portland, Oreg.; John D. Lynn, Memphis, Tenn., and Ravindran Nadarajah, Vancouver, Wash., assignors to Beloit Technologies, Inc., Wilmington, Del.

Filed Feb. 22, 1994, Ser. No. 200,089

Int. Cl.<sup>6</sup> B02C 4/02; 23/08

U.S. Cl. 241-24.29

19 Claims



1. A method for preparing a stream of pulpwood chips for subsequent delignification of the wood fibers, said stream including acceptable size chips overthick and oversize chips and gross overthick and oversize chips, the method employing a chip destructuring apparatus of the type having two opposed rolls forming a nip therebetween, wherein the method comprises the steps of:

- screening said stream of wood chips to obtain a first fraction of chips containing substantially all of said gross overthick and oversize chips, and a second fraction containing substantially only acceptable size and overthick and oversize chips;
- accumulating said second fraction of wood chips in a surge bin; sensing the level of chips in the bin;
- controlling a means for chip metering so that a constant flow of chips is metered when the sensed level of chips within the bin exceeds a selected level, and no chips are allowed to flow if the sensed level of chips within the bin is below the selected level, which would not support a given flow;
- passing said second fraction of chips from the bin through a chip destructuring apparatus, thus allowing the destructuring apparatus to be configured for a uniform high level of chip processing; and
- destructuring a substantial portion of chips, said destructuring being done without substantial size reduction.

5,568,897

#### CUTTER FOR CUTTING YARN IN TEXTILE MACHINES

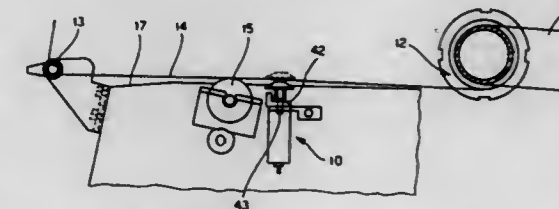
Carlo Menegatto, Monza, Italy, assignor to Menegatto S.r.l., Milan, Italy

Filed Dec. 23, 1994, Ser. No. 363,525

Claims priority, application Italy, Dec. 24, 1993, MI93A2732 Int. Cl.<sup>6</sup> B65H 54/71; 75/32

U.S. Cl. 242-19

8 Claims



1. A cutter for cutting yarn in a textile machine in which said yarn moves in the direction of a longitudinal line and also moves transversely relative to said longitudinal line to provide a trans-

verse oscillating movement in a horizontal plane, the cutter comprising: a first mobile cutting element, a second lower fixed cutting element, a stem for supporting the first mobile cutting element and extending toward the second fixed cutting element, said stem and said first mobile cutting element being normally positioned beneath said horizontal plane in order to permit said transverse oscillating movement of the yarn, means for driving the stem and therefore the first mobile cutting element to an upper intercepting position and to a lower cutting position, wherein in said intercepting position, the stem extends away from the lower fixed cutting element to define means for intercepting the yarn during said transverse oscillating movement of the yarn in said horizontal plane, and in said lower cutting position, the stem is retracted toward the second fixed cutting element to cut the yarn.

5,568,898

## WRAP AROUND LABEL

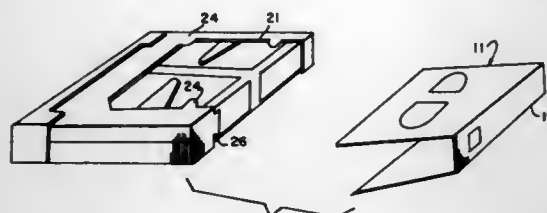
Paul J. Gelardi, John A. Gelardi, and David A. Capotosto, all of Cape Porpoise, Me., assignors to LCV Associates, Kennebunkport, Me.

Division of Ser. No. 145,318, Nov. 3, 1993. This application  
Jun. 7, 1995, Ser. No. 478,833

Int. Cl.<sup>6</sup> G11B 23/087

U.S. Cl. 242-344

7 Claims



1. A video cassette and label combination comprising a cassette having integrally formed base, back and cover portions, at least one of said portions having plural molded openings and further having plural hub openings formed in the base portion, a label having bottom, rear and upper sections for respective attachment to the base, back and cover portions of the cassette, the bottom section being detachable from the label along perforations between the rear and the bottom sections, for removal from the cassette.

5,568,899

## LIGHTWEIGHT VIDEO CASSETTE CARTRIDGE

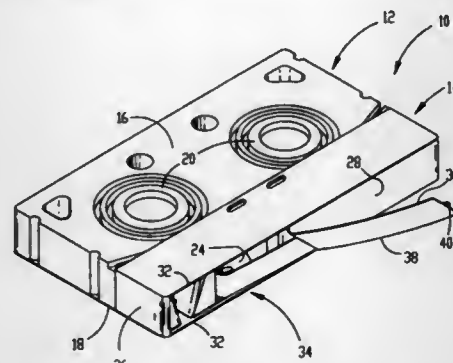
Kermit T. Krantz, and Charles R. Jones, Jr., both of Leawood, Kans., assignors to V-Lite Corporation, Leawood, Kans.

Filed May 5, 1995, Ser. No. 435,589

Int. Cl.<sup>6</sup> G11B 23/04; 23/087

U.S. Cl. 242-347.2

5 Claims



1. A video cassette cartridge for use in a video cassette recorder, said video cassette cartridge comprising:

a video tape housing;  
a pair of video tape reels rotatably mounted within said housing for storing and winding video tape thereon;  
said video tape housing having a slot for exposing the video tape; and  
a dust cover for covering said slot to protect the exposed video tape from damage, said dust cover including  
a base portion attached to said housing, and  
a tear strip releasably attached to said base portion by lines of weakness between said base portion and said tear strip so that said tear strip covers said slot when attached to said base portion and exposes the video tape for play in the video cassette recorder when removed from said base portion.

5,568,900

## RECEIVER HITCH SPOOLED WIRE DISPENSER

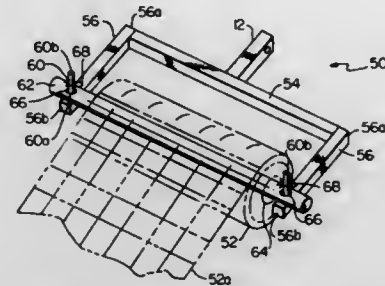
Harian D. Conroy, 814 W. 5th St., Hardin, Mont. 59034

Filed Jun. 26, 1995, Ser. No. 494,799

Int. Cl.<sup>6</sup> B65H 16/06; 49/00

U.S. Cl. 242-557

4 Claims



1. A wire dispenser adapted for use with a receiver hitch, comprising:

- a drawbar having a first end thereof that includes a substantially square cross section that is adapted for slideable insertion into said receiver hitch, said receiver hitch having a substantially square cross section the inside dimensions thereof being larger than the outside dimensions of said first end of said drawbar and being adapted to receive and surround a portion of said first end of said drawbar and said drawbar having a second end that is disposed opposite with respect to said first end;
- means for securing said first end of said drawbar to said receiver hitch when said first end of said drawbar is disposed substantially inside of said receiver hitch; and
- means for supporting at least one spool of wire attached to said second end of said drawbar, said means for supporting adapted to permit rotation of said at least one spool of wire thereon, said means for supporting including a cross member having a longitudinal axis disposed in substantially perpendicular alignment with respect to a longitudinal axis of said drawbar and including a pair of end support members each attached to said cross member at a predetermined spaced apart relationship, each of said pair of end support members having a longitudinal axis that is disposed parallel with respect to each other and with said longitudinal axis of said drawbar and wherein said longitudinal axis of each of said pair of end support members is disposed perpendicular with respect to said longitudinal axis of said cross member and including a pair of upright post members, each of said pair of upright post members attached at one end thereof to one of said pair of end support members and including a cross tube, said cross tube including a pair of holes disposed on opposite ends thereof wherein each of said pair of holes aligns with one of said pair of upright post members, whereby said cross tube is adapted for placement on said pair of end support members and for each of said pair of upright post members to pass through each of said pair of holes.

5,568,901

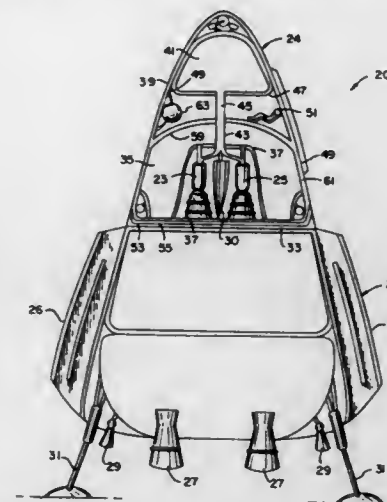
## TWO STAGE LAUNCH VEHICLE AND LAUNCH TRAJECTORY METHOD

Patrick J. G. Stiennon, Madison, Wis., assignor to William Henry Gates, Redmond, Wash.

Filed Aug. 1, 1994, Ser. No. 283,739

Int. Cl.<sup>6</sup> B64C 37/02; B64D 5/00; B64F 1/04; B64G 1/40  
U.S. Cl. 244-63

16 Claims



1. A method of launching payloads to earth orbit employing a two stage liquid fueled launch vehicle comprising the steps of:

- placing a payload on an upper stage having a velocity capability of between 24,000 ft/sec and 27,000 ft/sec when carrying the payload;
- placing the upper stage on a lower rocket propelled stage having a characteristic velocity capability of 4,000 to 10,000 ft/sec when carrying the upper stage and payload; and
- launching the two stages from a launch site, wherein the lower stage is launched substantially vertically during its entire powered flight so the lower stage may be recovered at the launch site.

5,568,902

## DESCENT, TRAVEL, AND PROTECTION APPARATUS, METHOD OF MAKING AND USING SAME

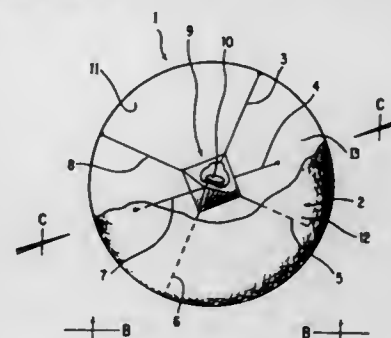
Rupert B. Hurley, Jr., 201 Ponders Rd., Greenville, S.C. 29615

Filed Aug. 1, 1994, Ser. No. 284,096

Int. Cl.<sup>6</sup> B64B 1/04; B64D 1/14

U.S. Cl. 244-138 R

23 Claims



1. An apparatus comprising:

- An inflated, deformable membrane surrounding an enclosed, substantially airtight volume and capable of withstanding impact on termination of descent; and
- A plurality of flexible cords extending inwardly from the membrane to a cargo, for suspending the cargo in spaced relationship above an impact zone on said membrane; and

wherein said apparatus has a design effective to prevent damage to the fragile cargo upon impact from a vertical free fall of 30 feet onto a hard horizontal concrete surface.

5,568,903

## PLANE SADDLE FOR A SAFETY AIRPLANE

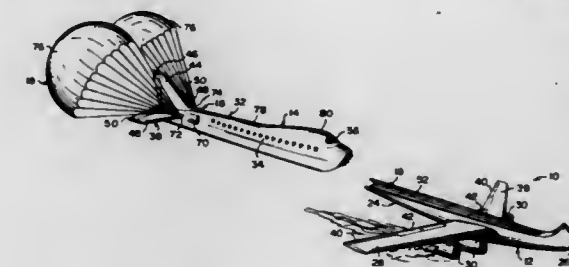
Jesus S. Pena, Julia M. Williams, and Joe L. Williams, all of 1939 Grand Concourse, Apt. 3M, Bronx, N.Y. 10453

Filed Jan. 18, 1995, Ser. No. 374,085

Int. Cl.<sup>6</sup> B64C 1/32

U.S. Cl. 244-140

6 Claims



1. A safety airplane comprising:

- a carrier portion, said carrier portion including a lower fuselage having a nose cone thereon, a pair of wings attached to said lower fuselage, and a plurality of engines on said wings, said wings including ailerons and flaps to help control movement of said airplane;
- a saddle portion, said saddle portion including an upper fuselage having a cabin and a cockpit therein for a pilot and passengers, and a tail assembly on a back end of said upper fuselage, said tail assembly including a vertical tail fin, a rudder on said tail fin, a pair of horizontal stabilizers, and an elevator on said horizontal stabilizer to help control movement of said airplane;
- means for retaining said saddle portion on said carrier portion, said retaining means including a plurality of rails affixed and extending in longitudinal parallel relationships within said lower fuselage of said carrier portion, a plurality of sleeves affixed and extending in longitudinal parallel relationships under said upper fuselage of said saddle portion, whereby said sleeves slide onto and engage with said rails, and means for locking said sleeves onto said rails;
- means for releasing said saddle portion from said carrier portion when there is a problem during flight; and
- means for gently lowering said saddle portion to the ground.

5,568,904

## STEERED PERIGEE VELOCITY AUGMENTATION

J. Kurt Brock, Darren R. Stratemeier, both of Mountain View, and Eugene L. Williams, San Jose, all of Calif., assignors to Space Systems/Loral, Inc., Palo Alto, Calif.

Filed Aug. 28, 1992, Ser. No. 937,957

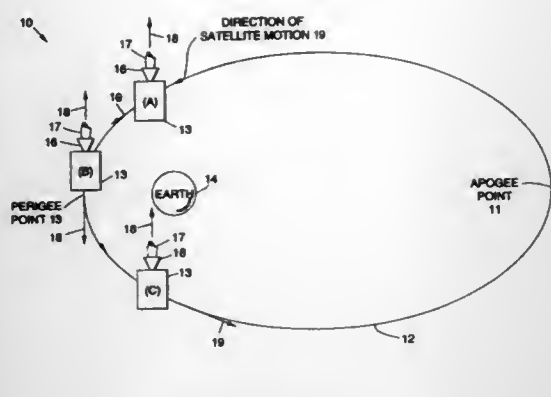
Int. Cl.<sup>6</sup> B64G 1/24; 1/26; F02K 1/00; 7/02

U.S. Cl. 244-169

3 Claims

1. A perigee velocity augmentation method for raising the apogee point of an elliptical transfer orbit of a satellite to synchronous altitude, said method comprising the steps of:  
launching a satellite having a thruster;  
injecting the satellite into a predetermined elliptical transfer orbit having an apogee altitude that is below geosynchronous altitude;  
causing the satellite to perform a perigee velocity augmentation maneuver, and  
during the perigee velocity augmentation maneuver, orienting the satellite such that the thruster is oriented in a direction that is approximately opposite to the direction of motion of the satellite at all positions during the maneuver.





5,568,905

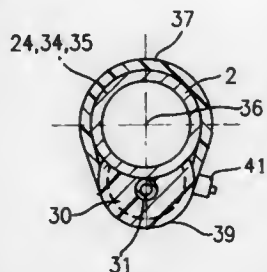
## BICYCLE CABLE KEEPER

Clayton E. Smith, II, 30 Don Galla Ct., Jacksonville, Fla. 32211  
Filed Mar. 7, 1994, Ser. No. 206,327

Int. Cl.<sup>6</sup> F16L 3/08

U.S. Cl. 248—65

18 Claims



1. A cable keeper comprising a substantially rigid crescent-shaped saddle in both an installed and uninstalled condition having an arcuate outside surface and an arcuate inside surface, which intersect at a pair of spaced corners, said saddle including a pair of closely spaced outer side walls connected to each of said arcuate surfaces, said outside surface having a groove extending generally at least half of said outside surface, said inside surface having a concave recess therein slightly smaller than a cable adapted to be disposable only partly therein to expose part of a cable beyond said arcuate surface and extending between said outer side walls and adapted to receive a cable nestingly therein when said arcuate inside surface is adapted to be disposed with part of a cable in juxtaposition to a tubing, and strap means disposed in said groove and tightly encircling said keeper and adapted to encircle a tubing whereby part of a cable is retained engaged with and juxtaposed to a tubing.

5,568,906

## FASTENING DEVICE FOR ROD-SHAPED ARTICLES

Ernst-Ludwig Hahn, Rabenau, and Harald Schätzy, Wetzlar, both of Germany, assignors to Emhart Inc., Newark, Del.

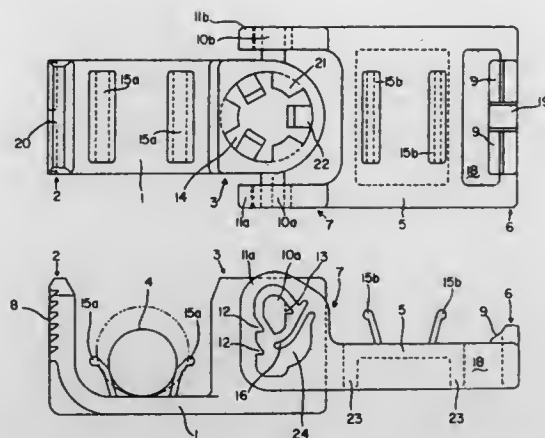
Filed Apr. 13, 1995, Ser. No. 421,117

Claims priority, application Germany, Apr. 13, 1994, 9406076 U

Int. Cl.<sup>6</sup> F16L 3/08

12 Claims

1. A fastening device capable of holding rod-shaped articles of different diameters, the fastening device comprising:  
a base body;  
a closure member articulated thereto, said closure member being movable between an open and a closed position on said base body;  
a hinge joint connecting said base body and said closure member, said joint including a joint pin and a joint lug, said joint pin and said joint lug together forming a joint eyelet;



one of said joint pin and said joint lug having an internal wall, said internal wall having a first set of teeth thereon, and the other of said joint pin and said joint lug having a first catch nose, said first catch nose being engageable with said first set of teeth when said closure member is in said closed position.

5,568,907

## DYNAMIC WRIST REST

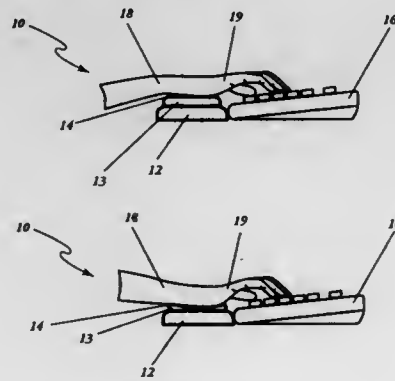
Jimmy V. Wolfe, 4233 Jernigan Rd., and Bruce L. Williams, 1119 Stillhouse Rd., both of White House, Tenn. 37188

Filed Apr. 27, 1995, Ser. No. 430,750

Int. Cl.<sup>6</sup> B68G 5/00

U.S. Cl. 248—118

6 Claims



1. A dynamic wrist rest, including:

- a housing;
- an expandable bladder combined with said housing to create a substantially air tight internal void space within said expandable bladder;
- said wrist rest having a top outer surface serving as a wrist interface; and
- means for moving said wrist interface in a piston-like motion in response to static or dynamic pressure.

5,568,908

## SIX-WAY MANUAL SEAT ADJUSTMENT ASSEMBLY

Peter Kiesel, Richmond Hill, Canada, assignor to Atoma International Inc., Newmarket, Canada

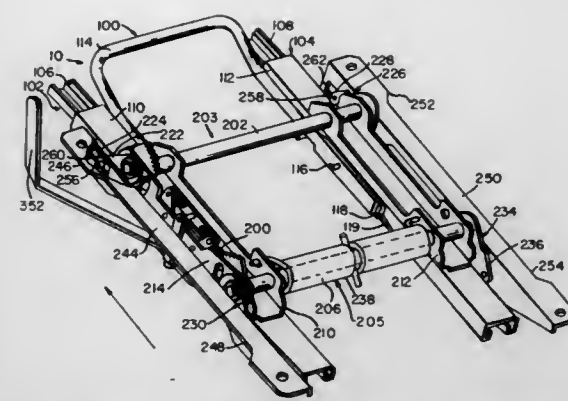
Filed Dec. 2, 1994, Ser. No. 341,222

Int. Cl.<sup>6</sup> F16M 13/00

U.S. Cl. 248—419

20 Claims

1. A manually adjustable vehicle seat assembly comprising:  
a seat including a seat cushion assembly having forward and rearward portions constructed and arranged to support an occupant sitting thereon and a seat back assembly constructed



and arranged to support the back of the occupant sitting on said seat cushion assembly;  
a forward seat support arm assembly constructed and arranged to support the forward portion of the seat cushion assembly in a selected one of a multiplicity of vertical positions;  
a rearward seat support arm assembly constructed and arranged to support the rearward portion of the seat cushion assembly in a selected one of a multiplicity of vertical positions;  
a mounting assembly constructed and arranged to support the forward and rearward seat support arm assemblies and the seat supported thereon on a vehicle floor;  
a biasing system operatively coupled with said rearward seat support arm assembly and constructed and arranged to urge the rearward seat support arm assembly and the rearward portion of the seat cushion assembly into an upward position; and  
a vertical adjusting mechanism, constructed and arranged to allow either of said seat support arm assemblies to be moved into a selected vertical position and to be retained thereat, said vertical adjusting mechanism comprising:  
a forward sector gear having a plurality of locking projections operatively coupled with the forward seat support arm assembly and moveable with the forward seat support arm assembly as the forward portion of the seat cushion assembly is positioned in the selected one of a multiplicity of vertical positions;  
a rearward sector gear having a plurality of locking projections operatively coupled with the rearward seat support arm assembly and moveable with the rearward seat support arm assembly as the rearward portion of the seat cushion assembly is positioned in the selected one of a multiplicity of vertical positions;  
a forward locking member and rearward locking member each having locking teeth, an engaging surface, and a disengaging surface, the forward locking member being mounted with respect to the mounting structure for movement between (1) an engaged position wherein the locking teeth of the forward locking member are engaged with the locking projections of the forward sector gear, thereby preventing movement of the forward sector gear, the forward seat support arm assembly, and the forward portion of the seat cushion assembly and (2) a disengaged position wherein the locking teeth of the forward locking member are disengaged from the locking projections of the forward sector gear, thereby releasing the forward sector gear, the forward seat support arm assembly, and the forward portion of the seat cushion assembly for movement of the forward portion of the seat cushion assembly into the selected one of a multiplicity of vertical positions, the rearward locking member being mounted with respect to the mounting structure for movement between (1) an engaged position wherein the locking teeth of the rearward locking member are engaged with the locking projections of the rearward sector gear, thereby preventing movement of the rearward sector gear, the rearward seat support arm assembly, and the rearward portion of the seat cushion assembly and (2) a disengaged position wherein the locking teeth of the rearward locking member are disengaged from the locking pro-

jections of the rearward sector gear, thereby releasing the rearward sector gear, the rearward seat support arm assembly, and the rearward portion of the seat cushion assembly for movement of the rearward portion of the seat cushion assembly into the selected one of a multiplicity of vertical positions; a forward camming member and a rearward camming member each having a locking surface and a camming surface, the forward camming member being mounted with respect to the mounting structure for movement between (1) a locked position wherein the locking surface of the forward camming member is engaged with the engaging surface of the forward locking member so as to urge the forward locking member into its engaged position and (2) a released position wherein the camming surface of the forward camming member is engaged with the disengaging surface of the forward locking member so as to move the forward locking member from its engaged position into its disengaged position, the rearward camming member being mounted with respect to the mounting structure for movement between (1) a locked position wherein the locking surface of the rearward camming member is engaged with the engaging surface of the rearward locking member so as to urge the rearward locking member into its engaged position and (2) a released position wherein the camming surface of the rearward camming member is engaged with the disengaging surface of the rearward locking member so as to move the rearward locking member from its engaged position into its disengaged position;  
a resilient coupling between the forward and rearward camming members constructed and arranged to urge the forward and rearward camming members into their locked positions;  
a lever actuated control member mounted with respect to the mounting structure for movement between a centered position and either (1) a fully forward position or (2) a fully rearward position;  
an actuating lever constructed and arranged to enable the occupant of said seat to move the lever actuated control member from the centered position into a selected one of the fully forward position and the fully rearward position; and  
a fore and aft motion transmitting member coupled at an intermediate portion thereof with the lever actuated control member and at opposite ends thereof with said forward and rearward camming members by pin and slot connections such that (1) when the lever actuated control member is moved from the centered position to its fully forward position the pin and slot connection with the rearward camming member causes the same to move against the urging of the resilient coupling from the locked position thereof into the released position thereof while the pin and slot connection with the forward camming member allows the same to remain in the locked position thereof and (2) when the lever actuated control member is moved from the centered position to its fully rearward position the pin and slot connection with the forward camming member causes the same to move against the urging of the resilient coupling from the locked position thereof into the released position thereof while the pin and slot connection with the rearward camming member allows the same to remain in the locked position thereof.

5,568,909

## MOUNTING BRACKET

Robert J. Timko, 31609 York Rd., Fraser, Mich. 48026

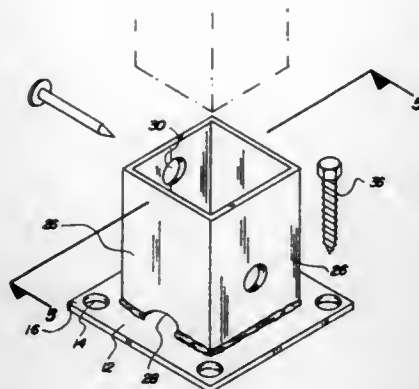
Filed Mar. 10, 1995, Ser. No. 402,533

Int. Cl.<sup>6</sup> F16M 13/00

U.S. Cl. 248—519

1 Claim

1. A mounting bracket for housing a wood post for installing on a flat deck for a watertight fit comprising, in combination:  
a base portion having a generally square configuration, the base portion having a thickness of about one-quarter of an inch, the base portion having apertures formed therethrough inwardly of each of four corners thereof, the apertures having a diameter large enough to allow a large diameter screw or bolt therein;



a square receiving tube having an open first end, an open second end, and four side walls, the square receiving tube having drainage holes existing through two of the sidewalls opposite one another extending upwardly from the open second end thereby allowing water to drain away from the bracket and off of the flat deck, the open second end secured to the base portion inwardly of the apertures formed inwardly of the four corners thereof, each of the four side walls having an aperture formed therein, each of the apertures having a diameter less than that of the apertures of the base plate, the square receiving tube dimensioned to receive a four by four wood post therein;

a plurality of concrete anchor bolts, wood screws or lag bolts, each of the anchor bolts, wood screws or lag bolts being dimensioned to be received through the apertures of the base plate to secure the base plate to a concrete porch, wooden deck or flat roof;

a plurality of lag screws, each of the lag screws dimensioned to be received through the apertures of the square receiving tube to secure the four by four wood post thereto.

5,568,910

## ANESTHESIA MACHINE

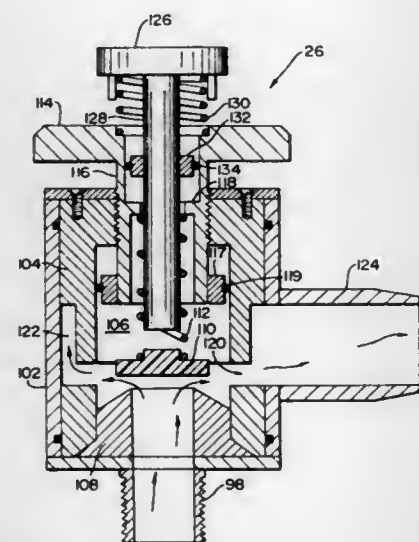
Raymond Koehler, Whitehouse Station, and James E. Donaldson, Neptune, both of N.J., assignors to Delmarva Laboratories, Inc., Midlothian, Va.

Filed Mar. 2, 1995, Ser. No. 397,671

Int. Cl.<sup>6</sup> F16K 15/18

U.S. Cl. 251—83

28 Claims



1. An anesthesia machine, comprising:

a breathing system for channeling inhalation and exhalation gases; and  
a pressure relief valve having a housing that defines a chamber in flow communication with the breathing system, a valve member for regulating a flow of gas from the breathing system into the chamber and venting gas into the chamber when pressure in the breathing system exceeds an adjustable predetermined pressure threshold setting, and a plunger normally biased by a biasing means to a first position out of contact with the valve member and depressible to a second position in contact with the valve member to close the valve member when a force is applied to the plunger to override the predetermined pressure threshold setting and prevent the flow of gas into the chamber, the plunger being returned to the first position by the biasing means when the force is removed therefrom to reestablish the same predetermined pressure threshold setting in the breathing system and allow venting of gas into the chamber when the pressure in the breathing system exceeds the predetermined pressure threshold setting.

5,568,911

## DRAINAGE VALVE ACTUATOR MECHANISM

Jin D. Kim, Ansan, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

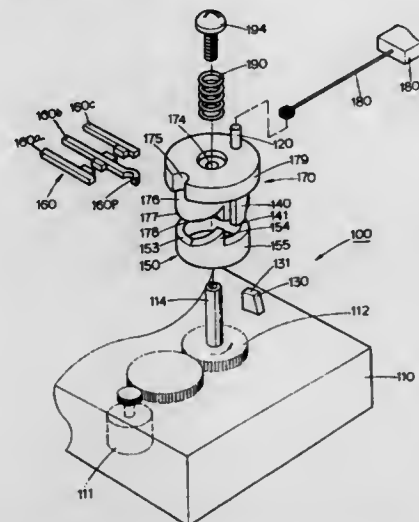
Filed Jun. 19, 1995, Ser. No. 491,721

Claims priority, application Rep. of Korea, Jul. 7, 1994, 1994-16227

Int. Cl.<sup>6</sup> F16K 31/04

U.S. Cl. 251—129.12

8 Claims



1. A water drainage apparatus for a clothes washer, comprising:  
a drain valve;  
an electric motor;  
a shaft rotatable by said motor in a first direction about an axis;  
a first rotatable member connected to said shaft for rotation thereby in said first direction about said axis;  
a second rotatable member releasably connectible with said first rotatable member to be rotated in said first direction by a rotary force of said first rotatable member;  
a connecting member connecting said second rotatable element to said drain valve and movable to a drain valve-opening position in response to rotation of said second rotatable member to a drain opening position by said first rotatable member;  
an electric switch operably connected to said second rotatable member to be actuated thereby when said second rotatable member reaches said drain valve-opening position to temporarily deactivate said motor for a predetermined time period, whereafter said motor is reactivated to effect further rotation of said first and second rotatable members in said direction; and

a disengaging mechanism for disengaging said second rotatable member from said first rotatable member during said further rotation, to enable said second rotatable member to rotate relative to said first rotatable member in a direction opposite said first rotatable member to close said drain valve.

5,568,912

## SLIDING FLOW CONTROLLER HAVING CHANNEL WITH VARIABLE SIZE GROOVE

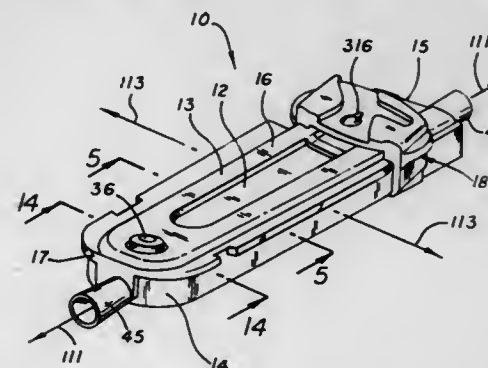
Don S. Minami, Monte Sereno, Calif., and Kevin S. Nason, Racine, Wis., assignors to IVAC Corporation, San Diego, Calif.

Filed Sep. 12, 1994, Ser. No. 304,675

Int. Cl.<sup>6</sup> F16K 3/34; F04B 43/08

U.S. Cl. 251—205

22 Claims U.S. Cl. 267—158



1. In a segment for fluid flow, a sliding flow controller comprising:  
a rigid component having a fluid control region through which fluid flows;  
a variable size groove formed in said fluid control region of said rigid component, said variable size groove having a variable cross-sectional area;  
an elastomeric membrane overlaying said fluid control region and said variable size groove, said elastomeric membrane and said variable size groove defining a sealed channel for fluid flow; and  
a slider having a flow control projection, said flow control projection adapted to travel along said elastomeric membrane and to deform said elastomeric membrane against said fluid control region at said variable size groove thereby controlling fluid flow.

5,568,913

## IMPACT ABSORBING DEVICE

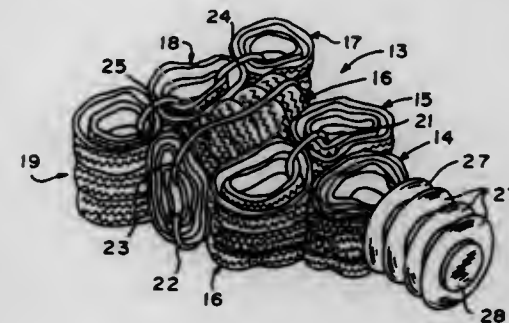
Yaacov Nagler, 7300 Pyle Rd., Bethesda, Md. 20817

Filed May 16, 1995, Ser. No. 442,504

Int. Cl.<sup>6</sup> E01F 15/00

U.S. Cl. 256—13.1

8 Claims



5,568,914

## COATED MAGNETIC TAPE CASSETTE SPRING

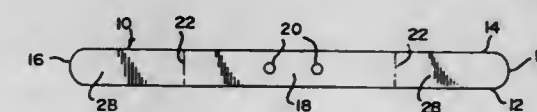
James T. Muraski, Gurney, Ill., assignor to Jason, Inc., Milwaukee, Wis.

Continuation of Ser. No. 287,851, Aug. 9, 1994, abandoned.

This application Aug. 16, 1995, Ser. No. 515,703

Int. Cl.<sup>6</sup> F16F 1/18

22 Claims



1. A reel spring for a magnetic tape cassette comprising an elongated strip of metal including a base portion adapted for coupling to an inside surface of a cover of the magnetic tape cassette and at least one leg portion extending out of the plane of the base for resiliently engaging a reel of the magnetic tape cassette, said spring being formed from ferromagnetic steel with a contamination coating disposed over an outer surface of the spring substantially enclosing and containing contamination from the spring.

5,568,915

## C-CLAMP WITH ADJUSTABLE THROAT AND A METHOD OF COMPRESSING A WORK PIECE

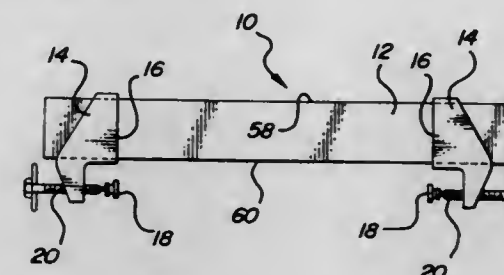
Ronald Raymond, P.O. Box 403, Standish, Mich. 48658

Filed Sep. 7, 1994, Ser. No. 302,346

Int. Cl.<sup>6</sup> B25B 1/02

U.S. Cl. 269—147

15 Claims



1. A clamp head comprising a clamp head body with two spaced-apart side plates, an upper friction block secured to both side plates and a lower friction block secured to both side plates and wherein the two side plates the upper friction block and the lower friction block cooperate to define an elongated structural member passage with a central axis and wherein the lower friction block is axially spaced from the upper friction block along the central axis, a linear actuator supported by the clamp head body to one side of the elongated structural member passage, a first jaw connected to the linear actuator and moveable along a path generally parallel to the central axis, an elongated structural member contact area on the upper friction block having a friction surface that extends in a direction generally parallel to said central axis, and an elongated structural member contact area on the lower friction block that extends in a direction generally parallel to said central axis.



5,568,916

## QUICK SET AND RELEASE CLAMPING DEVICE

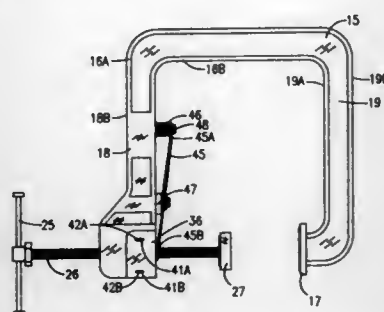
Robert R. Gibbons, 3842 Renee Dr., Bismarck, N. Dak. 58501,  
and Kenneth F. Halls, 6972 W. 76th Ave., Arvada, Colo.  
80003

Filed Jan. 4, 1995, Ser. No. 368,360

Int. Cl.<sup>6</sup> B25B 1/02

U.S. Cl. 269—174

11 Claims



1. A quick set and release clamping device comprising:  
a frame having a first workpiece engaging member and a transverse bore therethrough and further having an inner leg and an outer leg, said inner leg further having an inner side and an outer side, said transverse bore extending through an end portion of said inner leg and further having a tapered end in said inner side of said inner leg, said tapered end defining a seat portion in said transverse bore;  
a threaded rod having a handle and capable of being freely moved back and forth through said transverse bore and further having a second work piece engaging member which in cooperation with said first work piece engaging member, is for clamping a work piece therebetween; and  
a means to threadingly engage and disengage said threaded rod and to effect clamping of said work piece with said threaded rod and further comprising a pair of mirrored half bodies movably and biasedly disposed in said seat portion; a retaining cover for housing said half bodies and for limiting movement of said half bodies; and a detent movably mounted to said inner leg and engagingly biased to said retaining cover to releaseably urge said half bodies into engagement with said threaded rod extending through said transverse bore; each of said half bodies having a front end and a back end and further having at least three sides, a first of which has a threaded groove extending from said front end to said back end and is facing said first side of said other half body, a second of which is opposed to said first side and is tapered from said front end to said back end so that said half bodies are fittingly received and seated in said seat portion, and a third of which has a slot therein and is disposed generally in a plane with said third side of said other half body.

5,568,917

## APPARATUS FOR CALIPERING A COLLATED ASSEMBLAGE

Michael C. Buschhaus, Springboro; Richard D. Wamsley, Dayton, and Thomas Curtis, Centerville, all of Ohio, assignors to AM International, Inc., Mount Prospect, Ill.

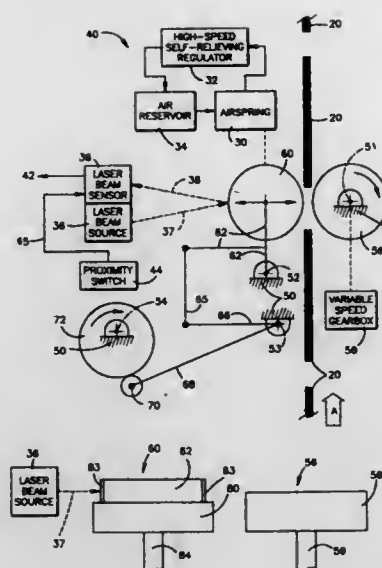
Filed Jul. 8, 1994, Ser. No. 272,415

Int. Cl.<sup>6</sup> B65H 7/02

U.S. Cl. 270—58.01

14 Claims

1. An apparatus for use along a collating conveyor having collated assemblies thereon, said apparatus comprising:  
a movable member comprising a rotatable wheel having a first circumferential surface which engages a collated assemblage when said movable member is moved towards the collated assemblage;  
a light source for directing a light beam toward said movable member;



said movable member further including a second circumferential surface, said second circumferential surface being a light reflective surface portion against which said light beam is directed and then reflected, said light reflective surface portion having a different diameter than the diameter of said collated assemblage engaging surface portion; and  
means for sensing said reflected light beam from said light reflective surface portion of said movable member.

5,568,918

## SHEET FEEDING APPARATUS

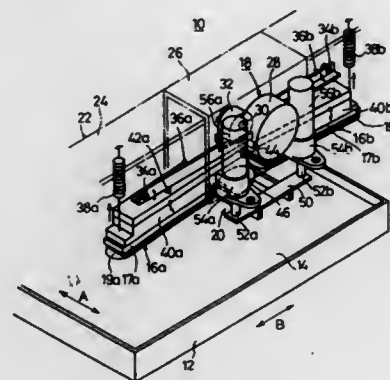
Nobuyuki Torisawa, and Toshiko Yamada, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 348,129, Nov. 28, 1994, abandoned, which is a continuation of Ser. No. 121,887, Sep. 17, 1993.  
Pat. No. 5,415,388. This application Jun. 7, 1995, Ser. No. 480,051

Claims priority, application Japan, Sep. 24, 1992, 4-254653  
Int. Cl.<sup>6</sup> B65H 3/40

U.S. Cl. 271—91

19 Claims



1. A sheet feeding apparatus comprising:  
a pair of suction cups spaced from each other for attracting an uppermost sheet of stacked sheets;  
a swinging mechanism for swinging said suction cups in opposite directions, respectively, to curve the uppermost sheet attracted thereto into an upwardly convex shape; and  
a flexing mechanism for forcibly flexing a portion of the uppermost sheet between said suction cups downwardly toward the stacked sheets when the uppermost sheet attracted to said suction cups is curved into the upwardly convex shape.

wherein said flexing mechanism comprises:

- a roller movably supported on a bracket between said suction cups; and
- a pair of weights coupled to said roller for normally biasing said roller toward said stacked sheets, said pair of weights being provided at respective sides of said roller such that each of said pair of weights imposes an equal bias on said roller.

5,568,919

## DELIVERY SYSTEM OF A SHEET-PROCESSING MACHINE

Andreas Detmers, Mauer, and Michael Gieser, Ostersheim, both of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany

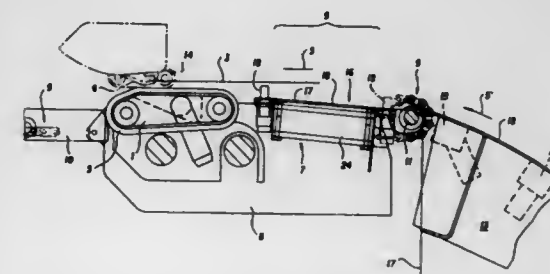
Filed Jul. 12, 1995, Ser. No. 501,398

Claims priority, application Germany, Jul. 12, 1994, 44 24 483.5

Int. Cl.<sup>6</sup> B65H 29/68

U.S. Cl. 271—183

7 Claims



1. Delivery of a sheet-processing machine for transporting a respective sheet in a conveying direction along a sheet-conveying path to a stacking device, the delivery having a sheet braking device engaging, during operation, with an underside of a respective sheet and retarding it by means of suction belts or the like; a suction region disposed adjacent to and upstream of the sheet braking device, as viewed in the sheet-conveying direction; a suction device for applying suction, in the suction region, to the underside of the respective sheet; and a brake carriage carrying the sheet braking device and the suction device and being displaceable between selective positions within a segment of the sheet-conveying path; and comprising a stationary first guide device formed with a first sheet guide surface segment set back upstream from the sheet braking device, as viewed in the sheet-conveying direction; and a second guide device having a guide element displaceable by means of the brake carriage and forming a second sheet guide surface segment located between the sheet braking device and said first sheet guide surface segment, said second sheet guide surface segment, together with said first sheet guide surface segment, forming a combined sheet guide surface having a telescopically variable length, said guide element assuming a first relative position with respect to the brake carriage in a first operating mode of the delivery, and assuming a second relative position with respect to the brake carriage in a second operating mode of the delivery; in said first relative position, said guide element being disposed upstream of the suction region, as viewed in the sheet-conveying direction, and the suction device being noncovered thereby and, in the second relative position, the guide element being disposed upstream of the sheet braking device, as viewed in the sheet-conveying direction, and the suction device being covered thereby.

5,568,920

## TURNING DEVICE FOR TRANSPORT APPARATUS

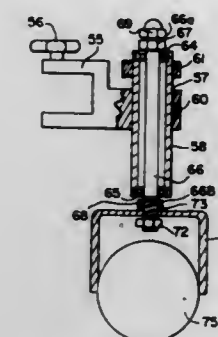
Richard J. Moll, 415 Constance Dr., Warminster, Pa. 18974

Filed Jan. 18, 1996, Ser. No. 588,268

Int. Cl.<sup>6</sup> B65H 5/00

U.S. Cl. 271—225

5 Claims



1. A turning device for turning products being conveyed on endless belts on a flatbed transport apparatus at at least a 90 degree angle from their original orientation while being transported and which are then again transported in their original direction, which comprises  
a track bar attached to at least one side of said bed,  
a support bar means attached to said track bar and which extends transversely across said bed,  
bracket means attached to said support bar means and positionable at selected locations thereacross;  
marble guide bar means attached to said bracket means and positionable to engage said products which pass between it and said bed;  
mounting clamp means attached to said support bar means and positionable thereacross;  
a vertical hollow tube engaged with said mounting clamp means;  
upper and lower bearings mounted in said tube;  
a swivel shaft carried in said bearings in said tube;  
a bump housing carried by said swivel shaft;  
a bump ball in said housing for engagement with said product for rotation thereabout;  
a guide support bar mounted to said track bar and extending transversely across said bed;  
a bracket engaged with said guide support bar and positionable thereacross;  
a rod engaged with said guide support bar bracket and;  
a guidebar engaged with said rod and which is oriented in the direction of conveyance of said product to receive and guide said product after it is rotated by said bump ball.

5,568,921

## RACQUET STRINGING MACHINE

John F. Lorentzen, El Cajon; Todd B. Colburn, San Diego, and Ray Mortvedt, Santee, all of Calif., assignors to Ektelon, San Diego, Calif.

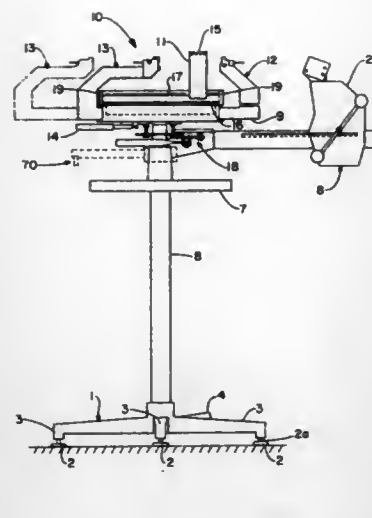
Filed Oct. 26, 1993, Ser. No. 142,687

Int. Cl.<sup>6</sup> A63B 51/14

U.S. Cl. 273—73 A

16 Claims

1. A racquet stringing machine comprising:  
a base and column assembly on which a work table is mounted;  
a glide bar assembly mounted on said table and having string clamp means slidably positioned thereon;  
a tension head assembly for applying tension to a string during stringing of a racquet;  
means for securing a racquet in association with said table including a throat riser assembly and a vertically adjustable tip riser assembly, each having racquet clamp means for securing a portion of a racquet frame therein, wherein said throat riser assembly and said tip riser assembly together accommodate different sized or shaped racquet frames.



5,568,922

**COMPOSITE TELESCOPING BATON**

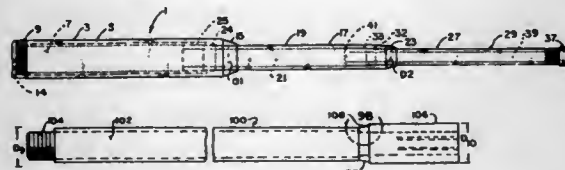
Bruce K. Siddle, Waterloo, Ill., assignor to PPCT Management Systems, Inc., Millstadt, Ill.

Continuation-in-part of Ser. No. 141,068, Oct. 26, 1993, Pat. No. 5,372,363. This application May 25, 1994, Ser. No. 249,279

Int. Cl.<sup>6</sup> F41B 15/02

U.S. Cl. 273—84 R

5 Claims



1. A telescoping baton for use in self defense or training, comprising:

- a cylindrical handle section having an axial bore formed therein, said handle section formed from and having a continuous winding of filaments of wound fibers formed in layers in an epoxy material;
- a cylindrical second section disposed within said axial bore in said handle section and being capable of being extended out of said handle section or retracted into said handle section, said second section having an axial bore formed therein, said second section being formed of continuously wound filaments of wound fibers formed in layers in an epoxy material;
- an end section, a metal core provided within said end section, said end section disposed within said second section and being capable of being extended out of said second section and retracted into said second section, said end section being formed of continuous wound filaments of wound fibers formed in layers in epoxy material around said metal core; and
- means for second section and said end section in an extended position.

5,568,923

**ROLLER HOCKEY PUCK**

Jon B. Kahn, 3002 Stargrass Ct., League City, Tex. 77573, and Todd J. McCusker, 16002 Copper Canyon, Friendswood, Tex. 77546

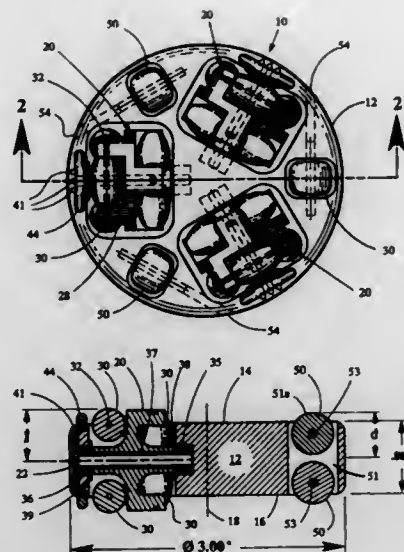
Filed Dec. 18, 1995, Ser. No. 572,880

Int. Cl.<sup>6</sup> A63B 71/02

U.S. Cl. 273—128 A

9 Claims

5. A hockey puck particularly adapted for use on a non-ice playing surface, said puck comprising:



a puck body of circular cylinder configuration having a pair of parallel planar end surfaces spaced to define the thickness of the puck, a circumferential cylindrical edge surface, and a plurality of at least three openings which extend through the puck body between said planar surfaces, said plurality of openings being located in equiangular spacing about the cylinder axis of the puck body and at equal radial distances from said axis;

a plurality of multi-directional wheel assemblies, each of which comprises a wheel support body mounted in a different one of said openings for rotation on an associated main axle which extends in a central plane parallel to said puck body planar surfaces, said wheel support body having an outer surface of cylindrical configuration defined about its associated main axle with a diameter which is slightly greater than the thickness of said puck body, each said wheel assembly further comprising a plurality of wheels, each of which is journaled for rotation on an axle mounted on said wheel support body in a plane perpendicular to the main axle of the wheel assembly, each said wheel having a curved roller surface which in a longitudinal cross section co-planar with the axes of all the wheels in the wheel assembly describes an arc of a circle having a radius of curvature which with respect to said central plane is of a length which slightly exceeds the radial distance of the cylindrical outer surface of the wheel support body from its associated main axle and is concentric with arcs described in said cross-section by the other roller surfaces of the wheel assembly, said plurality of wheel assemblies thereby allowing a rolling action of at least one of the wheels of the wheel assemblies whenever a pushing force is applied to the puck body with a force component in any direction parallel to the playing surface.

5,568,924

**SUPPLEMENTAL CARD INDICIA IDENTIFIES LIKE CARDS**

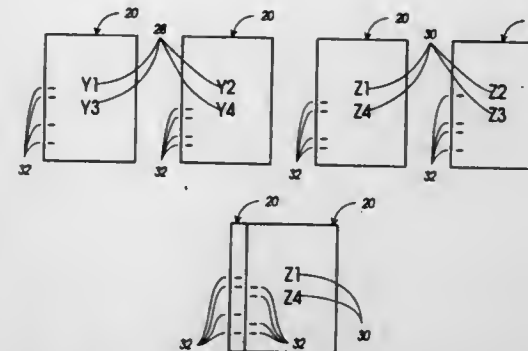
Roy I. Katsuren, 8368 Hawks Nest Ct., Centerville, Ohio 45458  
Filed Jun. 13, 1994, Ser. No. 259,250

Int. Cl.<sup>6</sup> A63F 1/00

U.S. Cl. 273—292

1 Claim

1. A deck of cards, comprising:  
at least four cards, wherein each card includes a first type of visibly printed symbol and a second type of visibly printed symbol on one surface of each said card, and each said card of said deck further includes a plurality of printed lines with predetermined spacing between said lines, wherein said printed lines have a predetermined spaced relation to said first type of visibly printed symbol and said printed lines have a second predetermined spaced relation to said second type of



5,568,925

**SCOOPED LACROSSE HEAD**

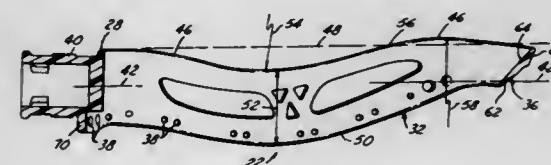
David Morrow, and Phillip Naumburg, both of Farmington Hills, Mich., assignors to Warrior Lacrosse, Inc., Farmington Hills, Mich.

Filed Aug. 18, 1995, Ser. No. 516,791

Int. Cl.<sup>6</sup> A63B 59/02

U.S. Cl. 273—326

57 Claims



1. A lacrosse head that comprises:

- an open frame having a base with a concave interior surface defining a ball rest, a pair of sidewalls diverging from said base and a lip interconnecting said sidewalls remotely of said base,
- means carried by said frame for securing a lacrosse net along a back side of said frame, leaving an opposing front side of said frame open for receiving lacrosse balls, and
- means exteriorly projecting from said base for attachment of a handle so as to define a handle/head axis, said front side of said frame at said base adjacent to said attachment means defining a plane parallel to said axis,
- both said front side and said back side of said sidewalls curving away from said plane and then back toward said plane from said base toward said lip so as to impart a curved scoop-like geometry to said head when viewed in side elevation.

5,568,926

**RODEO ROPING PRACTICE STEER**

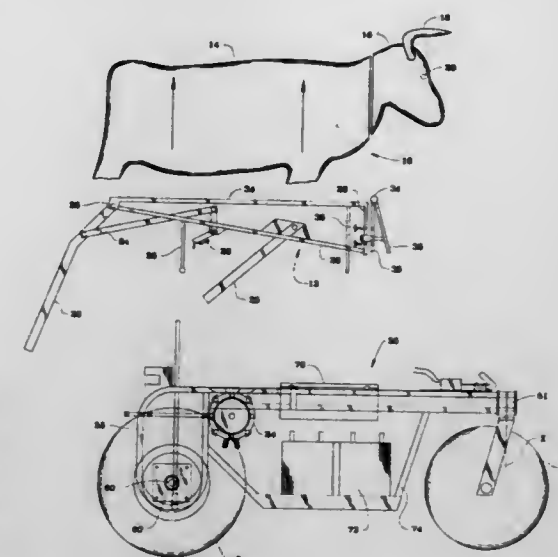
Marvin Kaptein, 278 Berland Rd., Conrad, Mont. 59425  
Filed Jan. 26, 1996, Ser. No. 592,018

Int. Cl.<sup>6</sup> A63B 69/00

U.S. Cl. 273—359

11 Claims

1. A rodeo roping practice steer comprising a body frame for mounting a body resembling a bovine animal, first pivot connecting means for pivotally attaching a head to said body frame and second pivot connecting means for pivotally attaching at least one



5,568,927

**THREE-DIMENSIONAL MOVING TARGET SYSTEM**

Hal C. Badorrek, 801 S. Carlisle La., Altoona, Pa. 16602

Filed Jan. 26, 1995, Ser. No. 378,783

Int. Cl.<sup>6</sup> F41J 3/00

U.S. Cl. 273—366

12 Claims



1. A three-dimensional moving target system comprising:

- a) a track assembly, said track assembly including a continuous serpentine rail having a bottom wall and a pair of upstanding side walls, said rail further including a pair of flanges with each said flange facing inwardly over said bottom wall from a top edge of one said side wall, and said bottom wall having a serrated course therealong;



- b) a three-dimensional target;  
 c) means for supporting said target in an upright position from said track assembly; and  
 d) means for propelling said supporting means with said target along said track assembly, so that an archer can practice at shooting an arrow from a bow at said target travelling along said track assembly.

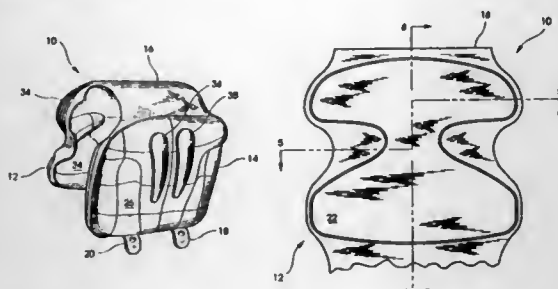
5,568,928

## VIDEO GAME CONTROLLER FOR USE WITH AN EXERCISE APPARATUS

Bruce N. Munson, Muncie, and Steven C. Visser, West Lafayette, both of Ind., assignors to Exertron, Inc., Muncie, Ind.  
 Filed Feb. 1, 1995, Ser. No. 382,135  
 Int. Cl.<sup>6</sup> A63F 9/22; G06F 17/00

U.S. Cl. 463—37

15 Claims



1. A video game controller for use with an exercise apparatus, comprising:  
 a first portion;  
 a second portion;  
 a connecting portion coupling said first and second portions;  
 a gross motion sensor integrated with said first portion; and  
 output means for coupling a signal produced by said gross motion sensor to a video game apparatus;  
 wherein said first portion, said connecting portion, and said second portion are coupled in a substantially U-shaped configuration in order to facilitate mounting said video game controller over a handle of said exercise apparatus.

5,568,929

## TEMPERATURE COMPENSATIONS SEAL

Jay K. Yoshinaga, Gardena, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.  
 Filed Apr. 3, 1995, Ser. No. 416,116  
 Int. Cl.<sup>6</sup> F16J 15/46

U.S. Cl. 277—26

11 Claims



1. A thermally-responsive actuator for a sealing assembly, comprising:  
 a first annular member having a first resilient leg portion including a horizontal load-bearing sealing surface and a second resilient leg portion disposed at an acute angle to said first leg portion and including a camming surface, said first and second leg portions being radially inwardly directed,  
 a second annular member including a camming surface configured for engagement with the camming surface of said first

annular member and a load-bearing sealing surface disposed parallel to said load-bearing sealing surface of said first annular member,  
 said first and second annular members being positioned one against the other so that they are disposed in a nested relationship, and together exhibit a height "h" at ambient temperatures,  
 said first annular member having a coefficient of thermal contraction that is less than the coefficient of thermal contraction of the second annular member,  
 such that when said thermal actuator is subjected to temperatures less than ambient temperatures, the first and second annular members experience contractions of different amounts such that the overall height of said cooled actuator increases.

5,568,930

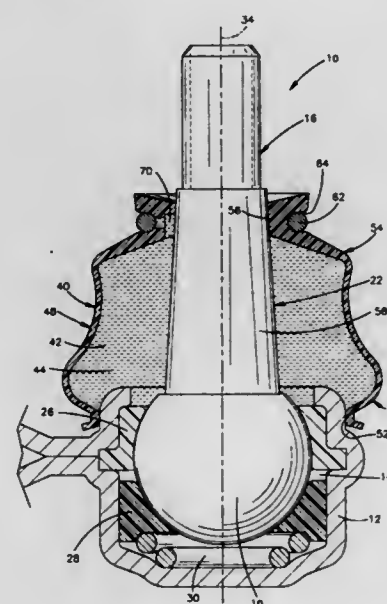
## JOINT ASSEMBLY

Brian A. Urbach, Rochester Hills, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Aug. 25, 1995, Ser. No. 519,245  
 Int. Cl.<sup>6</sup> F16J 9/00; F16D 1/12

U.S. Cl. 277—29

5 Claims



1. A joint assembly comprising:  
 a housing member;  
 a movable member extending from said housing member and movable relative to said housing member;  
 a flexible seal wall having a first end portion connected with said housing member and a second end portion connected with said movable member, said flexible seal wall cooperating with said housing member and said movable member to at least partially define a chamber containing lubricant, said flexible seal wall including surface means which defines a vent opening extending through one of said end portions of said flexible seal wall; and  
 a retainer means for pressing said one end portion of said flexible seal wall against one of said members and for blocking said vent opening in said one end portion of said flexible seal wall when lubricant pressure in the chamber is less than a predetermined pressure, said retainer means and said one end portion of said flexible seal wall being movable relative to each other under the influence of lubricant pressure to vent lubricant pressure through said vent opening in said one end portion of said flexible seal wall when the lubricant pressure exceeds the predetermined pressure.

5,568,931

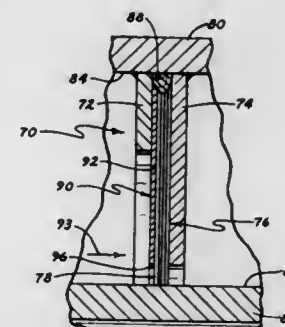
## BRUSH SEAL

Wu-Yang Tseng, West Chester; Brent L. Bristol, Milford; Rolf R. Hetico, Cincinnati, and Christopher C. Glynn, Hamilton, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Aug. 20, 1992, Ser. No. 932,463  
 Int. Cl.<sup>6</sup> F16J 15/48

U.S. Cl. 277—53

2 Claims



1. Sealing apparatus for sealing a leakage path extending axially from a high pressure, upstream region to a low pressure, downstream region between a rotating member and a stationary member of a fluid flow machine, said apparatus comprising:  
 a brush seal having at least one stage, said stage including a bristle pack sandwiched between upstream and downstream plates, said plates being attached to said stationary member, said bristle pack including a plurality of bristles, said bristles having free ends that sealingly engage said rotating member, and a damping plate disposed between said upstream plate and said bristle pack, said damping plate bearing against said upstream side of said bristle pack and having a substantially planar, annular configuration with a radially inside edge, said damping plate including a plurality of substantially radially directed slots extending from said inside edge outwardly, said slots being provided for absorbing vibrations.

5,568,932

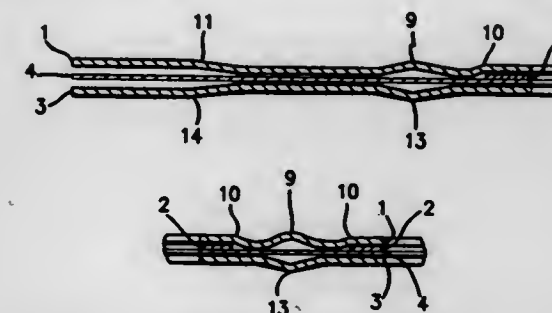
## METAL GASKET ASSEMBLY WITH SHIMS

Akira Tanaka, and Masamichi Hoshi, both of Ohmiya, Japan, assignors to Nippon Leakless Industry Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1994, Ser. No. 311,024  
 Claims priority, application Japan, Jun. 30, 1994, 6-149275  
 Int. Cl.<sup>6</sup> F16J 15/08

U.S. Cl. 277—180

1 Claim



1. A metal gasket assembly for a cylinder head comprising:  
 a metal substrate having a predetermined shape with apertures including cylinder openings, bolt holes, coolant openings and lubricant openings, said metal substrate being provided with half-beads in regions adjacent to the cylinder openings and full-beads in regions therearound;  
 a metal sub-plate having the same planar configuration with and being thinner than said metal substrate;

ring-shaped shims attached to said metal sub-plate in regions corresponding to the half-beads of said metal substrate; and a metal by-plate having the same planar configuration with said metal substrate and provided with full-beads in regions corresponding to the full-beads of said metal substrate but being free from half-beads in regions corresponding to the half-beads of said metal substrate;  
 said metal substrate, said metal sub-plate with shims and said metal by-plate being laminated such that a bulge of each full-bead of said metal substrate is situated back to back with and extends in an opposite direction from the corresponding full-bead of said metal by-plate.

5,568,933

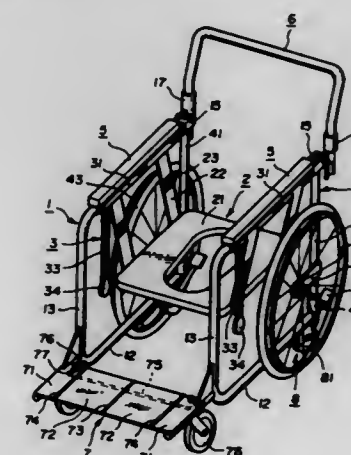
## FOLDABLE WHEELCHAIR

Jiro Mizuno, Tokyo, Japan, assignor to Labor Savings Machine Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1994, Ser. No. 343,230  
 Int. Cl.<sup>6</sup> B62B 7/06; B62M 1/14

U.S. Cl. 280—42

6 Claims



1. A foldable wheelchair comprising  
 a pair of main frames each extending in a longitudinal direction of said wheelchair,  
 a swingable back supporter extending in a lateral direction of said wheelchair to detachably connect said main frames together at rear upper ends thereof,  
 a lifter unit including a pair of lifter shafts turnably held by said respective main frames and a pair of lifter arms coupled to said respective lifter shafts to enable manual turning of said lifter shafts,  
 a seat unit including a seat plate detachably suspended to said lifter shafts in an arrangement such that turning of said lifter shafts causes lifting and lowering of said seat plate,  
 a pair of large wheel units each including a large wheel detachably coupled to one said main frame,  
 a foot unit coupled to front lower ends of said main frames and including a pair of footplates united together along a center hinge extending in said longitudinal direction, and  
 a pair of caster units coupled to rear lower ends of said main frames and each including a caster and a jack lever for lifting said caster from a floor.

5,568,934

## ADJUSTABLE TRICYCLE

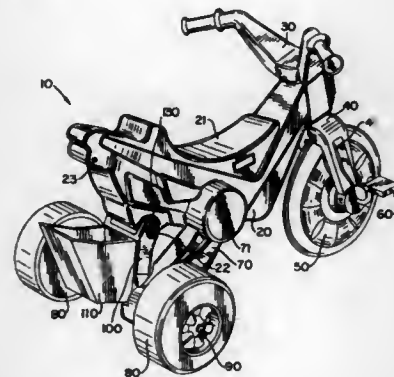
Duane J. Niemeyer, Olney, Ill., assignor to Roadmaster Corp., Olney, Ill.

Filed Jun. 7, 1995, Ser. No. 478,719

Int. Cl.<sup>6</sup> B62K 5/06; 9/02

U.S. Cl. 280—282

23 Claims



1. A tricycle comprising:
  - a) a body having a front and rear;
  - b) a front wheel rotatably attached to the front of said body;
  - c) a handlebar member pivotally connected to the front end of said body for steering said front wheel;
  - d) a pivotable link mounted on said body;
  - e) a pair of rear wheels rotatably mounted on said pivotable link; and
  - f) a positioning device pivotally connected to said pivotable link and moveable between at least a first and a second position with respect to the body wherein the position of said body with respect to said rear wheels is changed by moving said positioning device between said first and second positions.

5,568,935

## RECUMBENT CYCLE WITH IMPROVED DRIVE AND STEERING

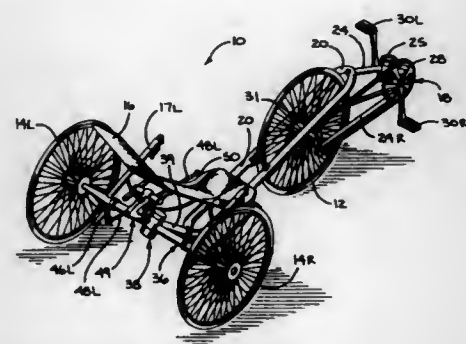
William P. Mason, 111 S. Main St., Deerfield, Wis. 58531

Filed Jun. 9, 1995, Ser. No. 488,707

Int. Cl.<sup>6</sup> B62K 5/04

U.S. Cl. 280—282

20 Claims



1. A recumbent cycle comprising:
  - a front wheel including a drive hub journaled in bearings;
  - a pair of rear wheels disposed in spaced-apart parallel relation and rotatably supported by a rear axle;
  - a frame assembly movably attached to the rear axle, the frame assembly including a seat disposed in a recumbent position, the frame assembly further including a forward mount disposed to support the front wheel bearings and drive hub;
  - drive means for rotating the front wheel to propel the cycle;
  - steering means including a pivot carried on the rear axle defining a pivot axis above which the frame assembly tilts and pivots

with respect to the rear axle, the pivot axis being disposed in a plane substantial transverse to the rear axle and at a predetermined angle  $\phi$  inclined upwardly and rearwardly from the rear axle;

the steering means further including two laterally spaced-apart steering levers with each steering lever being mounted on and disposed for rotation about the rear axle for moving the frame assembly relative to the rear axle, the frame assembly and forward mount carrying the front wheel so as to steer the cycle.

5,568,936

## AIRBAG MODULE CASE FOR SIDE IMPACT AIRBAG MODULE

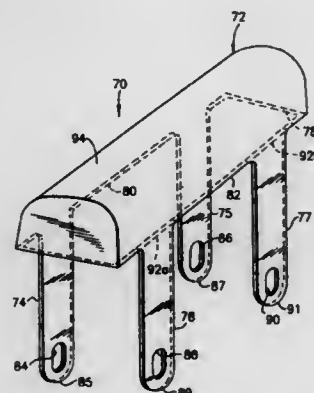
David L. Spilker, Pleasant View; Don L. Parker, Layton, and J. Kirk Storey, Farmington, all of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Nov. 8, 1995, Ser. No. 555,210

Int. Cl.<sup>6</sup> B60R 21/16

U.S. Cl. 280—728.2

16 Claims



1. A thermoplastic airbag module case for use with a side impact airbag module adapted to mount on the exterior of a motor vehicle seat and including an airbag cushion and inflator assembly having a folded airbag cushion and an inflator connected together so that inflation gas from the inflator will inflate the airbag cushion, the airbag module case comprising:
  - an assembly cover sized and shaped to substantially cover the airbag cushion and inflator assembly of the side-impact airbag module when the airbag module is mounted to the exterior of the motor vehicle seat, the assembly cover having a decorative outer surface and at least one edge defining an open base sized and shaped to receive the airbag cushion and inflator assembly; and
  - at least two flexible, opposed retainer arms extending from the at least one edge of the assembly cover, the opposed retainer arms being sized and shaped to substantially encircle the airbag cushion and inflator assembly with each retainer arm defining at least one projection receiving aperture located adjacent a distal end of the retainer arm for receiving at least one projection extending from the airbag cushion and inflator assembly to secure the airbag module case to the side-impact airbag module.

5,568,937

## AUTOMATIC MODULAR AIR BAG CONSTRUCTION SYSTEM

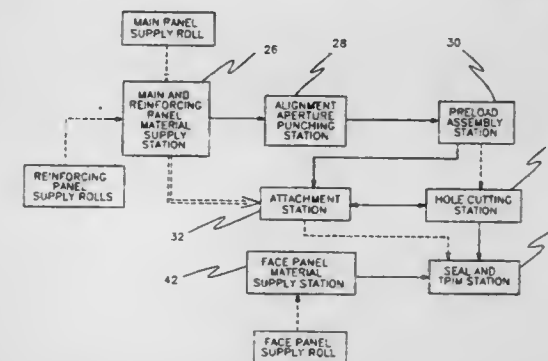
Ralph F. Conley, Jr., Miamisburg, Ohio, assignor to MIM Industries, Inc., Miamisburg, Ohio

Continuation of Ser. No. 78,449, Jun. 16, 1993, Pat. No. 5,460,408. This application Jun. 7, 1995, Ser. No. 475,185

Int. Cl.<sup>6</sup> B60R 21/16

U.S. Cl. 280—743.1

16 Claims



1. A method of constructing an air bag comprising the steps of:
  - providing a main panel,
  - attaching at least one piece of reinforcing material at a predetermined location to said main panel,
  - forming a hole through said main panel and said reinforcing material at said predetermined location after the attaching step, and
  - attaching a face panel to said main panel.

5,568,938

## AIR-BAG ARRANGEMENT

Martin Lindstrom, Stenkullen, Sweden, assignor to General Engineering (Netherlands) BV, Utrecht, Netherlands

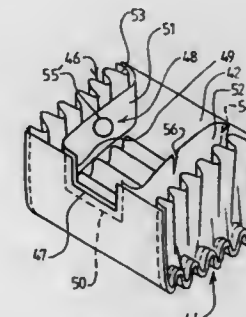
Filed Oct. 8, 1993, Ser. No. 133,386

Claims priority, application European Pat. Off., Oct. 9, 1992, 92309219

Int. Cl.<sup>6</sup> B60R 21/20

U.S. Cl. 280—743.2

16 Claims



1. An inflatable bag adapted to protect a driver or passenger in a motor vehicle, wherein the bag is provided with one or more tearable means comprising at least one fabric element provided with at least one of a notch, recess and aperture to define an area of weakness at which the fabric element is designed to tear, the tearable means being so located that when the bag is exposed to an internal pressure in excess of a predetermined pressure, the tearable means gradually tear and control the way the bag is inflated, the interior volume of the bag being greater when the tearable means have torn than before the tearable means have torn.

5,568,939

## SEAT BELT RETRACTOR SYSTEM

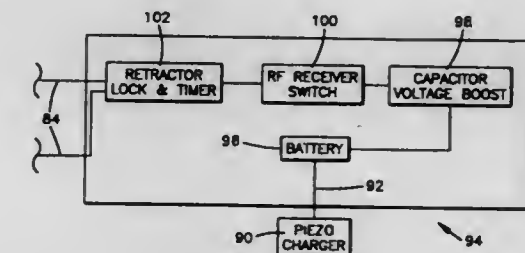
Brian K. Blackburn, Rochester; Louis R. Brown, Oxford; Joseph E. Mazur, Washington, and Scott B. Gentry, Romeo, all of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Apr. 4, 1994, Ser. No. 222,120

Int. Cl.<sup>6</sup> B60R 22/36; 21/00

U.S. Cl. 280—806

19 Claims



1. A vehicle safety apparatus comprising:
  - a first seat for an occupant of a vehicle;
  - a first seat belt retractor having a first spool on which belt webbing is wound and which is rotatable in a first belt withdrawal direction and in an opposite first belt retraction direction and a first locking means for blocking belt webbing withdrawal from said first spool in response to an electrical signal;
  - mounting means for mounting said first seat belt retractor on said first vehicle seat;
  - sensor means for sensing vehicle deceleration exceeding a predetermined deceleration and for providing a control signal indicative thereof;
  - an RF transmitter electrically connected with said sensor means and actuable in response to the control signal to transmit an RF signal; and
  - first RF receiver means for receiving the RF signal and for providing a first output signal indicative of the RF signal, said first locking means of said first seat belt retractor including means actuable in response to the first output signal for locking said first seat belt retractor.

5,568,940

## BELT TIGHTENER FOR A VEHICLE SAFETY BELT SYSTEM

Wendell C. Lane, Jr., Romeo, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Jul. 27, 1994, Ser. No. 281,306

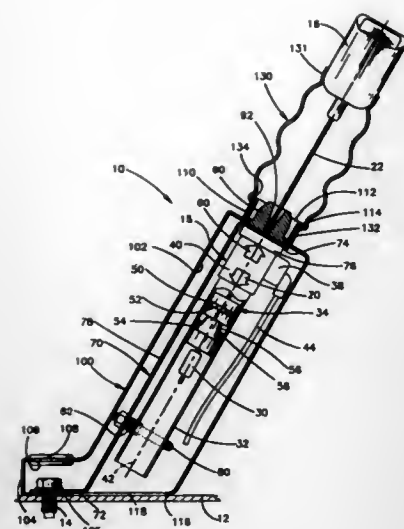
Int. Cl.<sup>6</sup> B60R 22/46

U.S. Cl. 280—806

21 Claims

1. Apparatus comprising:
  - a member for connection to vehicle seat belt webbing;
  - driving means for moving said member in a first direction in response to a vehicle collision, said driving means including a piston located within a cylinder and means for moving said piston along a longitudinal axis of said cylinder;
  - means for interconnecting said piston and said member;
  - a support member including a mounting portion to be connected to a vehicle and an intermediate portion extending from said mounting portion, said cylinder being fixedly connected to said support member with the longitudinal axis of said cylinder extending along the first direction, said intermediate portion of said support member extending substantially parallel to the longitudinal axis of said cylinder and spaced laterally from said cylinder; and
  - means for connecting a portion of said cylinder to said intermediate portion of said support member.





5,568,941

**SEAT BELT RETRACTOR AND IMPROVED SENSING MECHANISM**

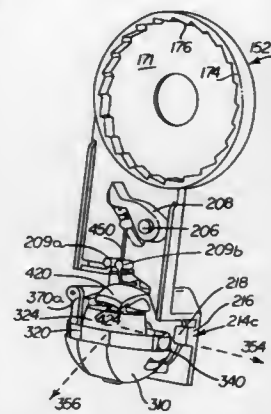
Mark C. Woydick, Romeo, and William L. Palmer, Rochester, both of Mich., assignors to AlliedSignal Inc., Morristown, N.J.

Continuation of Ser. No. 486,145, Jun. 7, 1995, abandoned, which is a continuation of Ser. No. 278,449, Jul. 21, 1994, abandoned. This application Jan. 11, 1996, Ser. No. 583,768

Int. Cl.<sup>6</sup> B60R 22/36

U.S. Cl. 280—806

20 Claims



1. A vehicle inertia or deceleration sensing device (300) of a seat belt retractor (30) comprising:
- an outer housing member (310) including a first housing part (344) for supporting an inner housing member (320) at a predetermined relative angle, the first housing part including first and second coordinate reference axes (354, 356) superimposed therein,
  - the inner housing member (320) comprising:
    - a second housing part (322) supported by the first housing part, including:
      - an outer surface (376), a portion (382) of which has a diameter of  $r_1$  measured from a geometric center of the second housing part and an inner surface,
      - at least one extending leg member (370a, b) having an end which defines a hinge axis (372, 374),
      - an activation portion (420) pivotally connected at the hinge axis and including a spherically shaped, top surface (424) having by a radius of  $r_1$  and an under surface (430), and
      - an inertial member (324), responsive to changes in vehicle acceleration or deceleration and movable relative to the inner surface (390) of the second housing part (322), the

inertial member also supporting the under surface (430) of the activation portion, such that in a rest position, the spherical top surface of the activation portion is positioned such that it lies on a sphere of radius  $r_1$ , centered at the center of the second housing part;

- first means (384, 350) for fixedly mounting the second housing part at a predetermined first angle about the first reference axis in the first housing part, such angular positioning not changing a height dimension of the activation surface,
- a support member (152) for supporting the first housing part,
- second means (214, 206) for fixedly mounting the first housing part at a predetermined second angle, about the second reference axis relative to the support member, without changing the height of the activation portion, wherein in response to an acceleration or deceleration greater than a given magnitude the inertial mass moves relative to the inner surface, and moves the activation portion outwardly.

5,568,942

**PERSONALIZED ENVELOPE ASSEMBLY FOR PRINTED PUBLICATION AND METHOD**

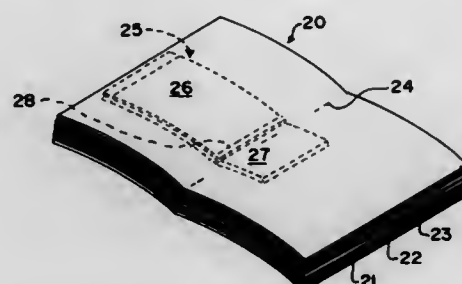
Scott A. Stevens, Downers Grove, Ill., assignor to Wallace Computer Services, Inc., Hillside, Ill.

Continuation-in-part of Ser. No. 91,321, Jul. 14, 1993, Pat. No. 5,419,587. This application Jan. 18, 1995, Ser. No. 374,239

Int. Cl.<sup>6</sup> B42D 15/00

U.S. Cl. 283—56

12 Claims



1. A personalized letter product in a mailable publication product, said personalized letter product comprising:
- envelope assembly having a pair of superposed outer plies enclosing at least one insert ply, each of said plies having top, bottom and side edges, at least some of said outer ply edges being adhesively united together, at least one of said outer ply edges being free of adhesive union to provide access to said insert ply,
  - at least one of said outer plies being equipped with printed indicia relating to a specific person, geographic area or demographic group, and
  - means associated with one of said edges for binding said envelope assembly into the interior of said publication, said publication product comprising a plurality of signatures arranged in superposed relation, each of said signatures being rectangular and having upper, lower and side edges, one of said side edges being a bound edge and the other side edge being a free edge, said envelope assembly edge means including a binding portion bound in between two adjacent signatures along said signature bound edge, and said publication product being equipped with printed indicia corresponding to the envelope assembly printed indicia.

5,568,943

**TELESCOPIC TUBE CONNECTION FOR A VACUUM CLEANER**

Lars G. Kllström, Täby; Nils T. Lindquist, Farsta, and Lars G. Tuvin, Knivsta, all of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

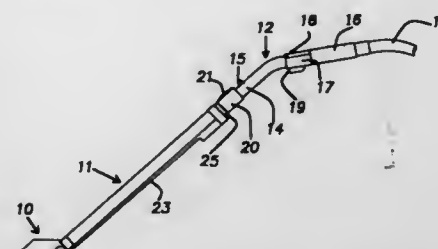
Filed Feb. 10, 1995, Ser. No. 386,634

Claims priority, application Sweden, Mar. 1, 1994, 9400702

Int. Cl.<sup>6</sup> F16L 21/00

U.S. Cl. 285—7

14 Claims



1. A device for a vacuum cleaner which comprises a hose (13), a tube handle (12), and a tube shaft (11), said hose having a first end connected to a vacuum cleaner housing and a second end connected directly to a first end of said tube handle (12), said tube handle having a second end directly connected to a first end of said tube shaft (11), said tube shaft having a second end which is secured to a nozzle, wherein the first end of the tube shaft (11) is movably connected to the second end of the tube handle (12) and can be locked in different positions with respect to said tube handle, said tube handle and said tube shaft cooperating to define means for releasably retaining said tube handle in any one of said different positions relative to said tube shaft.

5,568,944

**RESIN HOSE CONNECTING STRUCTURE**

Minoru Kawasaki, Komaki, Japan, assignor to Tokai Rubber Industries, Ltd., Komaki, Japan

PCT No. PCT/JP93/00581, § 371 Date Jul. 20, 1994, § 102(e) Date Jul. 20, 1994, PCT Pub. No. WO94/00286, PCT Pub. Date Jan. 6, 1994

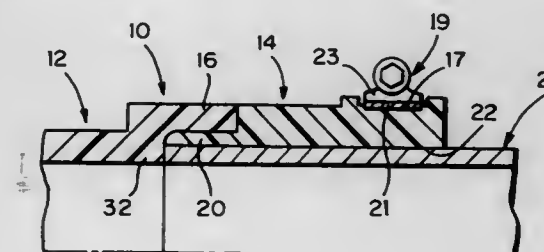
PCT Filed Apr. 30, 1993, Ser. No. 199,196

Claims priority, application Japan, Jun. 29, 1992, 4-194779

Int. Cl.<sup>6</sup> F16L 47/00

U.S. Cl. 285—21.1

14 Claims



1. A resin hose connecting structure comprising:
- a resin hose including a hose body and a soft thermoplastic resin, injection molded connecting portion extending coaxially and integrally with a hard thermoplastic resin, blow molded end portion of said hose body, said connecting portion having an axially extending inner peripheral surface; and
  - a mating member made of structural material having a tubular inserting end portion for inserting into said connecting portion of said resin hose, said tubular inserting end portion including a ring-shaped contacting surface disposed at a head thereof and an inserting outer peripheral surface disposed axially spaced from said ring-shaped contacting surface, said ring-

shaped contacting surface to be contacted to the inner surface of said hose body and said inserting outer peripheral surface to be inserted into said inserting inner peripheral surface of said connecting portion of said resin hose;

said head of said tubular inserting end portion of said mating member being inserted at least to an abutting edge of said end portion of said hose body, and said inserting outer peripheral surface of said tubular inserting end portion is fitted with said inserting inner peripheral surface of said connecting portion with said connecting portion extending radially from said tubular inserting end portion and forming an exterior surface of said resin hose which receives of a clamping member entirely on said exterior surface of said resin hose on said connecting portion so that said resin hose is bendable at said connecting portion with respect to said end portion.

5,568,945

**STABILIZING BRACKET FOR ADJUSTABLE METER SETTER**

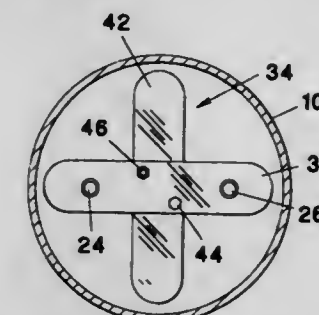
Mitchell Hunt, 1165 Park Ave., Murfreesboro, Tenn. 37130

Filed Aug. 22, 1995, Ser. No. 517,602

Int. Cl.<sup>6</sup> F16L 35/00

U.S. Cl. 285—30

7 Claims



1. In a water meter of the type including first and second spaced, substantially parallel, vertical water pipes connected, respectively, to the input and discharge ports of a water meter and housed within a vertically extending subterranean housing having at least one sidewall spaced from said first and second pipes, the improvement comprising:
- first member enclosing said first and second pipes and extending outwardly therefrom upward radially spaced first portions of the sidewalls of said housing; and
  - a second member operatively interconnected with said first member and said first and second pipes and extending outwardly therefrom toward radially spaced second portions of said sidewalls, said first and second portions being circumstantially spaced from one another.

5,568,946

**SQUEEZE-TO-RELEASE QUICK CONNECTOR WITH SNAP-IN RETAINER**

Keith T. Jackowski, Romeo, Mich., assignor to ITT Corporation, New York, N.Y.

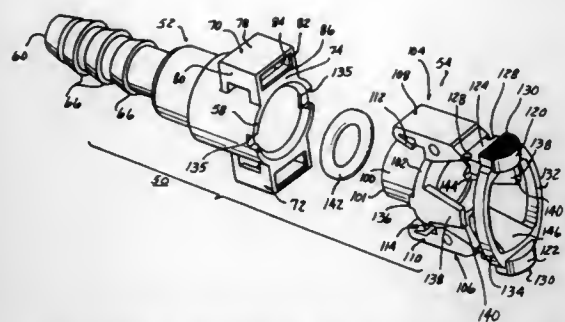
Filed Dec. 14, 1994, Ser. No. 355,679

Int. Cl.<sup>6</sup> F16L 37/084

U.S. Cl. 285—38

21 Claims

1. A squeeze-to-release quick connector adapted for selective locking engagement with a male connector part having a radially extending abutment surface comprising:
- a housing having a through bore extending from a first end to an opposed second end;
  - a retainer; and
  - receiver means, carried externally on the housing, for receiving the retainer in a detachable connection;
- the retainer including:



a body having a through bore, the body mountable through the first end of the housing into the through bore in the housing;

latch means, integrally extending from the body and detachably engagable with the receiver means, for detachably coupling the retainer to the housing;

pressure receiving portions formed on the body of the retainer and pivotally extending from the body;

a finger extending radially and angularly inward from each pressure receiving portion to engage an abutment surface on a male connector part to decouplingly mount the male connector part in the housing, and wherein

inward pressure on the pressure receiving portions urges the finger out of engagement with the abutment surface on the male connector allowing separation of the male connector from the housing while the retainer remains connected to the receiver means.

5,568,947

## CLOTHES DRYER AIR EXHAUST DUCT WALL CONNECTOR

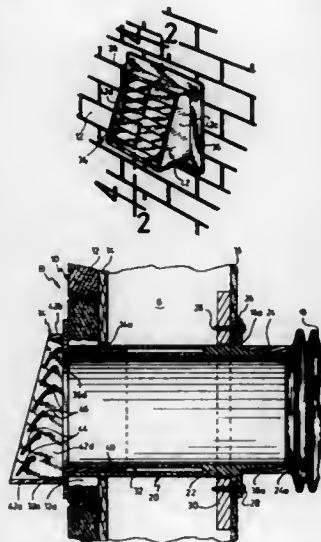
Claude Paquette, 532, rue de l'Église, St-Luc de Vincennes Québec, Canada

Filed Jan. 17, 1995, Ser. No. 373,698

Int. Cl.<sup>6</sup> F16L 5/00; E04F 17/04; F24F 13/08

U.S. Cl. 285-46

10 Claims



1. A wall connector for connecting a clothes dryer air outflow duct to outside ambient air through a building external wall hole, the dryer air duct being of the type having an outer end rigid mouthpiece; said wall connector consisting of a rigid cylindrical tubular main body, adapted to extend through and be mounted into an aperture in the building wall; wherein said connector main body defines:

(a) a through-channel, for free through passage of moist air expelled from the clothes dryer;

(b) an inner end portion, sized to fit within the dryer outer mouthpiece for interlocking engagement therewith in substantially fluid-tight fashion;

(c) an outer end portion, of double wall construction, wherein a peripheral annular cavity is formed thicknesswisely of said main body, said peripheral cavity defining a free end mouth; said peripheral cavity adapted to be releasably engaged by a complementary tubular section from an air inflow control hood member;

(d) a radially inward surface of substantially constant diameter all along said wall connector; and

(e) a radially outward surface of substantially constant diameter all along said wall connector, except at said inner end portion thereof;

wherein said wall connector main body radially outward surface is sized to be just slightly smaller than building wall hole, which facilitates retrofit installation of said wall connector to an existing building wall.

5,568,948

## APPARATUS FOR ATTACHING HOSES AND TUBES TO A FITTING

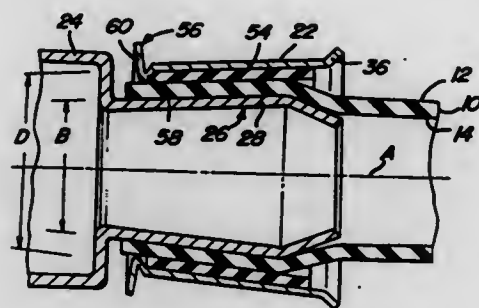
Donald D. Bartholomew, Marline City, Mich., assignor to Proprietary Technology, Inc., Bloomfield Hills, Mich.

Division of Ser. No. 335,541, Nov. 7, 1994, which is a division of Ser. No. 776,824, Oct. 15, 1991, Pat. No. 5,388,870, which is a division of Ser. No. 504,543, Apr. 4, 1990, Pat. No. 5,261,706, which is a division of Ser. No. 265,263, Oct. 31, 1988, Pat. No. 4,293,226, which is a continuation-in-part of Ser. No. 189,395, May 2, 1988, abandoned, which is a continuation-in-part of Ser. No. 66,749, Jun. 23, 1987, abandoned. This application Jun. 7, 1995, Ser. No. 487,965

Int. Cl.<sup>6</sup> F16L 33/22

U.S. Cl. 285-242

6 Claims



1. A hose coupling for terminating the end of a deformable hose or tubular member, comprising a fitting having an end adapted to be received interiorly of said hose and to expand the interior diameter of said hose when inserted therein, said fitting end having a smooth uninterrupted external surface to contact with the interior surface of said hose, a biconical shape with a first and second portion generally frusto-conical shaped and intersecting at a crest defining a largest diameter portion of said fitting for expanding said hose, and a locking sleeve having a smooth uninterrupted internal surface to contact with said hose, means for reducing stress on said conduit, said stress reducing means sandwiched between said sleeve and conduit, said locking sleeve locatable over said hose whereby to clampingly secure the hose between the fitting and sleeve, said fitting and sleeve are constructed such that a portion of each is formed with a matching frusto-conical surface defined by a double included angle of one to eight degrees the conical surfaces increasing in diameter toward the inserting end of said fitting, said double included angle of said sleeve being less than the double included angle of said fitting, and said sleeve and fitting retaining, sealing and positioning said hose between said sleeve and fitting.

5,568,949

## METHOD OF COUPLING TUBES OR PIPES, AND COUPLINGS OR THE LIKE OBTAINED BY IMPLEMENTING THE METHOD

Maxime Andre, St Germain des Pres, France, assignor to Hutchinson, Paris, France

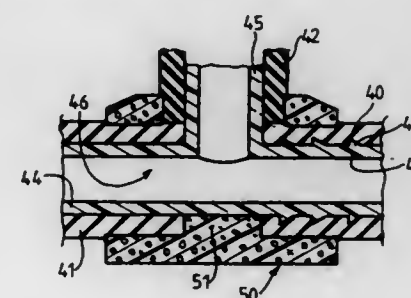
Division of Ser. No. 86,200, Jul. 1, 1993, Pat. No. 5,460,762.

This application Jul. 18, 1995, Ser. No. 503,847

Int. Cl.<sup>6</sup> F16L 33/00; 33/22

U.S. Cl. 285-284

13 Claims



1. A coupling device for tubes or pipes made of rubber-type material, comprising at least one insert on which the tubes or pipes are engaged, and a molding of plastics material that encloses in sealed manner at least those portions of said tubes or pipes that are engaged on the insert, wherein said plastics material is in the form of a cellular material that is expanded and rigid and that exerts compression forces on said tubes or pipes ensuring that said tubes or pipes are fixed and sealed on the insert and wherein the cellular material is reinforced by fillers.

5,568,950

## HAND HELD BALLOON TYING DEVICE

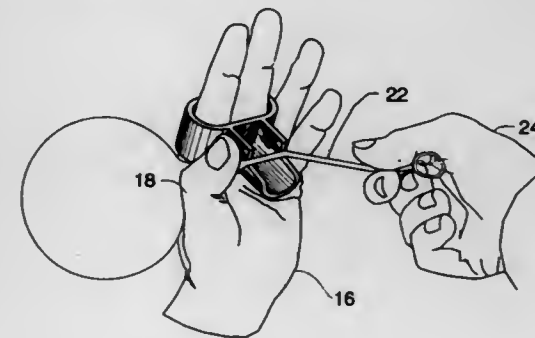
Gerald R. Herren, South Baxter, Tenn., assignor to H & M Enterprises, Inc., Cookeville, Tenn.

Filed Mar. 18, 1996, Ser. No. 618,288

Int. Cl.<sup>6</sup> D03J 3/00

U.S. Cl. 289-17

3 Claims



1. A knot tying device comprising:  
a base adapted for attaching firmly to a human hand by sliding over at least one finger; and  
a cantilever supported by said base and protruding away from the palm of the hand, said cantilever having a U-shaped cross section, said cantilever having a proximal region closest to said base and a distal region, said proximal region having two ears defining generally parallel planes extending outwardly therefrom, each of said ears terminating in a distal retaining edge for retaining a loop of balloon material, said cantilever defining inside said U-shape an axially oriented recess at least 3/8 inch wide, said recess extending from said proximal region and between said ears to said distal region.

5,568,951

## TAMPER EVIDENT SECURITY DEVICE

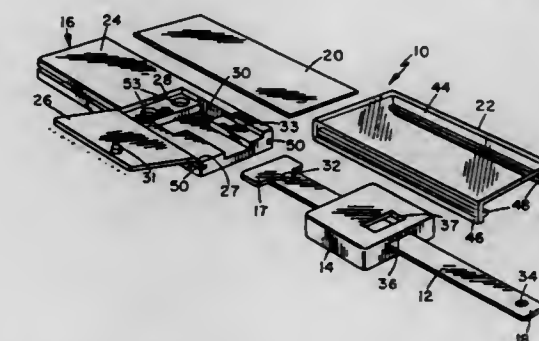
Brian R. Morgan, 2641 Calle Del Oro, La Jolla, Calif. 92037

Continuation-in-part of Ser. No. 133,556, Oct. 7, 1993, Pat. No. 5,452,930. This application Mar. 8, 1995, Ser. No. 401,030

Int. Cl.<sup>6</sup> B65D 27/30

U.S. Cl. 292-307 A

15 Claims



1. A tamper indicating security device, comprising:  
a base member having a base portion, a cover portion, and a hinge securing the cover portion to the base portion along a hinge line, whereby the cover portion is foldable between an open position in which at least part of the base portion is uncovered and a closed position covering the base portion;  
a securing device for securing the cover portion to the base portion in the closed position;  
the cover portion having an outer face which faces outwardly in the closed position to form at least part of a label-receiving surface for receiving an adhesive label;  
a label secured across said label-receiving surface for receiving personal indicia;  
an elongate, flexible strap having a first end secured to said base member and a second, free end for extending through at least one eyelet on a container or case to be protected;  
the base member having trapper means for receiving and trapping said free end in the closed position; and  
the securing device comprising means for preventing release of said free end without tearing said label.

5,568,952

## TAMPER RESISTANT SHACKLE SEAL WITH MULTIPLE LOCKING COMPONENTS

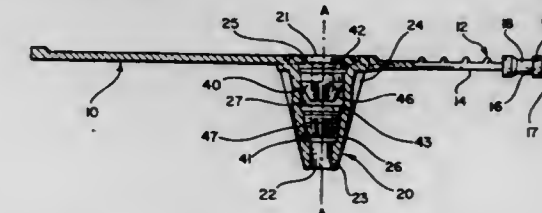
Erwin Ruegg, Tompkins Cove, N.Y., assignor to Stoffel Seal Corporation, Tuckahoe, N.Y.

Filed Oct. 2, 1995, Ser. No. 537,393

Int. Cl.<sup>6</sup> B65D 55/06

U.S. Cl. 292-318

19 Claims



1. A tamper indicating security seal comprising a housing, a strap member extending from said housing, said strap member including at least two locking elements extending outwardly therefrom in spaced relationship with respect to one another, an inlet opening into said housing of a size to receive said strap member, a first locking means within said housing including a plurality of locking fingers having inwardly extending portions defining a restricted passageway, said inwardly extending portions of said locking fingers of said first locking means being configured to abut a first one of said locking elements of said strap member when said



strap member is inserted within said housing to thereby resist the withdrawal of said strap member from said housing, a second locking means movably mounted within said housing and having a base defining an opening therethrough for selectively receiving said strap member and a plurality of spaced locking fingers having inwardly extending portions for selectively engaging a second one of said locking elements of said strap member when said strap member is inserted within said housing, said base portion of said second locking means being movable into engagement with said locking fingers of said first locking means when a force is exerted in a direction to withdraw said strap member from said housing to thereby urge said locking fingers of said first locking means toward said strap means.

5,568,953

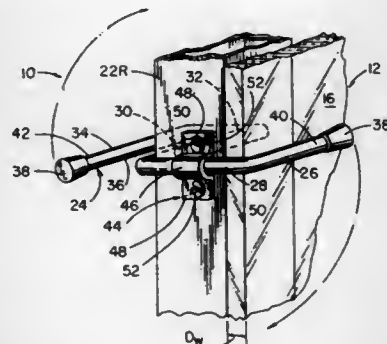
# RETAINING LATCH FOR GOLF CART HINGED WINDSHIELDS

Jerry M. Showalter, Wesley Chapel, Fla., assignor to Tampa G Manufacturing Co., Tampa, Fla.

Filed Sep. 9, 1994, Ser. No. 303,525  
Int. Cl.<sup>6</sup> E05C 3/02

U.S. Cl. 292—194

9 Claims



2. A retaining latch for use in connection with a hinged windshield for a golf cart, the hinged windshield having a portion overlying a roof structure support, comprising in combination: an S-shaped latch having serially connected first outer transverse member, first outer longitudinal member, middle transverse member, second outer longitudinal member and second outer transverse member that define an "S" configuration; said first outer transverse member, first outer longitudinal member, middle transverse member, second outer longitudinal member and second outer transverse member of said S-shaped latch being positioned in the same plane; and means for clamping one of said outer longitudinal members to a side of said support, whereby a first lobe defined by said first outer transverse member, first outer longitudinal member, and middle transverse member of said S-shaped latch is positioned about the support with said clamp means being positioned over said first outer longitudinal member and secured to the side of the support, whereby a second lobe defined by said middle transverse member, second outer longitudinal member and second outer transverse member functions as a handle that can be easily grasped and twisted such that said first outer transverse member moves across the front of the portion of the windshield to securely retain the windshield in the closed position and whereby the windshield may be released by grasping said second lobe and twisting it until said first outer transverse member pivots away from the front of the windshield.

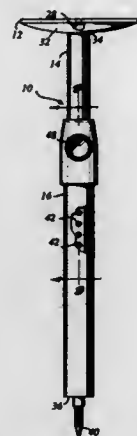
# 5,568,954 CEILING-MOUNTED DEVICE FOR STABILIZING A WORKPIECE

Robert K. Burgess, 621 Crystal Springs Rd., Lexington, S.C. 29072

Filed May 17, 1995, Ser. No. 443,147  
Int. Cl.<sup>6</sup> E05C 17/44

U.S. Cl. 292—338

14 Claims



1. A method for use in stabilizing a door in a room having a ceiling and a floor, said door having a top edge and an opposing bottom edge, said method comprising the steps of: attaching a telescoping support to a ceiling, said support telescoping between a retracted position and an extended position; positioning said door under said support, said bottom edge of said door against said floor; extending said support to engage said top edge of said door whereby said door is stabilized against said floor by said support; wherein said ceiling carries an electrical junction box, and said attaching step further comprises the step of attaching said support to said electrical junction box; and said support having a first end and an opposing second end, said first end being attachable to said ceiling and said second end carrying a pin, and said engaging step further comprising the step of pushing said pin into said top edge of said door.

5,568,955

# DEVICE FOR INDIVIDUAL COLLECTION OF PET EXCREMENTS

Mary-Louise Giuliano, and Yuri Tuvim, both of 22 Jenison St., Newton, Mass. 02160

Filed Sep. 22, 1995, Ser. No. 532,232  
Int. Cl.<sup>6</sup> A01K 29/00

U.S. Cl. 294—1.3

5 Claims

1. A device for individual collection of pet excrements, comprising a substantially elongated element having a first hollow portion formed to receive a user's palm and provided with a projection for receiving a user's thumb, and a second portion extending from said first portion and having an inlet opening for insertion of the user's arm, said second portion having a length which is at least equal to the length of said first portion, and a width which is at least equal to the width of said first portion, so that when a user by manipulations with the first portion and the projection collects the pet excrements, the second portion can be turned over the first portion and farther so that said element is turned inside out to produce a bag-like structure with excrements inside; and means for closing said element after it has been converted inside out, said closing means being a strap formed as a rear part of said second portion which is formed of one piece with a remaining part of said second portion and includes a plurality of transverse cuts, said rear part in an inoperative position being coextensive with said second portion while in an operative position said strap being unfolded and

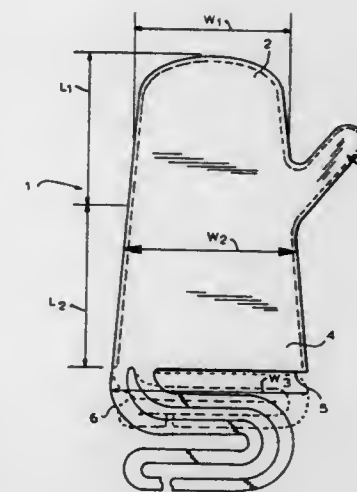
# 5,568,957 PRESSURE ACTUATED GRIPPING APPARATUS AND METHOD

Audun Haugs, Natlandsfjellet 56, N-5030, Landas, Norway  
Continuation-in-part of Ser. No. 81,004, Jun. 22, 1993, abandoned, which is a continuation of Ser. No. 778,829, Feb. 12, 1992, abandoned. This application Nov. 17, 1993, Ser. No. 154,166

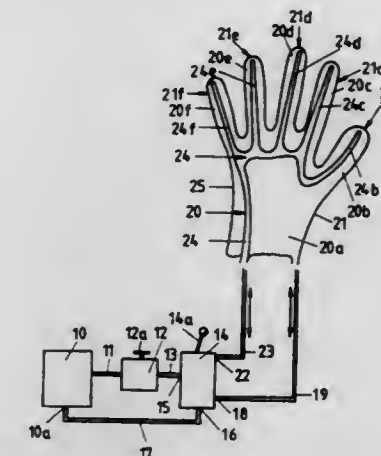
Int. Cl.<sup>6</sup> B25J 15/12

U.S. Cl. 294—119.3

23 Claims



forming an elongated element for tying up the device with both ends of said strap which are connected of one piece to the remaining part of said second portion.



5,568,956

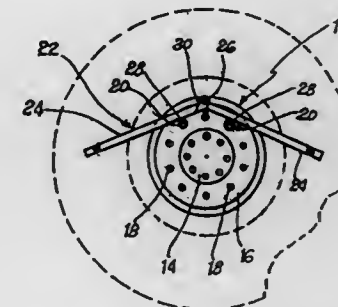
# TRUCK HUB CARRIER

Weldon Benefield, 1561 Sandlewood Dr., El Centro, Calif. 92243

Filed Jan. 17, 1995, Ser. No. 373,753  
Int. Cl.<sup>6</sup> B25B 27/14; B65G 7/12

U.S. Cl. 294—15

7 Claims



1. A truck hub carrier for a truck wheel hub defining an axis and having an annular mounting plate orthogonal to the wheel axis for mounting to an axle spindle and defining orthogonally outwardly-directed studs parallel to said axis for mounting a truck wheel thereon, and an inwardly-directed cowling which extends over a truck brake shoe from the periphery of said annular plate and causes said wheel hub to be eccentrically weighted with a center of gravity inwardly displaced from said annular plate, rendering said hub awkward to handle, said carrier comprising:

- (a) a spanner bar extending substantially perpendicularly to said axis and laterally outwardly beyond said hub when in use;
- (b) two parallel sleeves substantially parallel to said studs in use, and mounted on said bar at spaced locations thereon to permit same to slip over two studs of a wheel hub; and,
- (c) handle means attached to the ends of said spanner bar and extending parallel to said studs in the inward direction overlapping said hub to extend beyond the center of gravity of said hub such that said carrier can be engaged on two studs of a wheel hub by said sleeves and said handle means lifted to elevate and carry said wheel hub substantially in alignment with the center of gravity thereof, to and from an installation on a truck wheel axle and brake assembly.

# 5,568,958 SEAT ADJUSTING DEVICE

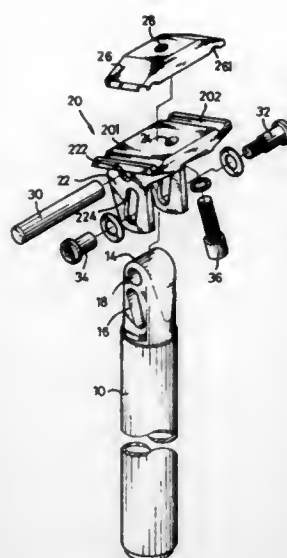
Chao-hu Chen, Taichung Hsien, Taiwan, assignor to Kalloy Industrial Co., Ltd., Taichung Hsien, Taiwan

Filed Dec. 7, 1995, Ser. No. 568,538  
Int. Cl.<sup>6</sup> B60J 1/00

U.S. Cl. 297—215.15

2 Claims

1. A seat adjusting device comprising: a base having an upper part and two plates extending from an under side of said upper part, said two plates extending in parallel with each other and each of said two plates having a first hole defined therein and a first slot defined below said first hole, said upper part having a second hole defined therein and having a first semi-circular recess defined in each one of two sides of an upper surface thereof; a mounting element having a threaded periphery defining a hole therein and having a second semi-circular recess defined in each one of two sides of an under surface thereof; a seat post having a first end and a second end, said first end thereof having a rounded top and having a third hole and a second slot transversely and respectively defined therein, said second slot located below said third hole, said first slot and said second slot having an opposite slope with each other corresponding to an axis of the seat post; and said base mounted to said rounded top of said seat post and said first hole and said third hole being in alignment with each other for a pin extending therethrough, said first and said



second slots forming an overlap portion when said base is mounted to said rounded top, a first bolt extending through said overlap portion to engage to a nut to securely position said base corresponding to said seat post, said mounting element mounting to said upper part of said base and being securely engaged to said base by extending a second bolt through said second hole of said upper part and threadably engaged with said threaded hole of said mounting element.

5,568,959

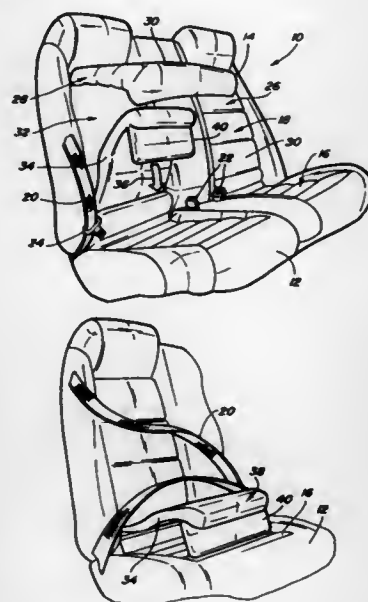
# VEHICLE SEAT WITH INTEGRATED BOOSTER SEAT AND WITH INTERCHANGEABLE MODULES

James L. Weber, West Bloomfield, and Vasile Nae, Troy, both of Mich., assignors to Hoover Universal, Inc., Plymouth, Mich.

Filed Mar. 28, 1995, Ser. No. 412,134  
Int. Cl.<sup>6</sup> A47C 15/00; A47D 11/00

U.S. Cl. 297—238

10 Claims



## 1. A vehicle seat comprising:

- a lower seat cushion having an upper seating surface upon which an adult seat occupant sits and having a rear end;
- a seat back extending generally upwardly from said rear end of said lower seat cushion and having a forward facing seat back surface upon which a seat occupant rests, said seat back

having a seat back panel which is movable between open and closed positions, said seat back panel forming a portion of said seat back surface against which a seat occupant rests when said seat back panel is in said closed position, and said seat back panel, when in said open position, revealing a recess in said seat back; and

a child booster seat cushion having a stowed position within said recess in said seat back and being concealed therein by said seat back panel when said seat back panel is in said closed position, said child booster seat cushion being movable, when said seat back panel is in said open position, to a use position extending forward from said seat back and spaced vertically above said upper seating surface of said lower seat cushion whereby a child can sit upon said child booster seat cushion and be positioned at a higher elevation than if the child were seated upon said lower seat cushion;

said seat back panel being movable back to said closed position after said child booster seat cushion is moved to said use position whereby said seat back panel forms a seat back surface for both child and adult seat occupants.

5,568,960

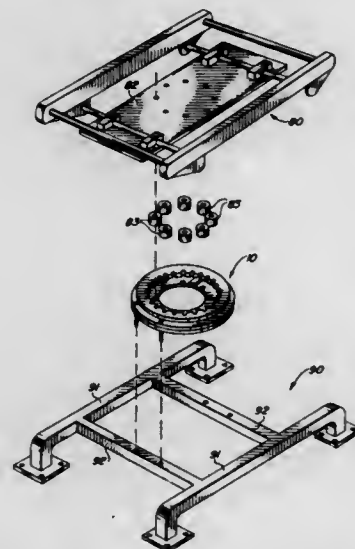
# AIRCRAFT PASSENGER SEAT SWIVEL ASSEMBLY

Michael Oleson, and Daryl Soderman, both of Ft. Lauderdale, Fla., assignors to Aircraft Modular Products, Inc., Miami, Fla.

Filed Sep. 15, 1995, Ser. No. 529,084  
Int. Cl.<sup>6</sup> B60N 2/14

U.S. Cl. 297—344.22

5 Claims



1. An aircraft passenger seat swivel assembly to be connected between an aircraft seat frame upon which an individual sits and an aircraft seat base which is secured to an underlying support surface, the seat base including a pair of transverse spar segments spanning a pair of base rails; said swivel assembly comprising:

- a bottom swivel plate, said bottom swivel plate including a generally annular recess formed therein and an exterior lock flange, said bottom swivel plate being structured to be secured to the seat base,
- a bearing track, said bearing track including a generally annular configuration and being structured to be disposed in said annular recess of said bottom swivel plate,
- said bearing track further including a plurality of slots disposed about a perimeter thereof,
- a plurality of bearing members, said bearing members being rotatably disposed in said plurality of slots of said bearing track,
- a swivel plate.

said swivel plate including a generally annular configuration and having an exterior segment about an exterior perimeter thereof and an interior mount segment in an interior thereof, said exterior segment of said swivel plate being structured to ride on said bearing members disposed in said slots of said bearing track,

said interior mount segment of said swivel plate being structured to supportingly receive the aircraft seat frame thereon, a lock ring, said lock ring including an annular lock recess and an exterior lock flange,

said lock ring being structured for secured engagement of said exterior lock flange of said lock ring with said exterior lock flange of said bottom swivel plate such that said bearing track, said plurality of bearing members and said exterior segment of said swivel plate are rotatably retained between said annular recess of said bottom swivel plate and said annular lock recess of said lock ring,

said lock ring further including a plurality of axially oriented notches disposed in spaced apart relation from one another along an interior perimeter of said lock ring, and

lock means disposed on said interior segment of said swivel plate, said lock means being structured and disposed to selectively and axially extend a lock pin into a select one of said notches in said interior perimeter of said lock ring so as to retain said swivel plate non-rotatably disposed relative to said lock ring, said bottom swivel and accordingly the seat base.

5,568,961

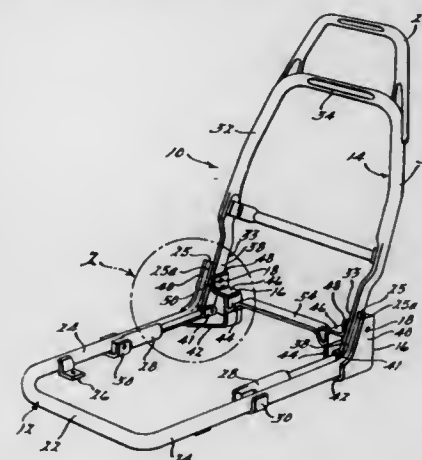
# TUBULAR SEAT FRAME

Arduino Colasanti, Eastpointe, Mich., assignor to Findlay Industries, Troy, Mich.

Filed Aug. 10, 1994, Ser. No. 288,450  
Int. Cl.<sup>6</sup> B60N 2/02

U.S. Cl. 297—362.12

7 Claims



## 1. A seat frame comprising:

- a U-shaped base frame, said base frame having a front member and corresponding side members;
- U-shaped brackets, including an outer side wall and an inner side wall, connected to said U-shaped base frame;
- a U-shaped seat back frame including a transverse top portion and upright side portions, said upright side portions having ends, each of said ends flattened to form a plate-like member, said plate-like member having first and second apertures therein where said plate-like member is positioned between said outer side wall and inner side wall of said bracket;
- a pivot pin extending through said second aperture in said plate-like member on said seat back frame and secured to said bracket to pivotally connect said seat back frame to said bracket; and
- actuation mechanisms mounted adjacent said side members, said actuation mechanisms pivotally connected to said seat back frame via said first apertures wherein said actuation mecha-

nisms operate to adjust the position of said seat back frame relative to said seat base frame.

5,568,962

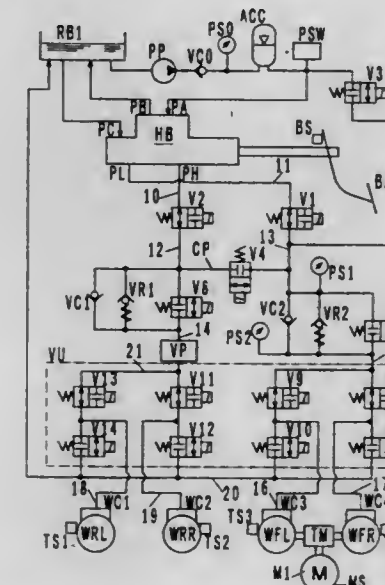
# BRAKING SYSTEM FOR MOTOR DRIVEN VEHICLE

Naoyasu Enomoto, Handa, and Masamoto Ando, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 13, 1995, Ser. No. 489,736  
Claims priority, application Japan, Jun. 14, 1994, 6-132047  
Int. Cl.<sup>6</sup> B60L 7/22

U.S. Cl. 303—3

4 Claims



## 1. A control system for motor driven vehicle comprising:

- an onboard battery which stores electric energy;
- an electric motor fed from the onboard battery for driving at least one of a first and a second wheel;
- regenerative braking means for returning electric power generated by the motor to the onboard battery as the first and/or the second driven wheels rotate;
- first liquid pressure generating means for generating a braking liquid pressure in response to a depression of a brake pedal;
- second liquid pressure generating means for generating a power liquid pressure in accordance with a stroke of the brake pedal, the power liquid pressure being substantially equal in liquid pressure to the braking liquid pressure generated by the first liquid pressure generating means;
- first liquid pressure braking means for applying a braking effort which depends on a given liquid pressure to the first wheel;
- second liquid pressure braking means for applying a braking effort which depends on a given liquid pressure to the second wheel;
- first liquid pressure restricting means interposed in a first liquid flow path extending from the first liquid pressure generating means to the first liquid pressure braking means to apply a restriction upon the liquid pressure supplied to the first liquid pressure braking means;
- first restriction terminate means for terminating the restriction upon the liquid pressure applied by the first liquid pressure restricting means;
- second liquid pressure restricting means, interposed in a second liquid flow path extending from the second liquid pressure generating means to the second liquid pressure braking means to apply a restriction upon the liquid pressure supplied to the second liquid pressure braking means;
- second restriction terminate means for terminating the restriction upon the liquid pressure applied by the second liquid pressure restricting means;



first valve means (V1) interposed in the first liquid flow path between the first liquid pressure generating means and the first liquid pressure restricting means for opening and closing the first liquid flow path;

second valve means (V4) interposed in a third liquid flow path (CP) which connects between the first liquid flow path extending between the first valve means (V1) and the first liquid pressure restricting means and the second liquid flow path extending between the second liquid pressure generating means and the second liquid pressure restricting means;

and switching control means for controlling the first and the second restriction terminate means to terminate the restriction applied by the first and the second liquid pressure restricting means when the regenerative braking means ceases to operate and for closing the first valve means (V1) and opening the second valve means (V4) at least temporarily.

5,568,963

#### METHOD AND APPARATUS FOR MULTIMEDIA PRESENTATIONS

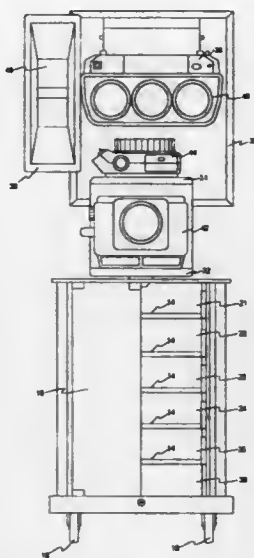
Allen C. Bennett, Mission Viejo; Bruce E. Del Mar, Laguna Beach, and Marna B. Schnabel, Los Angeles, all of Calif., assignors to Del Mar Avionics, Irvine, Calif.

Filed Mar. 9, 1994, Ser. No. 208,535

Int. Cl.<sup>6</sup> G03B 21/54

U.S. Cl. 353—122

17 Claims



1. A portable, expandable, and remotely controlled audiovisual tower for multimedia presentations, comprising:

- a cabinet rack, having mobile means and containing a plurality of shelves capable of holding at least one multimedia data recording and storage device;
- an elevated rack containing a plurality of shelves capable of holding at least one multimedia display device;
- telescoping means for connecting, expanding, and elevating said elevated rack to and from said cabinet rack;
- radio frequency and infrared control means for remotely and operatively acting upon said multimedia devices.

5,568,964

#### FIBER OPTIC LIGHT EMITTING PANEL ASSEMBLIES AND METHODS OF MAKING SUCH PANEL ASSEMBLIES

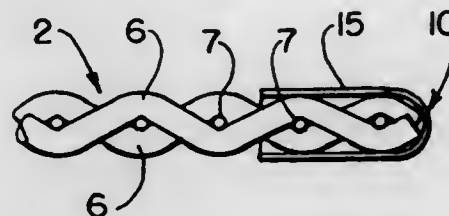
Jeffery R. Parker, Strongsville, and Mark D. Miller, Parma, both of Ohio, assignors to Lumitex, Inc., Strongsville, Ohio

Filed Jul. 10, 1992, Ser. No. 911,507

Int. Cl.<sup>6</sup> F21V 7/04

U.S. Cl. 362—32

41 Claims



8. A light emitting panel assembly comprising a light emitting portion formed by a plurality of woven optical fibers and fill threads extending transversely of said fibers, said fibers having disruptions or bends at discrete locations along the length of said fibers to allow light to be emitted therefrom, said light emitting portion having side edges and end edges, means for adhering said fibers and said fill threads together along at least one of said edges of said light emitting portion to prevent said fibers from separating from said light emitting portion at said one edge, a light cable extending from one of said end edges of said light emitting portion, and covering means extending over opposite sides of said light emitting portion, said covering means comprising a pocket having at least one clear or translucent side and an opening along one edge for insertion of said light emitting portion into said pocket.

5,568,965

#### HAND-HELD LIGHTED MICRO-INSPECTION MIRROR

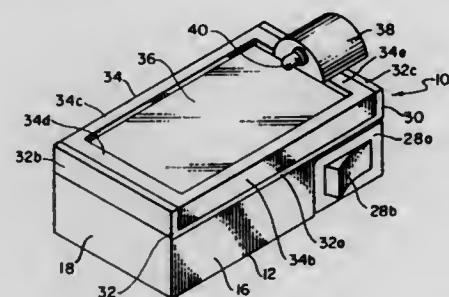
Chris S. Eagan, 670 E. Eldorado La., Las Vegas, Nev. 89123

Filed Aug. 15, 1995, Ser. No. 515,388

Int. Cl.<sup>6</sup> F21V 33/00

U.S. Cl. 362—135

5 Claims



1. A compact hand-held inspection tool for illuminating and viewing equipment components which are out of line-of-sight vision of an operator of the inspection tool, said tool comprising:

- a) a two-part housing including, i) a lower section consisting of an electrical component compartment having a head end and a foot end and being defined by side walls, end walls and a top wall, said compartment being enclosed by a removable bottom access slip cover, and said compartment including therein an inner battery compartment and a switch box having an on-off switch component projecting through one of the side walls of the electrical component compartment, and ii) an upper mirror support bracket defined by end walls projecting upwardly from the top wall of the lower section of the housing at the head end and foot end thereof;
- b) a mirror assembly including an upper mirror having a reflecting surface and an underlying mirror frame, said assembly

being removably gripped by and positionable between the upwardly projecting end walls of said mirror support bracket;

c) a mirror light mount affixed to the upper portion of the head end wall of the mirror support bracket and positioned over the mirror assembly, said light mount bearing a mirror light for illuminating the reflecting surface of said mirror and for projecting light onto said equipment components; and

d) a direct current battery power source contained within the said battery compartment, said mirror light being electrically interconnected through the mirror light mount to said power source and said on-off switch by electrical leads for effecting the illumination of the reflecting surface of said mirror when said switch is in its on position.

5,568,966

#### DECORATIVE LIGHT-SUPPORTING APPARATUS FOR HOLDING CONNECTED STRINGS OF LIGHTS

Donna R. Miller, and Kenneth B. Miller, both of 3969 Guasti Rd., Unit D, Ontario, Calif. 91761

Continuation of Ser. No. 325,576, Oct. 19, 1994, Pat. No. 5,488,549. This application Jan. 30, 1996, Ser. No. 594,085

Int. Cl.<sup>6</sup> F21P 1/00

U.S. Cl. 362—252

23 Claims



1. A decorative light-supporting apparatus for routing a string of lights up and down between a lower perimeter and an upper region comprising:

- a plurality of lower light-routing members extending from the lower perimeter with at least a portion of said lower light-routing members facing the lower perimeter whereby the string of lights may be securely retained behind said lower light-routing members;
- an upper light-routing member located in the upper region above the plurality of lower light-routing members whereby the string of lights may be routed up and down between the upper light-routing member and behind desired ones of the plurality of lower light-routing members; and
- means for supporting the upper light-routing member in the upper region above said plurality of lower light-routing members.

5,568,967

#### ELECTRIC LAMP WITH REFLECTOR

Marten Sikkens, and Johannes P. M. Ansems, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

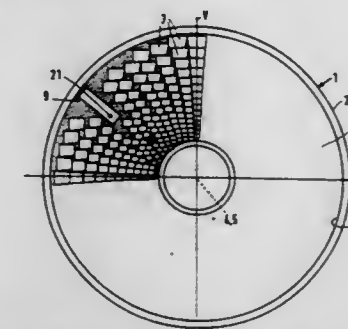
Filed Apr. 4, 1995, Ser. No. 416,276

Claims priority, application European Pat. Off., Apr. 8, 1994, 94200960

Int. Cl.<sup>6</sup> F21V 5/00

U.S. Cl. 362—328

28 Claims



1. An electric lamp with reflector, comprising:

a reflector having a reflector body with a concave reflecting surface chosen from surfaces with an ellipsoidal and surfaces with a paraboloidal general shape, an optical axis, a focus within the reflector, and a light emission window;

an electric lamp with a lamp vessel which is closed in a vacuum tight manner and in which a linear electric element is present, arranged on the optical axis,

characterized in that the reflecting surface mainly comprises substantially planar, substantially quadrangular reflecting facets superimposed on the general shape, which facets each have a point of tangency to the concave general shape and each individually illuminate a substantially quadrangular field in a plane at a distance from the light emission window, perpendicular to the optical axis which field is substantially of the same shape and size for each facet and has the same orientation, and

the light emission window has a diameter  $D_{LS}$  and the electric element has an axial dimension  $L$ ,  $D_{LS}/L$  being greater than 40.

5,568,968

#### ADJUSTABLE DROP LIGHT APPARATUS

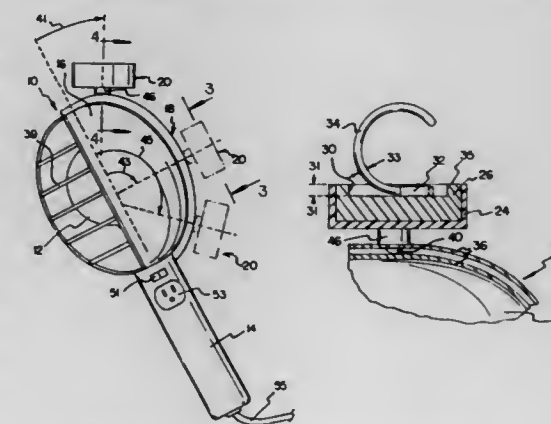
Lola Jaramillo, P.O. Box 1178, Claypool, Ariz. 85532

Filed Apr. 3, 1995, Ser. No. 415,704

Int. Cl.<sup>6</sup> F21V 21/08

U.S. Cl. 362—376

8 Claims



1. An adjustable drop light apparatus, comprising:

a lamp assembly,

a handle assembly connected to said lamp assembly, wherein said handle assembly supports said lamp assembly, a protective housing assembly, supported by said handle assembly, for protecting a portion of said lamp assembly, and a suspension assembly adjustably connected to said protective housing assembly, wherein said suspension assembly includes: a magnet retainer, a magnet retained by said magnet retainer, and a hook assembly connected to said magnet, and wherein said magnet includes a retention well, said hook assembly includes a pivot bracket connected to said magnet within said retention well, and said hook assembly includes a selectably pivotally connected to said pivot bracket.

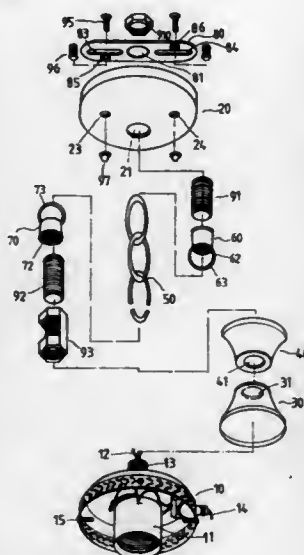
5,568,969

## CONVERTIBLE LIGHT ASSEMBLY

Jack Yu, No. 109-1, Avenue 6, Lane 164, Tzong Sa Road, Da Du Hsiang, Taichung Hsien, Taiwan  
Filed Mar. 22, 1996, Ser. No. 620,175  
Int. Cl.<sup>6</sup> F21S 1/04

U.S. Cl. 362-404

1 Claim



## 1. A light assembly comprising:

- a lower canopy for securing a lamp shade thereto, said lower canopy including a socket secured thereto for engaging with a lamp and including a first bolt sleeve extended upward therefrom,
- a nut including a lower portion for engaging with said first bolt sleeve and including an upper portion,
- a second bolt sleeve including a lower portion engaged with said upper portion of said nut and including an upper portion, at least one cover engaged on said lower canopy and including an aperture formed therein for engaging with said second bolt sleeve,
- a first coupler including an inner thread formed therein for engaging with said upper portion of said second bolt sleeve so as to be secured to said second bolt sleeve, said first coupler including a first ring secured thereto,
- a bar for securing to a ceiling, said bar including two slots formed therein for engaging with fastening means and including a screw hole formed therein,
- a ceiling canopy including a bore formed therein, means for securing said ceiling canopy to said bar,
- a third bolt sleeve engaged through said bore of said ceiling canopy and including an upper portion for engaging with said screw hole of said bar so as to be secured to said bar, said third bolt sleeve including a lower portion,

a second coupler including an inner thread formed therein for engaging with said third bolt sleeve so as to be secured to said third bolt sleeve and for securing said ceiling canopy to said third bolt sleeve, said second coupler including a second ring secured thereto, and a chain including two ends secured to said first ring and said second ring of said first and said second couplers so as to couple said lower canopy to said ceiling canopy and so as to form a pendent light, said third bolt sleeve being engaged with said nut in order to secure said lower canopy to said ceiling canopy so as to form an overhead lamp when said chain and said first and said second couplers and said second bolt sleeve and said cover are removed, and said first bolt sleeve being adapted to be engaged with a control box of a ceiling fan so as to form a ceiling fan light.

5,568,970

## APPARATUS FOR MOVING AN ORNAMENT AND DRIVE MEANS THEREFOR

Frank J. Prineppi, 1108 Avocado Isle, Ft. Lauderdale, Fla. 33315

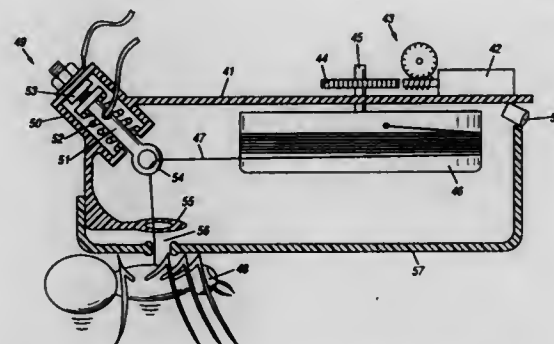
Filed Jul. 17, 1995, Ser. No. 503,248

Claims priority, application United Kingdom, Jul. 18, 1994, 9414479

Int. Cl.<sup>6</sup> F21V 21/16

U.S. Cl. 362-407

3 Claims



1. An ornament mover comprising an ornament movement reciprocation means including a synchronous motor connected to a pulley mechanism having a reaction means for stalling the motor at a point in the path of reciprocation, wherein the pulley mechanism comprises a gearing means powered by the motor to wind a cord to which the ornament is connected onto a pulley drum to a retracted position, wherein a reaction member butts against a casing of the ornament mover causing the synchronous motor to stall, wherein reaction forces between a rotor and a stator of the motor then cause the motor to reverse direction, thus unwinding the cord from the drum to its fullest extent, at which point the pulley drum continues to rotate in the same direction such that the cord is again wound onto the drum but from the opposite rotational direction.

5,568,971

## WRIST MOUNTED LIGHT SOURCE

Killairne Jewell, 8420 Cozycroft Ave., Canoga Park, Calif. 91306-1508

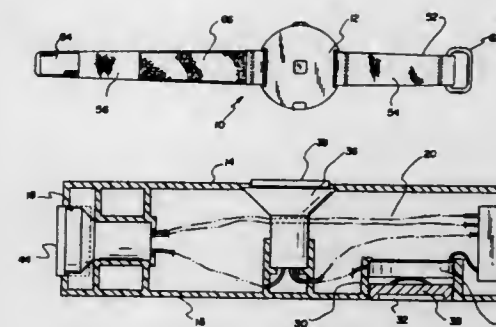
Filed Apr. 15, 1996, Ser. No. 631,960

Int. Cl.<sup>6</sup> F21L 15/08

U.S. Cl. 362-103

4 Claims

1. A wrist mounted light source for wearing a light source on a user's wrist comprising, in combination: a central housing having a generally cylindrical configuration, the central housing having a planar upper surface, a planar lower surface, and a surrounding side wall therebetween, the central housing having a hollow interior, the upper surface



having an opening centrally located therein, the lower surface having an opening therein, the surrounding side wall having a first opening and a second opening therein with the first opening and the second opening being diametrically opposed, the surrounding side wall having a pair of recesses therein being diametrically opposed;

- a pair of batteries secured within the hollow interior of the central housing inwardly of the opening in the lower surface thereof, a battery door removably coupled with the opening in the lower surface;
- an upper light secured within the hollow interior of the central housing inwardly of the opening in the upper surface thereof, the upper light being electrically coupled with the a circuit and the batteries, the upper light having a door slidably coupled within the opening in the upper surface of the central housing;
- a side light secured within the hollow interior of the central housing inwardly of the first opening in the surrounding side wall thereof, the side light being electrically coupled with the circuit and the batteries, the side light having a door slidably coupled within the first opening in the surrounding side wall of the central housing;
- a power switch secured within the second opening of the surrounding side wall of the central housing, the power switch being electrically coupled with a three way switch with the circuit to the batteries and the top light and the side light;
- a securement strap having a first segment and a second segment, the first segment and the second segment having end portions secured within the opposed recesses in the surrounding side wall of the central housing, the first segment having a loop secured to an opposing end portion thereof, the second segment having male and female pile type fasteners disposed thereon.

5,568,972

## LAMP HOUSING ASSEMBLY

Lyu-Shong Wang, No. 5, Lane 30, Ta Chou Road, Shern Kang Hsiang, Taichung, Taiwan

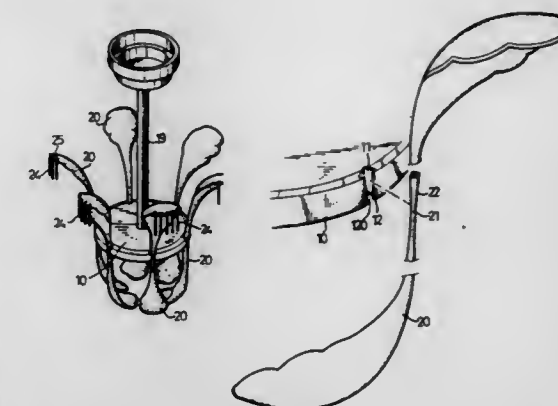
Filed Aug. 21, 1995, Ser. No. 517,071

Int. Cl.<sup>6</sup> F21S 1/06

U.S. Cl. 362-405

5 Claims

1. A lamp housing assembly comprising: a board including a peripheral portion having at least one notch formed therein, said notch defining an opening of relatively narrow size, said opening having a pair of flanges extending inwardly toward each other, the flanges having a wider upper portion and a narrower lower portion, and an attachment member including a neck portion for engaging within said notch and including an enlarged upper portion formed above said neck portion for engaging between said flanges so as to secure said attachment member to said board.



5,568,973

## ANTIFOAM BEVERAGE STIRRER OR STRAW

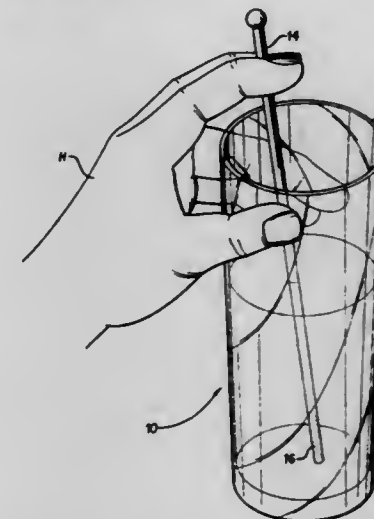
Glenn N. Gorab, 817 Peachtree La., Franklin Lakes, N.J. 07417

Filed Nov. 3, 1994, Ser. No. 334,390

Int. Cl.<sup>6</sup> B01F 17/54; A47G 21/18; B65D 77/24; B06D 77/28

U.S. Cl. 366-129

14 Claims



1. A stirrer for utilization in combination with a container for receiving and dispensing foaming liquids comprising a stirrer having on at least part of its surface an antifoaming agent which will reduce the surface tension of the liquid in the container when placed in the container prior to filling the container with the foaming liquid and will substantially reduce the amount of time required for pouring the foaming liquid into the container by reducing the amount of foam produced.

5,568,974

## LIQUID MIXING DEVICE

Van G. Plocus, Punxsutawney, and Chris Forsha, Blairsville, Pa., assignors to Vapco Engineering, Punxsutawney, Pa.

Filed Jan. 11, 1996, Ser. No. 584,556

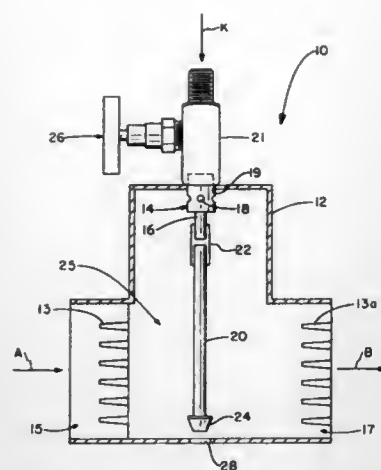
Int. Cl.<sup>6</sup> B01F 15/02

U.S. Cl. 366-151.1

16 Claims

1. A device for mixing fluids comprising: a housing enclosing a mixing chamber, said chamber being provided with at least two fluid entry ports, and a fluid exit port; first valve means extending into a first of said housing entry ports for entry of a first fluid into said mixing chamber, said





first fluid being mixed in said mixing chamber with a second fluid entering a second of said housing entry ports, said mixture being discharged from said chamber through said exit port;

first valve actuating means, actuated by the flow of said second fluid through said chamber, for initiating the entry of said first fluid, and

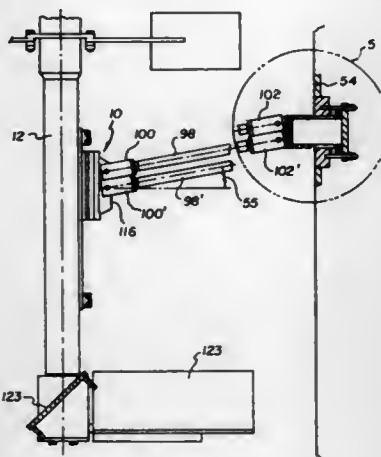
second valve means for controlling the flow of said first fluid to said first valve means, independently of the flow of said second fluid through said mixing device.

#### 5,568,975 SELF-ADJUSTING STEADY BEARING SUPPORT ASSEMBLY AND SUSPENSION

Robert Blakely, and Martin Schutte, both of Rochester, N.Y.,  
assignors to General Signal Corporation, Stamford, Conn.  
Filed Jan. 4, 1996, Ser. No. 582,688  
Int. Cl.<sup>6</sup> B01F 7/00

U.S. Cl. 366—285

16 Claims



1. An assembly for supporting a steady bearing for a mixer shaft in a vessel by allowing axial movement of said bearing along said shaft in response to changes in radial dimensions of said vessel while maintaining coaxial alignment of said bearing with said shaft and radial support of said shaft, said assembly being supported from a wall of said vessel, said assembly comprising:

- a) a bearing holder for containing and positioning said bearing in coaxial rotational contact with the surface of said shaft; and
- b) a plurality of pairs of struts disposed radially about said shaft for supporting said bearing holder within said vessel, each of said pairs of struts forming a parallel link suspension and
- i) extending between and being pivotably connected at an inner end thereof to said bearing holder and at an outer end thereof to said wall of said vessel,

- ii) having first and second struts of equal length disposed parallel to each other in a plane which includes the axis of the mixer shaft,
  - iii) being non-orthogonal to said mixer shaft in the shaft axial direction, and
  - iv) having the pivot axes of connection of said struts to said bearing holder normal to the axial direction of the mixer shaft axis and being included in a plane parallel to said shaft axis,
- said plurality of strut pairs cooperating to maintain radial support of said bearing.

#### 5,568,976 IDLER BEARING MOUNT FOR MOUNTING OF INCLINED AGITATORS

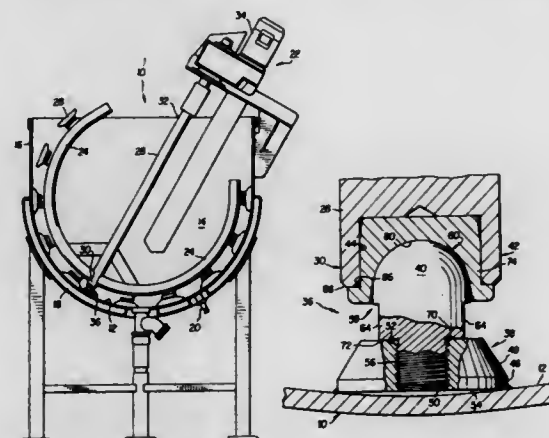
Valentino Gabriele, Baltimore, Md., assignor to J.C. Pardo & Sons, Baltimore, Md.

Filed Dec. 4, 1995, Ser. No. 566,943

Int. Cl.<sup>6</sup> B01F 7/04; F16C 17/08

U.S. Cl. 366—312

34 Claims



1. In combination, a kettle having inner walls and an agitator having a rotary shaft, the rotary shaft having a distal end extending into the interior of the kettle and having a free end extending from the interior of the kettle and mounted to a drive system for rotation of the shaft to mix materials being processed within the kettle, the combination further comprising:

a base fixed to a portion of the inner walls of the kettle, the base comprising a cylindrical base portion having a conical section formed on an inner planar end thereof and a beveled body portion formed outwardly of the base portion, a threaded bore formed centrally of the base portion and body portion and extending therethrough in alignment with the longitudinal axis of the combined base portion and body portion, the conical section of the base portion having the greatest height thereof about the periphery of the bore with said section tapering toward annular perimetric portions of the inner planar end of the base portion, the conical section facilitating attachment of the base to the walls of the kettle;

pin means removably mountable to the base and having a body portion defining first bearing surfaces; and, bushing means removably mountable to the distal end of the rotary shaft and having a body portion defining second bearing surfaces complementary to said first bearing surfaces, at least a portion of the pin means defining said first bearing surfaces being received into contact with the second bearing surfaces to mount the distal end of the rotary shaft relative to inner walls of the kettle.

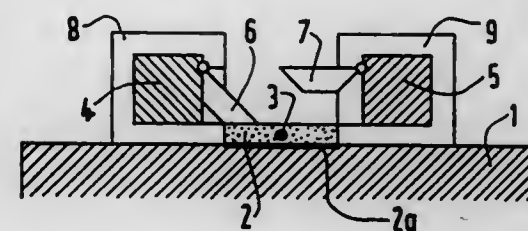
#### 5,568,977 PROCESS AND DEVICE TO DETECT A RISK OF WATER CONDENSATION ON A SURFACE BEING IN CONTACT WITH A WET AIR VOLUME

Michel Gschwind, Grasse, and Pascal Ancey, Le Rouret, both  
of France, assignors to Imra Europe SA, Valbonne, France  
Filed Feb. 3, 1994, Ser. No. 191,048

Claims priority, application France, Feb. 24, 1993, 93 02099  
Int. Cl.<sup>6</sup> G01N 25/12; 25/68

U.S. Cl. 374—45

11 Claims



1. A process for detecting risk of water condensation on a surface in contact with a volume of wet air, comprising the steps of:

- (a) placing a sensitive element on the surface causing the element to take on a temperature corresponding to the surface's temperature,
- (b) heating the sensitive element during a first heating phase with a heating device until a temperature higher than the surface's temperature is reached,
- (c) recording time duration and increase in temperature of the element during the first heating phase,
- (d) cooling the sensitive element during a cooling phase with a cooling device having the same thermal capacity as the heating device until a temperature lower than the surface's temperature is reached,
- (e) recording time duration and decrease in temperature of the element during the cooling phase,
- (f) comparing (1) the ratio of the first heating phase time duration to the temperature increase during the first heating phase to (2) the ratio of the cooling phase time duration to the temperature decrease during the cooling phase, wherein a difference between the ratios (1) and (2) corresponds to a risk of condensation on the surface.

10. A device for detecting risk of water condensation on a surface in contact with a volume of wet air comprising

- (a) a sensitive element which, when contacted with the surface, takes on a temperature corresponding to the surface's temperature,
- (b) a heating device for heating the sensitive element during a first heating phase,
- (c) means for recording time duration and increase in temperature of the element during the first heating phase,
- (d) a cooling device for cooling the sensitive element during a cooling phase,
- (e) means for recording time duration and decrease in temperature of the element during the cooling phase,
- (f) a control unit for controlling the heating and cooling devices so that the element is first heated to a predetermined temperature above the surface's temperature and then cooled to a temperature below the surface's temperature, and
- (g) means for comparing (1) the ratio of the first heating phase time duration to the temperature increase during the first heating phase to (2) the ratio of the cooling phase time duration to the temperature decrease during the cooling phase, wherein a difference between the ratios (1) and (2) corresponds to a risk of condensation on the surface.

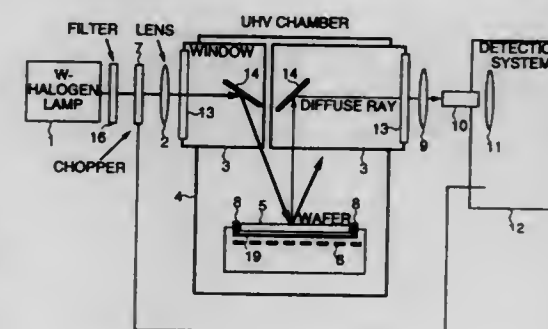
#### 5,568,978 OPTICAL APPARATUS AND METHOD FOR MEASURING TEMPERATURE OF A SUBSTRATE MATERIAL WITH A TEMPERATURE DEPENDENT BAND GAP

Shane R. Johnson; Christian Lavoie, both of 2626 Tennis  
Crescent, Vancouver, B.C., Canada; Mark K. Nissen, 215-  
2190 West 7th Avenue, Vancouver, B.C., Canada, and J.  
Thomas Tiedje, 1752 Westbrook Crescent, Vancouver, B.C.,  
Canada

Division of Ser. No. 121,521, Sep. 16, 1993, Pat. No. 5,388,909.  
This application Nov. 21, 1994, Ser. No. 343,097  
Int. Cl.<sup>6</sup> G01K 11/00; G01J 5/48

U.S. Cl. 374—161

9 Claims



1. An optical method for measuring the temperature of a substrate material in a process chamber comprising:

- (a) emitting radiation from an external light source to thereby cause broad spectrum radiation to be incident upon the front surface of the substrate;
- (b) placing a diffuse scattering element at the back of the substrate in the optical path of the light source to reflect the light rays from the external light source in a non-specular path through the substrate;
- (c) locating a wavelength selective detection system in a non-specular position with respect to rays from the light source that are reflected from the front surface of the substrate;
- (d) analyzing the non-specularly reflected light from the substrate to determine the knee in the spectrum of the non-specularly reflected light; and
- (e) computing the temperature of the substrate from the knee in the spectrum.

#### 5,568,979 CLOSEABLE THERMOPLASTIC BAG

Larry D. Fifer, Mt. Vernon, Ohio; Robert E. Hollenbeck, Newark, N.Y.; Mark F. Kozlowski, Pittsford, N.Y.; Richard E. Leone, Newark, N.Y., and Clifford H. Patridge, Newark, N.Y., assignors to Tenneco Plastics Company, Evanston, Ill.

Filed May 16, 1994, Ser. No. 243,357

Int. Cl.<sup>6</sup> B65D 33/16

U.S. Cl. 383—8

20 Claims

1. A bag comprising:

- a front wall, a rear wall, and side walls bridging said front and rear walls, said front wall, said rear wall, and said side walls forming an open mouth of said bag;
- handles extending upwardly from one or more of said front wall, said rear wall, and said side walls, each of said handles including an inside edge and an outside edge; and
- an elongated closure member closely adjacent to and below said open mouth and having opposing ends attached to said front wall adjacent to said handles, said closure member defining an opening between said closure member and said front wall adapted to accommodate a human hand during closure by grasping and pulling said handles through said opening to close said open mouth, said strap having a width less than the width of said bag and greater than or approximately equal to a distance between said inside edges of said handles.



5,568,980

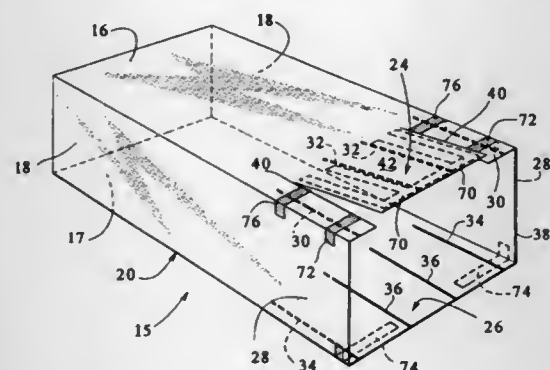
## QUASI-HEAT SEAL SOS BAG

Jay L. Kristola, Kiel, Wis., assignor to H.G. Weber Co., Inc., Kiel, Wis.

Filed Dec. 9, 1994, Ser. No. 352,503  
Int. Cl.<sup>6</sup> B65D 30/18

U.S. Cl. 383—126

22 Claims



1. A flat-bottom bag comprising:
  - a generally planar front wall;
  - a generally planar rear wall substantially parallel to said front wall;
  - gusseted side walls connecting said front and rear walls; and
  - a bottom end foldable to provide a flat bottom to said bag, said bottom comprising a front flap extension of said front wall, a bottom flap extension of said rear wall, and side flap extensions of said side walls;
  - a pair of first adhesive patterns, one on an interior of said front wall, one on an interior of said rear wall, each first adhesive pattern comprising a pair of outer lines disposed adjacently to said side walls at said bottom end, a pair of corresponding inner lines disposed between said outer lines, said inner and outer lines running parallel to said sides, such that when said side flap extensions are folded inwardly, each outer line intersects one of said corresponding inner lines.

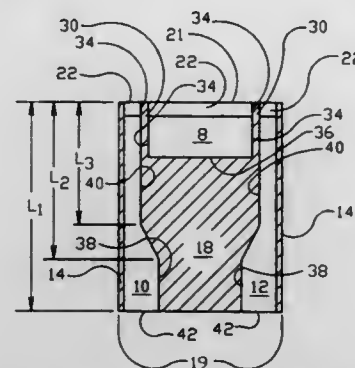
5,568,981

## NEGATIVE PRESSURE AIR BEARING SLIDER

Daniel A. Nepela, San Jose; Cluter Chang, Fremont; Ylao-Tee Hsia, Pleasanton, and Rajendra Bhadra, Fremont, all of Calif., assignors to Read-Rite Corporation, Milpitas, Calif.  
Continuation-in-part of Ser. No. 293,882, Aug. 19, 1994, abandoned. This application Apr. 10, 1995, Ser. No. 419,760  
Int. Cl.<sup>6</sup> F16C 32/06

U.S. Cl. 384—12

30 Claims



1. A negative pressure air bearing slider having an air bearing surface with a leading edge and a trailing edge and defining opposing first and second sides between said edges comprising:
  - first and second tapered regions disposed at said leading edge and adjacent to said respective first and second sides;
  - a third tapered region disposed at said leading edge and centered substantially between said first and second tapered regions;
  - first and second side rails extending from said first and second tapered regions respectively;
  - pad means extending from said tapered regions and located symmetrically or centrally between said first and second side rails;
  - a negative pressure recessed cavity extending from said pad means towards said trailing edge; and
  - at least one relief vent disposed adjacent to said pad means and extending from said leading edge to said negative pressure recessed cavity.

5,568,982

## LINEAR DRIVE

Kurt Stoll, Esslingen; Albrecht Wagner, Winterbach, and Eric Angué, Stuttgart, all of Germany, assignors to Festo KG, Essling, Germany

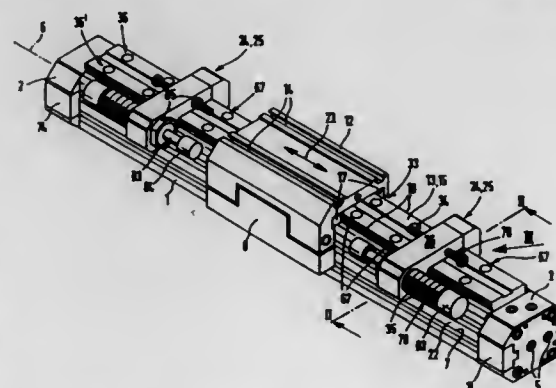
Filed Oct. 10, 1995, Ser. No. 541,856

Claims priority, application Germany, Oct. 14, 1994, 9416523 U

Int. Cl.<sup>6</sup> F16C 29/04

U.S. Cl. 384—55

20 Claims



1. A linear drive comprising a housing which contains a drive part coupled kinetically with an output drive part which is mov-

ingly arranged outside the housing on a longitudinal guide extending in the longitudinal direction thereof, a device arranged outside the housing and cooperating with the output drive part for limiting the travel of the output drive part, which device comprises at least one holder adapted to be set in fixed relationship to the housing along a setting range in different longitudinal positions, and an abutment-shock absorber unit arranged on the holder and extending into the path of travel of the output drive part, wherein a plurality of spaced positioning points is provided along the range of setting, at which respectively at least one support element is or may be arranged in fixed relationship to the housing, the holder is adapted to be arranged and to be secured at each of these positioning points, which are provided with at least one support element, in at least one support setting corresponding to a given longitudinal position, in the support setting an engaging portion provided on the holder is hookingly engaged by the associated support element on the side facing away from the output drive part and is supported in the longitudinal direction, and furthermore the abutment-shock absorber unit is arranged on the holder for stepless adjustment in the direction of travel of the output drive part.

5,568,983

## PEEK BEARING WITH TRAPPED PTFE BEARING LINER

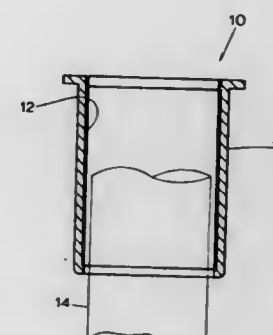
Robert T. Wilson, Marshalltown, Iowa, assignor to Fisher Controls International, Inc., Clayton, Mo.

Filed Jun. 21, 1994, Ser. No. 262,940

Int. Cl.<sup>6</sup> F16C 17/02

U.S. Cl. 384—295

6 Claims



1. A bearing for use on a fluid control valve having a rotary shaft subject to operating load pressures sufficient to overload and extrude PTFE, said bearing comprising:

- a cylindrical PTFE liner adapted to surround the rotary shaft to enable the shaft to rotate with respect to the liner during use of the fluid control valve with the cylindrical PTFE liner bearing the operating load pressures which may be sufficient to extrude PTFE;
- a cylindrical non-metallic bearing jacket having an interior surface and including a cylindrical inner cavity defined between opposite annular cavity end lips for retaining said liner, said cavity end lips extending inwardly from the interior surface to an end lip surface wherein the diameter of said end lip surface is slightly larger than the diameter of said rotary shaft and wherein the clearance between said end lip surface and the rotary shaft is zero on the load side of the bearing; and
- said cylindrical PTFE liner having a thickness sufficient to nest said liner in said cavity between said cavity end lips and with the inner diameter of said liner conforming to the diameter of said end lip surface so that with said rotary control valve under substantial operating pressure sufficient to extrude PTFE, any overloaded PTFE is maintained within said cavity and between said cavity end lips of said bearing jacket.

5,568,984

## FUEL LUBRICATED BEARING

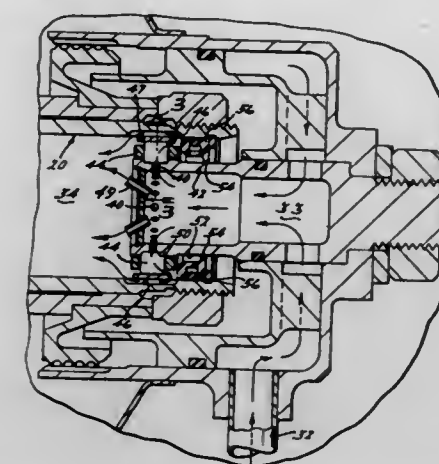
Gregg G. Williams, Milford, Mich., assignor to Williams International Corporation, Walled Lake, Mich.

Filed Sep. 5, 1995, Ser. No. 523,258

Int. Cl.<sup>6</sup> F16C 33/66; F02C 7/06; F01M 9/04

U.S. Cl. 384—475

6 Claims



1. A fuel lubricated anti-friction bearing comprising:
  - a fuel inlet manifold;
  - a cylindrical inner race for an anti friction bearing supported by said manifold having a plurality of radially opening apertures communicating with said manifold in fluid flow relation;
  - a hollow engine shaft;
  - an outer race on said engine shaft; and
  - a plurality of anti friction rollers between said inner and outer races, rotation of said engine shaft effecting rotation of said rollers and pumping of fuel radially outwardly of said fuel inlet manifold through the apertures in the inner race of said bearing to the rollers thereof.

5,568,985

## MIXER APPARATUS HAVING AN IMPROVED STEADY BEARING

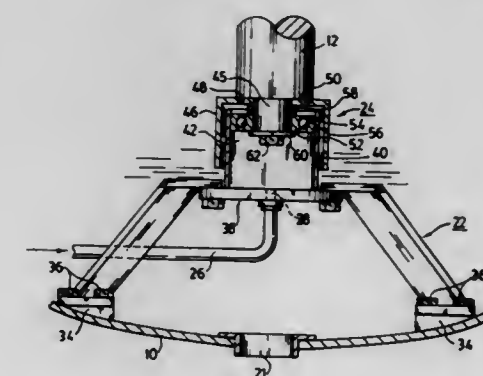
Marlin Schutte, Rochester, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Oct. 26, 1994, Ser. No. 329,592

Int. Cl.<sup>6</sup> F16C 33/76

U.S. Cl. 384—478

14 Claims



1. A mixer apparatus having a vessel for mixing materials, and a mixer shaft connected to a drive near one end of such shaft and being subject to deflection away from said one end; a steady bearing having a trap for preventing contact between the steady bearing and the materials being mixed, said steady bearing comprising:



- a) A bearing holder disposed within said vessel coaxially with said mixer shaft, said bearing holder being fixed to said vessel and being spaced from said shaft where it is subject to deflection;
- b) A hood defining a cavity, said hood being coaxially disposed on said mixer shaft radially and axially spaced from said bearing holder which is disposed coaxially in said cavity;
- c) A bearing in said cavity having a stationary portion and a rotatable portion, said bearing being connected to one of said hood and said shaft and to said bearing holder thereby permitting said shaft to turn while counteracting deflection thereof; and
- d) Means for providing a fluid into said cavity under pressure sufficient to exclude said materials from said cavity.

5,568,986

## PRINTER DEVICE

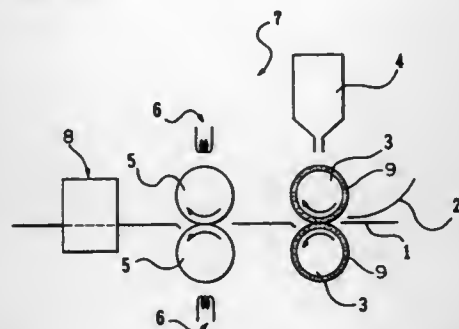
Ken Sugai, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 206,758, Mar. 7, 1994. This application May 11, 1995, Ser. No. 439,447

Claims priority, application Japan, Apr. 6, 1993, 5-079659 Int. Cl.<sup>6</sup> B14J 29/367

U.S. Cl. 400—695

5 Claims



1. In combination, a printer device and a sheet record medium, comprising:

- a sheet record medium containing a visible image recorded in color fading ink or color fading toner;
- erasing means for erasing the visible image recorded on the sheet record medium in color fading ink or color fading toner by fading the ink or toner in the image;
- guiding means for guiding the sheet record medium through the erasing means; and
- recording means for printing or copying a visible image on a surface of said sheet record medium after it has passed through said erasing means by applying a color fading ink or color fading toner.

5,568,987

## POINTING STICK IN A COMPUTER KEYBOARD FOR CURSOR CONTROL

Patrick J. Franz, Portland, Ore., assignor to InControl Solutions, Inc., Lake Oswego, Ore.

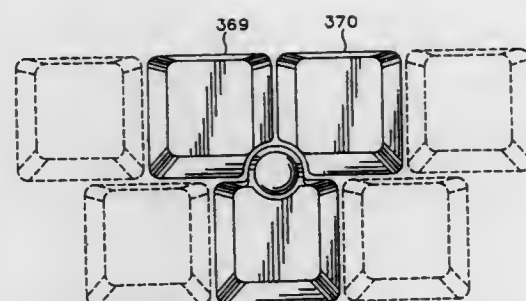
Division of Ser. No. 275,946, Jul. 14, 1994, Pat. No. 5,407,285, and a continuation-in-part of Ser. No. 11,676, Aug. 9, 1993, Pat. No. Des. 360,200, Ser. No. 18,842, Feb. 16, 1994, Pat. No. Des. 360,412, and Ser. No. 104,777, Aug. 9, 1993, Pat. No. 5,541,622, which is a continuation-in-part of Ser. No. 322,956, Oct. 13, 1994, Pat. No. 5,499,041, which is a continuation of Ser. No. 96,485, Jul. 22, 1993, abandoned, which is a division of Ser. No. 557,546, Jul. 24, 1990, Pat. No. 5,231,386. This application Mar. 24, 1995, Ser. No. 410,348

Int. Cl.<sup>6</sup> B41J 5/28

U.S. Cl. 400—490

11 Claims

9. An apparatus for use in a computer keyboard comprising:



- a first key cap coupled to a first keyswitch for typing a first alphanumeric character;
- a second key cap coupled to a second keyswitch for typing a second alphanumeric character; and
- a third key cap coupled to a third keyswitch for typing a third alphanumeric character;
- the first, second and third key caps being arranged adjacent each other in a generally triangular configuration for fitting into a typing array of key caps in a computer keyboard;
- the first key cap including a top surface and depending side-walls, the side-walls together forming a perimeter of the key cap, and further including an extension formed in said perimeter of the key cap, the extension including a central aperture formed therein for receiving a shaft;
- a rigid shaft, sized and arranged so as to extend through the aperture for actuation by a user's fingertip;
- the aperture being sized so as to allow slight lateral motion of the shaft for cursor control;
- force sensing means coupled to the shaft for sensing forces applied to the shaft by the user for cursor control; and
- at least one of the second and third key caps including means defining a generally concave gap between the said one key cap and the extension of the first key cap, so that the said extension does not interfere with normal operation of the adjacent key cap.

5,568,988

## MULTI-PART DISPENSER

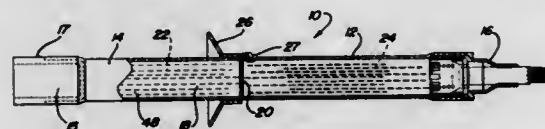
Gary Knox, Valencia; Nguyen T. Dang, Glendale; John S. Frost, Agoura, and Stan Shofner, Pasadena, all of Calif., assignors to Courtaulds Aerospace, Inc., Burbank, Calif.

Filed Jul. 24, 1995, Ser. No. 506,383

Int. Cl.<sup>6</sup> A46B 11/00

U.S. Cl. 401—40

11 Claims



1. A multiple part liquid dispenser comprising an elongated flexible housing defining an interior chamber, a disc contained within said chamber and movable from a closed to an open position, said disc in said closed position dividing said interior chamber into a first and second subchamber, said first subchamber adapted to contain a first liquid and said second subchamber adapted to contain a second liquid, wherein displacement of said disc to said open position enables said first and second liquids to intermix,
- a dispensing nozzle assembly having an outlet, an inlet and a fluid passageway between said inlet and said outlet, said inlet being fluidly connected with said interior chamber, said nozzle assembly including a normally closed valve in series with said fluid passageway,
- a collar axially slidably mounted around an outer periphery of said housing, said collar having an inside diameter smaller than the outside diameter of said housing so that when said collar is aligned with said disc in said closed position, said

housing is compressed between said disc and said collar to thereby prevent displacement of said disc to said open position and simultaneously fluidly seal an outer periphery of said disc to an inner periphery of said housing in said closed position.

5,568,989

## CASE FOR STORAGE AND APPLICATION OF PASTY PRODUCTS

Daniel R. Bengulgui, Rue Launay Jacquet La Roncière, Fontenay Les Brlis, France

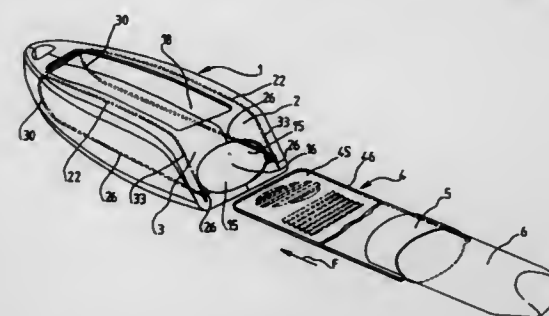
Filed Jan. 30, 1995, Ser. No. 380,870

Claims priority, application France, Feb. 1, 1994, 94 01089

Int. Cl.<sup>6</sup> A45D 40/02

U.S. Cl. 401—59

8 Claims



1. A case for a stick of a pasty product, said case comprising a hollow casing having an elongated shape closed at a first end and having an aperture at a second, open end and having a bottom wall, a top wall and two side walls, a longitudinal window being provided in said top wall, a stick-carrying cup mounted for axial motion within said casing between a first position retracted into the casing and a second position extended from the casing wherein, in said second position, the stick projects through the aperture in the casing, means for displacing the cup between the first and second positions, said means comprising a strip having first and second ends, said strip formed from a flexible material fastened at said first end to one end of the cup, guided by its longitudinal edges in guide grooves extending on each side wall and carrying at a zone near the second, free end, outer control means for manually displacing the strip, said control means being provided on a surface of the strip so as to be accessible through said window in the top wall of the casing, the length of said window corresponding at least to the length of travel of the cup between the first position and the second position,

each strip guide groove provided on each said side wall comprising lower and upper portions extending adjacent the bottom wall and the top wall respectively and a curved portion at said closed end of said casing, the lower strip guide groove portion adjacent said casing bottom wall being open to the exterior at a location slightly above said casing bottom wall and communicating with said opening of said casing, said strip being secured to said stick-carrying cup at a location adjacent to said casing bottom wall, said outer control means for displacing said strip being formed by means which project from said strip surface a distance less than the distance between said lower strip guide portion and said bottom wall, said strip being made from a flexible material having a stiffness in its longitudinal direction which is sufficient to allow the insertion through said opening by a pushing force exerted upon the strip in the insertion direction after the manufacture of said casing.

5,568,990

## SHOE POLISH APPLICATOR

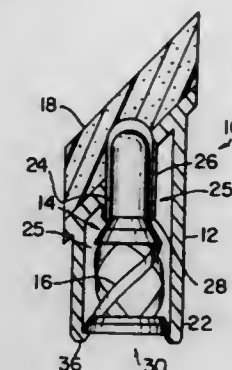
Brian McAuley, 896 S. Columbus Ave., Mt. Vernon, N.Y. 10550

Filed Mar. 29, 1995, Ser. No. 413,091

Int. Cl.<sup>6</sup> A47L 23/05; 13/17

U.S. Cl. 401—206

4 Claims



1. A liquid dispensing applicator for applying a liquid onto a work surface by operatively pressing an angularly-inclined liquid-dispensing end of the applicator against the work surface, said applicator comprising:

an elongated housing defining a longitudinal axis and an internal chamber for containing a liquid for dispensed application by said applicator onto a work surface, said housing including a top wall at a liquid-dispensing longitudinal end of said housing and inclined relative to said longitudinal axis for defining an angular inclination relative to said longitudinal axis at which said housing is operatively maintained relative to a work surface for operatively applying the contained liquid to the work surface by pressing the dispensing end of the applicator against the work surface, and an elongated sleeve defining a passage radially bounded by an interior periphery and extending into said internal chamber from said housing top wall to an interior end of said sleeve to define a sealing seat;

a valve member comprising an elongated shaft disposed for longitudinal sliding movement at least partly within and along said sleeve passage and a sealing member integral with said shaft and carried at an interior end of said shaft disposed within said housing chamber for longitudinal sliding movement of the sealing member with said shaft, said shaft having a predetermined cross-sectional configuration and size to define, between said sleeve periphery and said shaft, a flow space within and along which the contained liquid is flowingly communicable from said housing chamber to said housing top wall and outwardly from said housing for application of the contained liquid to a work surface, and said valve member being movable along said longitudinal housing axis between a first position in which a dispensing end of said shaft opposite said interior end extends outwardly from said sleeve passage and beyond said inclined top wall and in which said sealing member engages said sleeve sealing seat to form a liquid-tight seal between said sealing member and sealing seat for preventing passage of contained liquid from said housing chamber into said flow space and outwardly from said housing for dispensed application to a work surface, and a second position in which said sealing member is spaced from said sleeve sealing seat to permit passage of contained liquid from said housing chamber into said flow space for dispensed application to a work surface, said sealing member comprising an inclined contact surface extending radially outwardly beyond said sleeve periphery for releasable liquid-tight sealing engagement with said sleeve sealing seat; and

a helical spring disposed between said housing and said valve member for normally urging said valve member to said first position forming a liquid-tight seal with said sleeve sealing seat for preventing passage of contained liquid from said housing chamber into said flow space and outwardly from said housing, said helical spring being resiliently compressible as the applicator dispensing end is pressed against the

work surface to apply to the dispensing end of said shaft a combination of longitudinal forces directed substantially along said longitudinal axis and transverse forces directed, by virtue of said inclination, substantially transverse to said longitudinal axis to move said valve member from said first position to said second position against the urgency of said helical spring and thereby space said sealing member from said sleeve sealing seat to permit passage of contained liquid from said housing chamber into said flow space and outwardly of said housing beyond said housing top wall for dispensed application onto a work surface;

said shaft being cross-sectionally fluted so that predetermined peripheral portions of said shaft are maintained in substantial contact with said sleeve periphery for guiding said shaft for longitudinal movement within and along said sleeve as said shaft operatively moves along said housing axis between said first and second positions in response to said application of combined longitudinal and transverse forces to said shaft dispensing end as said applicator is operatively employed for dispensingly applying contained liquid to a work surface, and so as to define, between said predetermined peripheral portions of said shaft, said flow space between said sleeve periphery and said shaft and along which the contained liquid is flowingly communicable from said housing chamber to said housing top wall and outwardly from said housing for application of the contained liquid to a work surface.

5,568,991

## SEAT POST ASSEMBLY FOR BICYCLES

Wen-Hwa Lin, No. 5, Ming Shen Rd., Ta Chia Chen, Taichung Hsien, Taiwan

Filed Aug. 31, 1995, Ser. No. 522,493  
Int. Cl.<sup>6</sup> F16B 23/00

U.S. Cl. 403—24

3 Claims



1. A bicycle seat post assembly comprising a seat post made from a hollow tube having a closed top end and an open bottom end, the open bottom end of said seat post having an inner thread, an inner tube mounted inside said seat post for storing tools, said inner tube having an inner thread at a bottom end thereof, and a stepped screw cap threaded into the inner thread of said seat post and the inner thread of said inner tube to hold said inner tube inside said seat post.

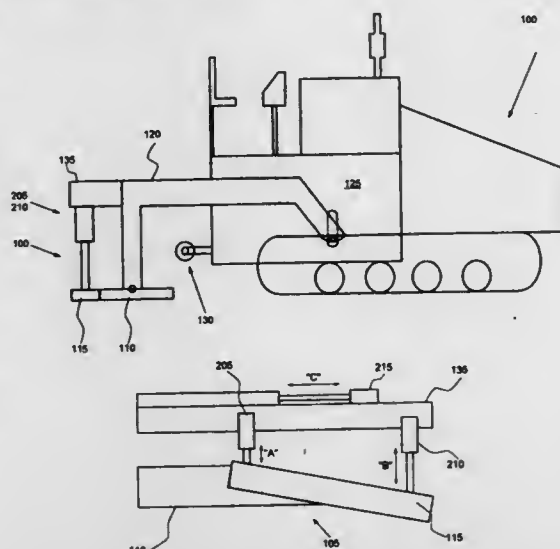
5,568,992  
SCREED CONTROL SYSTEM FOR AN ASPHALT PAVER  
AND METHOD OF USE

Conrad G. Grembowicz; Alan L. Ferguson, both of Peoria; Wade D. Samson, and Keith R. Schmidt, both of Sycamore, all of Ill., assignors to Caterpillar Paving Products Inc., Minneapolis, Minn.

Filed May 19, 1995, Ser. No. 444,945  
Int. Cl.<sup>6</sup> E01C 19/12

U.S. Cl. 404—101

8 Claims



1. A control system for a floating screed assembly for a paving machine comprising:

- a screed assembly including a main screed unit and an extension screed unit;
- a hydraulic cylinder for moving the extension screed unit relative to the main screed unit substantially transverse to the direction of machine travel;
- a plurality of hydraulic cylinders for raising, lowering and pivoting the extension screed unit relative to the main screed unit;
- operator control means for producing operator control signals indicative of a desired position of the extension screed unit;
- a plurality of linear position sensor for sensing the linear extension of respective hydraulic cylinders and for producing position signals in response to the position of the extension screed unit; and
- a controller for receiving the operator control and position signals and delivering command signals to the hydraulic cylinders in order to control the position of the extension screed unit to the desired position.

5. A method for automatically controlling a screed assembly of a floating screed paving machine, the screed assembly including a main screed and an extension screed unit, the method comprising the steps of:

- producing operator control signals indicative of a desired position of the extension screed unit;
- producing position signals in response to the actual position of the extension screed unit;
- receiving the operator control and position signals, and producing command signals in order to control the position of the extension screed unit to the desired position; and
- automatically adjusting the vertical position of the extension screed unit in response to the attack angle of the main screed unit changing in order to maintain a predetermined alignment between the main and extension screed units.

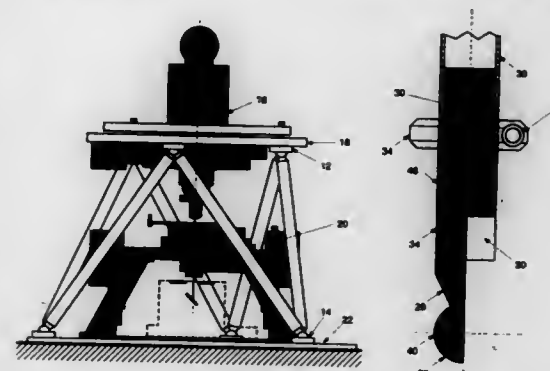
5,568,993

STRUT STRUCTURE AND RIGID JOINT THEREFOR  
James E. Potzick, Potomac, Md., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Dec. 21, 1994, Ser. No. 360,963  
Int. Cl.<sup>6</sup> F16C 11/04; F16M 11/14

U.S. Cl. 403—128

15 Claims



1. A joint assembly for transmitting axial loads from two elongated struts meeting at a node to a supporting member, comprising: two strut end members, one connected to each of the struts, for receiving axial loads from the corresponding strut, each strut end member comprising a half-spherical ball having a planar surface for contacting the planar surface of the other of said balls, such that an assembly of said two strut end members defines a substantially complete sphere, the centerlines of said elongated struts intersecting at the center of said substantially complete sphere, and means fixed with respect to said supporting member and defining a recess having a circular periphery, for receiving and retaining said substantially complete sphere defined by the assembly of said two strut end members.

5,568,994

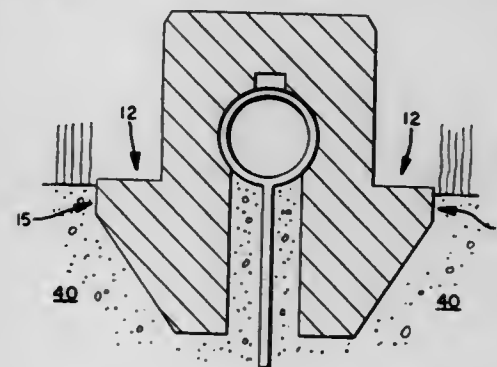
## LANDSCAPING BLOCK

William B. Dawson, Maple Grove, Minn., assignor to Keystone Retaining Wall Systems, Inc., Bloomington, Minn.

Filed May 19, 1994, Ser. No. 245,869  
Int. Cl.<sup>6</sup> A01G 1/08

U.S. Cl. 404—7

14 Claims



1. An landscaping block comprising: a top and a generally opposed bottom, first and second generally opposed sides, each side extending from the top to the bottom, first and second generally opposed ends, each end extending from the top to the bottom and from the first side to the second side, wherein the first side comprises a first upper face extending from the top downward to an inner edge of a first lip, the first lip extending outward from the first upper face to an outer edge of the first lip, a first lower face extending from

the outer edge of the first lip to the bottom, wherein the second side comprises a second upper face extending from the top downward to an inner edge of a second lip, the second lip extending outward from the second upper face to an outer edge of the second lip and a second lower face extending from the outer edge of the second lip to the bottom, wherein the first lower face is tapered inward from the outer edge of the first lip to a first bottom edge of the first lower face and the second lower face is tapered inward from the outer edge of the second lip to a second bottom edge of the second lower face.

5,568,995

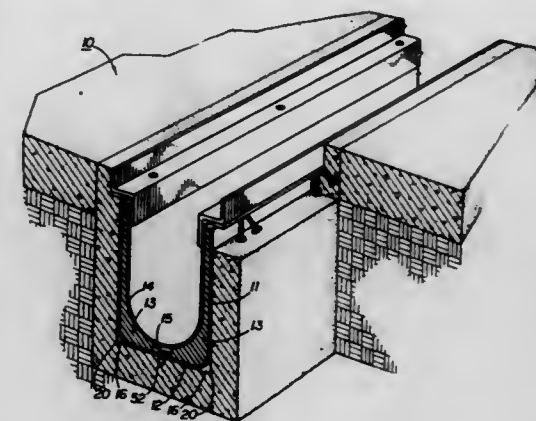
METHOD AND APPARATUS FOR ADDING A DOUBLE LINER TO A TRENCH

John V. Beamer, Atlanta, Ga., assignor to Hoosier Group, L.L.C., Atlanta, Ga.

Continuation-in-part of Ser. No. 287,654, Aug. 9, 1994. This application Dec. 6, 1994, Ser. No. 349,901  
Int. Cl.<sup>6</sup> E01F 5/00

U.S. Cl. 405—119

28 Claims



1. A trench liner system for forming a dual containment trench and for relining an existing trench having at least two walls and a bottom, comprising:

- a. secondary liner means, with an interior surface and an exterior surface, extending along the length of the trench;
- b. primary liner means, having an interior surface and an exterior surface, disposed within the trench within the secondary liner means and extending along the length of the trench; and
- c. means disposed between the secondary liner means and the primary liner means for separating the interior surface of the secondary liner means from the exterior surface of the primary liner means, wherein the primary liner means, the secondary liner means and the separating means are allowed to expand and contract independently from each other.

5,568,996

STORAGE AND DISPOSAL OF ORGANIC WASTE  
Charles H. Buehler, Etobicoke, Canada, assignor to Organic Resource Management Inc., Mississauga, Canada

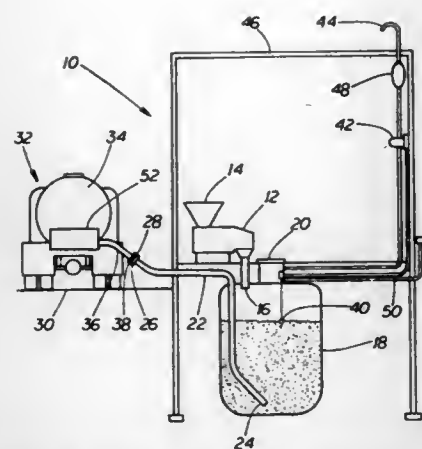
Filed Jul. 11, 1995, Ser. No. 500,502  
Int. Cl.<sup>6</sup> B09B 5/00

U.S. Cl. 405—129

8 Claims

5. A method of handling organic waste produced in a food-handling facility, comprising: milling the organic waste at the facility; delivering the milled organic waste to a storage tank at the facility; drawing the organic waste with suction from the storage tank into a portable tank mounted on a vehicle; and,





transporting the organic waste in the portable tank to a disposal site or to a storage site.

5,568,997

# METHOD AND APPARATUS FOR FORCING PILES INTO OR OUT OF THE GROUND

Yrjö Raunisto, Anttilankatu 13, FIN-13210 Hämeenlinna, Finland

PCT No. PCT/FI92/00259, § 371 Date Mar. 30, 1994, § 102(e) Date Mar. 30, 1994, PCT Pub. No. WO93/07341, PCT Pub. Date Apr. 15, 1993

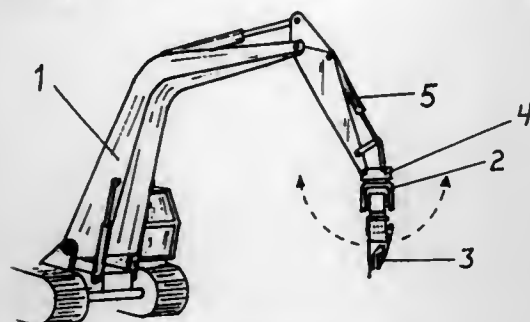
PCT Filed Sep. 30, 1992, Ser. No. 211,291

Claims priority, application Finland, Sep. 30, 1991, 914590; Aug. 28, 1992, 923880

Int. Cl.<sup>6</sup> E02D 7/18; 11/00

U.S. Cl. 405—232

5 Claims



1. Pile driving apparatus comprising: an articulated boom system adapted to transmit a percussive driving force to a pile driver attached to said boom; hydraulic means mounted on said boom for controlling the position of a pile driver attached to said boom to orient the attached pile driver into a pile driving position; and a pile driver attached to said boom, said pile driver comprising first and second spaced apart gripping jaws, means for permitting movement of said first and second jaws between a first position in which the first and second gripping jaws are oriented vertically and spaced apart horizontally for grasping a horizontally oriented pile or wall edge, and a second position in which the first and second gripping jaws are oriented horizontally and spaced apart vertically for gripping a vertically oriented pile or wall edge, means for locking said first and second gripping jaws in said first position for gripping a horizontally oriented pile or wall edge at first and second horizontally spaced apart positions along said pile or wall edge and for locking said first and second gripping jaws in said second position for gripping a vertically oriented pile or wall edge at first and second vertically spaced apart positions along said pile or wall edge for driving a vertically oriented pile or wall gripped by said first and second spaced apart gripping jaws;

said apparatus further comprising valve means for disengaging said hydraulic means from control of said position of said attached pile driver.

5,568,998

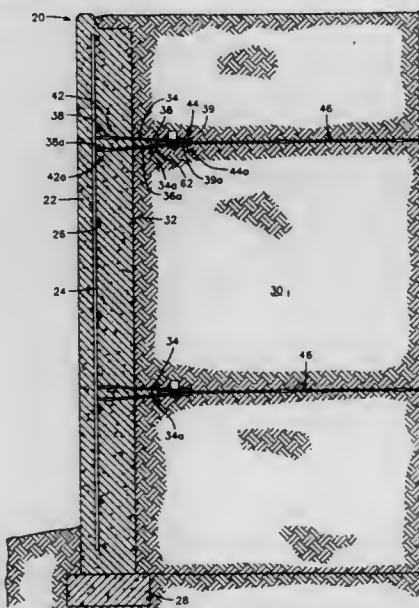
# PRECAST WALL PANEL AND GRID CONNECTION DEVICE

Philip D. Egan, Atlanta, and Robert A. Miller, Marietta, both of Ga., assignors to The Tensar Corporation, Atlanta, Ga. Filed Feb. 14, 1995, Ser. No. 389,338

Int. Cl.<sup>6</sup> E02D 29/02

U.S. Cl. 405—262

25 Claims



24. A wall panel of a retaining wall, said wall panel comprising: a front face, a rear face, and at least one pair of spaced attachment strips extending from said rear face with the spacing therebetween accommodating a reinforcing sheet material having a thickness substantially twice the thickness of each attachment strip so that said pair of attachment strips provide a strength substantially equal to the strength of a reinforcing sheet material to be secured therebetween.

5,568,999

# RETAINING WALL BLOCK SYSTEM

Philip D. Egan, Atlanta, Ga., and Paul Specht, Wilmette, Ill., assignors to The Tensar Corporation, Atlanta, Ga.

Filed Apr. 3, 1995, Ser. No. 416,074

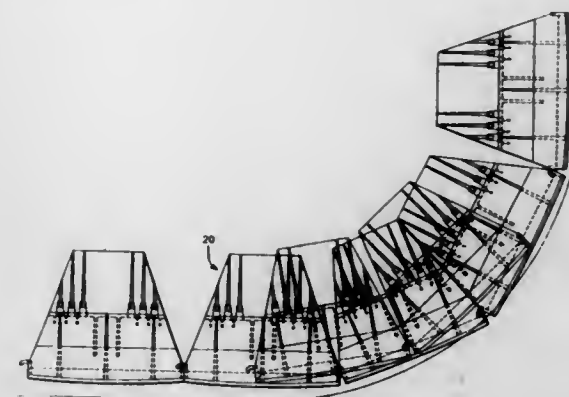
Int. Cl.<sup>6</sup> E02D 5/00

U.S. Cl. 405—262

57 Claims

1. A wall block to be used for forming a retaining wall including a plurality of superimposed courses each comprising a plurality of laterally juxtaposed wall blocks and grid-like sheets of materials attached to selected wall blocks for reinforcing fill material behind the retaining wall, said wall block comprising:

- a front member, a top member, a bottom member, and opposed sidewalls extending between said top and bottom members and said front member,
- a plurality of finger members extending from said bottom member, said finger members being laterally spaced apart by a distance corresponding to a spacing between selected openings in end portions of the grid-like sheets of material for securing the grid-like sheets of material to selected wall blocks,



one of said sidewalls defining first sidewall engaging portions and the other of said side walls defining second sidewall engaging portions, said first sidewall engaging portions of one wall block being engageable with said second sidewall engaging portions of an adjacent wall block in a course of wall blocks to laterally position the wall blocks in each course relative to each other, and said bottom member defining bottom engaging portions, said top member defining top engaging portions, said bottom engaging portions of one wall block being engageable with said top engaging portions of at least one wall block in a course below to vertically position superimposed wall blocks relative to each other.

5,569,000

# CUTTING INSERT ADJACENT CHIP BREAKERS HAVING SINTERED HARD BODIES DISPOSED IN CORNERS

Peter Littecke, Huddinge, and Anders Thelin, Vällingby, both of Sweden, assignors to Sandvik AB, Sandviken, Sweden

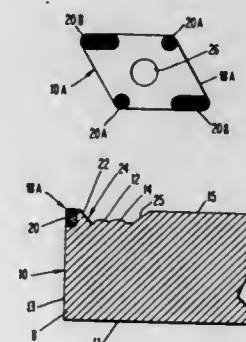
Filed May 26, 1994, Ser. No. 249,214

Claims priority, application Sweden, May 27, 1993, 9301811

Int. Cl.<sup>6</sup> B23B 27/22; 27/16

U.S. Cl. 407—114

5 Claims



1. A cutting insert comprising a polygonal base including a chip face having a plurality of corners, a bottom face, and a side face disposed between the chip face and bottom face, the chip face having formed therein a chip breaker structure spaced inwardly from the side face, the chip breaker structure comprising a plurality of projections, and a plurality of hard bodies disposed within respective corners of the chip face between the side face and the chip breaker structure, each hard body comprised of a material harder than the base, the hard bodies including at least one solid cylindrical hard body of round cross section as viewed in a direction perpendicular to the chip face and at least one solid hard body elongated in a direction parallel to the side face as viewed in a direction perpendicular to the chip face; all of the hard bodies being sintered directly to the base.

5,569,001

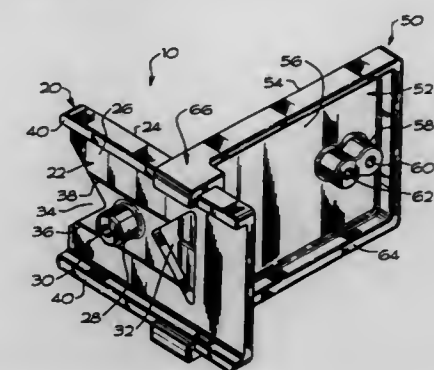
TEMPLATE USED IN INSTALLING DOOR LOCKS  
David T. Brutscher, Louisville, and Leroy R. Leet, Sr., Shelbyville, both of Ky., assignors to Credo Tool Company, Woodburn, Oreg.

Filed Jun. 14, 1995, Ser. No. 490,239

Int. Cl.<sup>6</sup> B23B 49/02

U.S. Cl. 408—115 R

19 Claims



1. A template for use as a guide to drill two perpendicular holes into a door, comprising:

- a. a side bracket, said side bracket having a door edge engaging portion, said door edge engaging portion having a door edge flat face and a door edge opposed face, said door edge engaging portion having two opposed parallel external sides, said door edge engaging portion having a door edge bore therethrough, said door edge bore having a door edge bore axis transverse to said door edge flat face;
- b. a front bracket, said front bracket having a door face engaging portion and means for slidably receiving said two opposed parallel external sides of said side bracket, said door face engaging portion having a door face flat face and a door face opposed face, said door face engaging portion having at least one door face bore therethrough, said at least one door face bore having a door face bore axis transverse to said door face flat face;
- c. said two opposed parallel external sides of said door edge engaging portion of said side bracket being slidably received by said means for slidably receiving said side bracket of said front bracket, said door edge flat face and said door face flat face being in a transverse relationship, said door edge bore axis being parallel to said door face flat face and slidably adjustable to a desired spaced distance therefrom, said at least one door face bore axis being parallel to said door edge flat face and a preselected distance therefrom.

5,569,002

# HOLLOW ANNULAR DRILL BIT WITH HOLLOW CYLINDRICAL CARRIER MEMBER

Werner Kleine, Achim, Germany, assignor to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Oct. 12, 1995, Ser. No. 542,087

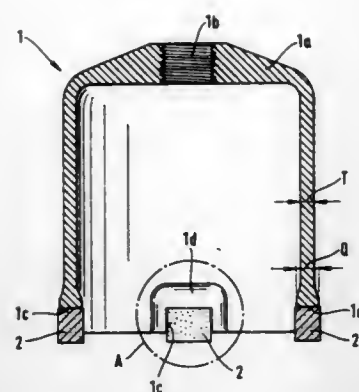
Claims priority, application Germany, Oct. 15, 1994, 44 36 915.8

Int. Cl.<sup>6</sup> B23B 51/04

U.S. Cl. 408—204

4 Claims

1. A hollow annular drill bit comprises an axially extending hollow cylindrical carrier member (1) having an axially extending inner surface and an axially extending outer surface, a leading end thereof and a trailing end each extending transversely of the axial direction thereof and a radial thickness (T), the leading end of said carrier member having recesses (1c) open in the leading end and extending towards the trailing end, cutter members (2) being secured in said recesses and extending axially outwardly from the leading end of the said carrier member and radially outwardly from the outer and inner surfaces of said carrier member, said recesses having



circumferentially spaced axially extending sides and a circumferentially extending base side spaced axially from the leading end, said carrier member having increased thickness wall sections (1d) extending along said axially extending sides and base side for the full axial extent thereof and circumferentially outwardly from said axially extending sides and axially from said base sides toward said trailing end, increased thickness wall sections (1d) project radially outwardly from the outer surface of said carrier member (1) and radially inwardly from the inner surface of said inner member (1).

5,569,003

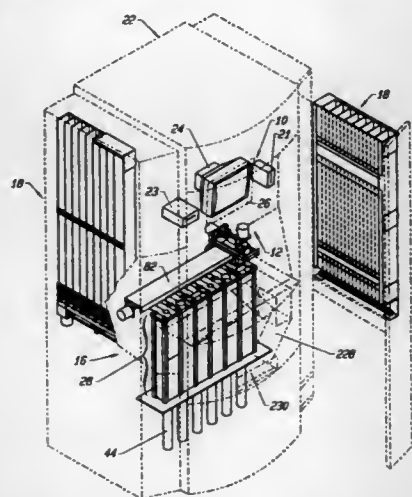
**AUTOMATED ENGRAVING APPARATUS AND METHOD**  
Mark E. Goldman; Michel A. Aubert, both of San Rafael; Alexander M. Shenderovich, San Francisco, and Jagat R. Acharya, Livermore, all of Calif., assignors to Quick-Tag, Inc., Rancho Santa Fe, Calif.

Filed May 13, 1994, Ser. No. 242,468

Int. Cl.<sup>6</sup> B43L 13/00; B65G 59/00; 1/07; G05B 19/00

U.S. Cl. 409—132

23 Claims



16. A method of controlling an engraving system of the type having a workpiece storage unit, an automated workpiece handling system for moving a selected workpiece from the workpiece storage unit, securing it in an engraving location during engraving, and an engraving tool for engraving the selected workpiece, the control system comprising:

- receiving user instructions from a user, the user instructions specifying a selected workpiece type and the indicia to be engraved onto a workpiece;
- generating engraving instructions corresponding to the indicia in the user instructions;
- converting the engraving instructions into engraving control signals;
- generating workpiece retrieval instructions corresponding to a position containing the selected workpiece type in the workpiece storage device of the workpiece type specified by the user;
- converting the workpiece retrieval instructions to workpiece retrieval control signals;
- transferring the workpiece retrieval control signals to the workpiece handling system;
- moving a selected workpiece from the workpiece storage location to an engraving location in response to the workpiece retrieval control signals;
- transferring the engraving control signals to an engraving system;
- engraving a surface of the selected workpiece in accordance with the engraving control signals to produce an engraved workpiece.

- receiving user instructions from a user, the user instructions specifying a selected workpiece type and the indicia to be engraved onto a workpiece;
- generating engraving instructions corresponding to the indicia in the user instructions;
- converting the engraving instructions into engraving control signals;
- generating workpiece retrieval instructions corresponding to a position containing the selected workpiece type in the workpiece storage device of the workpiece type specified by the user;
- converting the workpiece retrieval instructions to workpiece retrieval control signals;
- transferring the workpiece retrieval control signals to the workpiece handling system;
- moving a selected workpiece from the workpiece storage location to an engraving location in response to the workpiece retrieval control signals;
- transferring the engraving control signals to an engraving system;
- engraving a surface of the selected workpiece in accordance with the engraving control signals to produce an engraved workpiece.

5,569,004

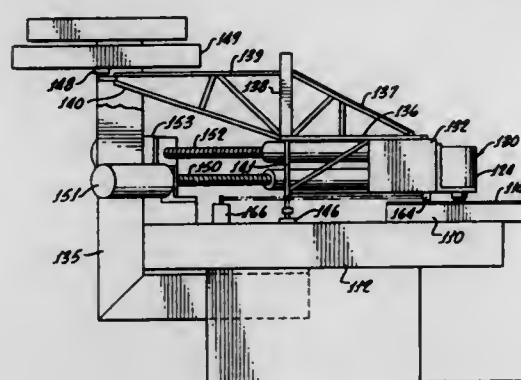
**MACHINE TOOL POSITIONING ARRANGEMENT**  
William F. Marantette, Torrance, Calif., assignor to Optima Industries, Inc., Torrance, Calif.

Continuation-in-part of Ser. No. 80,912, Jun. 22, 1993, Pat. No. 5,387,969. This application Jul. 1, 1994, Ser. No. 270,134

Int. Cl.<sup>6</sup> B23B 39/16

U.S. Cl. 409—235

18 Claims



- A machine tool comprising
  - a work table adapted to support a workpiece and having a planar surface facing in a first direction;
  - a carriage;
  - a first bearing means on said carriage facing said surface of said work table for supporting said carriage on said work table and permitting movement of said carriage across said work table;
  - said carriage including tool support means for supporting a tool for performing an operation on a workpiece supported by said work table;
  - said tool support means being on one side of said first bearing means;
  - said carriage and said tool support means being arranged so that the weight thereof creates a torque by biasing said carriage toward rotation about said first bearing means in one direction;
  - means defining a second planar surface facing in a direction opposite from that of said first planar surface;
  - a second bearing means on said carriage facing said second planar surface for countering said torque force so that said carriage does not rotate about said first bearing means; and
  - means for causing movement of said carriage relative to said work table so that a tool supported thereby can perform an operation on a workpiece supported by said work table.

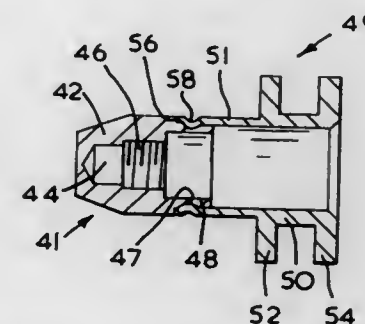
5,569,005

**TWO-PART DEFORMABLE FASTENER**  
Maurice E. Millington, Sutton Coldfield, United Kingdom, assignor to Emhart Inc., Newark, Del.  
Filed Jan. 17, 1995, Ser. No. 373,724  
Claims priority, application United Kingdom, Jan. 18, 1994, 9400826

Int. Cl.<sup>6</sup> F16B 13/04

U.S. Cl. 411—34

8 Claims



- A metal fastener for use in attaching parts to a workpiece, for example, a bumper to a car body, which fastener is formed from two parts secured together and comprises
  - a body having an axial recess with a closed end, which recess comprises a threaded bore adapted to receive a screw threaded setting mandrel
  - a barrel
  - a thin walled portion extending between the body and the barrel the closed end of the body being remote from the barrel
  - a first head flange extending radially from the barrel adjacent the thin walled portion
  - a second head flange extending radially from the barrel further away from the thin walled portion than said first head flange
 one of the two parts of the fastener comprising the body and the other of the two parts comprising at least one of the head flanges.

5,569,006

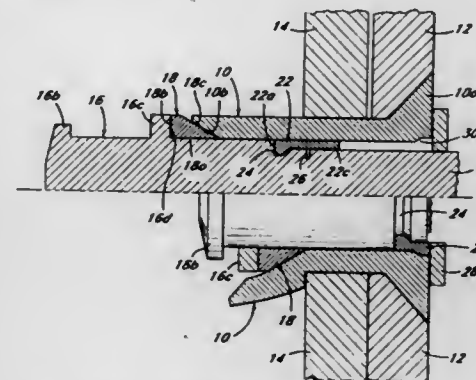
**BULB FASTENER**  
Edmundo Alvarado, Huntington Park; Soheil A. Esbraghi, Irvine, and Su Q. Tran, Santa Ana, all of Calif., assignors to Textron, Inc., Providence, R.I.

Filed May 11, 1995, Ser. No. 438,957

Int. Cl.<sup>6</sup> F16B 13/04; 13/06

U.S. Cl. 411—43

4 Claims



- A blind fastener comprising:
  - a tubular fastener sleeve having a head and a tail, the sleeve being adapted for insertion through aligned holes in a plurality of workpieces;
  - an elongated stem extending through said sleeve having a shear ring formed integral with the stem spaced rearwardly from the sleeve tail, said shear ring extending generally radially out-

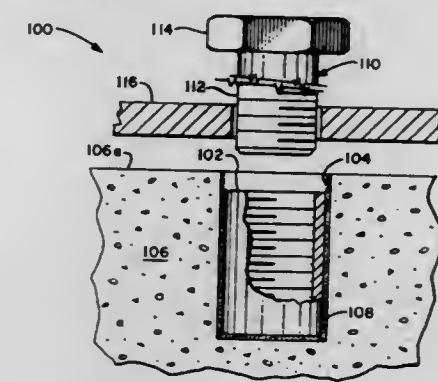
wardly and having an outer diameter larger than an inner diameter of the sleeve tail; and  
an expander ring formed separate from the stem positioned around the stem and between a forward surface of the shear ring and a rear surface of the sleeve tail, said expander ring being formed to facilitate expansion of the sleeve tail as the shear ring is drawn towards the sleeve tail as the fastener with respect to the workpieces.

5,569,007

**ANCHORING SYSTEM**  
Frederic C. Abraham, 21 West Pkwy., Pequannock, N.J. 07440  
Filed Apr. 22, 1994, Ser. No. 231,255  
Int. Cl.<sup>6</sup> F16B 37/04; 39/02

U.S. Cl. 411—82

26 Claims



- Anchoring system, comprising:
  - an anchoring element having an outside diameter, at one end, an other end and an internally-threaded bore extending axially at least partially through the anchoring element from the one end towards the other end;
 wherein:
  - the internally-threaded bore extends completely through the anchoring element, resulting in an opening at the other end of the anchoring element; and
 further comprising:
  - means for closing the opening at the other end of the anchoring element;
 wherein:
  - the means for closing is a plug having a portion fitting into the opening at the other end of the anchoring element; and
 wherein:
  - the portion fitting into the opening is threaded.

5,569,008

**HYBRID PANEL FASTENER AND A RETENTION MECHANISM FOR USE IN COMBINATION THEREWITH FOR COMPOSITE ARTICLES**  
John S. Chapkovich, Derby, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 22, 1995, Ser. No. 446,259

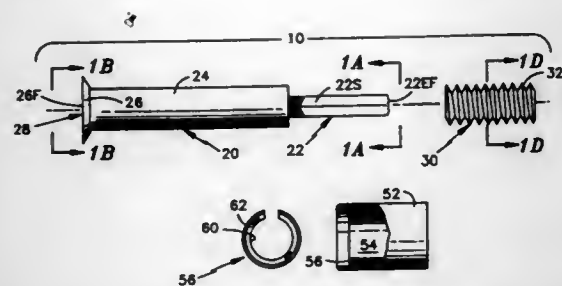
Int. Cl.<sup>6</sup> F16B 35/04; 35/06

U.S. Cl. 411—383

8 Claims

- A hybrid panel fastener for use in conjunction with a nut and cage assembly secured to an infrastructure for fastening and unfastening a composite access panel in combination with the infrastructure, comprising:
  - a shank member fabricated as a unitary component from a composite material having a low dielectric constant, said composite shank member including
  - an interface segment having a peripheral engagement surface, a body segment having a cylindrical configuration contiguous with said interface segment, and





a head contiguous with said body segment, said head including a torque-input surface for applying torque to said head to engage and disengage said hybrid panel fastener with the nut and cage assembly to fasten and unfasten the composite access panel in combination with the infrastructure, respectively; and

a unitary metallic sleeve member having an externally threaded surface and an integration bore that is complementary to said peripheral engagement surface of said interface segment, said unitary metallic sleeve member being mated in combination with said composite shank member by press fit insertion of said unitary metallic sleeve member onto said interface segment of said composite shank member wherein said integration bore mechanically engages said peripheral engagement surface to preclude relative rotation between said unitary metallic sleeve member and said composite shank member; said mated unitary metallic sleeve member being secured to said composite shank member to form said hybrid panel fastener; said hybrid panel fastener being disposed in combination with the composite access panel wherein said externally threaded surface of said unitary metallic sleeve member is engageable and disengageable with the nut and cage assembly to fasten and unfasten the composite access panel in combination with the infrastructure, respectively.

5,569,009

## LOOSENING PREVENTION SCREW

Yasuo Suzuki, Saitama, Japan, assignor to Kabushiki Kaisha Suzuki Rashi Seisakusho, Saitama, Japan

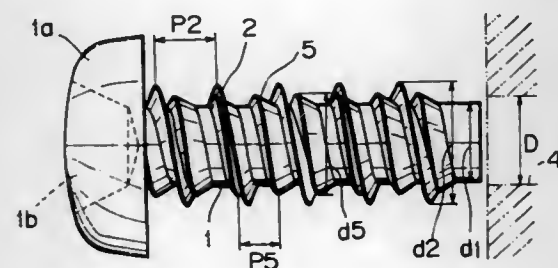
Filed Nov. 23, 1993, Ser. No. 156,044

Claims priority, application Japan, Nov. 26, 1992, 4-316981

Int. Cl.<sup>6</sup> F16B 35/04

U.S. Cl. 411—413

3 Claims



1. A loosening prevention screw comprising:  
a main thread for driving the screw into a hole; and  
a sub-thread running in the same direction as the main thread, being smaller in outer diameter than the main thread, and having a pitch different from that of the main thread;  
wherein the main thread and the sub-thread are formed over substantially a same longitudinal distance on a same shank of the screw; and  
wherein the pitch of the main thread is coarser than the pitch of the sub-thread.

# 5,569,010 ATTACHMENT MEMBER UNIT TO BE DRIVEN INTO HARD RECEIVING MATERIAL BY POWDER CHARGE OPERATED SETTING TOOL

Rupert Janssen, Meiningen, Austria; Markus Froewis, München, Germany; Friedrich Groeschel, Buchs, and Luc Guillon, Sax, both of Switzerland, assignors to Hilti Aktiengesellschaft, Furstentum, Liechtenstein

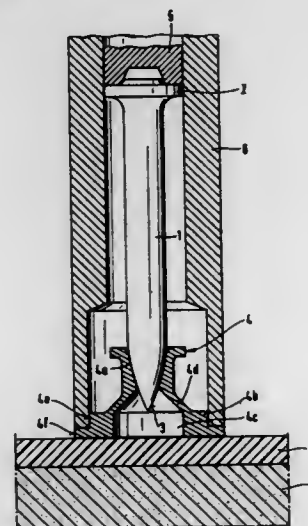
Filed Apr. 10, 1995, Ser. No. 419,337

Claims priority, application Germany, Apr. 9, 1994, 44 12 228.4

Int. Cl.<sup>6</sup> F16B 15/00; 15/02

U.S. Cl. 411—441

9 Claims



1. Attachment member unit to be driven into a hard receiving material (8) by an explosive powder charge operated setting tool comprising an axially extending shank (1, 9, 13) having a leading end and a trailing end relative to the direction the shank is driven into the receiving material, said shank (1, 9, 13) has a pointed tip (3, 11, 15) at the leading end and a load engagement means (2, 10, 14) at the trailing end, and an axially extending prestressing element (4, 12, 16) laterally enclosing said pointed tip (3, 11, 15), said prestressing element (4, 12, 16) having a leading end and a trailing end with a sleeve part (4a, 12a, 16a) having an outside diameter and extending axially from the trailing end toward the leading end and a flange-like bearing part having an outside diameter and extending axially from the leading end towards the trailing end, the outside diameter of said bearing part is greater than the outside diameter of said sleeve part, wherein the improvement comprises that the pointed tip (3, 11, 15) of said shank (1, 9, 13) is spaced axially from the leading end formed by said bearing part (4b, 12b, 16b) of said prestressing element (4, 12, 16) towards the trailing end thereof, and said pointed tip (3, 11, 15) is spaced from the leading end of the said prestressing element by an amount corresponding to the axial dimension of said bearing part (4b, 12b, 16b) measured in the leading end-trailing end direction.

5,569,011

## BOOK BINDING APPARATUS

Yoshimasu Yamaguchi, Kawasaki; Yuji Takahashi, Tokyo; Kimiaki Hayakawa; Toshihiko Kusumoto, both of Yokohama; Hideaki Kosasa; Hiroshi Ohta, both of Tokyo; Yuji Yamanaka, Kawasaki, and Kozo Sakakibara, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1994, Ser. No. 281,661

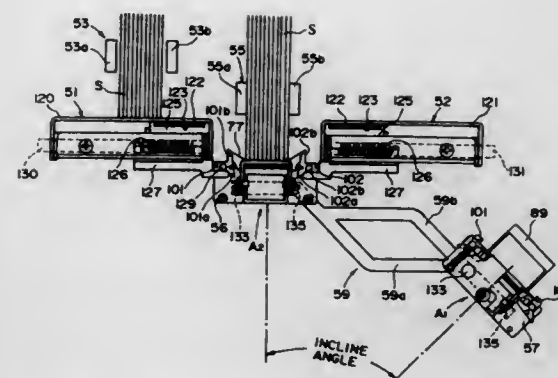
Claims priority, application Japan, Jul. 30, 1993, 5-208813

Int. Cl.<sup>6</sup> B42B 5/04

U.S. Cl. 412—9

34 Claims

1. A book binding apparatus comprising:



convey means for conveying a sheet on which an image is formed by image forming means;  
a plurality of sheet supporting means for supporting a sheet bundle to align a tip end of each sheet with each other;  
switching means for selecting one of said sheet supporting means to which the sheets conveyed by said convey means are sent;  
move means for moving the sheet bundle supported by each of said sheet supporting means to move the aligned tip end thereof to a bind position; and  
bind means disposed at the bind position for adhering a bind tape to the aligned tip end of each sheet bundle moved by said move means,  
wherein said move means moves the sheet bundle so that the aligned tip end after movement is parallel to the aligned tip end before movement.

5,569,012

## BOOK BINDING APPARATUS

Hideaki Kosasa; Yuji Takahashi, both of Tokyo; Kimiaki Hayakawa; Toshihiko Kusumoto, both of Yokohama; Yoshimasu Yamaguchi, Kawasaki; Hiroshi Ohta, Tokyo; Yuji Yamanaka, Kawasaki, and Kozo Sakakibara, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

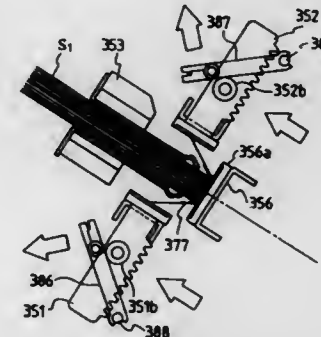
Filed Jul. 21, 1994, Ser. No. 278,280

Claims priority, application Japan, Jul. 30, 1993, 5-208813; Jul. 30, 1993, 5-208814; Jul. 30, 1993, 5-208815; Dec. 20, 1993, 5-344910; Dec. 20, 1993, 5-344914

Int. Cl.<sup>6</sup> B42B 5/00

U.S. Cl. 412—33

9 Claims



1. A book binding apparatus comprising:  
a sheet entrance portion constructed to be opposed to an outlet of a first another apparatus disposed upstream of said book binding apparatus for receiving a sheet therefrom;  
a sheet convey path for conveying the sheet from said sheet entrance portion;  
a first discharge opening disposed downstream of said sheet convey path and constructed to be opposed to a first entrance of a second another apparatus disposed downstream of said

book binding apparatus, for discharging the sheet from said book binding apparatus, and feeding into the second another apparatus;  
sheet storing means for temporarily storing the sheet branched from said sheet convey path by branching means;  
binding means for binding the sheets stored in said sheet storing means;  
conveying means for conveying a bound sheet bundle; and  
a second discharge opening constructed to be opposed to a second entrance of the second another apparatus, for discharging the sheet bundle from said book binding apparatus and feeding into the second another apparatus.

5,569,013

## LOAD TRANSPORTER WITH ALL-VERTICAL JACK LIFTING

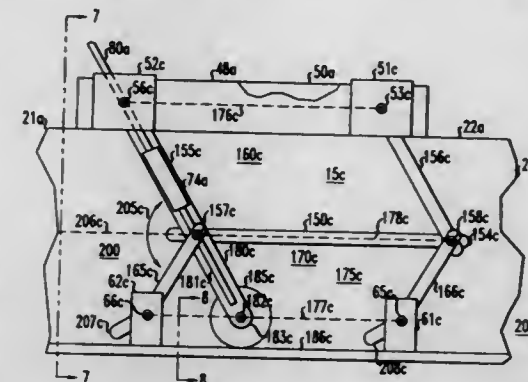
Glen A. Evans, Garwood, N.J., and Ruloff F. Kip, Jr., New Castle, N.Y., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation-in-part of Ser. No. 324,065, Oct. 14, 1994, Pat. No. 5,445,489, and a continuation-in-part of Ser. No. 164,071, Dec. 8, 1993, Pat. No. 5,449,266. This application Dec. 21, 1994, Ser. No. 361,354

Int. Cl.<sup>6</sup> B65G 7/00

U.S. Cl. 414—458

5 Claims



1. A transporter for loads comprising dolly means comprising, first and second laterally spaced horizontal support beams longitudinally extending between relatively forward and rearward portions thereof, forward and rearward wheels underneath each beam to make said dolly means rollable over a floor, and rigid elongated tie means extending between and secured to said beams to form therewith an articulated frame border

links extending between, and coupled at opposite ends to, respectively said yoke bar and such shoe top to be movable at said opposite ends about pivots carried by, respectively, such bar and shoe top so as to form therewith an upper simple parallelogram linkage shiftable over a range of angular configurations therefor, forward and rearward longitudinally horizontally spaced lower links extending between, and coupled at opposite ends to, respectively, said bar and such beam to be movable at such opposite ends about pivots carried by, respectively, said bar and such beam so as to form therewith a lower simple parallelogram linkage shiftable over a range of angular configurations therefor, the respective configurations of said upper and lower simple linkages together providing a changeable configuration for said compound linkage, and said yoke bar coupling together said upper and lower simple parallelogram linkages to maintain constant the angular position of said bar relative to each of the shoe top and beam coupled by said links to said bar, hand actuated drive means motion coupled to said compound linkage to change the configuration thereof so as to raise the corresponding shoe from said down to said up position therefor, and linkage guiding means cooperable with said compound linkage as such shoe is so raised to cause said changing in said configuration of said compound linkage to be produced by respective shiftings which occur in the configurations of said two simple linkages, and which are coordinated together to maintain the top of such shoe fixed in horizontal translational position relative to such beam as such shoe is raised.

5,569,014

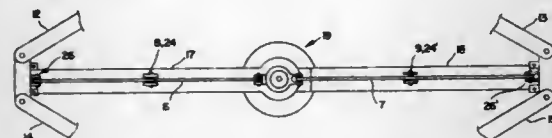
**FROG-LEG ROBOT HAVING WALKING-BEAMS**  
Christopher Hofmeister, Hampstead, N.H., assignor to Brooks Automation, Inc., Chelmsford, Mass.

Filed Aug. 8, 1994, Ser. No. 287,090

Int. Cl. B25J 9/06

U.S. Cl. 414-744.3

3 Claims



1. An apparatus for transferring objects, comprising a support, a first upper arm having a shoulder end and an elbow end and being supported on said support so as to be rotatable about a first axis at said shoulder end, a second upper arm having a shoulder end and an elbow end and being supported on said support so as to be rotatable about a second axis at said shoulder end of said second upper arm, at least one pair of forearms each having a wrist end and an elbow end and being articulated to said first and second upper arms at their respective elbow ends, each of said upper arms being of lesser length than each forearm, at least one end effector pivotally coupled to said pair of forearms at the wrist ends thereof, at least one engagement means connected between said pair of forearms and preventing rotation of said end effector, and means capable of driving said upper arms for rotation through an angle in the range of from greater than 120° up to and including 180° to move said end effector between an extended position and a retracted position, the improvement comprising:

a lift-rod mounted near the shoulder ends of said upper arms, at least two elbow blocks each of which is slidably mounted upon the elbow end of an upper arm, at least two walking-beams each having a fulcrum which is mounted upon an upper arm intermediate the ends thereof, each having one end which is affixed to said lift-rod in a vertically and horizontally rotatable manner and another end which is mounted in a vertically rotatable manner to one of said elbow blocks,

the elbow ends of said fore arms being affixed to one of said elbow blocks in a horizontally rotatable manner, and means for imparting vertical movement to said lift-rod, whereby vertical movement is imparted to said end effector and said

fore arms but not to said upper arms nor to the components which drive said upper arms.

5,569,015

**INTERMEDIATE STORAGE APPARATUS**

André Gerlier, Sciez, France, assignor to Mars Incorporated, McLean, Va.

Continuation of Ser. No. 732,034, Jul. 18, 1991, abandoned.

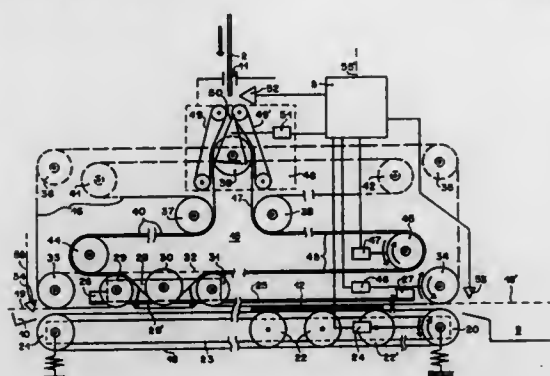
This application Apr. 29, 1994, Ser. No. 235,190

Claims priority, application Switzerland, May 8, 1991, 1392/91

Int. Cl. B65G 57/00

U.S. Cl. 414-790.7

51 Claims



1. An intermediate sheet storage apparatus, comprising:

a first conveyor belt;

a second conveyor belt;

an inlet station;

first mounting means for mounting said first and second conveyor belts so as to define therebetween a first feed path from said inlet station;

a third conveyor belt;

first and second outlet stations;

second mounting means for mounting said second and third conveyor belts so as to define therebetween a transportation path between said first and second outlet stations;

drive means for driving said conveyor belts; and

control means for controlling said drive means selectably (a) in an acceptance mode in which said third belt is stationary and in which said first and second conveyor belts are moved together by their drive means along said feed path so as to feed sheets nipped therebetween from said inlet station along said feed path to form a stationary stack on said third belt, said sheets being held between said second conveyor belt and the remainder of the stack while being conveyed onto the stack, and (b) in a transportation mode in which said second and third conveyor belts are moved together along said transportation path so as to transport said stack nipped between said second and third conveyor belts in one direction to said first outlet station and in a reversed direction to said second outlet station.

5,569,016

**MULTIPLE CONVEYOR STACKING APPARATUS**

Bernhard Mokler, Markgröningen, Germany, assignor to LG Lufttechnische Gesellschaft M.B.H., Stuttgart, Germany

Filed Jun. 1, 1995, Ser. No. 457,065

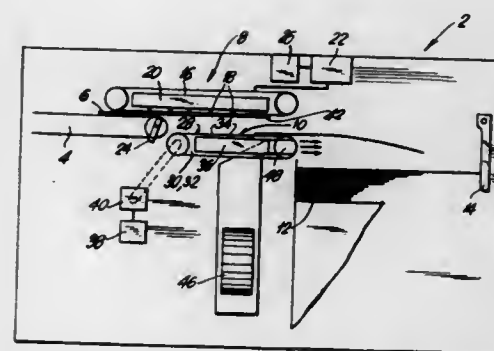
Claims priority, application Germany, Sep. 23, 1994, 44 33 912.7

Int. Cl. B65G 57/04

U.S. Cl. 414-793.1

9 Claims

1. An apparatus for stacking sheet products delivered one after another in a spaced relationship to each other at a predetermined speed by a transporting device, said stacking apparatus comprising:



conveyor means arranged above a transporting plane of the transporting device for lifting the sheet products from the transporting device and for conveying the sheet products in a direction toward a stacking position at a speed corresponding to the predetermined speed;

braking means located beneath the transporting plane of the transporting device, said braking means having a receiving surface defining a conveying surface of said braking means and formed by an upper surface of a conveyor belt;

drive means for driving said conveyor belt with a first speed corresponding to the predetermined speed and a second reduced speed when said conveyor belt reaches the stacking position; and

control means for controlling lifting of the sheet products by said conveyor means and depositing of the sheet products from said conveyor means on the receiving surface of said braking means.

5,569,017

**FAN END BRACKET FOR HIGH VELOCITY LOW PRESSURE BLOWERS**

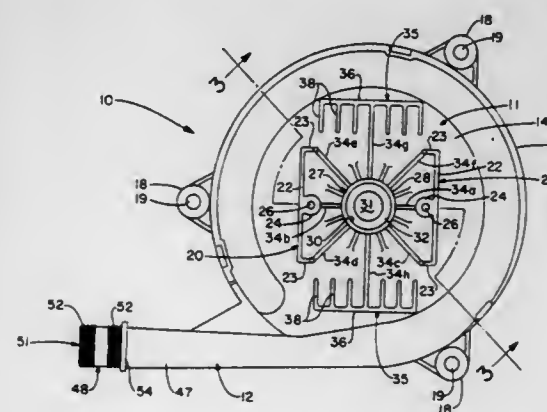
Gary A. Barnhart, Newbury, and David P. Gill, Canton, both of Ohio, assignors to Ametek, Inc., Kent, Ohio

Filed Dec. 22, 1994, Ser. No. 361,683

Int. Cl. F04D 29/58; 29/62

U.S. Cl. 415-177

8 Claims



1. In a high velocity, low pressure blower assembly having a working air hose, a fan assembly enclosed in a fan housing, the fan housing having an air intake, the fan assembly being drivingly connected to a motor, the improvement comprising:

an end bracket mounted on the fan housing and interposed between the motor and fan housing;

means for dissipating heat incorporated in said end bracket;

means for exhausting air from the fan housing, said means for exhausting incorporated in said end bracket;

means for directing air from the fan assembly to said means for exhausting, said means for directing incorporated in said end bracket;

means for reducing air turbulence in said means for directing, said means for reducing incorporated in said means for directing; and

means for connecting said means for exhausting to the working air hose, said means for connecting incorporated in said means for exhausting; and

wherein said end bracket comprises an annular plate member, a circumferential wall surrounding said plate member, a central shaft receiving aperture in said plate member, a bearing boss extending from said plate member, and at least one motor mounting standoff extending from said plate member.

5,569,018

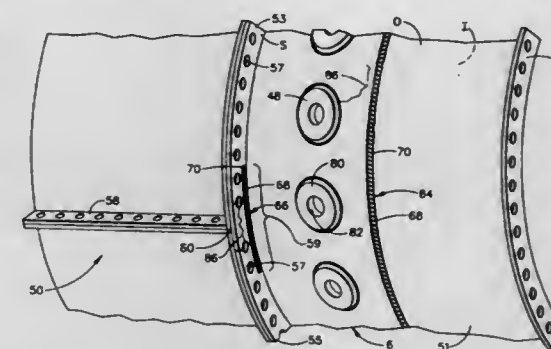
**TECHNIQUE TO PREVENT OR DIVERT CRACKS**  
Seetharamalah Mannava, Cincinnati, and William D. Cowie, Xenia, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Mar. 6, 1995, Ser. No. 399,319

Int. Cl. F04D 29/44

U.S. Cl. 415-200

12 Claims



1. A gas turbine engine static component comprising:

a metallic panel section adjacent a crack initiating feature of the component,

a generally elongated laser shock peened region having deep compressive residual stresses imparted by laser shock peening (LSP) disposed between said feature and a portion of said panel section,

said laser shock peened region is positioned such that said laser shock peened region diverts cracks that propagate from said feature away from said portion of said panel section, and said laser shock peened region extending into the component from a corresponding elongated laser shock peened surface area.

5,569,019

**TEAR-AWAY COMPOSITE FAN STATOR VANE**

Devinder N. Katariya, Chandler; Ronald J. Rich, Phoenix; Steven C. Stenard, Scottsdale, and Bruce D. Wilson, Gilbert, all of Ariz., assignors to AlliedSignal Inc., Morris Township, N.J.

Continuation-in-part of Ser. No. 173,318, Dec. 22, 1993, Pat. No. 5,494,404. This application Dec. 21, 1995, Ser. No. 576,023

Int. Cl. F04D 29/44

U.S. Cl. 415-200

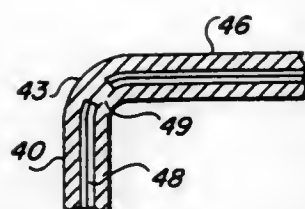
11 Claims

1. In a gas turbine engine having a rotary primary fan and a stationary fan stator vane assembly disposed downstream of said fan, said assembly comprising:

an annular outer shroud having openings therein;

an annular inner hub having openings therein and disposed concentrically to and radially inwardly of said shroud to define a radial space therebetween;





ignited and burnt there, and the hot gas flow is then mixed with the colder main burner flow in the burner interior space (14).

5,569,021

#### HYDRAULIC PUMP WITH IN-GROUND FILTRATION AND MONITORING CAPABILITY

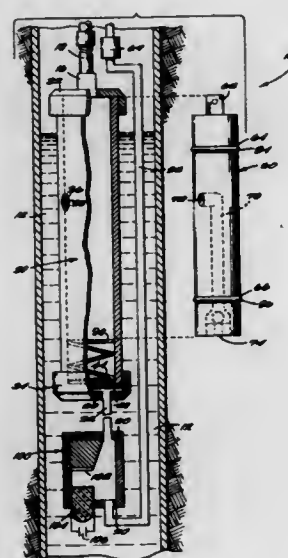
Charles D. Hopkins, Augusta, Ga.; Ronald R. Livingston, and William R. Toole, Jr., both of Aiken, S.C., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Jan. 17, 1995, Ser. No. 373,433

Int. Cl.<sup>6</sup> F04B 21/00

U.S. Cl. 417—63

20 Claims



a plurality of unitary stator vanes comprised of a nonmetallic composite material extending across said radial space and through said openings in said shroud and hub, each of said vanes having

a radial inner end extending through the associated one of said openings in the hub, and

an axially and circumferentially extending foot on the opposite radial outer end, said foot disposed radially outside said shroud, and

an aerodynamically configured airfoil section disposed radially across said space, and

a smoothly contoured transition section interconnecting said foot and said airfoil section,

said composite material comprising a plurality of compression molded, heat cured plies, said plies including a plurality of centrally located internal plies of reinforcement material of continuous yarns of para-aramid fibers, and a plurality of plies of resin impregnated graphite fiber material on each side of said centrally located plies of reinforcement material, substantially all of said para-aramid fibers being broken proximate said transition section between said airfoil section and said foot.

5,569,020

#### METHOD AND DEVICE FOR OPERATING A PREMIXING BURNER

Timothy Griffin, Ennetbaden, Switzerland, and Peter Senior, Countesthorpe, Great Britain, assignors to ABB Research Ltd., Zurich, Switzerland

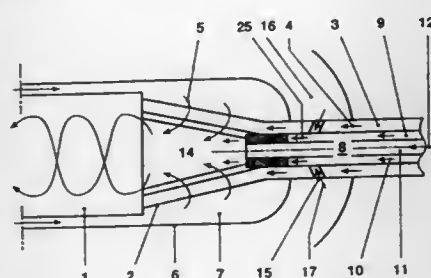
Filed Oct. 30, 1995, Ser. No. 550,351

Claims priority, application Germany, Nov. 5, 1994, 44 39 619.8

Int. Cl.<sup>6</sup> F23Q 9/00

U.S. Cl. 431—7

8 Claims



1. A method of operating a low-pollution premixing burner (2) stabilized by means of vortex breakdown, in particular a burner of the double-cone type of construction, with gaseous fuels (4, 10), the main fuel gas (4) being fed to the burner (2) via a main gas tube (3) connected in one piece to the burner (2) and the pilot gas (10) being fed to the burner (2) near the axis of the latter via a separate feed line (9) by means of an exchangeably inserted fuel lance (8), and the pilot gas (10) being mixed inside the fuel lance (8) with air (17) fed from a plenum (16) outside the burner hood (6), wherein the pilot-gas/air mixture (25) is fed to a catalyzer (21) arranged inside the fuel lance (8) at the tip of the burner (2) and is

10. A pump for transporting a fluid from a source, said pump comprising:

a hollow pump housing having an inside, a first end, a second end, and an outer surface, said pump housing having an inlet formed in said outer surface, said pump housing having an outlet formed in said second end;

a piston in said pump housing, said piston having a outer surface and an end, said piston dimensioned so that said piston is in spaced relation within said pump housing, said piston having a first position proximate to said first end of said pump housing and a second position proximate to said second end of said pump housing, said piston having a conduit formed therein for fluid flow, said conduit having an entrance in said outer surface of said piston and an exit in said end so that, when said piston is in said first position, said fluid flows from said source through said inlet to said inside of said pump housing, said fluid flowing from said inside through said entrance to said exit of said conduit, and, when said piston moves from said first position to said second position, said fluid flows from said exit through said outlet; and

means for monitoring said fluid, said monitoring means entirely external of said pump housing and in vertical line with said pump housing, said monitoring means receiving said fluid from said pump housing when said piston moves from said first position to said second position.

5,569,022

#### SELF-UNBLOCKING MOTOR-DRIVEN PUMP HAVING LAST MOTION SHAFT COUPLING

Luigi Rossi, Oderzo, Italy, assignor to Sole S.p.A., Pordenone, Italy

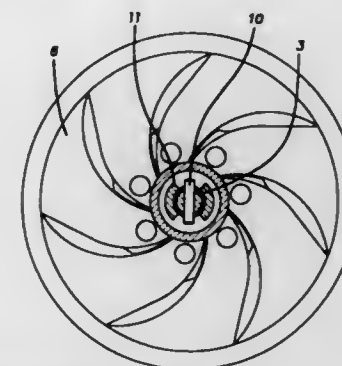
Filed Sep. 9, 1994, Ser. No. 303,952

Claims priority, application Italy, Sep. 17, 1993, PN93 00061

Int. Cl.<sup>6</sup> F04B 17/03

U.S. Cl. 417—319

5 Claims



1. A motor-driven pump having an electric motor, said motor-driven pump comprising a stator, a rotor for cooperating with said stator, a drive-shaft joined to said rotor for rotation with said rotor, a disk wheel joined to a free head of said drive-shaft for rotation with said drive-shaft, a first ring gasket encircling said drive-shaft, and a second ring gasket fixed to said disk wheel and engaging said first ring gasket, said first and second ring gaskets being engaged on sides orthogonal to said drive-shaft, and means for uncoupling said disk wheel from said rotor so that said rotor and said stator rotate reciprocally and freely relative to one another over an initial arc before driving torque is applied to said second ring gasket, wherein said drive-shaft is formed and placed so as to allow a partial initial rotation of the rotor with respect to the disk wheel, said motor being operable to turn the rotor in a direction opposite a direction of rotation of normal operation for a brief period of time after which the rotor is turned in the direction of rotation of normal operation.

5,569,023

#### VORTEX BLOWER

Fumiaki Ishida, Narashino; Masayuki Fujio, Sakura; Kazuo Kobayashi, Chiba, and Kengo Hasegawa, Sakura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

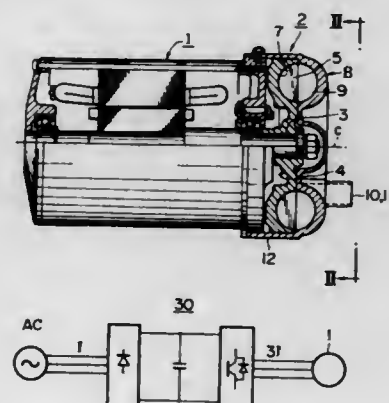
Filed Aug. 11, 1994, Ser. No. 288,904

Claims priority, application Japan, Aug. 12, 1993, 5-200732

Int. Cl.<sup>6</sup> F04B 17/00

U.S. Cl. 417—326

8 Claims



1. A vortex blower comprising:

motor means including a housing, a rotor and a stator enclosed within said housing, a bearing in one end of said housing, and an output rotary shaft extending from said rotor, through said bearing and outside said housing, for transmitting rotary motion of said rotor;

a casing covering said one end of said housing and said output rotary shaft, said casing having a first groove therein, and an inlet and an outlet communicating with said first groove; and

an impeller disposed outside said housing and within said casing, said impeller having a second groove therein facing said first groove, and having a plurality of blades extending radially within said second groove to partition said second groove into a plurality of sections, said second groove cooperating with said first groove to define a working chamber for pressurizing air, said impeller being connected to said output rotary shaft to rotate therewith, to draw air through said inlet into said working chamber, pressurize the air within said working chamber, and discharge the pressurized air from said working chamber through said outlet.

5,569,024

#### PUMP FOR DELIVERING HOT, CORROSIVE MEDIA

Hans-Ulrich Dummersdorf, Burscheid; Helmut Waldman; Helmut Härle, both of Leverkusen; Franz-Rudolf Minz, Dormagen, and Fritz Gestermann, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

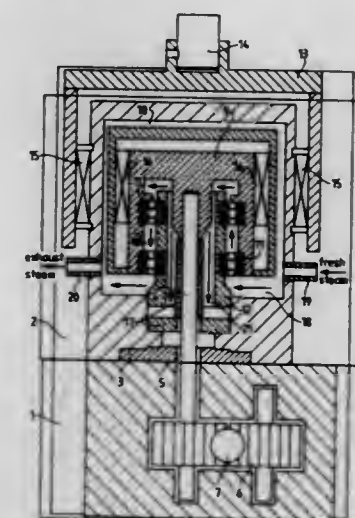
Filed Sep. 6, 1995, Ser. No. 523,886

Claims priority, application Germany, Sep. 13, 1994, 44 32 551.7

Int. Cl.<sup>6</sup> F04B 17/00

U.S. Cl. 417—420

8 Claims



1. Pump for delivering hot corrosive media, comprising a drive section, a pump body, and a drive shaft which is sealed off from the medium to be delivered by a shaft seal, wherein

- the shaft seal consists of a stator ring separating the pump body and the drive section and through which the drive shaft passes while leaving a seal gap between said drive shaft and said stator ring, and wherein
- the pump body, the stator ring and all portions of the pump body which contact the media to be pumped, are manufactured from a material which is resistant to corrosion and high temperatures, and wherein
- one or more dry-running bearings are arranged in the drive section to mount the drive shaft and further comprising
- a gas flow channel in the drive section, having a gas supply inlet and a gas discharge, and which communicates with the dry-running bearings and seal gap so as to enable gas supplied to the inlet to flow around the dry running bearings, and a portion of said gas to then enter the seal gap in the drive

section and flow through said seal gap into the pump body, while the remainder of the gas leaves the drive section through the gas discharge.

5,569,025

# LEAK-PROOF ABS/TCS PUMP ASSEMBLY WITH NON-RETURN VALVE

Klaus Bendel, Taunusstrasse 35d, 65830 Kriftel; Jürgen Uhlmer, Blütenweg 14, 63768 Hombach, and Armin Eiser, Gartenstrasse 10, 35519 Rockenberg, all of Germany  
PCT No. PCT/EP93/03185, § 371 Date Nov. 3, 1994, § 102(e) Date Nov. 3, 1994, PCT Pub. No. WO94/12375, PCT Pub. Date Jun. 9, 1994

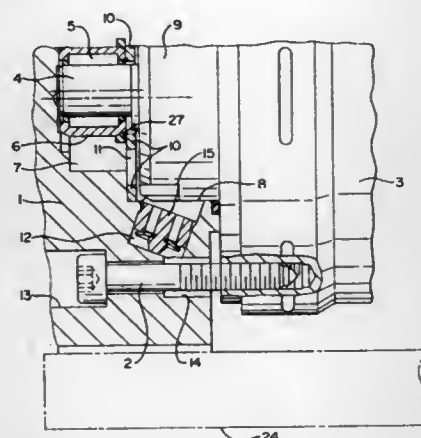
PCT Filed Nov. 13, 1993, Ser. No. 256,816

Claims priority, application Germany, Nov. 24, 1992, 42 39 361.2

Int. Cl.<sup>6</sup> F04B 21/00; B60T 8/40

U.S. Cl. 417—434

7 Claims



1. A pump and motor housing, comprising:
  - a housing having a first compartment receiving a pump eccentric for engaging pistons said housing having an aperture fluidly connecting the first compartment with an outside of the housing;
  - said housing further including an input port and an output port, said ports connected to a working chamber of said pump thereby enabling said pump to move fluids from said input port to said output port of said housing; and
  - a non-return valve disposed in the first aperture between the first compartment and the outside of the housing and configured to enable a flow of fluid out of the first compartment and through the aperture responsive to pressure within the first compartment and blocking a flow of fluid into the first compartment from the outside.

5,569,026

# TUBE PUMP IN WHICH TUBE CAN BE INSERTED ONLY IN ONE DIRECTION

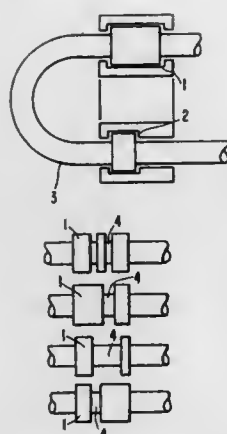
Pavel Novak, Schaffhausen, Germany, assignor to Storz Endoskop GmbH, Schaffhausen, Germany  
Continuation-in-part of Ser. No. 77,770, Jun. 18, 1993, abandoned. This application Jan. 24, 1995, Ser. No. 377,223  
Claims priority, application Germany, Jun. 18, 1992, 9208212 U

Int. Cl.<sup>6</sup> F09B 43/08

U.S. Cl. 417—477.1

6 Claims

1. A tube pump, comprising:
  - a tube for conveying liquid or viscous medium therethrough, the tube including two end pieces, wherein each of the end pieces has a cylindrical geometric form, one of the end pieces being larger than another of the end pieces; and wherein at least one



- of the end pieces exhibits an additional coding in the form of at least one continuous groove;
- a tube bed having a pair of sockets, one of the sockets being larger than another of the sockets, whereby the end pieces can be installed in the sockets in only one possible combination;
- a sensor provided in at least one of the sockets for identifying the additional coding of at least one of the end pieces; and
- a pump head on which at least two pump rollers are arranged, the pump rollers acting in succession on and squeezing the tube to convey the medium therethrough in one direction.

5,569,027

# LOBED ROTOR MACHINE

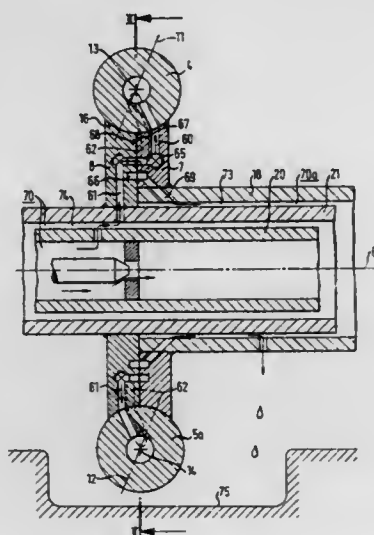
Wilfried Ball, Dingolfing; Peter Rönneberg, Seeshaupt, and Peter Pelz, Daimlerweg 2, D-82538 Geretsried, all of Germany, assignors to Peter Pelz, Geretsried, Germany  
Filed Aug. 8, 1995, Ser. No. 512,493

Claims priority, application Germany, Aug. 10, 1994, 44 28 338.5

Int. Cl.<sup>6</sup> F01C 1/00

U.S. Cl. 418—35

6 Claims



1. A lobed rotor machine, comprising:
  - an annular cylinder chamber having inlet and outlet openings;
  - four working pistons movable in pairs in the cylinder chamber;
  - two piston carriers for supporting respective pairs of the working cylinder, each of the two piston carriers being formed as a flat circular disc, and the two piston carriers being rotatable about a common machine axis and being displaceable relative to each other; and

means for cooling the working pistons, the cooling means comprising guide channels formed inside of each of the two piston carriers and defining a supply channel and a return channel extending at least to a vicinity of respective working pistons for conducting cooling medium thereto.

5,569,028

# SCROLL COMPRESSOR HAVING A COMPRESSOR HOUSING MADE UP OF A CUP-LIKE FRONT CASING AND A CAP-LIKE REAR CASING

Michio Yamamura, Kusatsu; Kunio Iwanami, Moriyama; Tatsuhisa Taguchi, Katano, and Masafumi Fukushima, Kusatsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

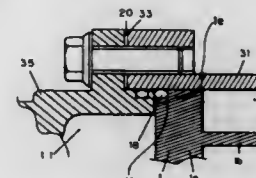
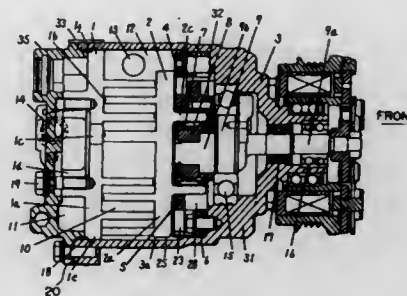
Filed Jul. 10, 1995, Ser. No. 500,370

Claims priority, application Japan, Nov. 30, 1994, 6-296587

Int. Cl.<sup>6</sup> F01C 1/04

U.S. Cl. 418—55.3

5 Claims



1. In a scroll compressor comprising a compressor housing, stationary and orbiting scroll members both accommodated in the compressor housing, a generally flat thrust bearing for supporting a thrust force axially applied to the orbiting scroll member, and a drive shaft rotatably accommodated in the compressor housing for orbiting the orbiting scroll member relative to the stationary scroll member, said stationary scroll member having a stationary end plate and a stationary scroll wrap protruding axially from the stationary end plate, said orbiting scroll member having an orbiting end plate and an orbiting scroll wrap protruding axially from the orbiting end plate, said orbiting scroll wrap being in engagement with the stationary scroll wrap to define a plurality of working pockets therebetween, wherein the improvement comprises:
  - said compressor housing being made up of a cup-like first casing having a suction port defined therein and a cap-like second casing having a discharge port defined therein, said first and second casings having respective mating surfaces secured to each other;
  - at least one shim interposed between said mating surfaces of said first and second casings;
  - a rotation constraint member for permitting said orbiting scroll member to undergo an orbiting motion relative to said stationary scroll member while preventing rotation of said orbiting scroll member about its own axis;
  - a rotation restraint member secured to said first casing in a proximity of said rotation constraint member for permitting said rotation constraint member to move in only one direction perpendicular to said drive shaft;
  - said rotation constraint member having a pair of first keys extending radially outwardly therefrom so as to be slidably engaged in associated first key grooves defined in said orbiting end plate, said rotation constraint member also having a

pair of second keys extending radially outwardly therefrom so as to be spaced 90° from said pair of first keys, said pair of second keys being slidably engaged in associated second key grooves defined in said rotation restraint member, one of said second key grooves communicating with a bottom portion inside said compressor housing through a communication passage which creates a resistance to flow when a lubricant stored in said bottom portion flows therethrough, said rotation restraint member having a pair of communication channels defined therein along respective sides of each of said second key grooves so as to communicate said second key grooves with a space delimited by said orbiting scroll member, said rotation restraint member and said drive shaft for lubrication thereof; and

said stationary end plate being positioned in a proximity of said mating surfaces of said first and second casings so that a low-pressure chamber is defined between said stationary end plate and said first casing, while a high-pressure chamber is defined between said stationary end plate and said second casing.

5,569,029

# BURNER

Günter Pöschl, Schalkheim, Germany, assignor to PPV Verwaltung AG, Zürich, Switzerland  
PCT No. PCT/EP93/01183, § 371 Date Nov. 14, 1994, § 102(e) Date Nov. 14, 1994, PCT Pub. No. WO93/23704, PCT Pub. Date Nov. 25, 1993

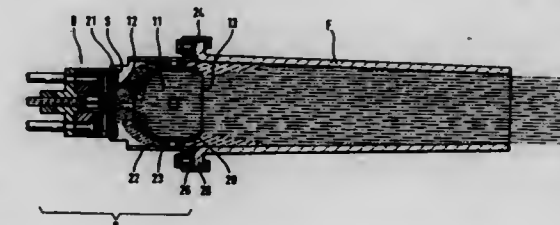
PCT Filed May 12, 1993, Ser. No. 335,749

Claims priority, application Germany, May 13, 1992, 42 15 763.3

Int. Cl.<sup>6</sup> F23L 9/00

U.S. Cl. 431—116

10 Claims



1. In a burner including a burner head and a flame tube connected to the burner head, the burner head having at least one air feed nozzle and a fuel feed nozzle, the air feed nozzle and fuel feed nozzle being arranged concentrically, the burner including an outlet housing, the burner also including a chamber located within the outlet housing and an annular space located between said chamber and the outlet housing, the annular space comprising means for recirculating gas between the chamber and the outlet housing, the improvement wherein there is an inner air feed nozzle and at least one outer air feed nozzle, the fuel feed nozzle being located between the inner and outer air feed nozzles, all of said nozzles being arranged concentrically, wherein the chamber is spaced from the air feed and fuel feed nozzles sufficiently to define a combustion zone within the chamber, wherein the burner includes a mixture formation zone located between the chamber and the air feed and fuel feed nozzles, wherein the recirculating means comprises means for recirculating hard-to-burn noncombusted gas compounds to the mixture formation zone, wherein the inner air feed nozzle and the fuel feed nozzle together define an injector which comprises means for sweeping fuel out of the fuel feed nozzle and into the mixture formation zone, wherein the outer air feed nozzle comprises means for feeding low-nitrogen air into the burner, and wherein the outer air feed nozzle is directed inwardly, the outer air feed nozzle comprising means for mixing low-nitrogen air



with the recirculating non-combusted gas compounds and for causing the low-nitrogen air and non-combusted gas compounds to flow into the chamber to be combusted, the outer air feed nozzle further comprising means for causing the low nitrogen air to envelop fuel introduced through the fuel feed nozzle, as a protective sheath against ambient air, prior to mixing with the non-combusted gas compounds.

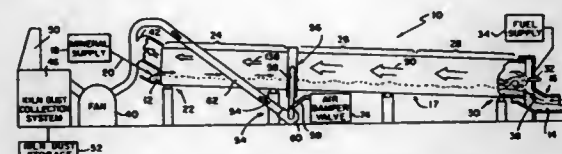
**5,569,030**  
**METHOD FOR IMPROVED MANUFACTURE OF CEMENT IN LONG KILNS**

Eric R. Hansen, Shawnee, Kans., and James R. Tutt, Nash, Tex., assignors to Cadence Environmental Energy, Inc., Michigan City, Ind., and Ash Grove Cement Company, Overland Park, Kans.

Continuation of Ser. No. 170,496, Dec. 20, 1993, abandoned, which is a continuation of Ser. No. 913,587, Jul. 14, 1992, abandoned. This application Oct. 31, 1994, Ser. No. 332,459 Int. Cl.<sup>6</sup> F27B 7/00

U.S. Cl. 432—103

4 Claims



1. A method for improving the oxidation of hydrocarbons in a kiln gas stream in a conventional long rotary cement kiln including a rotary vessel having a clinkering zone, an intermediate calcining zone, a mineral drying zone and said kiln gas stream flowing from said clinkering zone through the calcining and drying zones, said kiln modified to include a solid fuel charging apparatus for delivering combustible solids into the intermediate calcining zone in said kiln, said method comprising the steps of forming an air injection port in the wall of the rotary vessel of the kiln at a point downstream relative to kiln gas flow of the solid fuel charging apparatus and upstream of the drying zone, and injecting air into the kiln gas stream through the air injection port in the rotary vessel wall to provide an oxygen-enriched kiln gas stream.

**5,569,031**  
**COMBUSTION DEVICE**

Björn Heed, S-412 61, Göteborg, Sweden

PCT No. PCT/SE92/00575, § 371 Date May 17, 1994, § 102(e) Date May 17, 1994, PCT Pub. No. WO93/12380, PCT Pub. Date Jun. 24, 1995

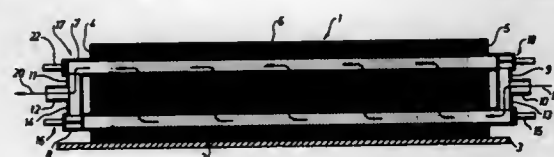
PCT Filed Aug. 24, 1992, Ser. No. 244,135

Claims priority, application Sweden, Dec. 9, 1991, 9103634

Int. Cl.<sup>6</sup> F23G 7/06

U.S. Cl. 431—170

8 Claims



1. A regenerative bed incinerator apparatus for decomposing combustible contaminants in a process gas stream, comprising:  
a heated stationary bed in the form of a regenerative bed of sand, stone, or other material having heat-accumulating and heat-exchanging properties, said bed having an upper face, a lower face, and a central portion;  
a housing structure for enclosing said stationary bed comprised of a horizontal support for positioning said bottom face of said stationary bed thereupon, a pair of side elements, a pair of end elements, and a roof element interconnecting with said

horizontal support, said side elements, and said end elements, said roof element in resting contact against said top face of said stationary bed such that said housing structure is free of an air gap between said structure and said stationary bed;  
means for heating said central portion of said bed to a temperature that combusts or decomposes said process gas contaminants;

means for communicating said process gas stream into and out of said regenerative bed, said means comprising an upper perforated tube having an inlet and an outlet side, and a lower perforated tube having an inlet and an outlet side, and an inlet and outlet valving and piping means on each respective inlet and outlet tubing side, each of said tubes disposed in a vertical and parallel alignment to each other wherein each of said tubes transverses said central portion of said bed and extends beyond said enclosure through said side elements by a like extent, each of said tube extensions defining a respective tube end, said inlet side of said upper and lower tubes having tube ends in communication with each other through said inlet valving and piping means, wherein said inlet piping means is comprised of a vertically disposed inlet header pipe having a central inlet for introducing said gas stream into said apparatus, an upper inlet pipe connection above said inlet for connecting said inlet to said upper tube end, and a lower inlet pipe connection below said inlet for connecting said inlet to said lower tube end,

said outlet side of said upper and lower tubes having tube ends in communication with each other through said outlet valving and piping means, wherein said outlet piping means is comprised of a vertically disposed outlet header pipe having a central outlet for removing said process gas stream from said apparatus, an upper outlet pipe connection above said outlet for connecting said outlet to said upper tube end, and a lower outlet pipe connection for connecting said outlet to said lower tube end,

said inlet valving means comprised of an upper and a lower valve respectively received within an inlet side upper and lower tube end, and operable in an axial direction between an inner, open position and an outer, closed position, each of said valves having a valve body corresponding to an internal cross-section of said respective tube, each of said upper and lower valves respectively capable of preventing said communication between said upper tube and said inlet and said lower tube and said inlet, when said respective valve is in said closed position,

said outlet valving means comprised of an upper and a lower valve respectively received within an outlet side upper and lower tube end, and operable in an axial direction between an inner, open position and an outer, closed position, each of said valves having a valve body corresponding to an internal cross-section of said respective tube, each of said upper and lower valves respectively capable of preventing communication between said upper tube and said outlet and said lower tube and said outlet when said respective valve is in said closed position,

wherein in a first mode of operation, said upper inlet valve is in said closed position and said lower inlet valve is in said open position, while said upper outlet valve is in said open position and said lower outlet valve is in said closed position, said process gas stream entering said lower tube and forced to exit said tube through said perforations therein, said process gas stream upwardly percolating through said stationary bed and forced into said perforations in said upper tube, wherein said gas stream exits said upper tube and said apparatus through said outlet as a contaminant-free gas stream, and

wherein in a second mode of operation, said upper inlet valve is in said open position and said lower inlet valve is in said closed position, while said upper outlet valve is in said closed position and said lower outlet valve is in said open position, said process gas stream entering said upper tube and forced to exit said tube through said perforations therein, said process gas stream downwardly percolating through said stationary bed and forced into said perforations in said lower tube, wherein said gas stream exits said lower tube and said apparatus through said outlet as a contaminant-free gas stream.

**5,569,032**

Patent Not Issued For This Number

**5,569,033**

**PINNED DENTAL MODELS AND THEIR PREPARATION AND USE**

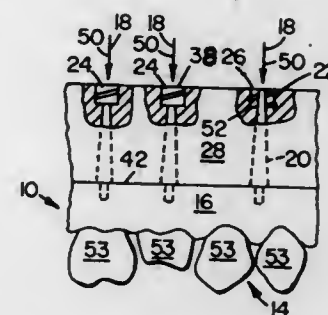
Robert M. Michael, 25 Devonshire Dr., Westampton, N.J. 08060

Filed Sep. 23, 1994, Ser. No. 311,521

Int. Cl.<sup>6</sup> A61C 19/00; 11/00

U.S. Cl. 433—74

21 Claims



1. A dental die model for use with or without articulating devices, said model having a tooth side containing at least one tooth positive molding affixed to a proximal surface of a base, said model having a bite axis, said tooth side and base being oriented generally along said bite axis, at least one dowel pin affixed to said model and having a free end extending outwardly from a distal surface of said base generally along said bite axis, and recess form means fictionally mounted on said free end and adapted to form access in a distal surface of a support of cured casting material encasing said pin and recess form means, said form means having side surface means provided with threads and an outer end surface portion, said threads being adapted to form mating threads in said support during casting thereof whereby when said form means is engaged by a tool and rotated, said form is screwed out of said recess against the strength of the bond between the cured casting material and said form means such that said recess becomes exposed upon removal of said form means from said free end and from said support which thereby exposes said free end of said pin lying within said recess.

**5,569,034**

**DENTAL HANDPIECE PROVIDING LOW SPEED, HIGH TORQUE ROTARY OUTPUT USING PLURAL STAGE PLANETARY GEAR REDUCTION**

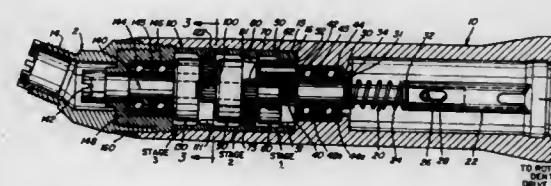
Moshe Meller, Princeton, and Michael Feldman, Toms River, both of N.J., assignors to MTI Precision Products, Inc., Lakewood, N.J.

Filed Jan. 4, 1995, Ser. No. 368,779

Int. Cl.<sup>6</sup> A61C 1/02; 1/08; 1/18

U.S. Cl. 433—105

19 Claims



1. A dental handpiece having a slow speed, high torque rotary output, comprising:  
a housing member;

an input shaft rotatably mounted in said housing member, and having a coupling member at an input end portion thereof for being coupled to a rotary dental drive unit;  
a plurality of speed reduction planetary gear stages sequentially arranged within said housing member, a first of said planetary gear stages being coupled so as to be rotationally driven by said input shaft;  
subsequent planetary gear stages being sequentially coupled to each other such that an output of one planetary gear stage drives an input of a next subsequent planetary gear stage; and an output shaft coupled to a final output planetary gear stage of said plurality of sequentially arranged planetary gear stages, said output shaft providing a slow speed, high torque rotary output responsive to said input shaft being driven by a higher speed rotary dental drive unit.

**5,569,035**

**ENHANCED CUTTING DRILL TIP FOR ENDOSSEOUS IMPLANTS**

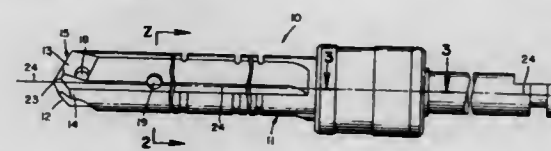
Alan R. Balfour, Camarillo, Calif., and Francois Aeby, Balgaves, Switzerland, assignors to Dentsply Research and Development Corp., Milford, Del.

Filed Jul. 1, 1994, Ser. No. 269,598

Int. Cl.<sup>6</sup> A61C 3/02

U.S. Cl. 433—165

7 Claims



1. A dental drill for use in drilling an opening in human jawbone tissue includes a cylindrical shank with lateral surfaces, said drill including a proximal end and a distal end, said drill further comprising:

- a cylindrical shank, having an internal passageway for delivering a fluid to portions of said drill;
- a plurality of cutting blades extending longitudinally along said shank lateral surfaces and terminating at the distal end of the drill in a cutting point converging upon the center axis of said drill; and
- a cutting tip at the distal end of said drill, wherein each blade comprises,
  - a primary cutting flute comprising a relief on the trailing edge of said blade, and a secondary cutting flute formed by a split point having a positive rake angle at said blade, converging on the center axis of the drill, wherein said secondary cutting flute is offset with respect to said primary cutting flute, said split point converging to the center axis of said drill, thus precluding chisel edges on said cutting blades.

**5,569,036**

**CUSTOM FIT TEETH**

Arthur Goldiner, and Linda Camplese, both of 1565 Strand Way, Oceano, Calif. 93445

Filed May 2, 1994, Ser. No. 236,380

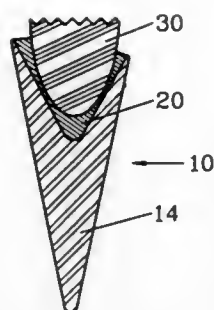
Int. Cl.<sup>6</sup> A61C 13/02

U.S. Cl. 433—168.1

21 Claims

1. A method of preparing an anatomically disproportionate artificial tooth apparatus for use in a human mouth with human teeth, comprising the steps of:

- (a) molding an anatomically disproportionate artificial tooth having an interior cavity;
- (b) thereafter inserting an impression compound into said interior cavity;
- (c) thereafter coating said interior cavity with said impression compound forming a liner whereby an anatomically disproportionate artificial tooth assembly is formed;



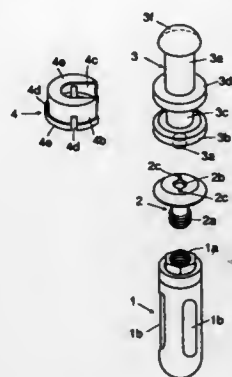
- (d) thereafter positioning said anatomically disproportionate artificial tooth assembly over at least one of said human teeth in said mouth;
- (e) thereafter waiting 3 to 10 minutes with said anatomically disproportionate artificial tooth assembly in position whereby said impression compound sets; and
- (f) thereafter removing said anatomically disproportionate artificial tooth assembly from said mouth.

#### 5,569,037 IMPLANT FIXTURE

Peter K. Moy, Los Angeles, Calif., and Kiyoshi Watanabe, Tokyo, Japan, assignors to GC Corporation, Tokyo, Japan  
Filed Sep. 15, 1994, Ser. No. 306,313  
Claims priority, application Japan, Sep. 17, 1993, 5-253675  
Int. Cl.<sup>6</sup> A61C 8/00

U.S. Cl. 433-173

5 Claims



1. An implant fixture comprising in combination:
- an implant fixture body of titanium having a nearly hemispheric head and a nearly columnar form contiguous to the head;
- a titanium cover having an externally threaded portion formed in a projected manner at one end thereof for threaded engagement with an internally threaded portion of said implant fixture body, said titanium cover further having a head provided with a small hole together with a groove for receiving a screwdriver at the other end thereof;
- an implant fixture support which is made up of a columnar form of protuberance at one end, which is to be loosely fitted in the small hole in the head of the cover, a columnar flange to which the protuberance is attached, a first shaft which is contiguous to the columnar flange and has an outer diameter smaller than that of the columnar flange, an intermediate flange which is contiguous to the first shaft and has an outer diameter larger than that of the first shaft, a second shaft which is contiguous to the intermediate flange and has an outer diameter smaller than that of the intermediate flange, and a round head which is contiguous to the second shaft and has an outer diameter larger than that of the second shaft; and
- a connector spring member including a cylindrical body flattened on one side for engagement with the columnar flange of the implant fixture support, said connector spring member

having a spring action which permits an outer surface of the cover to be held through the columnar flange, a hollow of the cylindrical body being fitted over the first shaft of the implant fixture support, and a portion of the cylindrical body that holds the outer surface of the cover being provided with a plurality of slits.

#### 5,569,038

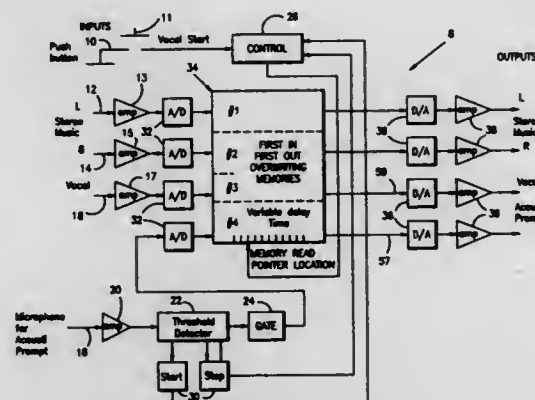
#### ACOUSTICAL PROMPT RECORDING SYSTEM AND METHOD

Louis Tubman, 1420 Locust St., Suite 8-F, Philadelphia, Pa. 19102, and Daniel W. Gravereaux, 602 Carter St., New Canaan, Conn. 06840

Filed Nov. 8, 1993, Ser. No. 148,626  
Int. Cl.<sup>6</sup> G09B 5/00

U.S. Cl. 434-308

21 Claims



1. A method of recording comprising:
- recording a first track of audio information having an associated vocal accompaniment;
- recording a second track of audio information in a predetermined timed relationship relative to the associated vocal accompaniment by automatically determining timing of said first track of audio information relative of said second track of audio information, and having a linguistic meaning related to a linguistic meaning of the associated vocal accompaniment;
- specifying at least one location of information in said first track;
- specifying at least one location of information in said second track; and
- receiving said locations and specifying a time shift amount used in time shifting said second track.
11. An apparatus for recording comprising:
- means for recording a first track of audio information having an associated vocal accompaniment;
- means for recording a second track of audio information in a predetermined timed relationship relative to the associated vocal accompaniment by automatically determining timing of said first track of audio information relative to said second track of audio information, said second track including information having a linguistic meaning related to a linguistic meaning of the associated vocal accompaniment; and
- means for specifying at least one location of information on said first track, for specifying at least one location of information in said second track, and for specifying, from said locations, a time shift amount used in time shifting said second track.

#### 5,569,039

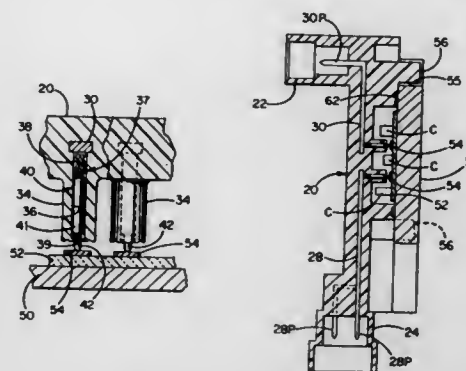
#### ELECTRICAL CONNECTORS

William R. Bailey, Glen Ellyn; Antonio A. Garay, Norridge, and Keith A. Rosborough, St. Charles, all of Ill., assignors to Labinal Components and Systems, Inc., Elk Grove Village, Ill.

Division of Ser. No. 182,641, Jan. 14, 1994, Pat. No. 5,382,169.  
This application Jan. 12, 1995, Ser. No. 372,011  
Int. Cl.<sup>6</sup> H01R 9/09

U.S. Cl. 439-76.1

67 Claims



1. An electrical connector device for connecting with a mating connector member that has, on one side thereof, generally planar conductive contact surfaces and outwardly projecting circuit components, said connector device comprising:
- an electrical insulator body which has a mounting side that includes a support surface for supporting such a connector member and a recess which extends inward of said body relative to said support surface for receiving said outwardly protruding circuit components of such connector member;
- electrical conductors extending within said insulator body;
- said insulator body defining an opening extending from each of said electrical conductors to an open distal end closely adjacent the position of a conductive contact surface of such a mating connector member supported on said support surface;
- a resilient electrically conductive contact disposed in each of said openings and retained and supported in said insulator body, each of said resilient electrically conductive contacts having a proximal end engaging the respective conductor and a distal end exposed through said distal end of the respective opening and being resiliently compressible axially of the respective opening for compressive engagement with a contact surface of such a mating connector member supported on said surface
- each of said openings has an inner side wall and said resilient conductive contact is retained and supported by the inner side wall of the respective opening.

#### 5,569,040

#### COMBINATION CONNECTOR

Tatsuya Sumida, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

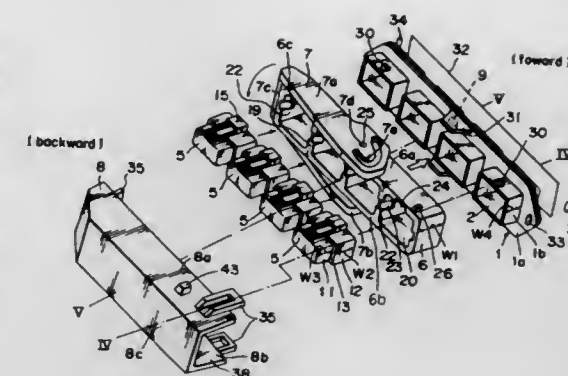
Filed Dec. 17, 1992, Ser. No. 992,474

Claims priority, application Japan, Dec. 27, 1991, 3-346966  
Int. Cl.<sup>6</sup> H01R 13/62

U.S. Cl. 439-157

13 Claims

1. A combination connector comprising:
- a first holding member for holding a plurality of female connectors, said first holding member comprising partitioning walls formed at regular intervals so as to form a plurality of connector-holding chambers in said first holding member;
- a second holding member for holding a plurality of male connectors, said second holding member comprising projecting walls so as to form a plurality of terminal-accommodating spaces in said second holding member;



- a lever rotatably mounted on one of the first holding member or the second holding member;
- a cam groove formed on the lever; and
- a downwardly projecting pin, engaging the cam groove, formed on the other of the first holding member or the second holding member; in which:
- said cam groove is positioned below said pin and said lever is rotated with the pin engaging the cam groove so as to simultaneously engage said plurality of female connectors held by the first holding member and said plurality of male connectors held by the second holding member with each other and connect the first holding member and the second holding member with each other; and
- at least one said plurality of female connectors or said plurality of said male connectors comprises connectors which are individually and separately removably received in at least one of said first holding member or said second holding member.

#### 5,569,041

#### LOW INSERTION FORCE ELECTRICAL CONNECTOR

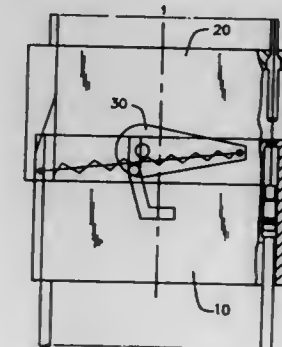
Toshimitsu Sonobe, Setagaya-ku, and Masahiro Yamamoto, Asahi-ku, both of Japan, assignors to Thomas & Betts Corporation, Memphis, Tenn.

Filed Oct. 14, 1993, Ser. No. 136,800

Claims priority, application Japan, Oct. 14, 1992, 4-276207  
Int. Cl.<sup>6</sup> H01R 13/62

U.S. Cl. 439-157

18 Claims



1. A connector comprising first and second housings (10) and (20) coupled to each other, a pivotal piece (30) pivotally provided on one of said two housings, a spring (40) interposed between said one housing and said pivotal piece, and latch means (12) for locking said two housings that are coupled to each other, said latch means comprising an engaging pin (31) provided on said pivotal piece, and a latch groove (12) formed in the other housing, wherein when said two housing are coupled, said pivotal piece is pivoted by said spring, thereby completing coupling of said two housings.



5,569,042

## LIGHT FIXTURE WITH SAFETY SOCKETS

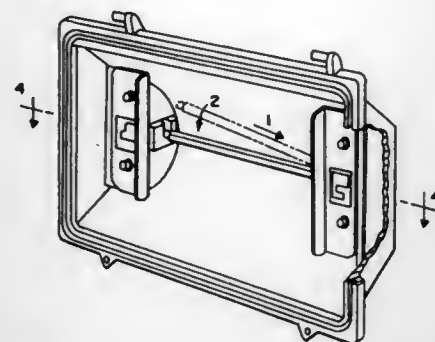
Garry M. Mosebach, Chicago, Ill., assignor to Appleton Electric Company, Chicago, Ill.

Filed Feb. 27, 1995, Ser. No. 394,780

Int. Cl.<sup>6</sup> H01R 33/02

U.S. Cl. 439—237

17 Claims



1. A fixture for receiving an elongated lamp having a terminal at each end thereof, said fixture comprising:

a housing mounting oppositely disposed first and second insulator blocks, said first insulator block being fixedly mounted and said second insulator block being supported for movement back and forth between a first position toward said first insulator block and a second position away from said first insulator block, said first insulator block having a first socket with a terminal therein for receiving one end of the lamp and a well communicating with said first socket, the well having a depth greater than the depth of the first socket, said second insulator block having a second socket with a terminal therein for receiving the other end of the lamp, the distance between said first and second sockets being less than the length of said lamp when said second insulator block is in said first position, obstruction means on said housing for preventing the lamp from being oriented such that one end of the lamp can be engaged with the terminal in said second socket when the other end of the lamp is disposed exteriorly of the well in said first insulator block, whereby said lamp may be mounted in place only by first inserting one end of the lamp in said well followed by insertion of the other end of the lamp in said second socket for engaging the terminal therein after movement of the second socket to its second position, whereupon said one end of the lamp may then be moved from said well to said first socket for engagement with the terminal therein.

5,569,043

## LATCH MECHANISM FOR USE IN AN ELECTRIC CONNECTOR

Kai-Mai Liu, No. 20, Lane 426, Sec 2, Chong Der Rd., Taichung, Taiwan

Filed Aug. 4, 1995, Ser. No. 511,254

Int. Cl.<sup>6</sup> H01R 13/62

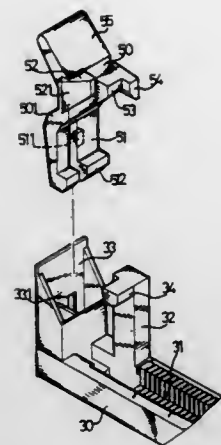
U.S. Cl. 439—326

2 Claims

1. An electric connector for engaging with and for securing a daughter card, the daughter card having two orifices formed therein, said electric connector comprising:

a housing including a middle portion having a groove longitudinally formed therein for engaging with the daughter card and including two ends each having a casing formed thereon and each having a beam extended upward therefrom, said beams each including an engaging protrusion means extended therefrom for engaging with the orifices of the daughter card, said casings each including a hollow interior and each including a notch formed therein distal to said beam,

a pair of latch members each including a lower portion having a pair of spaced legs formed therein for engaging with said casings and for being force-fitted in said casings, said legs including a catch means extended therefrom for engaging



with said notch so as to secure said latch members to said casing, said latch members each including a tapered middle portion for increasing a resilience of said latch members, said tapered middle portion of said latch members each including an upper portion having a pair of projections extended therefrom for engaging with the daughter card therebetween, a first of said projections including a tapered surface formed therein for engaging with the daughter card and for allowing the daughter card to be moved over said first projection and to be engaged between said projections, said latch members each including a knob provided on top thereof for operating said latch members and for disengaging said engaging protrusion means from the orifices of the daughter card,

said latch members being arranged for applying a force against the daughter card so as to resiliently and stably retain the daughter card in place, and

said projections include a second projection having a stop extended therefrom for engaging with said beam so as to stably retain said latch members to said beams and so as to prevent said latch members from being deformed.

5,569,044

## CHRISTMAS LAMP SOCKET

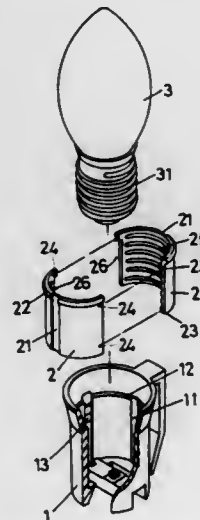
Shun-Feng Huang, No. 13, Lane 84, Nei Hu Road, Hsin-Chu City, Taiwan

Filed Feb. 16, 1995, Ser. No. 389,647

Int. Cl.<sup>6</sup> H01R 4/50

U.S. Cl. 439—340

1 Claim



1. A Christmas lamp socket comprising:

a socket body open on one end and having a cylindrical wall extending from a bottom wall to define a cavity therein, said cylindrical wall having an annular groove formed in an inner surface thereof adjacent said open end, said socket body having a pair of inwardly projecting vertically directed elongated plate members disposed on opposing sides of said cavity;

a pair of semi-cylindrical inner wall members being coupled together to form a cylindrical tube inserted into said cavity, each of said pair of inner wall members having opposing interior and exterior wall surfaces and a pair of opposing ends, one of said pair of inner wall members having a plurality of projections extending from said opposing ends thereof and the other of said pair of inner wall members having a plurality of apertures formed in said opposing ends thereof for receiving said plurality of projections respectively therein to couple one inner wall member to the other, a corresponding one of said pair of opposing ends of each of said pair of inner wall members having a recess formed therein for forming a slotted through opening in said cylindrical tube, each of said pair of inner wall members having an elongated vertically directed slot formed in said exterior wall surface intermediate said pair of opposing ends thereof for receiving a respective one of said pair of inwardly projecting vertically directed elongated plate members therein, each of said pair of inner wall members having a semi-annular ridge formed on an upper edge thereof for insertion into a respective portion of said annular groove, each of said pair of inner wall members having a threaded portion formed in said interior surface thereof for forming a lamp receiving thread on an interior of said cylindrical tube; and,

a pair of electrical contacts, a first of said pair of electrical contacts extending through an opening formed in said bottom wall of said socket body and a second of said pair of electrical contacts extending through said slotted through opening in said cylindrical tube for contacting corresponding portions of a lamp threadedly engaged with said lamp receiving thread.

5,569,045

## ELECTRICAL CONNECTOR

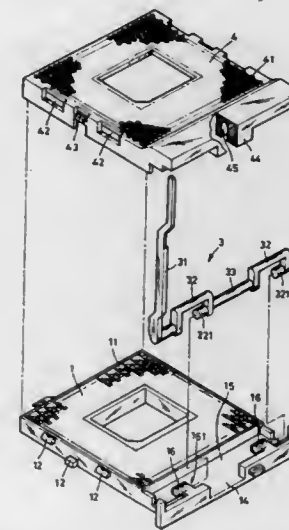
Fu-Yu Hsu, No. 1-2, Lane 975, Chun-Jih Road, Tao-Yuan City, Taiwan

Continuation-in-part of Ser. No. 194,309, Feb. 10, 1994, Pat. No. 5,454,727. This application Feb. 7, 1995, Ser. No. 384,876

Int. Cl.<sup>6</sup> H01R 13/62

U.S. Cl. 439—342

2 Claims



1. An electrical connector, comprising: a socket member having an upper surface and a lower surface and a plurality of slots formed therethrough in a grid-like pattern, said socket member having opposing side edge surfaces, each of said side edge surfaces having

a pair of stoppers integrally formed thereon, said socket having a front edge portion, said front edge portion having a notch portion and a horizontal surface portion formed therein, said horizontal surface having a pair of spaced positioning flanges formed thereon, each of said pair of positioning flanges having a positioning hole formed in one side thereof;

a sliding base member having an upper surface and a lower surface and a plurality of insertion holes formed therethrough, said sliding base member lower surface facing said socket member upper surface, said sliding base member insertion holes being positioned in alignment with said socket member slots, said sliding base member having opposing side walls for receiving said socket member side edge surfaces therebetween, each of said side walls having a pair of elongated apertures formed therethrough for respectively receiving said stoppers of said socket member therein, said stoppers of said socket member and said elongated apertures cooperating to slidably couple said socket member of said sliding base member, said sliding base member having a protrusion slidably receivable within said notch of said socket member, said protrusion having a lower edge with a slot formed therein;

driving rod means having a portion thereof disposed within said slot of said sliding base member protrusion and being pivotally coupled to said pair of positioning flanges for displacing said sliding base member relative to said socket member, said driving rod means including a lever arm extending from an end thereof for rotating said driving rod means with respect to said position flanges, said driving rod means including a pair of spaced U-shaped members, each of said U-shaped members having a peg extending therefrom and rotatably disposed within a respective one of said positioning holes, said pegs defining a rotational axis of said driving rod means; and,

a plurality of electrically conducting longitudinally extending terminals respectively disposed within said plurality of slots, each of said plurality of terminals being punched from a piece of sheet metal, each of said terminals having a stopper section and a contact base member extending longitudinally in a first direction therefrom, each said terminal having a long flexible support member extending longitudinally from said stopper section in a second direction, said second direction being opposite said first direction, said long flexible support member having a first contact section formed at a distal end thereof, said first contact section having a sloping contact portion leading to an upper contact surface portion, each said terminal further having a short flexible support member extending from said stopper portion in said section direction, said short flexible member having a second contact section formed at a distal end thereof, said second contact section having a lead surface leading to a lower contact surface portion, said lower contact surface portion being in aligned and longitudinally spaced relationship with said upper surface contact portion for contacting a pin inserted into a respective one of said insertion holes responsive to said displacement of said sliding base member, wherein the pin is contacted by both said upper and lower contact surface portions on one side thereof and by an inner surface of a respective one of said plurality of slots of said socket member on an opposing side.

5,569,046

## ELECTRICAL CONNECTION ARRANGEMENT

Johannes Pfetzer, Buehl, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE94/01387, § 371 Date Jun. 13, 1995, § 102(e) Date Jun. 13, 1995, PCT Pub. No. WO95/15019, PCT Pub. Date Jun. 1, 1995

PCT Filed Nov. 24, 1994, Ser. No. 481,345

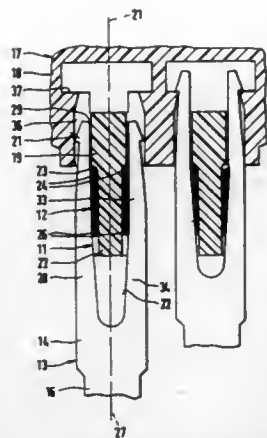
Claims priority, application Germany, Nov. 27, 1993, 43 40 638.6

Int. Cl.<sup>6</sup> H01R 4/24

U.S. Cl. 439—443

8 Claims

1. An electrical connection arrangement, comprising a connecting wire; a receptacle for retaining said connecting wire; a contact



element for connecting to said connecting wire and for detachably coupling to a mating plug, said connecting wire being arranged in form of a winding having a plurality of turns so as to bear against said receptacle, said contact element having at least one cutting edge extending in a longitudinal direction of said winding, said cutting edge and a delimitation of said winding opposite to said cutting edge being inclined relative to one another in the longitudinal direction of said winding so that in the event of a plugging movement of said contact element onto or into said receptacle, said cutting edges enter into a cutting connection with at least one of said turns of said connecting wire which is radially supported on said delimitation, said receptacle and said contact element having aligned longitudinal axes so that the plugging movement of said contact element onto or into said receptacle provided with said connecting wire takes place as far as an end position in which said contact element and said receptacle are fixed relative to one another; means for fixing said contact element in said receptacle with one another, said receptacle being formed as a connecting element of a coil with a winding section carrying said connecting wire in one layer and a cross-sectional area which is essentially constant in direction of a longitudinal axis of said receptacle, said contact element being formed as a flat-pin plug having two limbs with inner sides provided with cutting edges formed in a contact section, said cutting edges being inclined relative to the longitudinal axis of said contact element.

5,569,047

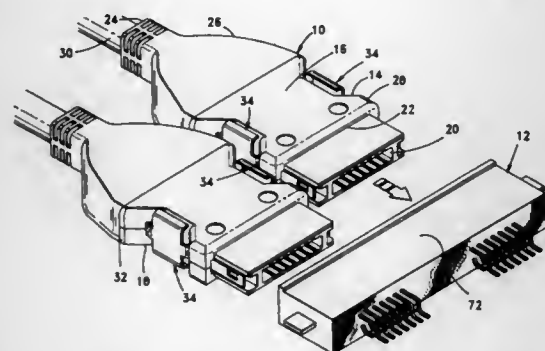
# LATCHING SYSTEM FOR INTERMATEABLE TRANSMISSION CONNECTORS

William V. Pauza, Palmyra, and Harold W. Kerlin, Port Royal, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Aug. 31, 1995, Ser. No. 521,718  
Int. Cl.<sup>6</sup> H01R 13/627

U.S. Cl. 439—353

10 Claims



1. In a latching mechanism for a pair of intermatable electrical or fiber optic transmission connectors, where lateral access thereto

may be limited to effect a manual unmating thereof, said connectors comprising a plug consisting of a housing having top and bottom surfaces, and supporting a first transmission component, and a receptacle for supporting a second transmission component, where said plug includes a pair of cantilevered flexible arms, engagable with complementary latching projections on said receptacle, said arms having exposed intermediate portions movable toward one another to manually disengage said latching projections from said flexible arms,

the improvement comprising in combination therewith the provision of each said intermediate portion having a pair of wing extensions directed toward said top and bottom surfaces, where the ends of said extensions are laterally turned to lie parallel with a respective said top or bottom surface.

5,569,048

Patent Not Issued For This Number

5,569,049

# COAXIAL CONNECTOR PLUG HAVING SHEATH PENETRATING CONTACTS AND RECEPTACLE FOR RECEIVING THE SAME

Yu Tatebe, and Shuuitsu Sannohe, both of Tokyo, Japan, assignors to Japan Aviation Electronics Industry, Limited, Japan

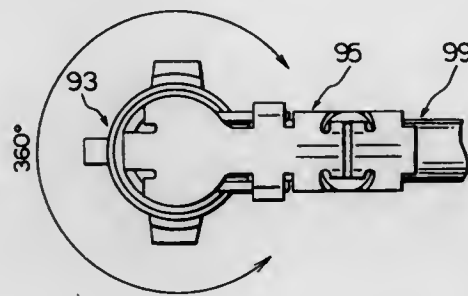
Filed Oct. 5, 1994, Ser. No. 330,721

Claims priority, application Japan, Oct. 6, 1993, 5-250572

Int. Cl.<sup>6</sup> H01R 17/04

U.S. Cl. 439—394

14 Claims



1. A coaxial connector plug (95) in combination with a coaxial cable comprising a plug outer contact (101) having a first contact portion (107) to be brought into contact with a receptacle outer contact (169) of a coaxial connector receptacle (93) and a second contact portion (111) to be brought into contact with an outer conductor (155) of a coaxial cable (99),

wherein said first contact portion and said second contact portion are integrally coupled by way of a coupling portion (113), said second contact portion having a plurality of press-bonding pieces (123, 125) for penetrating a sheath (153) of said coaxial cable to come into contact with said outer conductor of said coaxial cable, said press-bonding pieces being arranged so as to surround said coaxial cable and comprising a first press-bonding piece (123) for penetrating said coaxial cable inside said outer conductor and a second press-bonding piece (125) for penetrating said coaxial cable outside said outer conductor, said outer conductor being partially held between said first press-bonding piece and said second press-bonding piece.

5,569,050

# LOW-PROFILE, PIERCE-THROUGH CONNECTOR BACKSHELL

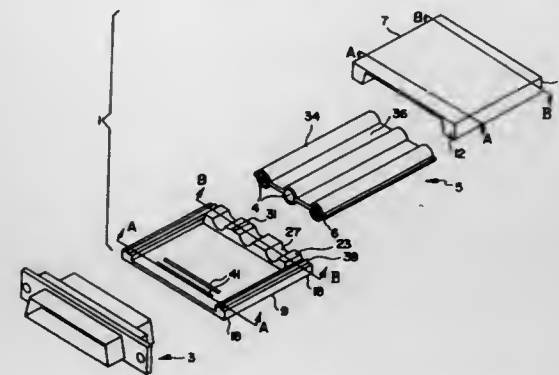
Brian K. Lloyd, Pflugerville, Tex., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Dec. 2, 1994, Ser. No. 349,118

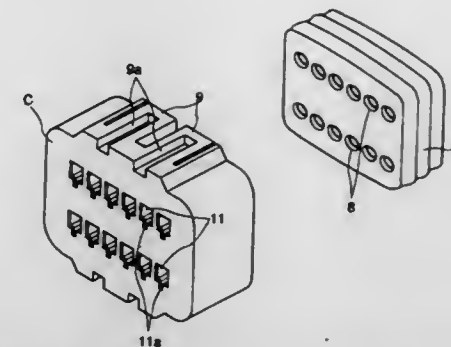
Int. Cl.<sup>6</sup> H01R 13/58

U.S. Cl. 439—465

2 Claims



1. A backshell housing for use with a multi-position connector and a flat cable, the backshell housing comprising:  
a. a top shell having a front section and a rear section;  
b. a bottom shell having a front section and a rear section, said front sections of the top and bottom shells defining a substantially (rectangular opening) for facilitating the entry and placement of the flat cable within the backshell;  
c. a first ledge located in the rear section of the top shell having a plurality of longitudinal grooves for placement of a plurality of cables of the flat cable;  
d. a second ledge located in the rear section of the bottom shell having a plurality of longitudinal grooves, said grooves being in the same position as the grooves of the top shell so that when the top shell and bottom shell are assembled, openings for said cables are created between the longitudinal grooves;  
e. at least one piercing means for piercing a web of the flat cable located between two longitudinal grooves on at least one said ledge, said piercing means piercing the web by application of both pressure and ultrasonic vibration;  
f. means for locking the top shell to the bottom shell the locking means comprising at least first and second energy directors formed as raised heads and disposed on lateral edge surfaces of one of the top or bottom shells, whereupon application of ultrasonic energy, said locking means welds the top shell to the bottom shell to form a rigid, unitary backshell housing; and  
(means for rigidly affixing the housing to the multi-position connector), said means comprising at least one energy director 41 found or a raised bead and disposed on an interior surface of each of the top and bottom shells, said means being operable to absorb ultrasonic energy and to melt and rigidly affix to the multi-position connector.



a waterproof plug having a plurality of sealing insertion holes corresponding to said terminal accommodating chambers and being fitted into a rear section of said connector housing;  
a waterproof plug retaining cover mounted on an end of said rear section of said housing and having terminal insertion holes corresponding to said sealing insertion holes; and  
posture controlling recesses in each of said terminal insertion holes allowing passage of said inserting posture controlling protrusions formed on said terminal members, so that the inserting posture of the terminal members with respect to said waterproof connector can be reliably controlled in the earlier stages of insertion, thereby improving the efficiency of the terminal member inserting operation.

5,569,052

# COMPUTER FOR USE WITH A PORT REPLICATOR

Steven Belt, St. Joseph, Mich.; Jeffrey Schindler, Lindenhurst, Ill., and Norman Stobert, St. Joseph, Mich., assignors to Zenith Data Systems Corporation, Sacramento, Calif.

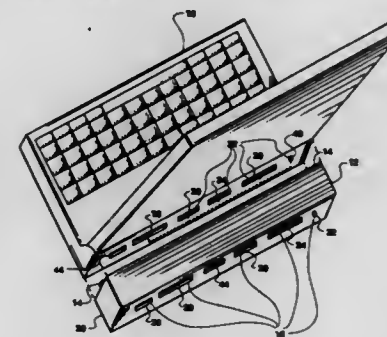
Division of Ser. No. 104,950, Aug. 10, 1993, Pat. No.

5,460,547, which is a continuation of Ser. No. 862,859, Apr. 3, 1992, abandoned. This application Jul. 21, 1995, Ser. No. 505,042

Int. Cl.<sup>6</sup> H01R 27/00

U.S. Cl. 439—638

18 Claims



1. A computer comprising:  
a computer housing;  
a plurality of peripheral ports of various different types;  
a plurality of electrical connectors carried by the computer housing and electrically coupled to said plurality of peripheral ports; and  
a first common electrical connector carried by the computer housing and electrically coupled to said plurality of electrical connectors, the first common electrical connector adapted to

5,569,051

# WATERPROOF CONNECTOR

Takayoshi Endo, and Takashi Takagishi, both of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Japan

Filed Jul. 27, 1994, Ser. No. 280,671

Claims priority, application Japan, Aug. 6, 1993, 5-196181

Int. Cl.<sup>6</sup> H01R 13/40

U.S. Cl. 439—587

9 Claims

1. A waterproof connector comprising:  
a plurality of terminal members having inserting posture controlling protrusions;  
a connector housing having a plurality of terminal accommodating chambers for accommodating said terminal members;



be removably attached and electrically coupled to a second common electrical connector external to said computer housing.

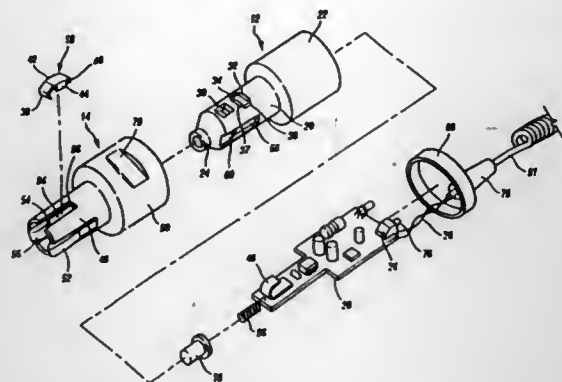
5,569,053

# CONNECTOR FOR CONNECTING AN ELECTRONIC DEVICE TO A VEHICLE ELECTRICAL SYSTEM

Robert N. Nelson, and Chad N. Nelson, both of Scottsdale, Ariz., assignors to Andrew Corporation, Orland Park, Ill.  
Filed Sep. 8, 1994, Ser. No. 303,168  
Int. Cl.<sup>6</sup> H01R 17/18

U.S. Cl. 439—668

13 Claims



1. A connector for connecting an electronic device to a vehicle electrical system, comprising:
  - a hollow inner sleeve forming a nozzle located at a distal end of said sleeve and opening into an interior of said inner sleeve;
  - a first conductive contact mounted within said nozzle;
  - a second conductive contact mounted to a sidewall of said inner sleeve; and
  - a hollow outer sleeve slidably mounted over said inner sleeve and longitudinally movable relative to said inner sleeve between a forward position and a retracted position, said outer sleeve forming at least a first expandable locking finger at a distal end thereof and spaced away from said second contact, said inner sleeve forming means for displacing said first locking finger laterally outward in response to longitudinal movement of said outer sleeve from said retracted position to said forward position.

5,569,054

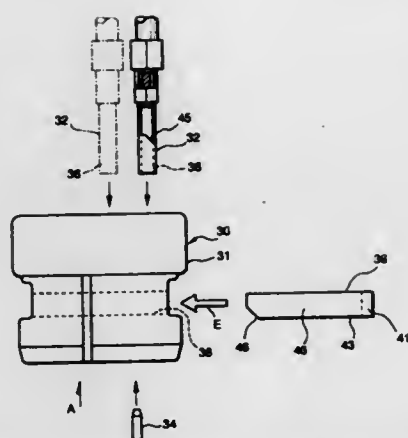
# ELECTRICAL CONNECTOR

Sakai Yagi, and Tamio Watanabe, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan  
Filed Apr. 24, 1995, Ser. No. 427,259  
Claims priority, application Japan, Apr. 22, 1994, 6-84883  
Int. Cl.<sup>6</sup> H01R 13/436

U.S. Cl. 439—752

3 Claims

1. A connector comprising:
  - a connector housing having a plurality of terminal receiving chambers arranged in predetermined rows, said connector housing having first retaining means for respectively retaining terminals inserted respectively in said terminal receiving chambers;
  - retaining pin insertion holes, each communicating with said terminal receiving chambers in the same row with one another, being open to an outer peripheral surface of said connector housing in corresponding relation to the rows of terminal receiving chambers;
  - second insertion retaining means, attached to said connector housing from the outside of said connector housing, for retaining said terminals, said second insertion retaining means including:



- a plurality of retaining pins for inserting respectively into said retaining pin insertion holes to retain said terminals received respectively in said terminal receiving chambers;
- a connecting portion interconnecting proximal ends of said retaining pins at an interval corresponding to an interval of said retaining pin insertion holes in said connector housing; and
- a slanting surface formed on a distal end of each of said retaining pins, said slanting surface extending in a direction intersecting a direction of insertion of said retaining pin, and said slanting surface producing a force urging the associated terminals to move deeper in the corresponding terminal receiving chambers when said second insertion retaining means is attached to said connector housing.

5,569,055

# CONNECTOR

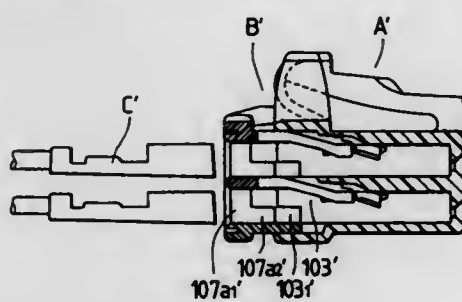
Makoto Yamanashi; Keishi Jinno; Tamio Watanabe; Takayoshi Endo, and Sakai Yagi, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan  
Division of Ser. No. 162,754, Dec. 7, 1993, Pat. No. 5,439,397, which is a continuation-in-part of Ser. No. 974,153, Nov. 10, 1992, abandoned, which is a division of Ser. No. 767,947, Sep. 30, 1991, Pat. No. 5,183,418. This application Jun. 7, 1995, Ser. No. 478,835

Claims priority, application Japan, Oct. 1, 1990, 2-260629; May 27, 1991, 3-37485

Int. Cl.<sup>6</sup> H01R 13/436

U.S. Cl. 439—752

2 Claims



1. A double locked connector comprising:
  - a connector housing having terminal receiving chambers for respectively receiving terminals, at least a bottom horizontal wall of said connector housing, which partially defines at least one of said chambers, having a first front inside surface and a second rear inside surface which is recessed with respect to said first inside surface, said connector housing including retaining arms for respectively retaining said terminals;
  - a terminal retainer connectable to a rear portion of said connector housing in a provisionally-connected condition and a completely-connected condition, said terminal retainer includ-

ing terminal retaining means extending in a forward direction toward said connector housing so as to be received in said terminal receiving chambers to respectively retain said terminals when said terminal retainer is in said completely-connected condition; and

terminal guide means for guiding the metal terminals into the respective terminal receiving chambers in the provisionally-connected condition, the terminal guide means being provided with the connector housing and the terminal retainer, wherein the terminal guide means includes:

a projection being independent of said terminal retaining means and extending forwardly from the terminal retainer in opposition to an associated one of said terminal retaining means; and

a recess portion defined by said second inside surface in which said projection of the terminal retainer is received when said terminal retainer is in the provisionally-connected condition such that an upper surface of said projection is substantially coplanar with said first inside surface of said bottom wall, to thereby smoothly guide an associated terminal into the associated terminal receiving chamber when the terminal is upwardly or downwardly tilted.

and wherein the malleable material does not extend laterally beyond the clips portion; and  
said clips portion is inserted into a circuit, wherein said malleable material is melted to flow by capillarity and solidifies to form conductive connections that do not extend substantially beyond the clips portion.

5,569,057

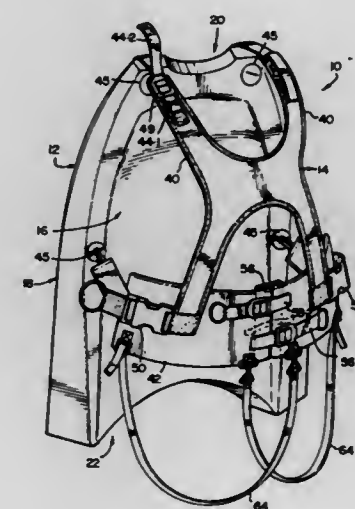
# BODY SURFING DEVICE

Gary K. Barsdorf, 12A Logan Place, Red Hill, 4051, South Africa, and Deon D. Schoeman, Red Hill, South Africa, assignors to Gary Keith Barsdorf, Red Hill, South Africa  
Filed Jul. 19, 1995, Ser. No. 504,246  
Claims priority, application South Africa, Jul. 20, 1994, 94/5309

Int. Cl.<sup>6</sup> B63B 1/00

U.S. Cl. 441—65

10 Claims



1. A body surfing device for riding water waves, comprising a semi-rigid board formed substantially of polymeric foam having an upper face, a lower face, a leading end, a trailing end and two sides extending between the leading and trailing ends, the upper face of the board defining a recess formation formed to receive the front torso part of a person therein; and

a harness secured to the board for strapping the board to the front torso part of the person's body, with the upper face of the board abutting the person's torso, the harness having a central element of sheet material that is operatively disposed substantially in the center of a person's back when the board is strapped to him, a waist strap that is connected to the central element of the harness and that is operatively disposed to extend around the waist of a person when the board is strapped to him, a pair of shoulder straps that are disposed to extend diagonally outwardly from said central element around the shoulders of a person when the board is strapped to him, the waist strap including a flexible elongate panel element having to adjustment straps that extend from opposite ends thereof and that are secured to the board, each adjustment strap being connected to the panel element via a buckle for making large-scale adjustments to the tension of the waist strap, the waist strap including at least one auxiliary adjustment strap having a buckle, that is attached to the panel element for making finer adjustment the tension in the panel element by causing bunching up of the panel element when the auxiliary adjustment straps are tightened, each shoulder strap including a buckle that permits the tension of the shoulder strap to be adjusted, the buckles of the waist strap and the shoulder straps being operatively disposed to be accessible to a person having the board strapped to himself, in use, for

5,569,056

# ELECTRICAL CONNECTION DEVICE AND PROCESS FOR THE PRODUCTION THEREOF

Girard Raimond, Montrouge, France, assignor to Proner Comatel, Noisy-Le-Grand, France

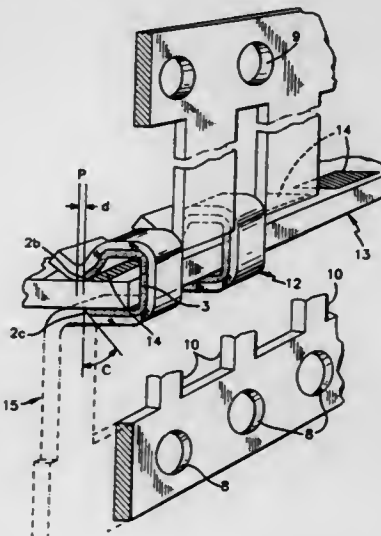
Continuation of Ser. No. 243,139, May 16, 1994, abandoned.

This application Jul. 17, 1995, Ser. No. 503,260

Claims priority, application France, May 14, 1993, 9305818  
Int. Cl.<sup>6</sup> H01R 4/02

U.S. Cl. 439—876

17 Claims



1. An electrical connection device comprising an electrically conductive and, resilient material adapted to ensure elastic retention and a coating of electrically conductive malleable material adapted to be melted to ensure electrical connection between said electrical connection device and any conductive material connected therewith;

said resilient material comprises at least one region of reduced thickness, wherein said coating of malleable material substantially fills said at least one region of reduced thickness of said resilient material;

wherein said at least one region of reduced thickness is a groove comprises at least one flat bottom surface and at least two flared edges;

wherein the resilient material with the malleable material is folded and cut to form a clips portion and a non-clip portion

enabling the person to strap the board to himself and for self-adjustment of the tension in said waist strap and shoulder straps.

5,569,058

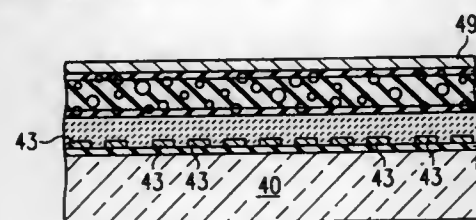
# LOW DENSITY, HIGH POROSITY MATERIAL AS GATE DIELECTRIC FOR FIELD EMISSION DEVICE

Bruce Gnade, Dallas; Chih-Chen Cho, Richardson, and Jules D. Levine, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 292,915, Aug. 19, 1994, Pat. No. 5,525,857. This application Jun. 5, 1995, Ser. No. 461,230 Int. Cl.<sup>6</sup> H04J 1/30; 9/18

U.S. Cl. 445-24

6 Claims



1. A method of fabricating an electron emission apparatus comprising the steps of:  
forming a conductive mesh structure on an insulating substrate;  
providing a resistive layer on said insulating substrate;  
forming an insulating layer over said resistive layer, said insulating layer comprising an aerogel;  
forming a conductive layer on said insulating layer;  
forming a plurality of apertures through said conductive layer and through said insulating layer; and  
forming a microtip emitter on said resistive layer within each of said apertures in said conductive layer.

5,569,059

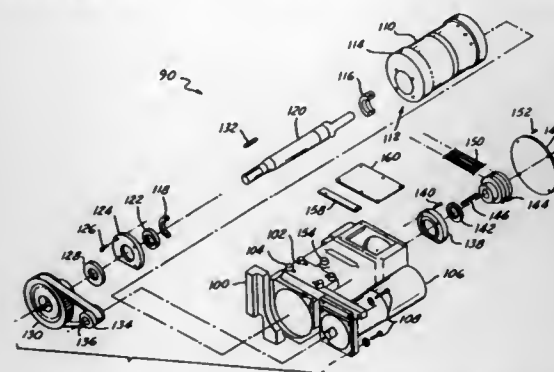
# SYSTEM FOR DRIVING A CENTERLESS GRINDER REGULATING WHEEL

Thomas J. Kirt, Clinton Township, Mich., assignor to Grinders Clearing House, Warren, Mich.

Filed Dec. 23, 1993, Ser. No. 159,298 Int. Cl.<sup>6</sup> B24B 49/00

U.S. Cl. 451-5

17 Claims



12. A centerless grinder having a regulating wheel and a grinding wheel rotatable about corresponding spindles, the regulating wheel being operative to rotate a workpiece in contact with the grinding wheel during a grinding cycle, the centerless grinder comprising:  
a housing;  
a cylindrical cam unit having a longitudinal aperture, the aperture having a longitudinal axis parallel to, but displaced from, the cam unit longitudinal axis, the cam unit being selectively

rotatable and disposed within the housing such that rotation of the cam unit varies the distance between the longitudinal axis of the aperture and a point on the housing perimeter;  
a shaft disposed within the aperture having first and second ends which extend beyond the cam unit;  
an electric servomotor having a longitudinal axis, the servomotor mounted to the housing such that the longitudinal axis is parallel to the longitudinal axis of the cam unit and is displaced therefrom an adjustable distance, the servomotor being operative to rotate the shaft;  
means for coupling the electric servomotor to the first end of the shaft; and  
means for coupling the second end of the shaft to the regulating wheel spindle so as to drive the regulating wheel.

5,569,060

# ON-LINE ROLL GRINDING APPARATUS

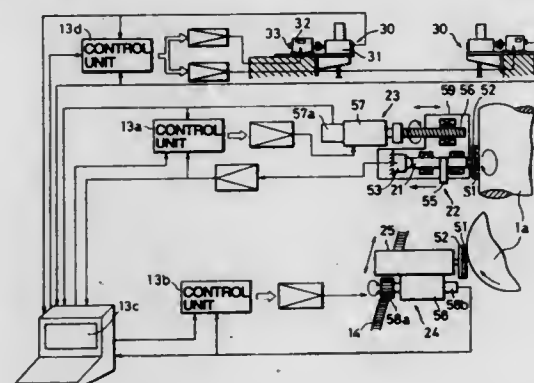
Shigeru Mori, and Yasuharu Imagawa, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 70,760, Jun. 3, 1993. This application May 27, 1994, Ser. No. 250,674

Claims priority, application Japan, May 27, 1993, 5-126189 Int. Cl.<sup>6</sup> B24B 5/37

U.S. Cl. 451-5

33 Claims



1. An on-line roll grinding apparatus equipped on a rolling mill including at least one pair of rolls rotatably supported between opposite stands, said apparatus comprising a single grinding unit provided for at least one roll and a rail frame for supporting said grinding unit movably in an axial direction of said roll, said grinding unit comprising a planar type grinding wheel for grinding said roll, driving means for rotating said grinding wheel through a spindle, shifting means for pressing said grinding wheel against said roll, and traversing means for moving said grinding unit along said rail frame, wherein:

said grinding wheel comprises a substantially planar wheel disk attached to said spindle and an abrasive layer fixed to one side of said planar wheel disk at a location spaced radially outwardly of a rotational axis of said wheel, said planar wheel disk being configured to elastically bend about said axis and function by itself as an elastic body to absorb vibration transmitted from said roll; and  
said apparatus further comprises rail tilting means for changing a tilt of said rail frame with respect to said stands while keeping the direction of movement of said grinding wheel parallel to the axis of said roll when said grinding unit is moved along said rail frame.

5,569,061

# METHOD AND DEVICE FOR MAGNETO-ABRASIVE MACHINING OF PARTS

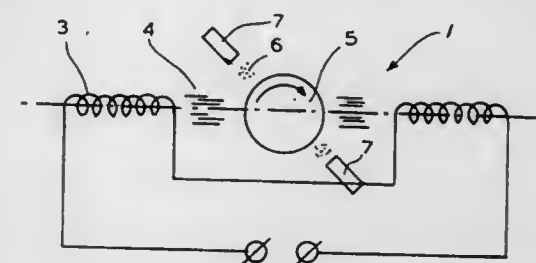
Genady Kremen, 150 95 Street, Brooklyn, N.Y. 11209

Filed Apr. 12, 1995, Ser. No. 441,721

Int. Cl.<sup>6</sup> B24C 5/08

U.S. Cl. 451-93

6 Claims U.S. Cl. 451-296



4. A device for magnetic-abrasive machining of a part having a longitudinal axis, comprising means for generating an external magnetic field providing a magnetic flux and including an electromagnetic coil having two substantially coaxial coil portions which are spaced from one another and spaced from one another; means for placing a part in the magnetic field axially between said coil sections so that the magnetic flux extends perpendicular to the longitudinal axis of the part; means for rotating the part about the longitudinal axis and oscillating the part along the longitudinal axis; means for supplying a magnetic-abrasive powder to the part in the magnetic field in a machining zone axially between said coil sections of said electromagnetic coil; means for supplying a fluid jet toward the magnetic-abrasive powder so as to press the magnetic-abrasive powder against a surface of the part.

5,569,062

# POLISHING PAD CONDITIONING

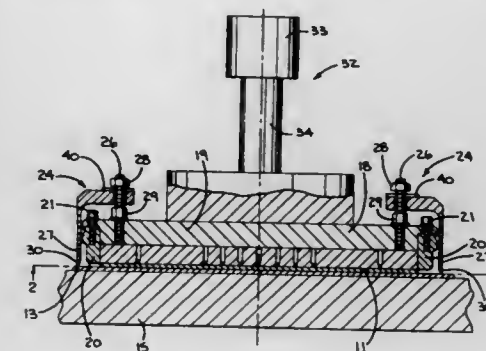
Chris Karlsrud, Chandler, Ariz., assignor to Speedfam Corporation, Des Plaines, Ill.

Filed Jul. 3, 1995, Ser. No. 497,530

Int. Cl.<sup>6</sup> B24B 5/00

U.S. Cl. 451-285

10 Claims



1. Apparatus for polishing a workpiece which comprises, in combination, a rotating polishing wheel having secured to its top surface a polishing pad, a vertically movable carrier element for carrying a workpiece to be polished into contact under pressure with said polishing pad, and a conditioning element supported by said carrier element and having on its bottom surface cutting means disposed in a circular configuration for conditioning the polishing pad by contact therewith.

5,569,063

# POLISHING APPARATUS

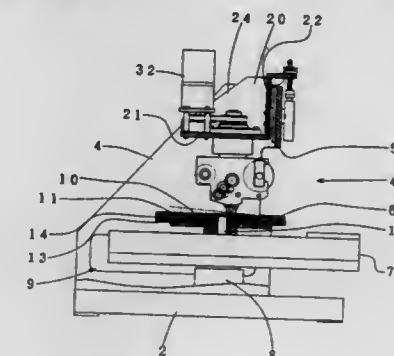
Izuru Morioka, and Kenji Kuwano, both of Tokyo, Japan, assignors to Nihon Micro Coating Co., Ltd., Japan

Filed Jul. 6, 1995, Ser. No. 499,286

Claims priority, application Japan, Aug. 5, 1994, 6-203008

Int. Cl.<sup>6</sup> B24B 21/00

20 Claims



1. A polishing apparatus for advancing and rotating a polishing tape, said polishing machine comprising:  
a base plate having an opening therethrough;  
a spindle rotatably contained in said opening through said base plate;  
a first rotating means attached to said base plate for rotating said spindle;  
a pair of side walls attached to said spindle;  
a compression roller for pressing a polishing tape against a target object, said compression roller being rotatably attached between said side walls, said compression roller having a rotary shaft which is perpendicular to the axis of said spindle, said compression roller having a center part with a smaller diameter than end parts which sandwich said center part;  
tape-advancing rollers including a supply roller and a take-up roller both having a rotary shaft which is parallel to the rotary shaft of said compression roller and rotatably supported by said side walls, said supply roller serving to supply said polishing tape and said take-up roller serving to take up said polishing tape supplied from said supply roller; and  
a second rotating means attached to said spindle for rotating said take-up roller.

5,569,064

# TOOL FOR REFURBISHING SKATE BLADES

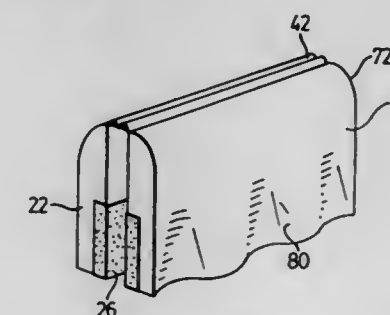
Jeffrey Gleadall, Stratford, Canada, assignor to Rinkratz International Inc., Ontario, Canada

Filed Jun. 5, 1995, Ser. No. 464,539

Int. Cl.<sup>6</sup> B24D 15/06

U.S. Cl. 451-558

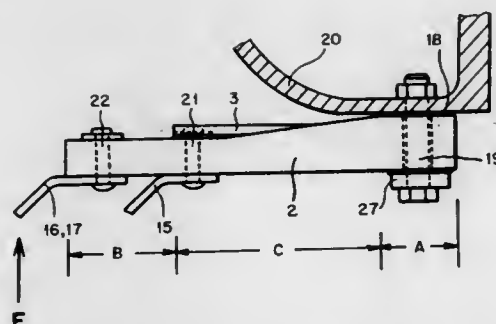
19 Claims



1. A tool for renewing cutting edges on a skate blade comprising a pair of rigid, generally rectangular supporting members, each having a flat abrasive surface on one side thereof and extending in the lengthwise direction of the supporting member, the abrasive



surfaces of the two members being able to face each other in a parallel manner, and a living hinge mechanism pivotally connecting said supporting members along adjacent lengthwise edges thereof, said hinge mechanism comprising at least one thin strip of plastic having a thickness substantially less than the thickness of each supporting member, wherein during use of said tool on a skate blade, said supporting members can be arranged on opposite sides of the blade with said abrasive surfaces substantially parallel to each other and engaging the sides of the blade and said tool is moved back and forth in the lengthwise direction of said supporting members to renew the edges of the blade.



5,569,065

# SHRIMP DEVEINING MACHINE HAVING PRECISION CUTTING CONTROL

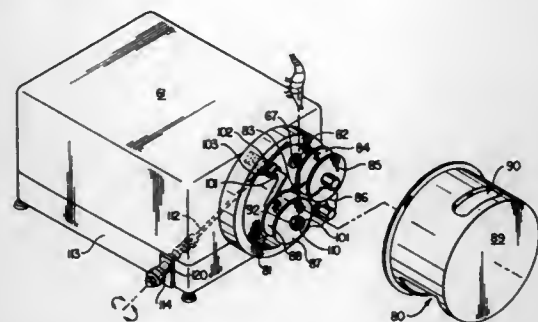
Derrell Sawyer, Caddo Mills, and Donald R. Morris, Greenville, both of Tex., assignors to Prawnto Shrimp Machine Company of Texas, Inc., Caddo Mills, Tex.

Filed Aug. 9, 1995, Ser. No. 512,845

Int. Cl.<sup>6</sup> A22C 25/02

U.S. Cl. 452—3

18 Claims



1. In a shrimp deveining machine of the type having a housing, a motor within said housing means external to said housing for gripping and propelling said shrimp, means external to said housing and adjacent said gripping and propelling means for cutting the sand vein from said shrimp, and means for adjusting the position of said cutting means in relation to said gripping and propelling means, the improvement comprising:

a pair of flexible disks for dynamically and automatically adjusting the position of said shrimp in relation to said cutting means, without manual intervention, in order to provide a uniform depth of cut for shrimp of different sizes, said flexible disks being adjustably positioned relative to said gripping and propelling means.

5,569,066

# DEVICE AS PART OF A SLAUGHTERING LINE

Ernst-August Meier, Bad Salzdetfurth, and Stefan Schirmer, Hanover, both of Germany, assignors to Phoenix Aktiengesellschaft, Hamburg, Germany

PCT No. PCT/DE94/00962, § 371 Date Apr. 17, 1995, § 102(e) Date Apr. 17, 1995, PCT Pub. No. WO95/05745, PCT Pub. Date Mar. 2, 1995

PCT Filed Aug. 23, 1994, Ser. No. 424,343

Claims priority, application Germany, Aug. 26, 1993, 43 28 738.7

Int. Cl.<sup>6</sup> A22B 5/08

U.S. Cl. 452—93

6 Claims

1. Device as part of a slaughtering line, especially for slaughtering hogs, consisting of  
a depilation beater made of elastomeric material with preferably embedded strength carriers, said beater being a substantially rectangular basis body having a starting zone A, and end zone B, and a center zone C with said starting zone A being thicker

than said end zone B; a step extending on the back side of said body within the center zone C; a baffle stool within said step and designed as one piece with the basis body; a recess formed in the distal end of the baffle stool; and which beater has bores within the zones A and B, as well as proximal to the recess;

a screw-on zone made of metal, to which the thicker zone A of the basic body is screwed, whereby the depilation beater is solidly joined by means of a first set of bores in said body having a screw-bolt system therein, as well as by a clamping plate on said screw-bolt system;

a stop, for supporting the depilation beater via the baffle stool at extreme deformation;

angle-shaped scrapers made of metal, which are arranged on the front side of the depilation beater within the zone B, as well as within the zone of the recess; means for anchoring the scrapers to the basic body comprising a second set of bores in said body having rivets therein; and

at least one fluted groove extending in the transverse direction provided in the proximal end of the baffle stool.

5,569,067

# METHOD OF AND APPARATUS FOR SEPARATING INTO PARTS THE ENTRAILS PACKAGE REMOVED FROM A SLAUGHTERED BIRD

Cornelis Meyn, Oostzaan, Netherlands, assignor to Machine-fabriek Meyn B.V., Oostzaan, Netherlands

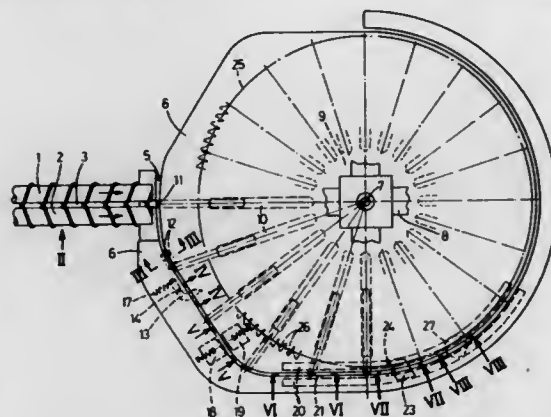
Filed Apr. 21, 1995, Ser. No. 427,073

Claims priority, application Netherlands, Apr. 26, 1994, 9400665

Int. Cl.<sup>6</sup> A22C 21/06

U.S. Cl. 452—106

21 Claims



1. A method for automatically processing the entrails packages from a slaughtered bird into parts, the entrails packages including gizzard, proventriculus, heart, lungs, liver, gallbladder, and intestines, said method comprising the steps of automatically conveying the entrails package with a conveyor device through an automated loosening device and first loosening the direct tissue connection between the gizzard and intestines so that the intestines remain

only indirectly connected to the gizzard through other parts of the entrails package; conveying the entrails packages with loosened tissue connection through a first automatic separating device and automatically separating the entrails packages into a first package including liver, gallbladder, and intestines and a second package including gizzard, proventriculus, heart, and lungs; and separately conveying the first and second packages for further processing.

5,569,068

# METHOD AND APPARATUS FOR SKINNING FISH

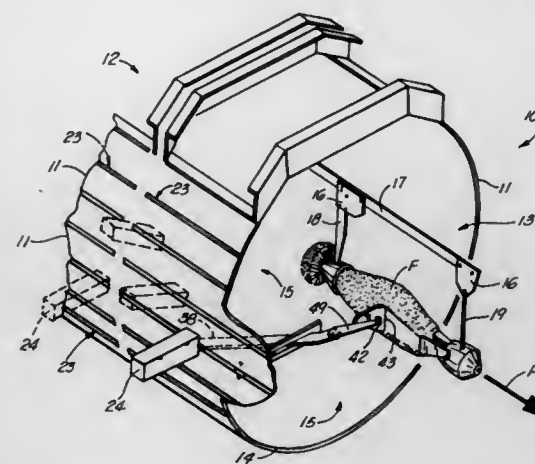
Thomas J. DeRoche, Metairie; Valerie S. Melancon, River Ridge, both of La., and Matthew M. Lyle, Milton, Fla., assignors to The Laitram Corporation, Harahan, La.

Filed Jun. 2, 1995, Ser. No. 458,742

Int. Cl.<sup>6</sup> A22C 25/17

U.S. Cl. 452—127

28 Claims



1. An apparatus for processing a fish body to remove the skin therefrom comprising:

- a frame;
- a plurality of radially extending, circumferentially spaced scraper arms mounted to the frame at spaced positions about the fish body to be processed, each of the arms having a first end portion attachable to the frame and a second end portion;
- each of the arms carrying a scraper blade member at the second end portion thereof, the scraper blades comprising:
  - a blade member having an edge for engaging the fish to be processed;
  - a pivot that joins each blade member to an arm;
  - wherein the blade pivots about an axis that allows the blade edge to change position responsive to changes in contour of the fish body being processed; and
- wherein each arm scrapes a different segment of the fish body and the plurality of arms engage and scrape substantially all of the skin from the fish.

5,569,069

# APPARATUS FOR CUTTING WINGS FROM POULTRY

Sheldon Horst, Lancaster, and Eugene Martin, Denver, both of Pa., assignors to Foodcraft Equipment Company, Lancaster, Pa.

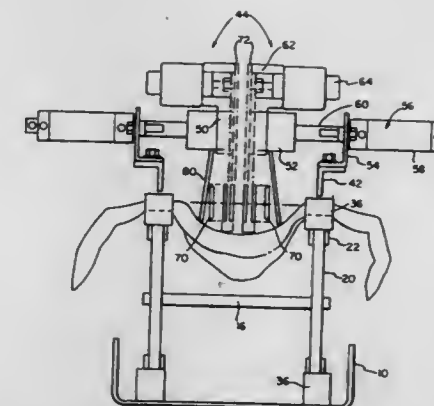
Filed Jan. 18, 1995, Ser. No. 374,167

Int. Cl.<sup>6</sup> A22C 21/00

U.S. Cl. 452—169

13 Claims

1. An apparatus for cutting wings from poultry comprising a frame, an endless conveyor supported by the frame, said conveyor comprising a pair of parallel chain loops, a series of wing-holding fixtures attached at intervals to each of said chains, each said fixture having an upwardly open recess



for receiving and holding the drumette of a wing attached to a whole boneless chicken breast, whereby the breast is suspended, by its wings, between opposite fixtures, a pair of shoulder cutting devices for cutting the wings from the breast, each such device including an annular blade and a motor for rotating the blade, means for driving the cutting devices away from each other from a first position above the breast to a second position engaging the fixtures, so that the blades move along a common axis substantially coincident with each humerus, thereby severing the wing from the breast with a semicylindrical cut.

5,569,070

# CONTROLLED VOLUME MEAT APPORTIONER

Jeffrey P. Smith, 128 Oakes Dr., Columbus, Ohio 43207

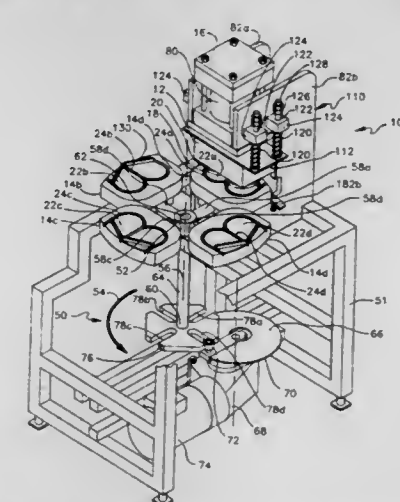
Continuation of Ser. No. 477,115, Jun. 7, 1995, abandoned.

This application Jan. 31, 1996, Ser. No. 594,420

Int. Cl.<sup>6</sup> A22C 7/00

U.S. Cl. 452—174

22 Claims



1. Apparatus for apportioning a cut of whole muscle meat into a product having margins of a select size and an excess trim portion comprising:

- an upper die having a forward blade portion and a rearward compression surface extending about said blade portion, said blade portion defining with said compression surface at least a portion of the margins of the product;
- at least one lower platen having a support surface for receiving said cut of whole muscle meat thereon, said support surface having a slot configured to receive said blade portion there-within intermediate a first and second side wall thereof, and a bearing surface configured to abuttingly engage said compression surface; and
- an actuator assembly for moving said upper die from a first position spaced above said lower platen to a second position

wherein said compression surface abuttingly engages said bearing surface effective to apportion the cut of whole muscle meat into the product and trim portion.

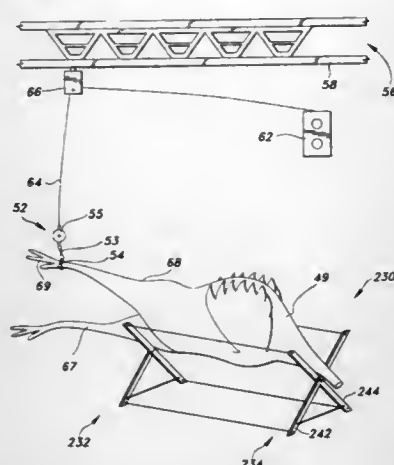
5,569,071

# CRADLE AND METHOD FOR THE SLAUGHTERING OF RATITES, INCLUDING OSTRICH AND EMU

T. Thomas Metier, 1430 Winfield Dr., Fort Collins, Colo. 80526, assignor to T. Thomas Metier, Fort Collins, Colo.  
Continuation-in-part of Ser. No. 86,221, Jul. 1, 1993, Pat. No. 5,405,289, which is a continuation-in-part of Ser. No. 713,467, Jun. 10, 1991, Pat. No. 5,246,396. This application Apr. 11, 1995, Ser. No. 420,384  
Int. Cl.<sup>6</sup> A22B 5/06

U.S. Cl. 452—185

11 Claims



1. A method for removing hides from ratites without damage to the hide during removal and on a mass scale in a facility having various processing areas, comprising the steps of:  
providing an overhead rail system in said facility for permitting movement of said ratites through said facility;  
rendering a ratite unconscious;  
after rendering said ratite unconscious, suspending said ratite in an inverted position on said rail system;  
moving said ratite via said rail system to a defeathering area;  
while said ratite is at said defeathering area, inserting an air dispensing probe into the ratite at various locations;  
while inserting said air dispensing probe, injecting air into said ratite between said hide and muscle tissue so that said hide and feathers are separated from said muscle tissue;  
after defeathering said ratite, lowering said ratite from said rail system onto a cradle for holding said ratite; and  
removing the hide from said ratite by cutting the hide at desirable locations.

5,569,072

# POULTRY PROCESSING MECHANISM HAVING CARCASS STABILIZER

Rudolf J. Tieleman, Kansas City, Kans., and Edward J. Tieleman, Ertz, Andorra, assignors to Johnson Food Equipment, Inc., Kansas City, Kans.

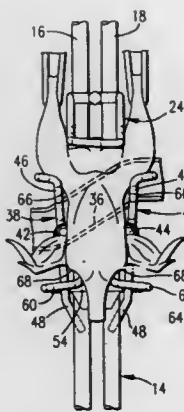
Filed Jan. 19, 1996, Ser. No. 589,116

Int. Cl.<sup>6</sup> A22B 5/00; A22C 21/00

U.S. Cl. 452—185

19 Claims

1. In a fixture for holding a poultry carcass in a stabilized condition during processing operations on the carcass, the improvement comprising:  
a central straddle bar adapted to project between the legs of the carcass when the carcass is positioned on the fixture in an inverted condition with its hocks up; and



5,569,073

# SYSTEM FOR THE REMOVAL AND DISPOSAL OF AIRBORN CONTAMINANTS FROM AN OUTDOOR PAINT BOOTH

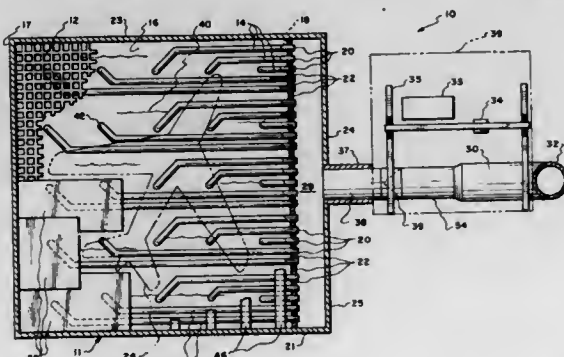
Guy F. Cooper, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 15, 1995, Ser. No. 404,846

Int. Cl.<sup>6</sup> B05B 15/12; B05C 15/00

U.S. Cl. 454—54

19 Claims



1. A system for the treatment of contaminated air from an outdoor spray paint booth, said system comprising:  
an underground pool having a base and first, second, third and fourth side walls extending perpendicularly upward from said base, said first, second, third and fourth side walls being arranged end to end to define a generally rectangular shaped structure, said underground pool having a lower water containment portion filled with a pool of water and an upper portion;  
a plenum positioned adjacent the first side wall of said underground pool, said plenum having an airtight inner chamber;  
a grillwork mounted on top of said underground pool, said grillwork being adapted to support an aircraft having a spray paint applied thereto;  
a plurality of suction pipes uniformly distributed throughout the upper portion of said underground pool, said plurality of suction pipes extending from the upper portion of said underground pool through the first side wall of said underground pool into the airtight inner chamber of said plenum;  
each of said plurality of suction pipes having a damper valve for regulating a flow rate of air streams from the upper portion of said underground pool through said suction pipe into the

airtight inner chamber of said plenum, said air streams having airborne contaminants from said spray paint contained therein;

said grillwork having a plurality of rectangular shaped openings through which said air streams including said airborne contaminants are drawn from a work area above said grillwork where said aircraft is being painted into the upper portion of said underground pool;

a gas turbine engine having an air inlet connected to said plenum and an air exhaust;

a cylindrical shaped after-burning incinerator having an air inlet connected to the air exhaust of said gas turbine engine and an air exhaust;

said gas turbine engine providing a suction force to draw said air streams including said airborne contaminants through said plurality of suction pipes, said plenum and said gas turbine engine into said cylindrical shaped after-burning incinerator; said cylindrical shaped after-burning incinerator including an inner cylindrical wall, a first retaining screen positioned at a front end of said inner cylindrical wall, a second retaining screen positioned at a rear end of said inner cylindrical wall and a plurality of gas burning elements positioned at a front end of said cylindrical shaped after-burning incinerator upstream from said first retaining screen;

a bed of pebbles positioned within an area defined by said inner cylindrical wall and said first and second retaining screens, said gas burning elements heating said bed of pebbles to a predetermined temperature range allowing said bed of pebbles to incinerate the airborne contaminants within said air streams entering said bed of pebbles through said first retaining screen, said bed of pebbles providing effluent air streams comprising purified air at the air exhaust of said cylindrical shaped after-burning incinerator.

5,569,074

# VENTILATED WORKSTATION WITH TURNTABLE

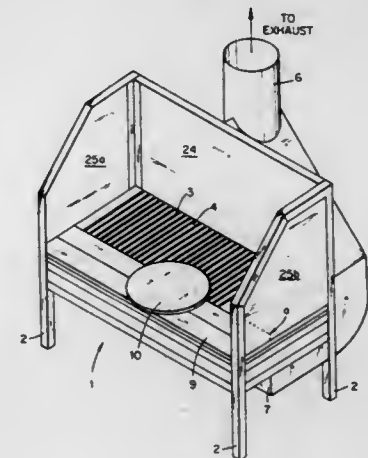
Michael Gressel, Cincinnati, Ohio, assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed May 20, 1994, Ser. No. 247,181

Int. Cl.<sup>6</sup> B08B 15/02

U.S. Cl. 454—56

20 Claims



15. In a ventilated workstation having a ventilated work surface through which ambient air is drawn downward by an applied suction, the improvement comprising:  
a rotatable workpiece support means attached to said ventilated workstation for supporting a workpiece in front of and above said ventilated work surface, to enable ambient air and entrained particulates generated by work done on the workpiece to be drawn downward through the ventilated surface away from a worker working on the workpiece.

5,569,075

# GAS INJECTION APPARATUS AND PROCESS TO FORM A CONTROLLED ATMOSPHERE IN A CONFINED SPACE

Marc Leturmy, Garanciere, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude, Paris Cedex, France

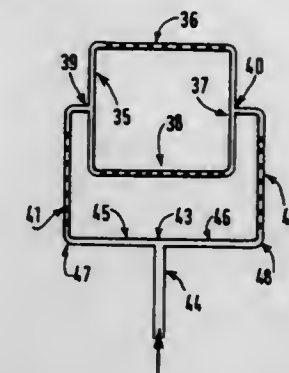
Filed Dec. 22, 1994, Ser. No. 361,534

Claims priority, application France, Dec. 22, 1993, 93 15503

Int. Cl.<sup>6</sup> B23K 31/02

U.S. Cl. 454—66

21 Claims



1. Gas injection apparatus to form a controlled atmosphere in a confined space, comprising at least one assembly of ducts installed in series and/or parallel, of which at least a portion of duct has gas injection apertures, said assembly being supplied by a least one gas supply main, each main being connected to the assembly at a primary connection node, the dimensions of the assembly observing the following relationship:

$$\Sigma \omega_i / \Sigma \phi_i \geq 1$$

wherein  $\Sigma \omega_i$  represents the sum of internal cross-sections of the gas supply mains feeding the assembly and  $\Sigma \phi_i$  represents the sum of the cross-sections of the gas injection apertures of the assembly of ducts.

5,569,076

# OSCILLATION FIXED GRILLE OUTLET

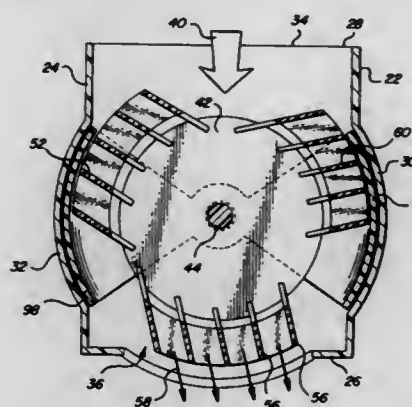
John Sudak, Newmarket, and Edoardo Panziera, Maple, both of Canada, assignors to Manchester Plastics, Troy, Mich.

Filed Oct. 27, 1994, Ser. No. 330,304

Int. Cl.<sup>6</sup> B60H 1/34

U.S. Cl. 454—155

23 Claims



1. A ventilation outlet assembly (10) for adjustably controlling airflow into a passenger compartment (12) of a motor vehicle, said assembly (10) comprising:  
a housing (16) having an air inlet (28) and an air outlet (26) extending substantially in a common plane and defining a first air direction (40) of airflow extending from said inlet (28) through said outlet (26);



a louver support (42) rotatably supported within said housing (16) for rotation about a support axis (44);  
 a first set of vanes (56) connected to and extending outwardly from said louver support (42) in a first vane direction when said first set of vanes (56) are rotatably positioned adjacent to said outlet (26), the first vane direction directing airflow from said first air direction (40) to a second air direction (58); and  
 a second set of vanes (60) connected to and extending outwardly from said louver support (42) in a second vane direction when said second set of vanes (60) are rotatably positioned adjacent to said outlet (26), said second vane direction different from said first vane direction and said second set of vanes adjacent and radially spaced from said first set of vanes (56), said second set of vanes directing airflow from said first air direction (40) to a third air direction (62) different from said second air direction wherein only one of said first or second sets of vanes is rotated to said outlet with the other of said sets rotated into said housing.

5,569,077

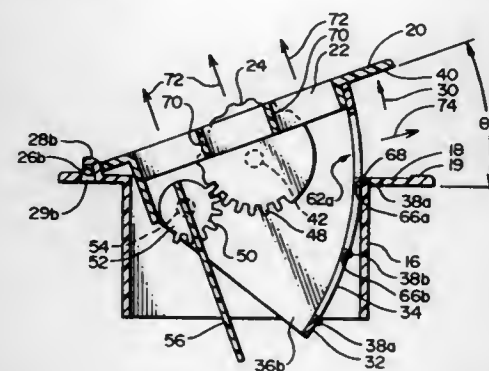
## DIRECTIONAL VENT REGISTER

Peter K. F. Lam, 2743 Nadina Dr., Coquitlam, Canada, and  
 Nigel B. Chivers, 20264 53rd Ave., Langley, Canada  
 Filed Jan. 31, 1995, Ser. No. 381,199

Int. Cl.<sup>6</sup> F24F 13/12

U.S. Cl. 454—290

14 Claims



1. A ventilation register for selectively diverting a flow of air passing therethrough, said register comprising:  
 a fixed flange section configured to be mounted to a discharge opening of a ventilation duct;  
 a pivoting deflector section for selectively diverting a flow of air from said duct opening, said deflector section comprising:  
 a top plate portion having a primary grill formed therein for passage of said flow of air therethrough; and  
 a front panel portion extending downwardly from a front edge of said top plate portion and having a secondary grill formed therein for passage of said flow of air therethrough, said secondary grill portion of said front panel member having at least one opening which extends downwardly therein over an angular distance, so that pivoting said deflector assembly upwardly from a first angular position to a second angular position increases an area of said opening which is exposed above said flange portion, so as to increase an amount of said air flow which can pass through said secondary grill opening;  
 hinge means interconnecting a rearward edge of said top plate portion of said deflector section to a rearward edge of said fixed flange section so as to permit said deflector section to be pivoted from a first position in which said top plate portion thereof abuts and lies substantially flush with a horizontal upper surface of said flange section so that said flow of air passes through said primary grill in a generally vertical direction, to a second position in which said front panel portion is fully extended above said upper surface of said flange section so as to permit at least a portion of said

flow of air to be deflected through said secondary grill in a generally horizontal direction;  
 means for selective angular positioning of said pivoting deflector section at one or more intermediate angles between said first position in which said top plate abuts said fixed flange section and said second position in which said secondary grill is fully exposed; and  
 means for selectively proportioning said flow of air which passes through said primary and secondary grills when said pivoting section is in said fully exposed or intermediate positions.

5,569,078

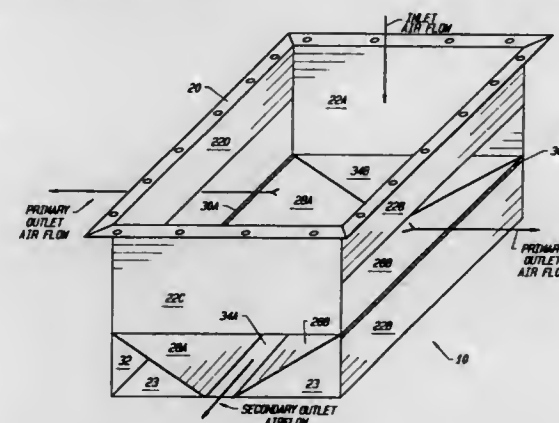
## AIR DIFFUSER HAVING FIXED AND VARIABLE OUTLET PORTS

Allan T. Kirkpatrick, Fort Collins, Colo., assignor to Colorado State University Research Foundation, Fort Collins, Colo.  
 Filed Mar. 6, 1995, Ser. No. 399,131

Int. Cl.<sup>6</sup> F24F 13/072

U.S. Cl. 454—292

18 Claims



15. An air diffuser for distributing air from an air supply mechanism into a conditioned space, comprising:  
 a diffuser body defining  
 an inlet to receive air from said air supply mechanism;  
 a primary outlet extending into said conditioned space, said primary outlet having a fixed primary area to direct said air from said air supply mechanism into said conditioned space; and  
 a secondary outlet extending into said conditioned space, said secondary outlet having an area whose size changes in response to the rate at which said air from said air supply is received at said inlet.

5,569,079

## DEVICE FOR SAMPLING GRAIN

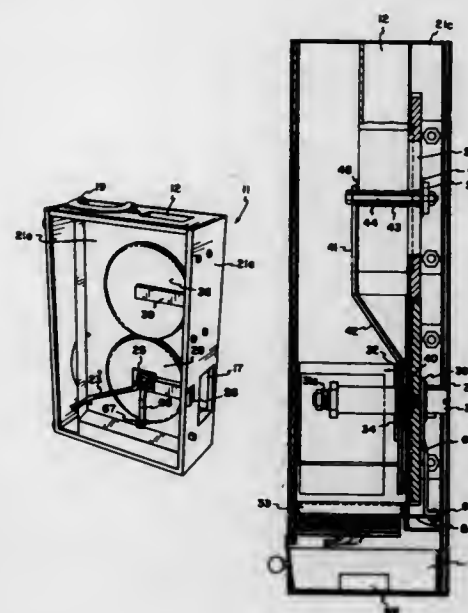
David M. Ryden, 315 S. Forest, and David W. Ryden, Jr., 219 N. Second St., both of, Hallock, Minn. 56728  
 Filed Mar. 8, 1995, Ser. No. 400,795

Int. Cl.<sup>6</sup> A01F 5/00

U.S. Cl. 460—16

13 Claims

1. A portable grain sampling device, comprising:  
 housing means defining an inlet for grain to be sampled, a first outlet for chaff separate from said grain sample and a second outlet for grain kernels separated from said grain sample;  
 threshing means disposed in the housing means for threshing the sampled grain, the threshing means communicating with the housing inlet and comprising first and second substantially planar threshing surfaces disposed in substantially parallel relation, each of said threshing surfaces being formed at least in part from a material that is frictional relative to the grain sample, and drive means for effecting relative movement



between said first and second threshing surfaces while maintaining said spaced, substantially parallel relation; and  
 separation means disposed in the housing means for receiving the threshed grain from the threshing means, for separating chaff from the grain kernels, for discharging the chaff to said first outlet and for discharging the grain kernels to the second outlet.

5,569,080

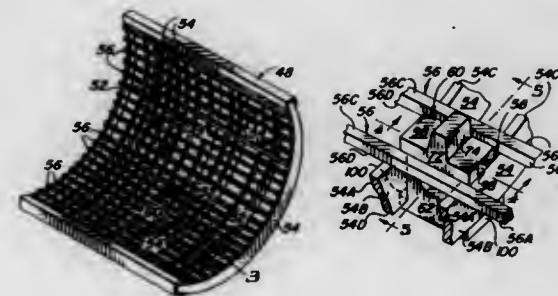
## CROP STRAW FLOW DISRUPTION DEVICE FOR USE ON CROP HARVESTING MACHINE SEPARATION GRATE

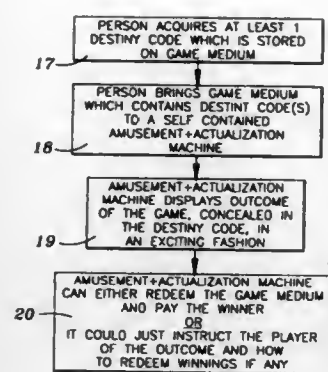
Don Estes, P.O. Box 397, Flanagan, Ill. 61740  
 Filed Jul. 6, 1995, Ser. No. 499,032

Int. Cl.<sup>6</sup> A01F 12/20

U.S. Cl. 460—72

19 Claims





step of: acquiring by a player a game piece, the gaming piece including a code which includes data indicating whether the player wins or loses the lottery game and an amusement game, the data being unrecognizable to the player, such that the player does not know whether the player will win or lose the game prior to play of the amusement game;

entering the code by the player into a processor prior to amusement game play;

the processor generating the amusement game on a display for play by the player, the player controlling game play by inputting game parameters to the processor;

the processor controlling whether the player will win or lose the amusement game based upon the code entered by the player; and

providing on a display an indication to the player of the amusement game win or loss based upon the code.

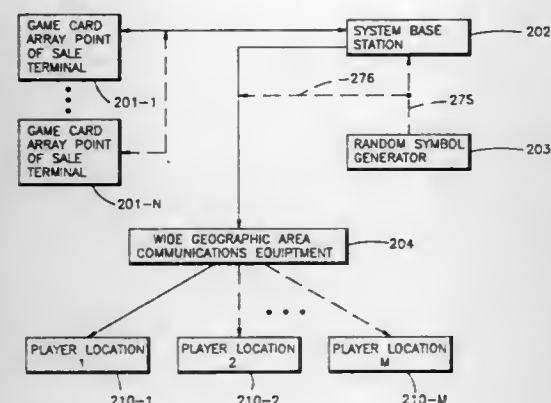
5,569,083

# METHODS AND APPARATUS FOR PLAYING BINGO OVER A WIDE GEOGRAPHIC AREA

Philip R. Fioretti, West Haven, Conn., assignor to Millennium Investments Limited, Cyprus  
Division of Ser. No. 946,176, Sep. 16, 1992, Pat. No. 5,351,970.  
This application Jul. 14, 1994, Ser. No. 274,833  
Int. Cl.<sup>6</sup> A63F 9/24

U.S. Cl. 463-19

27 Claims



1. A system for enabling bingo to be played over a wide geographic area, comprising:

(a) on-line point of sale terminal means for issuing valid game card arrays in response to purchase requests, at the time of request;

(b) means for keeping track of all game card arrays issued in response to said purchase requests;

(c) means for sequencing through each bingo game in a scheduled bingo session; and

(d) means for communicating over a wide geographic area the sequence of random symbols being generated during a par-

ticular bingo game to thereby enable players at locations over the wide geographic area to participate in the bingo session.

5,569,084

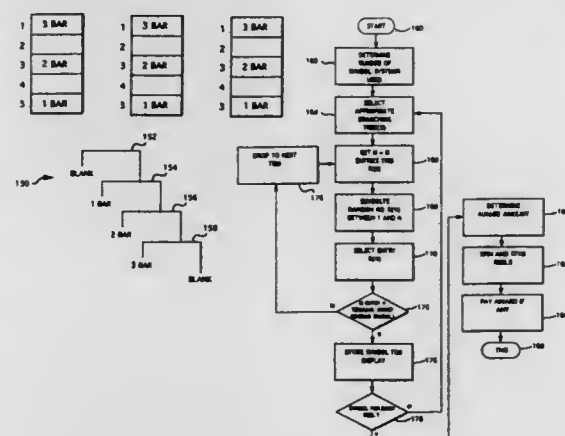
# FRACTIONAL BRANCHING REEL-TYPE SLOT MACHINE

Neil D. Nicastro, and Timothy J. Durham, both of Chicago, Ill., assignors to WMS Gaming Inc., Chicago, Ill.  
Continuation-in-part of Ser. No. 259,786, Jun. 14, 1994, Pat. No. 5,423,541. This application May 23, 1995, Ser. No. 447,988

Int. Cl.<sup>6</sup> G07F 17/34

U.S. Cl. 463-20

8 Claims



1. A method of setting the probability of selection of symbols to be displayed on the pay line(s) of a multi-reel slot machine comprising the steps of:

(a) specifying the symbols for each reel;

(b) providing a symbol look-up table in a memory device for each reel, each look-up table being arranged in a tree branch structure containing tiers of descending probability, each tier having terminal nodes at which individual symbols may be stored and descending nodes which lead to lower tiers, each lower tier having a decreasing probability of occurrence; and

(c) storing the symbols for each reel in the corresponding look-up table at terminal node locations within the tree branch structure corresponding to a desired payoff probability.

5,569,085

# GUN GAME MACHINE HAVING A SLIDING GUN BARREL COVER FOR SIMULATING THE IMPACT OF A FIRED GUN

Hiroshi Igarashi; Azuma Mochizuki; Yoshitaka Kajima; Toshiya Ohara; Hideki Inoue, and Shigeki Tohyama, all of Tokyo, Japan, assignors to Namco Limited, Tokyo, Japan  
Filed Jul. 19, 1995, Ser. No. 504,353

Claims priority, application Japan, Jul. 29, 1994, 6-197952  
Int. Cl.<sup>6</sup> A63F 9/02; F41J 5/02

U.S. Cl. 463-49

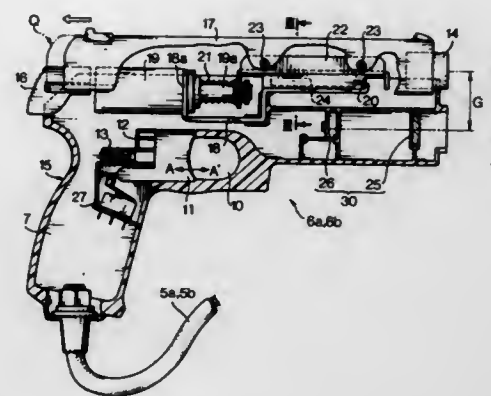
9 Claims

8. A gun game machine wherein a player can grip a model gun in the hand away from a machine casing, comprising:

a bullet hitting detection optical unit disposed in said model gun for detecting the simulated bullet hitting position;

a sliding cover provided on an exposed outward portion of a gunbarrel section of said model gun and slidable in the longitudinal direction of said gunbarrel section; and

a cover driving means for instantaneously moving said sliding cover at high speed.



5,569,086

# VISCOUS FLUID TORSIONAL VIBRATION DAMPENING DEVICE HAVING AN ELASTIC SLIDER CONFIGURED TO PROVIDE FRICTION DAMPENING

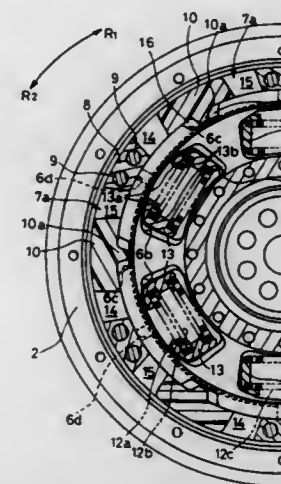
Masanobu Fukamachi, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan  
Filed Jun. 17, 1994, Ser. No. 262,521

Claims priority, application Japan, Jun. 24, 1993, 5-153491; Jun. 24, 1993, 5-153492; Jun. 24, 1993, 5-153493; Jun. 24, 1993, 5-153494

Int. Cl.<sup>6</sup> F16D 3/80

U.S. Cl. 464-24

16 Claims



1. A torsional vibration damping device comprising:

a first flywheel connectable to an output shaft of a rotary power source;

an input member rigidly connected to said first flywheel, said first flywheel and said input member at least partially defining an annular chamber having a plurality of arcuate chambers therein, at least a first and a second of said arcuate chambers in fluid communication with each other;

an output rotation member disposed in said annular chamber coupled to said input member for limited rotary displacement, said output rotation member having a circumferential surface formed with a plurality of first cam surfaces thereon;

a stopper member fixed to said first flywheel, said stopper member and said circumferential surface of said output rotation member defining a choke within said annular chamber between said first and second arcuate chambers which partially restricts fluid passage therebetween in response to relative rotary displacement between said input member and said output rotation member; and

a plurality, of discrete slider members, each of said slider members being formed with a radially inwardly extending protrusion, said protrusion having at least one second cam surface

formed thereon, each of said slider members disposed within said annular chamber proximate to one of said first cam surfaces, said second cam surface of each of said slider members engageable with a corresponding one of said first cam surfaces in response to relative movement of said first flywheel and said output rotation member, and each of said slider members engageable with said first flywheel for producing friction in response to contact between said first cam surface and said second cam surface, and each of said slider members engageable with said first flywheel for producing friction in response to centrifugal forces.

5,569,087

# TORSIONAL VIBRATION DAMPENING DEVICE HAVING MULTIPLE SLIDER MECHANISMS TO PROVIDE MULTIPLE DAMPENING FORCE LEVELS

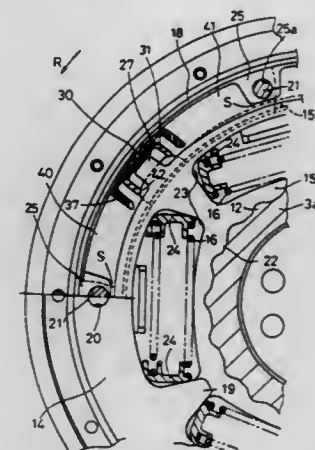
Kozo Yamamoto, Daito, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Nov. 4, 1994, Ser. No. 334,084  
Claims priority, application Japan, Nov. 10, 1993, 5-060451

U.S. Cl. 464-24

Int. Cl.<sup>6</sup> F16D 3/80

9 Claims



1. A viscous torsional vibration dampening device for a flywheel mechanism, comprising:

an input rotor;

an output rotor configured for limited relative rotation with respect to said input rotor;

a chamber housing coupled to said input rotor for rotation therewith, said chamber housing defining a fluid chamber;

a first sliding part disposed within said fluid chamber, formed with an internal containment portion and configured for limited movement in a circumferential direction within said fluid chamber;

a second sliding part disposed within said internal containment portion of said first sliding part, a portion of said second sliding part being engagable with a portion of said output rotor, allowing for limited displacement of said second sliding part within said first sliding part and limited displacement with respect to said output rotor;

wherein a space between a surface of said first sliding part and a surface of said chamber housing defines at least a portion of a first choke, a space between at least one surface of said second sliding part and one surface of said internal containment portion defines a second choke, and a space between a portion of said second sliding part and a portion of said output rotor defines a third choke.



5,569,088

# TWO MASS FLYWHEEL FOR A MOTOR VEHICLE TRANSMISSION HAVING A SEPERATE THRUST BEARING BETWEEN THE TWO MASSES

Bernhard Schierling, Kürnberg; Ralf Till, Euerbach, and Jörg Sudau, Niederwerrn, all of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

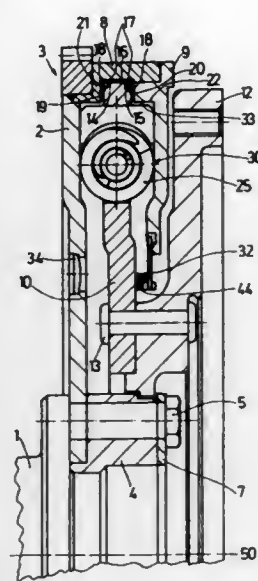
Filed Oct. 13, 1994, Ser. No. 322,598

Claims priority, application Germany, Oct. 15, 1993, 43 35 2073

Int. Cl.<sup>6</sup> F16F 15/12

U.S. Cl. 464—64

20 Claims



1. A flywheel for an internal combustion engine of a motor vehicle for transmitting mechanical rotary power from an internal combustion engine to a transmission, said flywheel comprising:

a first flywheel portion and a second flywheel portion, said second flywheel portion being disposed adjacent said first flywheel portion;

said first flywheel portion comprising means for non-rotationally connecting said first flywheel portion to a crankshaft of an internal combustion engine;

said first flywheel portion being rotatable about an axis of rotation, said axis of rotation having a first axial direction parallel to said axis of rotation, and a second axial direction opposite to the first axial direction;

said second flywheel portion being rotatable about said axis of rotation;

means for connecting together said first flywheel portion and said second flywheel portion for rotating said second flywheel portion with said first flywheel portion;

said second flywheel portion comprising a peripheral portion disposed radially away from the axis of rotation;

bearing means;

said bearing means being a separate part from said first flywheel portion and said second flywheel portion;

said bearing means comprising a thrust bearing for limiting axial movement of said second flywheel portion with respect to said first flywheel portion in both said first and second axial directions;

said thrust bearing being disposed adjacent said first flywheel portion;

said thrust bearing being disposed between said first flywheel portion and said second flywheel portion;

said thrust bearing being disposed adjacent said peripheral edge of said second flywheel portion.

5,569,089

# UNIVERSAL JOINT CONSTRUCTION

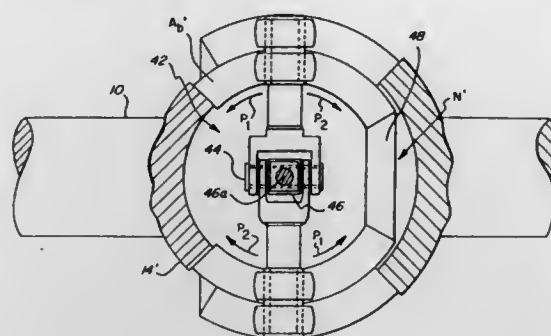
Richard L. Signorelli, 43 Sherwood Dr., Torrington, Conn. 06790

Filed Oct. 28, 1993, Ser. No. 144,302

Int. Cl.<sup>6</sup> F16D 3/16

U.S. Cl. 464—112

7 Claims



1. A constant velocity universal joint comprising:

a first shaft having a longitudinal first shaft axis;

a ball member, defining a substantially spherical convex ball surface, fixedly mounted on the end of the shaft so that the center of the ball member is substantially aligned with the first shaft axis, and the ball surface having (i) an imaginary ball shaft pole where the ball member is mounted on the shaft; (ii) an imaginary ball end pole diametrically opposite to the ball shaft pole, and (iii) an imaginary circumferential equator line equidistant at all points from the ball shaft pole and the ball end pole, the ball member defining at least two ball slots at the convex ball surface, the at least two ball slots being disposed along imaginary great circles on the ball surface, each great circle having a point of intersection with the equator line, the great circles being displaced to equal degrees and in like directions at their respective points of intersection with respect to meridians passing through their respective points of intersection;

the ball member being disposed in a socket member dimensioned and configured to receive the ball member therein;

a second shaft having a longitudinal second shaft axis;

the socket member defining a substantially spherical concave socket surface and being fixedly mounted on the end of the second shaft so that the center of the socket member is substantially aligned with the second shaft axis, the socket surface having (i) an imaginary socket shaft pole where the socket member is attached to the second shaft, (ii) an imaginary socket end pole at a point diametrically opposite to the shaft pole, and (iii) an imaginary circumferential equator line equidistant at all points from the socket shaft pole and the socket end pole, the socket member defining at least two socket slots at the concave socket surface, the at least two socket slots being disposed along imaginary great circles on the socket surface, each great circle having a point of intersection with the equator line, the great circles being displaced to equal degrees and in like directions at their respective points of intersection with respect to the meridians passing through their respective points of intersection, the like directions being opposite of the direction of displacement of the ball slot great circles;

each ball slot being associated with a socket slot to define a pin passageway; and

coplanar torque pin means comprising a torque pin extending into each pin passageway for transferring rotational motion from one of the ball member and the socket member to the other and for keeping the pins in mutual coplanar relation to one another and for allowing pins to move towards each other from diametrically opposite positions.

5,569,090

# UNIVERSAL JOINT COMPRISING A PAIR OF CROWN GEAR ELEMENTS CONFINED WITHIN A SLOTTED CASING

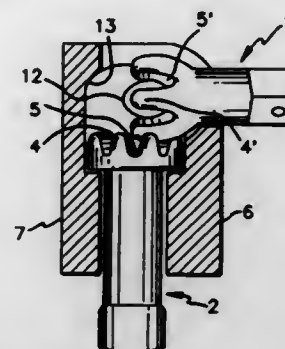
Hugh Hoskins, 7141 Butterfly Dr., Memphis, Tenn. 38133, and Gary Hoskins, 716 Saddlebrook South, Bedford, Tex. 76021

Filed May 11, 1995, Ser. No. 439,422

Int. Cl.<sup>6</sup> F16D 3/16

U.S. Cl. 464—157

8 Claims



1. In a universal joint comprising a driving gear and a driven gear each provided with a respective crown gear cluster, and a slotted casing confining said driving gear and said driven gear in meshing engagement, said casing comprising a slot through which said driven gear projects and along which said driven gear is angularly movable from a first position in which said driving gear and driven gear are in-line, and a second position in which said driving gear and driven gear are substantially at right angles to one another, the improvement wherein:

each of said drive and driven gears comprises a circular series of gear teeth forming said respective crown gear clusters and defining circular series of recesses each disposed between adjacent pairs of gear teeth, the gear teeth of one of said drive and driven gears being taller than the gear teeth of the other of said drive and driven gears, whereby said circular series of recesses of said one of said drive and driven gears are deeper than said circular series of recesses of the other of said drive and driven gears, and wherein said second bearing surfaces include an in-line bearing surface and a right-angle bearing surface, both of said in-line and right-angle bearing surfaces being interrupted by said slot, said in-line and right-angle bearing surfaces being interconnected by an intermediate bearing surface forming a smooth and continuous transition between said right-angle and in-line bearing surfaces.

5,569,091

# EXPANSIBLE METAL ANCHOR AND METHOD OF MANUFACTURING IT

Manfred Haage, Dornstetten; Guenter Seibold, Pfalzgrafenweiler; Bernd Plocher, Rottenburg; Bernd Hein, Freudenstadt, and Wilfried Weber, Schopfloch, all of Germany, assignors to Fischerwerke, Artur Fischer GmbH & Co KG, Waldachtal, Germany

Filed Jan. 20, 1995, Ser. No. 375,649

Claims priority, application Germany, Jan. 28, 1994, 44 02 478.9

Int. Cl.<sup>6</sup> B23G 9/00; F16B 13/04

U.S. Cl. 470—12

9 Claims

9. A method of manufacturing an expansible metal anchor comprising

a shank part (2) having a shank diameter, a shank cross-section, a front end and a rear end;

means (3,17) for fixing an article (18) at said rear end of said shank part (2);

an expander cone (4) at the front end of said shank part (2) and having an expander cone cross-section, wherein said expander cone cross-section decreases in a direction from the front end toward the rear end from approximately said shank cross-



section to a reduced cross-section less than the shank cross-section and said expander cone cross-section is approximately polygonal so that said expander cone (4) has a plurality of faces (13); and

a plurality of expansible segments (5) at least partially separated from each other by slots (14), wherein each of said expansible segments (5) are arranged on said shank part (2) so that each of said expansible segments (5) is spaced by a gap (7) from one of the faces (13) of the expander cone (4) and said expansible segments (5) project radially a distance (8) from said shank part (2), said gap (7) corresponds approximately to said distance (8), each of said expansible segments (5) are joined by at least one web member (6,6') at an end face thereof facing the shank part (2), and said web members (6,6') provide predetermined break points for separation of said expansible segments from said shank part (2), said method comprising the steps of:

a) injection molding the shank part (2) with the expander cone (4) and the expansible segments (5) from powdered metal using a system of binders;

b) subsequently removing said binders and sintering; and

c) forming the gap (7) between the expansible segments (5) and the faces (13) of the expander cone (4) with a slide member of a mold divided at corner edges (20) of the faces (13) of the expansible segments (5).

5,569,092

# AUTOMATIC PINSETTER WITH BAFFLE AT ELEVATOR ENTRANCE

Lucien Rochefort, Beauport, Canada, assignor to Mendes Inc., Ste-Foy, Canada

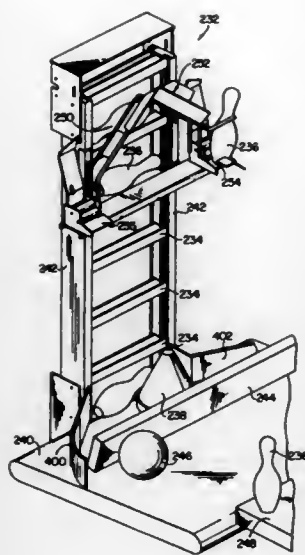
Continuation-in-part of Ser. No. 261,725, Jun. 17, 1994, abandoned, which is a continuation-in-part of Ser. No. 79,164, Jun. 18, 1993, abandoned. This application Jun. 15, 1995, Ser. No. 490,945

Int. Cl.<sup>6</sup> A63D 5/08

U.S. Cl. 473—73

10 Claims

1. In combination in an automatic pinsetter, an elevator mechanism for receiving bowling pins seriatim at a lower entrance portion from a pit-area at a rear end of a bowling alley and for transporting the same upwardly for discharge at an upper end portion of the mechanism, a rearwardly moving conveyor disposed forwardly of the entrance of the elevator mechanism and extending rearwardly thereto, the conveyor receiving fallen pins from a rear end portion of the bowling alley and transporting the same rearwardly in indiscriminate arrangement to the entrance of the elevator mechanism, upstanding left and right hand guides above the conveyor for co-operatively directing the pins rearwardly and inwardly toward the entrance of the elevator mechanism, and a baffle disposed above the conveyor between said guides and adjacent the entrance of the elevator mechanism, said baffle taking a generally circular configuration in cross section, and said baffle and said left and right hand guides co-operatively defining left and right hand entry passageways therebetween sufficiently wide for end-wise through passage of bowling pins but insufficient in width for side-wise pin passage.



5,569,093

**HOLLOW PLASTIC PIN WITH VARYING WALL THICKNESS**

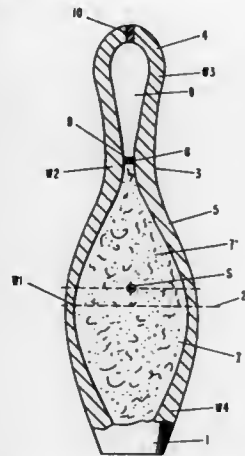
Arnold Jäger, Gehrbergsweg 6, 31303 Burgdorf, Germany  
Filed Jun. 2, 1995, Ser. No. 459,116

Claims priority, application Germany, Oct. 5, 1994, 44 35 569.6

Int. Cl.<sup>6</sup> A63D 9/00

U.S. Cl. 473—118

8 Claims



1. A plastic pin, including a bowling pin, for bowling lanes, comprising:

A hard shell that is hollow and has a lower bulging portion that is filled with a core of cellular or porous material and that has a maximum diameter, thereabove a neck-like reduced diameter portion and thereabove an again slightly wider head, and wherein said shell has a wall thickness that starting at said maximum diameter of said bulging portion increases gradually both upwardly toward said reduced diameter portion and downwardly toward a base of said pin.

5,569,094

**GOLF PRACTICE NET**

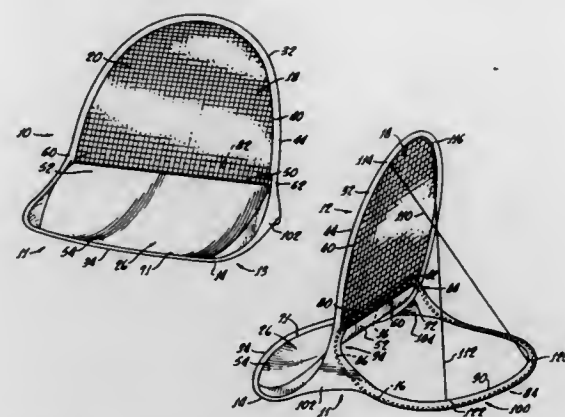
Anthony G. Macaluso, 2805 Albany Ave., Davis, Calif. 95616  
Filed Mar. 6, 1996, Ser. No. 611,902

Int. Cl.<sup>6</sup> A63B 63/00

U.S. Cl. 473—197

10 Claims

1. A self-erecting portable net that has an erected configuration for practicing golf by stopping the flight of a projectile such as a



golf ball and returning it to a selected location and a folded configuration for storage or transport, comprising:

an elastic frame that includes a first frame member and a second frame member, the first frame member being arranged to have an upper frame portion and a lower frame portion, the lower frame portion and the second frame member cooperating to form a base that supports the portable net in a generally upright orientation on a generally horizontal surface when the portable net is in its erected configuration, the lower frame portion having an end that is spaced apart from the upper frame portion to form a front portion of the base, the second frame member having an end that is spaced apart from the upper frame portion to form a rear portion of the base;

a first fabric section connected to the upper frame portion, the upper frame portion being arranged so that when the portable net is in its erected configuration, the upper frame portion extends upward away from the base, the first fabric section being arranged to stop a projectile that is incident thereon;

a second fabric section connected to the lower frame portion, the second fabric portion being arranged so that a projectile that has impinged upon the first fabric section falls to the second fabric section and then rolls to the front portion of the portable net;

the frame being configured such that a person may put the frame into the folded position by deforming the first and second frame members into a plurality of generally concentric rings; and

a retainer for selectively retaining the frame in the folded configuration, the frame being formed such that elastic forces in the frame spontaneously move the frame to the erected configuration when the retainer is not engaged to retain the frame in the storage configuration.

5,569,095

**STRAIGHT SHOT GOLF AID**

Gary McCollum, 74-5491 Alapa St., Kailua-Kona, HI. 96740

Filed Nov. 9, 1995, Ser. No. 555,389

Int. Cl.<sup>6</sup> A63B 69/36

U.S. Cl. 473—215

3 Claims

1. A straight shot golf aid for assisting a golfer wearing a waist belt to position his or her feet while executing a golf club swing comprising:

a) a waist belt including means for indicating a particular direction comprising an elongated straight tube having an open end at one end thereof, an elongated shaft slidably mounted within said tube with one end of said elongated shaft extending out the open end of said tube and a knob mounted on said one end of said shaft, said tube and shaft functioning as a pointer with said knob pointing in the direction where a golf ball is to be directed, said shaft being retracted into said tube when not in the pointing position; and

b) means for suspending said indicating means in a generally horizontal manner from said waist belt when in use comprising a pair of spaced apart lugs affixed to said tube in an aligned manner, each of said lugs having an aperture there-



through, a pair of straps of equal length, one end of each strap being attached to a lug on said tube, the other end of each said strap having means to engage said waist belt to position said tube in a horizontal position, said golfer positioning his or her feet so that said tube with the shaft and knob point in the direction said golf ball is to be hit by the golfer.

5,569,096

**GOLF CLUB PUTTER HAVING ADJUSTABLE LIE ANGLE AND SHAFT LENGTH**

Raymond H. Lee, 19035 Amber Valley Dr., Walnut, Calif. 91789

Filed May 30, 1995, Ser. No. 454,516

Int. Cl.<sup>6</sup> A63B 69/36; 53/02

U.S. Cl. 473—248

6 Claims



1. A length adjustable golf club putter comprising:

a. a hollow handle having a shaft chamber annularly formed at its longitudinal center, an opened end, and an externally threaded ring attached to said opened end;

b. a shaft having a first end and a second end, wherein said first end is inserted into said shaft chamber of said handle;

c. a locking mechanism located at said opened end of said handle and comprising:

(1) said externally threaded ring;

(2) a flexible ring made of soft non-metallic material disposed therebelow; and

(3) an internally threaded locking nut first covering said flexible ring and then threadably mated to said external thread;

d. a stem and a putter head; and

e. an adjustable lie angle mechanism located at said second end of said shaft and comprising:

(1) a bendable metal piece having a first end, a second end, and a ruffle edge located between said first end and said second end and formed on one longitudinal side only;

(2) wherein said first end of said bendable metal piece is insertably attached to said second end of said shaft;

(3) wherein said second end of said bendable metal piece is insertably attached to said stem of said putter; and

(4) a rubber cover covering said end of said shaft, said bendable metal piece, and said stem.

5,569,097

**BALANCED GOLF CLUB**

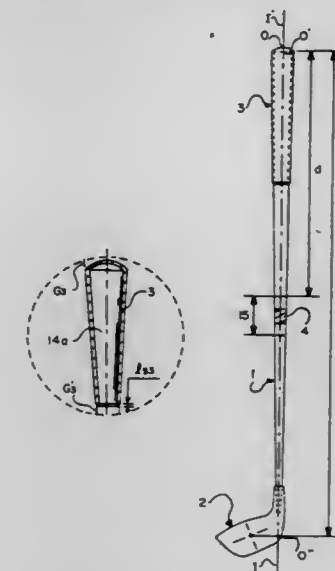
Jean-Luc Vieux, Rumilly, and Benoit Vincent, Annecy Le Vieux, both of France, assignors to Taylor Made Golf Company, Inc., Carlsbad, Calif.

Continuation-in-part of Ser. No. 211,436, Apr. 11, 1994, Pat. No. 5,467,984. This application Jun. 1, 1995, Ser. No. 457,130

Int. Cl.<sup>6</sup> A63B 53/00; G01M 1/12

U.S. Cl. 473—292

35 Claims



1. A golf club comprising:

a shaft having a lower end and an upper end;

a head mounted at the lower end of the shaft;

a grip mounted at the upper end of the shaft;

a total mass of less than 310 grams;

an equivalent pendulum length (LPE);

a club length (LC); and

a ratio of equivalent pendulum length to club length (LPE/LC) between 0.87 and 0.885.

5,569,098

**GOLF PUTTER HAVING TAPERED SHAFT AND LARGE GRIP**

Lon Klein, Ryebrook, N.Y., assignor to New Vision Golf Corp., New City, N.Y.

Filed Dec. 15, 1994, Ser. No. 356,841

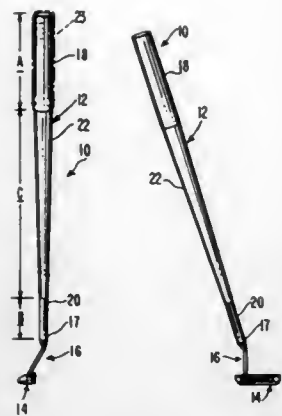
Int. Cl.<sup>6</sup> A63B 53/14

U.S. Cl. 473—300

12 Claims

1. An improved golf putter golf putter for putting a golf ball along a path of desired golf ball travel and of the type having a hosel connecting a head to an elongated shaft, said elongated shaft comprising a first head end affixed to said putter head and a second grip end, a grip end length portion





proximate to said grip end having a substantially constant enlarged transverse dimension greater than about 1.0 inches, a hosel end length portion proximate to said first head end having a substantially constant reduced transverse dimension less than about 0.9 inches, and a tapered major center length portion extending from said grip end length portion to said hosel end length portion having transverse dimensions which gradually diminish in size from said enlarged transverse dimension at an end thereof proximate to said grip end length portion to said reduced transverse dimension at an opposite end thereof proximate to said hosel end length portion.

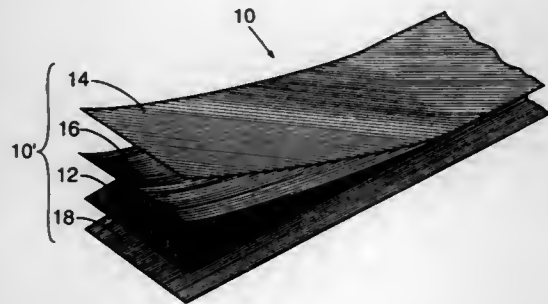
5,569,099

**GOLF CLUB SHAFT AND LAMINAR STRUCTURAL ELEMENT AND METHOD FOR ITS MANUFACTURE**  
Al Jackson, 2590 Pioneer Ave., Vista, Calif. 92083  
Filed Dec. 30, 1994, Ser. No. 366,965

Int. Cl.<sup>6</sup> A63B 53/10

U.S. Cl. 473—319

17 Claims

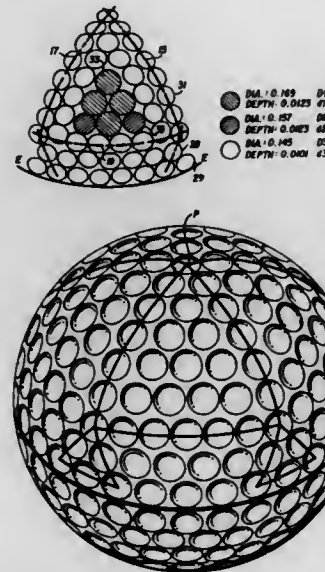


1. A method for producing a hollow generally cylindrical golf club shaft, the method comprising:

forming on a generally horizontal work surface an elongate generally planar laminar substructure including first and second outer oppositely angularly biased fiber plies having interposed therebetween a first longitudinally oriented fiber ply; laying a second longitudinally oriented fiber ply on one of the outer plies in substantially coextensive relationship therewith to form a laminar superstructure having no more than one surface-exposed biased fiber ply; rolling such laminar superstructure to produce a generally cylindrical tube formed of the laminar superstructure wherein a second edge of the laminar superstructure overlaps an inner rolled region thereof; heating said tube to a sufficient temperature to bond the plies thereof to one another; and smoothing an outer surface of said tube to produce a substantially circular generally cylindrical hollow shaft.

5,569,100  
GOLF BALL

Robert P. Molitor, Niles, Mich.; R. Dennis Nesbitt, Westfield; Joseph F. Stiefel, Shrewsbury, both of Mass., and Terence Melvin, Somers, Conn., assignors to Lisco, Inc., Tampa, Fla.  
Continuation-in-part of Ser. No. 171,956, Dec. 22, 1993, Pat. No. 5,503,397. This application Oct. 31, 1994, Ser. No. 332,295  
Int. Cl.<sup>6</sup> A63B 37/12; 37/14  
U.S. Cl. 473—384 6 Claims



1. A golf ball of improved playing characteristics comprising a ball having a mean outside diameter of substantially between 1.70 and 1.80 inches and a weight no greater than 1.62 ounces; and a dimple pattern comprising a plurality of dimples on the surface of said ball; said dimple pattern covering at least 65.0% of the surface of said ball.

5,569,101

GOLF BALL TEEING APPARATUS

John J. O'Keeffe, 83 GooseAcre, Botley Rd., Chesham, Bucks, United Kingdom  
PCT No. PCT/GB94/01110, § 371 Date Jan. 4, 1996, § 102(e)  
Date Jan. 4, 1996, PCT Pub. No. WO94/27686, PCT Pub. Date Dec. 8, 1994

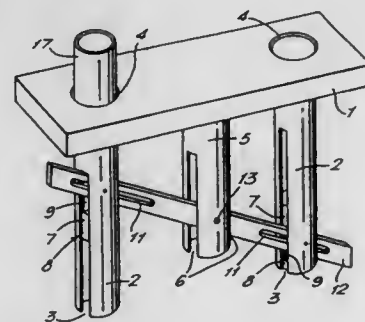
PCT Filed May 20, 1994, Ser. No. 578,595

Claims priority, application United Kingdom, May 25, 1993, 9310726

Int. Cl.<sup>6</sup> A63B 57/00

U.S. Cl. 473—390

9 Claims



1. A golf teeing apparatus comprising two movable carriers (7) each of which supports a flexible tee (17) adapted to support a golf

ball for striking, and a mechanism (2, 6, 12) linking the carriers and allowing alternate up and down movement thereof.

5,569,102

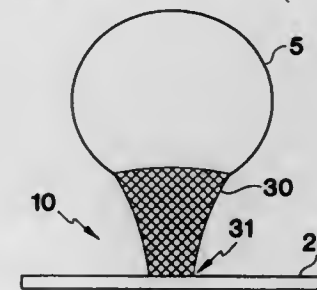
GOLF TEES

Bill Karron, 694-I Sabal Palm Cir., Altamonte Springs, Fla. 32701  
Filed May 26, 1995, Ser. No. 451,446

Int. Cl.<sup>6</sup> A63B 57/00

U.S. Cl. 473—401

22 Claims



1. A golf tee comprising:  
a shank portion made of a braided tube formed by a plurality of overlapping strips, said shank portion having an upper end and a lower end, each of said strips extending from said lower end to said upper end at an inclined angle with respect to a vertical axis; and  
a base portion formed of a substantially flat plate connected to said lower end of said shank portion.

5,569,103

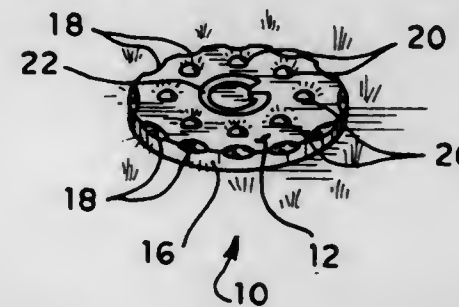
GOLF BALL MARKER

Sang C. Sohn, 1564 Bristol Pike, Bensalem, Pa. 19020  
Filed Mar. 12, 1996, Ser. No. 614,182

Int. Cl.<sup>6</sup> A63B 57/00

U.S. Cl. 473—406

20 Claims



1. A golf ball marker adapted for temporary placement on a golf green to mark the location of a golf ball temporarily removed therefrom, said marker comprising:

a generally flat plate having an upper surface and an opposite lower surface generally parallel to said upper surface, with said lower surface having a generally spherical stud generally centered thereon and projecting downwardly therefrom, with said marker comprising said plate and said stud being monolithically formed of durable solid metal, and;  
said plate having a periphery with an upper edge joining said upper surface, with said upper surface and said upper edge of said periphery including a plurality of beveled and highly polished and reflective facets formed completely therearound to provide brilliance means for said marker, whereby;  
said marker is adapted for removable attachment to golfing apparel by said stud and is removably placeable on a golf green for the temporary marking of a golf ball removed from

play with said stud further serving to secure said marker upon the green, and with said marker further adapted to be easily located on the green by said highly reflective facets and brilliance means.

5,569,104

ELECTRONIC TRANSMISSION CONTROL FOR HUMAN POWERED VEHICLE

Stephen Bellio, Roxbury, and Gerald P. Eidelman, Jamaica Plain, both of Mass., assignors to E.B.T., Inc., Brookline, Mass.

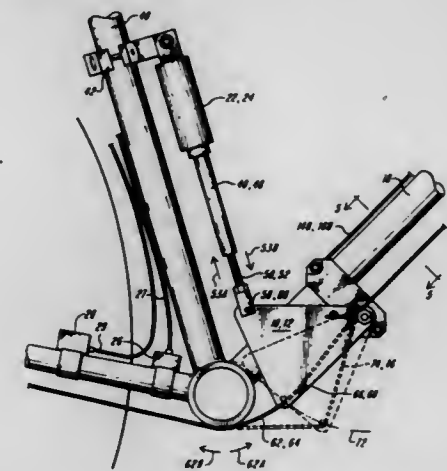
Division of Ser. No. 946,379, Nov. 6, 1992, Pat. No. 5,356,348, which is a continuation-in-part of Ser. No. 520,627, May 8, 1990, Pat. No. 5,059,158. This application Aug. 11, 1994, Ser. No. 289,087

Claims priority, application WIPO, Apr. 30, 1991, PCT/US91/02948

Int. Cl.<sup>6</sup> F16H 9/00

U.S. Cl. 474—70

1 Claim



1. A transmission control system for a human-powered vehicle, comprising:

a gear means;  
a crank means coupled to the gear means;  
cadence determining means for determining a cadence of the crank means;  
adjusting means including at least one linear actuator for varying a gear ratio of the gear means;  
at least one gear position sensor comprising a linear potentiometer; and  
computer control means responsive to the cadence determining means and the at least one gear position sensor for controlling the adjusting means, the computer control means comprising means for comparing the cadence with predetermined limits and means responsive to the comparison means for controlling the adjusting means.

5,569,105

DAMPER APPARATUS FOR AN AUTOTENSIONER

Kouichi Sakai, Zama; Shuhei Aoki; Shigenori Murata, both of Hiratsuka; Hayato Oumi, Chigasaki, and Hiroshi Suzuki, Yokohama, all of Japan, assignors to NSK, Ltd., Tokyo, Japan

Filed Jul. 28, 1994, Ser. No. 281,121

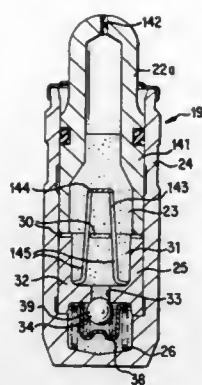
Claims priority, application Japan, Jul. 28, 1993, 5-045041 U; Jul. 28, 1993, 5-045042 U

Int. Cl.<sup>6</sup> F16H 7/08

U.S. Cl. 474—110

14 Claims

1. An autotensioner for use in applying a tension to a moving belt, comprising:



- a base member having a projection,
- a rocking member rockingly mounted to the base member through a first axle and having an arm,
- a pulley rotatably mounted to the rocking member through a second axle for applying the tension to the moving belt, and
- a damper apparatus provided between the projection of the base member and the arm of the rocking member, the damper apparatus comprising:
  - a cylinder having upper and lower chambers and a lower section with a bottom,
  - a piston fitted into the cylinder and having an upper section formed with a push member,
  - a spring member provided between the lower section of the cylinder and the piston, and placed under compression so as to push the piston up,
  - the lower chamber in the cylinder defined by the cylinder bottom and the piston,
  - the upper chamber in the cylinder formed over the piston,
  - a viscous fluid contained in the lower and upper chambers in the cylinder,
  - a leakage path for communicating the lower chamber with the upper chamber so as to apply a resistance to the viscous fluid flowing from the lower chamber to the upper chamber,
  - a release path for communicating the lower chamber with the upper chamber and having a check valve which is opened when the viscous fluid flows from the upper chamber to the lower chamber and is closed when the viscous fluid flows from the lower chamber to the upper chamber, and
  - a blockage member provided above the release path in the viscous fluid in the upper chamber for preventing any rapid inflow of air to the release path.

5,569,106

## AUTOTENSIONER FOR DRIVE CHAIN OF SELF-PROPELLED LAWN MOWER

Clair D. Splittstoesser, Coffeyville, Kans.; Brian C. Crockett, Bartlesville, Okla., and Ronald J. Eisenbart, Cherryvale, Kans., assignors to Dixon Industries, Inc., Coffeyville, Kans.

Filed Sep. 12, 1995, Ser. No. 526,739

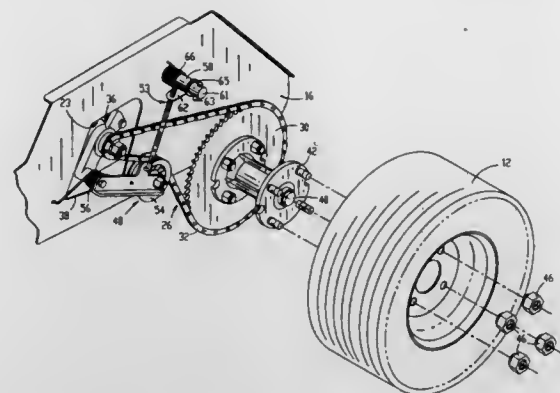
Int. Cl.<sup>6</sup> F16H 7/22; A01D 34/43

U.S. Cl. 474-125

8 Claims

1. In a self-propelled mower including propulsion means for propelling the mower, a ground wheel, and a drive train drivingly connecting the ground wheel to the propulsion means, wherein the drive train includes a rotatable, drive member coupled with said propulsion means, a rotatable driven member coupled with said ground wheel, and a flexible, endless element entraining said members, an automatic tensioner comprising:

tensioning mechanism for tensioning said element,



- said tensioning mechanism including a pivotal idler arm, an idler member rotatably supported by said arm, and arm biasing means for biasing said arm in a tensioning direction such that the idler member applies a tensioning force against the element; and
- an anti-slackening assembly for preventing retrograde movement of said idler arm in a slackening direction,
- said anti-slackening assembly including an elongated takeup rod having proximal and distal ends, said takeup rod being pivotally coupled with said idler arm at its proximal end such that the takeup rod moves generally with said idler arm in said tensioning and slackening directions, and a swingable control tab having an aperture receiving the distal end of the takeup rod,
- said takeup rod engaging the aperture of the control tab to swing the control tab to a disposition in which the takeup rod is generally aligned with the aperture permitting relative movement therebetween as the idler arm and takeup rod move in said tensioning direction, and to alternatively swing the control tab to a locking position in which the takeup rod is canted within the aperture to prevent the idler arm and takeup rod from moving in said slackening direction.

5,569,107

## MULTI-STEP BICYCLE TRANSMISSION SPROCKET ASSEMBLY

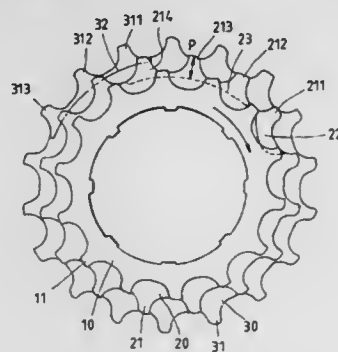
Hsueh C. Mu, Taichung, Taiwan, assignor to Falcon Industrial Co., Ltd., Taichung Hsien, Taiwan

Filed May 31, 1995, Ser. No. 455,399

Int. Cl.<sup>6</sup> F16H 55/30

U.S. Cl. 474-160

8 Claims



1. A multi-step transmission sprocket assembly of a bicycle

comprising a large sprocket gear, an intermediate sprocket gear and a small sprocket gear, said intermediate sprocket gear provided with a first recess located in a top surface of a tooth thereof, said intermediate sprocket gear further provided with a chain guiding slot located in a back side of a plurality of adjoining teeth thereof along a reverse revolving direction of said tooth, said large sprocket gear provided with a second recess located in a top surface of a plurality of teeth thereof, said second recess being corresponding obliquely in location to said chain guiding slot in a reverse revolving direction, said first recess and said chain guiding slot of said intermediate sprocket gear capable of causing a bicycle sprocket chain to be shifted rapidly and smoothly from said small sprocket gear to said intermediate sprocket gear, said second recess of said large sprocket gear capable of preventing said bicycle sprocket chain from interference with said large sprocket gear when said bicycle sprocket chain is deflected in a transmission process.

5,569,108

## HYBRID DRIVING SYSTEM

Theodorus P. Cadée, Asten, and Jacobus H. Van Rooij, Nuenen, both of Netherlands, assignors to Gear Chain Industrial B.V., Nuenen, Netherlands

PCT No. PCT/NL93/00192, § 371 Date Apr. 27, 1995, § 102(e)

Date Apr. 27, 1995, PCT Pub. No. WO94/10001, PCT Pub.

Date May 11, 1994

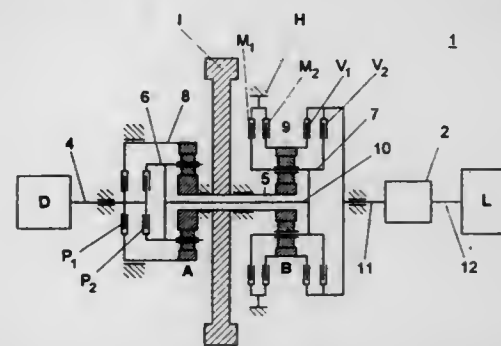
PCT Filed Sep. 28, 1993, Ser. No. 428,249

Claims priority, application Netherlands, Oct. 30, 1992, 9201893

Int. Cl.<sup>6</sup> B60K 6/10

U.S. Cl. 475-1

14 Claims



1. Hybrid driving system (1), containing at least a first planetary coupling (B), equipped with a central wheel spindle (5), a planetary spindle (6,7) and an annular ring spindle (8,9), a first driving component (I) coupled to the central wheel spindle (5), a second driving component (D) coupled to the planetary spindle (6,7), a continuously variable transmission (2) with a primary axle (11) and a secondary axle (12) and switchable clutches to provide several driving modes, characterized in that the secondary axle (12) of the continuously variable transmission (2) forms the outgoing axle of the hybrid driving system to be drivingly connected to the input of the load (L) and said switchable clutches (P1, P2; M1, M2) are connected on the one hand to the planetary spindle (6,7) and the annular ring spindle (8,9) and on the other hand to the fixed surroundings (H) and the primary axle (11) of the continuously variable transmission (2).

5,569,109

## GEARED STEERING DEVICE FOR CRAWLER VEHICLE AND CONTROL SYSTEM THEREFOR

Toshikazu Okada, Hirakata, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

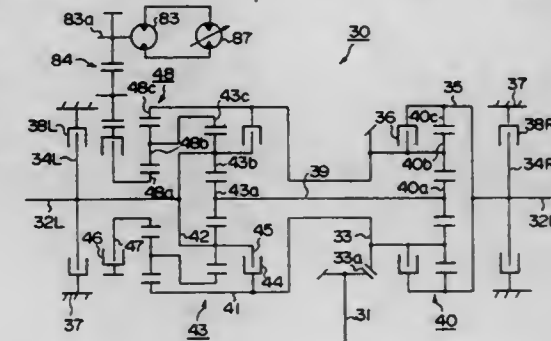
Continuation-in-part of Ser. No. 188,440, Jan. 28, 1994. This application Jun. 27, 1994, Ser. No. 266,019

Claims priority, application Japan, Jan. 28, 1993, 5-6096; Jun. 25, 1993, 5-180828

Int. Cl.<sup>6</sup> B62D 11/06; 11/02; 6/00

U.S. Cl. 475-28

19 Claims



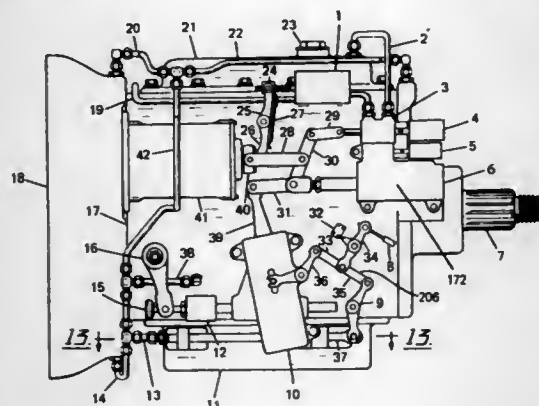
1. A geared steering device for a crawler vehicle having a prime mover, a rightside track shoe, a leftside track shoe, and rightside and leftside output shafts, for selectively operating the rightside and leftside output shafts at high speed rotation and low speed rotation, and for selectively braking said output shafts, to control steering of the rightside and leftside track shoes of the crawler vehicle, said geared steering device comprising:

- a power input drive element adapted to receive driving power from the prime mover;
  - a fixed housing;
  - a first steering brake for selectively engaging and releasing a first one of the output shafts with respect to the fixed housing;
  - a first rotatable housing coupled to the first one of said output shafts;
  - a first direct-coupled clutch for selectively engaging and releasing said first rotatable housing with respect to said power input drive element;
  - a center shaft;
  - a first planet gear train having a first sun gear, a first carrier gear, and a first ring gear; each of said first sun gear, said first carrier gear, and said first ring gear being connected to a respective different one of said center shaft, said power input drive element, and said first rotatable housing;
  - a second steering brake for selectively engaging and releasing a second one of said output shafts with respect to a fixed housing;
  - a second rotatable housing coupled to the power input drive element;
  - a drive hub coupled to the second one of the output shafts;
  - a second planet gear train having a second sun gear, a second carrier gear, and a second ring gear; each of said drive hub and said center shaft being connected to a respective different one of the second sun gear, the second carrier gear, and the second ring gear;
  - a second direct-coupled clutch for selectively engaging and releasing said second rotatable housing with respect to the second carrier gear;
  - a third planet gear train having a third sun gear, a third carrier gear, and a third ring gear;
  - a turn clutch for selectively engaging and releasing a turn clutch hub which is connected to one of the gears of the third planet gear train;
  - a variable capacity hydraulic pump having a discharge control device; and
  - a hydraulic turning motor for driving said turn clutch hub via the turn clutch;
- wherein each of the second rotatable housing and the turn clutch hub is connected to a respective different one of the third sun gear, the third carrier gear, and the third ring gear;



wherein the gear of said second planet gear train other than the gears connected to the center shaft and the drive hub is coupled with a gear of the third planet gear train other than the gears of the third planet gear train which are connected to the turn clutch hub and the second rotatable housing.

**5,569,110**  
**INTEGRATED HYDRO-MECHANICAL AUTOMOBILE TRANSMISSION**  
Walter S. Warren, 14 Chapman Road, Winnipeg, Manitoba, Canada  
Continuation-in-part of Ser. No. 905,334, Jun. 23, 1992, abandoned, which is a continuation-in-part of Ser. No. 774,555, Oct. 10, 1991, Pat. No. 5,203,747. This application Feb. 13, 1995, Ser. No. 387,194  
Int. Cl.<sup>6</sup> F16H 47/04; F01C 21/16  
U.S. Cl. 475—72 **20 Claims**



1. A hydro-mechanical transmission comprising a transmission housing, a hydraulic pump, a hydraulic motor, an input shaft, a sun and planetary gear set, and an output shaft wherein;

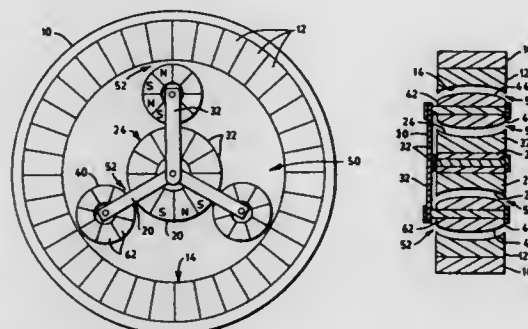
the transmission housing encloses the hydraulic pump, hydraulic motor, and sun and planetary gear set, and includes a first opening such that the input shaft extends through said first opening in the housing, and a second opening such that the output shaft extends through said second opening in the housing;

the hydraulic pump and motor each are of the internal gear type arranged in a back to back configuration with respect to one another, and each includes an internal gear, an external gear and a crescent that separates the respective internal gear and external gear, the internal gears being capped off by laterally constrained and rotatably supported internal gear plugs, and the external gears being laterally constrained and capped off by external gear plugs positioned between the two internal gears creating respective pump and motor working chambers, the internal gears and associated external gear plugs are laterally moveable by a control shaft which is displaceable in an axial direction causing the internal gears to engage a greater or lesser portion of the respective external gears such that the volumetric capacity of both pump and motor working chambers are made inversely variable to one another, and wherein the hydraulic pump and hydraulic motor each has an inlet and an outlet coupled by hydraulic coupling means;

the sun and planetary gear set comprises a sun gear, planet carrier, planet gears, and ring gear being arranged such that the planet carrier is coupled to the internal gear of the motor; the input shaft is coupled to the internal gear of the pump such that the internal gear of the pump is free to move axially, and is coupled to the sun gear such that the sun gear rotates at the same rate as said internal gear;

the output shaft is connected to the ring gear of the sun and planetary gear set so as to transmit the output of the transmission mechanically in the form of rotary motion.

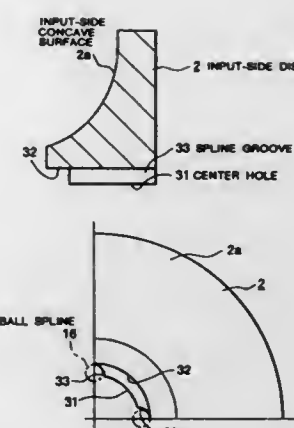
**5,569,111**  
**PERMANENT MAGNET TORQUE/FORCE TRANSFER APPARATUS**  
Chahee P. Cho, Portsmouth, and Ralph A. Bedingfield, Middletown, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.  
Filed Oct. 11, 1994, Ser. No. 322,655  
Int. Cl.<sup>6</sup> F16H 13/12; H02K 49/10  
U.S. Cl. 475—149 **2 Claims**



1. A torque/force transfer apparatus comprising:
  - a rigid annular ring having therein permanent first magnets side by side about the interior of said ring, said first magnets being arranged so as to alternate in polar orientation to present an inside circumference of alternating north and south magnetic poles;
  - a cylindrical central member having therein permanent second magnets side by side about the exterior of said member, said second magnets being arranged so as to alternate in polar orientation to present an outside circumference of alternating north and south magnetic poles;
  - a strut assembly pivotally attached to a center of a side of said central member and having arms extending radially outwardly from said central member center each of said arms being individually pivotally attached to said central member;
  - planetary members rotatably connected each to one of said arms, each of said planetary members having therein permanent third magnets side by side about the exterior of the planetary member, said third magnets being arranged so as to alternate in polar orientation to present an outside circumference of alternating north and south magnetic poles, each of said planetary members substantially bridging an annulus defined by said ring inside circumference and said central member outside circumference; and
  - whereby rotation of said central member causes, by magnetic flux, rotation of said planetary members which cause, by magnetic flux, rotation of said ring.

**5,569,112**  
**TOROIDAL TYPE CONTINUOUSLY VARIABLE TRANSMISSION**  
Hiroshi Fukushima, Ayase, Japan, assignor to NSK Ltd., Tokyo, Japan  
Filed Jun. 20, 1995, Ser. No. 492,452  
Claims priority, application Japan, Jun. 23, 1994, 6-141680  
Int. Cl.<sup>6</sup> F16H 15/38  
U.S. Cl. 476—40 **7 Claims**

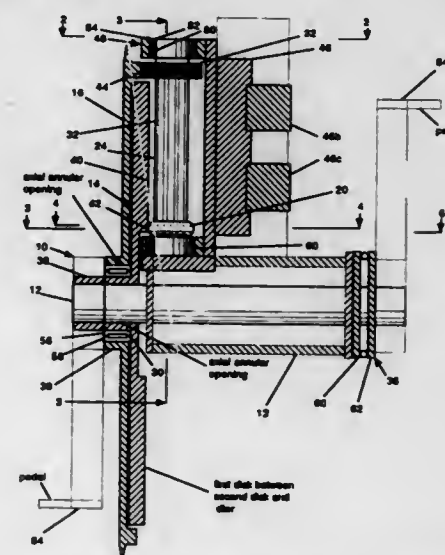
1. A toroidal type continuously variable transmission comprising a pair of discs of which axial side surfaces form concaves having circular-arc cross section, and which are supported coaxially with each other and are freely rotatable from each other in a manner causing the concave surfaces to face each other; trunnions which are respectively swung about pivot axes skewed with respect to a rotation center of said pair of discs; and power rollers of which peripheral surface are convex on revolution circular-arc surface, and which are supported rotatably and freely on displacement axes supported on said trunnions and held between the concave surfaces



of said pair of discs; and at least one disc of said pair of discs being supported on an outer peripheral surface of a rotating shaft through a ball spline so as to be displaceable along an axial direction of the rotating shaft,

wherein a spline groove extended in the axial direction for constituting said ball spline is formed on a center hole of said at least one disc, one end of said center hole is opened at a back surface of said at least one disc, one end of said ball spline reaches the back surface of said at least one disc, and the other end of said ball spline is located at a portion of said center hole deeper than the other end opening of said center hole.

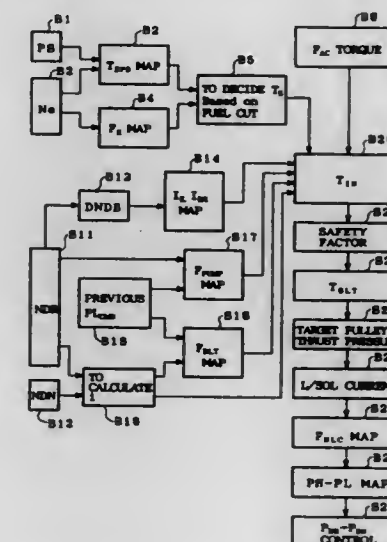
**5,569,113**  
**TRANSMISSION WITH A CONTINUOUSLY VARIABLE ADJUSTABLE RATIO**  
John W. Harrison, 5546 N. Sixth St., Fresno, Calif. 93710  
Filed Aug. 15, 1994, Ser. No. 291,310  
Int. Cl.<sup>6</sup> F16H 15/10; B62M 1/02  
U.S. Cl. 476—58 **5 Claims**



1. In a continuously variable transmission, comprising:
  - a support structure;
  - a first shaft, rotatably carried by said support structure;
  - a first disk having a planar face and an axial annular opening for receiving said first shaft, said first disk being fixed to said first shaft for rotation therewith;
  - a second disk having an axial annular opening for receiving said first shaft and being coaxially supported by said first shaft for rotation relative to said first shaft, and positioned adjacent to said first disk; and

assembly means carried by said support structure, said assembly means including a second shaft mounted transversely to the axis of said first shaft, and supported for rotation by said support structure, and a pinion coupled to said second shaft for rotation therewith and in contact with a portion of the surface of said second disk, so that rotation of said second shaft will rotate said second disk, and an idler fixed to said second shaft for rotation therewith, and movable axially along said second shaft in frictional contact with the planar face of said first disk, so that radial movement of said idler toward the outer circumference of said first disk will increase the speed of said second disk.

**5,569,114**  
**PULLEY THRUST PRESSURE CONTROL APPARATUS FOR BELT-TYPE CONTINUOUSLY VARIABLE TRANSMISSION**  
Takahiro Matsuda, Hiki-gun, and Daihei Teshima, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan  
Filed Mar. 29, 1994, Ser. No. 219,591  
Claims priority, application Japan, Mar. 31, 1993, 5-096811  
Int. Cl.<sup>6</sup> F16H 9/00  
U.S. Cl. 477—45 **20 Claims**



1. A pulley thrust pressure control apparatus for a belt-type continuously variable transmission having a drive pulley connected with an input member, a driven pulley connected with an output member, a V-belt passing around and engaging said drive and driven pulleys, a drive cylinder for varying a pulley thrust pressure applied to and a width of said drive pulley, and a driven cylinder for varying a pulley thrust pressure applied to and a width of said driven pulley, comprising:

actual transmitting torque calculation means for calculating an actual transmitting torque transmitted through said V-belt; belt transmitting torque calculation means for calculating a belt transmitting torque by multiplying said actual transmitting torque by a safety factor;

- a pulley thrust pressure control valve for controlling pulley thrust pressures supplied to said drive and driven cylinders based on at least said belt transmitting torque so as to obtain said belt transmitting torque in said belt-type continuously variable transmission; and
- said safety factor being set so as to be higher when said actual transmitting torque is negative than when it is positive.

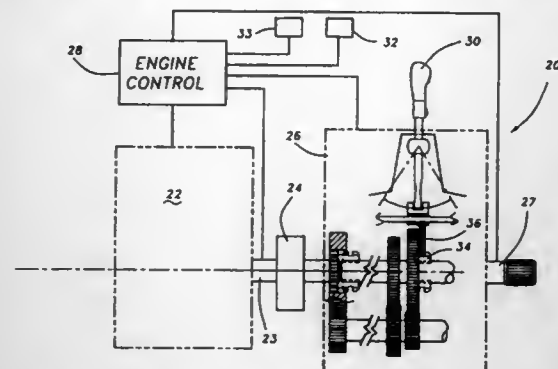
**5,569,115**

**ENGINE SPEED SYNCHRONIZATION SYSTEM FOR ASSISTING IN MANUAL TRANSMISSION SHIFTING**  
**Thomas Desautels, West Bloomfield; Charles E. Allen, Jr., Rochester Hills; Frank A. Palmeri, Troy, all of Mich., and Jon M. Huber, Laurinburg, N.C., assignors to Rockwell International Corporation, Pittsburgh, Pa.**

Filed Jul. 27, 1995, Ser. No. 508,135  
Int. Cl.<sup>6</sup> B60K 41/08

U.S. Cl. 477-110

### 30 Claims



1. A method of controlling the operation of a vehicle drive comprising the steps of:

- a) providing an engine having an output shaft, an electronic control unit for controlling the speed of said engine, a multi-speed transmission to be driven by said engine output shaft, a manual stick shift for allowing an operator to manually shift said multi-speed transmission between several speed ratios, and a driver intent switch allowing a driver to provide an indication to said electronic control unit of whether an upshift or a downshift is to be next expected, said electronic control unit using said driver intent signal to determine what the next speed ratio to be engaged by a manual shift by the operator will be, said electronic control unit then determining what engine synchronized speed would be necessary to achieve a synchronized shift to said next speed ratio at the present transmission output speed, and said electronic control unit being operable to change the output speed of said engine output shaft to achieve said synchronized speed;
- c) operating a vehicle using the system provided in step a);
- c) determining a currently engaged gear;
- d) utilizing said driver intent switch to provide a signal of whether an upshift or a downshift will be the next expected shift;
- e) determining a desired engine synchronization speed at a next expected gear by determining said next expected gear based upon said currently engaged gear and said shift intent signal of step d), identifying an engine synchronization speed by multiplying the speed ratio at said next expected gear with the current transmission output speed; and
- f) beginning to control said output speed of said engine output shaft to approach said synchronization speed, and
- g) manually shifting said multi-speed transmission to said next expected gear.

**5,569,116**

**ELECTRONIC AND HYDRAULIC SYSTEM OF FIVE  
SPEED AUTOMATIC TRANSMISSION**  
Jae-Duk Jang, Kyunggi-Do, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

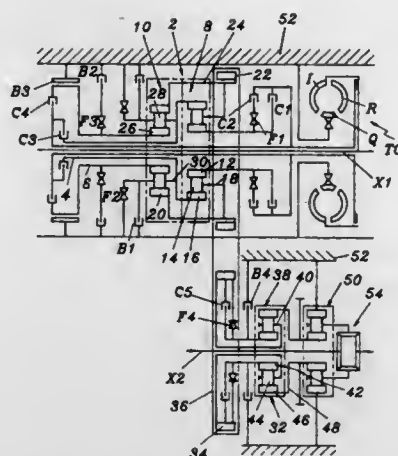
Filed Dec. 30, 1994, Ser. No. 366,892  
Claims priority, application Rep. of Korea, Dec. 31, 1993,  
1993-32032

Int. CL<sup>6</sup> F16H 61/26

U.S. CL 477-130

## 17 Claims

1. An electronic and hydraulic system of a five speed automatic transmission for a motor vehicle, the transmission including a



torque converter, a gear train operatively coupled to the torque converter for rendering five forward and at least one reverse gear ratios effective, a plurality of friction elements each hydraulically operated to change a power delivery path through the gear train, and a hydraulic control system for selectively engaging and disengaging the friction elements to establish one of the gear ratios, wherein the hydraulic control system comprises:

- wherein the hydraulic control system comprises:
- a) an oil pump for producing a pressurized working fluid;
  - a selector valve manually operable to distribute the working fluid to a forward fluid line and a reverse fluid line;
  - first to fourth shift valves for regulating the pressure of the working fluid and supplying the working fluid of the regulated pressure to at least one of the friction elements, each of the shift valves including a valve housing, first and second valve spools slidably fitted into the valve housing in a spaced apart relationship with each other for movement between a first position blocking up flow of the working fluid and a second position allowing the working fluid to flow therethrough, and first and second springs retained within the valve housing to bias the first and the second valve spools into one of the first and second positions, wherein the first spring of each of the first to fourth shift valves has a spring constant no greater than that of the second spring corresponding thereto;
  - first to fourth solenoid valves associated with each of the first to the fourth shift valves for controlling the movement of the shift valves in correspondence to a vehicle speed and a throttle opening degree;
  - a second speed valve communicating with the first shift valve and the forward fluid line, the second speed valve movable between a first position blocking up the flow of the working fluid therethrough and a second position permitting the flow of the working fluid toward a friction element associated therewith so as to establish the second forward gear ratio;
  - a third speed valve communicating with the second shift valve and the second speed valve, the third speed valve movable between a first position blocking up the flow of the working fluid therethrough and a second position permitting the flow of the working fluid from the second speed valve toward a friction element associated therewith so as to establish the third forward gear ratio;
  - a fourth speed valve communicating with the third shift valve and the third speed valve, the fourth speed valve movable between a first position blocking up the flow of the working fluid therethrough and a second position permitting the flow of the working fluid from the third speed valve toward a friction element associated therewith so as to establish the fourth forward gear ratio; and
  - an overdrive unit valve communicating with the fourth shift valve and the oil pump, the overdrive unit valve movable between a first position blocking up the flow of the working fluid therethrough and a second position permitting the flow of the working fluid from the fourth speed valve toward a friction element associated therewith so as to establish the fifth forward gear ratio.

5,569,117

**SLIP CONTROL APPARATUS FOR MOTOR VEHICLE  
LOCK-UP CLUTCH**

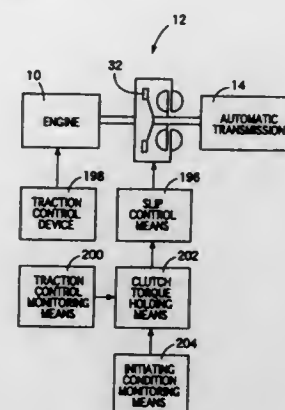
**Katsumi Kono, Toyota; Shinya Nakamura, Owariasahi, and  
Atsushi Honda, Susono, all of Japan, assignors to Toyota  
Jidosha Kabushiki Kaisha, Toyota, Japan**

Filed Jul. 18, 1995, Ser. No. 503,635

Claims priority, application Japan, Jul. 21, 1994, 6-169243

U.S. Cl. 477-169

## 9 Claims



1. An apparatus for controlling an amount of slip of a lock-up clutch disposed between a pump impeller and a turbine impeller of a torque converter of a motor vehicle having a traction control device for controlling throttle valve means of an engine so as to prevent excessive slipping of drive wheels of the vehicle, said apparatus including slip control means for controlling the amount of slip of said lock-up clutch in a slip control mode such that an actual slip speed of said lock-up clutch coincides with a predetermined target slip speed while a running condition of the vehicle is in a predetermined slip control area which is partially defined by an amount of opening of said throttle valve means, said apparatus comprising:
- traction control monitoring means for determining whether said traction control device is in operation to control the amount of opening of said throttle valve means; and
- clutch torque holding means for maintaining a present torque transmitting state of said lock-up clutch as long as said traction control monitoring means determines that said traction control device is in operation.

**5,569,118**

## TORQUE RESPONSIVE RELEASE CLUTCH MECHANISM

**Mats C. Holmin, Stockholm, Sweden, assignor to Atlas Copco Tools AB, Nacka, Sweden**

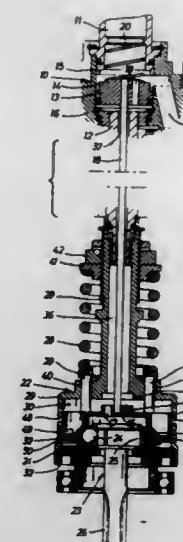
Filed Dec. 21, 1994, Ser. No. 360,949

Claims priority, application Sweden, Dec. 23, 1993, 9304278  
Int. Cl.<sup>6</sup> F16D 43/206

U.S. Cl. 477-178

### 13. Claims

1. A torque responsive release clutch mechanism for a power nutrunner with a rotation motor and an output shaft, the clutch mechanism comprising:
- a driving clutch half connected to said motor;
  - a driven clutch half connected to said output shaft;
  - at least two torque transferring balls;
  - an axially displaceable thrust element;
  - an axially acting bias spring acting on said thrust element such that said thrust element is arranged to transfer a load of said bias spring onto said at least two balls;
  - said driving clutch half including:
    - at least two pockets for accommodating and transferring torque to said at least two balls,
    - a cylinder chamber, and



an air feed passage connecting said cylinder chamber to a pressure air source;

said driven clutch half including:

cam surfaces for cooperation with said at least two balls;

said thrust element including:

a ball facing side,

a bias spring facing side, and

a cylindrical portion for sealing guidance in said cylinder chamber; and

a valve unit arranged between said thrust element and said driving clutch half, said valve unit:

simultaneously connecting the ball facing side and the spring facing side of said thrust element to said air feed passage to pressure balance said thrust element at transferred torque magnitudes below a release torque level of the clutch in order that an operating thrust force on said thrust element is determined by said bias spring, and

depressurizing said bias spring facing side of said thrust element as said release torque level is attained when said element has been initially displaced a certain distance by said at least two balls at release of the clutch.

5-569-119

## IMPLEMENT FOR GROUND TREATMENT WITH A DEAD-MAN SAFETY

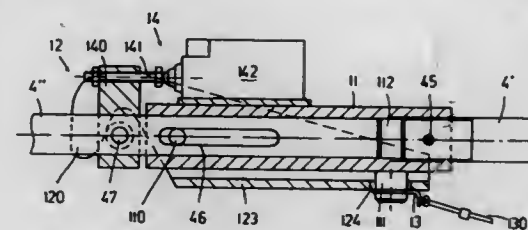
**Paul Dummermuth, Zunzgen, Switzerland, assignor to Pamag AG, Switzerland**

Filed Jun. 27, 1995, Ser. No. 495,153

Claims priority, application Switzerland, Jun. 27, 1994,  
02037/94

Int.  
U.S. CL 477-204

## 18 Claims



1. In a manually displaceable implement for ground treatment, comprising a housing (1), a motor-driven rotor drum (2) rotatably seated in the housing (1), a connecting piece (3), and running wheels (5) which are height-adjustable by means of a spring-loaded (43) height adjustment rod (4), said running wheels (5) being movable into a lower end position which is almost free of





- cated out of a strong durable material, said strong durable material being plastic, and each said handle including finger grips;
- b) means extending between said handles, for generating resistance when said handles are twisted in opposite directions by the hands of the person, to cause said resistance generating means to be flexed spirally, said resistance generating means being an elongated heavy flexible cylindrical hose, said elongated heavy flexible cylindrical hose being made out of rubber;
- c) means for retaining each end of said resistance generating means to one said handle, said retaining means including a plurality of holding tabs; and
- d) means for maintaining said resistance generating means in a straight line when being flexed spirally, said maintaining means including a pair of rods in which each said rod is affixed at a first end to said handle, so that said rod can extend longitudinally into said resistance generating means, and a sleeve to engage with a second end of each said rod, so as to prevent said resistance generating means from being compressed.

5,569,126

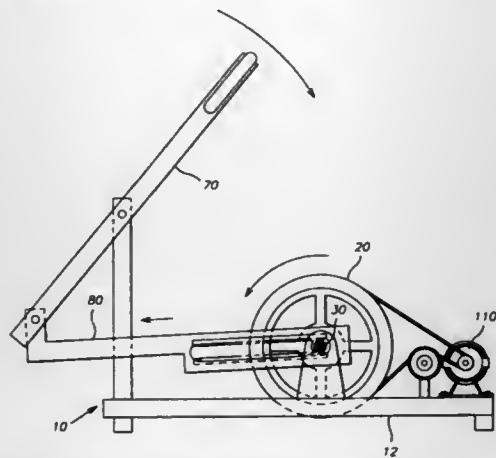
## ENERGY ABSORBING EXERCISER APPARATUS

Roberto A. Perussi, and Ruben O. Perussi, both of 10 Thomas, Irvine, Calif. 92718

Filed Mar. 8, 1996, Ser. No. 612,663  
Int. Cl.<sup>6</sup> A63B 69/16; 22/04

U.S. Cl. 482—51

7 Claims



1. An exercise apparatus comprising: a flywheel
- a means for supporting a flywheel mounted on a flywheel shaft, the shaft having a rotational axis, the shaft further supporting a pair of rotational clutches integral with pinion gears in rotational engagement on the shaft, one of the clutches mounted so as to be freewheeling in a first rotational sense on the shaft and to be engaged for driving the shaft in a second rotational sense, the other of the clutches mounted so as to be freewheeling in the second rotational sense on the shaft, and to be engaged for driving the shaft in the first rotational sense, said first rotational sense being opposite to said second rotational sense;
- an upright exercise arm pivotally engaged at a lower end thereof on the supporting means, the exercise arm thereby restrained to move in an arc;
- a drive arm pivotally engaged with the exercise arm;
- a pair of drive racks, each of the racks providing a set of linearly arranged drive teeth, the drive racks mounted on the drive arm, spaced apart in parallel relationship, each one of the sets of drive teeth engaging one of the pinion gears of one of the pair of clutches respectively; wherein
- arcuate motion of the exercise arm continuously driving the flywheel shaft through the drive arm, drive racks and clutches in alternate reciprocating power strokes.

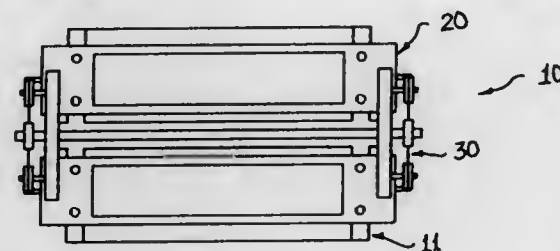
5,569,127

## SIDE STEPPING EXERCISE APPARATUS

Gary L. Johnston, P.O. Box 183, Cowarts, Ala. 36321  
Continuation-in-part of Ser. No. 151,178, Nov. 12, 1993, abandoned. This application Mar. 21, 1994, Ser. No. 215,040  
The portion of the term of this patent subsequent to Nov. 12, 2013, has been disclaimed.  
Int. Cl.<sup>6</sup> A63B 21/02; 23/04

U.S. Cl. 482—52

20 Claims



1. An exercise apparatus comprising:
- a structural frame means,
- two foot engaging members, both coupled to said structural frame means to move in a substantially vertical direction;
- a shaft member turnably mounted to said structural frame means;
- one force transmitting means operatively connecting the front portion of one foot engaging member, the front portion of the second foot engaging member, and the front portion of said shaft member, a second force transmitting means operatively connecting the rear portion of one foot engaging member, the rear portion of the second foot engaging member, and the rear portion of said shaft member, each force transmitting means being used to transmit the downward force applied to a portion of one foot engaging members into an upward force on the corresponding portion of the second foot engaging member, thereby moving said foot engaging members in opposite direction from one another, whereby the user may perform a stepping exercise routine whereby the feet of the user move opposite one another in a substantially vertical direction.

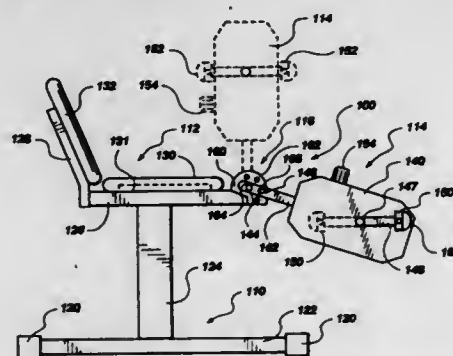
5,569,128

## LEG AND UPPER BODY EXERCISER

William T. Dalebout, Logan, Utah, assignor to ICON Health & Fitness, Inc., Logan, Utah  
Continuation of Ser. No. 191,009, Feb. 3, 1994, abandoned.  
This application Sep. 26, 1995, Ser. No. 534,084  
Int. Cl.<sup>6</sup> A63B 21/00

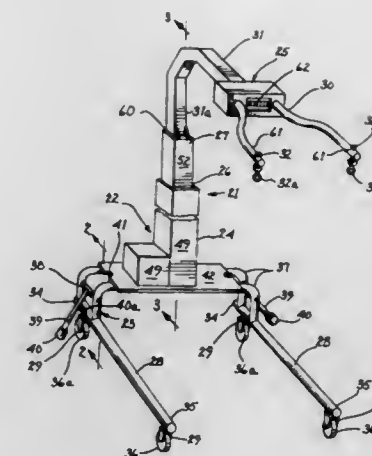
U.S. Cl. 482—57

5 Claims



1. A multipurpose pedal-type exercise apparatus for use in exercising the upper body and lower body of a user, said exercise apparatus comprising:
- frame means for supporting a user during said exercising the upper body and lower body of a user, the frame means including a first plurality of members, a single vertical support

- having one end connected to one member of the first plurality of members, and a substantially horizontal seat support connected to the other end of the vertical support;
- seat means connected to a portion of the horizontal seat support of the frame means for providing a seat for a user during said exercising the upper body and lower body of a user the seat means including an adjustable seat and rigid back portion connected to a portion of the frame means;
- pedal-type exercise means having a portion thereof located proximate the seat means for use by a user during said exercising the upper body and lower body of a user, the pedal-type exercise means including:
- a resistance means to provide resistance to operation by a user of the pedal-type exercise means, the resistance means including, in turn, a flywheel apparatus and adjustable tension belt apparatus having a portion thereof engaging a portion of the flywheel apparatus,
- a support arm means having a longitudinal axis thereof for supporting the flywheel apparatus and adjustable belt tension apparatus,
- a shaft means rotatably connected to a portion of the support arm means,
- a first pedal arm having one end thereof connected to one end of the shaft means and the other end having a first pedal connected thereto, the first pedal including a pedal face portion located on one side of the pedal for use in exercising the lower body of a user and a hand loop portion located on the other side of the pedal for use in exercising the upper body of a user, the hand loop portion being substantially parallel to the longitudinal axis of the support arm means, and
- a second pedal arm having one end thereof connected to the other end of the shaft means and the other end thereof having a second pedal connected thereto, the second pedal including a pedal face portion located on one side of the pedal for use in exercising the lower body of a user and a hand loop portion located on the other side of the pedal for use in exercising the upper body of a user, the hand loop portion being substantially parallel to the longitudinal axis of the support arm means; and
- a multiposition pedal adjustment assembly having a portion thereof connected to a portion of the horizontal seat support of the frame means and located forward of the seat means connected thereto and another portion thereof connected to a portion of the support arm means of the pedal-type exercise means, the multiposition pedal adjustment assembly providing a user the ability to orient at least a portion of the pedal-type exercise means with respect to a user such that the seat means to provide the exercising of the upper body of a user and the ability to orient a portion of the pedal-type exercise means with respect to a user such that the pedal-type exercise means extends substantially below the seat means to provide the exercising of the lower body of a user by adjusting the position of a portion of the pedal-type exercise means with respect to the frame means and seat means while a user remains in substantially one position with respect to the frame means and seat means.



- position for permitting the patient to walk while being supported by said harness means;
- b. support means coupled to said harness means for controlled vertical support of said harness means; and
- c. underlying and coupled to said support means, carriage means for controlled horizontal movement of said unitary device by a therapist;
- said support means being coupled to a distal end of said carriage means and extending upward and bending toward an opposite end of said carriage means for permitting the therapist unobstructed access to both legs of the patient being supported by said unitary device in proximity to said opposite end of said carriage means;
- said carriage means comprising a pair of horizontal parallel rail means unconnected at a first end of said pair of rail means;
- said support means being mounted adjacent a second end of said pair of rail means;
- said support means comprising:
- a. harness connection means for connecting said support means to said harness means; and
- b. vertical adjustment means, including a fixed upper portion of said vertical adjustment means parallel with said pair of rail means, for controlling the height of said harness connection means; and
- said harness connection means comprising:
- a. horizontally-disposed "Y"-shaped connection means for holding said harness means above both shoulders of the patient and including a foot end and a pair of arm ends;
- b. said foot end of said "Y"-shaped connection means is rigidly and fixedly attached to said upper portion of said vertical adjustment means; and
- c. said arm ends of said "Y"-shaped connection means are each removably connected to said harness means.

5,569,130

## ROWING MACHINE

Leao Wang, and Peter Wu, both of Taichung Hsien, Taiwan, assignors to Greenmaster Industrial Corp., Taichung Hsien, Taiwan

Filed Sep. 8, 1995, Ser. No. 525,018  
Int. Cl.<sup>6</sup> A63B 69/05

U.S. Cl. 482—96

4 Claims

1. A rowing machine comprising:
- a) two parallel main frames, each main frame including a straight section for engaging a support surface, the straight section having a front portion, a rear end, and a front section extending substantially vertically from the front portion;
- b) a first tube secured to and extending between the rear ends of the straight sections of the main frames;
- c) an action column including a front end, a rear end and a bottom notch, the front end of the action column being pivotally attached between the front sections of the main

5,569,129

## DEVICE FOR PATIENT GAIT TRAINING

Amir Seif-Naraghi, Scottsdale; David L. Dilli; Stephen C. D'Luzansky, both of Phoenix, and Richard M. Herman, Scottsdale, all of Ariz., assignors to Mobility Research L.L.C., Tempe, Ariz.

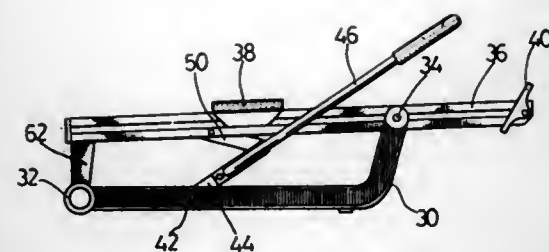
Filed Jun. 10, 1994, Ser. No. 258,346  
Int. Cl.<sup>6</sup> A61H 3/04

U.S. Cl. 482—69

13 Claims

1. In a unitary device for use in partial weight bearing gait training of a patient,
- a. harness means completely surrounding an upper body portion of the patient and holding the patient in a vertically upright





frames at the tops thereof, the action column further including a pair of lateral sides, each lateral side having an elongated groove, a seat slidably engaged within the grooves and a pair of pedals mounted at the front end of the action column on opposite sides thereof;

- d) a second tube pivotally connected to and extending between the straight portions of the main frame, the second tube including a middle section;
- e) a link including a first end and a second end, the first end of the link being pivotally secured to the middle section of the second tube to dispose the link at a right angle with respect to the second tube, the second end of the link including a U-shaped positioning piece;
- f) a pair of rowing bars rigidly secured to opposite sides of the link;
- g) a support bar including a first end and a second end, the first end of the support bar being pivotally secured to the U-shaped positioning piece and the second end of the support bar being configured in a cylindrical-shaped body pivotally secured within the bottom notch of the action column so that the link extends forwardly from the second tube towards the front end of the action column and the support bar extends rearwardly from the positioning piece towards the bottom notch of the action column; and
- h) whereby when the feet of the user are pressed against the pedals and the user pulls the rowing bars upwardly and rearwardly, the pivotal movements of the link and the support bar with respect to the main frames and the action column causes the rear end of the action column to be raised, thus pivoting the action column at the pivot connection between the main frames to simulate a rowing motion.

5,569,131

## CHILD'S HOPPING TOY

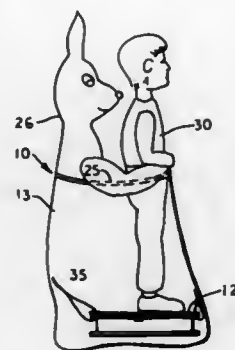
Jo A. Giulianielli, 635 Downing Ct., Erie, Pa. 16502

Filed Nov. 27, 1995, Ser. No. 562,700

Int. Cl.<sup>6</sup> A63H 7/00

U.S. Cl. 482-77

2 Claims



1. A child's hopping toy comprising a platform, a base and a resilient means for resiliently spacing apart said platform and said base;

- a sack having an open top;
- said sack being sized so that a child may sand inside with said open top reaching the waist of a child;
- a means for attaching said sack to said platform;

a ring, like a hula-hoop is attached to said open top of said sack for a child to hold onto while hopping;

a part of an inflated animal like body is attached to said sack and supported on said platform providing a space for a child to stand on said platform in said ring in front of said animal-like body;

the animal like body has arms that extend forwardly along the circumference of the ring, providing protection for a child and providing stability for a child.

5,569,132

## FOLDABLE HORSE RIDING TYPE EXERCISER

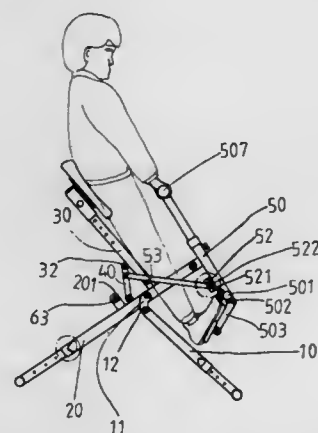
Tien-Lai Wu, 58, Ma Yuan West St., Taichung, Taiwan

Filed Mar. 6, 1995, Ser. No. 405,821

Int. Cl.<sup>6</sup> A63B 69/06

U.S. Cl. 482-96

1 Claim



1. A foldable exerciser comprising a stable base member including first and second inclined beams, said first inclined beam including a rear and lower portion adapted to rest on a support surface, a front and upper portion, and a middle portion having ear members provided thereon which supports a support rod, said second inclined beam including a front and lower portion adapted to rest on a support surface, and a rear and upper portion pivotally coupled to said middle portion of said first inclined beam, securing means for securing said rear and upper portion of said second inclined beam to said first inclined beam so as to form said stable base, a seat post, including a first end pivotally coupled to said middle portion of said first inclined beam and including a bottom surface, said seat post being supported by said support rod to thereby suspend said seat post in a substantially horizontal elevation above said first inclined beam, a link, including a lower end pivotally coupled to said middle portion of said first inclined beam and including an upper end having a roller rotatably secured thereon for rollable engagement with said bottom surface of said seat post so as to elevate said seat post when said link is rotated in a clockwise direction, said link including a middle portion, a handle including a middle portion pivotally coupled to said front and upper portion of said first inclined beam and including a lower portion having a foot support means secured thereto, a lever including a first end pivotally coupled to said middle portion of said link and including a second end, pivot shaft means pivotally coupling said second end of said lever to said lower portion of said handle, said first inclined beam being rotatably displaceable when said handle and said first and second inclined beams are shortened to a shortest configuration, and

wherein said support rod is disengaged from said ears in order to fold said seat post to engage with said first inclined beam, said pivot shaft means is disengaged from said second end of said lever, said handle is rotated relative to said first inclined beam, said securing means is disengaged from said first and second inclined beams, and said second inclined beam is folded to a position substantially aligned with said first inclined beam, and whereby said foldable exerciser is folded to a compact configuration to be stored and transported.

5,569,133

## SQUAT EXERCISE APPARATUS

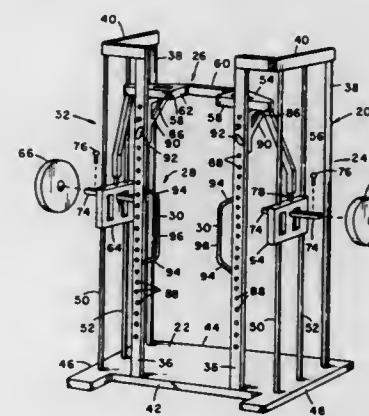
Larry W. Vittone, Rt. 1, Box 55, Hurley, Wis. 54534

Filed Dec. 7, 1994, Ser. No. 350,534

Int. Cl.<sup>6</sup> A63B 21/06

U.S. Cl. 482-98

4 Claims



1. An exercise apparatus for use when performing a squat exercise wherein a user moves between a standing position and a squat position as he maintains his balance over his feet, the apparatus comprising:

- resistance means supportable by the user for providing a resistance force in opposition to attempted movement of the user between the standing position and the squat position during a squat exercise wherein the resistance means includes a yoke assembly positionable about the neck of the user and to which the resistance force is applied so that as the user moves between a standing position and a squat position, the yoke assembly is moved between raised and lowered positions;
- a base platform including a front;
- guideway-providing means associated with the base platform for guiding and confining movement of the yoke assembly along a substantially vertical path as the user moves between the standing and the squat positions, the guideway-providing means includes at least two vertically-disposed rods between which the yoke assembly is positioned and wherein the two rods are spaced from one another to accommodate a forward and rearward shift of the yoke assembly relative to the base platform between forward and rearward limits of travel as the user moves between the standing and the squat positions during a squat exercise;
- at least one post mounted upon the platform so as to extend generally upwardly therefrom;
- grip means connected to the post capable of being gripped by the hands of the user throughout the performance of the squat exercise so that as the user moves between the standing position and the squat position, the grip means stabilize the user and thereby help the user to maintain his balance over his feet; and
- the yoke assembly includes a horizontally-disposed portion positionable across the neck of the user and carriage member portions secured to the guideways for slidable movement therealong, and the yoke assembly includes a ball joint assembly joining the horizontally-disposed portion to the carriage

members to accommodate a pivotal shift of the horizontally-disposed portion relative to the carriage members during use of the apparatus.

5,569,134

## COLLAPSIBLE HULA HOOP

Synnove Nordanger, Slettevikvn. 37, N-5085 Morvik, Norway

Continuation of Ser. No. 768,565, Nov. 1, 1991, abandoned.

This application Nov. 10, 1994, Ser. No. 337,314

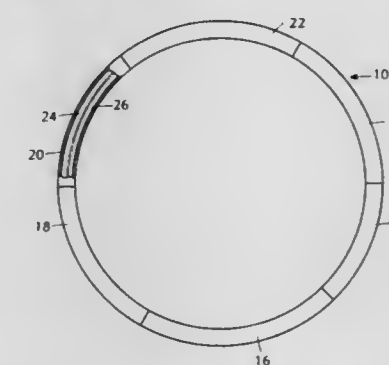
Claims priority, application Norway, May 2, 1989, 891806;

WIPO, Apr. 18, 1990, PCT/NO90/00066

Int. Cl.<sup>6</sup> A63H 33/02

U.S. Cl. 482-110

4 Claims



1. A collapsible hula hoop comprising a plurality of extruded plastic tube sections, each tube section being sized to be bent from a straight shape into an arcuate shape and having one end with a predetermined outside diameter;
- a plurality of injection molded connecting joints, each joint being of stiffer material than said tube sections and each joint interconnecting adjacent ends of a respective pair of said tube sections with said tube sections being disposed in an assembled hoop shape, each connecting joint being separately secured in said one end of a respective tube section and slidably received in one end of an adjacent tube section in said assembled hoop shape, each connecting joint having a radially directed flange having an outside diameter equal to said outside diameter of said one of a respective tube section.

5,569,135

## PULLING EXERCISER

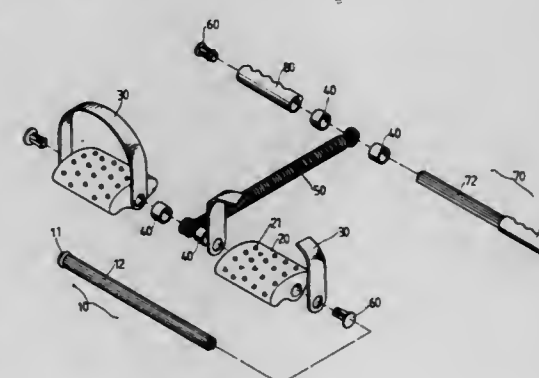
Tseng-Cheng Chen, P.O. Box 82-144, Taipei, Taiwan

Filed Dec. 20, 1995, Ser. No. 575,390

Int. Cl.<sup>6</sup> A63B 21/02

U.S. Cl. 482-125

1 Claim



1. A pulling exerciser comprising:

- a foot bar having a head at one end, a plurality of outside longitudinal ribs raised from an outside wall thereof, a plurality of inside longitudinal ribs raised from an inside wall thereof, and a plurality of recessed portions spaced around the inside wall near one end remote from said head;
- a handlebar having a fixed handgrip at one end, a plurality of outside longitudinal ribs raised from an outside wall thereof, a plurality of inside longitudinal ribs raised from an inside wall thereof, and a plurality of recessed portions spaced around the inside wall near one end remote from said head;
- a tubular handgrip sleeved onto the outside longitudinal ribs of said handlebar;
- a spring having a first end connected to said foot bar and a second end connected to said handlebar;
- two foot plates respectively mounted around said foot bar, each foot plate having a plurality of raised portions for massaging the foot;
- a first end cap fastened to one end of said handlebar remote from said fixed handgrip to secure said tubular handgrip in place, said first end cap comprising a plurality of longitudinal grooves engaged with the inside longitudinal ribs of said handlebar, a plurality of hinged split strips spaced between the longitudinal grooves of said first end cap, and a plurality of raised portions respectively raised from each split strip of said first end cap and engaged with the recessed portions of said handlebar;
- a second end cap fastened to one end of said foot bar remote from its head to secure said foot plates in place, said second end cap comprising a plurality of longitudinal grooves engaged with the inside longitudinal ribs of said foot bar, a plurality of hinged split strips spaced between the longitudinal grooves of said second end cap, and a plurality of raised portions respectively raised from each split strip of said second end cap and engaged with the recessed portions of said foot bar;
- a first pair of friction rings respectively mounted around said handlebar and stopped at two opposite sides by the second end of said spring between said tubular handgrip and said fixed handgrip; and
- a second pair of friction rings respectively mounted around said foot bar and stopped at two opposite sides by the first end of said spring between said foot plates.

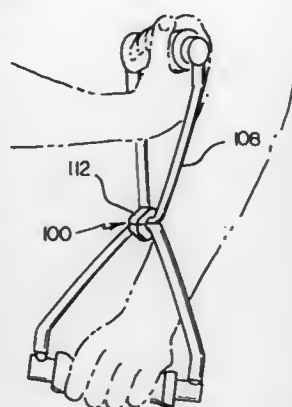
5,569,136

## PORTABLE FOREARM EXERCISING DEVICE

William S. Holten, 1000 Lincoln St., Maryville, Ill. 62062  
Continuation-in-part of Ser. No. 177,522, Jan. 4, 1994, abandoned. This application Dec. 22, 1994, Ser. No. 362,840  
Int. Cl.<sup>6</sup> A63B 21/055

U.S. Cl. 482—126

1 Claim



1. A new and improved portable forearm exercising device for developing and strengthening a group of forearm muscles important to sports activities requiring swinging motion such as baseball,

tennis, golf, and the like, the portable forearm exercising device comprising, in combination:

a first functional assembly being in cooperative interconnected relationship with a second functional assembly, the second functional assembly being identical to the first functional assembly, the first and second functional assemblies each comprising:

an elongated hand grip, each hand grip including a shaft formed in a generally cylindrical configuration with two end segments, each end segment having a smaller diameter than the remainder of the shaft and including a plurality of external screw threads, an inner sleeve formed in a hollow generally cylindrical configuration, the sleeve having a slightly larger diameter than the shaft, the sleeve being positioned around the shaft between the end segments, the configuration and positioning of the sleeve permitting circular rotation around the shaft, hand cushioning means being fabricated of a resilient material and affixed around the sleeve, the hand cushioning means having thick end regions and a thick central region therebetween, the thickness gradually decreasing from the region to each end region, the hand cushioning means providing the user with increased comfort and control of the hand grip during vigorous manipulation of the device particularly when the user's hands become slippery with perspiration;

an elastic resistance element for each hand grip, the resistance element being fabricated of an elastic material and formed in a hollow tubular configuration with two open ends, the resistance element including coupling means adjacent to each open end;

an attachment device for coupling the free ends of each attachment device having a large segment and a small segment extending generally transverse the large segment; the large segment formed in a generally cylindrical configuration with a bore at one end, the bore including a plurality of internal screw threads, the bore adapted to be coupled to the end segments of each shaft such that the small segment of each attachment device extends generally transverse the length of the hand grip, the small segment of the attachment device being formed in a generally cylindrical configuration with generally discoid shaped coupling means affixed thereto, the small segment adapted to be positioned within the coupling means of the open ends of each resistance element; and

a coupling ring formed in a generally circular configuration, the ring comprising two identical generally semi circular shaped portions, each portion having two end regions and a rounded middle region therebetween, the end regions each having a circular aperture extending therethrough, the portions being coupled together with nuts and bolts through their aligned apertures whereby the user may loosen or tighten the ring to ensure that the ring remains in position along each resistance element, the ring being positioned around the approximate center point of each elastic resistance element thereby coupling them together, the ring coupling the functional assemblies together during operation and use such that a user may grasp the hand grip of the first functional assembly with one hand while simultaneously grasping the hand grip of the second functional assembly with the other hand, the user thereby obtaining a repeatable amount of resistance to specific muscle activity, the specific muscles exercised being determined by an exercise routine.

5,569,137

## EXERCISER

Samuel Uen, No. 102, Kuo Chung Road, Ta-Li City, Taichung Hsien, Taiwan

Filed Jan. 17, 1996, Ser. No. 583,738

Int. Cl.<sup>6</sup> A63B 21/02

U.S. Cl. 482—126

7 Claims

1. An exerciser comprising:

a flexible hollow resilient member with a predetermined length, two sleeve members being respectively secured at two ends of



the resilient member, the resilient member being wrapped by a soft cushion member;

two hollow grips secured at two ends of the resilient member, the interiors of the grips being communicated with the interior of the resilient member, one end of each grip adjacent to the resilient member being formed with a fitting section for fitting around the sleeve member; and

an elastic rope passed through the resilient member and the grips, in an unextended state, the length of the elastic rope being longer than the total length of the resilient member and the grips, two stopper bodies being secured at two ends of the elastic rope for preventing the grips and the resilient member from detaching from the elastic rope.

5,569,138

## MULTI-PURPOSE EXERCISING APPARATUS

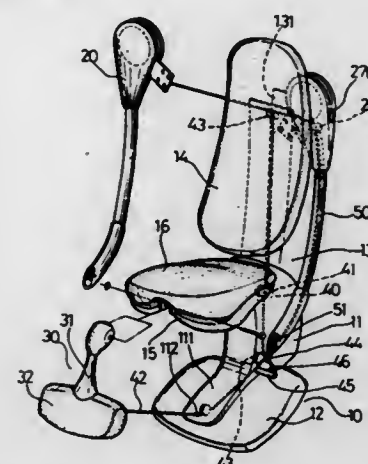
Leao Wang, and Peter Wu, both of Taichung Hsien, Taiwan, assignors to Greenmaster Industrial Corp., Taichung Hsien, Taiwan

Filed Jun. 5, 1995, Ser. No. 463,285

Int. Cl.<sup>6</sup> A63B 21/02

U.S. Cl. 482—130

4 Claims



1. A multi-purpose exercising apparatus comprising:
- a mounting base having a securing base with a curved top surface disposed at a bottom side of a hollow body thereof, said body having a backrest tubular body upwardly and vertically disposed at a top portion thereof and a backrest firmly secured to said tubular body, a seat cushion being horizontally mounted at a pre-determined height in front of said body of said mounting base, and a tensile arm being pivotally disposed below said seat cushion at a front edge thereof, said tensile arm having a cushion disposed at a front end of an arm thereof;
- two adjusting mechanisms, each of said adjusting mechanisms consisting of a brake device, a locking means, a limiting device, a control device and a shell body, said brake device having a disc body with one side thereof extending to form a securing plate for locking firmly onto a wall of said tubular body, said limiting device being pivotally provided with a pulley set at a rear side of a plate body near its bottom end, a connecting tube extending from a bottom edge of said plate body below said pulley set, said connecting tube having a bottom end thereof fixedly connected to one of two support arms;
- a damping device consisting of a revolving shaft provided at a suitable position of a wall of said tubular body, three resilient

5,569,139

## COUNTER COMPRESSIVE FORCE EXERCISE MACHINE

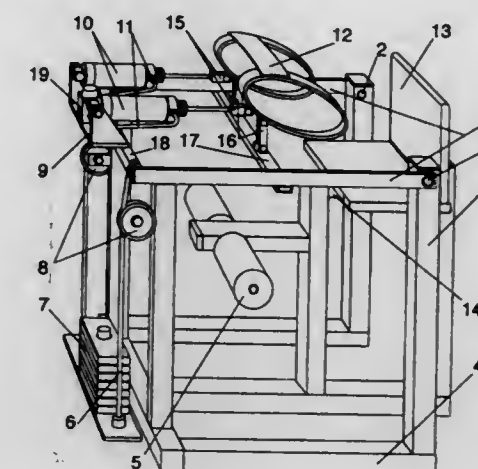
Richard Cive, 320 Lambert Rd., Orange, Conn. 06477, and Victor Cive, 248 Walnut St., Willimantic, Conn. 06226

Filed Jan. 11, 1995, Ser. No. 371,114

Int. Cl.<sup>6</sup> A63B 21/00; 23/02

U.S. Cl. 482—137

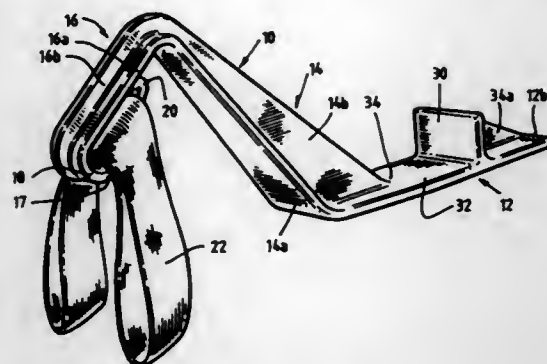
1 Claim



1. An exercise machine comprising:
- a frame;
- a pivot arm pivotally coupled to said frame by a pivot means;
- a support means attached to said frame adjacent said pivot means adapted to support and position a subject in a seated position;
- said support means including a seat;
- an exercise resistance means coupled to said pivot arm for resisting pivotal motion of said pivot arm about said pivot means;
- a body interface means pivotally coupled to said pivot arm, said body interface means adapted to engage the subject's upper torso;
- a counter compressive force device means mounted to said pivot arm producing a force on said body interface means directed away from said pivot means toward said opposite end of said pivot arm;
- said body interface means being pivotally coupled to said counter compressive force device means;
- whereby the counter compressive force device means imparts a tractive force on the subject's torso as the subject exercises against resistance to pivotal motion of the pivot arm.



**5,569,140**  
**EXERCISE DEVICE**  
 Andrew P. Elliman, Victoria, Australia, assignor to Great Southern Co. Proprietary Limited, West Brunswick, Australia  
 Filed Jun. 1, 1995, Ser. No. 457,358  
 Int. Cl.<sup>6</sup> A63B 23/02  
 U.S. Cl. 482—140 14 Claims



1. An exercise device for installing between a bottom edge of a door and a floor, comprising:  
 a base section in use disposed on the floor;  
 an outwardly extending section extending outwardly from the base section;  
 a body support portion coupled to the outwardly extending section for supporting a body support so that part of a person's body can be supported by the body support;  
 an abutment member extending from the base;  
 a space between the abutment member and the outwardly extending section; and  
 wherein the exercise device is adapted to be supported by the door by sliding the exercise device relative to the bottom edge of the door so that the door is arranged above the base section in the space between the abutment member and the outwardly extending section, the outwardly extending section extends outwardly from a point adjacent the bottom edge of the door and the abutment member engages the door to support the device when a person exercises.

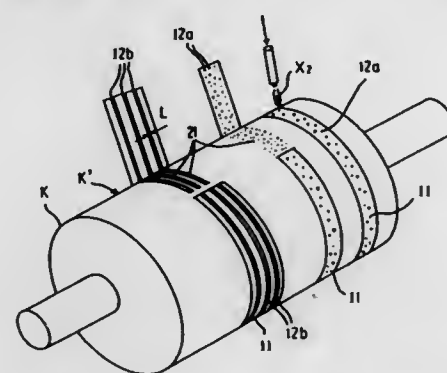
**5,569,141**  
**INVERSION PRACTICE EXERCISER**  
 Chen-chang Chou, No. 9, Chingchuan Rd., Taya Hsiang, Tai-chung Hsien, Taiwan  
 Filed Nov. 3, 1995, Ser. No. 552,721  
 Int. Cl.<sup>6</sup> A63B 23/00

U.S. Cl. 482—144 3 Claims  
 1. An inversion practice exerciser comprising:  
 a base member (10) including a horizontal beam (12) having two distal ends, and two side beams (14) each attached to a corresponding one of the two distal ends of said horizontal beam (12);  
 a pair of handgrip members (40) substantially inverted U-shaped in section each having a first distal end (41) fixedly mounted on a corresponding one of said two side beams (14) and a second distal end (42) supported on the ground;  
 a pair of upright members (20) vertically mounted on said base member (10) and each including a lower post (21) having a lower end portion slidably mounted on said horizontal beam (12) and an upper end portion, and an upper post (22) having a lower end portion pivotally engaged with the upper end portion of said lower post (21) and an upper end portion;  
 a pair of shoulder supporting members (30) each laterally and fixedly mounted on a corresponding one of the two upper posts (22) and each having a first buffer pad (33) mounted thereon in a horizontal manner; and  
 a pair of second buffer pad (27) each mounted on a corresponding one of the two upper posts (22).

**5,569,142**  
**CENTER ROLL IN THE PRESS OF A PAPER MACHINE**  
 Jorma Snellman, Jyväskylä, Finland, assignor to Valmet Corporation, Helsinki, Finland  
 Division of Ser. No. 249,844, May 26, 1994, Pat. No. 5,456,946, which is a continuation of Ser. No. 46,458, Apr. 12, 1993, abandoned. This application May 18, 1995, Ser. No. 443,467  
 Claims priority, application Finland, Apr. 14, 1992, 921680  
 Int. Cl.<sup>6</sup> B23P 15/00

U.S. Cl. 492—56

20 Claims



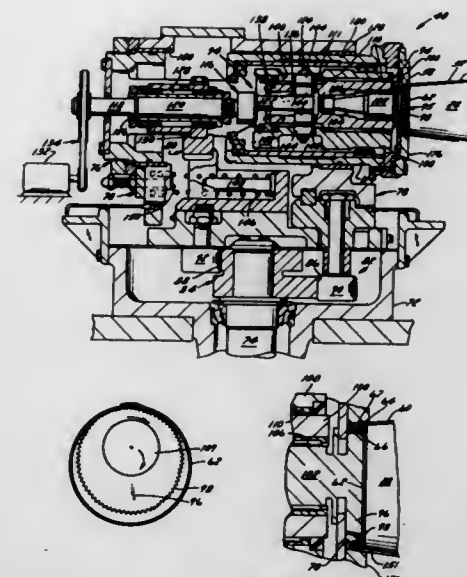
1. A center roll having a roll face of a ceramic or metal-ceramic base material having a web-contacting surface, a first region of the web-contacting surface being coated by applying a coating agent thereto, and a second region of the web-contacting surface being maintained in an uncoated state such that desired adhesion properties of a paper web or board running over the web-contacting surface are obtained, the coating agent comprising a polymer absorbed into the ceramic or metal-ceramic base material.

**5,569,143**  
**CUP BOTTOM FINISHING STATION FOR A CUP MAKING MACHINE**  
 Daryl R. Konzal, Wauwatosa, Wis., assignor to Paper Machinery Corporation, Milwaukee, Wis.  
 Filed Sep. 15, 1994, Ser. No. 306,812  
 Int. Cl.<sup>6</sup> B31B 1/32

U.S. Cl. 493—109

25 Claims

20. A method for radially transferring a cup bottom finisher wheel towards an adjacent abutment wall to squeeze a bottom



blank of a cup against a sidewall blank of a cup for sealing it thereto, comprising the steps of:  
 mounting a cup bottom finisher wheel to a rotatable inner component at a position radially offset from the axial centerline of the inner component;  
 rotatably mounting the rotatable inner component to a rotatable outer component at a position radially offset from the axial centerline of the outer component; and  
 rotating the inner component with respect to the outer component to move the cup bottom finisher wheel radially outward.

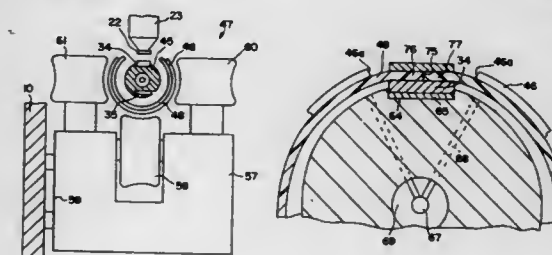
**5,569,144**  
**PROCESS FOR THE PRODUCTION OF TUBE BODIES FOR PACKAGING TUBES**

Bernhard A. Schwyn, Luzern, Switzerland, assignor to KMK Karl Magerie Lizenz AG, Zug, Switzerland  
 PCT No. PCT/CH93/00211, § 371 Date Jun. 27, 1994, § 102(e) Date Jun. 27, 1994, PCT Pub. No. WO94/04343, PCT Pub. Date Mar. 3, 1994

PCT Filed Aug. 25, 1993, Ser. No. 232,044  
 Claims priority, application Switzerland, Aug. 26, 1992, 2641/92-3

Int. Cl.<sup>6</sup> B29C 53/50; 53/54  
 U.S. Cl. 493—302

12 Claims



1. A process for the production of tubular bodies, comprising the steps of:  
 providing a foil formed from a weldable plastic material, said step of providing including providing said foil in web form, said foil having an upper surface and longitudinally extending edges having edge portions, wherein said edge portions have shapes which allow for their fusing together via the application of pressure in a plane substantially parallel to a tangent to said periphery of said tubular body along with the application of heat, said shapes comprising said edge portions having faces extending substantially perpendicular to said upper surface;

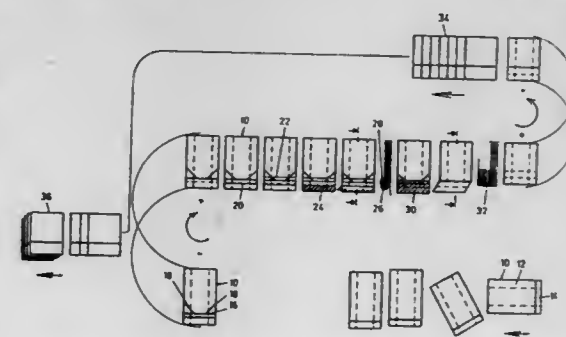
shaping said foil into a tubular body having a periphery by abutting said edge portions against each other, said step of shaping performed via a shaping element, a shaping belt member and a mandrel, whereby said foil is laid around said mandrel; and  
 applying pressure in a direction substantially parallel to a tangent to said periphery in an area of said edge portions and applying heat to said edge portions, said step of applying including fusing together said faces of said edge portions and forming a welded seam while said foil is in the shape of said tubular body.

**5,569,145**  
**METHOD AND APPARATUS FOR MANUFACTURING A SACK BOTTOM**  
 Fritz Achelpohl, Lienen, and Richard Feldkämper, Lengerich, both of Germany, assignors to Windmoller & Holscher, Lengerich, Germany  
 Filed Aug. 3, 1994, Ser. No. 285,468

Claims priority, application Germany, Aug. 4, 1993, 43 26 188.4

Int. Cl.<sup>6</sup> B31B 21/00  
 U.S. Cl. 493—240

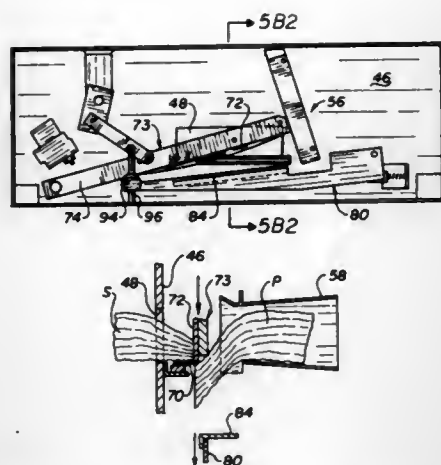
6 Claims



1. In a method for manufacturing a bag or sack bottom comprising the steps of:  
 a) feeding multilayer tubular sections in a feeding plane,  
 b) sealing predetermined sealing seams,  
 c) separating the tubular sections into individual units in a separating station, and  
 d) feeding the tubular sections to a packaging station;  
 an improvement comprising the steps of:  
 e) inverting the tubular sections, feeding the tubular sections parallel to the feeding plane into a processing plane, and scoring, gluing and folding an end of each of the tubular sections being fed in said processing plane; and  
 f) again inverting the tubular sections, each of which is now closed at said end, and conveying the tubular sections parallel to the feeding plane through a pressing section in an overlapping manner with each other.

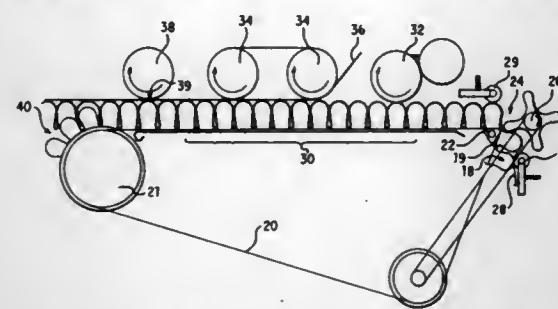
**5,569,146**  
**CUSHIONING CONVERSION MACHINE INCLUDING A CUTTING/ALIGNING ASSEMBLY**  
 James A. Simmons, Painesville Township, Ohio, assignor to Ranpak Corp., Concord Township, Ohio  
 Filed Jan. 28, 1994, Ser. No. 188,305

Int. Cl.<sup>6</sup> B65H 35/06  
 U.S. Cl. 493—352 20 Claims  
 1. A cushioning conversion machine for converting stock material into a cut section of dunnage, the machine comprising a frame, conversion assemblies, and a cutting/alignment assembly; the conversion assemblies being positioned upstream of the cutting/alignment assembly and converting the stock material into a dunnage strip;



the frame having a dunnage outlet opening through which the dunnage strip emerges;  
the cutting/alignment assembly being mounted on the frame adjacent the outlet opening and including a blade unit and an automatic alignment device;  
the blade unit traveling between a rest position and a cutting position whereby it cuts the dunnage strip into a cut section of dunnage;  
the automatic alignment device automatically aligning the cut section with the outlet opening as the blade unit is moved from the cutting position to the rest position; and  
the automatic alignment device being unattached to the blade unit yet traveling therewith as the blade travels between the rest position and the cutting position during jam-free operation of the cushioning conversion machine.

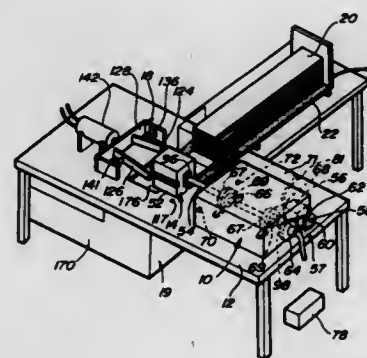
**5,569,147**  
**METHOD AND DEVICE TO PRODUCE CORRUGATED STRIP PACKAGING PARTS**  
Joachim Erhard-Hollmann, Wiesbaden, Germany, assignor to Alpha Industrie Design GmbH, Wiesbaden, Germany  
Filed Nov. 1, 1993, Ser. No. 144,251  
Claims priority, application Germany, Nov. 2, 1992, 42 36 981.9; Switzerland, Apr. 16, 1993, 01165/93  
Int. Cl.<sup>6</sup> B65H 45/30; B31F 1/28; 1/24  
U.S. Cl. 493-423 **26 Claims**



1. A method for producing corrugated strip packaging parts, comprising the steps of:  
continuously feeding a first strip of packaging material to a longitudinal form tool;  
pressing the strip of packaging material into a space between two elongated, parallel and separated form bodies of a continuous sequence of such form bodies using the longitudinal form tool, said pressing step comprising winding the length of material around cylindrically shaped sides of the form bodies that are facing the material to form lower loops of corrugations of a corrugated strip, and rerouting the length of material around a tip of the form tool to form upper loops of the corrugations of the corrugated strip;

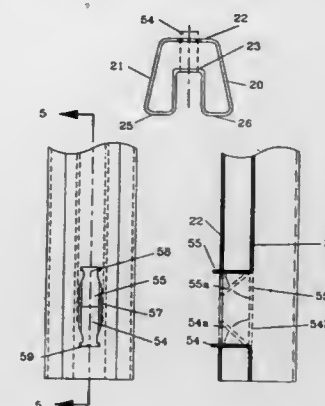
removing the form tool from the space between the form bodies while leaving the strip of packaging material in the space between adjacent form bodies;  
pushing the upper loops of the corrugated strip together crosswise to the direction of the corrugations such that the upper loops are narrowed;  
fixing the lower loops of the corrugated strip on a carrier sheet after the upper loops have been pushed together;  
consecutively removing the form bodies from the corrugated strip;  
dividing the strip into individual corrugated strip packaging parts; and  
supporting the upper loops of the corrugated strips, during the step of pushing the upper loops of the corrugated strip together, at least in the area of a summit of the upper loops, by means of external side surfaces of the form bodies;  
wherein the step of pushing the upper loops together comprises surrounding an outside surface of the upper loops with a flexible form surface connecting the two form bodies such that a summit curvature of the upper loops in a pushed together state of the upper loops is determined by said flexible form surface.

**5,569,148**  
**METHOD AND APPARATUS FOR MANUFACTURING PALLET SPACERS**  
Brian R. LaFreniere, Lambertville, Mich.; Dick L. Cardwell, Holland, Ohio, and George A. Spillon, Monroe, Mich., assignors to Bay Corrugated Container, Inc., Monroe, Mich.  
Continuation-in-part of Ser. No. 980,533, Nov. 23, 1992, abandoned. This application Jan. 12, 1994, Ser. No. 180,222  
Int. Cl.<sup>6</sup> B65H 45/04  
U.S. Cl. 493-462 **14 Claims**



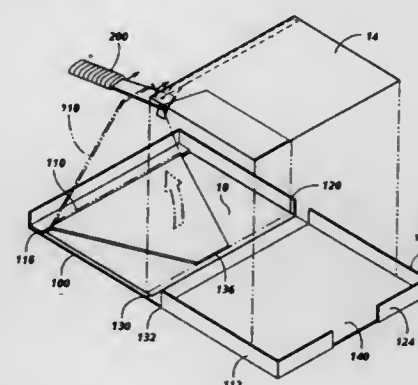
1. An apparatus for forming a pallet spacer from a one-piece blank, the one piece blank having at least a first end and a second opposite end and support segment disposed therebetween, the apparatus comprising:  
a base;  
a rotating mandrel mounted on said base for wrapping said one-piece blank around said mandrel forming a spiral shape, said rotating mandrel assembly including a selective engagement means for gripping said first end of said one-piece blank and wrapping said one-piece blank around said mandrel said support segment including a retention segment disposed between said first and second ends, said retention segment defining a retention aperture, said second end including a cut-out flange having a hinge, said rotating mandrel rotatable such that said retention aperture is registered directly adjacent said cutout flange;  
a punch for pushing said cut-out flange into said retention aperture thereby retaining said one-piece blank in a coiled shape forming a pallet spacer; and  
a stripper for removing said pallet spacer from said rotating mandrel assembly.

**5,569,149**  
**END LOCK MAGAZINE FOR SEMICONDUCTOR DEVICES**  
Jay R. Sedita, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.  
Division of Ser. No. 113,622, Aug. 30, 1993, Pat. No. 5,417,842. This application Apr. 18, 1995, Ser. No. 423,195  
Int. Cl.<sup>6</sup> B65D 73/02  
U.S. Cl. 493-466 **3 Claims**



1. A method for making a locking tab in the end of a magazine in which semiconductor devices are shipped and stored, said magazine including a channel in which semiconductor devices are placed and at least a top wall, and a bottom wall on which the semiconductor devices are placed, including the steps of:  
forming a first bendable tab in either one of said top or bottom walls;  
forming a second bendable tab adjacent said first tab;  
forming an opening in either of said top or bottom walls in which said first and second tabs are not formed, said opening having first and second reduced sections adjacent opposite ends of the opening, said first reduced section for holding said first tab in a first locked position, said second reduced section for holding said second tab in a second locked position.

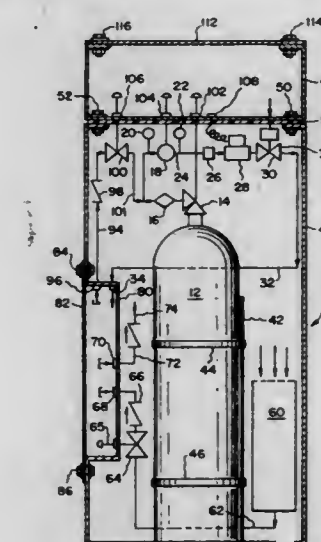
**5,569,150**  
**ASSEMBLY APPARATUS**  
Sharon G. Pane, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.  
Filed Nov. 25, 1994, Ser. No. 345,034  
Int. Cl.<sup>6</sup> B42F 7/02  
U.S. Cl. 493-480 **1 Claim**



1. An apparatus for assembling a two piece folder having a front panel hinged to a rear panel, comprising:  
a first cover having at least one registration edge for registering the front panel in a registration position;  
a movable flap portion, attached to said first cover, for holding the front panel in the registration position; and  
a stripper for removing said pallet spacer from said rotating mandrel assembly.

a second cover hinged to said first cover, said second cover having at least one registration edge for registering the rear panel so that the rear panel is aligned to the front panel when attached to the front panel in the registration position.

**5,569,151**  
**HANDLING AND DELIVERY SYSTEM FOR DANGEROUS GASES**  
Eugene J. Karwacki, Orefield; Arron D. Varn, Macungie; Howard P. Withers, Jr., Breinigsville, and Andrew J. Woytek, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.  
Filed May 8, 1995, Ser. No. 435,077  
Int. Cl.<sup>6</sup> A62D 3/00  
U.S. Cl. 588-249 **10 Claims**

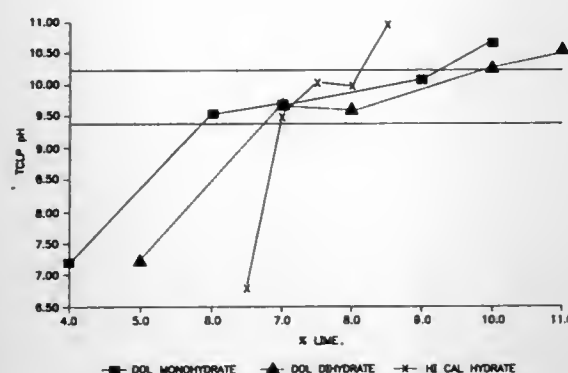


1. A system for handling and delivering dangerous gases comprising in combination:  
an outer containment vessel having a removable fluid tight cover and adapted to removably hold an inner vessel containing a volume of dangerous gas under pressure, said containment vessel having an internal volume sufficient to contain the volume of dangerous gas contained in said inner vessel without a significant increase in pressure should said dangerous gas discharge from said inner vessel;  
said inner vessel having a withdrawal valve to permit removing said gas from said inner vessel;  
means on said outer containment vessel to control removal of gas from said inner vessel;  
means in said outer containment vessel to absorb/scrub gas escaping from said inner vessel, said means including venting or evacuation of said outer vessel through said means to absorb/scrub said gas; and  
means to purge said outer containment vessel.

**5,569,152**  
**BUFFERING OF CEMENTITIOUS HAZARDOUS WASTE COMPOSITIONS CONTAINING ELECTRIC ARC FURNACE DUST**  
Charles L. Smith, Conshohocken, Pa., assignor to Conversion Systems, Inc., Horsham, Pa.  
Filed Dec. 21, 1994, Ser. No. 360,281  
Int. Cl.<sup>6</sup> A62D 3/00; B09B 3/00; C04B 7/28  
U.S. Cl. 588-256 **28 Claims**

1. A buffered hazardous waste composition comprising EAFD, sufficient water to react with said EAFD and dolomitic lime in an amount sufficient to: (a) achieve a magnesium oxide equivalents





concentration in said waste composition of at least 0.5%, measured on a wet weight basis and (b) maintain said waste composition within a pH range of 8.5-11.5 which reduces heavy metal ion solubility in water after acid exposure.

28. In a method of stabilizing a hazardous waste containing EAFD including forming a mixture of EAFD and water, the improvement comprising including in said mixture a buffering agent comprising dolomitic lime.

5,569,153

#### METHOD OF IMMOBILIZING TOXIC WASTE MATERIALS AND RESULTANT PRODUCTS

William A. Mallo, Helotes, and Robert D. Young, San Antonio, both of Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Mar. 1, 1995, Ser. No. 396,968

Int. Cl.<sup>6</sup> A62D 3/00; G21F 9/34

U.S. Cl. 588—256 18 Claims

1. A method of immobilizing toxic waste material slurries comprising:

- forming a cured aggregate by:
  - admixing a pozzolana, a calcium hydroxide-containing material, hydrothermal cement reactant, hydraulic cement, and said toxic waste material slurry with additional liquid, if required, to form a mixture of moldable consistency;
  - molding the mixture into a shape;
  - curing the shape; and
  - forming the cured shape into aggregates;
- admixing the aggregate with a molten sulfur cement, a pozzolana, and sand to form a mortar having the cured aggregate imbedded in the sulfur cement; and
- hardening the mixture into a solid mass.

16. An immobilized toxic waste material aggregate comprising a cured composition comprising a pozzolanic cement, hydrothermal cement reactant, hydraulic cement, and toxic waste material.

5,569,154

#### METHOD AND APPARATUS FOR REMOVING MERCURY FROM MERCURY-CONTAMINATED SOILS

Michael S. Navetta, 1216 Harper Pl., Knoxville, Tenn. 37922

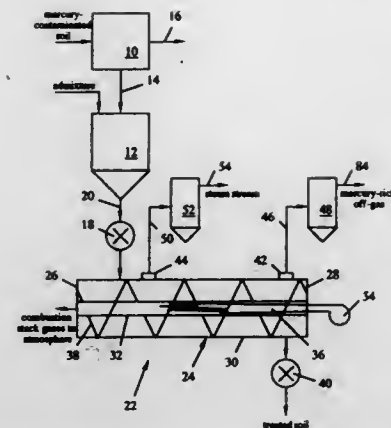
Filed Jun. 14, 1995, Ser. No. 490,129

Int. Cl.<sup>6</sup> C22B 43/00

U.S. Cl. 588—256 7 Claims

1. A method for the removal of mercury from soil, wherein the soil has been contaminated with mercury, the method comprising:

- adding the soil to one end of an internally fired hollow screw desorber under a vacuum in the range of from about 15 inches of mercury to about 30 inches of mercury;
- moving the soil from the one end of the internally fired hollow screw desorber to another end of the internally fired hollow screw desorber;
- increasing the temperature of the soil in the internally fired hollow screw desorber as it moves from the one end of the



internally fired hollow screw desorber to the other end of the internally fired hollow screw desorber, wherein the temperature of the soil is increased from a temperature in the range of from about ambient to about 150° F. to a temperature in the range of from about 1100° F. to about 1500° F.;

- producing a mercury vapor in the internally fired hollow screw desorber;
- removing the soil from the other end of the internally fired hollow screw desorber;
- removing the mercury vapor from the internally fired hollow screw desorber; and
- recovering mercury from the mercury vapor.

5,569,155

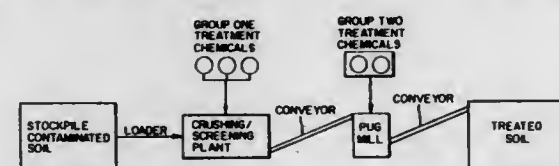
#### FIXATION AND STABILIZATION OF METALS IN CONTAMINATED MATERIALS

Dhiraj Pal, Chicago Heights, and Karl W. Yost, Crete, both of Ill., assignors to Severson Environmental Services, Inc., Niagara Falls, N.Y.

Continuation of Ser. No. 31,461, Mar. 15, 1993, which is a continuation-in-part of Ser. No. 721,935, Jul. 23, 1991, Pat. No. 5,193,936, which is a continuation-in-part of Ser. No. 494,774, Mar. 16, 1990, abandoned. This application May 12, 1995, Ser. No. 440,565

Int. Cl.<sup>6</sup> A62D 3/00; B09B 3/00

U.S. Cl. 588—256 30 Claims



1. A process for treating lead contaminated soils to stabilize leachable lead contained therein, said process comprising the steps of:

- mixing a contaminated soil containing leachable lead with a sulfate compound having at least one sulfate ion for reacting with said leachable lead to produce a first mixture, said first mixture containing a substantially insoluble lead compound or mineral species; and
- mixing said first mixture with a phosphate reagent having at least one phosphate ion for reacting with leachable lead remaining in said first mixture to produce a second mixture, said second mixture containing a substantially insoluble lead compound or mineral species;
- curing said second mixture for a period of time; wherein said soil so treated is substantially solid in form at the end of curing, the concentration of leachable lead is decreased below 5.0 mg/l, the volume of said contaminated soil is reduced as a result of treatment and curing, and no secondary waste streams are generated.

5,569,156

#### ELECTROHYDRAULIC VENTRICULAR ASSIST DEVICE

Tofy Mussivand, Ottawa, Canada, assignor to Ottawa Heart Institute Research Corporation, Canada

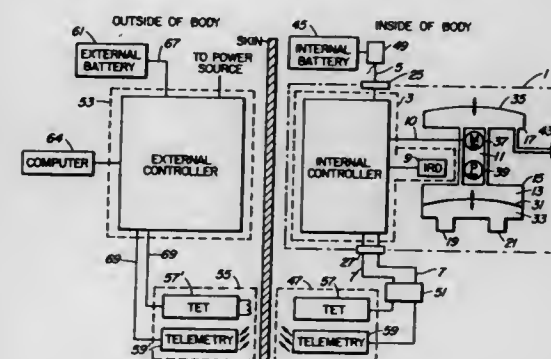
Filed Sep. 9, 1994, Ser. No. 303,766

Claims priority, application Canada, Sep. 10, 1993, 2105908; Sep. 10, 1993, 2105935

Int. Cl.<sup>6</sup> A61N 1/362

U.S. Cl. 600—16

4 Claims



1. An electrohydraulic ventricular assist device adapted for cannulation to the blood circulatory system comprising:

- unified system means adapted to be implanted in a human thorax proximal to the human heart to replace or assist a ventricle including an internal electronic controller for generating an actuating signal, a blood pumping means with an inflow blood port and an outflow blood port for cannulation to the blood circulatory system, said pumping means displacing blood through said inflow and outflow ports in response to said actuating signal and said unified system being contained within a housing the back of which has a convex surface curvature compatible with the internal human sagittal and transverse chest wall curvatures, said housing containing a support for said internal electronic controller and containing said blood pumping means in a compact structure with said inflow and outflow ports oriented away from the front of said housing, and said structure with an overall size and geometry such that when the unified system is placed within the human thorax with the back of said housing surface adjacent the chest wall, said structure does not adversely compress adjacent organs, create dead space or limit chest closure;
- rechargeable internal battery means adapted for subcutaneous implantation producing an internal supply voltage for said unified system means;
- external power supply source means for providing a DC voltage;
- external electronic controller means for converting said DC voltage received from said external power supply source to an AC supply voltage and for generating a recharge signal for said internal battery;
- transcutaneous energy transformer (TET) means for transmitting said AC supply voltage and said recharge signal across the skin to said unified system;
- first coupling means for connecting said internal battery means to said unified system means;
- second coupling means for connecting said unified system means to said transcutaneous energy transformer means to receive said AC supply voltage and for establishing a communication channel between said external controller and said unified system.

5,569,157

#### ENDOSCOPE

Masaaki Nakazawa; Hideo Ito; Koji Nakamoto; Yasuhito Kura; Seiji Kitano; Hisao Yabe, and Tatsuya Furukawa, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

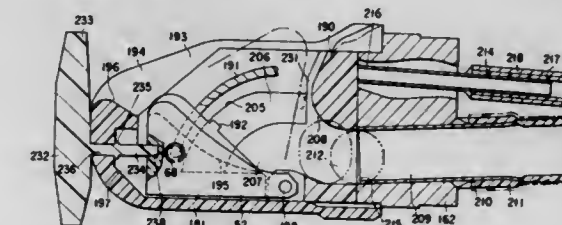
Filed May 2, 1994, Ser. No. 237,000

Claims priority, application Japan, May 7, 1993, 5-106426; May 7, 1993, 5-106990; May 10, 1993, 5-108456; May 10, 1993, 5-108509; May 7, 1993, 5-130110; May 11, 1993, 5-109570; Dec. 27, 1993, 5-333217; Dec. 27, 1993, 5-333218; Dec. 27, 1993, 5-333219; Dec. 28, 1993, 5-353932; Dec. 28, 1993, 5-354156; Dec. 28, 1993, 5-354157

Int. Cl.<sup>6</sup> A61B 1/00

U.S. Cl. 600—107

15 Claims



1. An endoscope including:

- an operating portion placed outside a living body;
- an elongated insertion portion having a proximal end portion coupled to said operating portion, a distal end portion to be inserted in the living body, and an instrument insertion channel extending through said insertion portion;
- a raising mechanism, having an operation wire, for directing a distal end portion of an instrument, caused to extend through the instrument insertion channel, to a predetermined position; and
- operation means, provided in said operating portion, for operating said operation wire, said operation means comprising:
  - a distal end body portion arranged at the distal end portion of said elongated insertion portion and incorporating observation means for observing an interior of the living body;
  - a support member for forming at least a portion of an outer surface of said distal end portion of the endoscope, said support member being detachable from said distal end body portion of said operation means;
  - a raising base which is supported on said support member such that an angle at which said raising base is arranged is adjustable;
  - wherein said operation wire has an end which is fitted in said raising base; and
  - a transmission member having an end detachably coupled to another end of said operation wire; and
  - wherein said operation means is arranged to cause said transmission member to operate said operation wire such that said operation wire adjusts an angle of said raising base.

5,569,158

#### SHIELDING STRUCTURE OF ELECTRONIC ENDOSCOPE APPARATUS

Shigeo Suzuki, and Fujio Okada, both of Omiya, Japan, assignors to Fuji Photo Optical Co. Ltd., Omiya, Japan

Filed Sep. 27, 1994, Ser. No. 313,363

Claims priority, application Japan, Oct. 15, 1993, 5-281643

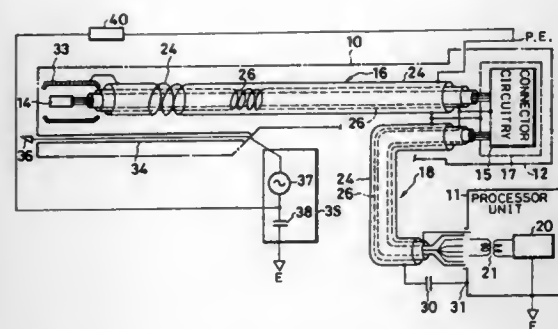
Int. Cl.<sup>6</sup> A61B 1/05

U.S. Cl. 600—110

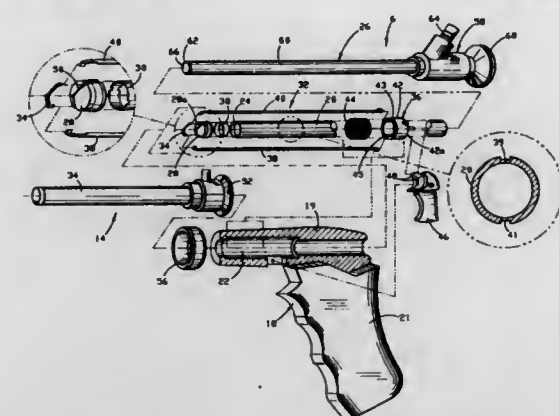
5 Claims

1. An electronic endoscope apparatus comprising:

- a signal transmission cable;
- a charge coupled device disposed at an end portion of the electronic endoscope signal transmission cable having an outer periphery;
- a processor unit having a circuit ground and a frame ground;
- an inner shield which is provided directly around said outer periphery of said signal transmission cable and which is

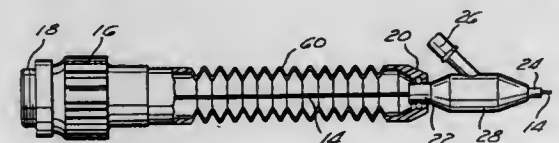


**5,569,160**  
**OPTICAL TROCAR**  
 Jude S. Sauer, Pittsford; Michael G. Oravec, Rochester; Roger J. Greenwald, Holley, and Alexander I. Koblansky, Pittsford, all of N.Y., assignors to United States Surgical Corporation, Norwalk, Conn.  
 Continuation of Ser. No. 132,403, Oct. 6, 1993, Pat. No. 5,467,762, which is a continuation-in-part of Ser. No. 120,489, Sep. 13, 1993, Pat. No. 5,441,041. This application Mar. 21, 1995, Ser. No. 407,929  
 Int. Cl.<sup>6</sup> A61B 1/04  
 U.S. Cl. 600—114  
 18 Claims



1. An apparatus comprising:
  - a) an outer sleeve member having a seal and a longitudinal bore extending therethrough, the longitudinal bore dimensioned to receive endoscopic instruments therethrough;
  - b) an inner sleeve member removably positioned in the outer sleeve, the inner sleeve having a proximal end and a distal end and including:
    - i) a bore dimensioned to receive an endoscope;
    - ii) a recess formed in a distal end;
    - iii) a cutting blade movably positioned at the distal end;
    - iv) an actuator positioned at the proximal end and operatively connected to the cutting blade, the actuator selectively moving the cutting blade between a retracted position and an extended position with respect to the recess, the cutting blade being movable to the retracted position when the actuator is moved to a predetermined position; and
    - v) an image passing member positioned at the distal end, the image passing member directing images into the bore of the inner sleeve member when the endoscope is positioned in the bore.

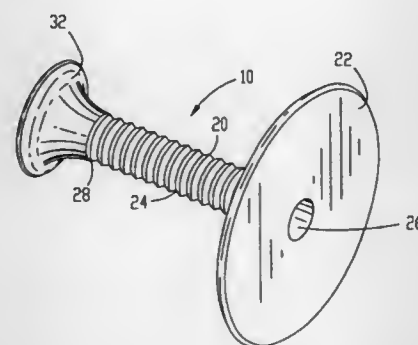
**5,569,161**  
**ENDOSCOPE WITH STERILE SLEEVE**  
 Wendell V. Ebling, 21131 Kensington La., Lake Forest, Calif. 92630; J. Charles Elmore, Mission Viejo, and Carl A. Swindle, Dana Point, both of Calif., assignors to Wendell V. Ebling, Lake Forest, Calif.  
 Continuation-in-part of Ser. No. 225,241, Apr. 8, 1994, abandoned, which is a division of Ser. No. 959,272, Oct. 8, 1992, Pat. No. 5,347,990. This application Apr. 13, 1995, Ser. No. 422,045  
 Int. Cl.<sup>6</sup> A61B 1/04  
 U.S. Cl. 600—121  
 18 Claims



1. An endoscope comprising:
  - a) a fiber optic image bundle;

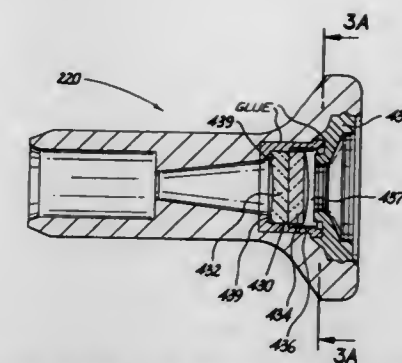
constituted by wound shielded wire and connected to said ground in the processor unit;  
 said inner shield having an insulator formed on the outside thereof;  
 an outer shield formed outside of said inner shield insulator and connected to said frame ground of said processor unit; and  
 a medical instrument insertion channel located outside of said outer shield.

**5,569,159**  
**ENDOSCOPIC SLEEVE**  
 Keven C. Anderson, 202 Houx Dr., Whiteman AFB, Mo. 65305, and Craig R. Kuhns, 1017 Walnut La., Warrensburg, Mo. 64093  
 Filed Dec. 16, 1994, Ser. No. 357,657  
 Int. Cl.<sup>6</sup> A61B 1/04  
 U.S. Cl. 600—114  
 3 Claims

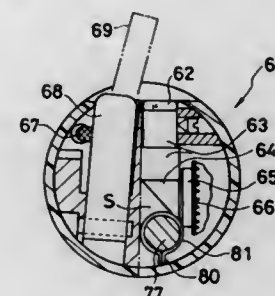


1. An endoscopic sleeve device adapted for receiving and gripping a medical probe, comprising:
  - an elongated flexible endoscopic sleeve including a sidewall presenting opposed axial ends and a hollow passageway extending between said axial ends;
  - said endoscopic sleeve including structure sized and configured for engaging and gripping a medical probe received in said passageway when said sleeve is gripped;
  - a flange member coupled to one of said axial ends for positioning said endoscopic sleeve adjacent a patient; and a second flange member coupled to the other of said axial ends for positioning said endoscopic sleeve adjacent a medical probe eyepiece.

- b) a sleeve having proximal and distal ends and having a bore formed therein such that said fiber optic image bundle is insertible through the proximal end into said bore;
- c) a window formed proximate the distal end of said sleeve;
- d) a contractile member for biasing the distal end of said sleeve in the proximal direction so as to position the fiber optic image bundle in abutment with said window; and
- e) wherein said sleeve and said window isolate said fiber optic image bundle from a patient such that said fiber optic image bundle need not be sterilized prior to use.



**5,569,162**  
**STRUCTURE OF END PORTION OF SIDE-LOOKING TYPE ELECTRONIC ENDOSCOPE**  
 Shuji Komi, Omiya, Japan, assignor to Fuji Photo Optical Co. Ltd., Omiya, Japan  
 Filed Aug. 28, 1995, Ser. No. 520,365  
 Claims priority, application Japan, Sep. 1, 1994, 6-232020; Sep. 1, 1994, 6-232021  
 Int. Cl.<sup>6</sup> A61B 1/00  
 U.S. Cl. 600—130  
 5 Claims



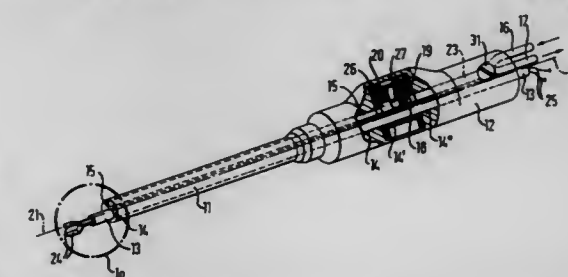
1. A side-looking electronic endoscope comprising:
  - an observation window disposed on a top surface of an end portion of said endoscope;
  - an objective system member connected to said observation window;
  - a rectangular prism disposed with rectangular prism side surfaces parallel to said top surface of said end portion and a side surface of said end portion for reflecting light which passes through said objective system member at an approximately right angle so as to emit said light towards said side surface of said end portion whereby a space is provided between a diagonal back surface of said rectangular prism and a bottom surface of said end portion;
  - a solid-state image sensor attached to said observation window via said rectangular prism for picking up an image of the internal body as an object of inspection;
  - a light guide disposed between said objective system and a forward end of said end portion and passing through said space formed between said diagonal back surface of said rectangular prism and said bottom surface of said end portion; and
  - an irradiation window which is connected to said light guide and disposed between said forward end and said observation window.

**5,569,163**  
**DISPOSABLE SURGICAL INSTRUMENT**  
 William J. Francis, Quincy, Mass., and Paul A. Scirica, Huntington, Conn., assignors to United States Surgical Corporation, Norwalk, Conn.  
 Filed Sep. 14, 1994, Ser. No. 306,094  
 Int. Cl.<sup>6</sup> A61B 1/04  
 U.S. Cl. 600—133  
 20 Claims

1. An endoscope comprising at least one lens mounting element for supporting at least one lens assembly of the endoscope, said

lens mounting element being fabricated with a readily degrading polymeric material deforming in a sterilization medium, thereby disabling the endoscope from further use.

**5,569,164**  
**SURGICAL LAPAROSCOPIC APPARATUS**  
 Michael Lurz, Dürbheim, Germany, assignor to Delma elektro- und medizinische Apparatebau Gesellschaft mbH, Tuttlingen, Germany  
 Filed Nov. 8, 1994, Ser. No. 336,370  
 Claims priority, application Germany, Nov. 24, 1993, 43 40 056.6  
 Int. Cl.<sup>6</sup> A61B 1/00  
 U.S. Cl. 600—158  
 6 Claims



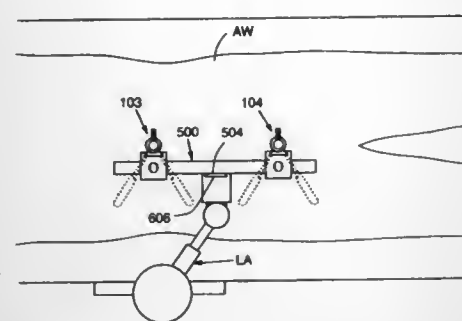
1. Surgical laparoscopic apparatus comprising a handgrip, and a protector tube mounted onto a front end thereof, an axial guide channel formed in the protector tube and the handgrip for axially movably receiving at least one rod-shaped instrument, a flushing and suction channel extending through the handgrip and the protector tube, a flush and suction connector operatively associated with the handgrip, and a twin-position three-way valve arranged in the handgrip adjacent the guide channel and fluidly coupled to the guide channel, the flushing and suction channel and the flush and suction connector which, in first position, connects the flushing and suction channel to the flush and suction connector and, in a second position, connects the guide channel to the flush and suction connector.

**5,569,165**  
**APPARATUS FOR MECHANICAL ABDOMINAL WALL RETRACTION**

Albert K. Chin, Palo Alto, and Edmund K. M. Tsoi, San Francisco, both of Calif., assignors to Origin Medsystems, Inc., Menlo Park, Calif.  
 Continuation of Ser. No. 959,717, Oct. 13, 1992, abandoned, which is a continuation of Ser. No. 890,033, May 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 706,781, May 29, 1991, abandoned. This application Dec. 29, 1994, Ser. No. 366,367  
 Int. Cl.<sup>6</sup> A61B 1/02  
 U.S. Cl. 600—204  
 21 Claims

14. In combination with a mechanical lifting arm and a pair of mechanical retractors insertable through small laparoscopic open-





ings in the body to lift a tissue plane of the body, an improved apparatus for connecting the retractors to the mechanical lifting arm for select movement towards and away from one another so that the relative positions of the retractors can be adjusted and lifting force and torque can be transmitted to the retractors from the lifting arm, said apparatus comprising:

an elongated rigid bar;

first connecting means secured in load and torque transmitting relationship with one of said retractors, said first connecting means being slidably mounted on the bar and lockable to the bar to selectively secure said one retractor in torque and load transmitting relationship to the bar at different positions along the length of the bar;

second connecting means secured in load and torque transmitting relationship with the other of said retractors, said second connecting means being slidably mounted on the bar and lockable to the bar to selectively secure said other retractor in torque and load transmitting relationship to the bar at different positions along the length of the bar and to, together with the first connecting means, adjust the distance between the retractors; and

third connecting means attached to the bar between the first and second connecting means to selectively secure the bar to the lifting arm and transmit lifting force and torque from the arm to the bar.

5,569,166

## HEADACHE TENSION RELIEVER

Ross G. Stone, 3610 S. Ocean Blvd., Apt. 301, Palm Beach, Fla. 33480

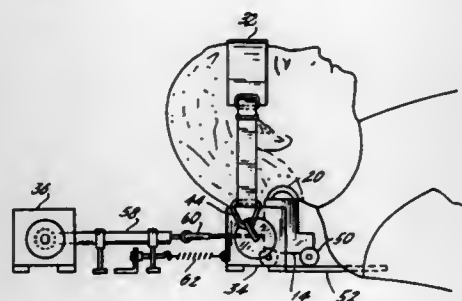
Continuation of Ser. No. 800,164, Nov. 27, 1991, abandoned.

This application Jun. 30, 1994, Ser. No. 269,611

Int. Cl.<sup>6</sup> A61H 11/02; A61N 1/26

U.S. Cl. 601—21

39 Claims



33. A pain relieving device comprising: apparatus for selectively applying three or more pain relieving

modalities to an upper body region of a patient, said modalities including acupressure and at least two other modalities selected from the group of vibration, massage, and electric stimulation, said apparatus including a first reciprocator and a carriage unit, said carriage unit for providing simultaneous application of two or more of said modalities and including a fulcrum adapted and arranged to be in contact with said patient's head region generally below said patient's occipital condyles, and said first reciprocator adapted and arranged to be in contact with said patient's head region for reciprocating said patient's head along an arcuate path generally perpendicular to the patient's spine when said fulcrum and said first reciprocator are in contact with said patient's head region.

5,569,167

## REHABILITATION APPARATUS IN COMBINATION WITH A MOTOR-DRIVEN VEHICLE

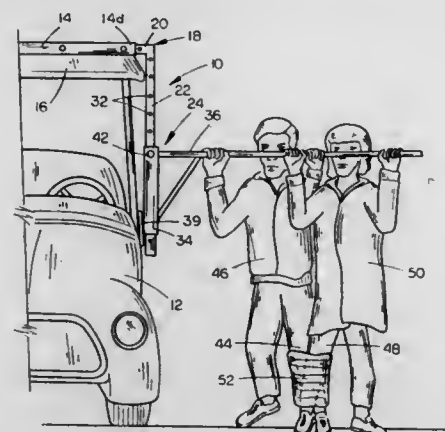
Faye E. Friedli, Route 1, Box 19, York, Nebr. 68467

Filed Mar. 28, 1995, Ser. No. 412,298

Int. Cl.<sup>6</sup> A61H 3/00

U.S. Cl. 601—23

1 Claim



1. In combination:

a motor-driven vehicle having forward and rearward directions of travel; and

a rehabilitation therapy apparatus projecting from said vehicle, said apparatus comprising:

a tube mounted on the vehicle, oriented perpendicularly to the direction of travel of the vehicle, said tube having opposing first and second open ends;

a frame with a horizontal arm slidably journaled within one of said first and second ends of the tube for selectively adjustable horizontal movement inwardly and outwardly relative to the vehicle, and a vertical leg rigidly affixed to and depending from an outer end of the arm, said support bar adjustably connected to the frame leg for selective vertical movement thereon;

means connected between the tube and frame arm for selectively locking the frame arm in a selected horizontal position in the tube;

a support bar having inward and outward ends, the inward end operably connected to the frame vertical leg for selective vertical movement thereon and the outward end cantilevered generally horizontally outwardly from said vehicle;

a vertically oriented sleeve mounted on the inward end of said support bar with said frame leg slidably journaled through said sleeve for adjustable vertical movement of the sleeve on the frame leg;

means connected between the frame leg and sleeve for selectively locking the sleeve in a selected position along the frame leg.

5,569,168

## KNEADER MASSAGER HAVING DWELL FEATURE

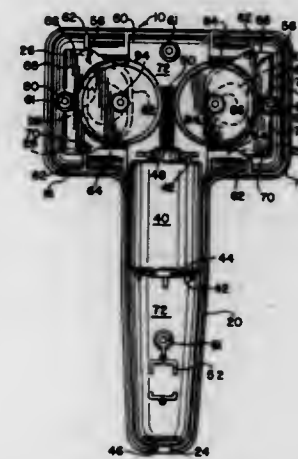
Charles D. Hartwig, Dixon, Ill., assignor to Wahl Clipper Corporation, Sterling, Ill.

Continuation-in-part of Ser. No. 17,524, Jan. 14, 1994, Pat. No. Des. 356,162. This application Jul. 18, 1994, Ser. No. 276,557

Int. Cl.<sup>6</sup> A61H 7/00

U.S. Cl. 601—133

17 Claims



1. A kneader massager, comprising:

a housing having an upper portion and a lower portion, each said upper and lower portions defining a power transmission chamber having at least one opening;

at least one pair of massaging means for massaging the skin of a user, each said pair of said massaging means being mounted in said chamber for reciprocating movement relative to each other, and each said massaging means extending through a corresponding one of said at least one opening;

motor means for powering said massaging means being disposed in said power transmission chamber;

drive means disposed in said power transmission chamber for transmitting power from said motor means to said massaging means to move each pair of said massaging means between a relaxed position, in which said means are at a maximum separation distance relative to each other, and a pressing position, in which said means are relatively close together to each other; and

said drive means including dwell means for periodically prolonging said massaging means in said pressing position so as to grab and hold the massaged flesh to simulate manual massage.

5,569,169

## AUTO MASSAGE APPARATUS AND METHOD

Maylon J. Lewark, Sr., 756 Hillwell Rd., Chesapeake, Va. 23320

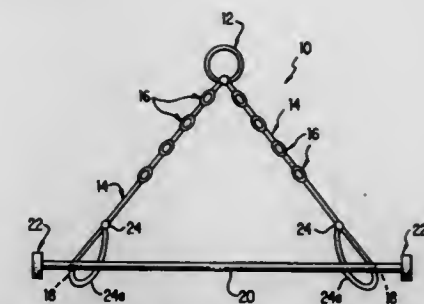
Filed Jun. 29, 1994, Ser. No. 267,248

Int. Cl.<sup>6</sup> A61H 11/00

U.S. Cl. 601—134

3 Claims

1. Method for the auto application of pressure to the desired muscles of the body comprising:



- forming a flexible strand with pressure applying nodules along the flexible strand, wherein the pressure applying nodules are formed by knots in the strand;
- placing the pressure applying nodules directly in contact with the body in the area of the muscles; and
- applying a substantially static force to the strand for causing the pressure applying nodules to apply pressure to the muscles at localized points.

5,569,170

## PULSATOR

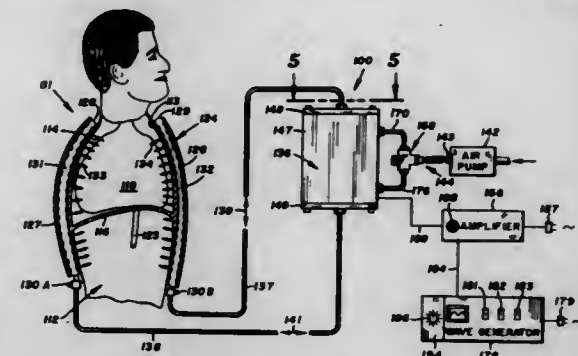
Craig N. Hansen, Minnetonka, Minn., assignor to Electromed, Inc., Minnetonka, Minn.

Continuation-in-part of Ser. No. 90,234, Jul. 12, 1993, Pat. No. 5,453,081. This application Jun. 5, 1995, Ser. No. 471,620

Int. Cl.<sup>6</sup> A61H 9/00

U.S. Cl. 601—150

32 Claims



23. An apparatus for providing repetitive pressure pulses to first and second portions of a person comprising: means having first flexible air-accommodating means engageable with the first portion of a person that is to be subjected to repetitive pressure pulses and second flexible air-accommodating means engageable with the second portion of a person that is to be subjected to repetitive pressure pulses, a pulsator operable to produce first and second air pressure pulses, first means having an air passage connecting the pulsator with the first air-accommodating means whereby the first air pressure pulses provided by the pulsator repetitively move the first air-accommodating means which applies pressure pulses to the first portion of a person, second means having an air passage connecting the pulsator with the second air-accommodating means whereby the second air pressure pulses produced by the pulsator move the second air-accommodating means unsynchronized with the repetitive movement of the first air-accommodating means which applies pressure pulses to the second portion of a person at different intervals from the application of pressure pulses to the first portion of a person, said pulsator having housing means including an internal chamber, diaphragm means located within said internal chamber dividing the internal chamber into a first chamber and a second chamber, means for supplying air under pressure to the chambers, means for vibrating the diaphragm means to pulsate air in the chambers at different intervals, the air passage of the first means being connected to the housing means and open to the first chamber whereby air in said first air-accommodating means is pulsated, which in turn subjects the first

portion of a person to repetitive pressure pulses, the air passage of the second means being connected to the housing means and open to the second chamber whereby air in said second air-accommodating means is pulsated opposite from the pulsation of air in the first air-accommodating means subjecting the second portion of a person to repetitive pressure pulses at different intervals from the pressure pulses applied to the first portion of a person, wave generator means for generating a wave signal, and means connecting the wave generator means to the means for vibrating the diaphragm means whereby the wave signal from the wave generator means energizes the means for vibrating the diaphragm means to pulsate air alternately in said first and second chambers and first and second air-accommodating means.

5,569,171

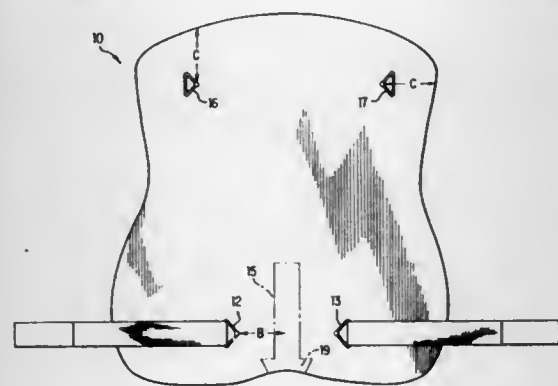
## CHIROPRACTIC BRACE

Ron Muncy, 1413 Bramblewood Dr., Lakeland, Fla. 33811  
Continuation of Ser. No. 189,689, Feb. 1, 1994, abandoned,  
which is a continuation of Ser. No. 875,324, Apr. 29, 1992,  
Pat. No. 5,295,947. This application Jun. 12, 1995, Ser. No.  
488,895

Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602-5

15 Claims



1. A brace for supporting a human spinal column, comprising:
  - a substantially rigid posterior section which supports a posterior region of a human including the spinal column area, said posterior section including an elongated recessed portion formed into said posterior section and structured and positioned to be abutable against a lumbar vertebra area of a human;
  - a substantially rigid anterior section which supports an anterior region of a human, said anterior section including a recessed portion formed into said anterior section and structured and positioned to produce a hydrostatic lift to an abdominal region of the human inwardly and upwardly; and
  - straps connectable between the anterior and posterior sections which adjustably secure the anterior and posterior sections together against the human, said straps including a first strap and a second strap each having one end thereof secured to said anterior section and each having another end thereof releaseably securable to said anterior section.

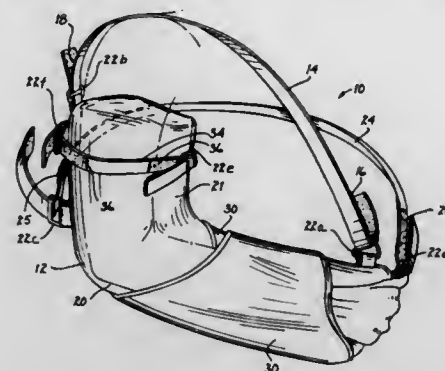
5,569,172  
DEVICE FOR SUPPORTING AND IMMOBILIZING A  
PATIENT'S ARM AND SHOULDER AND METHOD  
THEREOF

John Padden, 214 E. Ruth Ave., #303, Phoenix, Ariz. 85020,  
and Michael A. Steingard, 8602 N Starling La., Phoenix,  
Ariz. 85028

Continuation-in-part of Ser. No. 284,843, Aug. 2, 1994, Pat.  
No. 5,464,383. This application Nov. 3, 1995, Ser. No. 552,754  
Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602-20

16 Claims



1. An orthopedic pillow device for supporting and immobilizing a patient's arm relative to a patient's shoulder, comprising, in combination:

portable, reversible, pillow support means for selective attachment to one of the patient's right arm and left arm and the patient's upper torso, said support means comprising L-shaped pillow means, having a substantially elliptical cross-sectional shaped pillow configuration, for being configured to extend in an L-shaped configuration from just below a person's armpit to about the end of a person's hand for providing support and cushioning for both a lower and upper portion of the arm selected for support including a portion of the forearm, the wrist and a portion of the hand of said arm, and for providing abduction of said lower and upper portions of the arm selected for support with respect to said upper torso for reducing joint stress of said shoulder, said support means having a thickness along its L-shaped configuration and an outer surface portion means for supporting an inner portion of said selected arm extending substantially in one plane downward and in said L-shaped configuration from the armpit of said selected arm to said upper and said lower portions of said selected arm and an inner surface portion means for extending inwardly from the armpit of said selected arm and in said L-shaped configuration parallel to and adjacent to a front portion of a person's torso;

securing means coupled to said support means comprising first securing means for securing said support means to said patient's upper portion of the selected arm and second securing means adapted to extend along and about a substantial portion of the lower portion of the selected arm including the wrist for securing said support means to said patient's lower portion of the selected arm including a portion of said forearm, said wrist and said portion of said hand of said arm.

5,569,173

FOOT ORTHOSIS WITH DETACHABLE SOLE PLATE  
Harold T. Varn, Lawrenceville, Ga., assignor to Restorative  
Care of America Incorporated, Clearwater, Fla.

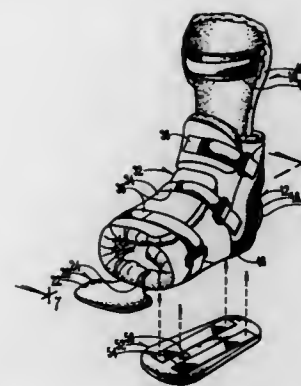
Filed Oct. 17, 1994, Ser. No. 324,244

Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602-27

2 Claims

1. A foot orthosis, comprising,
  - a generally L-shaped member to support the lower leg and foot of a patient, a flexible boot member on said L-shaped member adapted to receive the leg and a foot of a patient,



- said L-shaped member having a foot portion with a bottom surface,  
said boot member having a bottom surface portion substantially extending over said bottom surface of said L-shaped member, a first releasable interlocking surface on the bottom surface portion of said boot member which extends over the bottom surface of said L-shaped member, and  
a resilient foot sole member releasably secured to the bottom surface portion of said boot member, said foot sole member having a second releasable interlocking surface thereon releasably secured to said first releasable interlocking surface on the bottom surface portion of said boot member whereby said foot sole member can be removed from said boot member.

5,569,174

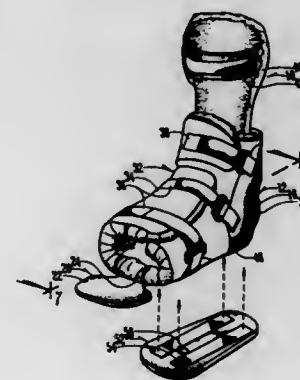
FOOT ORTHOSIS WITH DETACHABLE SOLE PLATE  
Harold T. Varn, Lawrenceville, Ga., assignor to Restorative  
Care of America Incorporated, Clearwater, Fla.

Continuation-in-part of Ser. No. 324,244, Oct. 17, 1994. This application Jan. 4, 1995, Ser. No. 368,349

Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602-27

2 Claims



1. A foot orthosis, comprising,
  - a generally L-shaped member to support the lower leg and foot of a patient, a flexible boot member on said L-shaped member adapted to receive the leg and a foot of a patient, said L-shaped member having a foot portion with a bottom surface;
  - said boot member having a bottom surface portion substantially extending over said bottom surface of said L-shaped member, a first releasable interlocking surface on the bottom surface portion of said boot member which extends over the bottom surface of said L-shaped member, and
  - a resilient foot sole member releasably secured to the bottom surface portion of said boot member, said foot sole member having a second releasable interlocking surface thereon releasably secured to said first releasable interlocking surface

on the bottom surface portion of said boot member whereby said foot sole member can be removed from said boot member,  
said resilient foot sole member comprising a resilient plate member having a central portion with substantially straight side edges, and terminating in forward and rearward ends which are horizontally curved in shape,  
said plate member having top and bottom surfaces,  
said top surface being substantially flat,  
said bottom surface having a substantially flat central portion terminating in opposite end portions that extend upwardly towards said top surface.

5,569,175

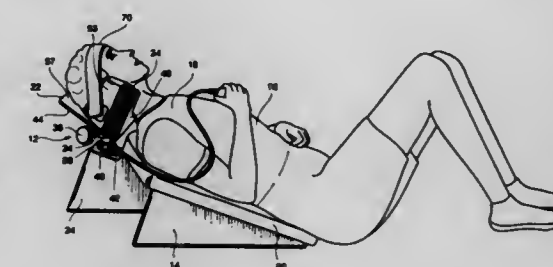
PIVOTABLE CERVICAL TRACTION/STRETCH AND  
NECK CURVE SUPPORT DEVICE

Ralph Chitwood, Whitefish, Mont., assignor to Glacier Cross,  
Inc., Kalispell, Mont.

Continuation-in-part of Ser. No. 120,602, Sep. 13, 1993, Pat.  
No. 5,441,479. This application Oct. 21, 1994, Ser. No. 327,021  
Int. Cl.<sup>6</sup> A61H 1/00

U.S. Cl. 602-32

17 Claims



1. A pivotable cervical traction/stretch and neck curve support device comprising:

a base portion having an upper end, an upper inclined surface extending upwardly to said upper end for supporting a person's upper body or torso and a lower surface for resting on a planar support surface;  
a table or platform situated adjacent said upper end of said base portion and having an upper surface and a bottom surface;  
mounting means attached to said upper end of said base and to said bottom of said platform for pivotally and rotatably mounting said platform to said upper end of said base and above said upper end of said base in a manner allowing rotation of said platform about any one of or all of an X-axis, a Y-axis and a Z-axis, said mounting means including means for securing the platform in a desired position;  
a head portion having an inner end surface, a bottom surface and a head receiving surface including a shoulder with an adjacent occipital cervical pressure or lift surface for engaging a user's head, said bottom surface being slidably supported on said platform; and  
moving means positioned on said platform, including a bellows portion and operable by the user or a healthcare practitioner for incrementally moving said head portion on said platform outwardly from said inclined surface.



5,569,176

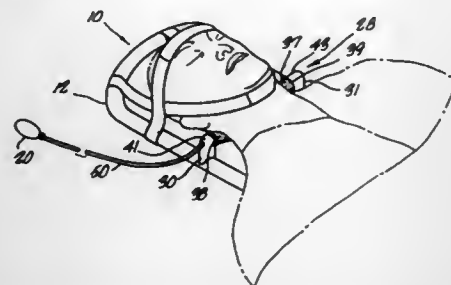
**INFLATABLE CERVICAL TRACTION AND EXERCISING DEVICE**

Richard A. Graham, 18582 Main St., Huntington Beach, Calif. 92648

Continuation of Ser. No. 17,042, Feb. 12, 1993, Pat. No. 5,382,226. This application Dec. 9, 1994, Ser. No. 351,787  
Int. Cl.<sup>6</sup> A61H 1/02

U.S. Cl. 602—32

7 Claims



1. A method for imparting a forward curve to the cervical spine and manipulating the spine and intervertebral discs to promote fluid transfer to the discs, said method comprising the steps of:
  - providing a support frame;
  - providing a transverse neck support carried by said frame;
  - securing said device to a user's head such that the neck support is positioned transversely across the back of the user's neck;
  - inflating a bladder between the user's neck and the neck support, in a first direction outwardly from said neck support toward the user's neck, forcing the cervical spine to curve forwardly, and in a second direction normal thereto, thereby applying an angular traction to the cervical spine;
  - selectively inflating and deflating said bladder forcing the cervical spine to curve forwardly and repeating inflation and deflation of said bladder in order to transfer fluid to the intervertebral discs.

5,569,177

**TAMPON APPLICATOR**

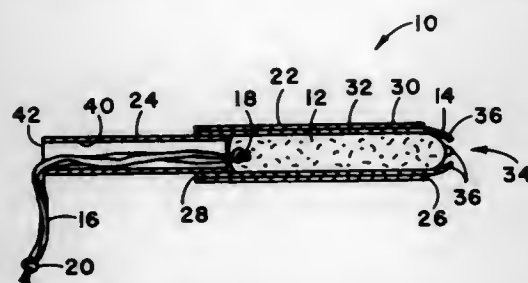
Donald G. Fox, Neenah; Tammy J. Rentmeester, Appleton, and Steven J. Nielsen, Greenville, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 294,169, Aug. 22, 1994, abandoned. This application Feb. 28, 1995, Ser. No. 395,940

Int. Cl.<sup>6</sup> A61F 13/20

U.S. Cl. 604—15

5 Claims



1. A tampon applicator comprising:
  - an elongated cylindrical tube capable of housing an absorbent tampon, said tube having an outside diameter and first and second spaced apart ends, and said tube having at least two distinct layers formed from at least two different materials with one of said layers being a film layer;
  - an insertion tip integrally formed on said tube from an interior layer, said interior layer being a film layer, said insertion tip extending outward from said first end and having a thickness which is less than that of said tube, and said insertion tip

having an outside diameter which is less than the outside diameter of said tube; and

- c) a second member telescopically mounted in said second end of said tube, said second member adapted to expel said tampon through said insertion tip as it is pushed into said tube.

5,569,178

**POWER ASSISTED SUCTION LIPECTOMY DEVICE**

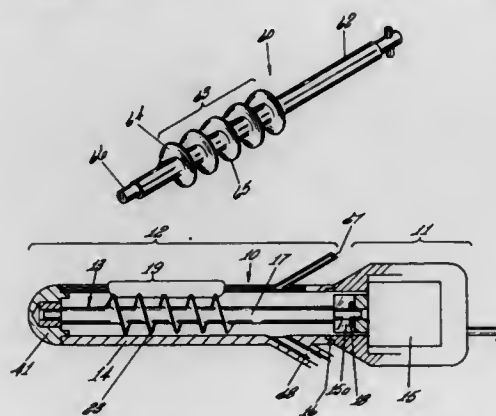
Julian L. Henley, 330 Orchard St., New Haven, Conn. 06511-4417

Filed Oct. 20, 1995, Ser. No. 546,478

Int. Cl.<sup>6</sup> A61B 17/20

U.S. Cl. 604—22

5 Claims



1. A power assisted suction lipectomy device operable for removing fatty tissue from beneath the skin of a patient, said device comprising a non-invasive handle portion housing A source of rotary power and having a proximal end and a distal end, said distal end having cannula connection means thereon, and an invasive cannula portion comprising:
  - (a) a rigid hollow elongate outer tube having an inner lumen, a proximal end adapted to matingly engage and releasably attach said outer tube to said cannula connection means on said distal end of said handle portion and a distal end and a cylindrical surface therebetween, said cylindrical surface having an aperture therein, the edge of said aperture providing a stationary avulsing edge.

- (b) a rotating member rotatably mounted coaxially within said inner lumen of said rigid outer tube comprising an elongate shaft having a proximal end adapted to mechanically engage said source of rotary power and a distal end and a shaft therebetween, said shaft having a spiral flange projecting laterally therefrom, the outermost lateral extension of said spiral flange being a rotating avulsing edge, and wherein a portion of said rotating avulsing edge adjacent to said stationary avulsing edge is adapted to elastically deform in response to pressure applied thereto.

5,569,179

**ACOUSTIC CATHETER WITH MAGNETIC DRIVE**

Sorin Adrian, Penn Valley, Pa., assignor to Medex, Inc., Penn Valley, Pa.

Filed Oct. 26, 1995, Ser. No. 547,743

Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 604—22

15 Claims

1. A catheter, comprising:
  - an elongated shaft defining a distal end and a proximal end, said proximal end including coupling means adapted for coupling to a rotary drive; and
  - rotary-to-axial motion conversion means, said conversion means including at least a first magnetically influenced pole mechanically coupled to said distal end of said shaft for being

5,569,181

**STERILITY ASSURANCE FOR CONTRAST DELIVERY SYSTEM**

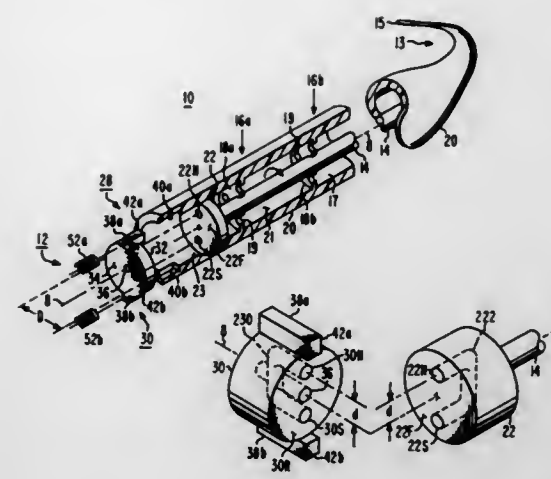
Marlin S. Heilman, Sarver, and Arthur E. Uber, III, Pittsburgh, both of Pa., assignors to Medrad, Inc., Pittsburgh, Pa.

Filed Oct. 28, 1993, Ser. No. 144,845

Int. Cl.<sup>6</sup> A61J 3/00

U.S. Cl. 604—30

10 Claims



rotated thereby along an arc, said conversion means further including nonrotating means capable of axial motion, said nonrotating means comprising at least a second magnetically influenced pole, and which is located so as to come within the magnetic influence of said first magnetically influenced pole during each said rotation of said shaft, for at least one of attracting and repelling said nonrotating means relative to said distal end of said shaft.

5,569,180

**METHOD FOR DELIVERING A GAS-SUPERSATURATED FLUID TO A GAS-DEPLETED SITE AND USE THEREOF**

James R. Spears, Bloomfield Hills, Mich., assignor to Wayne State University, Detroit, Mich.

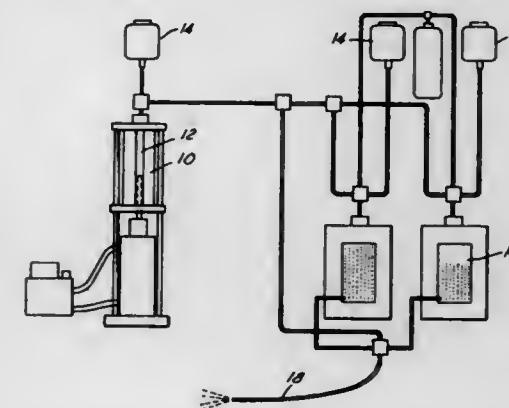
Continuation-in-part of Ser. No. 152,589, Nov. 15, 1993, Pat. No. 5,407,426, which is a continuation-in-part of Ser. No. 818,045, Jan. 8, 1992, Pat. No. 5,261,875, which is a continuation of Ser. No. 655,078, Feb. 14, 1991, Pat. No. 5,086,620.

This application Jul. 12, 1994, Ser. No. 273,652

Int. Cl.<sup>6</sup> A61M 37/00

U.S. Cl. 604—24

42 Claims



1. A method of injecting gas-supersaturated fluids as a bubble-free effluent from a delivery system into a gas-depleted environment, comprising the steps of:
  - eliminating cavitation nuclei from within the delivery system;
  - compressing a liquid and a gas to form a gas-supersaturated liquid; and
  - ejecting the gas-supersaturated liquid through the delivery system from an exit port as an effluent into the environment without associated cavitation formation in the effluent at or near the exit port.

5,569,182

**CLOT RESISTANT MULTIPLE LUMEN CATHETER AND METHOD**

Zbylut J. Twardowski; W. Kirt Nichols, and John C. Van Stone, all of Columbia, Mo., assignors to The Carators of the University of Missouri, Columbia, Mo.

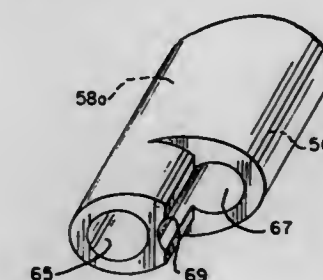
Continuation-in-part of Ser. No. 45,016, Apr. 8, 1993, Pat. No. 5,405,320, which is a continuation-in-part of Ser. No. 772,613, Oct. 8, 1991, Pat. No. 5,209,723, which is a continuation of Ser. No. 461,684, Jan. 8, 1990, abandoned. This application

Feb. 9, 1995, Ser. No. 386,473

Int. Cl.<sup>6</sup> A61M 3/00

U.S. Cl. 604—43

10 Claims



1. The method of circulating blood through a multiple lumen catheter which extends in substantially an inverted U-shape in the patient and connects between a vein of a patient and a blood

treatment device, said catheter and the lumens thereof each defining blunt, distal ends positioned within said vein, comprising the steps of:

withdrawing blood from said vein through one of said lumens at a flow rate of at least about 200 ml./min.; and inserting blood into said vein through another of said lumens at a similar flow; the distal ends of said lumens being longitudinally spaced from each other by no more than about 5 mm.

5,569,183

# METHOD FOR PERFORMING SURGERY AROUND A VIEWING SPACE IN THE INTERIOR OF THE BODY

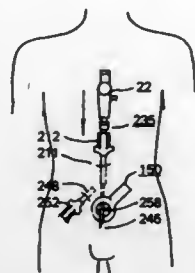
Maciej J. Kieturakis, San Carlos, Calif., assignor to Archimedes Surgical, Inc., Menlo Park, Calif.

Filed Jun. 1, 1994, Ser. No. 255,273

Int. Cl.<sup>6</sup> A61M 31/00

U.S. Cl. 604—51

10 Claims



1. A method for making at least one outward incision in a body for cannula placement using an elongate guide member, comprising the steps of:

introducing a distal extremity of the guide member through a first incision into the interior of the body at a first region; advancing the distal extremity of the guide member within the interior of the body to a second region remote from the first region; and

advancing the distal extremity of the guide member outwardly from the interior of the body in the second region until the distal end of the guide member projects outwardly from the skin of the body, thereby making the at least one outward incision in the second region.

5,569,184

# DELIVERY AND BALLOON DILATATION CATHETER AND METHOD OF USING

Michael Crocker, Mission Viejo; Michael Henson, Pleasanton, and Muny Chum, Santa Ana, all of Calif., assignors to Cardiovascular Dynamics, Inc., Irvine, Calif.

Continuation of Ser. No. 113,717, Aug. 27, 1993, abandoned, which is a continuation-in-part of Ser. No. 992,835, Dec. 18, 1992, Pat. No. 5,295,962, which is a continuation-in-part of Ser. No. 875,966, Apr. 29, 1992, Pat. No. 5,368,566. This application Aug. 3, 1995, Ser. No. 513,674

Int. Cl.<sup>6</sup> A61M 31/00

U.S. Cl. 604—53

10 Claims



1. A method of intraluminally delivering a fluid to a preselected vascular site, comprising the steps of:

providing a multiple lumen delivery catheter of the type having an elongate catheter body extending between proximal and distal ends and at least one inflatable delivery balloon in communication with the proximal end of the catheter body by a tubular, metal walled delivery lumen, the delivery catheter further having at least one nonmetallic walled lumen extending axially through at least a portion of the catheter body substantially parallel to the metal walled delivery lumen;

positioning the catheter so that the balloon is adjacent a desired delivery site;

inflating the balloon to position the wall of the balloon adjacent the wall of the vascular site; and

introducing the fluid into the balloon by way of the delivery lumen, so that fluid is caused to advance from the balloon to the preselected vascular site.

5,569,185

Patent Not Issued For This Number

5,569,186

# CLOSED LOOP INFUSION PUMP SYSTEM WITH REMOVABLE GLUCOSE SENSOR

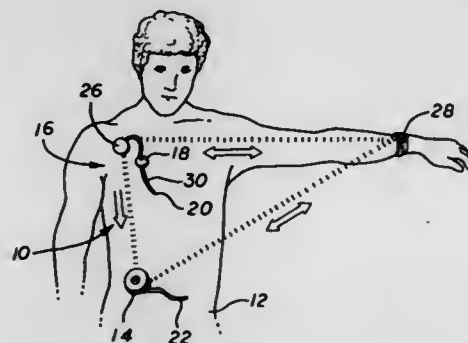
Peter C. Lord, Santa Clarita, and Fredric C. Coleman, Granada Hills, both of Calif., assignors to Minimed Inc., Sylmar, Calif.

Filed Apr. 25, 1994, Ser. No. 231,800

Int. Cl.<sup>6</sup> A61M 31/00

U.S. Cl. 604—67

9 Claims



1. A system for delivering medication to a patient, comprising: a sensor unit including implantable glucose sensor means for in vivo monitoring of a patient blood glucose parameter, an implantable connector fitting for supporting said sensor means within a patient to permit transcutaneous access to said sensor means for removal and replacement without removing said connector fitting from the patient, and control means coupled by said fitting to said sensor means for generating a signal representative of the monitored patient parameter; and

pump means for administering medication stored therein to the patient, said pump means including means responsive to said signal to administer the medication in accordance with the monitored patient parameter;

said sensor unit further comprising a catheter having one end connected to said connector fitting and adapted to extend from said fitting generally to a selected in vivo sensing site within the patient, said sensor means comprising a sensor tip and cable means having a distal end thereof connected to said sensor tip and a proximal end for removable mounting within said connector fitting, said cable means extending from said fitting through said catheter.

5,569,187

# METHOD AND APPARATUS FOR WIRELESS CHEMICAL SUPPLYING

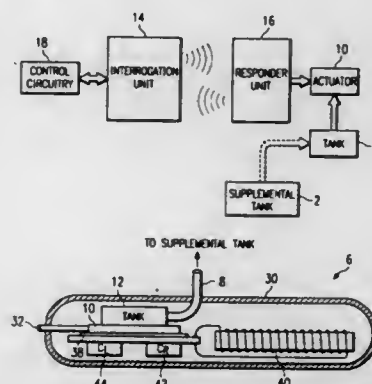
Ulrich Kaiser, Warstein, Germany, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 16, 1994, Ser. No. 291,257

Int. Cl.<sup>6</sup> A61M 31/00

U.S. Cl. 604—67

20 Claims



1. A wireless chemical supply system, comprising: an interrogation unit operable to transmit interrogation signals and receive responses; a responder unit, being powered from said interrogation signals, said responder unit operable to receive said interrogation signals and transmit responses to said interrogation signals; an actuator coupled to said responder unit, said actuator operable to receive control signals from said responder unit; and a supply tank operatively coupled to said actuator, said supply tank operable to supply chemicals under control of said actuator.

5,569,188

# APPARATUS FOR CONTROLLING FLUID FLOW THROUGH A SURGICAL INSTRUMENT AND THE TEMPERATURE OF AN ULTRASONIC INSTRUMENT

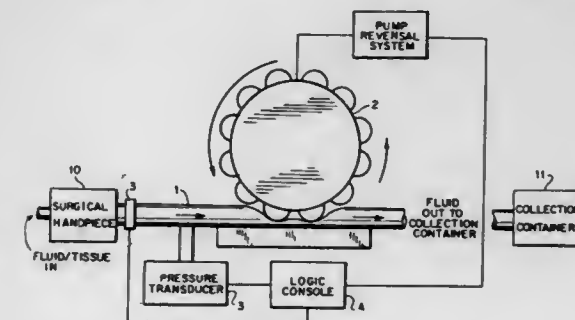
Richard J. Mackool, 31-27 41st St., Astoria, N.Y. 11103

Filed Apr. 11, 1995, Ser. No. 419,817

Int. Cl.<sup>6</sup> A61M 31/00; A61F 9/00

U.S. Cl. 604—67

15 Claims



1. An apparatus for controlling fluid flow through a surgical instrument in response to sudden release of an obstruction, comprising: an aspiration conduit adapted for connection with a surgical instrument; a pump connected to said aspiration conduit; a sensor that senses pressure within said aspiration conduit; and a logic console that directs actuation of said pump to pump fluid to flow in one direction through said aspiration conduit to create suction at a pressure level within said aspiration conduit and thereby remove fluid material from the surgical instrument, said logic console making a determination based

on the pressure sensed by said sensor as to whether a rate of decrease in vacuum within said aspiration conduit as results from release of an obstruction in said aspiration conduit exceeds an acceptable rate of decrease and, if so, directing said pump to effect reversal in flow direction of the fluid through said aspiration conduit and thereby causing said pressure to increase within said aspiration conduit and prevent the fluid from surging into the aspiration conduit from the surgical instrument and thereafter, in response to making a further determination based on the pressure sensed by said sensor of an occurrence of at least any one of an attainment of an acceptable vacuum level within said aspiration conduit and an elimination of the rate of decrease in vacuum within said aspiration conduit in excess of the acceptable rate of decrease, directing said pump to resume fluid flow in said one direction through said aspiration conduit.

5,569,189

# HYPODERMIC JET INJECTOR

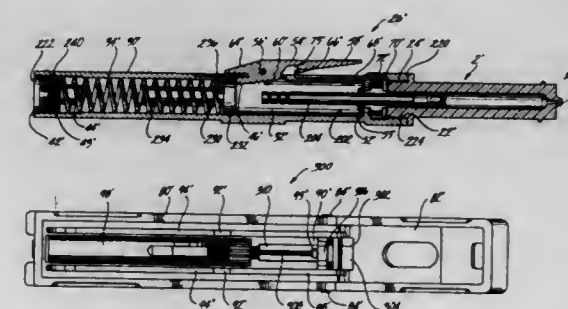
James S. Parsons, Laguna Niguel, Calif., assignor to Equidyne Systems, Inc., San Clemente, Calif.

Continuation-in-part of Ser. No. 130,022, Sep. 29, 1993, Pat. No. 5,499,972, which is a continuation-in-part of Ser. No. 952,562, Sep. 28, 1992, abandoned. This application Apr. 14, 1995, Ser. No. 422,345

Int. Cl.<sup>6</sup> A61M 5/30

U.S. Cl. 604—68

7 Claims



1. A spring actuated needleless hypodermic jet injection system comprising:

an ampule assembly comprising: a shell having a chamber for holding liquid medication between first and second ends of the shell; an orifice in the first end of the shell and communicating with the chamber through which liquid medication is drawn into and ejected out from the chamber; and a plunger assembly movable within the chamber for converting an applied force to a corresponding pressure applied to the liquid, the plunger assembly for drawing liquid medication into the chamber and for ejecting liquid medication out from the chamber;

an injector for receiving and mounting the ampule assembly and for providing said applied force to move the plunger assembly, the injector comprising:

a cylindrical housing having a front end, a back end, and defining a longitudinal channel therebetween, wherein the front end of the housing is open and configured to receive the second end of the ampule assembly; a piston mounted for sliding movement in the longitudinal channel, the piston for applying said force to the plunger assembly; a spring disposed within the channel and communicating with the piston, the spring for accumulating and storing a sufficient amount of energy when compressed to produce sufficient pressure to cause the liquid to leave the chamber via the orifice at such a velocity that it can be hypodermically injected at an injection site, wherein the energy is converted to said force by the piston when the spring is released;



a trigger assembly coupled to the spring for manually releasing the stored energy;

coupling means disposed in the open end of the injector housing for coupling the ampule assembly to the housing; a safety interlock assembly, coupled between the trigger assembly and the coupling means, the safety interlock operatively responsive to the ampule assembly as being coupled to the injector housing, the safety interlock assembly preventing release of the stored energy by the trigger assembly unless an ampule assembly is coupled to the injector; and

a cocking/carrying case comprising a cavity, wherein the injector is disposed within the cavity, the cocking/carrying case comprising:

a rectangular base and cover hingedly connected together at a short side such that the cover describes an arc when closed upon the base; and

cocking means operatively responsive to the closing of the cover, for engaging the injector to compress the spring to accumulate said suitable amount of energy.

5,569,190

## HYPODERMIC FLUID DISPENSER

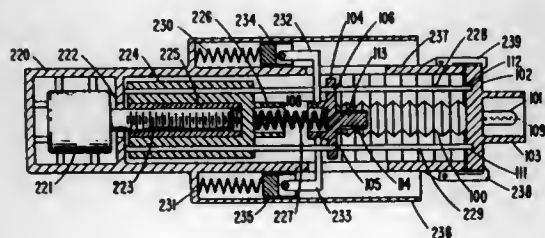
Nicholas F. D'Antonio, 7695 Admiral Dr., Liverpool, N.Y. 13090

Continuation-in-part of Ser. No. 818,235, Jan. 8, 1992, Pat. No. 5,318,522, which is a continuation-in-part of Ser. No. 336,636, Apr. 17, 1989, Pat. No. 5,080,648, which is a continuation of Ser. No. 59,620, Jun. 8, 1987, abandoned. This application Jun. 3, 1994, Ser. No. 253,416

Int. Cl.<sup>6</sup> A61M 11/00

U.S. Cl. 604—72

14 Claims



1. A hypodermic fluid dispenser for dispensing fluid from container means, said dispenser comprising:

fluid withdrawal means for withdrawing fluid from the fluid container means;

electrically-operated injection means for injecting fluid withdrawn from the container means into a body;

rechargeable power source means for supplying electrical power to said injection means, said power source means being depletable as its electrical power is transferred, said power source means being removable from said dispenser for subsequent recharging; and

power source operating means for operationally connecting said power source means to said injection means, said power source operating means making operational a power source means replacing a removed power source means.

5,569,191

## DEVICE FOR PREPARING A MEDICINAL SUBSTANCE SOLUTION, SUSPENSION OR EMULSION

Gabriel Meyer, Route la Dullive, CH - 1195 Dully, Switzerland  
PCT No. PCT/CH93/00282, § 371 Date Jul. 19, 1994, § 102(e)  
Date Jul. 19, 1994, PCT Pub. No. WO94/13344, PCT Pub. Date Jun. 23, 1994

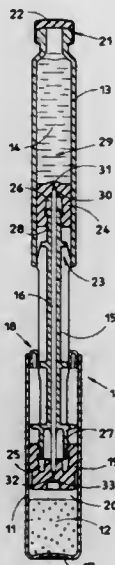
PCT Filed Dec. 15, 1993, Ser. No. 256,668

Claims priority, application France, Dec. 15, 1992, 9215072;  
Dec. 23, 1992, 9215699

Int. Cl.<sup>6</sup> A61M 37/00

U.S. Cl. 604—82

12 Claims



1. Device for the preparation of at least one of a solution, a suspension and an emulsion from an active medicinal substance comprising:

a first component being in at least one of a powder form, a lyophilisate, a liquid, and a paste;

a second component being at least one of a dilutant and a liquid solvent;

a first container (11) for storing said first component, said first container being closed at a first end (17);

a second container (13) for storing said second component;

a first stopper piston dish (19) at a second end of said first container (11), said first stopper piston dish (19) being axially movable within said first container (11);

a second stopper piston dish (24) at a first end of said second container (13), said second stopper piston dish (24) being axially movable within said second container (13);

a conveyance shaft (15) connecting said first and second stopper piston dishes (19, 24), said conveyance shaft (15) ensuring a rigid, tight, and sterile connection between said stopper piston dishes (19, 24) when said device is in a charging position, and defining a tight and sterile channel of communication between said containers (11, 13) when said device is in a use position, said use position being a position wherein said first stopper piston dish (19) of said first container (11) is at a higher level than said second stopper piston dish (24) of said second container (13);

at least one end of said conveyance shaft (15) being shaped in a plane substantially perpendicular to a longitudinal axis of said conveyance shaft;

a first slit (33) in a central zone of said first stopper piston dish (19), said first slit (33) being strongly compressed and tightly closed when said device is in said charging position, said first slit (33) being opened when a first end of said conveyance shaft (15) is introduced into said first slit (33) when said device is in said use position; and

a second slit (31) in a central zone of said second stopper piston dish (24), said second slit (31) being strongly compressed and tightly closed when said device is in said

charging position, said second slit (31) being opened when a second end of said conveyance shaft (15) is introduced into said second slit (31) when said device is in said use position.

5,569,192

## AUTOMATIC INJECTOR

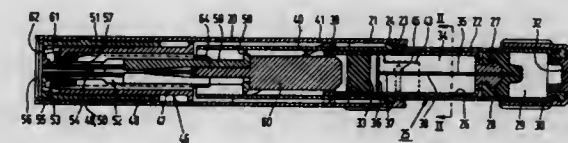
Gillis P. van der Wal, Olst, Netherlands, assignor to Duphar International Research B.V., Weesp, Netherlands  
Filed Mar. 24, 1993, Ser. No. 36,373

Claims priority, application European Pat. Off., Mar. 27, 1992, 92200877

Int. Cl.<sup>6</sup> A61M 37/00

U.S. Cl. 604—84

8 Claims



1. An automatic injector, in which, prior to use, different substances which are not allowed to be in contact with each other for a long period of time, can be stored separately, one of said substances being a solid and another being or comprising a solvent for this solid, which solid can be injected as an injection liquid after dissolving it in said solvent; said injector comprising a discharge mechanism, a cartridge assembly, and a front cover, connected to a front portion of said cartridge assembly and provided at its front with a pierceable central area;

said cartridge assembly comprising:

a plurality of different substances, accommodated in separate compartments in said cartridge assembly,

a hollow barrel which is open at its rear end and which comprises a substantially cylindrical portion,

a piston, which is movable in said substantially cylindrical portion of the barrel, and

a needle for injecting said injection liquid;

said discharge mechanism being connected in a cylindrical outer sleeve and being in operative relation to said piston; and said front cover being capable of rotational movement relative to said outer sleeve in order to allow the interior of the compartment accommodating the solid to communicate with the interior of the compartment accommodating the solvent for this solid, as a result of which the solid and the solvent can reach each other, so that the solvent can dissolve the solid and the injector is made ready for use;

said injector being characterized in that:

said cartridge assembly comprises a cartridge container, to the front portion of which said front cover is connected and which slidably accommodates a cartridge,

said cartridge comprising:

a hollow barrel having a backward portion with a cylindrical inner surface and a front portion,

a pierceable stopper sealingly connected to the front portion of the barrel and constituting a compartment in front of said stopper for accommodating the solid (solid compartment), said compartment being bound at its rear by the front face of said stopper, at its lateral side by the inner wall of the front portion of the cartridge container and at its front by the pierceable central area of the front cover, said pierceable stopper being capable of axial movement in said cartridge container,

a piston slidably accommodated in the backward portion of the barrel and constituting a compartment for liquid in said barrel,

an injection needle longitudinally extending in said liquid compartment, said needle having a bearing at its proximal end, which bearing centers said proximal end in the barrel, said injection needle being provided with inlet openings,

one near the bearing and another at a distance from the front face of the bearing exceeding the length of the pierceable stopper, and

a means for centering the distal end of the needle in order to position the needle tip towards the pierceable stopper;

wherein said rotational movement of the front cover relative to the outer sleeve causes a backward movement of the barrel in the cartridge container, the piston and the needle bearing thereon remaining in their places, as a result of which the injection needle pierces the pierceable stopper and allows the liquid in the barrel to reach the solid compartment through the needle, said injection needle is accommodated in the barrel in an unfixed manner to allow relative longitudinal movement between the injection needle and the barrel.

5,569,193

## SYRINGE SYSTEM ACCOMMODATING SEPARATELY STORABLE PREFILLED CONTAINERS FOR TWO CONSTITUENTS

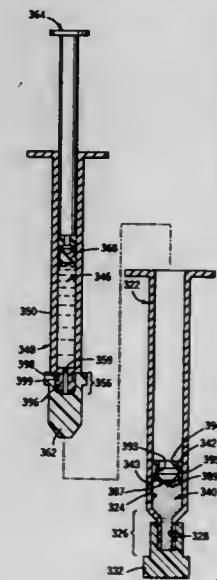
John M. Hofstetter, Vernon Hills; John A. O'Neil, Mundelein, and Richard W. Grabenkort, Barrington, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Mar. 22, 1995, Ser. No. 408,463

Int. Cl.<sup>6</sup> A61M 37/00

U.S. Cl. 604—89

18 Claims



1. A syringe system comprising:

a first container including

a first chamber having a dispensing end defining a dispensing passage communicating through said dispensing end to accommodate the dispensing of fluid from said first chamber,

a movable seal slidably disposed in said first chamber, and a first constituent in said first chamber between said dispensing end and said seal;

a second container including

a barrel that is sized to be disposed in said first container and that has a discharge end defining a discharge passage communicating through said discharge end to accommodate the discharge of fluid from said barrel,

a plunger slidably disposed within said barrel, and a liquid second constituent in said barrel between said discharge end and said plunger; and

said first container seal and said second container barrel discharge end being engageable to cooperatively define a coupling accommodating the flow of said liquid second constituent from said barrel into said first chamber as said second container and seal move outwardly relative to said first chamber,

wherein said coupling includes:

- (1) said seal is resilient and has at least one slit defining flaps which are biased to a normally closed position and which can open on the downstream side into said first chamber,
- (2) an enlarged receiving cavity in said seal adjacent an upstream side of said flaps and a smaller entrance passage in said seal opening to said cavity whereby a retention shoulder is defined at one end of said cavity around said smaller entrance passage, and
- (3) an enlarged head at said second container barrel discharge end for being received in said seal enlarged receiving cavity and a smaller neck at said second container barrel discharge end for being received in said seal entrance passage whereby said second container barrel discharge passage is normally occluded by said seal flaps in the biased closed position.

5,569,194

**DEVICE FOR PERMANENT CONNECTION BETWEEN AN ABDOMINAL WALL AND AN ABDOMINAL CAVITY**  
Lars Ericson, Prinsgatan 4B, Göteborg, and Peter Thomsen, Hängstensvägen, Västra Frölunda, both of Sweden  
PCT No. PCT/SE92/00452, § 371 Date Dec. 8, 1993, § 102(e)  
Date Dec. 8, 1993, PCT Pub. No. WO93/01844, PCT Pub. Date Feb. 4, 1993

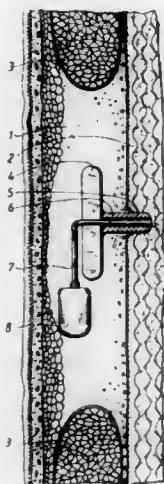
PCT Filed Jun. 23, 1992, Ser. No. 162,208

Claims priority, application Sweden, Jul. 15, 1991, 9102181

Int. Cl.<sup>6</sup> A61M 11/00

U.S. Cl. 604—93

17 Claims



1. A device providing a permanent connection between an abdominal wall and an abdominal cavity of humans or animals, comprising:

- an anchoring plate adapted for anchoring within said abdominal wall, a conduit having an opening extending therethrough, said conduit projecting outwardly from said anchoring plate and having a free end for penetrating into said abdominal cavity, said opening adapted for receiving a hose for delivery of a medication to said abdominal cavity by passing through and being supported by said opening in said conduit, and a reservoir containing said medication for delivery through said hose to said abdominal cavity,
- said conduit having at least an outer surface of pure titanium, whereby growth of tissue surrounding said device into said conduit and clogging of said conduit and hose are prevented.

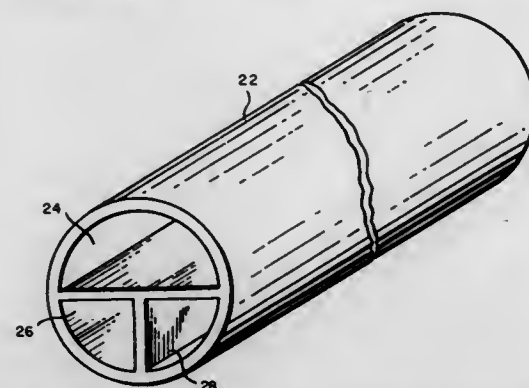
5,569,195

# **MEDICAL BALLOON AND METHOD OF MAKING SAME**

Mark A. Saab, 396 Andover St., Lowell, Mass. 01852  
Division of Ser. No. 929,305, Aug. 13, 1992, Pat. No. 5,342,301. This application May 3, 1994, Ser. No. 238,267  
Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 604—96

41 Claims



1. Medical apparatus for use as or in combination with a balloon dilatation catheter made by the method of blow molding every lumen of a multi-lumen, tubular element comprising orientable polymer so as to expand each of said lumens and to orient the polymer in at least one direction thereby forming a tubular segment comprising multiple lumens of oriented polymer having the properties of being very thin-walled, flexible, high strength, substantially inelastic, readily inflatable under fluid pressure, and readily collapsible under vacuum, said lumens further being integrally formed with one another.

5,569,196

# **TRACKABLE INTRAVASCULAR CATHETER**

Ketan P. Muni, San Jose; Celso J. Bagoisan, Newark, and Troy L. Thornton, Foster City, all of Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.  
Continuation of Ser. No. 918,832, Jul. 21, 1992, abandoned.  
This application Jul. 7, 1994, Ser. No. 272,103  
Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 604—96

9 Claims



1. A dilatation catheter for angioplasty procedures which is readily trackable over a guidewire through a patient's coronary arteries, comprising:

- a) an elongated catheter shaft having an inflation lumen and a guidewire receiving lumen extending therein;
- b) an inflatable dilatation member on a distal portion of the catheter shaft having an interior in fluid communication with the inflation lumen in the catheter shaft and being formed of a heat bondable polymeric material; and
- c) wherein the catheter shaft includes a distal tubular extension which defines at least a portion of the guidewire receiving inner lumen extending therein, said distal tubular extension extends through at least a portion of the interior of the inflatable dilatation member and out a distal end thereof, said distal tubular extension having a laminated section formed of a soft outer tubular lamina being formed of a polymeric material secured to an inner tubular plastic lamina diametrically more rigid than the outer tubular plastic lamina, said laminated section having a proximal end located within the inflatable dilatation member and a distal end located distal to

the inflatable member and a distal portion of said inflatable dilatation member heat bonded to said outer tubular lamina.

5,569,197

# **DRUG DELIVERY GUIDEWIRE**

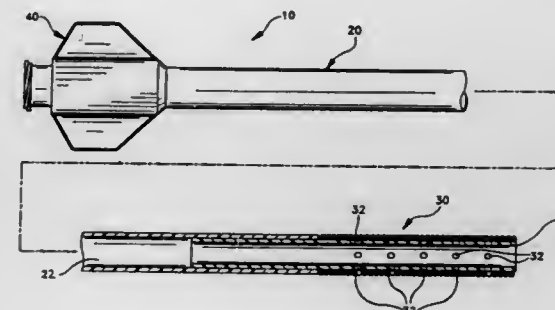
Michael N. Helmus, Louis Park, and Michael R. Forman, St. Paul, both of Minn., assignors to Schneider (USA) Inc, Plymouth, Minn.

Filed Dec. 21, 1994, Ser. No. 360,488

Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 604—96

34 Claims



1. A drug delivery device comprising:

- a hollow tube including means sized and configured to serve as a guidewire for intraluminal devices and having a proximal portion and a distal portion and defining a lumen therein;
- the distal portion of the tube having at least one opening having a diameter suitable for the infusion of a drug formulation therethrough, the opening being in fluid communication with the lumen.

5,569,198

# **MICROPOROUS CATHETER**

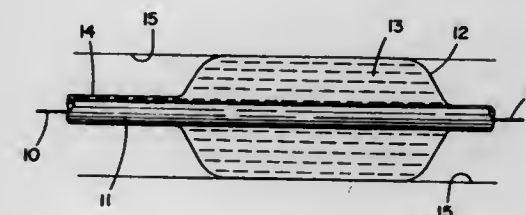
Joel R. Racchini, Edina, Minn., assignor to CorTrak Medical Inc., Minneapolis, Minn.

Filed Jan. 23, 1995, Ser. No. 376,765

Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 604—96

25 Claims



1. An apparatus for delivering an agent to a treatment area using pressure, the apparatus not including phoretic delivery means, the apparatus comprising:

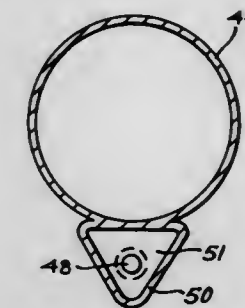
- a catheter having a distal portion and a proximal portion, the catheter defining a lumen;
- a selectively inflatable member in fluid communication with the lumen, wherein the selectively inflatable member is formed from a membrane having pores sized from about 10 Å to about 1 μ and a pore density from about 10<sup>4</sup> pores/cm<sup>2</sup> to about 10<sup>11</sup> pores/cm<sup>2</sup>, further wherein the selectively inflatable member has a single chamber.

5,569,199

**DILATATION CATHETER WITH ECCENTRIC BALLOON**  
Ronald J. Solar, San Diego, Calif., assignor to Cordis Corporation, Miami Lakes, Fla.  
Continuation-in-part of Ser. No. 111,304, Aug. 24, 1993, Pat. No. 5,413,557. This application Apr. 7, 1995, Ser. No. 418,536  
Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 604—96

38 Claims



1. A balloon dilatation catheter which comprises:

- a catheter shaft defining a first, inflation lumen and a second lumen, each of said first and second lumens having proximal and distal ends, and
- an inflatable dilatation balloon having proximal and distal ends, wherein the distal end of said first lumen opens into and is in fluid communication with the interior of the dilatation balloon and the second lumen extends longitudinally with the first lumen, the proximal end of the second lumen being adjacent to the proximal end of the first lumen, the distal end of the second lumen being open and distal to the distal end of the first lumen, the section of the second lumen distal to the proximal end of the dilatation balloon being exterior to the dilatation balloon and containing a rigid or substantially rigid triangularly-shaped lubricious liner, the distal end of the second lumen being open and distal to the distal end of the dilatation balloon, and the second lumen being sufficiently linear to allow the catheter to be slidingly advanced over a guidewire.

5,569,200

# **VASCULAR CATHETER**

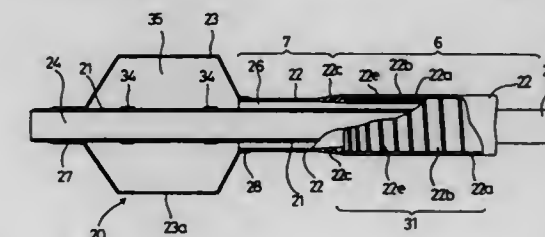
Akihiko Umeno, and Takahiro Kugo, both of Fujinomiya, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan  
Filed Jun. 19, 1995, Ser. No. 492,396

Claims priority, application Japan, Jun. 20, 1994, 6-137273

Int. Cl.<sup>6</sup> A61M 5/00

U.S. Cl. 604—96

6 Claims



1. A vascular dilatation instrument comprising

- an inner tube defining a first lumen extending between an open distal end and a proximal portion,
- an outer tube disposed coaxially around said inner tube, having a distal end retracted a predetermined distance from the distal end of said inner tube and a proximal portion, and defining a second lumen with the outside surface of said inner tube,
- an inflatable member having one end attached to said inner tube and another end attached to said outer tube, and defining an



interior space in fluid communication with said second lumen in the vicinity of the other end,  
 a first opening disposed in the proximal portion of said inner tube in communication with said first lumen, and  
 a second opening disposed in the proximal portion of said outer tube in fluid communication with said second lumen,  
 wherein at least one of said inner tube and said outer tube includes a main body section based on a tube formed of a metal selected from the group consisting of steel, tungsten and copper or an alloy selected from the group of steel alloy, tungsten alloy and copper alloy and a distal section made of a synthetic resin, the tube made of said metal or said alloy has one or more spiral slits in the distal end portion.

5,569,201

**BALLOON CATHETER WITH DISTAL SEAL**

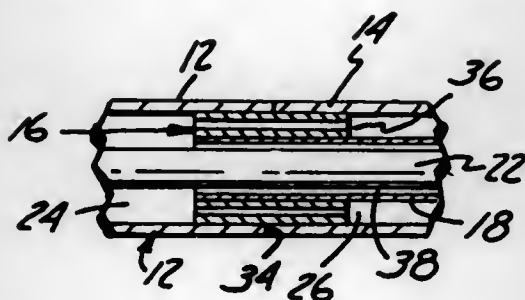
Matthew M. Burns, Minneapolis, Minn., assignor to SciMed Life Systems, Inc., Maple Grove, Minn.

Continuation of Ser. No. 262,224, Jun. 20, 1994, Pat. No. 5,484,408, which is a continuation of Ser. No. 13,149, Feb. 1, 1993, abandoned, which is a continuation of Ser. No. 730,224, Jul. 15, 1991, abandoned, which is a continuation of Ser. No. 337,272, Apr. 13, 1989, Pat. No. 5,032,113. This application

Oct. 5, 1995, Ser. No. 539,542  
 Int. Cl. A61M 29/00

U.S. Cl. 604—96

5 Claims



1. A balloon catheter assembly comprising:
  - a. a proximal single lumen shaft having a first lumen extending therethrough from a proximal end to a distal end;
  - b. a distal outer tube having a proximal end connected to the distal end of the shaft and having a second lumen therethrough which is in fluid communication with the first lumen;
  - c. a distal inner tube having a proximal end and a distal end, said distal inner tube disposed distally of the shaft and extending at least partially through the second lumen of the distal outer tube, the distal inner tube having a third lumen therethrough aligned generally with the first lumen;
  - d. a guide wire extending through at least part of the third lumen; and
  - e. an inflatable balloon having a proximal end and a distal end wherein the proximal end is connected to the distal end of the distal outer tube, the distal end connected to the distal end of the distal inner tube, and having an interior in fluid communication with the second lumen, wherein resistance to fluid flow between the first lumen and the third lumen, when the guide wire is located in at least part of the third lumen, is substantially greater than resistance to fluid flow between the first lumen and the second lumen.

5,569,202

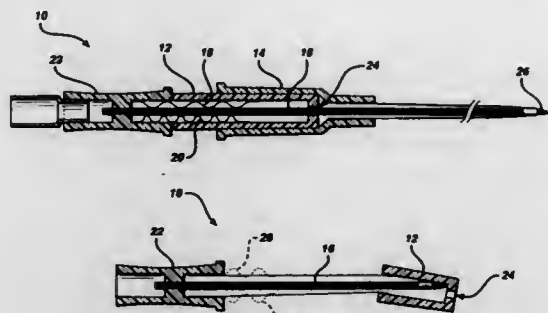
**CATHETER NEEDLE TIP PROTECTOR**

Gerald J. Kovalic, Odessa, Fla., and Joseph J. Chang, Avon, Conn., assignors to Johnson & Johnson Medical, Inc., Arlington, Tex.

Filed Jun. 7, 1995, Ser. No. 482,592  
 Int. Cl. A61M 5/00

U.S. Cl. 604—110

5 Claims



1. A catheter comprising:
  - a. a catheter hub;
  - b. a needle tip protector positioned within the catheter hub; and
  - c. a needle having a needle tip, with the needle being secured to a needle housing, and first and second unequal biasing means extending between the needle housing and the needle tip protector, wherein as the needle is withdrawn from the catheter hub, the first and second biasing means extend the needle tip protector relative to the needle to an oblique position caused by the first and second unequal biasing means in which the needle tip is positioned within the needle tip protector.

5,569,203

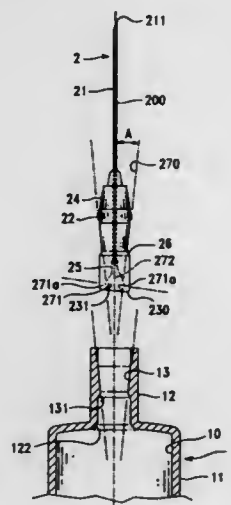
**SIMPLIFIED SAFETY SYRINGE WITH RETRACTABLE SELF-BIASED NEEDLE AND MINIMIZED PLUNGER**

Long-Hsiung Chen, 5 F, No. 91-3, Chung Cheng Rd., Sec. 1, Taiwan, Taiwan

Filed Jun. 23, 1995, Ser. No. 493,936  
 Int. Cl. A61M 5/00

U.S. Cl. 604—110

3 Claims



1. A safety syringe comprising a syringe means, a needle device

and a plunger means, in which:

said syringe means includes a hollow cylinder for filling liquid medicine therein, and a reduced sleeve provided at a reduced shoulder on a front portion of said cylinder having a central opening formed a bottle-neck inside said sleeve, an outward flange and an inward stop ring provided to a rear edge of said cylinder thereon;

said needle device includes a hollow needle having a needle tip at a front portion, a resilient rubber shank fixedly held a rear portion of said needle having an annular recess between a cylindrical rear body and a streamline front body so as to be held in said sleeve of said syringe means by said bottle neck therein, said cylindrical rear body of said shank having a bias rear end surface and a bias conical space formed of an arrowhead socket with a ratchet-means gate at a center of said bias rear end surface led to a hollow center of said hollow needle through said arrowhead socket therefrom;

said plunger means is made of solid plastic comprising a plunger head having an annular ring groove and a plunger ring been received therein which slidably held in said cylinder of said syringe means to push liquid medicine for injection operation, an arrowhead coupling member forwardly disposed to a center of a front end of said plunger head having a ratchet-means neck at a root portion thereof which said arrowhead will be inserted into said bias arrowhead socket through said ratchet-means gate of said rear body of said shank and firmly engaged said needle device to said plunger means together as said ratchet-means neck of said arrowhead of said plunger head been caught by said ratchet-means gate of said shank while said plunger means been fully pushed forward during finished an injection operation, furthermore said bias arrowhead socket of resilient material been distorted to a right status from a bias status by said arrowhead of solid material forced thereinto, simultaneously an insilient strain been stored in the resilient material of said rear body of said shank which caused said needle tip to be biased to said sleeve of said syringe means inside said cylinder while said needle device been fully pulled back into said cylinder by a retracting of said plunger means after an injection operation and then said needle will be bent and destroyed and safely remain in said cylinder while said needle tip be blocked against said reducing shoulder of said cylinder during said plunger means been pushed again forwardly into said cylinder after a fully retracting of said plunger means; a thin disk provided to a plunger rod behind said plunger head to an appropriate distance for limiting a drawn back motion of said plunger means in contacting against said stop ring of said cylinder thereof, a plunger rod formed of three blades protruding radially from a longitudinal center line of said plunger means disposed to a rear face of said plunger head and extended longitudinally out to said stop ring of said cylinder, and an end plate disposed to a rear end of said plunger rod for handling the pushing or pulling operation of said plunger means therefor.

5,569,204

**ASPIRATION CATHETER ARRANGEMENT**

Bernhard M. Cramer, Wuppertal, Germany, assignor to Schneider (Europe) A.G., Bulach, Switzerland

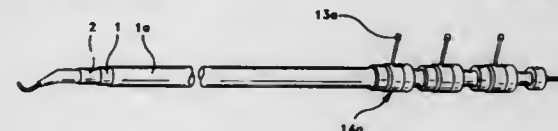
Filed Jun. 20, 1994, Ser. No. 262,206

Claims priority, application European Pat. Off., Jun. 24, 1993, 93110061

Int. Cl. A61M 5/178

U.S. Cl. 604—164

16 Claims



1. An aspiration device comprising:
  - (a) an outer catheter comprising a substantially cylindrical tube having a distal end and a proximal end; and

(b) an inner catheter slidably and removably configured at least partially within the outer catheter for removal from the proximal end of the outer catheter, the inner catheter comprising a substantially cylindrical tube having a distal end and a proximal end, the proximal end adapted for connection to suction means.

5,569,205

**MULTI-PORT TROCER**

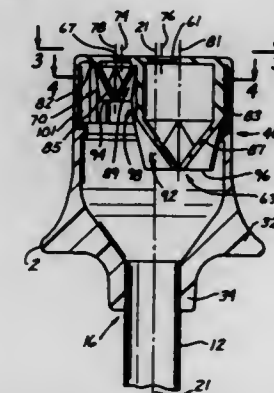
Charles C. Hart, 8252 Mandeville, Huntington Beach, Calif. 92646, and Vincent C. Tangherlini, 34 San Sebastian, Rancho Santa Margarita, Calif. 92688

Filed Jul. 14, 1994, Ser. No. 275,620

Int. Cl. A61M 39/22; 39/26

U.S. Cl. 604—167

25 Claims



1. An access device adapted to extend across a body wall into a body conduit or cavity and to form a seal around an instrument inserted through the device into the body conduit or cavity, the device comprising:

a cannula forming an elongate passage extending from a proximal end to a distal end of the cannula;  
 a valve housing disposed at the proximal end of the cannula;  
 a first valve set disposed relative to the housing and forming with the passage of the cannula a first working channel;  
 a first septum valve included in the first valve set and disposed along the first working channel;  
 a first zero closure valve included in the first valve set and disposed along the first working channel axially of the first septum valve;  
 a second valve set disposed relative to the housing and forming with the passage of the cannula a second working channel;  
 a second septum valve included in the second valve set and disposed along the second working channel;  
 a second zero closure valve included in the second valve set and disposed along the second working channel axially of the second septum valve; and  
 means for flexibly supporting at least one of the first septum valve and the second septum valve relative to the housing in a floating relationship with the cannula.

5,569,206

**TROCER ADAPTER SEAL**

Charles E. Gorman, Jr., Hamden, Conn.; Michael Ciccolella, Lake Carmel, N.Y.; Robert C. Smith, Watertown, Conn.; Thomas D. Guy, Fairfield, Conn., and Kurt Azarbarzin, Ridgefield, Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

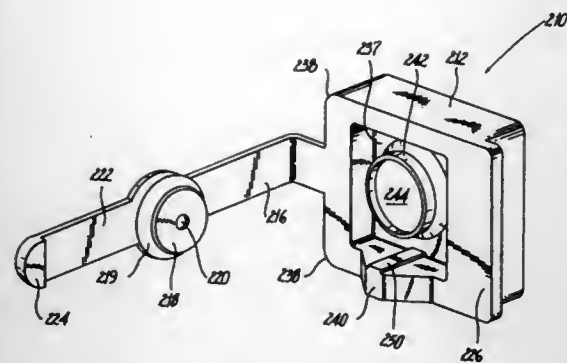
Continuation of Ser. No. 121,017, Sep. 14, 1993, abandoned. This application Nov. 7, 1994, Ser. No. 335,517

Int. Cl. A61M 5/178

U.S. Cl. 604—167

3 Claims

1. An adapter seal for use with a cannula assembly, comprising:



- (a) an adapter body member which includes a body member aperture of a first diameter;
- (b) a stabilizer plate operatively associated with said adapter body member and including a stabilizing aperture formed therethrough;
- (c) a button having a button aperture of a second diameter, said second diameter being less than said first diameter; and
- (d) at least one additional button having an additional button aperture of a third diameter, said third diameter being less than said first and second diameters,
- wherein each of said buttons is joined to said adapter body member such that each of said buttons may be selectively positioned relative to said body member by individually inserting each of said buttons at least partially through said stabilizing aperture, said stabilizer plate frictionally engaging each of said buttons, with each of said button apertures in alignment with said body member aperture when inserted at least partially through said stabilizing aperture.

5,569,207

## HYDROCOLLOID DRESSING

Margo L. Gisselberg, Lynnwood, and Lynn M. Layman-Spillar, Seattle, both of Wash., assignors to Quinton Instrument Company, Bothell, Wash.

Filed Oct. 13, 1994, Ser. No. 322,895

Int. Cl.<sup>6</sup> A61M 25/02

U.S. Cl. 604—175

37 Claims



1. A protective member for use with a percutaneous device which extends from the skin of the patient, the protective member comprising:
- a dressing having a first portion formed as generally planar member having at least a top surface and a bottom surface wherein said bottom surface is formed of a moisture reactive material and generally conforms to the top skin surface of the patient;

- a mesh layer along said bottom surface of said first portion and adjacent to the top skin surface of the patient, said mesh layer being oriented along said bottom surface of said first portion such that the removal of said dressing from the skin of the patient is facilitated; and
- a second portion which extends downwardly from said bottom surface to form a lip-like surface which extends into the catheter tract of a patient in use.

5,569,208

## SYSTEM FOR MANAGING DELIVERY OF CONTRAST MEDIA

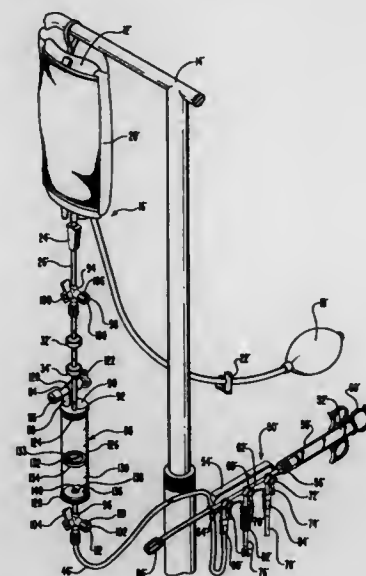
William R. Woelpper, Sandy; Richard L. Young, Alpine, and Ronald L. Stoker, South Jordan, all of Utah, assignors to Merit Medical Systems, Inc., South Jordan, Utah

Filed Aug. 1, 1995, Ser. No. 509,926

Int. Cl.<sup>6</sup> A61M 5/178

U.S. Cl. 604—183

21 Claims



1. A system adapted for managing delivery of contrast media from a contrast media source to a manifold assembly which includes a syringe for injection from the manifold to a patient comprising:

- a. chamber means for receiving fluid from a contrast media source said chamber means having an inlet port at one end thereof and an outlet port at art opposite end thereof;
- b. an inlet line adapted for connection at one end thereof to a contrast media source, said inlet line connected at art opposite end thereof to said inlet port of said chamber means;
- c. an outlet line connected at one end thereof to said outlet port of said chamber means, said outlet line adapted for connection at an opposite end thereof to a manifold assembly; and
- d. a valve means disposed in said outlet line for controlling the flow of contrast media therethrough and comprising a means for venting to atmosphere, said valve means further comprising a handle means having a first position which permits flow of fluid through the line without venting to atmosphere, said handle means having a second position which permits fluid flow toward a patient while at the same time venting the system to atmosphere through said means for venting.

5,569,209

## NEEDLELESS TRANSFER SYSTEM

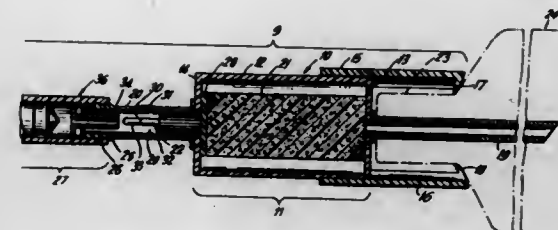
Alan L. Roltman, Woodbury, N.Y., assignor to Jemm Tran-Safe Systems, Inc., Woodbury, N.Y.

Filed Dec. 21, 1994, Ser. No. 361,128

Int. Cl.<sup>6</sup> A61M 5/00

U.S. Cl. 604—190

17 Claims



1. A needleless transfer system capable of transferring a liquid without the utilization of a needle, the needleless transfer system comprising:

- a. a valve mechanism capable of selective mechanical interfit with a container into which or from which a liquid is to be transferred, said valve mechanism comprising:
- (1) a hollow enclosure;
  - (2) a hollow spike member having one end thereof structurally affixed to one end of said hollow structure in an airtight manner so as to allow for the selective flow of a liquid through said hollow spike member into or out of the interior of said hollow enclosure;
  - (3) a hollow neck member having one end thereof structurally affixed in an airtight manner to the opposite end of said hollow enclosure affixed to said hollow spike member so as to allow for the selective flow of a liquid through said hollow neck member into or out of said hollow enclosure when said valve mechanism is in an open position;
  - (4) a filter member positioned within said hollow enclosure having one end thereof structurally abut against the interior end of said hollow enclosure to which said hollow spike member is affixed wherein said filter member is of a resilient composition and capable of expanding back to its original shape after being compressed;
  - (5) a washer member structurally affixed to the end of said filter member that is adjacent to the end of said hollow enclosure to which said hollow neck member is affixed;
  - (6) a shaft member structurally affixed to said washer member so as to be in axial alignment with said hollow neck member and extending from the interior of said hollow enclosure into the interior of said neck member;
  - (7) an indicator shaft structurally affixed to said shaft member so as to be in axial alignment with said shaft member;
  - (8) coupling means formed on the exterior of said hollow neck member at the end of said hollow neck member not structurally affixed to said hollow enclosure;
  - (9) means structurally affixed to the exterior of said hollow enclosure capable of selectively mechanically affixing said hollow enclosure to a container; and
- b. a syringe comprising a tip member, plunger and cylindrical shaft member wherein there is formed about the interior portion of said cylindrical shaft member coupling means capable of mechanical interfit with the coupling means formed on the exterior of said hollow neck member such that upon the selective coupling of said syringe to said hollow neck member said washer member is caused to move axially with said shaft member and said indicator shaft so as to move away from the end of said hollow enclosure to which is affixed said hollow neck member thereby causing said valve mechanism to open.

5,569,210

## MULTIPLE DRAW SYRINGE

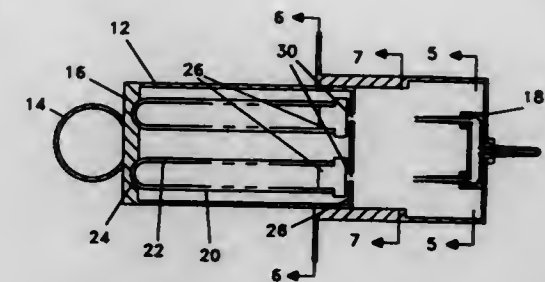
Michael Moen, 401 Mensinger Ave., Modesto, Calif. 95350

Filed Nov. 6, 1995, Ser. No. 554,553

Int. Cl.<sup>6</sup> A61M 3/00

U.S. Cl. 604—191

12 Claims



1. A multiple draw syringe for drawing multiple fluid samples into a plurality of conventional, stoppered, evacuated, sample tubes comprising:

- (1) a protective barrel being hollow and having an open rearward face, a forward face, and a top face; the forward face having a slot perpendicular to the top face; said top face having an opening at the end of said top face nearest said forward face such that the opening in said top face is connected with the slot in said forward face;
- (2) a plunger tray having a rearward end, a forward end, and a bottom; the forward end of the plunger tray being capable of being inserted into the open rearward face of the protective barrel; said plunger tray being adapted to hold a plurality of stoppered, evacuated, sample tubes such that the stoppered, evacuated, sample tubes are perpendicular to said forward end of said plunger tray and the stoppered ends of said stoppered, evacuated, sample tubes are adjacent to said forward end of said plunger tray; and
- (3) a needle manifold having a rearward face and a forward face; the needle manifold being capable of being inserted into the interior of said protective barrel through the opening in said top face of said protective barrel; said needle manifold having a hollow drawing needle projecting forward from the forward face of said needle manifold such that the hollow drawing needle protrudes forward through said slot in said forward face of said protective barrel; said needle manifold having a plurality of hollow specimen needles protruding rearward from the rearward face of said needle manifold; the number of the hollow specimen needles being equal to the number of said stoppered, evacuated, sample tubes held by said plunger tray and one of said hollow specimen needles being aligned with each of said stoppered, evacuated, sample tubes; said needle manifold having an interior tube placing the hollow interior of said hollow drawing needle in operational contact with the hollow interiors of said hollow specimen needles; said needle manifold being adapted such that, if said plunger tray is pressed forward inside said protective barrel, one of said hollow specimen needles pierces the stoppered top of each of said stoppered, evacuated, sample tubes and places the interior of said stoppered, evacuated, sample tubes in operational contact with the hollow interiors of said hollow specimen needles;

whereby conventional, stoppered, evacuated, sample tubes may be placed within said plunger tray with the stoppers toward said forward face of said plunger tray; said plunger tray may be inserted into the rearward end of said protective barrel; and said needle manifold may be inserted through said opening in said top of said protective barrel into said protective barrel with said hollow drawing needle protruding forward from the forward end of said protective barrel; said plunger tray may be pushed forward into said protective barrel until the rearward ends of said hollow specimen needles press against the tops of the stoppers; said hollow drawing needle may be inserted into a vessel from which a fluid sample is to be taken; said plunger tray may be pushed further forward causing said hollow specimen needles to puncture the stoppers of



said stoppered, evacuated, sample tubes and placing said hollow drawing needle in operational contact with the interiors of said stoppered, evacuated, sample tubes; and the fluid to be sampled flows from the vessel from which a fluid sample is to be taken, through said needle manifold, and into said stoppered, evacuated, sample tubes.

5,569,211

## SINGLE-USE HYPODERMIC SYRINGE

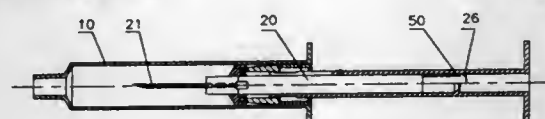
Victor Lekhgolts, 817 N. Croft Ave. #C, Los Angeles, Calif. 90069, and Oleg Shvabsky, 1422 N. Martel Ave. #7, Los Angeles, Calif. 90046

Filed Jun. 5, 1995, Ser. No. 461,494

Int. Cl.<sup>6</sup> A61M 5/32

U.S. Cl. 604—195

4 Claims



1. A single-use hypodermic syringe comprising a barrel having an open end and a needle end, a needle holder having an end that has a needle receiving passage and an end facing toward said open end of said barrel, and is detachably mounted in said needle end of said barrel, said needle holder defining an annular space with said barrel communicating with said needle receiving passage of said needle holder, a piston in said annular space mounted for reciprocation from one end of stroke position to another between said needle end and said open end of said barrel, a piston rod in said annular space mounted for reciprocation, a lost motion means for connecting said piston to said piston rod, whereby said piston moves with a delay determined by an amount of lost motion provided by said lost motion means after a movement during of said piston rod during at least a part of said reciprocation of said piston rod, and a means for connecting said needle holder to said piston rod, said means for connecting said needle holder to said piston rod comprising an outer elastic projection of said needle holder at the end thereof facing toward said open end of said barrel, said outer elastic projection having an axial length, and an internal projection of said piston rod having an axial length, said internal projection of said piston rod being engageable with said outer elastic projection of said needle holder, the amount of said lost motion being greater than the total of said axial lengths of said outer elastic projection of said piston rod and said internal projection of said needle holder.

5,569,212

## APPARATUS FOR ELECTRICALLY DETERMINING INJECTION DOSES IN SYRINGES

Stephen J. Brown, Palo Alto, Calif., assignor to Raya Systems, Inc., Mountain View, Calif.

Filed Jul. 22, 1994, Ser. No. 278,929

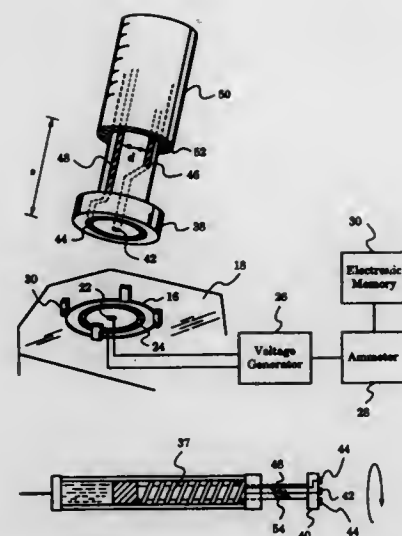
Int. Cl.<sup>6</sup> A61M 5/00

U.S. Cl. 604—207

10 Claims

1. In combination with a syringe, an apparatus for determining and recording the dose of an agent delivered with said syringe, said syringe being of the type comprising:

- a barrel for holding said agent;
- a plunger arranged inside said barrel for expelling said agent;
- a conducting path for conducting an electric current inside said barrel and parallel to said plunger, said conducting path comprising a conductive strip located inside said barrel and oriented parallel along said plunger, a rim on said barrel made of an electrically conducting material and remaining in electric contact with said conductive strip, and an electrically resistive means in the form of a strip whose resistance changes depending on the position of said plunger inside said barrel, said conducting path having a first end and a second end;



- d) an input terminal located on the outside of said syringe and in contact with said first end and with said conducting strip;
  - e) an output terminal located on the outside of said syringe and in contact with said second end and with said electrically resistive means;
- said apparatus comprising:
- a housing;
  - a field on the outside of said housing, said field having an input contact for contacting said input terminal and an output contact for contacting said output terminal;
  - a voltage generating means located inside said housing for producing a voltage difference across said input contact and said output contact, thereby causing said electric current to flow through said conducting path when said input contact is contacting said input terminal and said output contact is contacting said output terminal;
  - d) an electric response measuring means located inside said housing for measuring said electric current and calculating from said electric current said dose; and
  - e) a recording means located inside said housing for recording said dose.

5,569,213

## AUGMENTED POLYMERIC HYPODERMIC DEVICES

Bruce H. Humphrey, P.O. Box 07513, Milwaukee, Wis. 53207 Division of Ser. No. 117,231, Sep. 3, 1993, Pat. No. 5,458,614, which is a continuation-in-part of Ser. No. 754,457, Sep. 3, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 480,089

Int. Cl.<sup>6</sup> A61M 5/00; 5/31

U.S. Cl. 604—239

11 Claims



1. A hypodermic device for performing a piercing process comprising:

a flexible polymeric piercing member with at least one lumen and a piercing tip; and an augmenting means at least partly about and slidably engaged with said piercing member and includes a resilient foam at least partly about said piercing member and a guard at least partly about said foam wherein said augmenting means provides such stiffness to said piercing member in order for said piercing member to perform the piercing process.

5,569,214

## DOSE SETTING KNOB ADAPTER FOR MEDICATION DELIVERY PEN

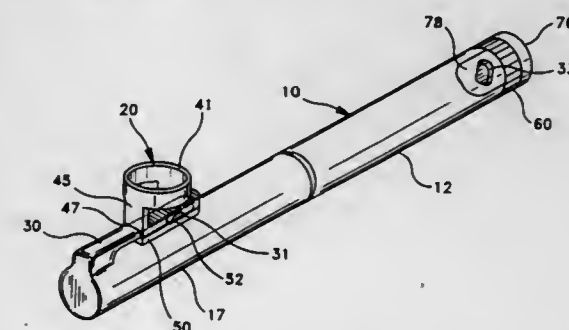
Lawrence H. Chanoch, Mahwah, N.J., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 20, 1994, Ser. No. 309,378

Int. Cl.<sup>6</sup> A61M 5/00

U.S. Cl. 604—246

7 Claims



1. An adapter for use on a medication delivery pen to provide improved control when setting a selected dosage of a medication to be delivered by the medication delivery pen, said adapter comprising:

- means for attaching said adapter to a cap on a medication delivery pen; and
- means for receiving a dose setting knob on the medication delivery pen, said receiving means comprising a receiving ring extending from said attaching means, said receiving ring being capable of receiving the dose setting knob so that when the cap attached to said adapter is rotated the dose setting knob is rotated and a desired dosage of medication to be delivered by the medication delivery pen can be set.

5,569,215

## LOW PROFILE INFUSION CATHETER

Michael Crocker, Mission Viejo, Calif., assignor to Cardiovascular Dynamics, Inc., Irvine, Calif.

Continuation of Ser. No. 83,021, Jun. 24, 1993, abandoned.

This application Jun. 6, 1995, Ser. No. 467,856

Int. Cl.<sup>6</sup> A61M 5/00

U.S. Cl. 604—264

10 Claims



1. An infusion catheter, comprising:
- an elongate tubular body extending from a proximal end to a distal end in a distal direction;
  - at least one proximal, fluid lumen extending through a proximal zone of said tubular body;
  - a branch point in said proximal, fluid lumen at which said proximal, fluid lumen divides into at least a first and a second distal fluid lumen;

at least a first effluent zone on the tubular body in fluid communication with the first distal fluid lumen; and at least a second effluent zone on the tubular body in fluid communication with the second distal fluid lumen; said second distal fluid lumen having a distal portion extending farther in said distal direction than said first distal fluid lumen, said distal portion containing at least a portion of said second effluent zone.

5,569,216

## MULTIPURPOSE COLOSTOMY DEVICE HAVING BALLOONS ON AN END THEREOF

Jae H. Kim, Bosung Hwangsil Town 109-701, Namsan-Dong, Joong-Ku, Taegu, Rep. of Korea

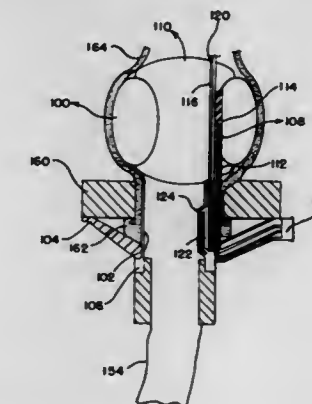
Filed Nov. 30, 1994, Ser. No. 352,071

Claims priority, application Rep. of Korea, Dec. 2, 1993, UM93-26400; Aug. 18, 1994, UM94-21031

Int. Cl.<sup>6</sup> A61M 31/00; A61F 5/44; 2/00

U.S. Cl. 604—277

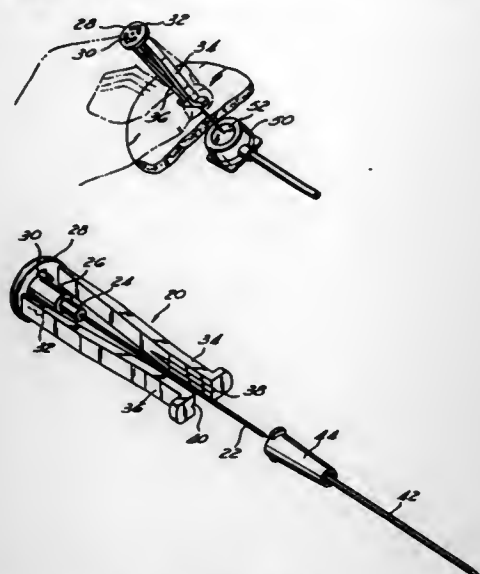
12 Claims



1. A multipurpose colostomy device for fixing in the stoma or the rectum of a human body, said colostomy device comprising:

- an internal balloon;
- an external balloon surrounding said internal balloon;
- a connecting tube disposed under said internal and external balloons;
- a joint tube disposed under said connecting tube;
- an annular supporting plate upwardly disposed between said connecting tube and said joint tube, for fixing the multipurpose colostomy device to the abdominal wall of the stoma;
- a supply tube vertically disposed in said connecting tube and between said internal and said external balloons for communicating with the connecting tube and the internal and external balloons, said supply tube having a holder disposed at an end of a bending portion thereof, for assembling with a socket connected to a fluid tank and an air pump wherein said supply tube includes a pair of air passages communicating with said internal and external balloons through a first air opening and a second air opening, respectively, said supply tube further including an enema fluid passage passed through said internal balloon for communicating with the colon through an enema one-way valve, and wherein said enema fluid passage includes an enema fluid one-way valve located over said internal balloon and in the colon; and
- means for inflating and deflating the internal and external balloons and supplying enema irrigating fluid, such that the multipurpose colostomy device can effectively close the stoma, prevent leakage, particularly liquids and gases, discharge the stool, wash the contaminated connecting tube after discharging of stool, and irrigate the colon with enema fluid.

**5,569,217**  
**PERCUTANEOUS PORT CATHETER ASSEMBLY AND METHOD OF USE**  
 Ronald B. Luther, Newport Beach, Calif., assignor to Luther Medical Products, Inc., Tustin, Calif.  
 Division of Ser. No. 144,881, Oct. 28, 1993, Pat. No. 5,403,283.  
 This application Oct. 27, 1994, Ser. No. 331,222  
 Int. Cl.<sup>6</sup> A61M 25/00; 31/00  
 U.S. Cl. 604—280 7 Claims

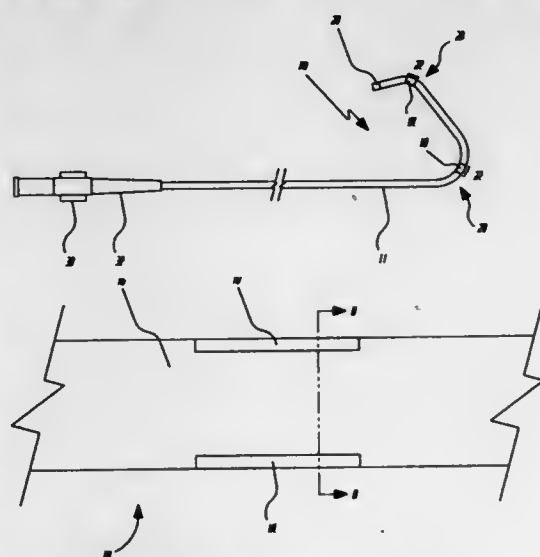


1. An apparatus for introducing a catheter into a septum of a surgically implanted port comprising:

- a catheter for accessing the port, wherein the catheter is comprised of a polytetrafluoroethylene polymer;
- a solid stylet;
- a housing for securing the stylet within the catheter so that the catheter and stylet are maintained in a slidably interconnectible configuration, the housing having at least one member for stably guiding and supporting the interconnected catheter and stylet through the septum of the port;
- a asking with proximal and distal end portions slidably mounted within the housing, the distal end portion being oriented and designed to simultaneously encase and force the retraction of the stylet, the proximal end portion extending beyond a portion of the housing;
- a cap fastened to the proximal end portion of the casing, the cap being so connected, that, when depressed, forces the entire length of the casing to advance a distance sufficient to fully retract and encase the stylet while permitting the interconnected catheter to disengage from the stylet and remain sufficiently embedded within the port;
- wherein the stylet is internally fastened within the housing;
- wherein the catheter comprises a tube of flexible material forming distal end proximal end portions, the proximal end portion being connected to a sleeve;
- wherein the stylet comprises distal and proximal end portions, the distal portion having a shaft and tip, the shaft being shaped and oriented to slidably fit longitudinally within the catheter in a configuration suitable for insertion of both the catheter and the stylet into the septum of the port;
- wherein the housing comprises a base securely fastened to the proximal end portion of the stylet, the base having at least one passage orifice, the base having a first member protruding axially about the stylet toward the distal end of the stylet, the first member being shaped and oriented so as to be received in reversible engagement with the sleeve of the proximal end of the catheter, the base having at least one second member oriented toward the distal end portion of the stylet, the second member being shaped and oriented so as to stably hold the catheter and the stylet while the catheter and stylet are in a longitudinally interconnectible configuration suitable for insertion into the septum of the port;

- wherein the casing comprises a barrel section end portion having at least one member projecting longitudinally from the barrel section so as to form the proximal end portion, the member being designed to be received in the passage orifice and extending longitudinally beyond the housing;
- wherein the cap comprises an apparatus for fastening the cap to the proximal end portion of the casing, the protective cap having an outer surface that, when depressed, forces the casing to longitudinally advance through the housing toward the distal end of the stylet so that the distal end portion of the casing simultaneously retracts and protectively encases the stylet while leaving the catheter embedded within the septum of the port at a depth sufficient to allow for fluid communication between the distal end of the catheter and the reservoir of the port;
- wherein the base of the housing has two passage orifices, the orifices each having a slot for receiving spring-lock panels;
- wherein the second member of the base for stably guiding and supporting the interconnected catheter and stylet are flexible grips in juxtaposition, the flexible grips each having a slot that, when manually compressed, provides axial support for the interconnected catheter and stylet and provides a structure for applying force to insert the interconnected catheter and stylet into the septum of the port;
- wherein the casing having two proximally projecting members, each member being received in a separate passage orifice; and
- wherein the cap further comprises two spring-lock panels that descend towards the distal end of the casing that lock the casing into position when the spring-lock panels are compressed into the slots or receiving the spring-lock panels, the slots defining a portion of the passage orifices.

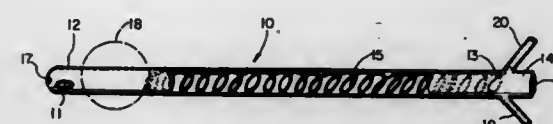
**5,569,218**  
**ELASTIC GUIDE CATHETER TRANSITION ELEMENT**  
 Todd A. Berg, Lino Lakes, Minn., assignor to SCIMED Life Systems, Inc., Maple Grove, Minn.  
 Filed Feb. 14, 1994, Ser. No. 195,222  
 Int. Cl.<sup>6</sup> A61M 25/00  
 U.S. Cl. 604—282 15 Claims



1. An intravascular guiding catheter which comprises:
- a flexible inner tube;
  - a support member coupled to said inner tube;
  - an outer tube congruent to said inner tube, having a proximal section, a transition section, and a distal section;
  - wherein the transition section, located between the proximal and distal sections of said outer tube, is comprised of a material having different physical properties than the material of said proximal and distal sections; and

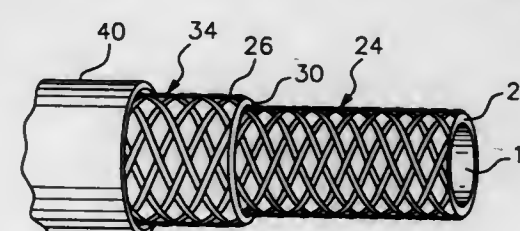
- said proximal and distal sections being comprised of materials having the same physical properties.

**5,569,219**  
**COLLAPSIBLE CATHETER**  
 A-Hamid Hakki, and Said I. Hakki, both of 8547 Merrimoor Blvd., E., Largo, Fla. 34647-3145  
 Filed Sep. 13, 1994, Ser. No. 306,183  
 Int. Cl.<sup>6</sup> A61M 25/00—  
 U.S. Cl. 604—282 30 Claims



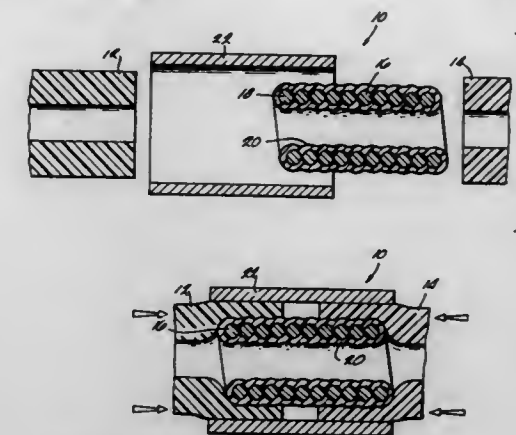
1. A catheter for insertion into a patient, said catheter comprising:
- at least a partially collapsible elongated elastomeric tube wherein the tube is thin enough to remain in a state of collapse at all times and which is open at a proximal end and substantially closed at a distal end, the distal end of said tube having at least one opening;
  - valve means at the proximal end of said elastomeric tube; and
  - actuation balloon means along said tube for at least partially collapsing or partially stiffening said elastomeric tube when inserted in the patient.

**5,569,220**  
**CARDIOVASCULAR CATHETER HAVING HIGH TORSIONAL STIFFNESS**  
 Wilton W. Webster, Jr., Alta Dena, Calif., assignor to Cordis Webster, Inc., Baldwin Park, Calif.  
 Continuation of Ser. No. 60,494, May 11, 1993, abandoned, which is a continuation of Ser. No. 645,230, Jan. 24, 1991, abandoned. This application Dec. 30, 1994, Ser. No. 367,690  
 Int. Cl.<sup>6</sup> A61M 25/00  
 U.S. Cl. 604—282 18 Claims



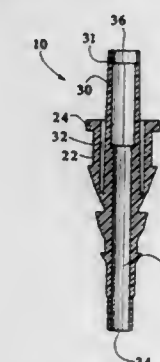
1. A catheter adapted for insertion into a blood vessel of a human patient, said catheter exhibiting high torsional stiffness and comprising:
- an elongated catheter tubular body having a proximal end and a distal end, said body comprising a wall, said wall comprising inner, intermediate and outer layers of flexible non-toxic plastic material, a first tubular braided reinforcing mesh between the inner and intermediate layers and a second tubular braided reinforcing mesh between the intermediate and outer layers so that the first and second tubular braided reinforcing meshes are disposed in the wall in concentric relation, wherein the first and second meshes comprise metal and are sandwiched between the inner and outer plastic layers and are spaced apart by the intermediate plastic layer without touching each other for increasing stiffness of the catheter body.

**5,569,221**  
**CATHETER COMPONENT BOND AND METHOD**  
 Russell A. Houser, Livermore; Jerome Jackson, Sunnyvale, and Russell B. Thompson, Menlo Park, all of Calif., assignors to EP Technologies, Inc., Sunnyvale, Calif.  
 Continuation of Ser. No. 271,186, Jul. 7, 1994, abandoned.  
 This application Nov. 21, 1995, Ser. No. 561,092  
 Int. Cl.<sup>6</sup> A61M 25/00  
 U.S. Cl. 604—282 5 Claims



1. A catheter body having segments thereof bonded together in abutting relationship comprising:
- a temperature resistant polymeric sleeve, said sleeve including a spirally wound metallic wire imbedded therein, said sleeve extending into ends of thermoplastic, polymeric tubing segments joined together to form said catheter body, said segments being fused to each other over the area including said sleeve to form said bond, said sleeve being formed of a polymer having a melting temperature exceeding 700° F. and maintaining its integrity to thereby form a reinforcement within the area of said bond.

**5,569,222**  
**ADAPTER FOR A VARIETY OF TUBES HAVING VARIOUS DIAMETERS AND A METHOD OF USING THE ADAPTER**  
 Ronald Haselhorst, Lindenhurst, and Tom Lillegard, Crystal Lake, both of Ill., assignors to Clintec Nutrition Company, Deerfield, Ill.  
 Filed Jun. 21, 1994, Ser. No. 263,043  
 Int. Cl.<sup>6</sup> A61M 25/00  
 U.S. Cl. 604—283 5 Claims



1. An adapter for connecting a fluid source to a feed tube, the adapter comprising:
- a body having a channel therethrough, the channel defined by a first opening at a first end and a second opening at a second end, the body integrally formed by, in continuous and sequential order from the first end to the second end, a first continuously uniform cylindrical segment, a first tapered segment, a



second continuously uniform cylindrical segment, a second tapered segment and a third tapered segment wherein a diameter of the first tapered segment is larger than a diameter of the second cylindrical continuously uniform segment and further wherein a diameter of the second tapered segment is larger than a diameter of a junction between the second tapered segment and the third tapered segment wherein the first continuously uniform cylindrical segment is divided in two sections having a first diameter and a second diameter in continuous and sequential order from the first end to the second end, respectively, wherein the first diameter is smaller than the second diameter of the first continuously uniform cylindrical segment.

5,569,223

# APPARATUS AND METHOD FOR ENHANCING BLOOD FLOW TO OBTAIN A BLOOD SAMPLE

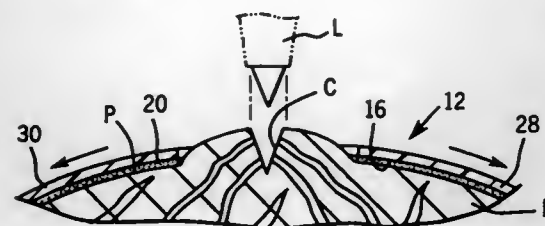
Michael Wandell, Mercer Island, Wash.; Richard A. Quattrocchi, Barrington, and Allan Frank, Chicago, both of Ill., assignors to Home Access Health Corporation, Rolling Meadows, Ill.

Division of Ser. No. 466,609, Jun. 6, 1995. This application Dec. 29, 1995, Ser. No. 581,313

Int. Cl.<sup>6</sup> A61M 35/00; 5/32

U.S. Cl. 604—290

2 Claims



1. A method for obtaining a blood sample from a person's finger comprising the steps of:

- applying a disposable adhesive non-absorptive tape about a person's finger, said tape having a throughhole with an inner peripheral surface defined by and between opposite ends of said tape, with the peripheral surface of said throughhole defining an unobstructed passage extending through said tape, and wherein said tape is tautly applied about the person's finger such that the throughhole overlies a finger pad on the person's finger and inhibits venous blood flow in that area of the finger; and
- puncturing the finger pad of the person in the area circumscribed by the throughhole.

5,569,224

# EYEDROP APPLICATOR

Peter Michalos, 137 Hampton Rd., South Hampton, N.Y. 11968

Filed Jun. 2, 1995, Ser. No. 460,779

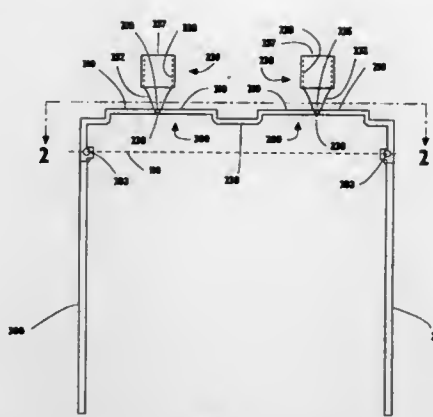
Int. Cl.<sup>6</sup> A61M 35/00; A61H 33/04

U.S. Cl. 604—300

13 Claims

1. A frame assembly for wearing on the head of a person, the top of the person's head defining an up direction, the frame assembly comprising:

- a left eye plate having a first opaque major surface defining a first optical aperture and a first liquid aperture;
- a right eye plate, coupled to the left eye plate, having a second opaque major surface defining a second optical aperture and a second liquid aperture, the first optical aperture and the first liquid aperture defining a line transverse to a line defined by the first and second optical apertures, and the second optical aperture and the second liquid aperture defining a line transverse to the line defined by the first and second optical apertures; and



securing means, coupled to the left eye plate and to the right eye plate, for securing the left and right eye plates to the person's head such that the first optical aperture is above the first liquid aperture and the second optical aperture is above the second liquid aperture.

5,569,225

# BODILY FLUID TEST KIT AND METHOD OF TESTING BODILY FLUIDS

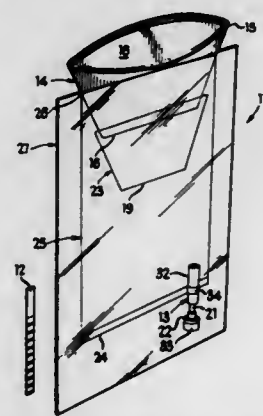
Richard L. Fleury, Orland Park, Ill., assignor to GKR Industries, Inc., Alsip, Ill.

Filed Jun. 29, 1995, Ser. No. 496,761

Int. Cl.<sup>6</sup> A61F 1/00

U.S. Cl. 604—323

2 Claims



1. A kit for collecting and testing bodily fluids, the kit comprising:

- a disposable container including
- a tubular member having an upper end portion and a lower end portion,
- a valve sealably attached to the lower end portion of the tubular member,
- a closure means attached to the upper end of the tubular member that is further characterized as including two overlapping opposing flaps attached to the upper end of the tubular member, each flap folding inward, one on top of the other, to substantially close the upper end of the tubular member,
- a collection bag, the bag including an upper portion that is sealably attached to an outer surface of the tubular member and a lower portion for collecting fluid, the lower portion of the collection bag including an injection site for removing samples of fluid from the collection bag, the injection site is further characterized as being an injection tube that sealably passes through the lower end of the collection bag, the injection tube accommodating a membrane, the membrane sealing the injection tube and preventing leakage of fluid

through the injection tube, the membrane capable of being punctured by the syringe during removal of a sample from the collection bag, the membrane further being sufficiently resilient so that the membrane is resealed upon the withdrawal of the syringe from the membrane, the injection tube of the injection site also includes a removable cap to protect the membrane prior to the removal of a sample, a sleeve including a first open end portion and a second open end portion, the first open end portion being sealably attached to the outer surface of the tubular member between an upper end of the tubular member and the upper portion of the collection bag,

the second open end portion of the sleeve folding upward over the upper end of the tubular member and being sealable, the upper portion of the collection bag, the valve and the second open end of the sleeve combining to provide substantial containment of fluid within the disposable container after fluid is disposed therein;

means for withdrawing a sample of fluid through the injection site, said means for withdrawing a sample of fluid through the injection site further characterized as including

- a test tube for receiving the fluid sample that is passed through the syringe,
- a test-tube-holding-sleeve having a closed end and an open end, the syringe is sealably attached to a closed end of a test tube-holding sleeve, the open end of the test-tube-holding-sleeve receiving the test tube.

- i) an upper layer comprising about 20 to 95 wt-% resilient hydrophilic fibers and about 5 to 80 wt-% superabsorbent material, having a third average pore size of about 400 to 1,000 μm; and
- ii) a lower layer disposed below and in fluid communication with the upper layer of the second planar region, comprising an air-laid mixture of natural pulp fibers and hydrophilic synthetic fibers, the layer having a fourth average pore size of about 40 to 140 μm.

5,569,227

# DISPOSABLE ABSORBENT HYGIENE ARTICLE HAVING WAISTBAND POCKETS IMPROVING THE SEALING

Philippe Vandemoortele, Lille, and André Leroy, Mouvaux, both of France, assignors to Peadouze, Linselles, France

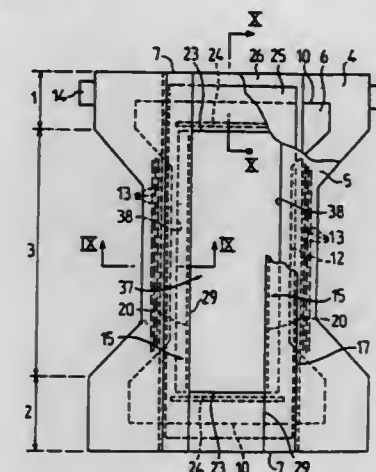
PCT No. PCT/FR92/00525, § 371 Date Jan. 11, 1994, § 102(e) Date Jan. 11, 1994, PCT Pub. No. WO92/22271, PCT Pub. Date Dec. 23, 1992

PCT Filed Jun. 10, 1992, Ser. No. 162,110

Claims priority, application France, Jun. 12, 1991, 91/07164 Int. Cl.<sup>6</sup> A61F 13/15

U.S. Cl. 604—382

14 Claims



1. A disposable absorbent hygiene article having a general rectangular shape with first and second opposite longitudinal edges and first and second opposite transverse edges and comprising from outside inward:

- a supporting sheet impermeable to liquids having first and second opposite longitudinal edges, first and second opposite transverse edges, an external face and an internal face;
- an absorbent pad having first and second opposite longitudinal edges, first and second opposite transverse edges, an external face, and an internal face, said absorbent pad being arranged on the internal face of said supporting sheet, said pad being smaller in size than said supporting sheet;
- a covering sheet having first and second opposite longitudinal edges, first and second opposite transverse edges, an external face and an internal face, said covering sheet covering the internal face of said absorbent pad and of the supporting sheet and being joined to the supporting sheet around said longitudinal and transverse edges of the absorbent pad;
- longitudinal elastic elements fastened in a tensioned state to said supporting sheet transversely outside the first and second opposite longitudinal edges of said absorbent pad;
- fastening means provided in the vicinity of said first transverse edge of the hygiene article, in order to close the latter around a user's waist in such a way that the hygiene article defines a rear part and a front part corresponding respectively to two end zones near said opposite first and second transverse edges of said hygiene article and a crotch part corresponding to an intermediate zone located between said end zones;
- two transversely spaced lateral flaps arranged on the internal face of the covering sheet substantially along said first and

5,569,226

# MULTILAYERED ABSORBENT STRUCTURES

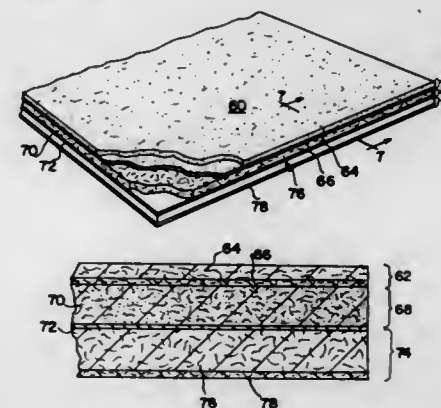
Richmond R. Cohen, Warren, N.J.; James A. Minetola, Newtown, Pa., and John F. Poccia, Union Beach, N.J., assignors to McNeil-PPC, Inc., Skillman, N.J.

Division of Ser. No. 268,400, Jun. 30, 1994, Pat. No. 5,505,719. This application Apr. 25, 1995, Ser. No. 429,265

Int. Cl.<sup>6</sup> A61F 13/15; 13/20

U.S. Cl. 604—378

15 Claims



1. An absorbent structure providing a substantially dry liquid-accepting surface after application of a quantity of liquid to the surface, the structure comprising:

- a) a first planar region defining an upper, liquid-accepting surface of the absorbent structure comprising:
  - i) an upper layer comprising hydrophilic synthetic fibers, the layer having a first average pore size of about 75 to 400 μm; and
  - ii) a lower layer disposed below and in fluid communication with the upper layer, comprising an air-laid mixture of natural pulp fibers and hydrophilic synthetic fibers, the layer having a second average pore size, less than the first average pore size, within the range of about 40 to 140 μm; and
- b) a second planar region, disposed below and in fluid communication with the lower layer of the first planar region, comprising:



second longitudinal edges of said hygiene article, each of said flaps having a proximal part joined to the covering sheet and a distal part having a tensioned longitudinal elastic element; and

a first additional sheet permeable to liquids having first and second opposite transverse edges, first and second opposite longitudinal edges, an external face and an internal face, said first additional sheet being arranged between the absorbent pad and the covering sheet and extending from said first transverse edge of the hygiene article at least over the first transverse edge of the absorbent pad which is closest to said first transverse edge of the hygiene article;

wherein said covering sheet further comprises:

- a) a first transverse cutout above the absorbent pad between the proximal parts of said lateral flaps, in the vicinity of said first transverse edge of the absorbent pad, and having a first side confronting said first transverse edge of the hygiene article and a second opposite side; and
- b) a first tensioned transverse elastic element extending along said first cutout on said first side thereof confronting said first transverse edge of the hygiene article and having two ends,

wherein said covering sheet is fastened to the first additional sheet at least along said first transverse edge of the hygiene article and adjacent the two ends of said first transverse elastic element, in order to form a sealing waistband pocket open at the location of said first transverse cutout.

7. A disposable absorbent hygiene article having a general rectangular shape with first and second opposite longitudinal edges and first and second opposite transverse edges and comprising, from outside inward:

- a supporting sheet impermeable to liquids having first and second opposite longitudinal edges, first and second opposite transverse edges, an external face and an internal face;
- an absorbent pad having first and second opposite longitudinal edges, first and second opposite transverse edges, an external face and an internal face, said absorbent pad being arranged on the internal face of said supporting sheet, said pad being smaller in size than said supporting sheet;

- a covering sheet permeable to liquids having first and second opposite longitudinal edges, first and second transverse edges, an external face and an internal face, said covering sheet covering the internal face of said absorbent pad and of the supporting sheet and being joined to the supporting sheet around said longitudinal and transverse edges of the absorbent pad;

longitudinal elastic elements fastened in a tensioned state to said supporting sheet transversely outside of the first and second opposite longitudinal edges of said absorbent pad;

fastening means provided in the vicinity of said first transverse edge of the hygiene article, in order to close the latter around a user's waist in such a way that the hygiene article defines a rear part and a front part corresponding respectively to two end zones near said opposite first and second transverse edges of said hygiene article and a crotch part corresponding to an intermediate zone located between said end zones;

two transversely spaced lateral flaps arranged on the internal face of the covering sheet substantially along said first and second longitudinal edges of said hygiene article, each of said flaps having a proximal part joined to the covering sheet and a distal part having a tensioned longitudinal elastic element; and

a first sheet portion having a first and second opposite longitudinal edges, first and transverse edge, an external face and an internal face, said first sheet portion being arranged on the internal face of said covering sheet and extending from said first transverse edge of the hygiene article to at least over the first transverse edge of the absorbent pad which is closest to said first transverse edge of the hygiene article;

wherein said first sheet portion further comprises:

- a) a first transverse cutout above the absorbent pad between the proximal parts of said lateral flaps, in the vicinity of said first transverse edge of the absorbent pad, and having a first side confronting said first transverse edge of the hygiene article and a second opposite side; and,

- b) a first tensioned transverse elastic element extending along said first cutout on said first side thereof confronting said first transverse edge of the hygiene article and having two ends,

wherein said first sheet portion is fastened to said covering sheet at least along said first transverse edge of the hygiene article and adjacent the two ends of said first transverse elastic element, in order to form a sealing waistband pocket open at the location of said first transverse cutout.

5,569,228

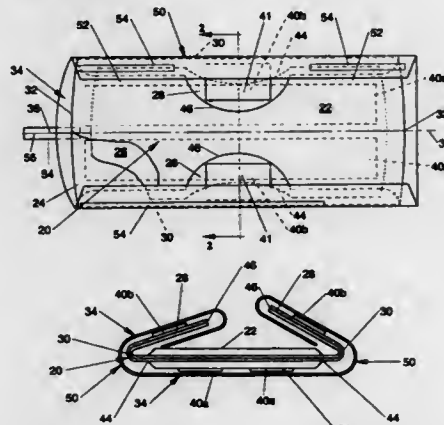
## C-FOLD RELEASABLE WRAPPER

Alan E. Byrd, Hamilton; Thomas W. Osborn, III, Cincinnati, and Gary E. McKibben, Middletown, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio  
Continuation of Ser. No. 348,282, Nov. 30, 1994, abandoned, which is a continuation of Ser. No. 247,912, May 23, 1994, abandoned, which is a continuation of Ser. No. 990,825, Dec. 14, 1992, abandoned, which is a continuation of Ser. No. 533,614, Jun. 5, 1990, abandoned. This application Jun. 2, 1995, Ser. No. 459,372

Int. Cl.<sup>6</sup> A61F 13/15; A61B 17/06

U.S. Cl. 604—385.1

1 Claim



1. An individually wrapped sanitary napkin for wearing in a crotch region of an undergarment, said individually wrapped sanitary napkin comprising:

- a sanitary napkin having two major mutually opposed faces and a longitudinal centerline said sanitary napkin comprising:

- a central portion having two opposed longitudinal side margins and two opposed lateral side margins defining the perimeter of said central portion, said central portion comprising:

- a liquid pervious topsheet defining one major face of said sanitary napkin;

- a liquid impervious backsheet defining the other major face of said sanitary napkin, said backsheet having opposed inwardly and outwardly oriented faces, and being joined to said topsheet

- an adhesive patch on said outwardly oriented face of said backsheet;

- an absorbent core positioned between said topsheet and said backsheet; and

- two flaps for folding under the undergarment, each said flap having a proximal edge between one said longitudinal side margin of said central portion and said longitudinal centerline of said sanitary napkin and being joined to said central portion at said proximal edge, each said flap extending laterally from said proximal edge to a distal edge lying outboard of said one longitudinal side margin of said central portion, said flaps being folded over one of said topsheet or said backsheet so that said distal edges of said flaps are intermediate said longitudinal side margins of said central portion; and

a releasable wrapper disposed on said sanitary napkin, said releasable wrapper having two longitudinal side margins and two ends, one end of said releasable wrapper being juxtaposed with a lateral side margin of said central portion of said sanitary napkin, said releasable wrapper being generally laterally centered on the longitudinal centerline of the other of said topsheet or said backsheet, and wrapping said longitudinal side margins of said central portion of said sanitary napkin in a first C-fold oriented towards said longitudinal centerline, and wrapping the distal edges of said flaps in a second C-fold oriented towards said longitudinal side margins of said central portion of said sanitary napkin so that said longitudinal side margins of said wrapper are interposed between said flaps and the one of said topsheet or said backsheet that said flaps are folded over.

5,569,229

## VIEW FLAP DIAPER

Candies M. Rogers, 16031 Tacoma, Detroit, Mich. 48205, assignor to Candies M. Rogers, Detroit, Mich., and Peter D. Keefe, Roseville, Mich.

Filed Oct. 31, 1994, Ser. No. 332,245

Int. Cl.<sup>6</sup> A61F 13/15

U.S. Cl. 604—385.1

17 Claims



1. A diaper equipped with a view flap, comprising:

- a diaper member having an aperture therein, said aperture having a predetermined shape and size so that a person is able to view therethrough into said diaper member and thereupon directly inspect for urinal and fecal excrement present in said diaper member;

- a view flap member having a lower end and an upper end, said lower end of said view flap member being connected with said diaper member adjacent said aperture, said view flap member being selectively movable from a closed position with respect to said aperture to an open position with respect to said aperture, wherein when said view flap member is in said open position the person is able to view through said aperture into said diaper member and thereupon directly inspect for presence of urinal and fecal excrement therein, said view flap member having a second predetermined shape and size wherein said view flap member covers and closes said aperture when said view flap member is in said closed position so that excrement is retained within said diaper member; and

releasable connection means for releasably connecting said upper end of said view flap member to said diaper member adjacent said aperture.

5,569,230

## INDIVIDUALLY PACKAGED SANITARY NAPKIN HAVING CLEANING WIPE PACKAGED THEREWITH

Daniella J. Fisher; Thomas W. Osborn, III; Mark D. Seymour; Gary W. Kingry; Charles J. Berg, Jr., all of Cincinnati; Charles D. Cook, Fairfield; Steven R. Gilbert, and Douglas Toms, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

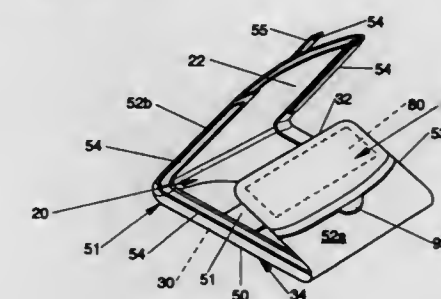
Continuation of Ser. No. 346,985, Nov. 30, 1994, abandoned, which is a continuation of Ser. No. 874,871, Apr. 28, 1992, abandoned, which is a continuation-in-part of Ser. No.

795,932, Nov. 15, 1991, Pat. No. 5,484,636, which is a continuation-in-part of Ser. No. 533,614, Jun. 5, 1990. This application May 30, 1995, Ser. No. 453,326

Int. Cl.<sup>6</sup> A61F 13/15; A61B 17/06

U.S. Cl. 604—385.1

14 Claims



1. An individually packaged sanitary napkin comprising:

- a sanitary napkin having a body-facing side, a garment-facing side, a length, a width, two longitudinal edges, and two end edges, said sanitary napkin comprising:

- a liquid pervious topsheet;
- a liquid impervious backsheet joined to said topsheet, said backsheet having opposed inwardly and outwardly oriented faces;

- an adhesive fastener on said outwardly oriented face of said backsheet;

- an absorbent core positioned between said topsheet and said backsheet;

- a releasable wrapper releasably affixed to the adhesive fastener on said outwardly oriented face of said backsheet, said releasable wrapper having a longitudinal dimension, a transverse dimension, an inwardly oriented face, an outwardly oriented face, a pair of longitudinal side edges, a pair of end edges, and a pair of ends, wherein only said releasable wrapper is folded about a longitudinal axis adjacent at least one of said longitudinal edges of said sanitary napkin in a C-fold thereby wrapping said at least one of said longitudinal edges, and wherein said sanitary napkin and said releasable wrapper are folded about two transverse axes which form said wrapper into first, second, and third trisections, wherein said first trisection is folded over said second trisection to form a package body and said third trisection is folded over said first trisection to form a package flap;

- a pouch disposed on one of said faces of said wrapper and positioned entirely within one of said trisections said pouch comprising a first portion of said wrapper and a thin flexible material having sides that are joined

- to said first portion of said wrapper with a seal, at least a portion of said seal being releasable; and

- a cleansing wipe positioned inside said pouch.



5,569,231

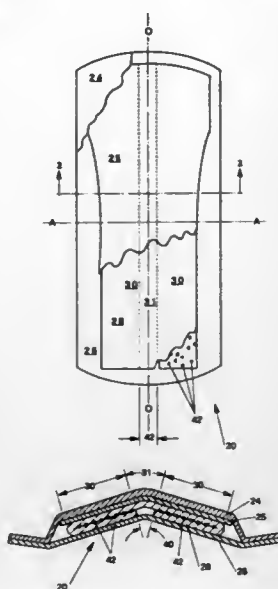
## TRISECTION SANITARY NAPKIN

Ralph R. Emenaker, Hamilton, and Charles W. Amos, Jr., Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio  
Continuation of Ser. No. 339,511, Nov. 14, 1994, Pat. No. 5,460,623, which is a continuation of Ser. No. 204,821, Mar. 1, 1994, abandoned. This application Aug. 11, 1995, Ser. No. 514,165

Int. Cl. A61F 13/15; 13/20

U.S. Cl. 604—385.1

8 Claims



1. A sanitary napkin comprising:  
a liquid pervious topsheet;  
a liquid impervious backsheet joined to said topsheet; and  
an absorbent core further comprising absorbent gelling material,  
said core being intermediate said topsheet and said backsheet;  
said sanitary napkin having a peak crush resistance less than 0.6 psi.

5,569,232

## ABSORBENT ARTICLE WITH MULTIPLE ZONE STRUCTURAL ELASTIC-LIKE FILM WEB EXTENSIBLE WAIST FEATURE

Donald C. Roe, West Chester; David J. K. Goulait; Sheila S. Rodriguez, both of Cincinnati; Edward P. Carlin, Maineville; Kimberly A. Dreier, Cincinnati; Carolyn M. Jasper, Cincinnati, and Dean J. Daniels, Cincinnati, all of Ohio, assignors to The Procter and Gamble Company, Cincinnati, Ohio

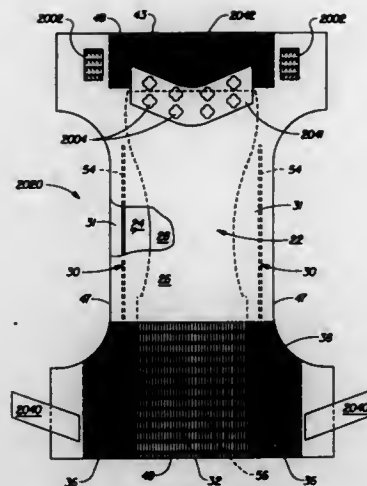
Division of Ser. No. 203,456, Feb. 28, 1994. This application May 24, 1995, Ser. No. 448,951

Int. Cl. A61F 13/15

U.S. Cl. 604—385.2

12 Claims

1. A disposable absorbent article having a front waist region and a back waist region, the absorbent article comprising:  
a chassis assembly comprising a liquid pervious topsheet, a liquid impervious backsheet joined with said topsheet, and an absorbent core positioned between said topsheet and said backsheet;  
an extensible front waist feature positioned in said front waist region, said extensible front waist feature comprising a front waist panel joined to and extending longitudinally outwardly from said chassis assembly; and  
an extensible back waist feature positioned in said back waist region, said extensible back waist feature joined to and extending longitudinally outwardly from said chassis assembly comprising:



(a) a hip panel extending longitudinally outwardly from said absorbent core, said hip panel being extensible in a direction having a vector component in the lateral direction;  
(b) a central waistband panel joined to and extending longitudinally outwardly from said hip panel, said central waistband panel being extensible in a direction having a vector component in the lateral direction, the extension force of said central waistband panel being greater than the extension force of said hip panel; and  
(c) a pair of side panels joined to and extending laterally outwardly from said central waistband panel and at least a portion of said hip panel, each said side panel being extensible in a direction having a vector component in the lateral direction.

5,569,233

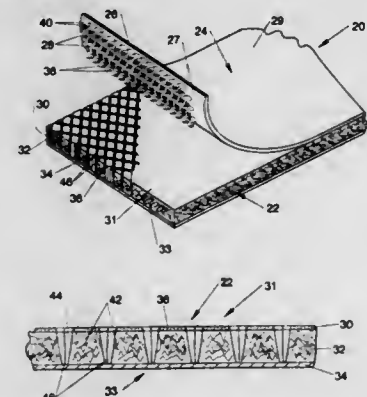
## MULTI-LAYER FEMALE COMPONENT FOR REFASTENABLE FASTENING DEVICE AND METHOD OF MAKING THE SAME

David J. K. Goulait, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio  
Division of Ser. No. 252,985, Jun. 1, 1994, Pat. No. 5,407,439, which is a continuation of Ser. No. 141,425, Oct. 22, 1993, abandoned, which is a continuation of Ser. No. 703,426, May 20, 1991, abandoned. This application Dec. 20, 1994, Ser. No. 359,779

Int. Cl. A61F 13/15; 13/20

U.S. Cl. 604—391

17 Claims



1. A multi-zone female component for a refastenable fastening device that is capable of engaging a complementary hook fastening component which has a base with individual hooks extending outward from said base, and said hooks comprise a stem supported at one end on said base and a blunt head on the opposite end of said stem, said multi-zone female component comprising:

an entanglement zone for admitting and mechanically entangling at least some of the hooks of the complementary hook component, said entanglement zone comprising a first material having a thickness, said first material comprised of at least one structural element, said first material being capable of providing a multiplicity of openings for said hooks so that a plurality of said hooks of said hook component may readily penetrate said thickness of said first material without forcibly piercing said first material;

a spacing zone comprising a second material adjacent said entanglement zone for providing space for at least portions of said hooks to occupy after said hooks have penetrated said entanglement zone;

a backing comprising a third material adjacent said spacing zone for providing a foundation for said entanglement zone and said spacing zone, wherein said entanglement zone and said spacing zone are held in place with respect to said backing with said spacing zone in between said entanglement zone and said backing; and a joining means for joining said first material with said third material.

5,569,234

## DISPOSABLE PULL-ON PANT

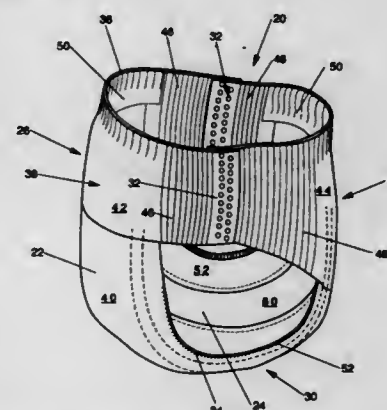
Kenneth B. Boell, Cincinnati, and Edward P. Carlin, Maineville, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 3, 1995, Ser. No. 415,816

Int. Cl. A61F 13/15

U.S. Cl. 604—396

36 Claims



1. A unitary disposable pull-on garment comprising:

(a) a chassis layer comprising a continuous sheet defining  
(i) a front region having a top end edge, side edges, leg edges, a central panel comprising a waistband panel and a medial panel, side panels extending laterally outwardly from said central panel, and a seam panel extending laterally outwardly from each said side panel to said side edge, said seam panels and said side panels extending longitudinally from said top end edge to said leg edge;  
(ii) a back region opposed to said front region, said back region having a top end edge, side edges, leg edges, a central panel comprising a waistband panel and a medial panel, side panels extending laterally outwardly from said central panel, and a seam panel extending laterally outwardly from each said side panel to said side edge, said seam panels and said side panels extending longitudinally from said top end edge to said leg edge; and  
(iii) a crotch region between said front region and said back region;

(b) a first belt layer positioned so as to extend continuously laterally across said front region from at least one said side panel to the other said side panel, said first belt layer being joined to said chassis layer, said first belt layer having a top end edge and a bottom edge so as to extend continuously longitudinally along said front region;

(c) a second belt layer positioned so as to extend continuously laterally across said back region from at least one said side panel to the other said side panel, said second belt layer being joined to said chassis layer, said second belt layer having a top end edge and a bottom edge so as to extend continuously longitudinally along said back region;

(d) an elastically extensible front stretch laminate positioned in each said side panel of said front region, each said front stretch laminate comprising a portion of said chassis layer in said side panel, a portion of said first belt layer in said side panel, and an elastic panel member operatively joined with said chassis layer or said first belt layer, each said front stretch laminate being elastically extensible in at least the lateral direction;

(e) an elastically extensible back stretch laminate positioned in each said side panel of said back region, each said back stretch laminate comprising a portion of said chassis layer in said side panel, a portion of said second belt layer in said side panel, and an elastic panel member operatively joined with said chassis layer or said second belt layer, each said back stretch laminate being elastically extensible in at least the lateral direction; and

(f) seams joining said front region to said back region adjacent said side edges in said seam panels so as to form two leg openings and a waist opening.

5,569,235

## VALVE AND VALVED CONTAINER FOR USE WITH A SYRINGE FITTING

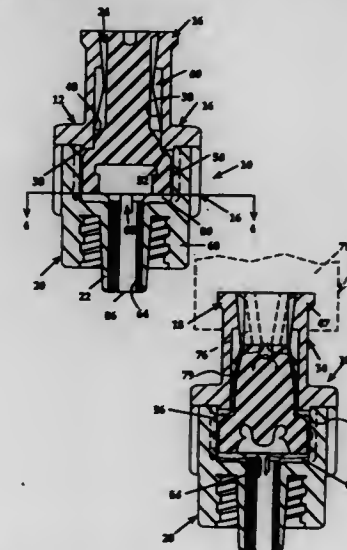
James B. Ross, Livermore, and Ronald Chang, Redwood City, both of Calif., assignors to Modern Medical Devices, Fremont, Calif.

Filed Jun. 21, 1994, Ser. No. 263,790

Int. Cl. A61M 5/00; 19/00; F16K 51/00

U.S. Cl. 604—403

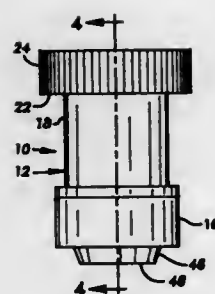
14 Claims



1. A valve for use with a syringe fitting having an extended neck, said valve comprising

(a) a housing defining (i) an elongate bore terminating at an outer end in a receptacle fitting adapted to releasably engage the syringe fitting, with the neck thereof received in an outer end region of the bore, (ii) a valve chamber communicating with the bore, (iii) a valve seat formed between said bore and chamber, and (iv) a chamber opening, and  
(b) a valve plunger having (i) an invertible elastomeric bowl defining an open interior region, disposed in said chamber for movement between a relaxed condition, in which the bowl is in sealing engagement with the valve seat, and a partially inverted condition, in which the open interior of the bowl is at least partially filled, and the bowl is separated from the valve

seat, and (ii) a stem connected to the bowl and extending into the outer end region of the bore, wherein attaching a syringe fitting to the valve, with insertion of the syringe-fitting neck into the valve bore's outer end region, forces the plunger stem toward said valve chamber, moving the invertible plunger bowl from its relaxed to its partially inverted condition, opening the valve to fluid flow around the plunger stem and between the valve seat and bowl, and removing the syringe fitting the valve causes the bowl to return to its relaxed condition, closing the valve.



5,569,236

## FLUID DELIVERY APPARATUS

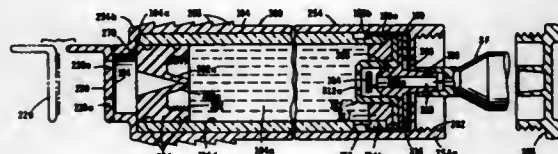
Marshall S. Kriesel, St. Paul, Minn., assignor to Science Incorporated, Bloomington, Minn.

Continuation-in-part of Ser. No. 129,470, Sep. 29, 1993, Pat. No. 5,374,256, which is a continuation-in-part of Ser. No. 129,693, Sep. 29, 1993, Pat. No. 5,419,771, which is a continuation-in-part of Ser. No. 69,937, May 28, 1993, Pat. No. 5,336,188, which is a continuation-in-part of Ser. No. 46,438, May 18, 1993, Pat. No. 5,411,480, which is a continuation-in-part of Ser. No. 987,021, Dec. 7, 1992, Pat. No. 5,279,558, which is a continuation of Ser. No. 870,269, Apr. 17, 1992, Pat. No. 5,205,820, which is a continuation-in-part of Ser. No. 642,208, Jan. 16, 1991, Pat. No. 5,169,389, which is a continuation-in-part of Ser. No. 367,304, Jun. 16, 1989, Pat. No. 5,019,047. This application Jun. 30, 1994, Ser. No. 269,445

Int. Cl.<sup>6</sup> A61B 19/00

U.S. Cl. 604-403

14 Claims



1. A fluid container assembly for use with a fluid delivery apparatus of the character having a base and a stored energy means for forming in conjunction with the base a fluid reservoir having an inlet and an outlet, said stored energy means being adapted to expel fluid from the fluid reservoir, said fluid container assembly comprising:

- a container having a fluid chamber having an inlet and an outlet;
- a plunger telescopically movable within said fluid chamber of said container as a result of fluid pressure being exerted thereon by fluid introduced through said inlet; and
- inlet valve means disposed between said plunger and said inlet for controlling fluid flow into said chamber, said inlet valve means including a valve member movable in response to fluid pressure from a first valve closed position to a second valve open position.

5,569,237

## MARKING DEVICE FOR BREAST SURGERY

Michael S. Beckenstein, 1113 Windridge Dr., Atlanta, Ga. 30350

Filed Apr. 27, 1995, Ser. No. 429,903

Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606-1

18 Claims

1. A marking device comprising:
  - a body;
  - a circular marking pad disposed on a front end of said body and adapted to hold ink; and
  - a projection extending from the device and defining a circular, pointed marking edge having substantially the same diameter as the marking pad.

5,569,238

## ENERGY DELIVERY SYSTEM CONTROLLABLE TO CONTINUOUSLY DELIVER LASER ENERGY IN PERFORMING PHOTOREFRACTIVE KERATECTOMY

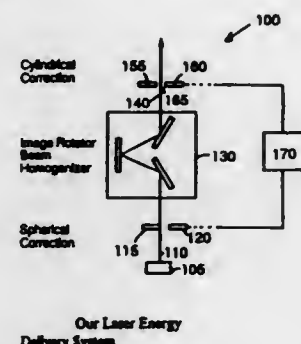
Sun-Sheng Shel, and Ta-Ming Fang, both of Massachusetts Technological Laboratory, 330 Pleasant St., Belmont, Mass. 02178

Filed Oct. 19, 1994, Ser. No. 326,658

Int. Cl.<sup>6</sup> A61N 5/06

U.S. Cl. 606-4

11 Claims



6. An optical system for performing a laser photorefractive keratectomy operation on a cornea for vision correction comprising:

- a laser source emitting a laser beam therefrom;
- a beam processing means including an image rotator and a beam homogenizer for receiving and processing said laser beam for generating a processed laser beam suitable for performing said keratectomy operation;
- an energy delivery means including a continuous energy-delivery control means cooperating with said beam processing means for optically controlling the energy delivered by said processed laser beam to different areas of said cornea for vision correction wherein said continuous energy-delivery control system includes moving slits disposed in front of said image rotator and said beam homogenizer for corrections of myopia and hyperopia;
- said continuous energy-delivery control means further includes a movable screen of variable transparency; and
- said continuous energy-delivery control means includes said moving slits and said moveable screen of variable transparency are controlled by said microprocessor for vision correction.

5,569,239

## PHOTOREACTIVE SUTURING OF BIOLOGICAL MATERIALS

Edward L. Sinofsky, Dennis, Mass., assignor to Rare Earth Medical, Inc., West Yarmouth, Mass.

Continuation of Ser. No. 56,192, May 3, 1993, abandoned, which is a continuation of Ser. No. 804,791, Dec. 9, 1991, Pat. No. 5,207,670, which is a continuation-in-part of Ser. No. 538,977, Jun. 15, 1990, Pat. No. 5,071,417. This application Aug. 18, 1994, Ser. No. 292,608

Int. Cl.<sup>6</sup> A61N 5/06

U.S. Cl. 606-8

21 Claims



1. A suture for joining biological material comprising a structure adapted for positioning at an anastomotic site, the structure further comprising at least one tensile strength-imparting element for resisting tensile and shearing forces and a photoreactive crosslinking agent coupled to the tensile strengthening element and positioned such that the crosslinking agent can contact said biological material at said site, such that upon irradiation of said structure the crosslinking agent adheres to the biological material to form a suture and the tensile strengthening element inhibiting tears in said structure.

5,569,240

## APPARATUS FOR INTERSTITIAL LASER THERAPY

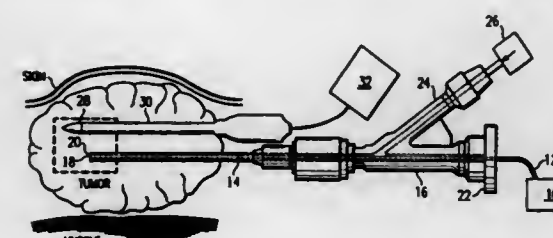
Kambiz Dowlatabadi, and Charles K. Rhodes, both of Chicago, Ill., assignors to Kelsey, Inc., Chicago, Ill.

Continuation of Ser. No. 182,452, Jan. 13, 1994, abandoned, which is a continuation of Ser. No. 988,219, Dec. 8, 1992, abandoned, which is a division of Ser. No. 534,931, Jun. 8, 1990, Pat. No. 5,169,396. This application Jun. 7, 1995, Ser. No. 479,241

Int. Cl.<sup>6</sup> A61B 17/32

U.S. Cl. 606-15

4 Claims



1. An apparatus for interstitial laser therapy, which comprises in combination:

- at most a single thin cannula for penetration and insertion into a tissue mass to be treated, and for delivering a chosen physiologically acceptable liquid to the tissue mass;
- means for generating laser light having a chosen wavelength and intensity;
- an optical fiber in communication with said light generating means for receiving and transmitting the laser light from said light generating means to the tissue mass, said optical fiber for placement within said single cannula such that the chosen liquid may be passed coaxially between said single cannula and said optical fiber;
- means for adjustably securing the longitudinal location of said optical fiber within said single cannula; and
- a liquid pump in communication with the single cannula for flowing the chosen liquid through said single cannula and into the tissue mass.

5,569,241

## THIN LAYER ABLATION APPARATUS

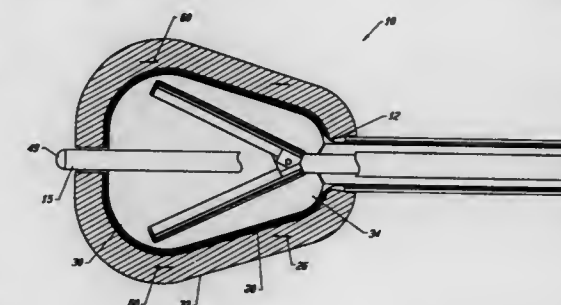
Stuart D. Edwards, Los Altos, Calif., assignor to Vidacare, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 265,459, Jun. 24, 1994, Pat. No. 5,505,730. This application Jul. 7, 1994, Ser. No. 272,162

Int. Cl.<sup>6</sup> A61B 17/39

U.S. Cl. 606-41

22 Claims



1. An ablation apparatus for ablating an inner layer in an organ of a body, comprising:

- an inflatable member with an exterior surface including a plurality of apertures that communicate with an interior that houses an electrolytic solution, the inflatable member selectively releasing electrolytic solution through the apertures at a flow rate that is dependent on a pressure applied to the inflatable member by the electrolytic solution;
- a conforming member with a conductive surface coupled to an RF energy source and a back side in surrounding relationship to the exterior of the inflatable member, the conforming member being made of a material that provides substantial conformity between the conductive surface and a shape of the inner layer of the organ and receives electrolytic solution from the inflatable member and delivers it out of the conductive surface, the conductive surface delivering electrolytic solution and RF energy to the inner layer;
- a circuit with segments positioned at one of on the conforming member or in the division of the inner layer; and
- a feedback device including an apparatus for detecting a characteristic of the inner layer, the feedback device connected to the RF power source to provide a controlled delivery of RF energy to segments of the circuit in response to the detected characteristic.

5,569,242

## METHOD AND APPARATUS FOR CONTROLLED CONTRACTION OF SOFT TISSUE

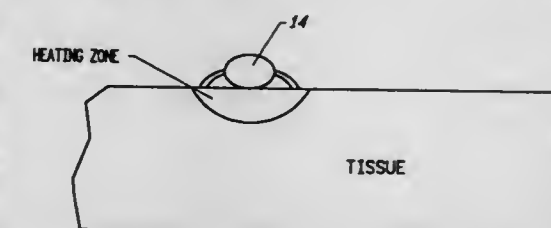
Ronald G. Lax, P.O. Box 2796, Grass Valley, Calif. 95945; Gary S. Fanton, 265 Golden Oak Dr., Portola Valley, Calif. 94028, and Stuart D. Edwards, 1681 Austin Ave., Los Altos, Calif. 94024

Continuation of Ser. No. 238,862, May 6, 1994, Pat. No. 5,458,596. This application Feb. 16, 1995, Ser. No. 389,924

Int. Cl.<sup>6</sup> A61B 17/36

U.S. Cl. 606-42

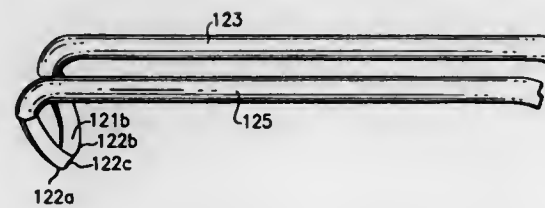
15 Claims



1. A method for repairing ligaments, joint capsules and connective tissue through the controlled contraction of collagen fibers, the method comprising:



providing an apparatus including a handle and an electrode having an electrode proximal end attached to the handle and an electrode distal end, the distal end including an energy delivering distal electrode portion having a surface with radiused edges for delivering substantially uniform energy across the surface of the energy delivering distal electrode portion; positioning the energy delivering distal electrode portion adjacent to an area of collagen fibers to be contracted; delivering substantially uniform energy across the surface of the energy delivering distal electrode portion to the area of collagen fibers; and contracting the collagen fibers through the application of energy to the collagen fibers.



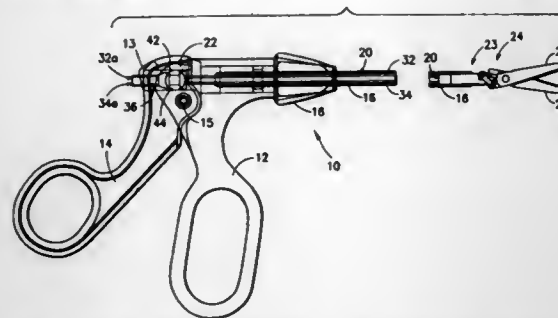
**5,569,243**  
**DOUBLE ACTING ENDOSCOPIC SCISSORS WITH BIPOLAR CAUTERY CAPABILITY**

Juergen A. Kortenbach, Miami Springs; Michael S. McBrayer, Miami; Charles R. Slater, Fort Lauderdale, and Saul Gottlieb, Miami, all of Fla., assignors to Symbiosis Corporation, Miami, Fla.

Continuation-in-part of Ser. No. 91,177, Jul. 13, 1993, Pat. No. 5,395,369. This application Aug. 2, 1994, Ser. No. 284,793 Int. Cl.<sup>6</sup> A61B 17/36

U.S. Cl. 606—46

26 Claims



18. A bipolar push rod for use in an endoscopic instrument having a hollow tube, an actuator handle coupled to the proximal end of the tube, an actuator movably coupled to the handle, and a pair of end effectors mounted on a clevis at the distal end of the tube, said bipolar push rod comprising:

- first and second conductive rods, each having a proximal end and a distal end;
- an insulating proximal collar embracing said first and second conductive rods and holding them laterally spaced apart, said proximal collar including means for coupling said proximal collar to the actuator; and
- an insulating distal collar embracing said first and second conductive rods and holding them laterally spaced apart, said distal ends of said first and second conductive rods each exiting said distal collar at an angle of approximately 90° relative to entering said distal collar for coupling to the end effectors.

**5,569,244**  
**LOOP ELECTRODES FOR ELECTROCAUTERY PROBES FOR USE WITH A RESECTOSCOPE**

Kevin F. Hahnen, Cooper City, Fla., assignor to Symbiosis Corporation, Miami, Fla.

Filed Apr. 20, 1995, Ser. No. 425,386  
Int. Cl.<sup>6</sup> A61B 17/39

U.S. Cl. 606—46

24 Claims

1. A loop electrode for use in an electrocautery probe having two arms between which said electrode is mounted, said electrode comprising:

- a substantially U-shaped conductive member having a cross section defining at least one sharp edge and a substantially flat lower surface.

**5,569,245**  
**DETACHABLE ENDOVASCULAR OCCLUSION DEVICE ACTIVATED BY ALTERNATING ELECTRIC CURRENT**

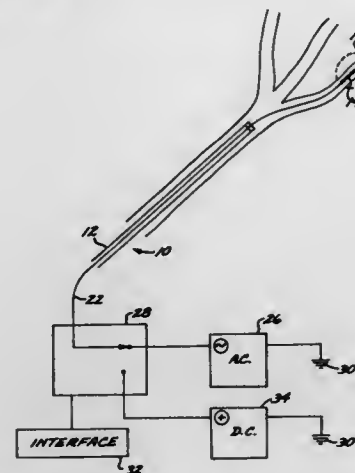
Guido Guglielmi, Santa Monica, and Cheng Ji, Los Angeles, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 311,508, Sep. 23, 1994, which is a continuation of Ser. No. 840,211, Feb. 24, 1992, Pat. No. 5,354,295, which is a continuation-in-part of Ser. No. 492,717, Mar. 13, 1990, Pat. No. 5,122,136. This application Oct. 17, 1994, Ser. No. 323,662

Int. Cl.<sup>6</sup> A61B 17/39

U.S. Cl. 606—49

21 Claims



1. An apparatus for selectively providing endovascular occlusion in a patient comprising:
  - a delivery wire guidable to or near an endovascular occlusion site;
  - a detachable conductive coil temporarily and selectively coupled to said delivery wire; and
  - an alternating current generator selectively coupled to said detachable conductive coil,
 whereby a controllable occlusive apparatus efficacious and usable in small vessels is provided.

**5,569,246**  
**FIXING INSTRUMENT FOR SPINAL FUSION MEMBERS**

Satoshi Ojima, Tokyo, and Shoji Uchida, Hyogo-ken, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1994, Ser. No. 364,464

Claims priority, application Japan, Dec. 28, 1993, 5-074709

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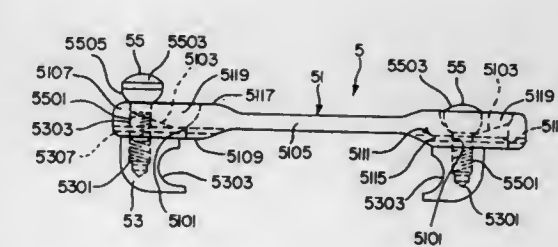
Int. Cl.<sup>6</sup> A61B 17/70; 17/80

U.S. Cl. 606—61

15 Claims

1. A fixing instrument for spinal fusion members for mutually fixing a plurality of spinal fusion members to be secured over a plurality of vertebrae constituting a spine, comprising:

- an elongated connecting member, having a longitudinal axis to be positioned across said plurality of spinal fusion members along said longitudinal axis;



a plurality of engagement members each having engaging portions to engage said spinal fusion members, said engagement members provided on said connecting member and being slidable along said longitudinal axis of said connecting member;

moving members, engaging said engagement members and said connecting member, that are movable in a first direction transverse to said longitudinal axis of said connecting member, by an external operation; and

conversion means on said connecting member for converting the movement of said moving members from said first transverse direction to the sliding movement of said engagement members along said longitudinal axis of said connecting member.

**5,569,247**  
**ENHANCED VARIABLE ANGLE BONE BOLT**

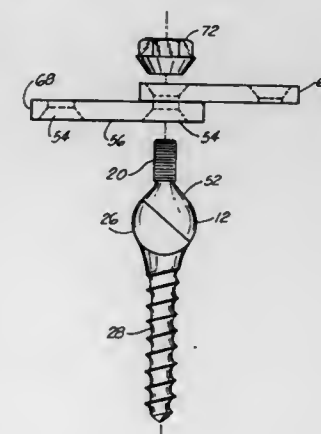
Matthew M. Morrison, Memphis, Tenn., assignor to Smith & Nephew Richards, Inc., Memphis, Tenn.

Filed Mar. 27, 1995, Ser. No. 411,531

Int. Cl.<sup>6</sup> A61B 17/56

U.S. Cl. 606—61

6 Claims



1. A multi-angle fastener for use in connecting a bone portion with a connecting member, said multi-angle fastener comprising a rotating member having a central longitudinal axis and an outer surface; a fixed member having a central longitudinal axis and an outer surface having a bone attachment means configured to be surgically implantable into a patient's bone tissue; and joint means for connecting the rotating and fixed members together, said joint means including corresponding mating surfaces configured to articulate with each other sufficiently to allow the rotating and fixed members to angle relative to one another, the mating surfaces forming enhanced mating surfaces comprising:

- tapered flange and a corresponding tapered groove respectively configured to allow for increased fatigue resistance of the fastener when the rotating and fixed members are secured together, said rotating member having a tapered portion configured to abut a lower surface of a bone plate member.

**5,569,248**  
**APPARATUS FOR SUBCUTANEOUS SUPRAFASCIAL PEDICULAR INTERNAL FIXATION**

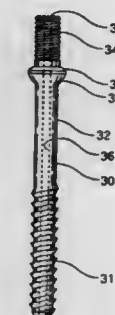
Hallett H. Mathews, Richmond, Va., assignor to Danek Medical, Inc., Memphis, Tenn.

Continuation of Ser. No. 116,351, Sep. 2, 1993, abandoned, which is a continuation of Ser. No. 938,708, Sep. 1, 1992, abandoned, which is a division of Ser. No. 852,577, Mar. 17, 1992, Pat. No. 5,171,279. This application May 9, 1995, Ser. No. 437,523

Int. Cl.<sup>6</sup> A61F 5/04

U.S. Cl. 606—61

8 Claims



1. The spinal fixation system for internal fixation of the spine of a human patient, comprising:

- an elongated fixation element configured to be implanted under the skin of a patient spanning between at least two vertebrae; at least two bone engaging fasteners each having an elongated shank with a first end and an opposite second end, the shank including bone engaging threads defined at said first end for engagement into one of the at least two vertebrae, and a smooth shank portion extending from said bone engaging threads toward said second end, said smooth shank portion having a length approximately equal to the distance from a pedicle of the one vertebra to the muscle fascia posterior of the one vertebra when said bone engaging threads are disposed within the one vertebra, said bone engaging threads extending a length from said first end that is approximately equal to said length of said smooth shank portion; and
- means for clamping said elongated fixation element to each of said at least two bone engaging fasteners at said second end thereof so that said fixation element is positioned above the muscle fascia of the patient.

**5,569,249**  
**CANNULATED MODULAR INTRAMEDULLARY NAIL**

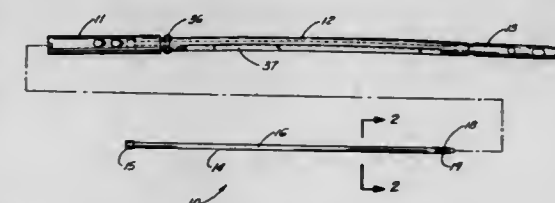
Anthony James, Bartlett, Tenn.; Harry Lee, South Haven, Miss.; John R. Pepper, Germantown, and Thomas A. Russell, Memphis, both of Tenn., assignors to Smith & Nephew Richards Inc., Memphis, Tenn.

Continuation of Ser. No. 275,636, Jul. 15, 1994, Pat. No. 5,489,284. This application Feb. 5, 1996, Ser. No. 596,514

Int. Cl.<sup>6</sup> A61B 17/72

U.S. Cl. 606—62

19 Claims



1. A modular intramedullary nail, comprising:

- a proximal nail component having an open ended longitudinal bore;

- b) a distal nail component having an open ended longitudinal bore;
- c) a central nail component having an open ended longitudinal bore and having proximal and distal end portions that are respectively connected during use to the proximal and distal nail components;
- d) distal and proximal connections respectively on the proximal and distal nail components for securing to the proximal and distal end portions of the central nail component, the proximal and distal connections and the proximal and distal end portions including corresponding conical socket and conical projecting end portions of the respective nail components that can be fitted together and secured with force;
- e) the proximal and distal connections including self orienting interlocking portions on the proximal and distal nail components adjacent the respective conical socket and conical projecting end portions for resisting relative rotational movement between the components upon assembly;
- f) a cannulated fastener extending through at least a portion of the bore of the proximal and distal nail components, and through the entire length of the bore of the central nail component, the fastener having respective proximal and distal end portions for gripping the proximal and distal nail components, and an open ended longitudinal bore; and
- g) the proximal end of the bore of the distal nail component and the distal end of the bore of the proximal nail component each having fastener receptive portions that removably connect to the cannulated fastener distal and proximal end portions, respectively.

5,569,250

## METHOD AND APPARATUS FOR SECURING ADJACENT BONE PORTIONS

David R. Sarver, R.R. 5, Box 236, Logansport, Ind. 46947; Barry L. Eppley, 5302 Deer Creek Dr., Indianapolis, Ind. 46254; Keith R. D'Alessio, 3111 N. Bayberry Ct.; William S. Pietrzak, 1691 S. Meadow, both of Warsaw, Ind. 46580, and Thomas W. Sander, 6 Stone Camp Trail, Winona Lake, Ind. 46590

Filed Mar. 1, 1994, Ser. No. 204,036  
Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—69

36 Claims



1. A biocompatible osteosynthesis plate operable to be secured by at least one fastener through at least one fastener opening formed in the plate during a surgical procedure to a plurality of bone portions substantially mated at a joint, said osteosynthesis plate comprising:

an elongated section having first and second surfaces, the plate being formed from a material that is substantially rigid at a first thermochemical state and is substantially deformable at a second thermochemical state, said material being dimensionally stable when at said first and second thermochemical states; and

means disposed on said elongated section to permit the formation of said at least one fastener opening therethrough during the surgical procedure at a plurality of different positions;

whereby said biocompatible osteosynthesis plate may be secured to said bone portions by forming said one fastener opening and inserting said one fastener through said one fastener opening into said one of said plurality of bone portions.

5,569,251

## IMPLANT DEVICE AND METHOD OF INSTALLING

Gregg S. Baker, Lake Forest, and Paul B. Hafell, El Toro, both of Calif., assignors to BHC Engineering, L.P., Maitland, Fla.

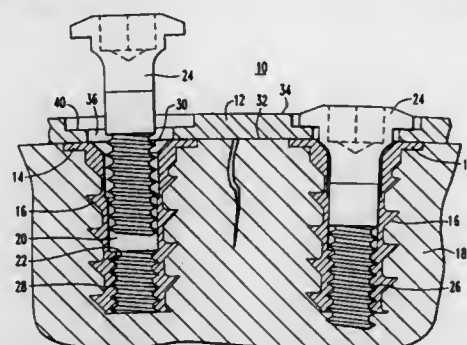
Continuation of Ser. No. 92,697, Jul. 16, 1993, abandoned.

This application Nov. 18, 1994, Ser. No. 345,358

Int. Cl.<sup>6</sup> A61B 17/80

U.S. Cl. 606—69

29 Claims



19. An assembly comprising:

an element having at least one opening for attachment to a bone; an anchor having a hollow shank having a threaded outer surface surrounding a threaded interior surface, said interior surface of said hollow shank for extending into a cavity of the bone, said outer surface for fixedly engaging the cavity of the bone; and

an engaging member having a shank with an outer surface for insertion into said hollow shank to fixedly engage said outer surface of said engaging member to said interior surface of said hollow shank of said anchor for holding said element between said engaging member and said anchor, said engaging member having means for cooperating to fix said engaging member to said interior surface of said hollow shank.

5,569,252

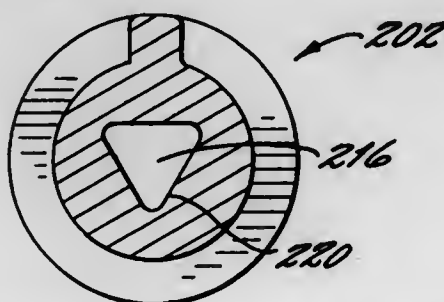
## DEVICE FOR REPAIRING A MENISCAL TEAR IN A KNEE AND METHOD

Daniel F. Justin, 4544 Trescott Dr., Orlando, Fla. 32817, and Thomas F. Winters, Jr., 1800 Summerland Ave., Winter Park, Fla. 32789

Filed Sep. 27, 1994, Ser. No. 312,999  
Int. Cl.<sup>6</sup> A61B 17/68

U.S. Cl. 606—73

10 Claims



1. A fastener for repairing a tear in soft tissue of a patient, the fastener having:
- a proximal end;

- a distal end;
- a distal portion having a narrowing cross section toward the distal end, wherein in use an insertion of the fastener into soft tissue is facilitated by the narrowed distal end;
- a unitary and continuous variable-pitch helical protrusion along a central portion between the proximal end and the distal end, wherein the helical pitch along the central portion decreases from the distal end to the proximal end, and wherein in use the decrease in the helical pitch can serve to bring two sides of the tear into apposition as the fastener is advanced across the two sides of the tear in a screwing motion; and
- an axial bore therethrough generally along the helical axis proceeding from the proximal end to the distal end, the bore having a noncircular cross-sectional shape completely therealong for an elongated driving device having a noncircular cross-sectional shape to pass in to the bore and to protrude from the distal end and to advance the fastener into the soft tissue by being rotated in a direction having a handedness commensurate with the helically shaped protrusion.

5,569,253

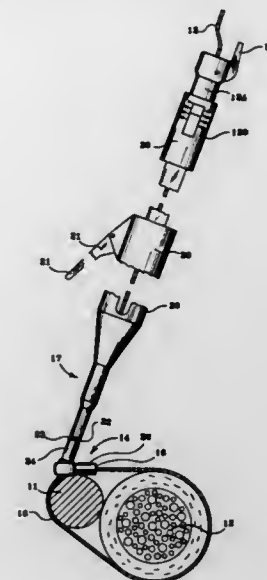
## VARIABLE-ANGLE SURGICAL CABLE CRIMP ASSEMBLY AND METHOD

Robert A. Farris, Memphis, Tenn., and M. Jeffrey Bonner, Southaven, Miss., assignors to Danek Medical, Inc., Memphis, Tenn.

Filed Mar. 29, 1994, Ser. No. 219,763  
Int. Cl.<sup>6</sup> A61B 17/82

U.S. Cl. 606—74

17 Claims



1. A surgical cable assembly comprising:
- a first crimp having a bearing surface and having a crimpable portion with an aperture therein;
- a second crimp having a bearing surface and having a crimpable portion with an aperture therein; and
- a surgical cable having an end portion received and crimped in the aperture of the first crimp;
- the bearing surface of the second crimp engaging the bearing surface of the first crimp and enabling the second crimp swiveling on the first crimp.

5,569,254

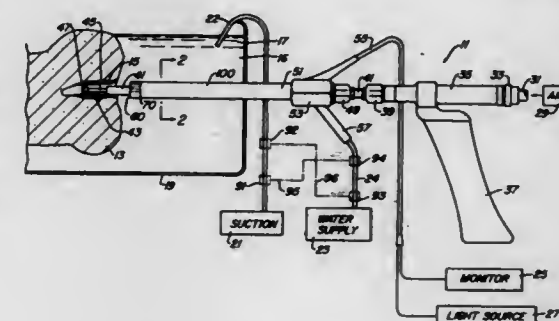
## SURGICAL RESECTION TOOL HAVING AN IRRIGATION, LIGHTING, SUCTION AND VISION ATTACHMENT

Glenn T. Carlson; William J. Vaughn, both of Fort Worth, and Ray E. Umber, Arlington, all of Tex., assignors to Midas Rex Pneumatic Tools, Inc., Fort Worth, Tex.

Filed Apr. 12, 1995, Ser. No. 420,661  
Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—79

26 Claims



10. A surgical tool for resecting an adhesive from a bone interior, the surgical tool comprising in combination:

a tool motor having a drive shaft;

a resecting tool having a shank for securing to the drive shaft of the tool motor, and a cutting tool disposed at an end of the shank which is distal from the tool motor and rotatably driven by the tool motor;

a bearing tube through which the resecting tool extends, rotatably supported by the bearing tube, the bearing tube being rigidly secured to a stationary portion of the tool motor;

an attachment tube having a central passage for slidably securing the bearing tube therein for selectively telescoping the attachment tube along the bearing tube, and an irrigation fluid flow channel extending within the attachment tube for passing an irrigation fluid between an intake port and a discharge port, wherein one of the intake and discharge ports are disposed proximate to a specimen end of the attachment tube;

a first optical fiber extending from a light source, through the attachment tube and to the specimen end of the attachment tube for passing light from the light source to the specimen end of the attachment tube;

a first lens disposed proximate to the specimen end of the attachment tube for receiving the light from the first optical fiber and dispersing the light to illuminate the bone interior disposed about the cutting tool;

a second lens disposed proximate to the specimen end of the attachment tube for receiving the light from about the cutting tool, and focusing the light into a linear direction within the attachment tube;

a second optical fiber extending within the attachment tube for receiving the light from the second lens, and passing the light to an optical viewer; and

wherein the bearing tube is rigidly secured within the attachment tube by a compression assembly, which includes a collet ring having collets extending longitudinally therefrom, and a collet nut for threadingly securing to the collet ring and turning thereon to squeeze the collets between the collet nut and an exterior surface of the bearing tube to rigidly secure the bearing tube within the attachment tube.



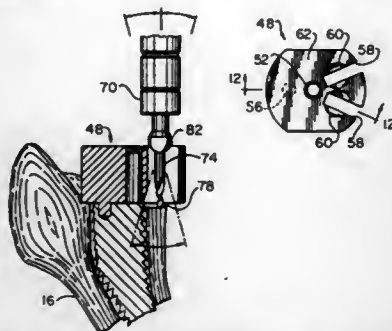
5,569,255

**METHOD FOR IMPLANTING A PROSTHETIC DEVICE INTO A BONE**

Dennis W. Burke, 245 Highland St., Milton, Mass. 02186  
 Division of Ser. No. 183,077, Jan. 18, 1994, Pat. No. 5,480,453,  
 which is a continuation of Ser. No. 979,615, Nov. 20, 1992,  
 abandoned. This application May 26, 1995, Ser. No. 452,340  
 Int. Cl.<sup>6</sup> A61B 17/17; 17/56

U.S. Cl. 606—79

22 Claims



1. A method for implanting a prosthetic device into a proximal end of a bone, the prosthetic device including a projection on a surface thereof which is adapted to extend into the bone, said method comprising the steps of:

positioning a mill guide on the proximal end of the bone, the mill guide having an upper surface, a lower surface resting on the proximal end of the bone and at least one slot extending from the upper surface to the lower surface, the mill guide having a pivot point disposed thereon;

milling into the proximal end of the bone at least one groove substantially corresponding in size and shape to the projection on the prosthetic device, said milling step comprising the steps of:

placing a milling tool in the slot on the mill guide, the milling tool having a lower end adapted to cut bone and an upper end, the lower end extending beyond the lower surface of the mill guide when the upper end of the milling tool rests on the pivot point; and

pivoting the milling tool about the pivot point within the slot to cause the milling tool to cut a groove in the proximal end of the bone that substantially corresponds in size and shape to the projection on the prosthetic device;

removing the mill guide and the milling tool from the proximal end of the bone; and

inserting the projection on the prosthetic device into the groove formed on the proximal end of the bone.

5,569,256

**SURGICAL RESECTION TOOL WITH A DOUBLE QUICK RELEASE**

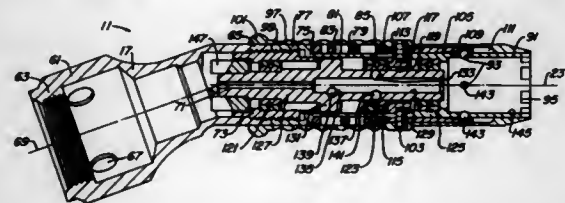
William J. Vaughn, Fort Worth; Ray E. Umber, Arlington; William E. St. Clair, Colleyville; Larry D. Estes, North Richland Hills, and Glenn T. Carlson, Fort Worth, all of Tex., assignors to Midas Rex Pneumatic Tools, Inc., Fort Worth, Tex.

Filed Feb. 10, 1995, Ser. No. 386,927

Int. Cl.<sup>6</sup> A61B 17/14; 17/32

U.S. Cl. 606—80

24 Claims



1. In a surgical resection tool of the type having a rotary motor which includes a spindle and a stationary portions, the spindle

being rotatable relative to the stationary portion, a stationary member which is rigidly secured to the stationary portion of the rotary motor and which longitudinally extends and defines a central axis for the tool, a collet shaft which has a central bore formed therein and which is rotatably secured to the stationary member for rotating about the central axis with the central bore coaxially aligned with the central axis, a dissecting tool which includes a cutting head for rotating to resect bone and a shank with a proximal end portion secured within the collet shaft in coaxial relation to the central bore, a bearing tube nonrotatably secured to the stationary member for rotatably supporting an intermediate portion of the shank for the dissecting tool, and a power transfer means for securing the rotary motor to the collet shaft and transferring torque therebetween, the improvement comprising in combination:

the shank having at least one indentation formed therein to laterally extend into the shank in transverse relation to the central axis;

the collet shaft having a hole formed therein to laterally extend into the collet shaft, the hole aligned with the at least one indentation formed into the shank, and the hole extending in transverse relation to the central axis;

a locking member extending within both the hole in the collet shaft and the indentation in the shank to secure the dissecting tool to the collet shaft, and the locking member being moveable away from the central axis to remove the locking member from extending within the at least one indentation in the shank;

locking means movably secured to the collet shaft for retaining the locking member within both the hole in the collet shaft and the at least one indentation in the shank, and for selectively moving relative to the collet shaft to release the locking member for moving transversely away from the central axis and from within the at least one indentation in the shank to selectively release the dissecting tool for removal from the collet shaft;

the bearing tube having a latch indentation which laterally extends into the bearing tube in transverse relation to the central axis;

the stationary member having an aperture laterally extending therein in transverse relation to the central axis;

a latching member extending within both the aperture in the stationary member and the latch indentation in the bearing tube to nonrotatably secure the bearing tube to the stationary member, and the latching member being moveable in transverse relation to the central axis to remove the latching member from extending within one of the aperture and the latch indentation; and

latching means movably secured to the stationary member for retaining the locking member within both the aperture in the stationary member and the latch indentation in the bearing tube, and for selectively moving relative to the stationary member to release the latching member for moving in transverse relation to the central axis and from within the one of the aperture and the latch indentation to release the bearing tube for removal from the stationary member.

5,569,257

**SAW BLADE FOR PARTING CUTS MADE IN AN OSCILLATING OR ROTARY MANNER**

Richard E. Arnegger, Uerikon, Switzerland; Antonius G. M. Gunnewijk, Feldbach, Netherlands, and Thomas Maurer, Zürich, Switzerland, assignors to Ricana AG, Uerikon, Switzerland

Filed Aug. 2, 1994, Ser. No. 284,342

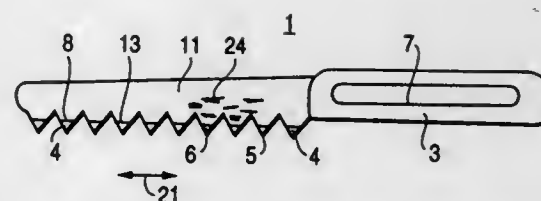
Claims priority, application Switzerland, Aug. 3, 1993, 02327/93

Int. Cl.<sup>6</sup> A61B 17/14

U.S. Cl. 606—82

12 Claims

1. A saw blade for making parting cuts when driven in an oscillating or rotary motion, the blade comprising a holding area comprising a blade substrate material;



a cutting area having saw teeth for making a cut having a width (S);

a non-cutting blade area having a thickness (D) in at least selected zones which is less than said cutting width (S) of said cutting area; and

a surface coating (11) comprising a biological neutral precious metal on at least selected zones of opposite sides of said non-cutting blade area, said surface coating being softer than said blade substrate material, said cutting area being not covered by said surface coating.

5,569,258

**LAMINECTOMY RONGEURS**

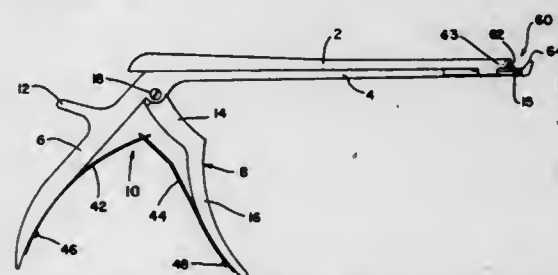
Charles E. Gambale, East Boston, Mass., assignor to Logan Instruments, Inc., East Boston, Mass.

Filed Jun. 22, 1995, Ser. No. 493,763

Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—83

5 Claims



1. A laminectomy rongeur having a top bar and a bottom bar having adjacent ends forming a cutting tip, means securing said bars together in parallel adjacent relation, means for longitudinally sliding one bar relative to the other said lower bar having a cross section along at least the cutting tip end which includes an upwardly longitudinally extending flange, and an orthogonally related reinforcing wall that extends laterally beyond said longitudinally extending flange and an ejecting flange integral with and extending longitudinally of said longitudinally extending flange with said ejecting flange projecting beyond said cutting tips of said top bar when said cutting tips are spread apart.

5,569,259

**MODULAR SHAPING AND TRIAL REDUCTION GUIDE FOR IMPLANTATION OF FEMORAL PROSTHESIS AND METHOD OF USING SAME**

Joseph M. Ferrante; James E. Van Hoeck; Bradley J. Coates, all of Cordova, Tenn., and Leo A. Whiteside, Chesterfield, Mo., assignors to Wright Medical Technology, Inc., Arlington, Tenn.

Continuation of Ser. No. 975,247, Nov. 12, 1992, Pat. No. 5,415,662, which is a continuation of Ser. No. 839,425, Feb. 20, 1992, Pat. No. 5,176,684. This application Jan. 30, 1995, Ser. No. 380,363

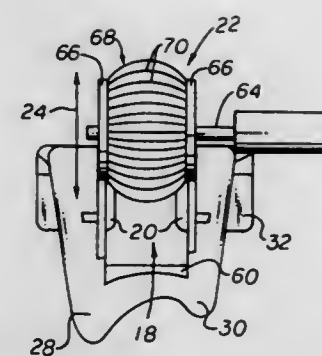
Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 606—87

8 Claims

1. A method of implanting a condylar prosthesis onto the proximal aspect of a resected femur comprising the steps of:

(a) resecting the distal aspect of the femur to receive a trial implant thereon;



(b) providing a trial implant including, in combination, a bracket defining a modular structure with an internal surface adapted to be seated on the distal aspect of the femur and an external surface formed with a shape resembling the normal condyle, including an opening appointed to expose a selected portion of the anterior distal resected surface of the femur to a shaping tool and guide means joined to the bracket as an integral, one piece unit for guiding the tool along a predetermined path for controlled shaping of a patellar groove in the exposed portion of the femur through the opening;

(c) moving the shaping tool along the guide means, cutting or abrading a patellar groove in the selected portion of the femur exposed through the opening; and

(d) performing a trial reduction of the knee joint, while the bracket remains seated on the distal aspect of the femur and without removing any portion of the modular bracket or guide means.

5,569,260

**DISTAL FEMORAL RESECTOR GUIDE**

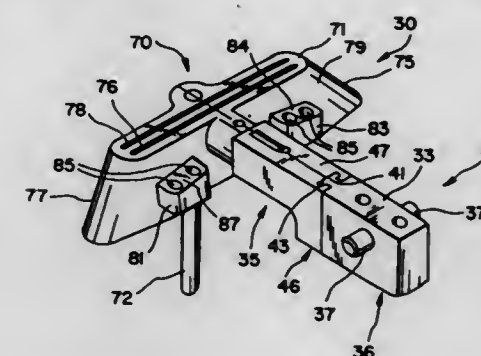
Thomas D. Petersen, 9680 Alto Dr., La Mesa, Calif. 91941

Filed Dec. 1, 1994, Ser. No. 353,225

Int. Cl.<sup>6</sup> A61B 17/15

U.S. Cl. 606—88

10 Claims



1. A distal femoral retractor guide, for resecting a femur having an outer surface comprising:

a) a body including an elongated stem structure having a proximal end, a distal end and an axis of elongation and a saw guide attached at said stem structure distal end to form a T-shaped configuration;

b) said stem structure having adjustment means for controllably elongating said stem structure, and including a bone engageable surface convexly radiused in a plane of a cross-section of said stem structure perpendicular to said axis of elongation of said stem structure whereby when said saw guide is engaged with the distal femur to guide resection of the distal femur, said convexly radiused surface of said stem structure is adapted to engage said femur outer surface with a line contact regardless of a degree of slope of an associated anterior femoral cortex.

5,569,261

# DISTAL FEMORAL CUTTING GUIDE APPARATUS WITH ANTERIOR OR POSTERIOR REFERENCING FOR USE IN KNEE JOINT REPLACEMENT SURGERY

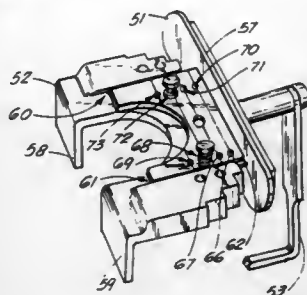
Gregory C. Marik, Collierville; Jennifer J. Lackey, and M. Scott Elliott, both of Memphis, all of Tenn., assignors to Smith & Nephew Richards Inc., Memphis, Tenn.

Continuation of Ser. No. 149,053, Nov. 8, 1993, Pat. No. 5,417,694. This application May 22, 1995, Ser. No. 447,204

Int. Cl.<sup>6</sup> A61B 12/15

U.S. Cl. 606—88

6 Claims



1. A distal femoral cutting instrument for preparing a patient's distal femur to receive a femoral prosthesis, the femur having anterior and posterior distal femoral surfaces, comprising:

- a) an intramedullary rod for referencing the patient's intramedullary canal by aligning the rod with the patient's intramedullary canal;
- b) a valvulus block having a plurality of flat surfaces and including at least anterior and posterior parallel flat surfaces and a distal flat surface perpendicular to the anterior and posterior surfaces;
- c) a bore in the valvulus block that extends between two of the flat surfaces, forming an acute angle therewith, said bore being sized and shaped to register upon the intramedullary rod;
- d) a distal femoral cutting block that removably attaches to the valvulus block, the cutting block having a flat surface for guiding a blade or saw during cutting of the distal femur;
- e) the cutting block including a connector thereon for affixing the distal femoral cutting block to the anterior cortical bone of the patient's femur;
- f) a gauge that forms a sliding connection with the distal femoral cutting block for measuring the thickness of the patient's distal femur between the anterior and posterior surfaces thereof;
- g) the gauge including indicia for enabling a surgeon to determine the thickness of the patient's distal femur, said indicia including independent anterior and posterior referencing indicia, allowing the surgeon to measure the distal femur by selecting the anterior or the posterior referencing indicia.

5,569,262

# GUIDE TOOL FOR SURGICAL DEVICES

William P. Carney, 4 High Ridge La., Oyster Bay, N.Y. 11771

Filed May 19, 1995, Ser. No. 444,937

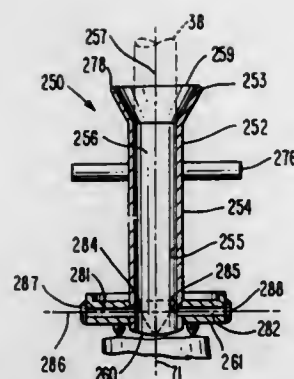
Int. Cl.<sup>6</sup> A61B 17/58

U.S. Cl. 606—96

10 Claims

1. A guide tool for directing a surgical device into attachment with a bone segment comprising:

- a generally tubular portion forming a wall having an outside surface and an inside surface, said inside surface defining an axial bore extending between a proximal end and a distal end of said tubular portion, said axial bore being shaped for receiving and guiding said surgical device therethrough;
- a transversely extending generally planar pressure plate and means for affixing said pressure plate to said tubular portion formed at said distal end thereof; and
- said pressure plate forming a top side and a bottom side, said bottom side defining engagement means for securing said pressure plate to said bone segment, said top side defining a



substantially planar surface for applying finger pressure thereon to urge said engagement means into securement with said bone segment.

5,569,263

# ADJUSTABLE PROVISIONAL ARTICULATING DEVICE

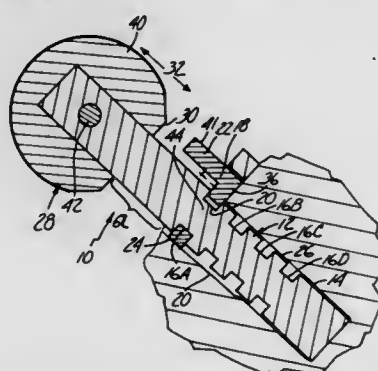
Todd J. Hein, Minneapolis, Minn., assignor to Orthopaedic Innovations, Inc., Minneapolis, Minn.

Filed Jan. 12, 1995, Ser. No. 371,844

Int. Cl.<sup>6</sup> A61B 17/58

U.S. Cl. 606—102

15 Claims



1. An adjustable provisional device for aligning a joint center distance of a joint prosthesis to a natural joint center distance comprising:

- a bearing;
- a neck attachable to the bearing, the neck having a plurality of grooves circumferential space apart from one another along the length of the neck; and
- a main body with a bore for receiving the neck; and
- a retaining mechanism attached to the main body for retaining the neck in the main body at one of the grooves.

5,569,264

# SURGICAL INSTALLATION INSTRUMENT

Markku Tamminmäki, Tampere, Finland; Peter Albrecht-Olsen, Charlottenlund; Gert Kristensen, Ebeltoft, both of Denmark, and Pertti Törmälä, Tampere, Finland, assignors to Blocon Oy, Tampere, Finland

PCT No. PCT/Fin93/00015, § 371 Date Oct. 14, 1994, § 102(e) Date Oct. 14, 1994, PCT Pub. No. WO93/14706, PCT Pub. Date Aug. 5, 1993

PCT Filed Jan. 18, 1993, Ser. No. 256,787

Claims priority, application Finland, Jan. 24, 1992, 920306

Int. Cl.<sup>6</sup> A61B 17/56

U.S. Cl. 606—104

15 Claims

1. A surgical instrument for installation of a surgical implant in a living tissue said surgical instrument comprising:

5,569,266

# MAGNETIC RESONANCE IMAGING DEVICE USEFUL FOR GUIDING A MEDICAL INSTRUMENT

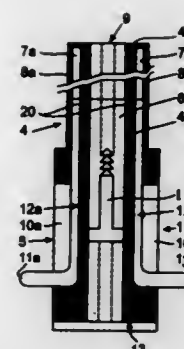
Bernard Siczek, Boulder, Colo., assignor to Fischer Imaging Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 851,683, Mar. 12, 1992, Pat. No. 5,409,497, which is a continuation-in-part of Ser. No. 667,011, Mar. 11, 1991, Pat. No. 5,129,911. This application Sep. 13, 1993, Ser. No. 120,744

Int. Cl.<sup>6</sup> A61B 5/05

U.S. Cl. 606—130

25 Claims



a frame including an installation channel that is adapted for receiving the implant and to be placed in connection with the tissue, whereby the implant is inserted in the tissue when it exits said installation channel;

said frame including an installation end that contacts said tissue during installation of the implant;

at least one arresting means provided in said frame for arresting said frame in relation to said tissue during installation of said implant;

means for producing a reciprocating movement that is transmitted to the implant during installation of the implant to produce a periodic movement in the implant;

an installation member insertable into said installation channel for conveying external installation force to the implant for installing the implant; and

wherein said at least one arresting means is movable and lockable in relation to the frame such that in a non-operational position said at least one arresting means is located within the installation end of the frame and protrudes from the installation end of the frame in an operational position.

5,569,265

# OBSTETRIC BONNET FOR ASSISTING CHILDBIRTH

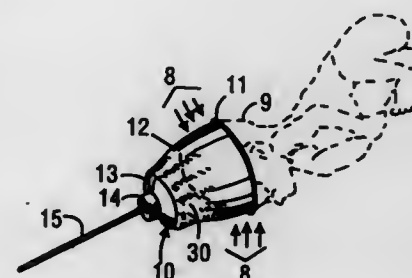
Byron D. Elliott, San Antonio, Tex., assignor to Board Of Regents, The University Of Texas System, Austin, Tex.

Continuation of Ser. No. 928,131, Aug. 10, 1992, Pat. No. 5,507,752, which is a continuation of Ser. No. 578,819, Sep. 6, 1990, abandoned. This application Jan. 13, 1995, Ser. No. 372,606

Int. Cl.<sup>6</sup> A61B 17/42

U.S. Cl. 606—123

15 Claims



1. An obstetric bonnet shaped to snugly encase a fetal head down to about eyes and ears, the bonnet being formed from a soft, flexible and substantially air-impermeable sheet of material, such that, when emplaced, the bonnet has frictional and substantially airtight adherence to the fetal head, the bonnet defined further as comprising a means for applying force to move a fetus and wherein the bonnet leaks when a predetermined stretching force is applied to the bonnet.

1. An apparatus for use in performing medical procedures on a patient's breast, comprising:

an immobilizer for immobilizing said patient's breast within a predetermined frame of reference;

magnetic resonance imaging means, disposed relative to said patient's immobilized breast for imaging said patient's breast

including transmitting means for applying a signal to said patient's breast and receiving means for receiving a signal from said patient's breast, said magnetic resonance imaging means defining a volume dimensioned for receiving said patient's breast and accommodating said immobilizer so as to provide breast specific magnetic resonance imaging information, said immobilizer means disposed at least partially between said patient's breast and said receiving means;

identifying means, interconnected to said magnetic resonance imaging means so as to receive said imaging information, for identifying the location of an area of interest within said patient's breast based on said breast specific magnetic resonance information; and

a medical instrument positioner, disposed in predetermined relation to and moveable relative to said predetermined frame of reference, for use in selectively targeting a medical instrument to said identified location of said area of interest within said patient's breast via a penetration path wherein said immobilizer and said magnetic resonance imaging means are avoided, whereby said breast specific magnetic resonance imaging information is employed for instrument guidance substantially without penetration path interference.



5,569,267

**DEVICE AND METHODS FOR PARIETO-OCCIPITAL PLACEMENT OF VENTRICULAR CATHETERS**

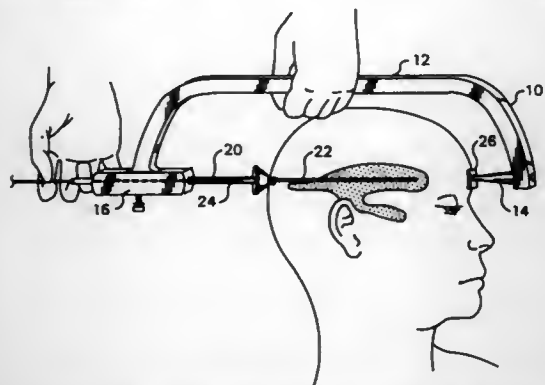
Matthew A. Howard, III, Iowa City, Iowa; M. Sean Grady, Mercer Island, and H. Richard Winn, Seattle, both of Wash., assignors to University of Washington, Seattle, Wash.

Filed Mar. 4, 1994, Ser. No. 207,476

Int. Cl.<sup>6</sup> A61B 19/00

U.S. Cl. 606—130

9 Claims



1. A device for occipital placement of a ventricular catheter in a brain, comprising:
  - a rigid C-shaped member having an anterior end and a posterior end;
  - a frontal positioner affixed to the anterior end of the C-shaped member;
  - a guide cannula holder affixed to the posterior end of the C-shaped member; and
  - a guide cannula, which guide cannula may be movably inserted into the guide cannula holder, wherein the guide cannula comprises a tubular shaft having an occiput end, an operator end, and an occipital burr hole locator affixed to the occiput end.

5,569,268

**ENDOSCOPIC INSTRUMENT FOR LIGATING VARIX**

Masayuki Hosoda, Tokyo, Japan, assignor to Kabushiki Kaisha Top, Tokyo, Japan

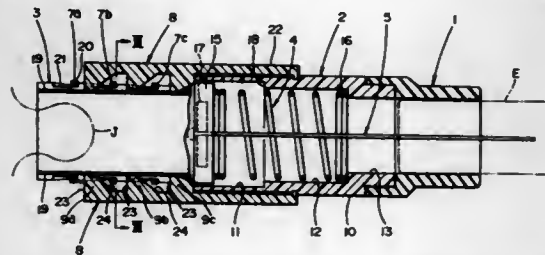
Filed Feb. 15, 1995, Ser. No. 388,816

Claims priority, application Japan, Apr. 26, 1994, 6-088893

Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—140

12 Claims



1. An endoscopic instrument for ligating a plurality of varices, comprising:
  - an outer tube having a rear end for supporting a tip end of an endoscope;
  - an inner tube axially movably mounted in said outer tube;
  - a trip wire having an end coupled to said inner tube for extending through the endoscope supported by the rear end of the outer tube, and having an opposite end for projecting out of the endoscope, for moving said inner tube rearwardly when said opposite end of the trip wire is pulled;
  - a plurality of resilient ring-shaped members resiliently expanded radially outwardly and mounted respectively at axially spaced positions on an outer circumferential surface of a portion of

said inner tube which projects forwardly from a front end of said outer tube, said ring-shaped members being expanded substantially equally and mounted on said inner tube at positions having substantially equal diameters, and means for forwardly pushing each of said resilient ring-shaped members, one at a time, off of said inner tube by abutment against said outer tube when said inner tube is moved rearwardly.

5,569,269

**SURGICAL GRASPING AND SUTURING DEVICE AND METHOD**

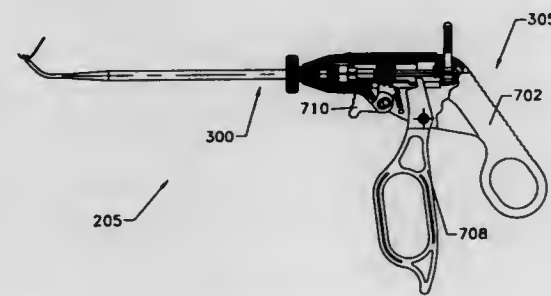
Rickey D. Hart, Plainville, and John T. Rice, Lincoln, both of Mass., assignors to Innovative Devices, Inc., Marlborough, Mass.

Continuation-in-part of Ser. No. 97,154, Jul. 26, 1993, abandoned. This application Feb. 23, 1994, Ser. No. 200,883

Int. Cl.<sup>6</sup> A61B 17/04

U.S. Cl. 606—144

18 Claims



1. A device for grasping a filament-like object comprising:
  - a wire assembly comprising at least one wire-like element having a distal end, a proximal end, and object capturing means for capturing said object adjacent to said distal end of said at least one wire-like element, and a rigid tube having a longitudinal axis, a distal end and a proximal end;
  - said tube being bent at a substantially right angle to said longitudinal axis at a point spaced from said proximal end of said tube so as to form a generally L-shaped configuration having a long leg and a short leg, said proximal end of said wire-like element being attached to said proximal end of said tube and extending through said tube such that said wire-like element at least in part extends out of said distal end of said tube;
  - a hollow shaft adapted to substantially contain said wire assembly, said shaft having a pointed distal end, a proximal end, and a longitudinal slot having a distal end and a proximal end;
  - said slot being adapted to receive said short leg of said L-shaped tube, said proximal end of said slot being located at an axially measured distance from said distal end of said shaft, and said distal end of said slot being located at an axially measured distance from said distal end of said shaft, such that when said tube short leg engages said distal end of said slot, portions of said wire-like element extend beyond said distal end of said shaft, and when said wire assembly short leg is disposed proximate said proximal end of said slot, said wire-like element is disposed within said shaft; and
  - actuation means attached to said proximal end of said shaft and to said short leg of said L-shaped tube for (i) reciprocally moving said L-shaped tube between a first position wherein said capturing means is contained within said shaft and a second position wherein said capturing means extend out of said distal end of said shaft, and (ii) rotating said wire assembly and said shaft as a unit about said longitudinal axis of said shaft.

5,569,270

**LAPAROSCOPIC SURGICAL INSTRUMENT**

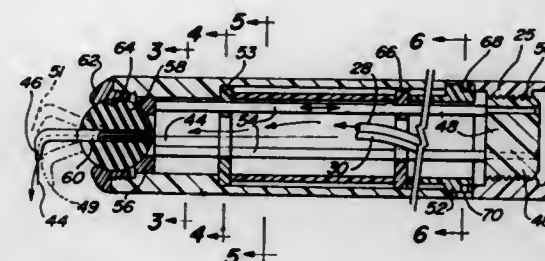
Edward E. Weng, 51077 Sand Shores, Shelby Township, Macomb County, Mich. 48316

Filed Dec. 13, 1994, Ser. No. 354,650

Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—144

11 Claims



1. A surgical tool for performing internal surgery on a patient comprising:
  - 1) an instrument body extending along an axis;
  - 2) a tool mounted at an internal first end of said body, said tool being connected to said body such that the angular orientation of said tool relative to said axis of said body may be adjustable in three dimensions;
  - 3) said tool being connected to a spherical shaped member that is selectively locked within said body, the angular orientation of said tool being adjusted by adjusting the position of said spherical member relative to said body, an end cap on said body provides a spherical contact surface for said spherical member; and
  - 4) means to lock said tool at a desired angular orientation relative to said axis carried on said tool, said means to lock said tool includes a plurality of rods that are selectively axially moveable within said body to contact said spherical shaped member and hold said ball, and thus said tool, at a particular angular orientation, said rods also being moveable to an unlocked position wherein said ball may move relative to said axis.

5,569,271

**SURGICAL INSTRUMENT FOR SUTURING**

Steven B. Hoel, 701 Orchard, Longview, Tex. 75601

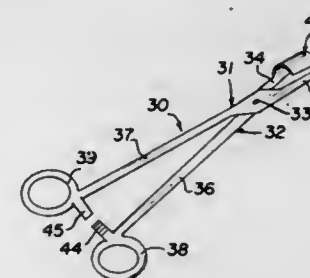
Continuation of Ser. No. 131,443, Oct. 4, 1993, abandoned.

This application Sep. 26, 1995, Ser. No. 534,023

Int. Cl.<sup>6</sup> A61B 17/04;17/28

U.S. Cl. 606—148

5 Claims



1. In a clamp device of the type used for driving, manipulating, clearing and extracting a suture needle in surgical procedures that comprises a pair of elongated members pivotally hinged to each other at a point along their lengths between their midpoints and their first ends to form a pair of jaw sections extending from about said hinge point to said first end and to form a pair of handle sections from about the hinge point to the second ends of said members, said jaw sections being adapted to clamp and hold therebetween a suture needle near its midsection with the ends of said needle extending laterally from between said jaw sections, the improvement comprising: a shield plate affixed to one of said jaw

sections over essentially the full length of said one jaw section and extending laterally outward and arcuately over the other of said jaw sections so as to shield from accidental contact with other objects one end of a suture needle clamped between said jaw sections near the midsection of said suture needle for manipulation of said needle by a user of said clamp device.

5,569,272

**TISSUE-CONNECTIVE DEVICES WITH MICROMECHANICAL BARBS**

Michael L. Reed, and Lee E. Weiss, both of Pittsburgh, Pa., assignors to Carnegie Mellon University, Pittsburgh, Pa.

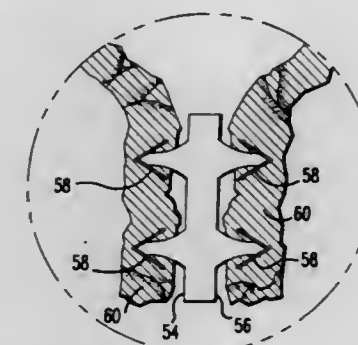
Continuation of Ser. No. 648,275, Jan. 31, 1991, Pat. No.

5,312,456. This application Feb. 8, 1994, Ser. No. 193,385

Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—151

13 Claims



1. An apparatus for connecting to tissue, comprising: a member, the member having at least one surface upon which is disposed a plurality of micromechanical barbs, each of the plurality of micromechanical barbs having length no greater than 0.5 millimeters and being capable of piercing tissue and anchoring therein.

5,569,273

**SURGICAL MESH FABRIC**

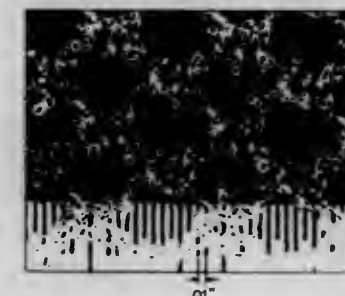
Milo A. Titone, Wilmington, Del., and Fred D. Herzog, Westford, Mass., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Jul. 13, 1995, Ser. No. 502,021

Int. Cl.<sup>6</sup> A61B 17/00;19/00; A61F 2/02;2/08

U.S. Cl. 606—151

11 Claims



1. As a prosthetic for repairing living animal tissue, body wall or muscle defects, a biologically compatible, implantable dual bar warp knit, hexagonal mesh produced according to a back bar pattern chain of 2/0 2/4 2/0 4/6 4/2 4/6 and a front bar pattern chain of 4/6 4/2 4/6 2/0 2/4 2/0.

5,569,274

**ENDOSCOPIC VASCULAR CLAMPING SYSTEM AND METHOD**

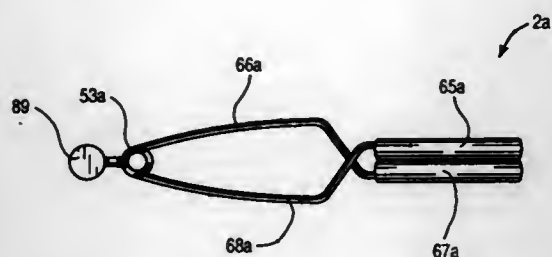
Alan R. Rapacki, San Francisco, and John H. Stevens, Palo Alto, both of Calif., assignors to Heartport, Inc., Redwood City, Calif.

Continuation-in-part of Ser. No. 23,778, Feb. 22, 1993, Pat. No. 5,452,733. This application Jun. 24, 1994, Ser. No. 265,477

Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—158

48 Claims



1. A surgical clamp configured for introduction through a small percutaneous incision in the body for occluding a vessel in a body cavity, the surgical clamp comprising:

first and second jaws having distal and proximal ends, the proximal ends being coupled together such that the distal ends are movable between an open position where the first and second jaws are disposed apart and a closed position where the first and second jaws including atraumatic surfaces on the first and second jaws configured to atraumatically occlude the vessel without damaging the vessel;

means at the proximal ends of the first and second jaws for releasably holding the clamp, the holding means including a spherical member;

first and second camming surfaces on the first and second jaws distal to the holding means configured so that sliding engagement of the camming surfaces in an axial direction opens and closes the first and second jaws; and

means for biasing the first and second jaws into the closed position.

5,569,275

**MECHANICAL THROMBUS MACERATION DEVICE**

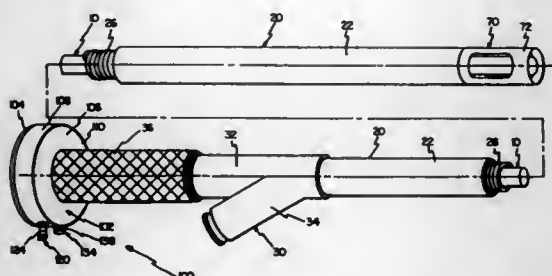
Frank Kotula, Maple Grove, and Timothy Claude, Coon Rapids, both of Minn., assignors to Microvena Corporation, White Bear Lake, Minn.

Continuation-in-part of Ser. No. 713,394, Jun. 11, 1991, Pat. No. 5,284,486. This application Feb. 8, 1994, Ser. No. 193,490

Int. Cl.<sup>6</sup> A61B 17/32

U.S. Cl. 606—159

18 Claims



1. A mechanical thrombus maceration device comprising:  
a. an elongate, flexible shaft having proximal and distal ends, the shaft being adapted to be guided along a vascular path and being rotatable within a vascular channel having a vascular wall;

b. a plurality of rotors affixed to the shaft for rotation therewith, the rotors being spaced apart from one another along the shaft;

c. drive means for rapidly rotating the shaft; and

d. a rotor housing enclosing at least one of the rotors and within which said rotor rotates, the housing comprising a generally cylindrical wall substantially surrounding said rotor.

5,569,276

**INTRAVASCULAR CATHETER HAVING COMBINED IMAGING ABRASION HEAD**

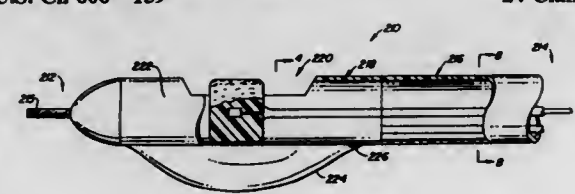
Yue-Teh Jang, Fremont, and William M. Belef, San Jose, both of Calif., assignors to Cardiovascular Imaging Systems, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 293,831, Aug. 22, 1994, Pat. No. 5,507,292, which is a continuation of Ser. No. 842,813, Feb. 27, 1992, Pat. No. 5,402,790, which is a continuation of Ser. No. 526,413, May 21, 1990, Pat. No. 5,100,424. This application Jun. 6, 1995, Ser. No. 468,254

Int. Cl.<sup>6</sup> A61B 17/22; 8/12

U.S. Cl. 606—159

24 Claims



13. A method for removing the stenotic material from a patient's vascular system comprising the steps of:

introducing a catheter, said catheter having an abrasive member contained substantially within the catheter during positioning and abrasion, into the vascular system;

contacting the stenotic material with said abrasive member, whereby the stenotic material is abraded and collected by the catheter; and

monitoring the extent of removal of stenotic material concurrent with or subsequent to the abrasion process.

5,569,277

**ATHERECTOMY DEVICE HAVING HELICAL BLADE AND BLADE GUIDE**

Michael Evans, Palo Alto, and Richard L. Mueller, Mountain View, both of Calif., assignors to Devices for Vascular Intervention, Inc., Santa Clara, Calif.

Division of Ser. No. 130,344, Oct. 1, 1993, Pat. No. 5,403,334, which is a division of Ser. No. 44,131, Apr. 7, 1993, Pat. No. 5,312,425, which is a division of Ser. No. 971,697, Nov. 4, 1992, Pat. No. 5,226,909, which is a continuation of Ser. No. 726,626, Jun. 28, 1991, abandoned, which is a continuation of Ser. No. 405,906, Sep. 12, 1989, abandoned. This application Dec. 19, 1994, Ser. No. 359,239

Int. Cl.<sup>6</sup> A61B 17/32

U.S. Cl. 606—159

3 Claims

1. An atherectomy catheter comprising:  
a catheter body having a lumen extending between proximal and distal ends thereof;

a cylindrical housing secured to the distal end of the catheter body, said housing having a substantially open interior and an axially-aligned, elongate aperture on one side thereof;

a circular cutting blade disposed within the housing;

an elongate guide frame disposed within the housing adjacent the elongate aperture, said guide frame defines an exterior which receives and guides the circular cutting blade and an interior volume, wherein the elongate frame is a helical coil; means for translating the circular cutting blade over the elongate guide frame, whereby the coil acts as a guide for the cutting blade;

5,569,279

**SURGICAL ABRADING DEVICE**

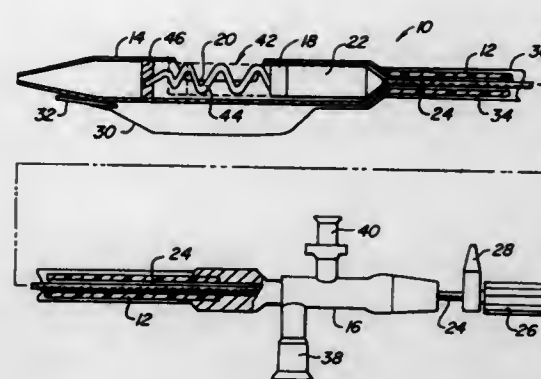
Edgar A. Rainin, 111 Wild Oak Ct., Danville, Calif. 94526

Filed Apr. 29, 1994, Ser. No. 236,372

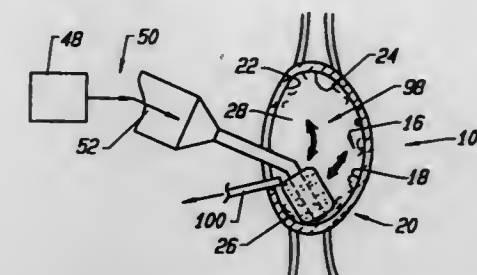
Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—166

19 Claims



means for rotating the helical coil, whereby material severed by the cutting blade may be translated to one end of the cylindrical housing.



1. A surgical abrading device to remove biological material held to a membranous surface, comprising:

a. an element including a resilient body having an abrading surface for removing biological material held to a membranous surface, said element including a core of fluid absorbing material;

b. irrigation means for transporting fluid from a source, said irrigation means including a tubular member; and

c. connecting means for holding said element to said irrigation means to permit flow of fluid to the membranous surface.

5,569,278

**ARCULATE TONGUE SCRAPER**

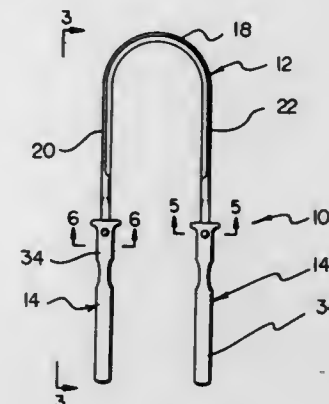
Diane C. Persad, 9701 Elm La., Miramar, Fla. 33025

Filed Apr. 3, 1995, Ser. No. 415,244

Int. Cl.<sup>6</sup> A61B 17/24

U.S. Cl. 606—161

7 Claims



1. An arcuate tongue scraper comprising:

a scraping means for engaging an upper surface of a human tongue and scraping debris therefrom, the scraping means comprises an arcuate scraping blade including an arcuate scraping leg of substantially semi-circular configuration; a first lateral scraping leg projecting from the arcuate scraping leg; and a second lateral scraping leg projecting from an opposed end of the arcuate leg and into a substantially spaced orientation relative to the first lateral scraping leg to define the arcuate scraping blade of the scraping means, the scraping legs so as to define a flat engaging surface positionable upon an upper surface of a tongue; an arcuate outer surface extending from the flat engaging surface; an angled interior surface projecting from the flat engaging surface and intersecting the arcuate outer surface, wherein an intersection of the angled interior surface and the flat engaging surface defines a scraping blade which can be dragged across an upper surface of a tongue to facilitate mechanical removal of debris therefrom;

a handle means pivotally mounted relative to the scraping means for facilitating manual manipulation of the scraping means.

5,569,280

**OPHTHALMIC TEMPLATE**

William H. Kamerling, 423 Clements Bridge Rd., Barrington, N.J. 08007

Filed Jun. 29, 1994, Ser. No. 276,853

Int. Cl.<sup>6</sup> A61B 17/32

U.S. Cl. 606—166

13 Claims



1. An ophthalmic template for use in cutting an opening in the anterior capsule of the eye comprising

a first member to be placed on the anterior capsule and having a shape that corresponds to the shape of the opening that is to be cut in the anterior capsule, and means for selectively retaining said first member on the anterior capsule, said last named means including means for connecting said first member to a source of vacuum.

5,569,281

**GUARDED SURGICAL SCALPEL**

Michael R. Abidin, Charlottesville, Va., and Steven P. Lehmbeck, Baltimore, Md., assignors to Leonard Bloom, Towson, Md.

Continuation of Ser. No. 150,843, Nov. 12, 1993, Pat. No. 5,411,512, which is a continuation-in-part of Ser. No. 40,165, Mar. 30, 1993, Pat. No. 5,275,606, which is a continuation-in-part of Ser. No. 825,556, Jan. 24, 1992, Pat. No. 5,250,063.

This application Apr. 26, 1995, Ser. No. 429,194

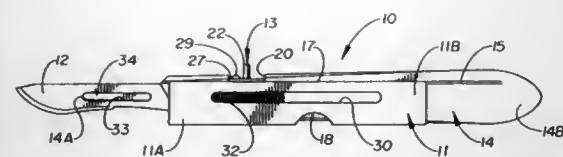
Int. Cl.<sup>6</sup> A61B 17/32

U.S. Cl. 606—167

2 Claims

1. In a guarded scalpel, wherein a guard is slidably mounted on a handle, and wherein a two-position detent means is provided





between the guard and the handle, thereby defining the alternate advanced and retracted positions of the guard relative to the handle, the improvement comprising a stop means between the guard and the handle, the stop means being independent of the detent means, providing a bearing guide for the guard, and including at least one pin carried transversely by the handle and riding in at least one closed longitudinal slot formed in the guard.

5,569,282

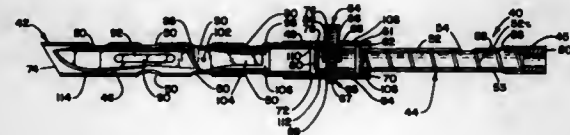
## RETRACTABLE SURGICAL KNIFE

Richard S. Werner, 2920 W. 38th St., Minneapolis, Minn. 55410  
Continuation-in-part of Ser. No. 161,662, Dec. 3, 1993, Pat. No. 5,423,843, which is a continuation-in-part of Ser. No. 986,139, Dec. 4, 1992, Pat. No. 5,292,329. This application Jun. 13, 1995, Ser. No. 489,890

Int. Cl.<sup>6</sup> A61B 17/32

U.S. Cl. 606—167

8 Claims



## 1. A retractable tool holder, comprising:

- a sheath member;
- a tool support member holding a tool at a front end of the tool support member, the tool support member including at least one longitudinally extended slot, the tool support member being receivable in and reciprocal along the sheath member;
- a first spring with two ends being disposed inside the tool support member, the first end of said spring is proximate a back end of the tool support member and the second end of said spring is proximate a back end of the sheath member;
- a latch mechanism for releasing and locking the tool support member, the latch mechanism disposed proximate the back end of the sheath member, said latch mechanism reciprocating in the slot of the tool support member;
- wherein upon pushing the back end of the tool support member toward the latch mechanism, the tool is extended out of the sheath member, the first spring is compressed between the back end of the tool support member and a first side of the latch mechanism, and the tool support member is locked with the latch mechanism; and
- wherein upon pushing the latch mechanism, the first spring is relaxed and expanded between the back end of the tool support member and the first side of the latch mechanism, the back end of the tool support member moves away from the latch mechanism, and the tool is retracted into the sheath member.

5,569,283

## SURGICAL CUTTING INSTRUMENT WITH GUARDED BLADE

David T. Green, Westport; Salvatore Castro, Seymour; Keith Ratcliff, Sandy Hook; Graham W. Bryan, Norwalk, and Paul Nolan, Wilton, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 116,779, Sep. 3, 1993, abandoned.

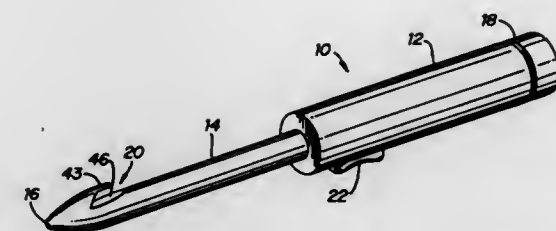
This application Mar. 29, 1995, Ser. No. 412,599

Int. Cl.<sup>6</sup> A61B 17/32; B26B 3/06; 29/00

U.S. Cl. 606—170

34 Claims

## 1. A surgical cutting instrument comprising:



a sheath member defining a longitudinal axis having a proximal end and a closed distal end and an outwardly radially directed nodule tapered towards said distal end and defining a proximally directed opening, said opening being disposed in a plane which is at an angle with respect to the longitudinal axis; and

a cutting member disposed within said sheath member having a proximally directed cutting edge disposed at an angle to the longitudinal axis, said cutting member being manipulable from a position spaced from said distal end and being movable from a first position wherein said cutting edge is fully enclosed within said sheath member to a second position wherein only said cutting edge is exposed at said opening of said nodule, said cutting edge retaining the same angle with respect to the longitudinal axis in each of said first and second positions and wherein the sheath member has a bore extending through the length thereof and to the cutting member, the bore having a diameter sufficient to receive a viewing member to enable viewing of the cutting edge.

5,569,284

## MORCELLATOR

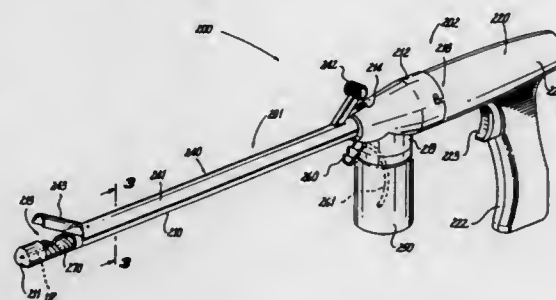
Wayne P. Young, Brewster, N.Y.; Darryl S. Pereira, Monroe, Conn.; Salvatore Castro, Seymour, Conn.; Michael S. Kolesa, Norwalk, Conn.; Dominick L. Matri, Bridgeport, Conn., and Frank J. Viola, Sandy Hook, Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Sep. 23, 1994, Ser. No. 311,395

Int. Cl.<sup>6</sup> A61B 17/14; 17/32

U.S. Cl. 606—180

24 Claims



## 1. A surgical apparatus for morcellizing body tissue, which comprises:

- a) an endoscopic portion including an elongated tubular member having an axial bore, and an elongated auger rotatably disposed within the axial bore, the tubular member having an aperture which provides access for body tissue to contact the auger, and a cover member movable between a first position wherein the aperture is covered and a second position wherein the aperture is uncovered; and
- b) a housing portion engaged with the endoscopic portion and including a rotary driver mounted therein, the rotary driver being operatively associated with the auger, and an actuation member responsive to user contact for actuating the rotary driver, wherein actuation of the rotary driver causes rotation of the auger.

5,569,285

## SCALPEL WITH ROTARY DEPTH GUARD

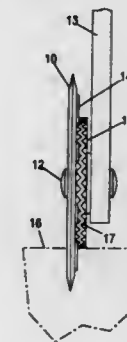
Nicholas J. Webb, 5370 Basel Dr., Box 831, Wrightwood, Calif. 92397

Continuation-in-part of Ser. No. 333,606, Nov. 2, 1994, abandoned. This application Mar. 23, 1995, Ser. No. 409,140

Int. Cl.<sup>6</sup> B26B 25/00; A61B 17/32

U.S. Cl. 606—180

7 Claims



## 1. A cutting implement, comprising:

- a handle,
- a circular blade rotatably attached to said handle,
- a circular depth guard rotatably attached to said handle,
- a first gear fixedly attached to said circular blade, and
- a second gear fixedly attached to said circular depth guard and in engagement with said first gear, whereby rolling said circular depth guard along a member to be cut rotates said circular blade via said first and said second gears to make a smooth incision.

5,569,286

## LANCET ASSEMBLY

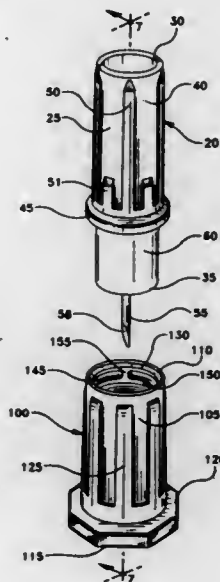
Allison A. Peckham, Pompton Plains, N.J.; Lennox O. Watts, Bronx; Marina Gertsek, County of Manhattan, both of N.Y.; Kevin R. Smith, Holdrege, Nebr.; Don D. Tanbenheim, Holdrege, Nebr., and Ronald J. Pistulka, Holdrege, Nebr., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Mar. 29, 1995, Ser. No. 413,044

Int. Cl.<sup>6</sup> A61B 17/14

U.S. Cl. 606—181

13 Claims



## 1. A lancet assembly comprising:

an annular housing having a proximal end and a distal bottom end connected by an outer wall with a passageway contained therein and a lower annular portion at said distal bottom end surrounding said passageway;

a stylet mounted in said passageway and extending a predetermined distance from said distal bottom end of said annular housing; and

a cap for receiving said distal bottom end of said annular housing to shield said stylet when not in use,

wherein said lower annular portion comprises a hub surrounding said passageway for holding and positioning said stylet in said annular housing and a plurality of supports extending radially from said hub to said outer wall to support said hub within said annular housing.

5,569,287

## MEANS FOR COLLECTING AND SPOTTING SMALL AMOUNT OF BLOOD

Shigeru Tezuka; Hikaru Tsuruta; Teruaki Kozumi, and Masao Kitajima, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

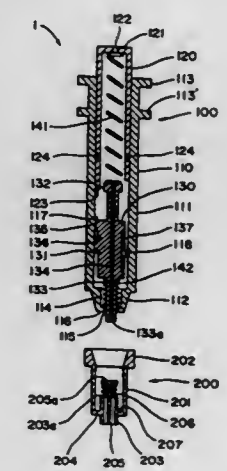
Filed Dec. 9, 1994, Ser. No. 353,108

Claims priority, application Japan, Dec. 9, 1993, 5-341510; Apr. 11, 1994, 6-098130

Int. Cl.<sup>6</sup> A61B 17/14

U.S. Cl. 606—182

3 Claims



## 1. An apparatus for collecting and delivering a small amount of blood which comprises a cylinder, a piston, and a puncturing tip, wherein

- the piston is inserted airtightly into the upper end of the cylinder;
- the puncturing tip is airtightly and exchangeably fitted onto the lower end of the cylinder;
- the puncturing tip comprises a blood conduit and a needle suspended by a spring within the blood conduit;
- the blood conduit has a volume which is equal to a volume of blood to be delivered; and
- the needle is arranged to be pushed out from the puncturing tip by descent of the piston and then returned back by ascent of the piston,

wherein

the cylinder contains in its lower end, a sliding means having a through-hole therein, the top the sliding means being connected with the piston via a spring, the lower end of the sliding means protruding from the lower end of the cylinder, the lower end of the sliding means being able to be so pushed into the cylinder that the sliding means is fixed in a predetermined position under engagement with the inner surface of the cylinder and being able to be pushed down rapidly by breakage of the engagement which is caused by the descent of the piston.

5,569,288

## SAFETY PENETRATING INSTRUMENT

InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131  
Division of Ser. No. 745,071, Aug. 14, 1991, abandoned, which  
is a continuation-in-part of Ser. No. 628,899, Dec. 18, 1990,  
Pat. No. 5,226,426. This application Jan. 6, 1994, Ser. No.  
178,153

Int. Cl. A61M 5/00

U.S. Cl. 606—185

22 Claims



1. A safety penetrating instrument comprising an elongate, hollow penetrating member having a proximal end and an open distal end having a peripheral edge and a sharp tip for penetrating tissue;
- a safety probe movably disposed in said penetrating member having a proximal end and a distal end with an end surface and being movable between an extended position with said safety probe distal end protruding distally from said sharp tip and a retracted position with said safety probe distal end disposed within said penetrating member to expose said sharp tip;
- a hub receiving said proximal ends of said penetrating member and said safety probe;
- bias means for biasing said safety probe toward said extended position and for permitting said safety probe to move proximally to said retracted position in response to a proximally directed force applied to said safety probe distal end, said bias means returning said safety probe to said extended position when the force applied to said safety probe distal end is removed;
- a housing abutting said hub;
- an elongate, tubular portal sleeve surrounding said penetrating member and having a proximal end secured to said housing and a distal end disposed adjacent said penetrating member distal end; and
- a stop structure for limiting proximal movement of said safety probe to a position where said end surface of said safety probe distal end is in substantial alignment with said peripheral edge of said penetrating member distal end when said safety probe is in said retracted position whereby said safety probe and said penetrating member distal end present a substantially continuous surface during tissue penetration, said stop structure including a proximal abutment member held stationary relative to said hub and a stop member extending radially from said safety probe to define a proximal abutment surface for abutting said stationary proximal abutment member when said safety probe is in said retracted position.

5,569,289

## SAFETY PENETRATING INSTRUMENT WITH PENETRATING MEMBER AND CANNULA MOVING DURING PENETRATION AND TRIGGERED SAFETY MEMBER PROTRUSION

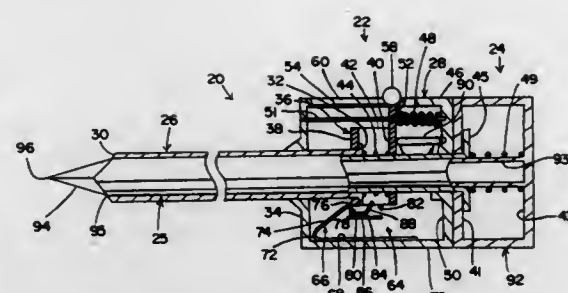
InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131  
Continuation-in-part of Ser. No. 83,220, Jun. 24, 1993, Pat.  
No. 5,431,635, Ser. No. 83,728, Jun. 29, 1993, Pat. No.  
5,466,224, and Ser. No. 115,152, Sep. 2, 1993. This application  
Oct. 4, 1994, Ser. No. 317,939

Int. Cl. A61M 5/20

U.S. Cl. 606—185

29 Claims

1. A safety penetrating instrument for establishing a portal in the wall of an anatomical cavity comprising:
  - a housing;
  - an elongate cannula mounted by said housing and having a distal end for introduction in the anatomical cavity and a proximal end for positioning externally of the anatomical cavity;
  - a penetrating member disposed in said cannula and having a distal end for penetrating the anatomical cavity wall, said



- penetrating member being movable relative to said housing between an extended rest position and a penetrating member retracted position relative to said cannula;
- cannula extending means for moving said cannula distally relative to said housing from a cannula retracted position where said cannula distal end is disposed proximally of said penetrating member distal end to an extended position where said cannula distal end protrudes distally from said penetrating member distal end
- means for manually moving said cannula proximally relative to said housing from said cannula extended position to said cannula retracted position;
- cannula locking means for locking said cannula in said cannula retracted position to prevent distal movement of said cannula relative to said housing beyond said cannula retracted position while permitting proximal movement of said cannula relative to said housing during penetration of the anatomical cavity wall;
- cannula bias means for biasing said cannula distally relative to said housing in said cannula retracted position to permit said cannula to move proximally relative to said housing from said cannula retracted position during penetration of the anatomical cavity wall and distally relative to said housing toward said cannula retracted position upon introduction into the anatomical cavity;
- penetrating member bias means for biasing said penetrating member distally relative to said housing toward said penetrating member rest position and for permitting proximal movement of said penetrating member relative to said housing; and
- releasing means responsive to penetration of said safety penetrating instrument into the anatomical cavity for triggering release of said cannula locking means to permit said cannula extending means to move said cannula distally relative to said housing from said cannula retracted position to said cannula extended position.

5,569,290

## METHOD OF AND APPARATUS FOR LAPAROSCOPIC OR ENDOSCOPIC SPINAL SURGERY USING AN UNSEALED ANTERIORLY INSERTED TRANSPARENT TROCHAR

Paul C. McAfee, 621 E. Belfast Rd., Sparks, Md. 21152,  
assignor to Paul C. McAfee, Towson, Md.

Filed Jan. 30, 1995, Ser. No. 380,393

Int. Cl. A61B 17/34

U.S. Cl. 606—185

19 Claims

1. An apparatus for use in endoscopic or laparoscopic surgery on a patient's spine comprising:
  - means for forming a passageway to said patient's spine through an incision made in said patient's abdominal or chest for the insertion of specially designed long-necked surgical instruments therethrough to perform a surgical procedure on said patient's spine wherein said means forming said passageway includes an inner tubular member of a first diameter and an outer tubular member of a second diameter which is slightly larger than said first diameter in order for said inner tubular member to fit telescopically within said outer tubular member;
  - means for dually functioning to prevent telescoping of said inner tubular member within said outer tubular member and to

5,569,292

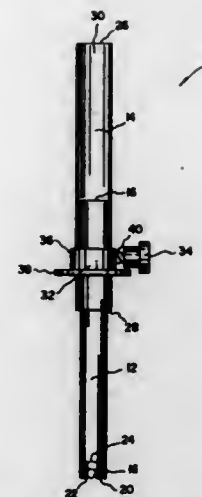
## SURGICAL PENETRATION INSTRUMENT WITH TRANSPARENT BLADES AND TIP COVER

Richard F. Schwemmer, Cincinnati; Salvatore Privitera, West Chester, and Robert Hughes, Cincinnati, all of Ohio, assignors to Ethicon Endo-Surgery, Inc., Cincinnati, Ohio  
Filed Feb. 1, 1995, Ser. No. 382,462

Int. Cl. A61B 17/34

U.S. Cl. 606—185

24 Claims



- stabilize said means for forming a passageway in a position for use during surgery against movement relative to said patient's spine; and
- means positioned on an end of said inner tubular member for anchoring said means for forming a passageway to a vertebrae in said patient's spine, wherein said means for anchoring is a tubular metal fitting and wherein said tubular metal fitting has a plurality of serrated teeth on one end and on an opposite end a threaded outer periphery which mates with an inner periphery of said inner tubular member.

5,569,291

## SURGICAL PENETRATION AND DISSECTION INSTRUMENT

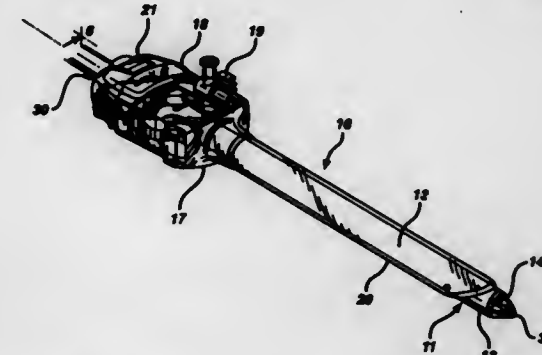
Salvatore Privitera, West Chester, and Richard F. Schwemmer, Cincinnati, both of Ohio, assignors to Ethicon Endo-Surgery, Inc., Cincinnati, Ohio

Filed Feb. 1, 1995, Ser. No. 382,461

Int. Cl. A61M 5/18

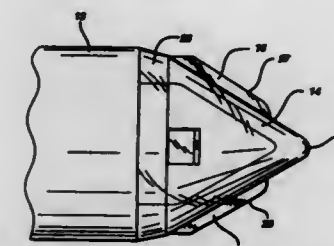
U.S. Cl. 606—185

7 Claims



1. A surgical instrument for penetrating or dissecting bodily tissue, said instrument comprising a generally cylindrical, elongated hollow shaft having a longitudinal axis and proximal and distal ends, said hollow shaft having a lumen therethrough with a diameter sized to slidably receive an endoscope therein from said shaft proximal end to said shaft distal end; a hub attached to said shaft proximal end having a passageway therethrough communicating with said shaft lumen; and an endoscope locking assembly on said hub, said locking assembly including a camming member therein, said camming member terminating at an arcuate camming edge surface; wherein when said endoscope is received in said shaft lumen, said locking assembly is actuatable from an open position wherein said arcuate camming edge surface of said camming member of said locking assembly is spaced from said shaft lumen and disengaged from said endoscope, to a closed position

wherein said arcuate camming edge surface constricts said shaft lumen and engages said endoscope so as to prevent substantial movement thereof.



1. A surgical penetration instrument for penetrating bodily tissue during a surgical procedure; said instrument comprising an elongated shaft having a distal end; a penetrating tip in communication with said shaft distal end and extending distally therefrom, said penetrating tip having a surface configuration shaped to enlarge an opening in said bodily tissue as said instrument is advanced distally into said tissue; and a first transparent blade extending outwardly from said penetrating tip, wherein said penetrating tip and said first transparent blade are integrally formed from a single piece of material.

5,569,293

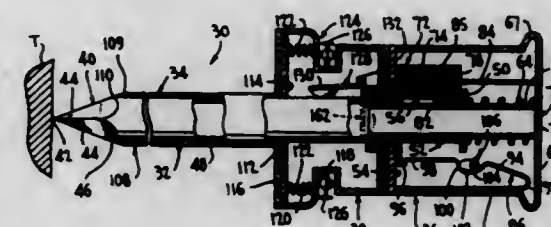
## RETRACTABLE SAFETY PENETRATING INSTRUMENT FOR PORTAL SLEEVE INTRODUCTION

InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131  
Division of Ser. No. 254,007, Jun. 3, 1994, Pat. No. 5,478,317,  
which is a continuation of Ser. No. 800,507, Nov. 27, 1991,  
abandoned. This application May 10, 1995, Ser. No. 438,601

Int. Cl. A61M 5/20

U.S. Cl. 606—185

5 Claims



1. A retractable safety penetrating instrument for forming a portal communicating with a cavity in the body to allow passage of instruments for performing least invasive medical procedures comprising



a hollow portal sleeve for providing a passage through a cavity wall and having a distal end for positioning in the body cavity, a proximal end for positioning externally of the body cavity and a lumen extending between said distal and proximal ends;

a housing mounting said proximal end of said sleeve;

a penetrating member disposed in said lumen of said sleeve and having a distal end for penetrating the cavity wall a proximal end and a longitudinal axis;

a hub mounting said proximal end of said penetrating member and having a distal wall for engaging said housing;

a rail mounted externally on said proximal end of said penetrating member, said rail including a hollow cylindrical member laterally offset from and parallel with said longitudinal axis and having an abutment wall;

a retracting mechanism for moving said penetrating member proximally relative to said sleeve from an extended position where said distal end of said penetrating member protrudes beyond said distal end of said sleeve to a retracted position to prevent contact of said distal end of said penetrating member with tissue, said retracting mechanism including means for biasing said penetrating member in a proximal direction, said biasing means including a spring disposed within said cylindrical member and mounted in compression between said distal wall of said hub and said abutment wall; and

trigger means for automatically actuating said retracting mechanism to move said penetrating member to said retracted position in response to movement of said retractable safety penetrating instrument distally upon said distal end of said sleeve entering the body cavity whereby said distal end of said penetrating member is protected from inadvertent contact with tissue in the body cavity.

5,569,294

## TWO PIECE BALLOON PROTECTOR

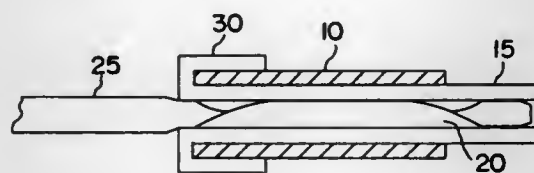
Walter R. Parkola, El Cajon, Calif., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Sep. 26, 1994, Ser. No. 312,338

Int. Cl.<sup>6</sup> A61M 25/00

U.S. Cl. 606—194

3 Claims



1. A method of installing a balloon protector around a dilatation catheter balloon comprising the steps of:

assembling a balloon protector by inserting an inner elastomeric member, having a proximal end and a distal end, through a cylindrical tube, having a proximal end and a distal end, until their proximal ends are engaged;

installing the balloon protector on a dilatation catheter balloon by securing the cylindrical tube;

pulling the distal end of the inner elastomeric member longitudinally until its inner diameter is greater than the outer diameter of a dilatation catheter balloon;

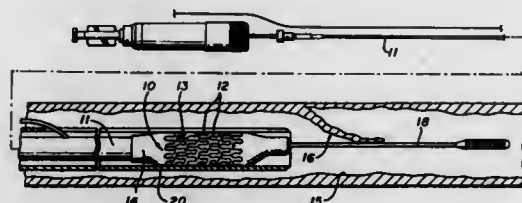
sliding the balloon protector over the dilatation catheter balloon; and

releasing the inner elastomeric member which reduces its diameter and protects the dilatation catheter balloon.

5,569,295  
EXPANDABLE STENTS AND METHOD FOR MAKING SAMESharon S. Lam, San Jose, Calif., assignor to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.  
Continuation of Ser. No. 396,886, Mar. 1, 1995, abandoned, which is a continuation of Ser. No. 175,214, Dec. 28, 1993, abandoned. This application May 31, 1995, Ser. No. 454,599  
Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 606—198

23 Claims



1. A longitudinally flexible stent for implanting in a body lumen and expandable from a contracted condition to an expanded condition, comprising:

a plurality of adjacent cylindrical elements each having a circumference extending around a longitudinal stent axis and each element being substantially independently expandable in the radial direction, said elements being arranged in alignment along the longitudinal stent axis;

said cylindrical elements formed in a generally serpentine wave pattern transverse to the longitudinal axis and containing a plurality of alternating peaks and valleys;

said peaks and valleys having different radii of curvature;

at least one interconnecting member extending between adjacent cylindrical elements and connecting them to one another;

said serpentine pattern having varying radii of curvature at least in regions of said peaks, the varying radii of curvature being selected to provide a generally uniform radial expansion of said cylindrical elements and a generally uniform expansion of said serpentine pattern around the circumference of each cylindrical element during expansion of the stent from the contracted condition to the expanded condition.

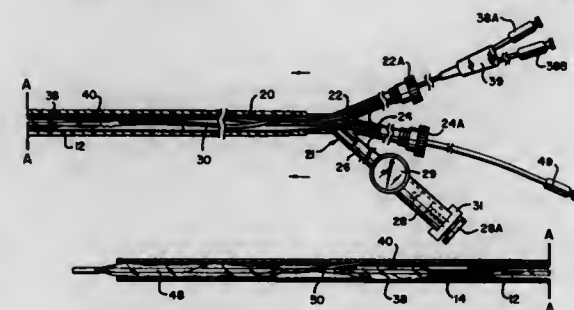
5,569,296

## METHOD FOR DELIVERING AND DEPLOYING INTRALUMINAL DEVICES

Michael L. Marin, and Ralph Marin, both of New York, N.Y., assignors to Stentco, Inc., Cross River, N.Y.  
Continuation-in-part of Ser. No. 243,190, May 13, 1994, Pat. No. 5,456,694. This application Jun. 7, 1995, Ser. No. 483,191  
Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 606—198

4 Claims



1. A method for introducing a transluminal device into a blood vessel, comprising the steps of:

causing a guide wire to enter the blood vessel at an entrance point;

passing the guide wire through the blood vessel;

causing the guide wire to exit the blood vessel at an exit point;

passing a first catheter over said guide wire with the ends of said catheter protruding from said entrance and exit points;

connecting a second catheter containing said transluminal device to said first catheter; and

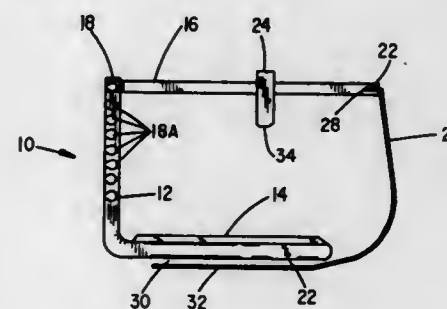
positioning said transluminal device within said blood vessel by pushing said second catheter and pulling said first catheter.

5,569,297

SELECTIVE VASCULAR COMPRESSION DEVICE  
Joshua Makower, Nannet, and Brett Stern, New York, both of N.Y., assignors to Schneider (USA) Inc., Plymouth, Minn.  
Filed Sep. 8, 1994, Ser. No. 302,542  
Int. Cl.<sup>6</sup> A61B 17/12

U.S. Cl. 606—201

19 Claims



1. An adjustable device for selectively applying localized compressive force to a body surface area of interest comprising:

(a) an adjustable clamping frame for adjustably enclosing a limb or other body region of interest, said clamping frame including a pivotally adjustable hinged member for closing on said region of interest forming one side thereof and an adjustable closure means for removably retaining said hinged member in a clamping position;

(b) a force applying resilient element carried by and positioned on said hinged member; and

(c) resilient, non-slip pad means on at least a portion of a surface of said clamp frame means contacting the body.

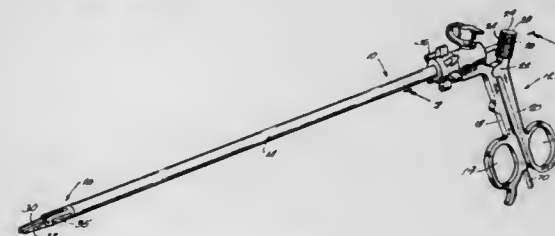
5,569,298

## RESPONSABLE SCISSORS

William J. Schnell, 1100 Crane Blvd., Libertyville, Ill. 60048  
Filed May 2, 1994, Ser. No. 236,991  
Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—205

6 Claims



1. A surgical instrument comprising:

a hollow elongated shaft for insertion into the body, said shaft having a distal end supporting a tip component, said shaft being connected at its proximal end to a first movable component of an operating handle,

said distal tip component having a longitudinal axis and a bifurcated distal end supporting a pair of interacting pivotable jaws, said distal tip component also having a pair of slots on its lateral edges,

said jaws being pivotally connected by a pivot pin supported transversely to the axis of said tip component each of said jaws having a proximal end extending proximally from said pivot pin, each of said proximal ends being provided with an

elongated opening therethrough, each of said openings forming an elongated slot oriented at an oblique angle relative to said longitudinal axis, and

a reciprocal rod being located within said shaft, a proximal end of said rod being connected to a second movable component of said handle for reciprocation within said shaft when said first and second components are moved relative to each other, said reciprocal rod having a distal end bent in a hook configuration having a section thereof oriented transversely to the longitudinal axis of said rod, said section extending into each of said elongated slots and the elongated openings of said jaws, whereby reciprocation of said rod causes said jaws to open and close.

5,569,299

## ENDOSCOPIC UROLOGICAL BIOPSY FORCEPS

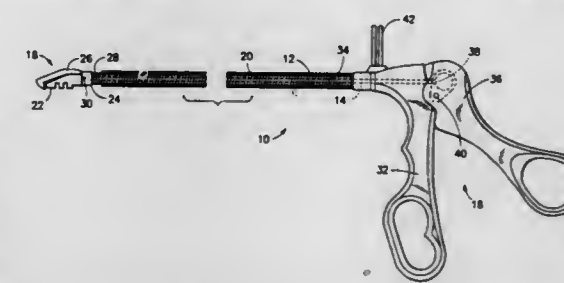
Gary R. Dill, Lauderhill, and Kevin F. Hahnen, Cooper City, both of Fla., assignors to Symbiosis Corporation, Miami, Fla.

Filed Mar. 1, 1995, Ser. No. 397,423

Int. Cl.<sup>6</sup> A61B 17/32

U.S. Cl. 606—205

19 Claims



1. A biopsy forceps surgical instrument comprising:

a) a hollow tube having a proximal and a distal end;

b) a control member having a proximal and a distal end and extending through said hollow tube;

c) an actuator coupled to said proximal end of said tube and said proximal end of said control member for imparting translational movement to said control member relative to said hollow tube;

d) a stationary jaw coupled to said distal end of said tube, said stationary jaw having a longitudinal axis and a pin substantially perpendicular to said longitudinal axis; and

e) a scooping movable jaw having an arcuate slot through which said pin extends, such that said movable jaw is pivotally coupled to said stationary jaw, said movable jaw being coupled to said distal end of said control member so that translational movement of said control member causes both translational and rotational movement of said movable jaw relative to said stationary jaw such that said movable jaw scoops a biopsy sample into said stationary jaw.

5,569,300

DILATING SURGICAL FORCEPS HAVING ILLUMINATION MEANS ON BLADE INNER SURFACE  
Henry A. Redmon, 12029 Orange Grove Dr., Tampa, Fla. 33618

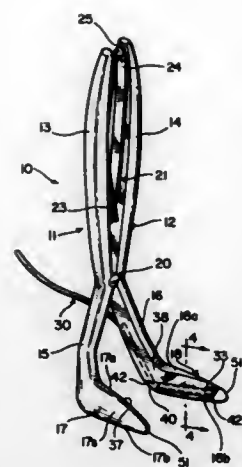
Filed Apr. 12, 1995, Ser. No. 420,812

Int. Cl.<sup>6</sup> A61B 1/313; 17/28

U.S. Cl. 606—207

12 Claims

1. A surgical instrument comprising a pair of legs, each leg including a handle portion disposed transverse to a blade portion, means uniting said handle portions for effecting movement of said blade portions between first and second positions in which said blade portions are in respectively adjacent and spaced relationship to each other, each blade portion being of a substantially elongated configuration converging along a longitudinal axis toward a termi-

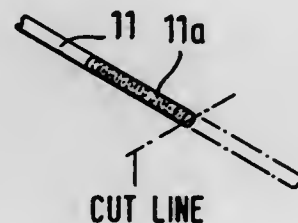


**5,569,302**  
**TIPPED MULTIFILAMENT SURGICAL SUTURE**  
 George R. Proto, West Haven; Francis D. Colligan, Waterbury, and Harold Bellmore, Jr., West Haven, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn. Division of Ser. No. 122,072, Sep. 14, 1993, Pat. No. 5,425,746, which is a division of Ser. No. 7,361, Jan. 21, 1993, Pat. No. 5,269,808, which is a continuation of Ser. No. 626,995, Dec. 13, 1990, abandoned. This application Mar. 3, 1995, Ser. No. 400,710

Int. Cl.<sup>6</sup> A61B 17/04

U.S. Cl. 606—228

9 Claims



nal nose, each blade portion having a relatively broad inner face and a relatively broad opposite outer surface, said inner faces being in generally opposing adjacent relationship to each other in said first position and in generally opposing substantially spaced relationship to each other in said second position, and illuminating means disposed within an elongate slot extending along at least a substantial portion of the said broad inner face of the longitudinal extent of said one blade portion for emitting illumination generally in a transverse direction relative to said longitudinal axis from said broad inner face of one of said blade portions thereby to effectively illuminate a substantially large longitudinal area between said inner faces when said inner faces are in said second position.

1. In a length of multifilament surgical suture, the improvement comprising at least one end of said multifilament surgical suture tipped with substantially fully cured cyanoacrylate.

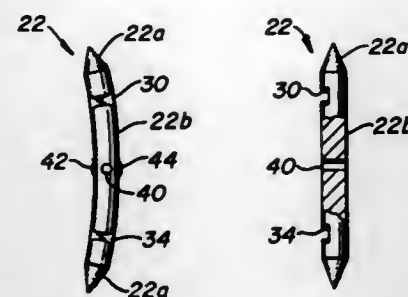
**5,569,301**  
**SURGICAL INCISION MEMBERS FOR ENDOSCOPIC SUTURING APPARATUS**

Richard N. Granger; Paul A. Scirica, both of Huntington, and Michael J. Gorecki, Cromwell, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn. Continuation-in-part of Ser. No. 134,145, Oct. 8, 1993, abandoned. This application Jun. 16, 1994, Ser. No. 260,579

Int. Cl.<sup>6</sup> A61B 17/04

U.S. Cl. 606—224

16 Claims



1. A surgical incision member for remote suturing of tissue comprising:  
 a curved body portion of substantially uniform cross-section defining first and second longitudinal ends;  
 tissue penetrating portions adjacent the first and second longitudinal ends;  
 suture attachment structure defined in the curved body portion for receiving a portion of a suture to be attached to the surgical incision member; and  
 a chamfer formed in the body portion adjacent the suture attachment structure, wherein the body portion includes a bulge along an outer surface opposite the body chamfer.

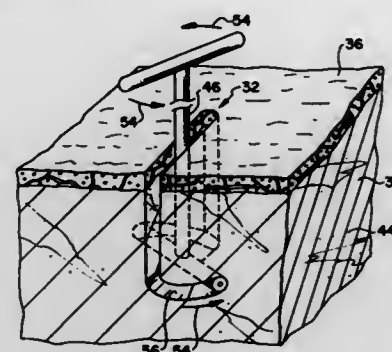
**5,569,303**  
**APPARATUS AND METHOD FOR ATTACHING AN OBJECT TO BONE**

Lanny L. Johnson, 4528 Hagadorn, East Lansing, Mich. 48823 Filed Oct. 18, 1994, Ser. No. 324,663

Int. Cl.<sup>6</sup> A61B 17/56

U.S. Cl. 606—232

16 Claims



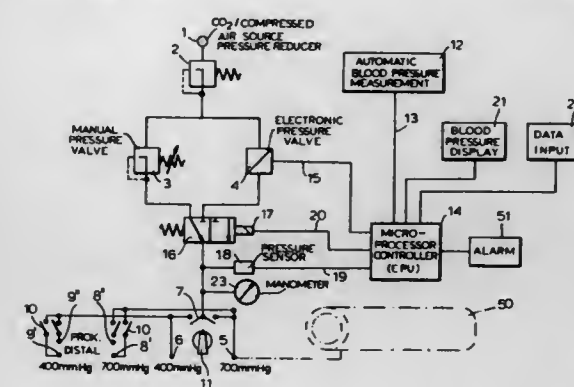
1. A method for attaching an object to a bone, comprising the steps of:  
 preparing an elongated channel within said bone;  
 inserting a fixation device into said channel such that a first axis of said fixation device is generally parallel to said channel, said fixation device including means for attaching said object thereto; and  
 rotating said fixation device in a rotation plane that is generally parallel to the surface of said bone such that at least a portion of said fixation device is positioned under bone tissue.

**5,569,304**  
**APPARATUS FOR INDUCING BLOODLESSNESS AT THE EXTREMITIES OF A PATIENT**  
 Heinrich C. Ulrich, Buchbrunnweg 12, 89081 Ulm, Germany Filed May 13, 1994, Ser. No. 242,734  
 Claims priority, application Germany, May 27, 1993, 43 17 600.3

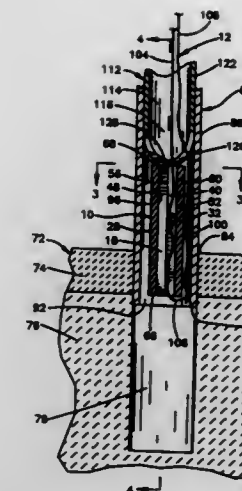
Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 606—201

11 Claims



1. An apparatus for inducing bloodlessness in an extremity of a patient for a surgical procedure or for intravenous local anaesthesia, said apparatus comprising:  
 a source of a gas under pressure;  
 a compression sleeve adapted to surround said extremity and connectable with said source for pressurization thereby to compress said extremity;  
 a controllable pressure regulating valve between said source and said sleeve for regulation a gas pressure in said sleeve;  
 an automatic blood pressure measuring device for monitoring blood pressure of said patient at least intermittently and producing a signal representing measured blood pressure; and  
 a control signal generator connected to said automatic blood pressure measuring device and to said controllable pressure regulating valve for receiving said signal representing measured blood pressure and producing a control signal operating said valve to alter pressure in said sleeve in response to a change in measured blood pressure;  
 a manually operated pressure control valve connected in parallel with said controllable pressure regulating valve between said source and said sleeve, and a two-way valve between said manually operated pressure control valve and said controllable pressure regulating valve for selectively controlling compression pressure in said sleeve therewith;  
 wherein said control signal generator operates said valve so as to maintain a compression pressure in said sleeve at a value equal to the measured blood pressure plus a predetermined additional pressure having a constant magnitude independent of the measured blood pressure; and  
 wherein said control signal generator is integrated in a computer-supported controller provided with means for calculating said control signal from a magnitude of the measured blood pressure.

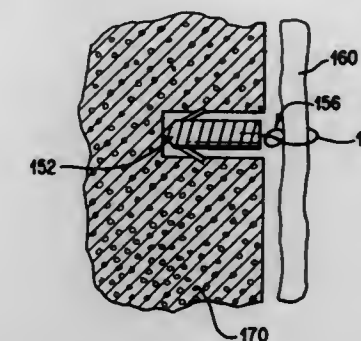


said anchor into body tissue with said suture extending through the passage in said anchor, said inserter including a tubular outer member having a passage in which said anchor is received, and an inner member which is received in the passage in said tubular outer member and has an end portion which engages a trailing end portion of the anchor during insertion of the anchor into body tissue, said tubular outer member including surface means for holding said anchor against rotation about a longitudinal central axis of the passage in said tubular outer member during movement of the anchor in said inserter.

**5,569,306**  
**KNOTLESS SUTURE ANCHOR ASSEMBLY**  
 Raymond Thal, 11321 Bright Pond Ln., Reston, Va. 22094 Filed Jun. 6, 1995, Ser. No. 471,508  
 Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—232

4 Claims



**5,569,305**  
**APPARATUS FOR ANCHORING A SUTURE**  
 Peter M. Bonutti, 1303 W. Evergreen Plaza, Effingham, Ill. 62401 Division of Ser. No. 291,970, Aug. 17, 1994, abandoned, which is a continuation-in-part of Ser. No. 62,295, May 14, 1993, Pat. No. 5,403,348, and Ser. No. 207,297, Mar. 7, 1994, Pat. No. 5,464,426. This application May 26, 1995, Ser. No. 452,283

Int. Cl.<sup>6</sup> A61B 17/04

U.S. Cl. 606—232

13 Claims

1. An apparatus comprising an anchor which is at least to be partially received in body tissue, a suture which extends through a passage in said anchor, and an inserter which is operable to insert

1. A knotless suture anchor assembly for attachment of tissue to a bone mass, said assembly comprising:  
 an anchor means for attachment to said bone mass, said anchor means having a first end and a second end, said first end having a suture element attached thereto, wherein said suture element has at least one loop portion located along its length for passing through said soft tissue, said second end of said anchor having a bone attachment means located on said suture anchor for securely anchoring said anchor to bone and means being passed through said loop portion of said suture element and being anchorable into said bone mass for secure attachment of said tissue to said bone mass.



5,569,307

**IMPLANTABLE COCHLEAR STIMULATOR HAVING BACKTELEMETRY HANDSHAKE SIGNAL**

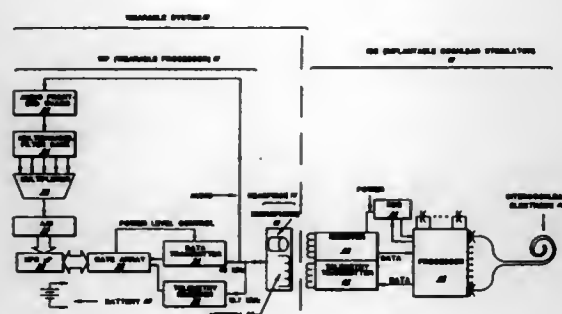
Joseph H. Schulman, Santa Clarita; John C. Gord, Venice; Primoz Strojnik, Granada Hills; David I. Whitmeyer, Los Angeles, and James H. Wolfe, Canyon Country, all of Calif., assignors to Alfred E. Mann Foundation for Scientific Research, Sylmar, Calif.

Continuation-in-part of Ser. No. 23,584, Feb. 26, 1993, which is a continuation of Ser. No. 752,069, Aug. 29, 1991, abandoned, which is a continuation-in-part of Ser. No. 411,563, Sep. 22, 1989, abandoned. This application Oct. 12, 1994, Ser. No. 322,066

Int. Cl. 6 A61F 2/18; H04R 25/00

U.S. Cl. 607-56

13 Claims



5. A cochlear stimulator system comprising: a wearable processor (WP); and an implantable cochlear stimulator (ICS); the WP including: a headpiece having an external coil, and means for generating a data signal and applying it to the external coil in the headpiece, the data signal comprising a series of data frames separated by a parity bit signal and an end of frame signal, each data frame comprising a plurality of data words, each data word defining an amplitude for a cochlear stimulating signal for a different output channel of the ICS, and a command word for controlling a processor means in the ICS;

the ICS including:

receiver means, including an implanted coil inductively coupled to the external coil of the headpiece, for receiving the data signal from the WP;  
data conditioner means connected to said receiver means for generating a carrier detect signal and a conditioned data signal whenever said data signal is being received;  
clock decoder means connected to said data conditioner means for generating a clock signal and a phase locked loop (PLL) lock signal, the PLL lock signal being generated only when the generated clock signal is phase-locked to the conditioned data signal;  
parity error detection means for receiving said conditioned data signal and generating a parity alarm signal whenever a parity error occurs within the data frame;

power supply means coupled to the receiver means for extracting a raw power signal from the data signal, the raw power signal being used to provide operating power for the ICS;

voltage downconverter means for generating a plurality of different operating voltages from the raw power signal;  
power bad detector means for generating a power bad signal whenever at least one of the plurality of different operating voltages is less than a prescribed reference voltage;  
a plurality of output channels, each having an electrode connected thereto, the electrode being insertable into a human cochlea;

processor means for serially processing the plurality of data words and command word in each data frame received by the receiver means, including a command detector responsive to the command words for controlling the functions of the processor, data word latching means for successively storing the data words, and switch means for successively coupling voltage signals representative of output signals from the data word latching means to successive ones of the plurality of output channels, and  
back telemetry means for generating a back telemetry carrier signal receivable by the WP only when a prescribed combination of said carrier detect signal, PLL lock signal, power bad signal, and parity alarm signal exists, said back telemetry carrier signal thereby serving as a handshake signal for the WP;

the WP further including means for receiving the back telemetry carrier signal and controlling the ICS, via the control word sent in each data frame, so that the ICS does not generate any cochlear stimulating signals until such time as the ICS generates, and the WP receives, the back telemetry carrier signal.

5,569,308

**METHODS FOR USE IN BONE TISSUE REGENERATION**

John S. Sottosanti, 2326 Calle Chiquita, La Jolla, Calif. 92037

Continuation of Ser. No. 847,626, Mar. 6, 1992, Pat. No. 5,366,507. This application Sep. 6, 1994, Ser. No. 301,499

Int. Cl. 6 A61F 2/28; A61C 5/00

U.S. Cl. 623-165

31 Claims

1. A method of regenerating bone tissue, comprising:

(a) filling a recipient graft site with graft material, the graft material comprising a stimulus to bone tissue growth, wherein the stimulus to bone tissue growth is selected from the group consisting of a bone forming cell, an inducer of bone tissue growth, a scaffolding-type structure that actively attracts osteoblasts, a scaffolding-type structure that passively attracts osteoblasts, and a combination of any of these; and

(b) placing a layer of resorbable barrier material over at least a portion of the graft material, wherein the barrier material comprises calcium sulfate, and wherein the barrier material physically protects the graft material, retards the ingrowth of unwanted tissue into the graft material, and allows cells to migrate into the recipient graft site from adjacent osseous tissue.

## CHEMICAL

5,569,309

**DISPERSE DYE COMPOSITIONS**

Toshio Hihara, and Kiyoshi Himeno, both of Kitakyushu, Japan, assignors to Dystar Japan Ltd., Osaka, Japan

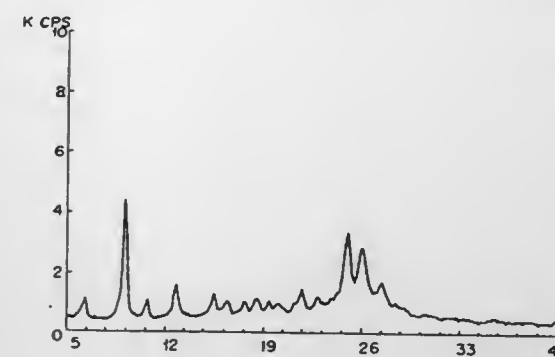
Filed May 19, 1995, Ser. No. 444,576

Claims priority, application Japan, May 23, 1994, 6-132533

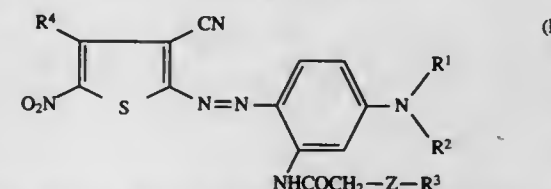
Int. Cl. 6 C09B 29/033; 67/22

U.S. Cl. 8-639

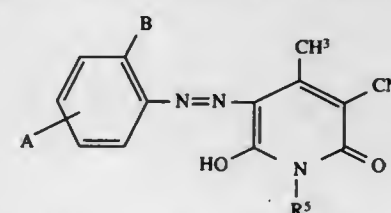
12 Claims



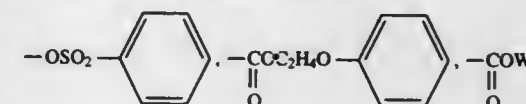
1. A green dye composition comprising at least one turquoise blue monoazo dye of the following formula (I):



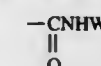
wherein each of R<sup>1</sup> and R<sup>2</sup> which are independent of each other, is a C<sub>1</sub>-C<sub>5</sub> alkyl group, an allyl group or a C<sub>1</sub>-C<sub>4</sub> alkoxy C<sub>2</sub>-C<sub>3</sub> alkyl group, R<sup>3</sup> is a C<sub>1</sub>-C<sub>5</sub> alkyl group, a C<sub>1</sub>-C<sub>4</sub> alkoxy C<sub>2</sub>-C<sub>3</sub> alkyl group or a phenyl group, R<sup>4</sup> is a hydrogen atom, a halogen atom or a methyl group, and Z is an oxygen atom or a sulfur atom, and at least one yellow monoazo dye of the following formula (II):



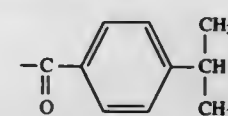
wherein A is a hydrogen atom, a halogen atom,



(wherein W is a C<sub>4</sub>-C<sub>8</sub> alkyl group),



(wherein W is as defined above) or



B is a hydrogen atom or a nitro group and R<sup>5</sup> is a C<sub>1</sub>-C<sub>8</sub> alkyl group or a C<sub>1</sub>-C<sub>3</sub> alkoxy C<sub>1</sub>-C<sub>3</sub> alkyl group.

5,569,310

**POLY(OXYALKYLENE) HYDROXYAROMATIC ETHERS****AND FUEL COMPOSITIONS CONTAINING THE SAME**

Richard E. Cherpeck, Cotati, Calif., assignor to Chevron

Chemical Company, San Ramon, Calif.

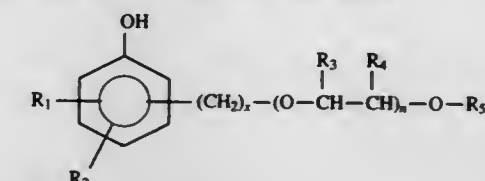
Filed Dec. 18, 1992, Ser. No. 992,953

Int. Cl. 6 C10L 1/18

U.S. Cl. 44-442

15 Claims

1. A fuel composition comprising a major amount of hydrocarbons boiling in the gasoline or diesel range and an effective detergent amount of a compound of the formula:

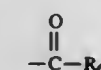


or a fuel-soluble salt thereof; wherein

R<sub>1</sub> and R<sub>2</sub> are each independently hydrogen, hydroxy, lower alkyl having 1 to 6 carbon atoms, or lower alkoxy having 1 to 6 carbon atoms;

R<sub>3</sub> and R<sub>4</sub> are each independently hydrogen or lower alkyl having 1 to 6 carbon atoms;

R<sub>5</sub> is hydrogen, alkyl having 1 to 30 carbon atoms, phenyl, aralkyl or alkaryl having 7 to 36 carbon atoms, or an acyl group of the formula:



wherein R<sub>6</sub> is alkyl having 1 to 30 carbon atoms, phenyl, or aralkyl or alkaryl having 7 to 36 carbon atoms;

n is an integer from 5 to 100; and x is an integer from 0 to 10.

5,569,311

**AIR CLEANER**

Kouichi Oda, Chita; Kazuyuki Horie, Nagoya, and Masao Ino,

Toyota, all of Japan, assignors to Toyota Boshoku Corporation, and Nippondenso Co., Ltd., both of Kariya, Japan

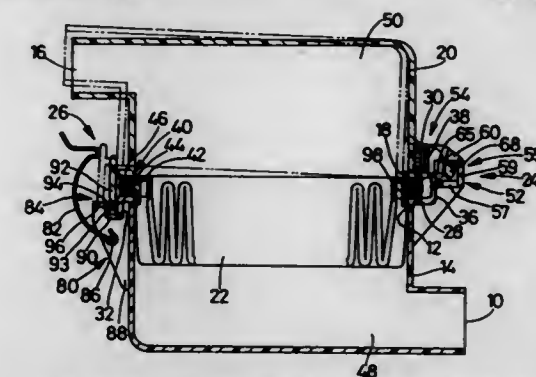
Filed Mar. 10, 1995, Ser. No. 401,681

Claims priority, application Japan, Mar. 11, 1994, 6-040990

Int. Cl. 6 B01D 46/00

U.S. Cl. 55-493

20 Claims



1. An air cleaner for cleaning air flowing through an air passage, comprising:

a separable housing including a first and a second housing for communicating with an upstream and a downstream portion of the air passage, respectively, said first and second housings having a first and a second opening, respectively;  
a filter element accommodated in said separable housing;  
one of said first and second housings having a sealing surface surrounding a corresponding one of said first and second openings;  
a sealing member for sealing contact with said sealing surface;

a hinge device located outwardly of said first and second openings of said first and second housings, for rotatably connecting the first and second housings to each other, said hinge device including a receiving member having a receiving opening, and an axis member for being received in said receiving member through said receiving opening, said axis member and said receiving member being displaceable relative to each other substantially along a plane in which said sealing member extends;

a clamp device cooperating with said hinge device to secure said first and second housings to each other; and  
a protector including a first and a second abutting portion, said protector allowing said sealing surface and said sealing member to be brought into said sealing contact with each other when said axis member of said hinge device is positioned at a prescribed hinging position in said receiving member of the hinge device, and inhibiting the sealing surface and the sealing member from being brought into the sealing contact with each other, by abutment of said first and second abutting portions thereof, when the axis member is not positioned at said hinging position, said protector including, as said first and second abutting portions thereof, a portion of said first housing and a portion of said second housing, respectively.

5,569,312

**METHOD FOR REDUCING NO<sub>x</sub> EMISSIONS FROM A REGENERATIVE GLASS FURNACE**  
Richard Quirk, Aughton; David A. Bird, Rufford; Ian N. W. Shulver, Southport, and Robin M. McIntosh, Newburgh, all of United Kingdom, assignors to Pilkington Glass Limited, United Kingdom

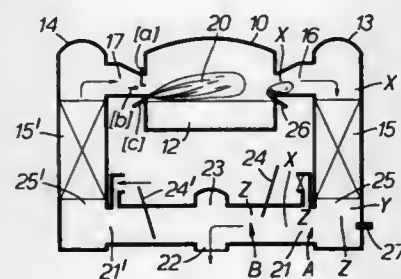
Filed Nov. 18, 1993, Ser. No. 153,986

Claims priority, application United Kingdom, Nov. 27, 1992, 9224852

Int. Cl.<sup>6</sup> C03B 5/167

U.S. Cl. 65—134.6

11 Claims



1. A method of operating a cross-fired regenerative glass furnace for the manufacture of flat glass so as to minimize emission of NO<sub>x</sub> in waste gases leaving the furnace, the furnace including a melting chamber and including sealed regenerators which act as heat exchangers, the method comprising melting glass in the melting chamber, to which fuel and combustion air are supplied, under substantially stoichiometric conditions, and supplying excess fuel to the waste gases as they leave the melting chamber and enter the sealed regenerators such that waste gases in the sealed regenerators contain combustible material available to react with NO<sub>x</sub> in the waste gases, and thereafter reacting said combustible material with sufficient air to ensure that the waste gases leaving the furnace through the regenerators and exiting to atmosphere contain permissible levels of combustible material and contain permissible levels of NO<sub>x</sub>.

5,569,313

**MOULD MECHANISM**

Willi Meyer, Effretikon, Switzerland, assignor to Emhart Glass Machinery Investments Inc., Wilmington, Del.

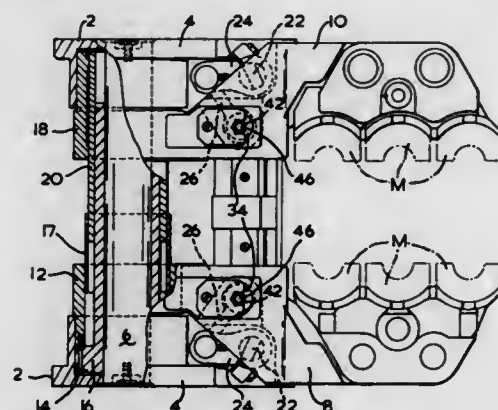
Filed Mar. 9, 1995, Ser. No. 401,399

Claims priority, application United Kingdom, Mar. 9, 1994, 9404488

Int. Cl.<sup>6</sup> C03B 9/353

U.S. Cl. 65—359

2 Claims



1. A mold mechanism for an I.S. Machine comprising a pair of mold assemblies, means for supporting said pair of mold assemblies for linear displacement between a retracted open position and an advanced closed position including a support including a hardened steel rod, a first mold arm for supporting one of said pair of mold assemblies, said first mold arm including a cast iron sleeve having an elongated bore for matingly receiving said hardened steel rod and an elongated outer cylindrical surface, a second mold arm supporting the other of said pair of mold assemblies, said second mold arm including a hardened steel sleeve having an elongated bore for matingly receiving the elongated outer cylindrical surface of said cast iron sleeve, and means for displacing said supported pair of mold assemblies between said retracted and advanced positions.

5,569,314

**THERMAL STABILIZATION OF STEELMAKING SLAG**  
Shaheer Mikhall, Nepean, and Anne-Marie Turcotte, Aylmer, both of Canada, assignors to Energy Mines & Resources Canada, Ottawa, Canada

Filed Jan. 30, 1995, Ser. No. 380,701

Int. Cl.<sup>6</sup> C22B 7/04

U.S. Cl. 75—434

6 Claims

1. A process for thermally stabilizing slag from a steelmaking process which comprises (a) thermally hydrating particles of steelmaking slag at a temperature in the range of about 100°–400° C. whereby hydrated slag particles are obtained in which hydration has taken place throughout the particles and (b) thereafter subjecting the hydrated slag particles to carbonation in the presence of carbon dioxide at a temperature in the range of about 500°–900° C., whereby water is diffused from and carbon dioxide is diffused into micropores in the particles, resulting in substantially all calcium hydroxide formed throughout the slag particles during hydration being converted to calcium carbonate.

5,569,315

**PROCESS AND DEVICE FOR CLEANING THE WASTE AIR OF SYSTEMS FOR THE SOLIDIFICATION OF MELTS**

Axel König, Stuttgart; Herbert Würmscher, Metzingen, and Matthias Kleinhans, Waiblingen-Hegnach, all of Germany, assignors to Santrade Ltd., Luzern, Switzerland  
PCT No. PCT/EP94/02094, § 371 Date Mar. 31, 1995, § 102(e)  
Date Mar. 31, 1995, PCT Pub. No. WO95/01858, PCT Pub. Date Jan. 19, 1995

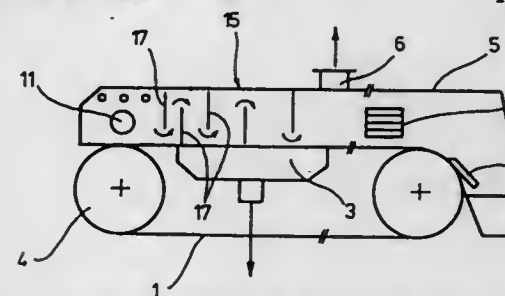
PCT Filed Jun. 28, 1994, Ser. No. 381,964

Claims priority, application Germany, Jul. 7, 1993, 43 22 628.0

Int. Cl.<sup>6</sup> B01D 9/00

U.S. Cl. 95—290

19 Claims



1. A process for cleaning waste air generated during the solidification of a molten material comprising the steps of:  
A) converting the molten material into individual quantities which are positioned on a cooling surface for solidification;  
B) collecting, in a space formed above the cooling surface, waste air which contains a vaporous component emanating from the material;  
C) conducting the collected waste air from the space to a cleaner; and  
D) causing at least some of the vaporous component to crystallize on surfaces located within the space prior to step C.

5,569,316

**DESICCANT CONTAINER HAVING MOUNT FOR CANISTER TUBE AND INNER WALL EXTENSION PORTION**

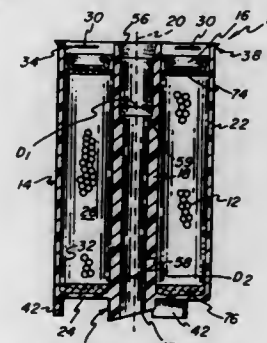
David Flaughner, Beaver Creek; Glenn Perrine, Eaton; Stephen F. Sullivan, Boardman, and Raymond B. Wood, Brookville, all of Ohio, assignors to Stanhope Products Company, Brookville, Ohio

Filed Mar. 1, 1995, Ser. No. 396,932

Int. Cl.<sup>6</sup> B01D 53/04

U.S. Cl. 96—135

15 Claims



1. A container for a particulate desiccant, said container comprising:  
a cup member extending along an axis and including spaced inner and outer wall portions connected by a transverse web portion to define a chamber having an opening;  
a cap for receipt in said chamber, said cap having a hole for receiving said inner wall portion when said cap is received in said chamber; and

an inner wall extension portion coaxially joined with said inner wall portion at a web side of said cut said inner wall extension terminating in a tapered free end spaced below said transverse web to facilitate fluid flow through said inner wall extension portion and said inner wall.

5,569,317

**FLUORESCENT AND PHOSPHORESCENT TAGGED INK FOR INDICIA**

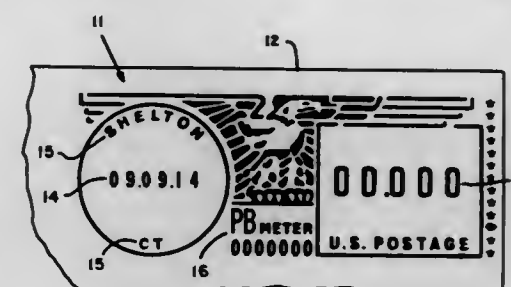
Thyagaraj Sarada, and Richard A. Bernard, both of Norwalk, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 22, 1994, Ser. No. 362,372

Int. Cl.<sup>6</sup> C09D 11/02

U.S. Cl. 106—21 A

20 Claims



1. A fluorescent, phosphorescent composition dispersion ink that is both fluorescent and phosphorescent when radiated with ultra violet light having a wavelength of 254 nm, said ink composition consisting essentially of:

13.5 to 19.4 weight % of fluorescent pigment;  
5 to 10 weight % phosphorescent material;  
0 to 1.0 weight % wetting agent;  
0.45 to 0.5 weight % aluminum stearate;  
0 to 0.2 weight % polyvinyl chloride;  
0 to 0.5 weight % deodorant;  
0 to 1.0 weight % substituted diphenylamine  
2.4 to 4.1 weight % non fluorescent pigments; and  
the balance consisting of dioctyl phthalate, or diisooctyl phthalate or dioctyl adipate, or butyl acetal ricinoleate and/or extender and plasticizer containing severely hydro-treated vehicles or mixtures thereof.

5,569,318

**FRICTIONIZING COMPOSITION**

Mark L. Jarand, Vancouver, Wash., assignor to Applied Research, Inc., Portland, Oreg.

Filed Jun. 24, 1994, Ser. No. 265,449

Int. Cl.<sup>6</sup> B01J 13/00; C09K 3/14

U.S. Cl. 106—36

1 Claim

1: A frictionizing composition, comprising:  
(a) an aqueous sol of colloidal silica providing 12–20 wt % silica solids;  
(b) 5–16.5 wt % glycerin; and  
(c) 0.5–10 wt % of N,N-dimethyl acetoacetamide.



5,569,319

**SULFONATED OLEOCHEMICAL DERIVATIVES AS A NEW CLASS OF LUBRICATING/RHEOLOGICAL FLOW MODIFYING COMPOUNDS FOR THE PAPER INDUSTRY**  
 Rudolph F. Klima, Lansdale; Joseph D. Rossi, Erdenheim, both of Pa., and Bert Gruber, Bedburg, Germany, assignors to Henkel Corporation, Plymouth Meeting, Pa.

Division of Ser. No. 182,265, Jan. 14, 1994, Pat. No. 5,503,669.

This application Sep. 22, 1995, Ser. No. 532,947

Int. Cl.<sup>6</sup> C09D 191/00

U.S. Cl. 106—243

5 Claims

1. A coating composition for coating paper and paper board comprising:

- a) a paper coating mixture, and
- b) from about 0.1% to about 1% by weight of a lubricating additive dispersion containing calcium stearate and a compound selected from the group consisting of
  - i) hydrogenated lard oil,
  - ii) a mixture of stearyl ether and oleyl alcohol,
  - iii) polyacrylate-polyvinyl acetate copolymer, and
  - iv) polyoxyethylene-8-stearate, based on the weight of said coating composition.

5,569,320

**PROCESS FOR PREPARING REFRACTORY MOLDED ARTICLES AND BINDERS THEREFOR**

Nobuyoshi Sasaki; Tetsuya Yokokawa, both of Yokohama; Yoshikazu Hashimoto, Tokyo; Yoshiro Ohta, Kawasaki, and Hideo Sekiguchi, Tokyo, all of Japan, assignors to Cadic Corporation; KSP Inc., and Tama Chemicals Co., Ltd., all of Kanagawa-ken, Japan

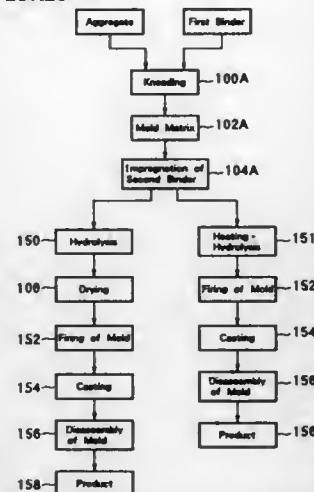
Filed Dec. 28, 1994, Ser. No. 365,111

Claims priority, application Japan, Dec. 28, 1993, 5-354148; Jul. 13, 1994, 6-183048

Int. Cl.<sup>6</sup> C09K 3/00

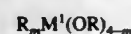
U.S. Cl. 106—287.26

21 Claims



1. A refractory molded article which comprises a molded matrix of an aggregate and a first binder, impregnated with a second higher temperature binder comprising an alcoholic solvent containing:

- 1 to 50% by weight, as converted to metal oxide, of one or more alcohol-soluble metal or metalloidal alkoxides represented by the following general formulae



or



wherein  $M^1$  designates an element of Group 4A or Group 4B excepting carbon of the periodic table,  $M^2$  designates an element of Group 3A or Group 3B of the periodic table, R

designates mutually identical or different alkyl group with 1 to 6 carbon atoms, aryl group with 6 to 8 carbon atoms, alkoxyalkyl group with 2 to 6 carbon atoms or aryloxyalkyl group with 7 to 12 carbon atoms, m is an integer from 0 to 3 when  $M^1$  is Si and m is zero when  $M^1$  is other than Si, or hydrolysates of said alcohol-soluble metal or metalloidal alkoxides; and

1 to 16% by weight, as converted to metal oxide, of an alcohol-soluble alkaline compound represented by the following general formulae



or



wherein  $M^3$  designates alkali metal,  $M^4$  designates alkaline earth metal and  $R'$  designates hydrogen or alkyl group with 1 to 6 carbon atoms, as binder components.

5,569,321

**PRE-TREATING SOLUTION FOR ELECTROLESS PLATING**

Takao Takita, Yuki; Takeshi Sakai, Tsukuba, and Takeshi Shimazaki, Yuki, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Apr. 8, 1994, Ser. No. 225,316

Claims priority, application Japan, Apr. 9, 1993, 5-083145

Int. Cl.<sup>6</sup> C23C 18/00

U.S. Cl. 106—1.05

2 Claims

1. A pre-treating solution for electroless plating comprising sulfuric acid, a halide, an organic acid which is an aromatic carboxylic acid and water as a diluent wherein the sulfuric acid is contained in an amount of 0.70 to 2.50 mole/l, the halide is contained in an amount of 0.01 to 6.0 mole/l and the organic acid is contained in an amount of 0.005 to 1.5 mole/l and the aromatic carboxylic acid is benzoic acid or phthalic acid.

5,569,322

**PROCESS FOR USING TANTALUM NITRIDE AS A PIGMENT AND THE COLORED PRODUCTS PRODUCED THEREBY**

Martin Jansen, Bonn; Hans-Peter Letschert, Ransbach-Baumbach, and Dietrich Speer, Hanau, all of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Germany

Division of Ser. No. 135,998, Oct. 14, 1993, Pat. No. 5,376,349.

This application Nov. 10, 1994, Ser. No. 336,940

Claims priority, application Germany, Oct. 16, 1992, 42 34 938.9

Int. Cl.<sup>6</sup> C04B 35/58

U.S. Cl. 106—401

13 Claims

1. A method of coloring a material, comprising: adding a tantalum (V) nitride ( $Ta_5N_3$ ) coloring pigment to the material, wherein the tantalum (V) nitride is produced by a process comprising: nitriding an oxidic tantalum (V) compound with dry ammonia at 750° C. to 950° C., wherein the oxidic tantalum (V) compound is a tantalum (V) hydrated oxide having a composition according to the formula  $Ta_2O_5 \cdot aq$ , with a hydrate content in a range of 14 to 17% by weight.

5,569,323

**INORGANIC LIQUID FILLER COMPOSITIONS FOR CONSOLIDATION/SEALING OF GROUND FORMATIONS AND BUILDING MATERIALS**

Laurent Frouin, L'Hay Les Roses, and Maryse Pennavaire, Romainville, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Filed May 23, 1994, Ser. No. 247,543

Claims priority, application France, May 21, 1993, 93 06115

Int. Cl.<sup>6</sup> C04B 12/04

U.S. Cl. 106—633

32 Claims

1. A liquid filler composition of matter, having an Al/Si molar ratio ranging from 0.01–0.5 comprising homogeneous solution of (i) an alkali metal silicate, (ii) an alkali metal polyphosphate and (iii) an alkali metal aluminate.

said feed material having an average crystal size less than the average crystal size of said seed crystal, said feed material being added in an amount and at a rate sufficient to effect growth of said seed crystal, said feed material having sufficient solubility in said fluid medium to provide a soluble nutrient species for deposition on said seed crystal to effect said growth, said feed material being introduced over a given period of time during which crystal growth is occurring; treating the mixture of said seed crystal and said feed material under conditions which stimulate crystal growth for a period of time sufficient to obtain a desired quantity of a product comprising at least one grown crystal having a desired average crystal size greater than the average crystal size of said seed crystal.

5,569,324

**CEMENTITIOUS COMPOSITIONS**

Patty L. Totten; Bobby J. King, and Jiten Chatterji, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 314,557, Sep. 28, 1994, Pat. No. 5,458,195.

This application Jun. 2, 1995, Ser. No. 458,519

Int. Cl.<sup>6</sup> C04B 24/00

U.S. Cl. 106—696

22 Claims

1. A cementitious composition comprising:  
 a cementitious material selected from the group consisting of Portland cement, high alumina cement, slag, fly ash, condensed silica fume with lime, gypsum cement and mixtures thereof;  
 a hardenable resinous material present in said composition in an amount in the range of from about 1% to about 50% by weight of said cementitious material or materials therein;  
 water present in said composition in an amount in the range of from about 20% to about 175% by weight of said cementitious material or materials therein; and drilling fluid.

**DEVICE FOR APPLYING AND DOSING LIQUID OR PASTY MATERIALS**

Friedhelm Ruhl, Steinheim, Germany, assignor to J. M. Voith GmbH, Heidenheim, Germany

Continuation of Ser. No. 6,381, Jan. 19, 1993, abandoned.

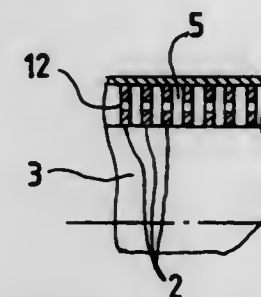
This application Feb. 16, 1995, Ser. No. 390,822

Claims priority, application Germany, Jan. 17, 1992, 42 01 057.8

Int. Cl.<sup>6</sup> B05C 1/08

U.S. Cl. 118—205

14 Claims



1. A device for applying and dosing liquid or pasty materials onto moving surfaces, comprising a roll having a roll shell which cooperates with a rigid support member and which includes an outer surface and a diameter which is capable of being locally varied along the length of the roll by the application of energy so that the roll shell may assume a wavy outer surface comprising a multiplicity of hills and valleys during application of energy while remaining in contact with said support member at each of one of said hills or valleys, in response to predetermined controllable conditions.

5,569,325

**PROCESS FOR GROWING CRYSTALS**

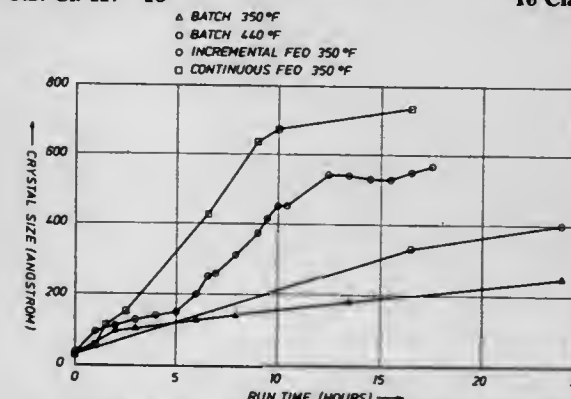
David A. Barclay; Duane J. Lewis, both of Austin; Lewis B. Decker, Jr., Lago Vista, and William R. Carradine, Austin, all of Tex., assignors to Condea Vista Company, Houston, Tex.

Filed Apr. 22, 1991, Ser. No. 690,164

Int. Cl.<sup>6</sup> C30B 15/02

U.S. Cl. 117—18

16 Claims



1. A process for increasing the rate of crystal growth comprising: providing a dispersion of a fluid medium and at least one seed crystal comprising a metal oxide species, said metal oxide species being sufficiently insoluble in said fluid medium to provide a solid growth site; introducing feed material into said dispersion and forming a generally uniform mixture of said seed crystal and said feed material, said feed material comprising a metal oxide species,

5,569,327

**ENVELOPE FLAT MOISTENER**

Jason P. Paradis, West Haven, and Steven A. Supron, Prospect, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

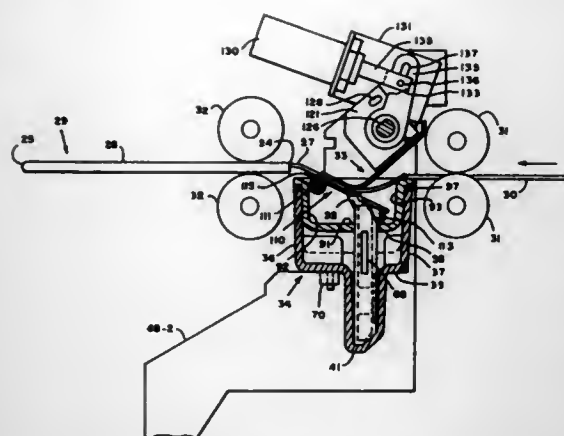
Filed Feb. 13, 1995, Ser. No. 387,547

Int. Cl.<sup>6</sup> B05C 1/00

U.S. Cl. 118—253

17 Claims

1. An apparatus for applying moisture to an article, comprising:  
 a frame;  
 an elongate substantially rectangular-shaped base removably connected to the frame, the base having a plurality of pockets located at spaced intervals longitudinally across the base, the base having a fluid outlet aperture;  
 a plurality of brushes disposed upwardly for transferring fluid by capillary action, the plurality of brushes including means for slidably engaging the plurality of brushes within the plurality of pockets located in the base;



- a cover mounted onto the base, the cover having a fluid inlet aperture, the cover having a plurality of openings for exposing the plurality of brushes, the cover including a substantially horizontal first shaft extending longitudinally across the cover;
- a shield rotatably mounted onto the first shaft, the shield having a first plurality of fingers which extend substantially horizontally between the plurality of brushes;
- holding means for holding the shield in a substantially horizontal position;
- a substantially rectangular-shaped deflector disposed above the shield, the deflector having a second plurality of fingers interconnected by an edge bar, the deflector having oppositely-spaced end walls, each end wall having an aperture;
- rotating means coupled to said deflector for rotating the deflector towards the shield; and,
- a second shaft extending through the aperture in each end wall, the second shaft is rotatably mounted onto the frame.

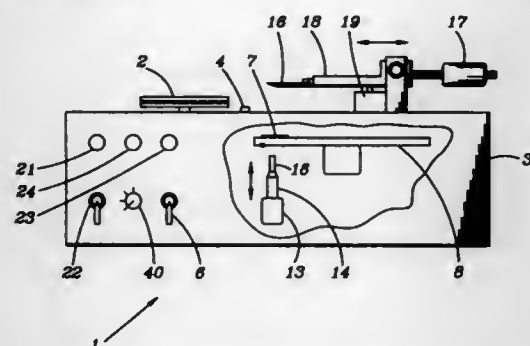
5,569,328

**SILICON SEMICONDUCTOR WAFER TEST**  
Steve I. Petval, 2 Bell Air La., Wappinger Falls, N.Y. 12590,  
and Michael P. Bnet, 2 Mountain View Rd., New Fairfield,  
Conn. 06812

Filed Jan. 10, 1995, Ser. No. 370,318  
Int. Cl. C23C 16/00

U.S. Cl. 118—696

8 Claims



1. A system for manufacturing semiconductor devices from silicon semiconductor wafers, comprising forming means operable for forming a silicon semiconductor wafer, oxidizing means operable for forming an oxidation gate on the silicon semiconductor wafer and thereafter, a testing arrangement for testing the silicon semiconductor wafer for contaminants using a liquid test drop; wherein the improvement comprises, rotating means operable for receiving the wafer and for rotating in one direction and the opposite direction at predetermined rates in response to first electrical signals; carrier means operable for being positioned on said silicon

semiconductor wafer and for retaining at least a portion of the test drop in contact with said wafer during relative movements of said carrier means over the surface of said wafer while substantially eliminating direct contact between said carrier means and said wafer; said carrier means comprising a disk like object having a generally centrally located hole for receiving said test drop, radial moving means operable for moving said carrier means along a predetermined radial path relative any clockwise and counterclockwise rotation of said wafer in response to second electrical signals; said radial moving means comprising balancing means coupled to said object, said balancing means operable to provide a counterbalance, to said object so that said object is positioned above said wafer by a portion of said test drop; first control means operable for generating said first electrical signals for causing said rotating means to rotate first in one direction and then in the opposite direction so that the resultant effect is an incremental rotation of said wafer; and second control means operable for generating second electrical signals for causing said radial moving means to move said carrier means incrementally radially so that said carrier means follows a path covering substantially all of a predetermined portion of the surface of said wafer.

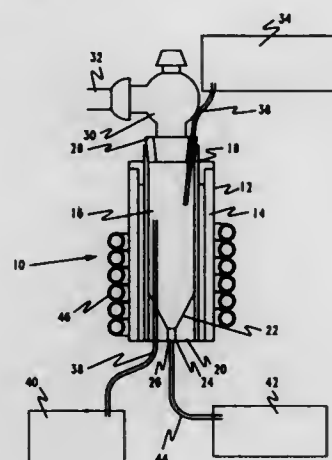
5,569,329

**FLUIDIZED BED WITH UNIFORM HEAT DISTRIBUTION AND MULTIPLE PORT NOZZLE**  
Kenneth W. Cox, Leander, Tex., assignor to CarboMedics, Inc.,  
Austin, Tex.

Filed Jun. 6, 1995, Ser. No. 473,771  
Int. Cl. C23C 16/00; 16/26

U.S. Cl. 118—716

9 Claims



1. A fluidized bed apparatus comprising a reaction chamber, means for maintaining a bed of particles within said chamber, a supply of fluidizing gases and carbonaceous material, means for conducting said fluidizing gases and carbonaceous material through said bed of particles within said chamber, said means for conducting comprising a nozzle having a plurality of jets, each jet having a substantially linear passageway, the linear passageways of said jets being oriented such that selected sets of said passageways define a conical shape, each conical shape having a vertex remote from said reaction chamber, a base adjacent said reaction chamber and a common axis, and means for maintaining a relatively constant temperature throughout a reactive zone in said bed of particles.

5,569,330

**METHOD AND DEVICE FOR CHEMICALLY TREATING SUBSTRATES**

Robin Schild, Villingen-Schwenningen; Milan Kozak, Hüfingen, and Johann Durst, Donaueschingen, all of Germany, assignors to Steag MicroTech GmbH Donaueschingen, Donaueschingen, Germany

PCT No. PCT/EP94/01585, § 371 Date Jan. 13, 1995, § 102(c)  
Date Jan. 13, 1995, PCT Pub. No. WO95/28736, PCT Pub. Date Oct. 26, 1995

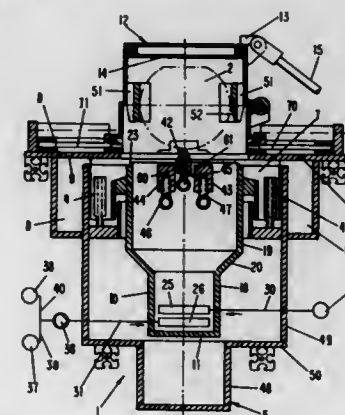
PCT Filed May 17, 1994, Ser. No. 367,358

Claims priority, application Germany, Apr. 15, 1994, 44 13 077.5

Int. Cl. B08B 3/10; 3/12; 11/02

U.S. Cl. 134—1

27 Claims



1. A method for treating substrates, said method comprising the steps of:  
positioning at least one substrate above a container;  
positioning a hood with a guide above the container; surrounding said at least one substrate; lowering said at least one substrate into the container;  
chemically treating the at least one substrate in the container with at least one treatment fluid;  
washing said at least one substrate with a washing fluid in the same container;  
lifting said at least one substrate from the container into the hood and guiding said at least one substrate in to the guide of the hood; and  
drying said at least one substrate in the hood.

5,569,331

**METHOD AND APPARATUS FOR RECYCLING OIL-SOAKED BOOM AND PADS**

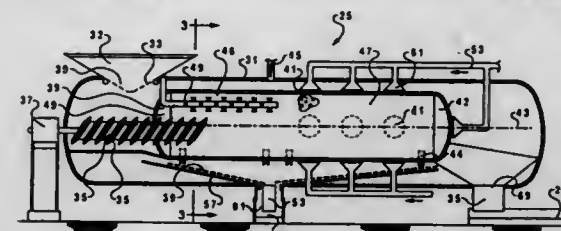
John Barber, III, 9446 Lechner Rd., Fort Worth, Tex. 76179

Filed Jan. 6, 1995, Ser. No. 369,883

Int. Cl. B08B 7/00; E02B 15/04; B01D 17/00

U.S. Cl. 134—40

20 Claims



1. A method for removing oil from absorbent materials of the type used in absorbent components for absorbing oil and containing oil spills, the method comprising the steps of:  
providing a trommel having a forward end, a rearward end, and a perforated wall defining an exterior for the trommel, the trommel further having a central axis which extends through a central portion of the trommel, wherein the trommel is rotatably mounted for rotating about the central axis;

shredding absorbent components into pieces of the absorbent materials prior to feeding the absorbent materials through the forward end of the trommel;  
feeding the absorbent materials through the forward end of the trommel and into the trommel;  
rotating the trommel about the central axis and tumbling the absorbent materials within the central portion of the trommel;  
spraying treatment fluids on the absorbent materials while in the trommel;  
collecting the treatment fluids and the oil which pass through the perforated wall of the trommel and drain beneath the trommel;  
blowing heated air on the absorbent materials while contained within the trommel and while the trommel is rotating; and  
moving the absorbent materials out the downstream end of the trommel.

5,569,332

**OPTICALLY ENHANCED PHOTOVOLTAIC BACK REFLECTOR**

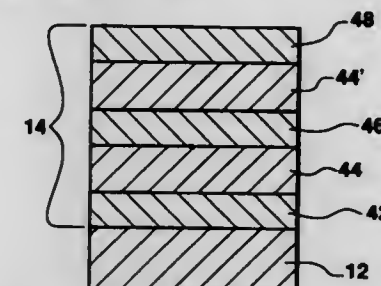
Troy Glatfelter, Royal Oak; Kevin Hoffman, Sterling Heights; Chi C. Yang, and Subhendu Guha, both of Troy, all of Mich., assignors to United Solar Systems Corporation, Troy, Mich.

Filed Aug. 7, 1995, Ser. No. 511,887

Int. Cl. H01L 31/06; 31/075

U.S. Cl. 136—249

17 Claims



1. A photovoltaic device with an optically enhanced back reflector, comprising:  
a metallic back reflector layer;  
a multi-layered reflectivity enhancement member disposed on said reflector layer, said member comprising at least one pair of layers, including a first layer of an optically transparent material having a relatively low index of refraction on said reflector layer and a second, overlying layer of a material having a higher index of refraction than that of the first layer, said first and second layers each having a thickness equal to an integral multiple of one-quarter of the wavelength of the light to be reflected in their respective materials, with a tolerance of plus or minus 20%;  
an optically transmissive, electrically conductive layer disposed on top of said reflectivity enhancement member; and  
a multi-layer semiconductor body disposed on said conductive layer.

5,569,333

**PROCESS FOR PRODUCING A MATERIAL FOR A PERMANENT MAGNET**

Yasunori Takahashi, Tokyo, Japan, assignor to Kawasaki Teitoku Co., Ltd.; Komeya, Inc., and Sanei Kasei Co., Ltd., all of Tokyo, Japan

Filed Jun. 2, 1995, Ser. No. 460,636

Claims priority, application Japan, Mar. 30, 1994, 6-82668

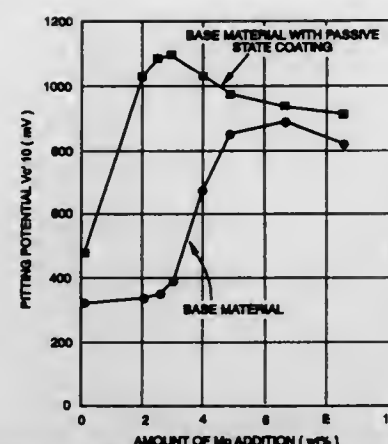
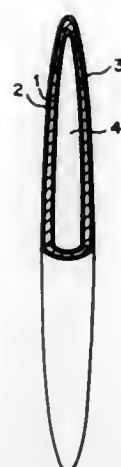
Int. Cl. H01F 1/03

U.S. Cl. 148—105

10 Claims

1. A process for producing a material for a permanent magnet, wherein the material comprises an acicular iron powder having successively on the surface thereof (1) a coated layer of aluminum





curve determined with a potentiostat in 3.5% aqueous sodium chloride solution is 10  $\mu\text{A}/\text{cm}^2$ .

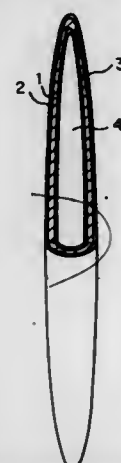
5,569,335

## SINTERED PERMANENT MAGNET

Yasunori Takahashi, Tokyo, Japan, assignor to Kawasaki Teitoku Co., Ltd.; Komeya Inc., and Sanei Kasei Co., Ltd., all of Tokyo, Japan  
Division of Ser. No. 318,289, Oct. 5, 1994, Pat. No. 5,453,137.  
This application Jun. 2, 1995, Ser. No. 460,088  
Claims priority, application Japan, Mar. 30, 1994, 6-82668  
Int. Cl.<sup>6</sup> H01F 1/057

U.S. Cl. 148—302

4 Claims



1. A sintered permanent magnet prepared by compression molding of an acicular iron powder and sintering the resulted compact in the presence of a magnetic field, wherein the acicular iron powder has successively on the surface a coated layer of aluminum phosphate, a diffused layer of rare earth element or a diffused layer of rare earth element.boron or a diffused layer of rare earth element.boron.nitrogen, and a coated layer of aluminum phosphate.

5,569,336

## BONDED PERMANENT MAGNET

Yasunori Takahashi, Tokyo, Japan, assignor to Kawasaki Teitoku Co., Ltd.; Komeya, Inc., and Sanei Kasei Co., Ltd., all of Tokyo, Japan  
Division of Ser. No. 318,289, Oct. 5, 1994, Pat. No. 5,453,137.  
This application Jun. 2, 1995, Ser. No. 460,761  
Claims priority, application Japan, Mar. 30, 1994, 6-82668  
Int. Cl.<sup>6</sup> H01F 1/057

U.S. Cl. 148—302

5 Claims

1. A bond permanent magnet prepared by hot compression molding of a mixture of an acicular iron powder and a binder in the

phosphate, (2) a diffused layer of rare earth element or a diffused layer of rare earth element.boron, and (3) a coated layer of aluminum phosphate, wherein the process comprises the steps of:

- mixing and covering an acicular goethite ( $\text{FeOOH}$ ) crystal with aluminum phosphate,
- preparing an acicular iron powder coated with a layer of aluminum phosphate by reducing under hydrogen atmosphere at 300°–500° C. the acicular goethite ( $\text{FeOOH}$ ) crystal covered by aluminum phosphate,
- diffusing a rare earth element or a rare earth element and boron into the surface layer of aluminum phosphate by heating under argon atmosphere at 650°–1000° C. the acicular iron powder coated with the layer of aluminum phosphate in the presence of the rare earth element or the rare earth element and boron,
- mixing and covering the rare earth element diffused powder or rare earth element and boron diffused powder with aluminum phosphate, and
- coating the rare earth element diffused powder or rare earth element and boron diffused powder with aluminum phosphate by heating under argon atmosphere at 300°–500° C. the rare earth element diffused powder or rare earth element and boron diffused powder covered by aluminum phosphate.

5,569,334

## STAINLESS STEEL MEMBER FOR SEMICONDUCTOR FABRICATION EQUIPMENT AND SURFACE TREATMENT METHOD THEREFOR

Tsunehiro Kawata, Kumagaya; Katsuhiko Kojo, Fukaya; Youichiro Kazama, Kumagaya; Takayuki Fukaya, Kuwana, and Toshihiko Tsujimura, Tsu, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Dec. 7, 1993, Ser. No. 162,479

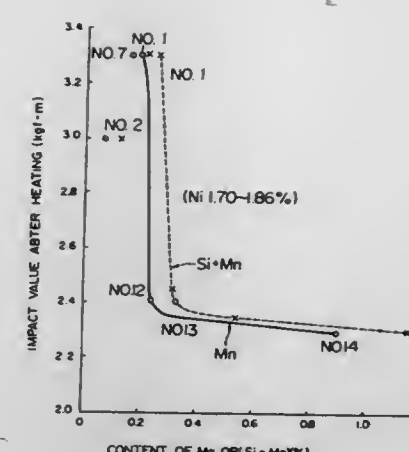
Claims priority, application Japan, Dec. 8, 1992, 4-351746; Mar. 5, 1993, 5-044757; Jun. 29, 1993, 5-158674; Sep. 6, 1993, 5-246013

Int. Cl.<sup>6</sup> C23C 8/10

U.S. Cl. 148—287

11 Claims

1. A stainless steel member for semiconductor fabrication equipment having a passive state coating with a pitting potential of at least 900 mV (when the current density of the anode polarization



presence of a magnetic field, wherein the acicular iron powder has successively on the surface a coated layer of aluminum phosphate, a diffused layer of rare earth element or a diffused layer of rare earth element.boron or a diffused layer of rare earth element.boron.nitrogen, and a coated layer of aluminum phosphate.

5,569,337

## GOLF-CLUB HEAD

Daisaku Yoshida, and Katsumi Yamano, both of Kagawa-ken, Japan, assignors to Shintomi Golf Co., Ltd., Tokyo, and Kasco Corporation, Kagawa-ken, both of Japan  
Filed Nov. 18, 1994, Ser. No. 344,657

Claims priority, application Japan, Nov. 19, 1993, 5-290346  
Int. Cl.<sup>6</sup> C22C 38/44; 38/52

U.S. Cl. 148—325

16 Claims

1. A golf-club head comprising a face, said face comprising an alloy steel which comprises at most 0.2 wt. % of C, 0.05–1.0 wt. % of Si, at most 0.5 wt. % of Mn, 3.0–8.0 wt. % of Ni, 10.0–20.0 wt. % of Cr, 3.0–8.0 wt. % of Mo and 10.0–20.0 wt. % of Co, the remainder being substantially Fe, and has a metallic texture composed principally of martensite, wherein said golf-club head has a face with a thickness of 2.7–2.2 mm.

5,569,338

## STEAM TURBINE ROTOR SHAFT THEREOF AND HEAT RESISTING STEEL

Masao Siga; Yutaka Fukui, both of Hitachi; Mitsuo Kuriyama, Ibaraki-ken; Yoshimi Maeno, Hitachi; Masateru Suwa, Ibaraki-ken; Ryoichi Kaneko; Takeshi Onoda, both of Hitachi; Hidefumi Kajiwara; Yasuo Watanabe, both of Katsuta; Shintaro Takahashi, Hitachi, and Toshimi Tan, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 305,186, Sep. 13, 1994, which is a division of Ser. No. 893,079, Jun. 3, 1992, Pat. No. 5,383,768, which is a continuation-in-part of Ser. No. 472,838, Jan. 31, 1990, abandoned. This application Jun. 5, 1995, Ser. No. 461,521

Claims priority, application Japan, Feb. 3, 1989, 1-023890; May 22, 1989, 1-126622

Int. Cl.<sup>6</sup> C21D 9/00; C22C 38/44; 38/46

U.S. Cl. 148—335

35 Claims

1. A steam turbine having a rotor provided with a mono-block rotor shaft, multi-stage blades fixed on the mono-block rotor shaft from a high pressure side at which first stage blades are fixed thereon to a low pressure side of steam at which final stage blades are fixed thereon, and a casing covering the rotor, a temperature at

the steam inlet toward the first stage blades thereof being not less than 530° C. and a steam temperature at the outlet of the final stage blades thereof being not more than 100° C., a ratio (L/D) of a length (L) defined between bearings of said rotor shaft to a diameter (D) measured between the terminal ends of said blades disposed at the final stage being 1.4 to 2.3, said blades at least at the final stage thereof having a length not less than 30 inches, and said mono-block rotor shaft being made of a material containing, by weight, 0.15 to 0.4% C, not more than 0.1% Si, 0.15 to 0.25% Mn, 1.5 to 2.5% Ni, 0.8 to 2.5% Cr, 0.8 to 2.5% Mo, 0.15 to 0.35% V, and the balance Fe and incidental impurities, wherein a ratio of Mn/Ni is not more than 0.12.

5,569,339

## METHOD OF ANNEALING METAL PARTS

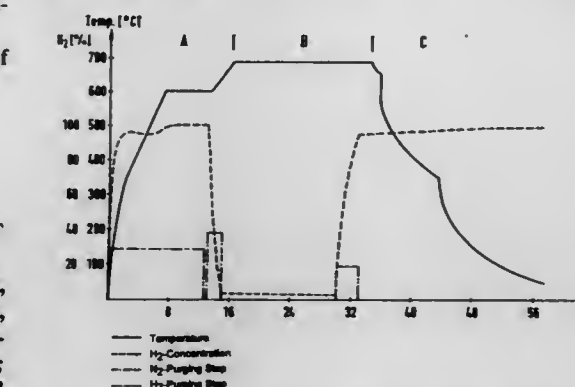
Walter Scheuermann, Bonn, Germany, assignor to LOI Thermoprocess GmbH, Germany  
Filed Aug. 9, 1995, Ser. No. 513,004

Claims priority, application Germany, Aug. 12, 1990, 44 28 614.7

Int. Cl.<sup>6</sup> C21D 1/74

U.S. Cl. 148—634

11 Claims



1. A method for annealing metal parts, in particular sheets, in an annealing chamber of an industrial furnace under a protective-gas atmosphere, wherein the annealing comprises a heating phase, a soaking phase following thereafter and a cooling phase following the two previous phases and wherein the method comprises the following measures:

During the heating phase the annealing chamber is purged in a first purging step with hydrogen or a gas rich in hydrogen until the protective gas predominantly consists of hydrogen; towards the end of the heating phase the annealing chamber is purged in a second purging step with an inert gas until the percentage of hydrogen in the protective gas is reduced to such an extent that the formation of carbon-containing breakdown products is largely avoided; and

towards the end of the soaking phase the annealing chamber is purged in a third purging step with hydrogen or a gas rich in hydrogen until the protective gas predominantly consists of hydrogen.

5,569,340

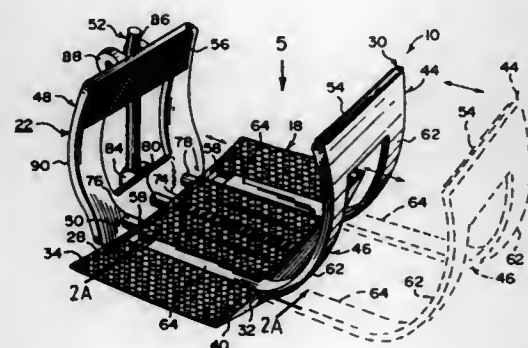
## TRACTION DEVICE

Fritzler Ulrich, 65-15 Booth St., Rego Park, N.Y. 11374-4155  
Filed Jan. 30, 1995, Ser. No. 380,289

Int. Cl.<sup>6</sup> B60C 27/04

U.S. Cl. 152-225 C

21 Claims



1. A traction device for a tire on a driven wheel of a motor vehicle, comprising:

- a base adapted for resting circumferentially upon a tread of a tire;
- means for securing said base to said tire, said means for securing including an adjustable clamp assembly extending from first and second longitudinal sides of said base for holding onto side walls of said tire for applying pressure against both sides of said tire for securing said traction device to said tire, said adjustable clamp assembly including a rear jaw, a front jaw, means on said first longitudinal side of said base for adjusting in a retained coarse manner said rear jaw, means on said second longitudinal side of said base for adjusting in a retained normal manner said front jaw, and means on said second longitudinal side of said base for adjusting in a retained fine manner said front jaw so that said rear jaw and said front jaw will butt up against opposite side walls of said tire; and
- means for providing traction for said tire when said tire is stuck on ice, snow or other slippery road surface, said means for providing traction located on said base.

5,569,341

## PNEUMATIC RADIAL TIRE WITH SIDE CUT RESISTANCE

Masaharu Fukushima, Saitama, and Yuichi Nagai, Tokyo, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 6, 1994, Ser. No. 354,108

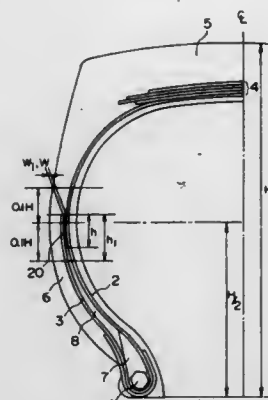
Claims priority, application Japan, Dec. 21, 1993, 5-322671

Int. Cl.<sup>6</sup> B60C 1/00; 9/08; 15/00; 15/06

U.S. Cl. 152-527

8 Claims

1. A pneumatic radial tire comprising: at least one carcass ply arranged toroidally between a pair of bead cores, said at least one carcass ply containing rubber coated steel cords disposed radially therein and being turned up around each bead core from inside to outside of the tire, the carcass turn-up portion around each bead core extending to around one half height H/2 of a tire height H, wherein, when a radial length of an overlapping portion of the turn-up portion of the at least one carcass ply and a main portion of said at least one carcass ply is  $b_1$ , and a thickness of the overlapping



portion is  $w_1$ , within a range of  $\pm 0.1 H$  having half height H/2 of the tire height H measured from a bead base line as the center, a radial length  $h$  and a thickness  $w$  of a reinforcing rubber material arranged between the turn-up portion of the at least one carcass ply and the main portion of said at least one carcass ply satisfy the following formulae

$$0.2w_1 \leq w \leq 1.0w_1, \quad (1)$$

and

$$0.5h_1 \leq h \leq 1.0h_1, \quad (2)$$

and said reinforcing rubber material satisfies the following conditions

$$100 \text{ parts by weight of rubber includes } 10\text{--}80 \text{ parts by weight of a cis-1,4 polybutadiene}, \quad (3)$$

and

$$\text{a modulus of elasticity } M \text{ is } 60 \text{ kgf/cm}^2 \leq M \leq 100 \text{ kgf/cm}^2 \text{ at } 300\% \text{ elongation and a rebound resilience coefficient } R \text{ is } 0.4 < R < 0.7 \quad (4)$$

5,569,342

## METHOD FOR PREPARING SOLID SURFACES FOR INSPECTION

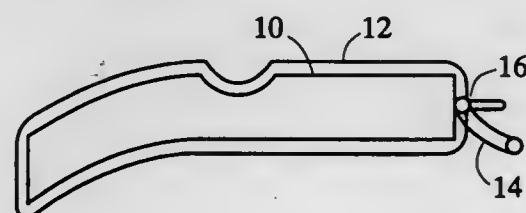
Ronald W. Gould, Kemptville, and Jerzy P. Komorowski, Gloucester, both of Canada, assignors to National Research Council of Canada, Ottawa, Canada

Continuation-in-part of Ser. No. 18,225, Feb. 16, 1993, abandoned. This application Aug. 25, 1994, Ser. No. 295,475

Int. Cl.<sup>6</sup> B32B 31/04; G01N 21/00; G01B 11/30

U.S. Cl. 156-64

5 Claims



1. A method of preparing the surface of a solid object for instrumental optical inspection, the method consisting of:

- applying a layer of a solid, deformable film to the surface to be inspected, and
- bringing said layer and said surface or a part thereof into a controlled contiguous releasable relationship to modify the

optical response of said surface wherein the contiguity is achieved by way of negative pressure applied between said film and said surface.

5,569,343

## CERAMIC FABRIC REINFORCED FIBER/MICROPARTICLE CERAMIC COMPOSITE

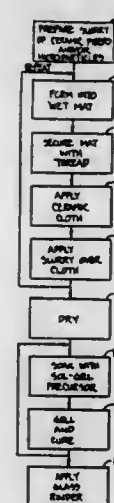
Darryl F. Garrigus, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 381,498, Jul. 18, 1989, which is a continuation-in-part of Ser. No. 698,496, Feb. 5, 1985, Pat. No. 5,041,321, which is a continuation-in-part of Ser. No. 667,568, Nov. 2, 1984, abandoned. This application Jun. 13, 1990, Ser. No. 537,339

Int. Cl.<sup>6</sup> C03B 29/00; C04B 33/34; B65H 81/00

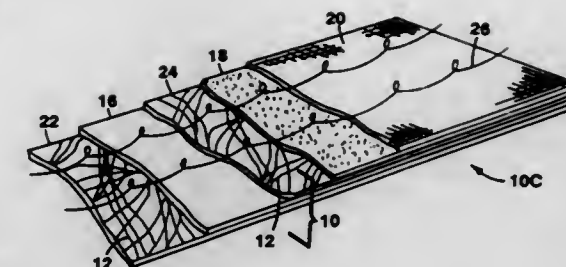
U.S. Cl. 156-89

11 Claims



1. A process for forming a reinforced ceramic composite, comprising the steps of:

- forming at least one slurry comprising ceramic fibers and, optionally, ceramic microparticles;
- molding said slurry to form a felt mat;
- optionally, securing said mat with glass or ceramic thread;
- applying a ceramic reinforcement cloth upon said mat;
- applying more of said slurry over said cloth and molding as in step (b) and repeating steps (c) and (d);
- drying said mat formed in steps (b) and (e);
- impregnating said mat from step (f) with a portion of a sol-gel binder;
- gelling said binder so that said reinforcing cloth and mat are dimensionally stabilized;
- curing the gelled binder;
- optionally, repeating each of steps (g), (h) and (i);
- optionally applying a glass coating to said cured, dimensionally stabilized composite.



providing a decorative layer in superimposed spaced relation to the fabric layer;  
providing a barrier layer interposed between the fabric layer and the decorative layer;  
selecting the barrier layer to have a sufficiently high density to substantially prevent the thermoplastic resin from migrating through the barrier layer if the thermoplastic resin is heated; and  
binding the fabric layer, decorative layer and barrier layer together to form a composite by stitching through the fabric layer, decorative layer and barrier layer.

5,569,345

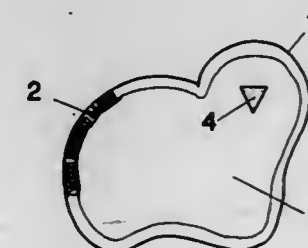
## FLEXIBLE IRON-ON PATCH FOR SOFT CLOTHING

Sarah Kenyon, 2291 W. Wycoff Rd., Ovid, N.Y. 14521  
Filed Apr. 11, 1994, Ser. No. 226,268

Int. Cl.<sup>6</sup> B32B 3/06; 7/08

U.S. Cl. 156-93

7 Claims



1. A method of making flexible iron-on patches comprising the steps of:

- bonding a heat-fusible transfer web to the back of a soft pliable material, said transfer web being heavy enough to allow the patch to bond when it is ironed on while not significantly increasing the stiffness of the soft pliable material, transferring an outline pattern in the desired shape of the patch to the bonded transfer-web and soft pliable material, cutting the edge of the patch along the outline pattern, binding the edge of the patch with thread using an overlock stitch having a density of 2.5 to 5 stitches per cm.

5,569,344

## METHODS OF PRODUCING STRUCTURALLY REINFORCED THERMOPLASTIC-FABRIC COMPOSITE CONSTRUCTION MATERIAL THAT ARE MOLDABLE

Martin S. Grimnes, Brunswick, Me., assignor to Brunswick Technologies, Inc., Brunswick, Me.

Division of Ser. No. 766,516, Sep. 27, 1991, Pat. No. 5,344,687. This application Jul. 6, 1993, Ser. No. 85,827

Int. Cl.<sup>6</sup> B32B 31/04; 31/16; 31/20; 31/26

U.S. Cl. 156-90

12 Claims

1. A method of forming a structurally reinforced thermoplastic-fabric composite element comprising:  
providing a fabric layer which contains reinforcing fibers;  
introducing a thermoplastic resin to the fabric layer;

5,569,346

## METHOD AND KIT TO RESTORE THE APPEARANCE OF A DAMAGED LENS

Todd C. Marshall, Palm Beach Gardens, Fla., assignor to Green Island Research, Inc., Palm Gardens, Fla.

Filed Nov. 1, 1994, Ser. No. 332,075

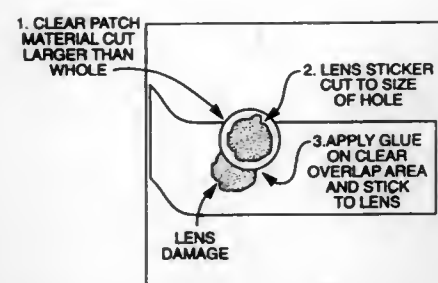
Int. Cl.<sup>6</sup> B32B 35/00

U.S. Cl. 156-94

18 Claims

1. A method for restoring the appearance of a damaged area of a patterned lens comprising the steps of:  
fitting a translucent thermoplastic patch to overlap the damaged area,  
adhering a patterned plastic sheet to the thermoplastic patch to form a patterned patch, and





permanently bonding the patterned patch to the lens thereby covering the damaged area.

5,569,347

## THERMAL TRANSFER MATERIAL

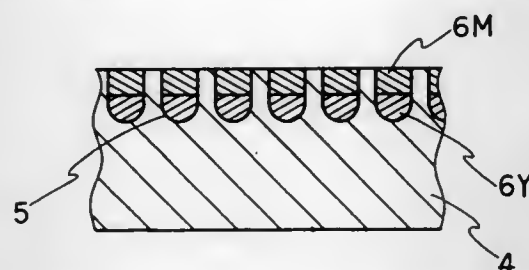
Yoshiyuki Obata; Hideki Snematsu, and Manabu Ikemoto, all of Osaka, Japan, assignors to Fujicopian Co., Ltd., Osaka, Japan

Filed Dec. 20, 1994, Ser. No. 359,416

Claims priority, application Japan, Dec. 21, 1993, 5-322330  
Int. Cl.<sup>6</sup> B41M 5/34

U.S. Cl. 156—235

8 Claims



5. A method for forming a color image, comprising the steps of: providing a thermal transfer material comprising a foundation, and a yellow heat-meltable ink layer, a magenta heat-meltable ink layer and a cyan heat-meltable ink layer provided in a side-by-side relationship on the foundation, each ink layer having a melt viscosity of 20 to 200 cps/90° C. and a coating amount of 0.5 to 2.5 g/m², the foundation having a thickness of 1.0 to 4.5 μm and the thermal transfer material having an overall thickness of 2.5 to 7.0 μm,

selectively melt-transferring at least two of the ink layers onto a receptor, said receptor having a multiplicity of micropores in the surface layer thereof and each ink entering into the micropores in a molten state, thereby forming a color image, said color image comprising at least one color region developed on the basis of subtractive color mixture of at least two of yellow, magenta and cyan, or a combination of said color region with at least one single color region of yellow, magenta or cyan.

5,569,348

## METHOD FOR THE RASTER-PATTERN COATING OF FABRICS WITH HOT MELT ADHESIVE

Josef Hefe, Gräfelfing, Germany, assignor to Kufner Textilwerk GmbH, Munich, Germany

Filed Mar. 28, 1995, Ser. No. 412,145

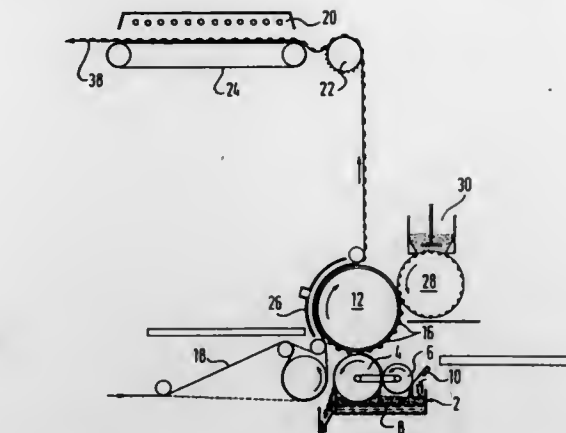
Claims priority, application European Pat. Off., Mar. 30, 1994, 94105055

Int. Cl.<sup>6</sup> B29C 65/52; B32B 31/12; 7/14; B05D 1/36

U.S. Cl. 156—239

22 Claims

1. A method for the raster pattern coating of fabrics comprising (a) applying a raster pattern of a plurality of dots of a hot melt



adhesive onto an intermediate carrier; (b) applying a liquid layer of a dispersion or a solution of a curable plastic onto the tops of said hot melt adhesive dots; and (c) transferring said hot melt adhesive dots coated on its tops with said curable plastic onto a final support.

5,569,349

## THERMAL STEREOGRAPHY

Thomas A. Almquist, San Gabriel, and Dennis R. Smalley, Baldwin Park, both of Calif., assignors to 3D Systems, Inc., Valencia, Calif.

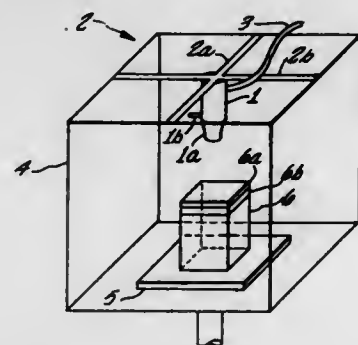
Continuation of Ser. No. 148,544, Nov. 8, 1993, Pat. No. 5,501,824, which is a continuation of Ser. No. 900,001, Jun. 17, 1992, abandoned, which is a continuation of Ser. No. 592,559, Oct. 4, 1990, Pat. No. 5,141,680. This application

Jun. 5, 1995, Ser. No. 464,194

Int. Cl.<sup>6</sup> B29C 41/02; 41/36

U.S. Cl. 156—242

27 Claims



14. A method of forming a three-dimensional object comprising the steps:

containing a building material which is normally in a solid state and which is made flowable when maintained at or above a flowable temperature;

maintaining said building material at a temperature at or above said flowable temperatures thereby forming flowable building material;

maintaining a building environment at a temperature below said flowable temperature;

supporting at least a portion of the object on a platform situated within said building environment; identifying locations which comprise the object; transmitting positioning control signals for said identified locations; positioning at least one dispenser relative to said platform to allow selective dispensing of flowable building material to at least some object locations; dispensing said flowable building material from said container into said building environment; and applying an adhesive between at least some of the dispensed building material and a working surface.

5,569,350

## MECHANISM AND METHOD FOR MECHANICALLY REMOVING A SUBSTRATE

Tomoaki Osada, and Yasuyuki Shirai, both of Tokyo, Japan, assignors to Anelva Corporation, Tokyo, Japan

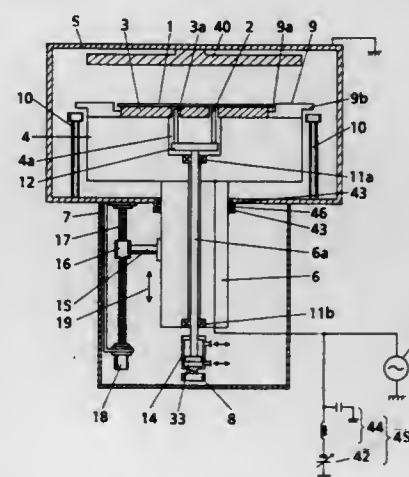
Filed Feb. 16, 1995, Ser. No. 389,789

Claims priority, application Japan, Mar. 18, 1994, 6-048703

Int. Cl.<sup>6</sup> C23F 1/02; C23C 16/00

U.S. Cl. 156—345

20 Claims



1. A mechanism for mechanically removing a substrate, comprising:

a base;

a pedestal placed on said base to hold said substrate, said pedestal having an upper surface which defines a plane and being configured such that when said substrate is placed on said pedestal, an edge of said substrate extends beyond an edge of said pedestal;

at least one substrate elevating member movable in an axial direction to protrude beyond said pedestal and engage said substrate;

a movable ring disposed around said pedestal, said ring having a portion disposed below said edge of said substrate, said portion of said ring defined by having an upper surface which is below the plane defined by the upper surface of said pedestal; and

driving means for lifting the edge of the substrate away from the pedestal after the substrate elevating member lift said substrate.

5,569,351

## BANDING MACHINE HAVING IMPROVED FILM REGISTRATION SYSTEM

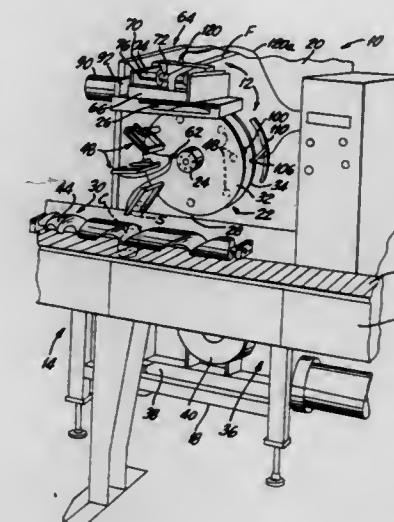
William J. Menta, W. Wyoming, and Michael Yager, Shaver, both of Pa., assignors to CMS Glibreth Packaging Systems, Inc., Trevose, Pa.

Filed Nov. 14, 1994, Ser. No. 337,745

Int. Cl.<sup>6</sup> B32B 31/00; B26D 5/00

U.S. Cl. 156—353

37 Claims



10. A banding machine for applying labels to the tops of containers comprising

a frame,

a turret plate rotatably mounted on said frame,

drive means for rotating said turret plate,

a plurality of band holders positioned on said turret plate for a) receiving cut film sleeves having spaced indicia thereon in an unopened, flattened condition; b) opening the band into a circular sleeve; and c) holding and moving the band onto the top of a vertically oriented container advancing into a banding position,

at least two parallel support plates fixed to said frame and extending over an upper portion of the turret plate,

at least one feed roller positioned between and mounted to the support plates for feeding film in a path of travel between the support plates,

a stepper motor coupled to the feed roller for driving the feed roller and advancing film a predetermined amount corresponding to the desired cut length of the band,

a cutter for receiving and cutting film into cut lengths for delivery into said band holders,

a support bracket adjustably mounted on at least one support plate for movement linearly in the film feed direction, registration sensing means mounted on said support bracket for sensing film indicia fed between said plates and generating a signal indicative of said sensed registration, and

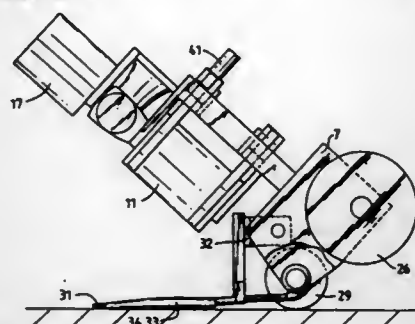
control means for receiving said registration signal and stopping film advancement upon detection of film indicia for film cutting at a predetermined film location and then initiating said motor to advance film again a predetermined amount after cutting,

wherein said bracket is linearly positioned on said support plate at a position to sense film indicia at a point to allow film stopping and cutting at a predetermined location on the film corresponding to a desired film indicia.

**5,569,352**  
**MACHINE FOR SEAM WELDING LAPS OF WELDABLE LENGTHS OF COVERING**  
 Tore Johansen, Oslo, and Hakon Svindal, Gan, both of Norway, assignors to A/S Fjeldhammer Brug, Fjellhamar, Norway

Filed Dec. 14, 1994, Ser. No. 355,684  
 Claims priority, application Norway, Dec. 14, 1993, 934603  
 Int. Cl.<sup>6</sup> B32B 31/00

U.S. Cl. 156—499 9 Claims

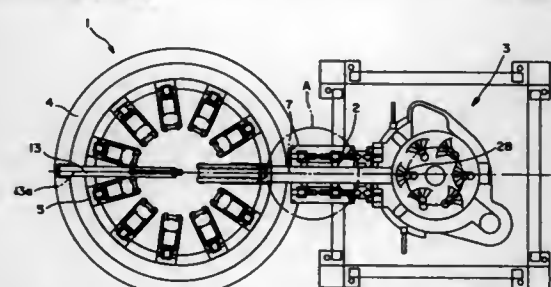


1. A machine for seam welding a lap of a weldable length of covering comprising a wheel-borne frame having a heating element suspended on one side, designed for insertion between an underlying and an overlying length of covering, and having pressing means and driving wheels for compressive stress of the upper side of the overlying length of covering in the seam area above the inserted heating element and for movement of the frame in the longitudinal direction of the overlapping seam, characterized in that the frame has transport wheels positioned transverse to the operational direction of the driving wheels and outside the heating element, said transport wheels being lifted clear of the underlying surface, in the welding position.

**5,569,353**  
**LABELLING MACHINE AND APPARATUS FOR THE AUTOMATIC LOADING OF THE MAIN MAGAZINE OF A LABELLING MACHINE, AND A SUPPLY MAGAZINE WHICH CAN BE USED IN SUCH AN APPARATUS**  
 Rudolf Zedrow, Düsseldorf, Germany, assignor to KHS ETI-TEC Maschinenbau GmbH, Erkrath, Germany

Filed May 19, 1995, Ser. No. 444,621  
 Claims priority, application Germany, May 19, 1994, 44 17 497.7

Int. Cl.<sup>6</sup> B32B 31/00; B65C 9/00  
 U.S. Cl. 156—566 19 Claims



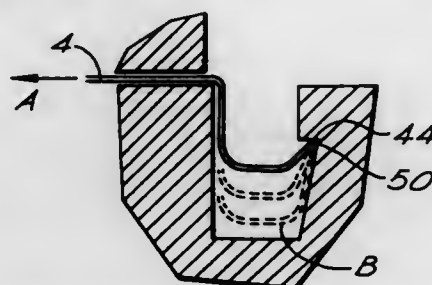
1. A labelling machine for attaching a label to at least one container or the like, said labelling machine comprising: a container platform for supporting at least one container thereon; means for applying a label to at least one container, said means for applying a label being disposed adjacent said container platform; means for transporting at least one container past said means for applying a label; means for feeding at least one container into said labelling machine; means for feeding at least one container out of said labelling machine;

means for supplying labels to said means for applying a label, said means for supplying labels comprising: a supply magazine for containing a supply of labels; a main magazine disposed between said supply magazine and said means for applying a label; means for pivoting said supply magazine between a first position for loading labels from said supply magazine into said main magazine, and a second position, said second position being a standby position wherein labels are not loadable into said main magazine; said supply magazine comprising an opening for permitting ejection of labels out of said supply magazine; said main magazine comprising means for receiving labels from said supply magazine, said means for receiving comprising an opening; and said means for pivoting comprising means for disposing said opening of said supply magazine immediately adjacent said opening of said main magazine in said first position of said supply magazine, and for permitting transfer of the labels in said supply magazine to said main magazine.

**5,569,354**  
**TAPE CUTTING APPARATUS**  
 Robert C. L. Day, Cambridge, United Kingdom, assignor to Esselte N.V., St. Niklaas, Belgium

Filed Jun. 27, 1994, Ser. No. 266,817  
 Claims priority, application United Kingdom, Jul. 12, 1993, 9314389

Int. Cl.<sup>6</sup> B32B 35/00  
 U.S. Cl. 156—584 16 Claims

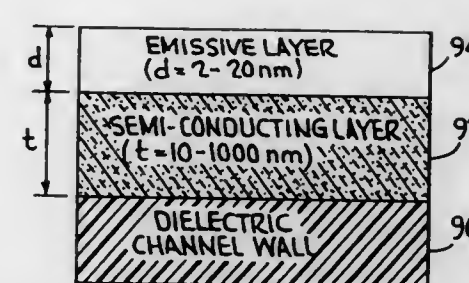


1. An apparatus for separating an upper layer from a lower layer against an adhesive strength between the upper and lower layers at a cut edge of a portion of tape, the apparatus comprising a tape separating member at which a bend can be formed in the tape and which has a wall portion acting against the cut edge of the tape, wherein the cut edge of the tape is retained by the tape separating member by friction between the cut edge and the wall portion so that, as the tape is drawn out of the tape separating member against said friction to straighten it, the resilience in the upper layer overcomes the adhesive strength between the upper and lower layers and causes them to separate at the cut edge of the tape.

**5,569,355**  
**METHOD FOR FABRICATION OF MICROCHANNEL ELECTRON MULTIPLIERS**  
 Alan M. Then, Auburn, Mass.; Steven M. Shank, Ithaca; Robert J. Soave, Cortland, both of N.Y., and G. William Tasker, West Brookfield, Mass., assignors to Center for Advanced Fiberoptic Applications, SouthBridge, Mass.

Filed Jan. 11, 1995, Ser. No. 371,548  
 Int. Cl.<sup>6</sup> H01L 21/00; B44C 1/22  
 U.S. Cl. 156—643.1 26 Claims

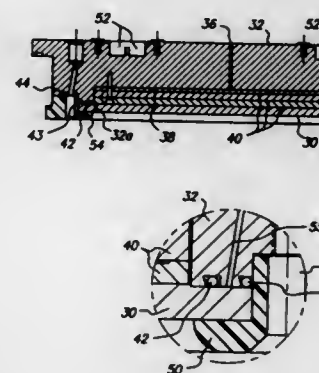
1. A method of manufacturing a microchannel plate comprising the steps of: forming a body of etchable material; applying a flux of reactive particles against the body in selected areas for removing material from the selected areas; back filling the selected areas with a membrane material;



selectively removing material adjacent the back filled areas to produce microchannels in the membrane material; and activating the microchannels for electron multiplication by forming a continuous thin-film dynode therein.

**5,569,356**  
**ELECTRODE CLAMPING ASSEMBLY AND METHOD FOR ASSEMBLY AND USE THEREOF**  
 Eric H. Lenz, San Jose; Michael L. Calvisi, Union City; Ivo A. Miller, San Jose, and Robert A. Frazier, Fremont, all of Calif., assignors to LAM Research Corporation, Fremont, Calif.

Filed May 19, 1995, Ser. No. 445,292  
 Int. Cl.<sup>6</sup> H01L 21/00  
 U.S. Cl. 156—643.1 29 Claims

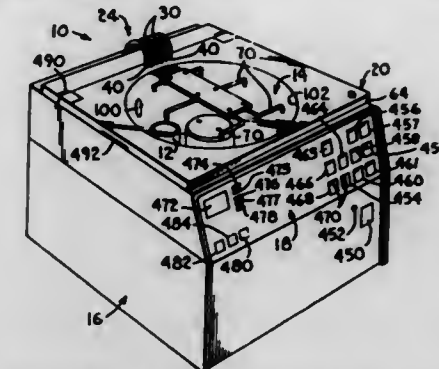


24. A method of processing a wafer in a plasma reaction chamber, comprising:

supplying a wafer to the plasma reaction chamber; supplying process gas to a gas passage in a support member mounted in the plasma reaction chamber such that the process gas exits a lower surface of the support member and passes through an exposed lower surface of a showerhead electrode; supplying electrical power to the showerhead electrode such that the electrical power passes through a contact zone between an upper surface of an outer edge of the electrode and the lower surface of the support member, the electrical power causing the process gas to form a plasma in contact with an upper surface of the wafer; and confining the plasma in an area above the wafer with a clamping member which engages the outer edge of the showerhead electrode and attaches the showerhead electrode to the support member, the clamping member providing a resilient clamping force pressing against the showerhead electrode during processing of the wafer.

**5,569,357**  
**VORTEX EVAPORATOR**  
 Lowell L. Kuhn, Independence; James F. Ptacek, Kansas City, and Gary P. Roepke, Blue Springs, all of Mo., assignors to Labconco Corporation, Kansas City, Mo.

Filed Apr. 28, 1994, Ser. No. 234,241  
 Int. Cl.<sup>6</sup> B01D 1/00; 3/08  
 U.S. Cl. 159—16.1 27 Claims



1. A vortex evaporator for evaporating liquid from a liquid and solid solution in an open container, the vortex evaporator comprising:

a chamber; a container holder inside the chamber; drive means, coupled with the holder, for moving the holder in an orbital motion to cause the solution in the container to form a vortex configuration, thereby increasing the surface area of the solution and promoting liquid evaporation; gas delivery means for directing gas into the container from a point source overlying the solution to decrease the partial pressure on the solution thereby increasing the evaporation rate of the liquid from the solution; and control means coupled with the drive means for controlling the operation of said drive means.

18. A vortex evaporator for evaporating liquid from a liquid and solid solution in an open container, the vortex evaporator comprising:

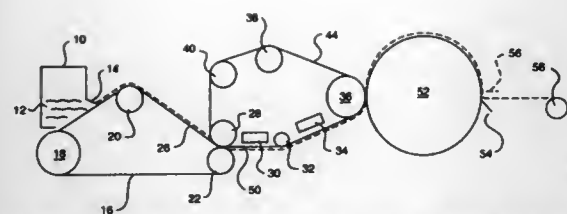
a chamber; a container holder inside the chamber; drive means, coupled with the holder, for moving the holder in an orbital motion to cause the solution in the container to form a vortex configuration, thereby increasing the surface area of the solution and promoting liquid evaporation; vacuum means for drawing a vacuum within the chamber, thereby decreasing the boiling temperature of the solution without moving liquid from the container into the chamber; control means coupled with the drive means for controlling the operation of said drive means; heater means inside the chamber for heating the holder thereby increasing the temperature of the solution in the container, wherein said heater means is coupled with the control means so that the control means can control the operation of said heater means; and a liquid level sensor, mounted within the chamber, for sensing a predetermined liquid level in the container, the liquid level sensor being coupled to the control means so that said control means causes the vortex evaporator to turn off when the liquid level sensor detects the predetermined liquid level within the container.

**5,569,358**  
**IMPRINTING FELT AND METHOD OF USING THE SAME**  
 John H. Cameron, Appleton, Wis., assignor to James River Corporation of Virginia, Richmond, Va.

Filed Jun. 1, 1994, Ser. No. 252,449  
 Int. Cl.<sup>6</sup> D21H 11/00  
 U.S. Cl. 162—117 15 Claims

1. An imprinting felt for use in the production of paper comprising:





a base fabric having two sides including a sheet side, at least said sheet side having a batting applied in an amount of from about 50 to 150 g/m<sup>2</sup>, said imprinting felt having applied thereto a polymer in an amount from about 1% to about 50% by weight based upon the combined weight of the base fabric and the total batting on both sides thereof.

5,569,359

# SYSTEM FOR REDUCING BLISTERING OF A WET PAPER WEB ON A YANKEE DRYER

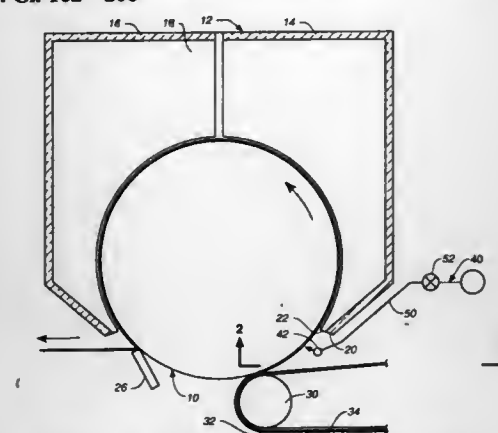
John R. Joiner, Vancouver, Wash., assignor to James River Paper Company, Inc., Richmond, Va.

Division of Ser. No. 172,755, Dec. 27, 1993, Pat. No. 5,425,852. This application Mar. 28, 1995, Ser. No. 412,300

Int. Cl.<sup>6</sup> D21F 5/18

U.S. Cl. 162—206

1 Claim



1. A method of reducing blistering of a wet paper web at a yankee dryer including a rotatable dryer drum having an outer cylindrical surface and a dryer hood partially encompassing said dryer drum and having a hood interior and a hood wet end defining an opening with said dryer drum outer cylindrical surface communicating with said hood interior, said wet paper web being pressed by a pressure roll against the dryer drum outer cylindrical surface at a nip location exterior of said dryer hood and spaced from said opening, and said dryer drum delivering said wet paper web in the machine direction into said hood interior through said opening upon rotation of said dryer drum, said method comprising the steps of:

positioning a plurality of air nozzle segments between the pressure roll and the opening with the air nozzle segments disposed side-by-side between said pressure roll and said opening in the cross-machine direction adjacent to said dryer drum and extending along the length of the dryer drum, each air nozzle segment extending only part way along the length of said dryer drum in the cross-machine direction;

detecting the formation of blisters in incremental portions of the paper web caused by heating of the wet paper web by the dryer drum as said wet paper web is delivered by the dryer drum between the pressure roll and the opening;

selectively and independently passing dry air through said air nozzle segments to direct flow of dry air to incremental width portions of said wet paper web on the dryer drum outer cylindrical surface between said pressure roll and said opening wherein blistering is detected to impinge on the wet paper web between said pressure roll and said opening, cause air turbulence at the wet paper web to promote evaporation, and

cool the wet paper web to reduce blistering of the wet paper web caused by heating of said wet paper web by the dryer drum; and

independently controlling the flow of dry air out of each of said plurality of air nozzle segments whereby the amount of dry air directed to incremental width portions of said wet paper web between said nip location and said opening by said air nozzle segments can be selectively independently varied.

5,569,360

# MULTI-LAYER HEADBOX

Jyrki Huovila, Muurame; Petri Nyberg, and Michael Odell, both of Jyväskylä, all of Finland, assignors to Valmet Corporation, Helsinki, Finland

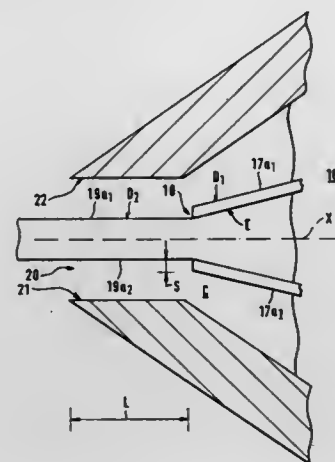
Filed Oct. 24, 1994, Ser. No. 328,021

Claims priority, application Finland, Oct. 29, 1993, 93794

Int. Cl.<sup>6</sup> D21F 1/02

U.S. Cl. 162—343

17 Claims



1. Multi-layer headbox including inlet headers for stock from which at least two separate stocks flow into a system of distributor pipes and then through a turbulence generator into an elongate slice cone having a narrowing portion in a stock flow direction, comprising

a straight duct portion arranged after said narrowing portion in the stock flow direction, and

at least one elongate flap arranged at least partially in said slice cone separating two of the stock flows and defining in part a pair of flow ducts, at least one of said flow ducts having a first region in said narrowing portion of said slice cone in which the stock flows in a first direction and a second region following said first region in said straight duct portion in which the stock flows in a second direction different than said first direction such that the stock flow direction curves, one end of said at least one flap being attached to the turbulence generator,

said at least one flap comprising a main body portion having a first thickness arranged in said narrowing portion of said slice cone and a flap extension having a second thickness less than the first thickness, said flap extension being arranged in said straight duct portion and being connected to said main body portion such that a step is defined between said main body portion and said flap extension in a region of intersection of said straight duct portion and said narrowing portion of said slice cone in which the stock flow changes direction from said first direction to said second direction, said step being arranged to dissipate secondary vortices forming on faces of said at least one flap.

5,569,361

# METHOD AND APPARATUS FOR COOLING A SPUTTERING TARGET

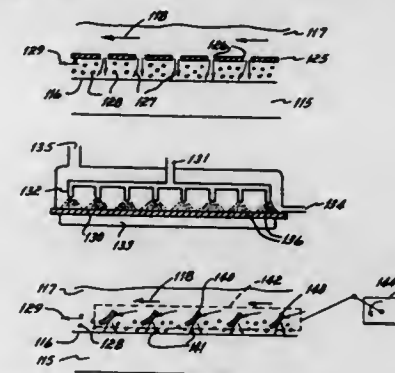
Steven Hurwitz, Park Ridge, N.J., assignor to Sony Corporation, Tokyo, Japan, and Materials Research Corporation, Orangeburg, N.Y.

Filed Mar. 6, 1995, Ser. No. 398,743

Int. Cl.<sup>6</sup> C23C 14/34

U.S. Cl. 204—192.12

41 Claims



1. A method of cooling a sputtering target, comprising the steps of:

providing a sputtering target and a cooling surface in operable conductive heat transfer contact with the sputtering target; introducing a cooling liquid onto the cooling surface to conductively remove heat from the sputtering target;

utilizing the latent heat of vaporization of the cooling liquid to remove heat from the target by allowing only a portion of the cooling liquid to change from a liquid phase into a vapor phase; and

preventing a continuous insulating vapor layer from forming on the cooling surface by flowing an unvaporized portion of the cooling liquid against the cooling surface to ensure continuing conductive heat transfer from the target to the cooling surface so as to avoid overheating of the target.

5,569,362

# PROCESS FOR TREATMENT OF THIN FILMS BASED UPON METALLIC OXIDE OR NITRIDE

Francois Lerbet, Paris, and Daniele Pillias, Aulnay Sous Bois, both of France, assignors to Saint-Gobain Vitrage International, Courbevoie, France

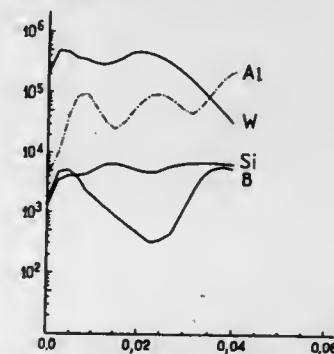
Filed Dec. 13, 1993, Ser. No. 165,493

Claims priority, application France, Dec. 11, 1992, 92 14911

Int. Cl.<sup>6</sup> C23C 14/34; 14/58

U.S. Cl. 204—192.16

12 Claims



1. A process for increasing the chemical or physical durability of a film deposited on a transparent substrate by a reactive cathodic sputtering technique comprising:

subjecting the film after the deposition to an ion beam wherein the energy of the ions at impact on the film is 200 eV or less, and obtaining a film having a root mean square rugosity of 1.4 nm or less,

wherein the deposition of the film is carried out in sequential steps and at least one of the sequential deposition steps is followed by at least one step of treatment with said ion beam, and wherein said film comprises a member selected from the group consisting of titanium oxide, titanium nitride, tantalum oxide, tin oxide, zinc oxide, silicon oxide and silicon nitride.

5,569,363

# INDUCTIVELY COUPLED PLASMA SPUTTER CHAMBER WITH CONDUCTIVE MATERIAL SPUTTERING CAPABILITIES

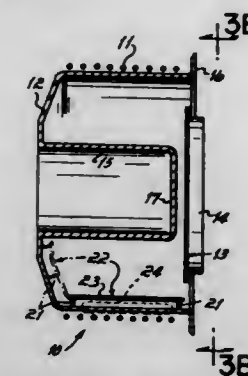
Robert Bayer, West Milford, N.J.; Alexander D. Lantsman, Middletown, and James A. Seiramarco, Buchanan, both of N.Y., assignors to Sony Corporation, Tokyo, Japan, and Materials Research Corporation, Orangeburg, N.Y.

Filed Oct. 25, 1994, Ser. No. 326,743

Int. Cl.<sup>6</sup> C23C 14/34

U.S. Cl. 204—192.32

27 Claims



20. A method of sputtering a conductive material from a surface disposed in a vacuum chamber, comprising:

evacuating said chamber and providing a process gas to said chamber,

electrically exciting said process gas with an electrical coil angularly disposed about an axis for a length along said axis, causing said process gas to form a plasma, and causing ions from said plasma to bombard said surface and sputter said conductive material from said surface,

providing a shade disposed on an inner wall of said chamber generally opposite a portion of said coil over a protected zone of said inner wall, said shade preventing accumulation of conductive material in said protective zone, said shade extending, in one angular region of said coil, a distance along said axis of said coil a substantial fraction of the length of said coil, and, in another angular region of said coil, said shade not extending along said axis of said coil any substantial fraction of the length of said coil,

whereby closed paths for eddy current flow along said inner chamber or said shade wall are restricted.

5,569,364

# SEPARATION MEDIA FOR ELECTROPHORESIS

Herbert H. Hooper, Belmont; Stephen Pacetti, Sunnyvale; David S. Soane, Piedmont, all of Calif., and Young C. Bae, Seoul, Rep. of Korea, assignors to Soane Biosciences, Inc., Hayward, Calif.

Continuation-in-part of Ser. No. 971,956, Nov. 5, 1992, abandoned. This application May 10, 1994, Ser. No. 241,048

Int. Cl.<sup>6</sup> C25B 9/00

U.S. Cl. 204—455

24 Claims

1. In an electrophoretic device comprising an electrophoretic medium, the improvement which comprises: an electrophoretic medium comprising a dispersion of particulate chemically-crosslinked microgels having particle sizes





introducing air in the form of bubbles at the bottom of the anode tank to provide agitation of the slurry and to provide oxidation conditions in the anode tank  
 reacting the slurry of the ore in the anode tank by an anode reaction to leach metal values therefrom,  
 withdrawing leached slurry from the anode tank and separating a liquid portion and a solid residue portion from the leached slurry, and  
 passing the liquid portion to a cathode tank including a cathode of the electrochemical cell and providing an electrical connection between a first electrode in the anode tank and a second electrode in the cathode tank said electrical connection being independent of any electrical connection between the anode and the cathode and supplying an electrical potential between the anode and the cathode to effect a cathode reaction to thereby deposit the metal at the cathode.

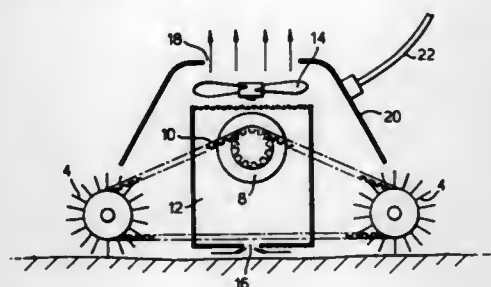
5,569,371

**SYSTEM FOR UNDERWATER NAVIGATION AND CONTROL OF MOBILE SWIMMING POOL FILTER**  
 Jeremy Perling, Kibbutz Yizreel, Israel, assignor to Maytronics Ltd., Kibbutz Yizreel, Israel

Filed Apr. 17, 1995, Ser. No. 422,819  
 Claims priority, application Israel, Apr. 22, 1994, 109394  
 Int. Cl.<sup>6</sup> B01D 33/80; 35/02

U.S. Cl. 210—85

15 Claims



1. A swimming pool cleaning, navigational controlled system, comprising:  
 a robot;  
 locomotion means for said robot for producing a steerable motion therefor;  
 impeller means, movable with said robot, for drawing solids-entraining water from the floor of said pool through filter means for filtering the solids-entraining water, the filter means being mounted adjacent to, and upstream of, said impeller means, and returning said water after filtering to said pool;  
 microprocessor means associated with said robot for controlling said locomotion means for causing said robot to follow a preprogrammed route, and to generate correction signals whenever, at a given instant, the actual location of said robot deviates from said preprogrammed route;  
 signal-producing means carried by said robot;  
 at least two signal-detecting means defining together with said signal producing means a stationary triangulation base and being fixedly mounted in spaced-apart relationship at, or in close proximity to each other, on at least one side of said pool and being acted upon by said signal-producing means;  
 a mobile triangle apex being defined by said signal-producing means together with said signal detecting means; and  
 coupling means located on the ground in proximity to said pool and comprising a detector processing logic to receive and process data from said detecting means for transmission to said microprocessor means;  
 wherein the actual robot location is determined by triangulation of said stationary triangulation base defined by said at least two spaced-apart signal-detecting means and the mobile triangle apex.

5,569,372

**CATCH BASIN STRUCTURE FOR INTERCEPTION OF CONTAMINANTS HAVING DETACHABLE PARTS**

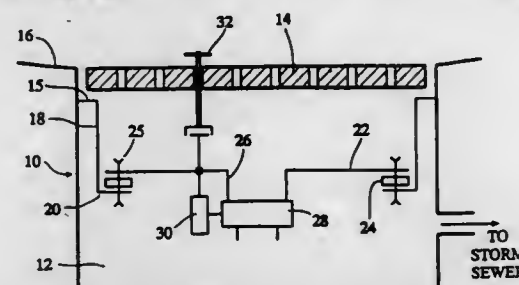
Robert G. Smith, Brampton, Canada, assignor to Her Majesty the Queen in right of Canada as represented by the Minister of Transport Canada, Ottawa, Canada

Filed Jun. 5, 1995, Ser. No. 461,553

Claims priority, application Canada, Jul. 13, 1994, 2127974  
 Int. Cl.<sup>6</sup> B01D 17/12; E03F 5/06; 5/14

U.S. Cl. 210—85

7 Claims



1. A catchbasin structure constructed and arranged for replacement in a catchbasin cavity which is disposed below ground level and connected to a storm sewer system, the structure comprising:  
 a receptacle mounted sealingly around the upper periphery of the catchbasin cavity and extending downwardly from said upper periphery,  
 a perforated cover placed over said receptacle with said receptacle having in its lowermost portion an outlet, a valve associated with said outlet and adapted to selectively open or close said outlet, and  
 valve control means operable from outside of the catchbasin to selectively open or close said valve,  
 wherein said receptacle comprises at least two parts, detachably interconnected in a manner to provide a sealed container when said valve is closed, at least one of said parts being removable from said catchbasin cavity.

2. The structure according to claim 1 further comprising sensing means for detecting the presence of a predetermined contaminant in said receptacle, and for generating a signal indicative of said presence.

5,569,373

**REUSABLE FLUID FILTER AND ADAPTER**

Gerald F. Smith, 5084 Three Point Blvd., Mound, Minn. 55364, and William J. Ellis, 4329 Shoreline Dr., Spring Park, Minn. 55384

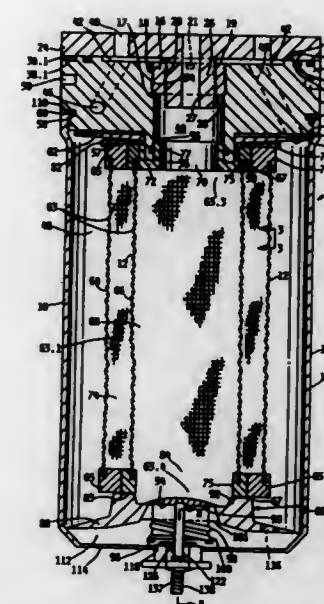
Filed Jun. 28, 1995, Ser. No. 496,021

Int. Cl.<sup>6</sup> B01D 35/02

U.S. Cl. 210—90

14 Claims

1. A reusable fluid filter comprising:  
 (a) a canister, the canister having an outer wall, an inner wall, a closed end, an axis of symmetry, and an open end, a support plate in the closed end;  
 (b) a reusable filter element removably mounted in the canister, the filter element having two ends, an outside wall and an inside wall defining a hollow core, a filter element top on one end of the filter element having a fluid exit opening adjacent the hollow core, a bypass opening at the other end of the filter element sealingly mounted on the support plate whereby the support plate supports the filter element in the canister and seals the bypass opening;  
 (c) an adapter body, the adapter body having an inside face and an outside face, a sealing means for removably attaching the canister to the adapter body, a filter sleeve on the inside face, a hexagonal surface adjacent the inside face and around the filter sleeve to adapt a socket wrench to the adapter body for threadably mounting the adapter body, a fluid outlet aperture extending through the adapter body having a circumference and internal threads along a portion of the fluid outlet aperture extending to the outside face, a means for attaching the filter



5,569,375  
**APPARATUS FOR FILTERING LIQUIDS IN A CLOSED SYSTEM**

Kent Ridgeway, 8617 W. Cavalier Dr., Glendale, Ariz. 85305

Filed Feb. 21, 1995, Ser. No. 391,774

Int. Cl.<sup>6</sup> B01D 35/02

U.S. Cl. 210—137

11 Claims

element top to the adapter body wherein the hollow core is in fluid communication with the fluid outlet aperture, an unfiltered fluid compartment defined between the outside wall of the filter element and the inner wall of the canister, a plurality of unfiltered fluid inlet orifices formed in the adapter body at an angle to the axis of the canister and in fluid communication with the unfiltered fluid compartment whereby fluid entering the fluid filter creates a swirling action in the unfiltered fluid compartment; and  
 (d) an adapter ring, the adapter ring having internal and external threads, the external threads being threadably mounted onto the internal threads of the fluid outlet aperture.

5,569,374  
**PORTABLE DRINKING WATER FILTRATION APPARATUS**

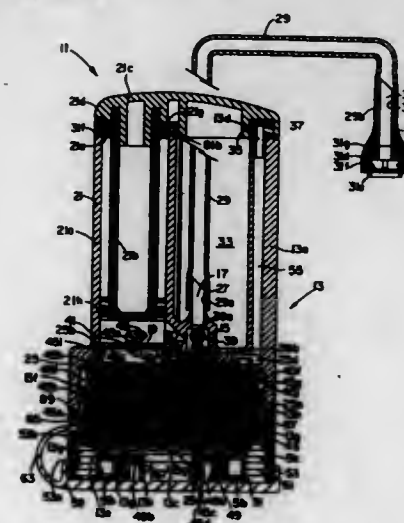
Richard T. Williams, P.O. Box 39, Uwchland, Chester County, Pa. 19480

Filed Jan. 21, 1994, Ser. No. 184,299

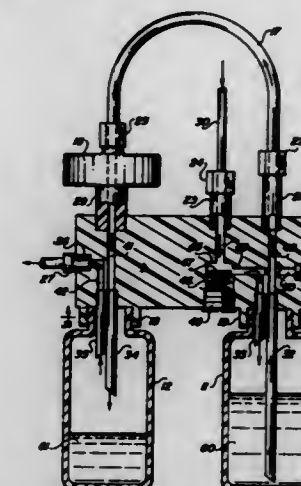
Int. Cl.<sup>6</sup> B01D 35/26

U.S. Cl. 210—136

28 Claims



23. A portable drinking water filtration apparatus for filtering and purifying water, comprising  
 a housing,  
 a chamber formed inside the housing having an inlet opening and an outlet opening,



1. A closed system for filtering a liquid during transfer from a first to a second container, said system comprising:  
 a) a housing including a top surface and containing first and second fluid transfer channels therein;  
 b) a fluid transfer conduit interconnecting said first and second fluid transfer channels;  
 c) first and second engaging means formed in said housing for removably receiving first and second containers therein, each of said engaging means communicating with a corresponding one of said fluid transfer channels;  
 d) pressure drive means, arranged for communicating with the first container, for conveying fluid to said first container and driving liquid therefrom;  
 e) a first egress tube attached to the first and fluid transfer channel and arranged for extending into the first container;  
 f) venting means, arranged for communicating with the second container, for conveying fluid therefrom;  
 g) a first ingress tube attached to the second fluid transfer channel and arranged for extending into the second container and;  
 h) a filter coupled to the fluid transfer conduit for removing impurities from liquid passing therethrough, activation of the pressure drive means urging liquid through the filter to the second container.

2. The invention in accordance with claim 1 wherein said pressure drive means includes a second ingress tube arranged for extending into the first container, the egress tube configured and arranged for extending beyond the second ingress tube.

3. The invention in accordance with claim 2 wherein said venting means comprises a vent passage formed in said housing and a second egress tube arranged for extending into the second

container, the first ingress tube configured and arranged for extending beyond the second egress tube, said vent passage extending to outside said housing.

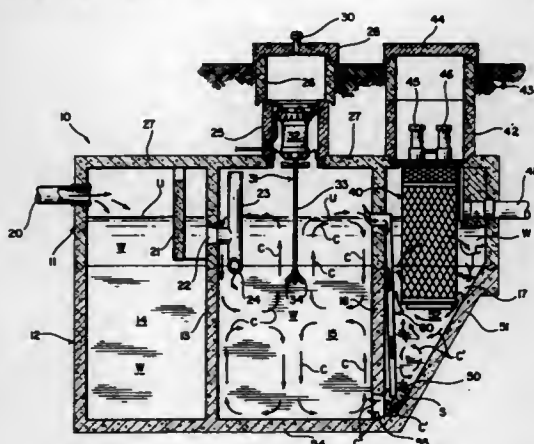
4. The invention in accordance with claim 3 wherein said pressure drive means is contained within the housing and includes a pressure responsive valve.

# 5,569,376 FLOW AUGMENTING DEVICES FOR A WASTEWATER TREATMENT PLANT

Jan D. Graves, Norwalk, Ohio, assignor to Norwalk Wastewater Equipment Company, Norwalk, Ohio  
Filed Mar. 6, 1995, Ser. No. 399,935  
Int. Cl.<sup>6</sup> C02F 9/00

U.S. Cl. 210—195.4

7 Claims



1. A wastewater treatment apparatus comprising at least a first chamber adapted to receive wastewater, a second chamber also adapted to receive wastewater, a common wall between said first and second chambers said second chamber including a lower chamber portion in which sludge is adapted to settle, means for transferring sludge from said second chamber lower chamber portion into said first chamber through a lowermost opening in a lowermost portion of said common wall, means including an uppermost opening in said common wall for conducting wastewater from an uppermost wastewater surface of the wastewater in said first chamber into said second chamber lower chamber portion to create wastewater current flow augmenting the transfer of the sludge from said second chamber lower chamber portion into said first chamber through said common wall lowermost opening, and said common wall lowermost opening being in immediate and direct fluid communication with a lower chamber portion of said first chamber at said common wall lowermost portion.

# 5,569,377 SPRAY PAINTING EQUIPMENT

Milton Hashimoto, Honolulu, HI., assignor to Milton Hashimoto, Honolulu; Susumu Emoto; Masulchi Matsuura, both of Kahului; Michael J. Tamanaha, Wailuku, and Christopher P. McKenzie, Honolulu, all of HI.

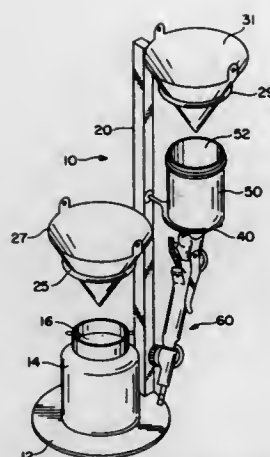
Filed Oct. 21, 1994, Ser. No. 335,062  
Int. Cl.<sup>6</sup> B01D 29/085

U.S. Cl. 210—238

10 Claims

1. Spray painting equipment comprising a paint spray gun in combination with a supporting stand, said supporting stand comprising:

- a horizontal base member dimensioned to underlie and support a primary paint supply container;
- a primary paint supply container on said base, said container having an open upper end;
- a vertically extending support post secured to and upstanding from said base member at a point on said base member such



that a clear space is left on said base member to support said primary paint supply container;

an initial filter holder selectively positioned on said support post at a point above the open upper end of said primary paint supply container;

an initial filter mounted for support by said initial filter holder;

a final filter holder secured to said support post;

a final filter mounted for support on said final filter holder;

a tank support adjustably secured to said post beneath said final filter;

a gravity feed paint tank positioned on said tank support; and

a coupling between the paint spray gun and said gravity feed tank to permit flow of paint from said tank to said gun.

# 5,569,378 COLLECTION AND SEPARATION APPARATUS

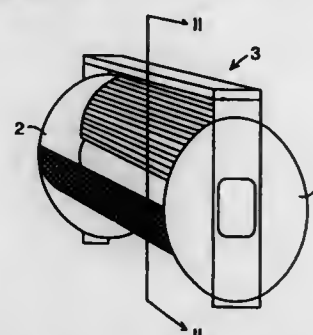
Majvor Nilsson, Ekerö, Sweden, assignor to MKH-Konsult, Ekerö, Sweden

Filed Feb. 8, 1995, Ser. No. 360,741

Claims priority, application Sweden, Jun. 23, 1992, 9201933  
Int. Cl.<sup>6</sup> E02B 15/04

U.S. Cl. 210—242.1

5 Claims



1. A collection and separation apparatus for removing oil floating on a water surface, comprising:

a frame having a horizontally arranged, upwardly opening trough having a generally cylindrically curved outer peripheral surface;

a helical member disposed in the trough and arranged to be rotated for conveying axially in the trough, oil which has collected in the trough from above the trough;

a horizontally arranged rotor journaled in the frame for rotation about a horizontal longitudinal axis of the rotor;

the trough being radially peripherally surrounded by the rotor;

the rotor including two axially spaced end flanges and at least two shovels extending between and fastened to said end flanges and having equiangular spacing from one to another around said rotor;

each said shovel being concave towards a direction of rotation of said rotor about said axis of said rotor;

each said shovel having an inner edge arranged to sweep in contact with said outer peripheral surface of said trough, and an outer edge located radially distally of said trough;

at least one of said shovels being made of a rectangular piece of material made of at least one of perforated metal and filter cloth; and

at least another of said shovels being made of a radially and angularly extending series of radially spaced longitudinal ribs.

# 5,569,379 GRIT COLLECTOR FOR WASTE WATER TREATMENT FACILITY

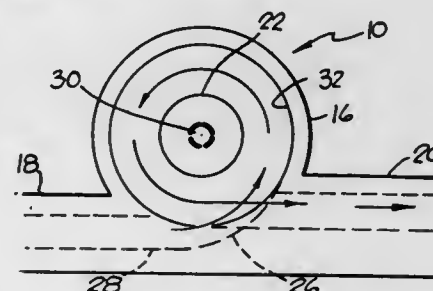
Charles M. Schloss, Englewood, Colo., assignor to Schloss Engineered Equipment, Inc., Aurora, Colo.

Filed Jul. 11, 1994, Ser. No. 273,562

Int. Cl.<sup>6</sup> B01D 21/24; 21/26

U.S. Cl. 210—257.1

14 Claims



1. A grit collector for use in a waste water treatment facility to separate grit from a liquid stream comprising: a substantially cylindrical settling chamber, a curved liquid inlet connected to the substantially cylindrical settling chamber, said curved inlet having a varying radius of curvature as measured from a centerline of the substantially cylindrical settling chamber; a grit collection chamber disposed beneath the settling chamber; and a liquid outlet in fluid communication with the settling chamber.

# 5,569,380 PORTABLE WATER FILTERING DEVICE

John L. Sullivan, 1362 NE. 117 St., Miami, Fla. 33161  
Continuation-in-part of Ser. No. 65,418, May 24, 1993, Pat. No. 5,456,831. This application Nov. 25, 1994, Ser. No. 344,917

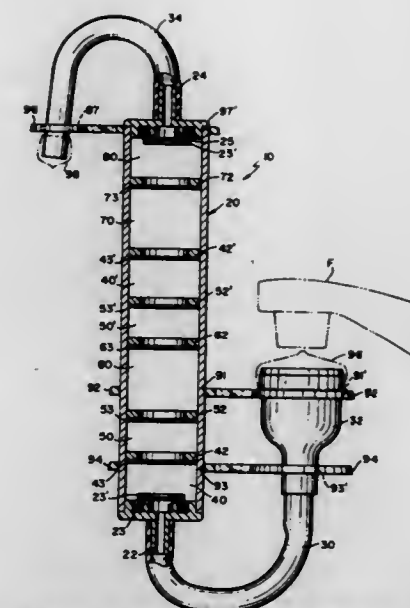
Int. Cl.<sup>6</sup> C02F 9/00

U.S. Cl. 210—266

8 Claims

1. A device to filter water removably connected to a supply of low pressure water, comprising:

- A) an elongated tubular housing having two ends, an inlet port in one of said ends and an outlet port in the other end, said elongated tubular housing includes six dividing filter members, each of said dividing member including an opening and a screen mounted against each dividing member covering said opening thereby defining first, second, third, fourth, fifth, sixth and seventh chambers, and said first chamber being the one that is adjacent to said inlet port including a granular activated carbon filtering medium, said second chamber being adjacent to the first including an iodinated anion resin filtering medium, said third chamber, being adjacent to said second chamber, being empty, said fourth chamber, being adjacent to said third chamber, including an iodinated resin filtering medium, said fifth chamber, being adjacent to said fourth chamber, including a granular activated carbon filtering medium, said sixth chamber, being adjacent to said fifth chamber, including an anion exchange resin filtering medium, said seventh chamber, being adjacent to said sixth chamber and to said outlet port, including a granular activated carbon filtering medium; and



B) faucet adapter means for limiting the magnitude of the water pressure applied to said inlet port and said faucet adapter further including a flexible tubular conduit, having first and second ends, and said first end being connected to said faucet adapter means and said second end being removably connected to said inlet port so that backwashing can be accomplished thereby removing particulate matter from the surface of said filtering media in said chambers and their redistribution.

# 5,569,381 UPFLOW CLARIFIER

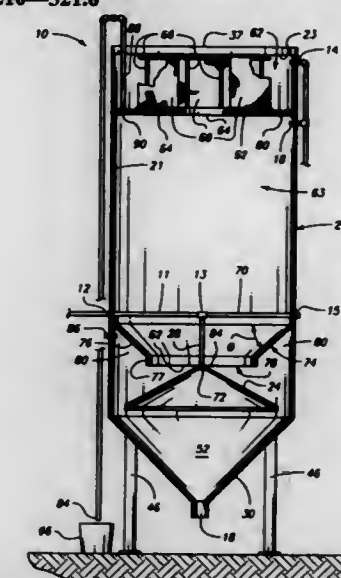
James Kuntz, Spokane, Wash., assignor to Spokane Industries, Inc., Spokane, Wash.

Filed May 24, 1995, Ser. No. 448,653

Int. Cl.<sup>6</sup> B01D 63/00

U.S. Cl. 210—321.6

18 Claims



1. An upflow clarifier comprising: an enclosure defining a bounded volume for holding liquid; an inlet coupled to said enclosure; an outlet coupled to the enclosure above said inlet; a barrier in said enclosure, between said inlet and said outlet, said barrier having a plurality of apertures therethrough, and said barrier defining an upper compartment above said barrier and a lower compartment below said barrier;



- a plurality of filter membranes respectively mounted to said apertures, wherein liquid flowing through said apertures flows through said filter membranes, said filter membranes extending upwardly from said barrier
- a downwardly directed baffle in fluid communication with said inlet; and
- a particulate restriction member above said baffle and below said barrier.

5,569,382

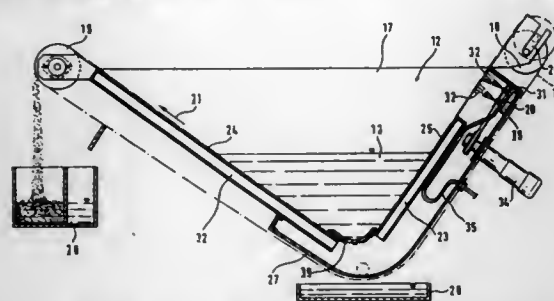
# BELT FILTER DEVICE HAVING A CLEANING SPRAY HEAD

Luc Reynnders, Riemst, Belgium, assignor to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Germany  
Filed May 23, 1994, Ser. No. 247,223  
Claims priority, application Germany, Jun. 19, 1993, 43 20 387.6

Int. Cl.<sup>6</sup> B01D 33/04

U.S. Cl. 210—391

9 Claims



1. A belt filter device for cleaning contaminated liquids, comprising:
- an upper dirt chamber which receives contaminated liquid;
  - a clean chamber underneath the dirt chamber and which receives cleaned liquid;
  - a filter bottom arranged between the upper dirt chamber and the clean chamber and which has passage openings for liquid;
  - a revolving filter belt adjacent the filter bottom and which is movable along automatically as a function of an amount of contamination deposited on the filter belt
  - a cleaning device, outside the dirt chamber, which removes contamination situated on the filter belt with cleaning liquid;
  - wherein the cleaning device has at least one spray head that sprays cleaning fluid at a rear of the filter belt and above a level of the contaminated liquid in the upper dirt chamber such that at least some of the cleaning fluid is reflected by the filter belt toward the rear of the filter belt and is guided by a funnel into the clean chamber and such that dirtied cleaning fluid which passes through the filter belt to a front of the filter belt is provided directly to the contaminated liquid.

5,569,383

# FILTER WITH AXIALLY AND ROTATABLY MOVABLE WIPER

John D. Vander Ark, Jr., Kalamazoo, and Danny K. Kaiser, Three Rivers, both of Mich., assignors to Delaware Capital Formation, Inc., Wilmington, Del.

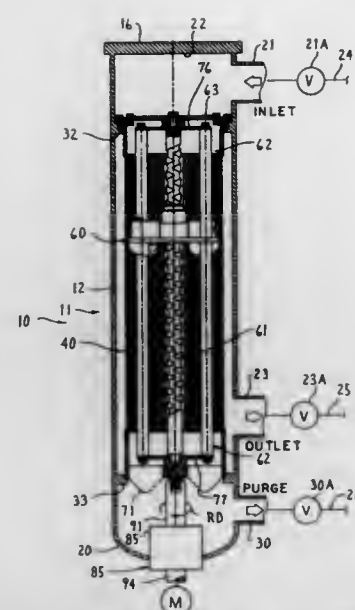
Filed Dec. 15, 1994, Ser. No. 356,567

Int. Cl.<sup>6</sup> B01D 29/64

U.S. Cl. 210—408

18 Claims

8. A self-cleaning pressure filter system comprising:
- a housing having an unfiltered liquid inlet and a filtered liquid outlet;
  - a filter element of generally cylindrical shape with open ends and an interior face and defining a center axis, said filter element having an interior defined by said interior face communicating with said unfiltered liquid inlet and an exterior communicating with said filtered liquid outlet and configured



- to filter solids from the liquid and wherein filtered out solids are left in the interior of said filter element;
- a cleaning assembly for cleaning said filter element, said cleaning assembly including: a support member mounted in said filter element interior; at least one blade carrier mounted to said support member; a cleaning blade fitted in said blade carrier and positioned to be oriented directly outwardly relative to said support member; a biasing member positioned against said blade carrier for urging said blade carrier outwardly so that said cleaning blade is urged against said filter element interior wall; and drive means for axially moving said support member through said filter element while simultaneously rotating said support member so that said cleaning blade travels along a helical path around said interior face of said filter member, wherein said support member includes an eccentrically located hole relative to the filter element axis and said drive means for rotating and axially moving said support member includes a rotating member extending axially through said eccentric hole and rotatable within said filter element for rotating said support member.

5,569,384

# PROCESS FOR RECOVERING THE OVERSPRAY OF AQUEOUS COATING AGENTS DURING SPRAY APPLICATION IN SPRAY BOOTHS

Dietrich Saatweber, Wuppertal, and Friedrich L. Siever, Schwelm, both of Germany, assignors to Herberts GmbH Continuation of Ser. No. 27,823, Mar. 8, 1993, abandoned.

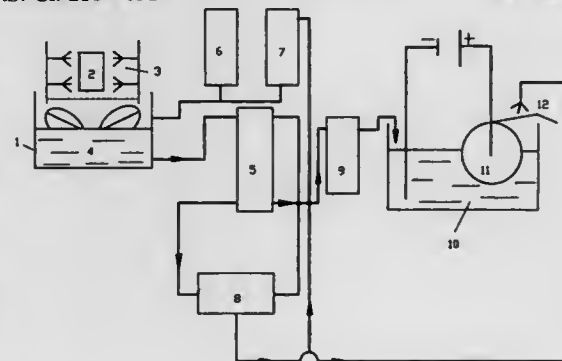
This application Nov. 5, 1993, Ser. No. 148,182

Claims priority, application Germany, Mar. 9, 1992, 42 07 383.9

Int. Cl.<sup>6</sup> B01D 61/20

U.S. Cl. 210—651

10 Claims



1. Process for recovering the overspray of aqueous coating agents during spray application in spray booths in which aqueous circulating liquid is circulated for the purpose of collecting the overspray, characterised in that the overspray material is extracted from the circulating liquid in an electrocoagulation bath, a higher concentration of overspray being maintained in the electrocoagulation bath than in the circulating liquid of the spray booth as a result of ultrafiltration.

5,569,385

# FOOD PROCESSING EFFLUENT RENDERING PROCESS AND APPARATUS

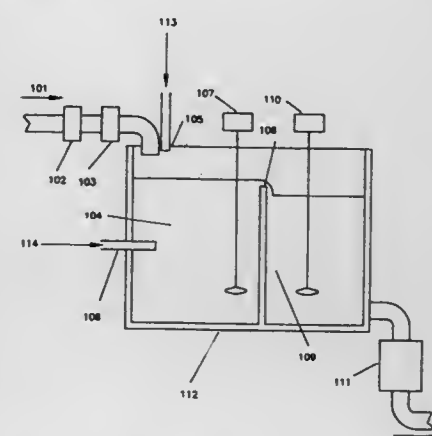
Lynda C. O'Carroll; Colm D. O'Carroll; Alan Jones, all of Edmonton; Marilyn T. Matlock, Winterburn, and Roderick D. McLeod, Edmonton, all of Canada, assignors to Epsilon Chemicals Ltd., Edmonton, Canada

Filed Nov. 14, 1994, Ser. No. 340,331

Int. Cl.<sup>6</sup> C02F 1/54

U.S. Cl. 210—727

15 Claims



1. A process for the treatment of an effluent stream from a food processing plant, in which the effluent has an acidic pH and carries proteinaceous material, the method comprising the steps of:
- contacting the effluent with an inorganic coagulant clay of the montmorillonite class that together with the acidic pH effectively neutralises ionic charges on the proteinaceous material to cause the proteinaceous material to precipitate out of solution;
  - contacting the effluent with biologically derived carrageenan to facilitate settling of the precipitated proteinaceous material as flocs;
  - the inorganic coagulant being present in an amount by weight of between 1.5 and 7 times the amount by weight of carrageenan;
  - allowing the flocs to settle in a settling vessel;
  - and removing the flocs from the effluent stream.

5,569,386

# METHOD FOR CONTROLLING THE DETOXIFICATION OF CYANIDIC WASTE WATERS

Hubert Wolf, Hammersbach, Germany, assignor to Degussa Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 5, 1994, Ser. No. 353,290

Claims priority, application Germany, Dec. 24, 1993, 43 44 598.5

Int. Cl.<sup>6</sup> C02F 1/72; 1/62

U.S. Cl. 210—746

9 Claims

1. A method for controlling the detoxification of an aqueous solution containing cyanides, unstable heavy-metal cyano complexes or mixtures thereof, comprising the stages

- (i) adding a source for formaldehyde to said aqueous solution to be treated at a pH value in the range from 8.5 to 12, thereby converting free and released cyanide into glycolnitrile, keeping the pH value substantially constant by a pH-controlled addition of an acid, discontinuing the adding of formaldehyde if the pH value no longer increases as a result of said adding, and afterwards
- (ii) subjecting said glycolnitrile to perhydrolysis by adding a source for hydrogen peroxide at a pH value in the range from 8.5 to 12, measuring the redox potential, discontinuing adding if the redox potential no longer increases with the pH value kept constant, said method being carried out without cyanide determination prior to said detoxification.

5,569,387

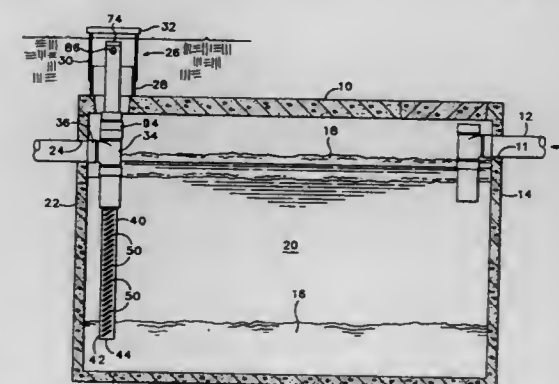
# WASTEWATER COLLECTION AND DISCHARGE SYSTEM

William C. Bowne, 2755 Warren, Eugene, Oreg. 97405, and Gary L. Thorsby, 3790 Honolulu Ave., Eugene, Oreg. 97404  
Filed Nov. 14, 1994, Ser. No. 338,401

Int. Cl.<sup>6</sup> B01D 35/16

U.S. Cl. 210—754

30 Claims



18. A method of treating wastewater, comprising:
- (a) flowing wastewater having a concentration of waste solids into a wastewater collection container through a wastewater inlet and allowing said solids to distribute into a lower horizontal sludge layer and an upper horizontal scum layer with a horizontal layer of liquid therebetween;
  - (b) immersing a substantially upstanding elongate tube in said wastewater within said container and exposing the interior of said tube to said horizontal layer of liquid through a plurality of apertures in said tube;
  - (c) flowing liquid from said horizontal layer through said apertures into the interior of said tube and thereafter through a liquid effluent outlet of said container;
  - (d) flowing said liquid from the interior of said tube to said outlet through a first portion of an opening in said tube, said first portion having a first width, thereby providing a restriction on the volumetric flow rate of said liquid, and flowing said liquid from the interior of said tube to said outlet through a second portion of said opening in said tube located at a higher elevation than said first portion of said opening and having a second width greater than said first width, thereby lessening said restriction; and
  - (e) chlorinating said liquid before flowing said liquid through said first portion so that said first portion restricts the volumetric flow rate of said liquid as said liquid is being chlorinated.

5,569,388

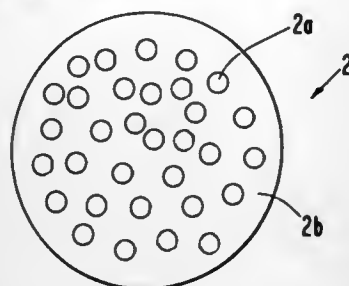
# METHOD OF CONTROLLING THE GROWTH OF MICROORGANISM IN A LIQUID WITH TOURMALINE CRYSTALS

Tetsujiro Kubo, Tokyo, Japan, assignor to Yugen Kaisha Kubo Technic Office, Tokyo, Japan  
Continuation of Ser. No. 274,361, Jul. 13, 1994, abandoned, which is a continuation of Ser. No. 949,372, Sep. 23, 1992, abandoned, which is a continuation of Ser. No. 660,022, Feb. 25, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 466,984

Claims priority, application Japan, Feb. 27, 1990, 2-46449  
Int. Cl.<sup>6</sup> C02F 1/68

U.S. Cl. 210—764

19 Claims



1. A method of supplying an electrically charged substance to a liquid, comprising the steps of:

- immersing in a liquid a plurality of free bodies having both positive and negative electrically charged surfaces and having deposits of, an electrically charged substance on the oppositely charged surfaces of the free bodies, where the electrically charged substance is dissolved into the liquid, the free bodies comprising a plurality of fine tourmaline crystals each possessing positive and negative poles which crystals are insulated from one another by an electrically insulating material, such that the positive and negative electrically charged surfaces of the free bodies are positive and negative poles of tourmaline crystals which are exposed on the surfaces of the free bodies.

5,569,389

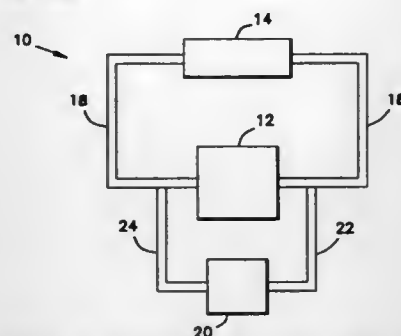
# HVAC HEAT TRANSFER FLUID RECYCLING

Wallace L. Hilgren, Edina, Minn., assignor to Kleer-Flo Company, Eden Prairie, Minn.  
Continuation of Ser. No. 334,436, Nov. 3, 1994, Pat. No. 5,429,753, and a continuation of Ser. No. 31,099, Mar. 11, 1993, abandoned. This application Apr. 10, 1995, Ser. No. 419,714

Int. Cl.<sup>6</sup> B01D 37/04

U.S. Cl. 210—805

1 Claim



1. A method of cleansing heat transfer liquid in a heating ventilating and air conditioning (HVAC) system, said HVAC system including a pump for circulating said fluid in said system under a pressure, said method comprising the steps of:

- drawing only a portion of said liquid from said system while leaving a remainder of said liquid circulating within said

system by flowing said portion from said system in response to said pressure and controlling said flow for only said portion to be drawn from said system;

filtering said portion through a filter to provide a cleansed permeate and an uncleansed condensate;

delivering said cleansed permeate to said system and returning said uncleansed condensate for further filtering;

drawing a subsequent portion of said liquid from said system while leaving a remainder of said liquid circulating within said system;

filtering said subsequent portion through said filter to provide a subsequent cleansed permeate and subsequent uncleansed condensate;

delivering said subsequent cleansed permeate to said system and returning said uncleansed condensate for further filtering;

repeatedly drawing still further portions and filtering said still further portions through said filter to provide cleansed permeates and repeatedly delivering said cleansed permeates to said system;

whereby said fluid is cleansed in a repeating batch process which progressively dilutes uncleansed fluid in said system with cleansed permeate from said filter.

5,569,390

# IMAGE SENSOR HAVING A MULTI-LAYERED PRINTED CIRCUIT BOARD WITH INCREASED PARALLEL-PLATE CAPACITANCE AND METHOD FOR MANUFACTURING THE SAME

Takafumi Endo, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

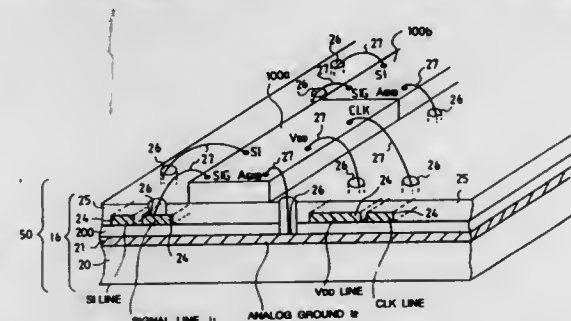
Filed Jun. 1, 1995, Ser. No. 457,319

Claims priority, application Japan, Jun. 16, 1994, 6-134564

Int. Cl.<sup>6</sup> B44C 1/22; C23F 1/00

U.S. Cl. 250—208.1

22 Claims



18. A method for manufacturing a board, comprising the steps of:

- forming a first conductor layer;
- forming a ground on the first conductor layer by chemical etching;
- forming an internal insulator layer next to the first conductor layer;
- forming a second conductor layer next to the insulator layer;
- forming a signal line on the second conductor layer by chemical etching;
- forming a surface insulator layer next to the second conductor layer;
- mounting chips on the surface insulator layer; and
- electrically coupling the chips to the signal line and ground.

5,569,391

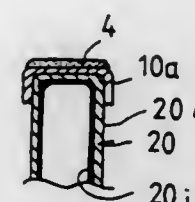
# INDIRECT CATHODE SLEEVE MANUFACTURING METHOD

Gil Y. Jung; Kyeong S. Lee; Gong S. Park; Byeong D. Ko, and Huo G. Park, all of Kyungsangbook-Do, Rep. of Korea, assignors to Goldstar Co., Ltd., Rep. of Korea  
Filed Sep. 20, 1994, Ser. No. 309,396  
Claims priority, application Rep. of Korea, Sep. 20, 1993, 19070/1993

Int. Cl.<sup>6</sup> B44C 1/22; C23C 1/00

U.S. Cl. 216—33

9 Claims



1. A method for manufacturing an indirect cathode sleeve, comprising the steps of:

- forming a structure of a cathode sleeve consisting of a bimetal of a Nickel-Chrome alloy component at an inside surface of the cathode sleeve and a Nickel alloy component at an outside surface of the cathode sleeve, said cathode sleeve being cylindrical;

oxidizing said Nickel-Chrome alloy component of the cathode sleeve in a high temperature wet hydrogen environment;

selectively etching said Nickel alloy component of the cathode sleeve to form a base metal at a top of the cathode sleeve; and forming an electron-emitting material layer at an outside surface of the base metal.

5,569,392

# METHOD AND APPARATUS FOR REPAIRING DEFECT ON PLANE SURFACE OF PHASE SHIFT MASK

Motosuke Miyoshi, Minato-ku, Japan, and Katsuya Okumura, Poughkeepsie, N.Y., assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

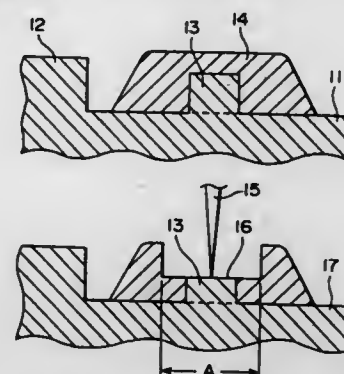
Filed Dec. 27, 1994, Ser. No. 364,227

Claims priority, application Japan, Dec. 27, 1993, 5-331484

Int. Cl.<sup>6</sup> B44C 1/22

U.S. Cl. 216—60

8 Claims



1. A method for repairing a defect of a phase shift mask by eliminating a bump defect having a partially projected shape from a region to be flat, said method comprising:

- a step of depositing a carbon in the manner of covering said bump defect to form a carbon deposit layer;
- a step of etching a partial region including said bump defect and being wider than said bump defect in a carbon deposit region of said carbon deposit layer under the condition that an etching rate of a carbon and a mask material is 1:1 of a selectivity, until said bump defect is exposed;

a step of depositing a carbon along a straight line in view of a vertical direction to a mask surface in the manner of including an etched surface of said carbon deposit layer and a flat surface of said mask material so as to form a carbon deposit line;

a step of measuring a discrepancy amount between a carbon line on a remaining surface on said carbon deposit layer after an etching and a carbon deposit line of said flat surface of said mask material by an observation in the oblique direction to the mask surface of said phase shift mask;

a step of etching said partial region under the condition that an etching rate of a carbon and a mask material is 1:1 of a selectivity, until said discrepancy amount becomes zero; and a step of perfectly eliminating said carbon deposit layer and said carbon line remaining on said phase shift mask.

5,569,393

# METHOD AND APPARATUS FOR SAMPLE AND DEFECT REMOVAL FROM A BORE

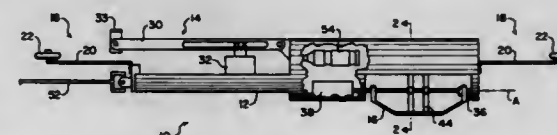
Eugene R. Reinhart; Michael C. Monaco, and Gary T. Salisbury, all of Austin, Tex., assignors to Reinhart & Associates, Inc., Austin, Tex.

Filed Jul. 8, 1994, Ser. No. 272,697

Int. Cl.<sup>6</sup> B23H 1/00; 9/00

U.S. Cl. 219—69.15

7 Claims



1. An apparatus for removing a section of material from the surface of an elongated bore extending through a metal object, the apparatus comprising:

- (a) an elongated carriage adapted to be inserted longitudinally through the bore;
- (b) securing means connected to the carriage for securing the carriage at a desired longitudinal position within the bore;
- (c) a shaft mounted on the carriage and extending substantially parallel to a longitudinal axis of the carriage, the shaft being rotatable with respect to the carriage along a shaft longitudinal axis;
- (d) drive means associated with the shaft for rotating the shaft about the shaft longitudinal axis; and
- (e) an elongated cutting element for separating an elongated section of material from the object, the elongated cutting element including a central section extending substantially parallel to the shaft and two end sections each extending from a different end of the central section toward the shaft, the cutting element also being connected by its end sections to the shaft in position to pivot about a cutting arc axis corresponding to the shaft longitudinal axis so that the cutting element travels along a cutting arc through the object to separate a section of material therefrom, the cutting arc intersecting the bore surface in two spaced apart locations.

5,569,394

# ELECTRIC DISCHARGE MACHINING METHOD FOR INSULATING MATERIAL USING ELECTROCONDUCTIVE LAYER FORMED THEREON

Yasushi Fukuzawa, Tokyo, Japan, assignor to Research Development Corporation of Japan, Japan

Filed Jun. 20, 1995, Ser. No. 492,671

Claims priority, application Japan, Jun. 20, 1994, 6-160693

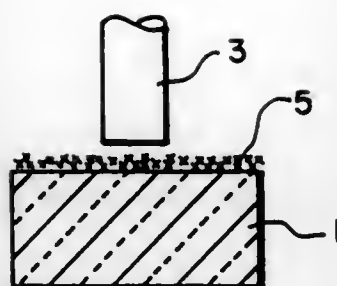
Int. Cl.<sup>6</sup> B23H 1/00; 9/00

U.S. Cl. 219—69.17

24 Claims

1. A method of electric discharge machining an insulating material, comprising the steps of:





providing a porous preformed body selected from the group of a mesh-shaped electroconductive material, fine metal wires or a complex body containing needle metal in close contact with the surface of an insulating material; providing a work electrode at a position facing said insulating material; and machining said insulating material by electric discharge generated between said work electrode and said insulating material.

5,569,395

## DEEP COAT FACED PLATE AND METHOD

Roman F. Arnoldy, Houston, Tex., assignor to Arco Technology Trust, Houston, Tex.

PCT No. PCT/US93/01200, § 371 Date Aug. 18, 1994, § 102(e) Date Aug. 18, 1994, PCT Pub. No. WO93/16873, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 9, 1993, Ser. No. 290,820

Int. Cl.<sup>6</sup> B23K 9/04

U.S. Cl. 219—76.14

7 Claims

1. A method of providing an abrasion or corrosion resistant facing having an alloy composition of a predetermined iron content and a predetermined alloy content on a surface of a weldable iron based material comprising, creating an electric arc between a single iron based electrode and the surface of the weldable iron based material, the electric arc and cross-sectional area of the single electrode coating to form a weld puddle of the predetermined iron content of the alloy composition in which the iron based material provides from about 35% to about 80% by weight of the iron content of the alloy composition and the balance the iron based electrode, depositing into and melting a predetermined quantity of alloy forming powder in the weld puddle sufficient to form the predetermined alloy content of alloy composition of the facing, the alloy composition being free of dilution by additional iron from the iron based material.

5,569,396

## METHOD FOR MAKING ALLOYING ADDITIONS TO THE WELD OVERLAY WELD POOL

Mark J. Topolski, Canton, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Apr. 13, 1995, Ser. No. 421,336

Int. Cl.<sup>6</sup> B23K 9/04

U.S. Cl. 219—76.14

8 Claims

1. An improved method for increasing the chromium content of a clad layer, comprising the steps of: providing a chromium plated substrate; placing a single pass of weld overlay of chromium containing weld filler metal on a surface of the chromium-plated substrate to form a weld overlay weld pool with a chromium plating on the chromium plated substrate, the filler metal, and a portion of the substrate; and

forming a resultant alloyed deposit to increase the chromium weld clad deposit.

5,569,397

## PLASMA TORCH

Naoya Tsurumaki, Hiratsuka, and Shunichi Sakuragi, Naga-gun, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP94/01218, § 371 Date Jan. 26, 1996, § 102(e) Date Jan. 26, 1996, PCT Pub. No. WO95/03910, PCT Pub. Date Feb. 9, 1995

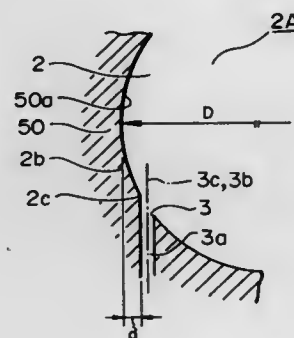
PCT Filed Jul. 25, 1994, Ser. No. 586,884

Claims priority, application Japan, Jul. 28, 1993, 5-205821

Int. Cl.<sup>6</sup> B23K 10/00

U.S. Cl. 219—121.51

9 Claims



1. In a plasma torch comprising: an electrode, a swirler positioned along an outer periphery of said electrode to form a swirler chamber adjacent a front end of said electrode, said swirler having a plurality of jet holes, each of said jet holes extending through said swirler to an inner wall of said swirler so as to provide a jet port in said inner wall open to said swirler chamber, whereby operating gas can be ejected from said jet ports into said swirler chamber to produce a swirl in the operating gas in said swirler chamber, the improvement comprising: each said jet port being positioned in said swirler such that in a transverse cross-section of said swirler including the respective jet port, a relationship represented by  $0 < d/D < 0.03$  exists, wherein said D is a diameter of said inner wall and said d is a distance from a line, which is tangent to said inner wall and parallel to a projected line of an axis of the respective jet hole, to a side end of a side of the respective jet port adjacent to said line which is tangent.

5,569,398

## LASER SYSTEM AND METHOD FOR SELECTIVELY TRIMMING FILMS

Yunlong Sun, and Ed Swenson, both of Portland, Oreg., assignors to Electro Scientific Industries, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 943,875, Sep. 10, 1992, Pat. No. 5,265,114. This application Nov. 22, 1994, Ser. No.

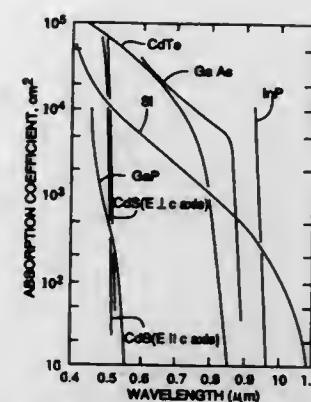
343,779

Int. Cl.<sup>6</sup> B23K 26/00

U.S. Cl. 219—121.68

24 Claims

17. A method for employing a laser system to process a film structure formed on a silicon, gallium arsenide, or other semiconductor substrate, comprising: generating laser output in a wavelength range of about 1.2 to 3  $\mu\text{m}$ ; and



directing the laser output at the film structure such that it is effectively processed but the substrate is relatively undamaged.

5,569,399

## LASING MEDIUM SURFACE MODIFICATION

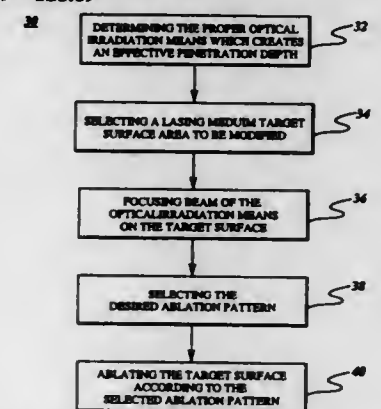
Carl M. Penney, Saratoga Springs; Joseph P. Chernoch, Scotia, and Carl E. Erikson, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 20, 1995, Ser. No. 376,196

Int. Cl.<sup>6</sup> B23K 26/02

U.S. Cl. 219—121.69

3 Claims



1. A method of lasing medium surface modification comprising the steps of: choosing an optical irradiation means having a penetration depth for surface roughness; selecting a target surface to be modified; providing appropriate focus of said optical irradiation means on said target surface; selecting a desired ablation pattern; ablating separated strips while making 1 mil steps in lens to surface distance between each strip; and inspecting the resulting ablation strips to determine an optimum focal distance.

5,569,400

## SOLDERING GUN WITH U-SHAPED INSERTABLE TERMINAL STRUCTURE AND TIP HAVING DIFFERING IMPEDANCE LAYERS

In S. Lee, 20520 S.W. Kirkwood St., Aloha, Oreg. 97006

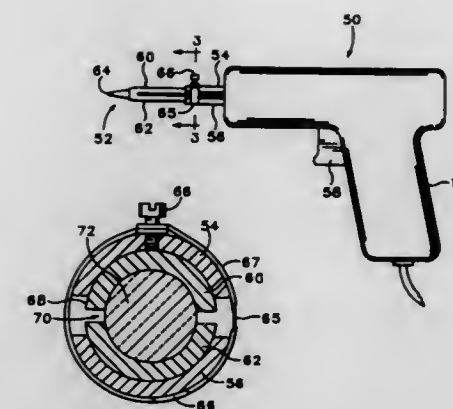
Filed Feb. 28, 1994, Ser. No. 202,350

Int. Cl.<sup>6</sup> B23K 3/02; H05B 1/02

U.S. Cl. 219—233

16 Claims

1. A soldering device, comprising: a first terminal providing an energy feed path and a second terminal providing an energy return path, the first and second



terminals spaced a predetermined distance apart forming a single terminal cavity; and an elongate solder tip including first and second leads each elongated in parallel alignment from a front end to a back end forming an outside surface with a uniform cross-sectional profile including interior lead cavities aligned in opposed directions forming a slot for retaining an insulative material, the first and second leads conductively joined together at the front ends forming a front end tip having an outer solder tip surface the outer surface of the front end tip including a rear end having a cross-sectional profile substantially equal to the cross-sectional profile formed by the first and a second leads and tapering down to a front point; the back ends of the first and second leads insertable and rigidly held inside the terminal cavity thereby electrically coupling the first lead to the first terminal and the second lead to the second terminal.

5,569,401

## INSULATED HEATING CONTAINER

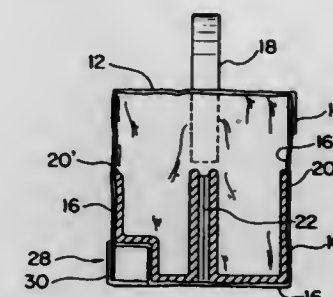
Linda L. Gilliland, 301 Hickory Dr., Longwood, Fla. 32779, and Mary R. Downs, 2206 Morriswood Ct., Franklin, Tenn. 37064

Continuation of Ser. No. 30,018, Sep. 23, 1994, Pat. No. Des. 365,728. This application Dec. 6, 1994, Ser. No. 354,728

Int. Cl.<sup>6</sup> F24C 7/10

U.S. Cl. 219—386

16 Claims



1. A container for heating textiles, said container comprising: a first enclosure including first access means for ingress and egress of the textiles to and from an interior of said first enclosure, said first access means including a first closure covering an aperture into said interior, said first enclosure further including a plurality of collapsible surfaces surrounding said aperture and defining said interior, said collapsible surfaces having an inside face facing said interior, and an exterior face opposite to said interior face;

at least one heating element inside said interior, said heating element being in the form of a separate flexible sheet overlying at least a portion of a first inside face of a first collapsible surface, and continuously extending from said first inside face along a substantially perpendicular second inside face of a second collapsible surface; and control means for regulating said at least one heating element, said control means is mounted on an exterior of the container.

5,569,402

# CURING OVEN FOR MAGAZINE HOLDING COMPUTER CHIP LEAD FRAMES, PROVIDING FLOW DIRECTION CONTROL FOR HOT GAS STREAM

Claudio Meisser, Cham, and Rolf Honegger, Horgen, both of Switzerland, assignors to ESEC S.A., Cham, Switzerland  
PCT No. PCT/CH93/00131, § 371 Date Jun. 7, 1994, § 102(e) Date Jun. 7, 1994, PCT Pub. No. WO93/24801, PCT Pub. Date Dec. 9, 1993

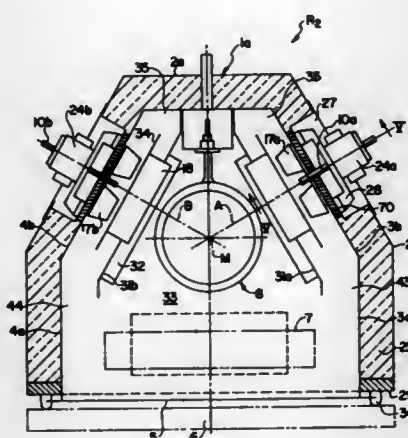
PCT Filed May 21, 1993, Ser. No. 190,027

Claims priority, application Switzerland, Jun. 3, 1992, 01786/92

Int. Cl.<sup>6</sup> F27B 17/00; F26B 21/02

U.S. Cl. 219—400

17 Claims



1. A curing oven for heat treating lead frames fitted with electronic chips, while the lead frames are disposed in a cuboidal magazine having a horizontally extending longitudinal axis and the lead frames extend parallel to one another and to said longitudinal axis,

said curing oven comprising:

a box having a housing providing a heat-treating cavity for receiving said magazine, said housing being provided with a charging opening for said cavity, said opening being defined by perimetrical edges, and an openable door closing said opening;

a heater for providing a heated gas within said heat-treating cavity;

fan means comprising at least two fans arranged to be alternately used, for organizing said heated gas into a gas stream flowing along a path within said heat-treating cavity; and

at least one gas stream-directing element fixedly arranged within said heat-treating cavity for directing said gas stream to flow substantially horizontally and parallel to said longitudinal axis in a section of said path which, in use, is proximate said magazine;

said fan means being operable for reversing direction of flow of said gas stream along said path, including in said section of said path, for thereby evening direction of flow-dependent disparity in heating effects of the heated gas on the lead frames fitted with electronic chips.

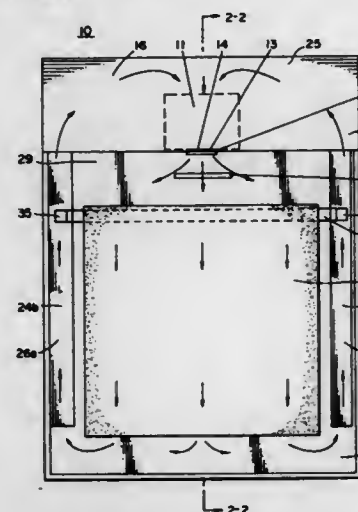
5,569,403

# TOWEL WARMER

John Swanson, P.O. Box 84, New York, N.Y. 10268, and Lawrence Wright, 54 Cheshire Rd., Bethpage, N.Y. 11714  
Filed Jul. 15, 1994, Ser. No. 275,251  
Int. Cl.<sup>6</sup> H05B 3/06

U.S. Cl. 219—400

6 Claims



1. A towel warmer comprising:

a heater blower;

a hollow cabinet having a base, upwardly extending walls and an upper portion including a top support means for a towel extending transversely between said walls therein;

a duct in the upper portion of the cabinet having a first centrally located aperture having an upper surface forming the top of the cabinet and a lower surface, said first centrally located aperture having the heater blower mounted thereto within the duct to direct a flow of warmed air downwardly against the towel, and a pair of apertures extending therethrough on the lower surface of the duct; and

a pair of elongated hollow members, having upper and lower ends extending along opposite walls of the cabinet and each being connected to an aperture in the duct at its upper end and extending above the base of the cabinet at its lower end to direct the flow of air upwardly therethrough for recycling to the heater blower.

5,569,404

# OIL SOLUBLE IODIDES AS LUBRICANT ANTIOXIDANTS

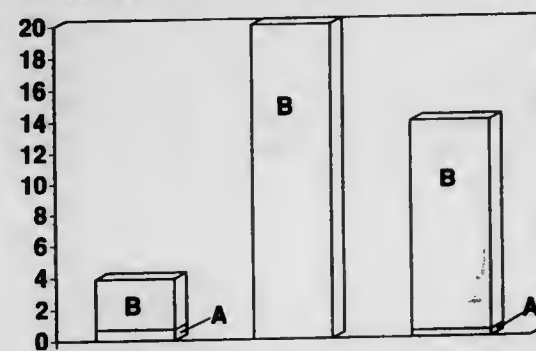
Manuel A. Francisco, Washington, and Kenneth D. Rose, Clinton, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Feb. 17, 1995, Ser. No. 390,728

Int. Cl.<sup>6</sup> C10M 125/18

U.S. Cl. 508—547

4 Claims



1. A lubricating oil composition, comprising: a major amount of an oil of lubricating viscosity and a minor amount of an organic

iodide salt capable of generating oil soluble iodide ions in the oil effective to enhance the antioxidant of the lubricating oil.

5,569,405

# LOW PHOSPHOROUS ENGINE OIL COMPOSITIONS AND ADDITIVE COMPOSITIONS

Morikuni Nakazato, Takahiro Muramatsu, and Shigeru Iwamoto, all of Ogasa-gun, Japan, assignors to Chevron Chemical Company, San Ramon, Calif.

Filed Aug. 27, 1993, Ser. No. 113,868

Claims priority, application Japan, Sep. 14, 1992, 4-272424  
The portion of the term of this patent subsequent to Apr. 4, 2014, has been disclaimed.

Int. Cl.<sup>6</sup> C10M 141/10

U.S. Cl. 508—192

7 Claims

1. A low-phosphorous lubricating oil composition for internal combustion engines comprising:

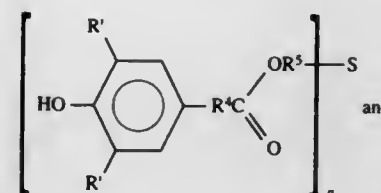
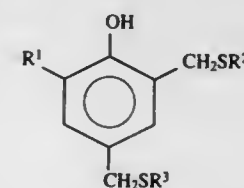
(a) a major amount of a base oil of lubricating viscosity,

(b) from 0.5 to 20 wt. % of metal-containing detergent selected from the group consisting of a metal phenate and a metal sulfonate,

(c) from 0.5 to 15 wt. % of ashless dispersant selected from the group consisting of borated succinimides and succinic esters,

(d) from 0.1 to 3 wt. % of a secondary alkyl zinc dithiophosphate,

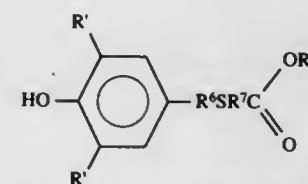
(e) from 0.05 to 5 wt. % of a sulfur-containing phenol derivative selected from the group consisting of:



(i)

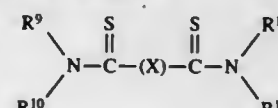
(ii)

(iii)



wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, and R<sup>4</sup> are the same or different and each represents an alkyl group of 1 to 18 carbon atoms; R<sup>5</sup>, R<sup>6</sup>, and R<sup>7</sup> are the same or different and each represents an alkylene group of 1 to 3 carbon atoms; and R<sup>8</sup> represents an alkyl group of 1 to 4 carbon atoms; and

(f) from 0.05 to 8 wt. % of an alkylthiocarbonyl compound represented by the formula:



wherein R<sup>9</sup>, R<sup>10</sup>, R<sup>11</sup> and R<sup>12</sup> are the same or different and each represents an alkyl group of 1–18 carbon atoms, and (X) represents S, S—S, S—CH<sub>2</sub>—S, S—CH<sub>2</sub>—CH<sub>2</sub>—S, S—CH<sub>2</sub>—CH<sub>2</sub>—CH<sub>2</sub>—S or S—CH<sub>2</sub>—CH(CH<sub>3</sub>)—S.

5,569,406

# STAMPING LUBRICANTS

Jeff A. Barnhorst, Roger H. Garst, both of Cincinnati, Ohio; Ronald H. Gordon, Marlboro, N.J., and Eugene R. Zehler, West Chester, Ohio, assignors to Henkel Corporation, Plymouth Meeting, Pa.

Filed Mar. 15, 1995, Ser. No. 404,783

Int. Cl.<sup>6</sup> C10M 173/02; 145/26

U.S. Cl. 508—431

29 Claims

1. A stamping lubricant composition comprising:

I)

- from about 60 to about 69% by weight of mineral spirits;
- from about 3 to about 8% by weight of a (POP)<sub>n</sub>(POE)<sub>m</sub>C<sub>8</sub>–C<sub>18</sub> alkylalcohol wherein n and m are independently a number from about 3 to about 8;
- from about 3 to about 12% by weight of an alkali metal salt of a phosphate ester of a (POE)<sub>n</sub>C<sub>8</sub>–C<sub>18</sub> alkylalcohol wherein n' is a number from about 3 to about 8; and
- from about 20 to about 25% by weight of a polyester of a dimer acid; or

II)

- from about 70 to about 95% by weight of water;
- optionally up to about 3% by weight of a (POP)<sub>n</sub>(POE)<sub>m</sub>C<sub>8</sub>–C<sub>18</sub> alkylalcohol wherein n and m are independently a number from about 3 to about 8;
- from about 0.1 to about 4% by weight of an alkali metal salt of a phosphate ester of a (POE)<sub>n</sub>C<sub>8</sub>–C<sub>18</sub> alkylalcohol wherein n' is a number from about 3 to about 8;
- from about 2 to about 8% by weight of a polyester of a dimer acid; or from about 3 to about 12% by weight of a polyester derivative; and
- from about 1 to about 6% by weight of a trialkanolamine.

5,569,407

# ADDITIVES FOR FUELS AND LUBRICANTS

Noyes L. Avery, Bryn Mawr; Joan C. Axelrod, Media, both of Pa.; James T. Carey, Medford, N.J.; John Hiebert, Levittown, Pa., and Andrew G. Horodysky, Cherry Hill, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 217,820, Mar. 25, 1994, abandoned. This application May 5, 1995, Ser. No. 435,908

Int. Cl.<sup>6</sup> C10M 133/04; 133/16

U.S. Cl. 508—454

4 Claims

1. A lubricant composition comprising a lubricating oil or a grease prepared therefrom and an effective amount, sufficient to enhance cleanliness, provide stability at high temperatures, retard wear, and inhibit corrosion in an engine, of a reaction product obtained by reacting (1) a polyisobutyleneamine which has been derived from polyisobutylene molecules of which at least 80% have a terminal vinyl group, with (2) a carboxylate group at a temperature in the range from 32° F. to 300° F. and at a pressure from subatmospheric to about 500 psig.



5,569,408

**NEW WATER-SOLUBLE, BIOLOGICALLY DECOMPOSABLE CARBONIC ACID POLYESTERS AND THEIR USE AS PREPARING AND SLIP ADDITIVES OF SYNTHETIC FIBRES**

Reinmar Peppmüller, Krefeld; Bernhard Goossens, Weeze, and Karl Winck, Neukirchen-Vluyn, all of Germany, assignors to Chemische Fabrik Stockhausen GMBH, Krefeld, Germany  
PCT No. PCT/EP92/00894, § 371 Date Oct. 27, 1993, § 102(e)  
Date Oct. 27, 1993, PCT Pub. No. WO92/19664, PCT Pub. Date Nov. 12, 1992

PCT Filed Apr. 23, 1992, Ser. No. 140,048

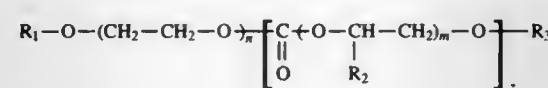
Claims priority, application Germany, Apr. 27, 1991, 41 13 889.9

Int. Cl.<sup>6</sup> C10M 119/16; 145/38

U.S. Cl. 508—462

12 Claims

1. Water-soluble, biodegradable carbonic acid polyesters of the general formula (I):

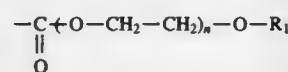


wherein:

R<sub>1</sub> is a linear or branched, saturated or monounsaturated alkyl residue with from 6 to 22 carbon atoms;

R<sub>2</sub> is hydrogen or a methyl group;

R<sub>3</sub> is hydrogen or the group:

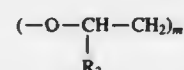


n is an integer from 0 to 10;

m is an integer from 5 to 16, and

z is an integer from 1 to 3,

and wherein the polyalkylene glycol sequence of the formula



consists of polyethylene glycol groups or consists of at least 80 mole % ethylene oxide units and at maximum 20 mol % propylene oxide units.

5,569,409

**FINELY DIVIDED ACICULAR MAGNETIC MODIFIED CHROMIUM DIOXIDE**

Harald Jachow, Worms; Reinhard Körner, Frankenthal; Ronald J. Veitch, Maxdorf; Ekkehard Schwab, Neustadt; Helmut Jakusch, Frankenthal; Bernd Höppner, Neustadt; Rudi Lehnert, Ludwigshafen, and Manfred Ohlinger, Frankenthal, all of Germany, assignors to BASF Magnetics GmbH, Mannheim, Germany

Filed Nov. 16, 1994, Ser. No. 341,962

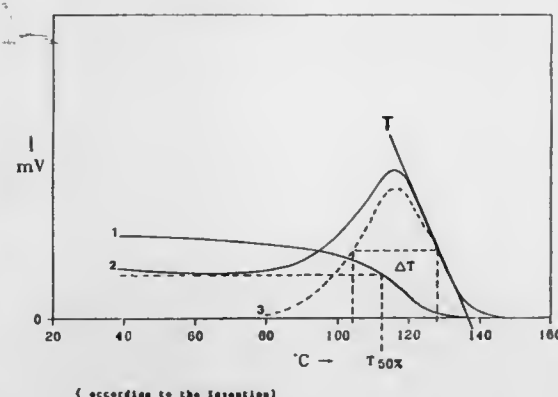
Claims priority, application Germany, Nov. 23, 1993, 43 39 841.3

Int. Cl.<sup>6</sup> C01G 37/027

U.S. Cl. 252—62.56

4 Claims

1. A process for the preparation of an acicular magnetic chromium dioxide modified with iron and tellurium or antimony and having a saturation magnetization of at least 85 nTm<sup>3</sup>/g, a coercive force of at least 40 kA/m, a mean particle length of less than 230



nm, specific surface area (SSA) of at least 25 m<sup>2</sup>/g, and further characterized by a halving of the residual induction with regard to the value measured at 40° C. to one measured above 110° C., when depicted in a graph of rectangular coordinates having an x and a y axis such that when the x axis is expressed in °C. the y axis is indicative of the residual induction in mV, and by a half-width of less than 24° C. determined at the maximum of the temperature-dependent measurement of the susceptibility, when depicted in a graph of rectangular coordinates having an x and a y axis such that when the x axis is expressed in °C. the y axis is indicative of the susceptibility in mV, by converting an aqueous CrO<sub>3</sub> suspension, to which from 0.05 to 30% by weight, based on the theoretical CrO<sub>2</sub> yield, of one or more iron compounds and tellurium or antimony compounds, and glycerol and octanol to establish a Cr(VI):Cr(III) ratio of from 4:1 to 1:1, from 1.54 to 2.52 parts by weight of CrO<sub>3</sub> being used per part of water, taking into account the amount of water formed in the oxidation of the organic reducing agents, at from 250° to 400° C. under at least 70 bar, wherein at least one of the iron compounds used as modifiers is an iron salt of an organic acid which is oxidized completely by chromic acid.

5,569,410

**AMMONIUM BICARBONATE/AMMONIUM CARBAMATE ACTIVATED BENZYL ALCOHOL PAINT STRIPPER**

John Distaso, Orange, Orange County, Calif., assignor to Elf Atochem North America, Inc., Philadelphia, Pa.

Filed Nov. 17, 1994, Ser. No. 340,919

Int. Cl.<sup>6</sup> C09D 9/00; 9/04; C11D 7/50

U.S. Cl. 510—202

14 Claims

1. In a paint stripping composition containing a water-in-oil emulsion which comprises (a) a continuous organic phase containing a predominant amount of benzyl alcohol, an emulsifying agent, a thickening agent and at least one corrosion inhibitor; and (b) a discrete water phase containing ammonia and a predominant amount of water wherein the improvement comprises the addition of a source of ammonia and carbon dioxide selected from the group consisting of ammonium carbamate, ammonium bicarbonate and ammonium carbonate acid carbonate and wherein benzyl alcohol is present in the composition in the composition in an amount of at least about 34% by weight of the composition and said source of ammonia and carbon dioxide is present in an amount of at least about 4% by weight of the composition.

5,569,411

**LIQUID HOUSEHOLD CLEANING COMPOSITION WITH INSECT REPELLENT**

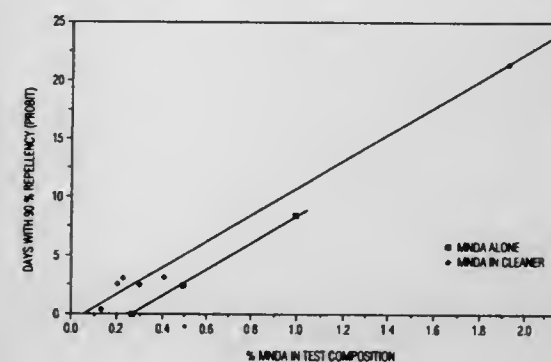
Robert J. Steltenkamp, Somerset; John H. Puckhaber, Jr., Flemington; Daniel Colodney, Hampton, and Thomas C. Hendrickson, South River, all of N.J., assignors to Colgate-Palmolive Co., New York, N.Y.

Continuation of Ser. No. 290,444, Aug. 15, 1994, abandoned, which is a continuation of Ser. No. 44,137, Apr. 8, 1993, abandoned, which is a continuation-in-part of Ser. No. 755,267, Sep. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 734,829, Jul. 24, 1991, abandoned, which is a continuation-in-part of Ser. No. 685,329, Apr. 15, 1991, Pat. No. 5,258,408, which is a continuation of Ser. No. 612,747, Nov. 13, 1990, Pat. No. 5,182,304, which is a continuation of Ser. No. 267,141, Nov. 4, 1988, Pat. No. 5,006,562, which is a continuation-in-part of Ser. No. 894,985, Aug. 8, 1986, abandoned, and Ser. No. 71,305, Jul. 16, 1987, Pat. No. 4,804,683. This application May 15, 1995, Ser. No. 441,163

Int. Cl.<sup>6</sup> A01N 25/00; C11D 1/00

U.S. Cl. 510—383

9 Claims



1. An aqueous liquid detergent composition for cleaning a household hard surface and for repelling insects therefrom comprising (i) a detergent proportion of a surface active detergent compound selected from the group consisting of anionic, nonionic, cationic and amphoteric detergent compounds and mixtures thereof; (ii) at least about 50%, by weight, water and; (iii) an effective amount of an insect repellent material selected from among N,N-diethyl-m-toluidide (DEET), 2-Hydroxyethyl-n-octyl sulfide (MGK 874), N-Octyl bicycloheptene dicarboximide (MGK 264), a mixture comprising MGK 264 and MGK 874 in combination, Hexahydrodibenzofuran carboxaldehyde (MGK 11), Di-n-propyl isocinchomerate (MGK 326), 2-Ethyl-1,3-bexanediol (Rutgers 612), 2-(n-butyl)- 2-ethyl-1,3-propanediol, Dimethyl phthalate, Dibutyl succinate (Tabutrex), Piperonyl butoxide and Pyrethrum, said effective amount of repellent material being sufficient to repel insects from such hard surface after application of the liquid detergent composition thereto, said liquid detergent composition being free of an insecticide.

5,569,412

**TIN OXIDE BASED CONDUCTIVE POWDERS AND COATINGS**

Thomas P. Feist, Hockessin, and Howard W. Jacobson, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 18, 1994, Ser. No. 292,895

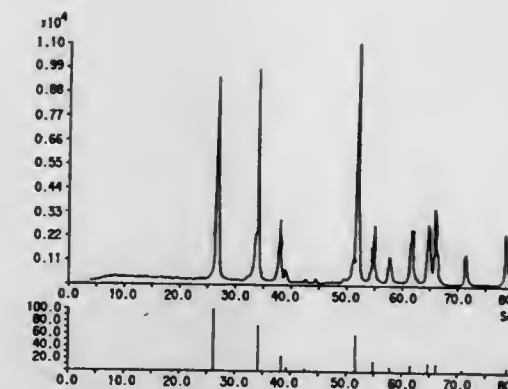
Int. Cl.<sup>6</sup> H01B 1/02; 1/08

U.S. Cl. 252—518

19 Claims

1. A method for making an electroconductive powder by a process comprising:

(1) preparing a first solution comprising at least one source of at least two members from the group consisting of tantalum, niobium or phosphorus, and a second solution comprising a tin source,



- (2) contacting the first and second solutions,
- (3) adding the mixed solution to water while maintaining pH at about 0 to about 7 by adding a basic solution, and stirring the aqueous mixture thereby precipitating a hydrous tin oxide,
- (4) heating the hydrous tin oxide to a temperature sufficient to form the electroconductive powder.

5,569,413

**ELECTROCONDUCTIVE MATERIAL AND PROCESS**  
Howard W. Jacobson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 218,874, Mar. 25, 1994, Pat. No. 5,476,613, which is a continuation of Ser. No. 905,980, Jun. 29, 1992, abandoned. This application Feb. 3, 1995, Ser. No. 382,816

Int. Cl.<sup>6</sup> H01B 1/00; 1/08; 1/22

U.S. Cl. 252—518

5 Claims



1. An electroconductive powder comprising agglomerates of crystallites which comprise a mixture of silica and an antimony-containing tin oxide, wherein the crystallites have an average diameter no greater than about 100 Angstroms, said mixture comprising about 1 to 20 wt % silica, about 80 to 99 wt % of an antimony-containing tin oxide, and wherein the antimony component of the tin oxide being between about 0.5 and 12.5 wt %, said mixture having a resistivity of less than about 2000 ohm-cm.

5,569,414

# METHOD OF MANUFACTURING ZINC OXIDE SINTERED COMPACT BODY

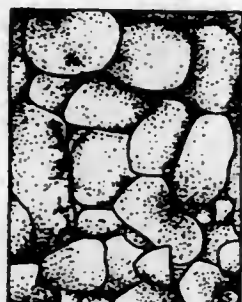
Masahiro Itoh, Atsushi Iga, and Hideyuki Okinaka, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 10, 1995, Ser. No. 513,543

Claims priority, application Japan, Aug. 29, 1994, 6-203988  
Int. Cl.<sup>6</sup> H01B 1/00; 1/08

U.S. Cl. 252—518

12 Claims



1. A method of manufacturing a zinc oxide sintered compact body comprising the step of burning a zinc oxide varistor composition comprising zinc oxide at 78 mol % or more, magnesium oxide at 0 to 20 mol %, bismuth oxide at 0.1 to 2 mol %, TiO<sub>2</sub> at 0.1 to 2 mol %, and antimony oxide (as Sb<sub>2</sub>O<sub>3</sub>) at 0.01 to 0.5 mol %, wherein said zinc oxide varistor composition is burned at the programming rate of 175° to 500° C./hr in the temperature range of from 650° to 950° C. to form a primary phase of a solid solution of zinc oxide spinel, and subsequently burned at the programming rate of 30° to 500° C./hr in the range of from 950° to 1300° C.

5,569,415

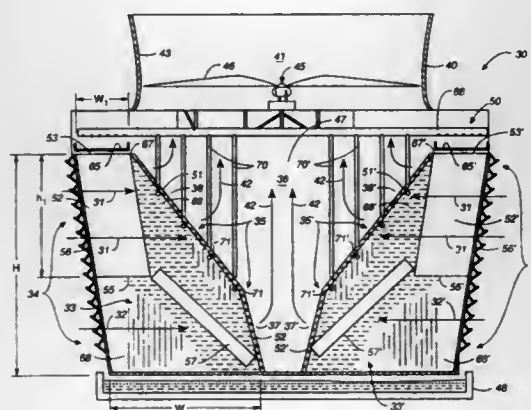
# CROSS-FLOW COOLING TOWER WITH REDUCED UPPER INBOARD FILL SECTION

Peter M. Phelps, 15 Buckeye Way, Kentfield, Calif. 94904  
Filed Sep. 18, 1995, Ser. No. 529,334

Int. Cl.<sup>6</sup> B01D 47/02

U.S. Cl. 261—23.1

30 Claims



1. A crossflow cooling tower assembly for contacting generally horizontally flowing gas in cooling relationship with generally vertically descending liquid, said tower assembly comprising:

a fill assembly having a gas inlet opening and a gas outlet opening enabling the flow of said gas, over substantially the entire vertical height of said fill assembly, from said gas inlet opening to said gas outlet opening and into an exhaust plenum chamber of said tower assembly;

said outlet opening being defined by a lower outlet portion having a principal dimension generally inclined at an angle of about 5° to 15° to the vertical, and an upper outlet portion having a principal dimension generally inclined at an angle of about 20° to 45° to the vertical, and beginning from a location proximal said lower outlet portion at about 1/3 to 2/3 the vertical height of the fill assembly; and

a vertical stack forming an exhaust port positioned vertically over said exhaust plenum chamber for exhaust of said gas in the generally vertical direction, and having an inner wall defining a dimension sufficient to extend said exhaust port substantially vertically over both the lower outlet portion and the upper outlet portion such that said inner wall extends to a location proximal an innermost upper portion of said fill assembly.

5,569,416

# APPARATUS FOR AERATING FISH PONDS AND LAKES

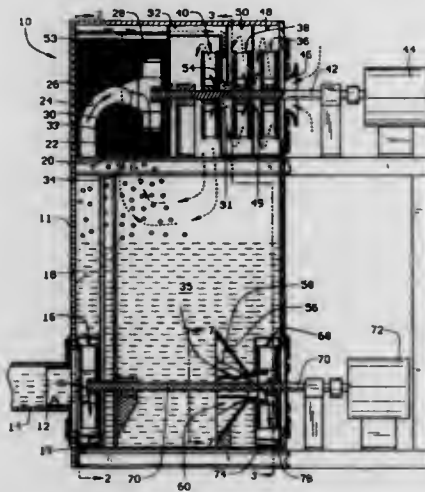
Billy G. Cross, 614 West Lake Washington Rd., Glen Allan, Miss. 38744

Filed Jan. 23, 1995, Ser. No. 376,236

Int. Cl.<sup>6</sup> B01D 47/16

U.S. Cl. 261—37

17 Claims



17. An apparatus for oxygenating water in a lake or pond, the apparatus comprising a housing defining an enclosed volume, a water intake conduit having an inlet for receiving water external to the housing and an outlet for delivering water to the enclosed volume so that water enters the housing through the intake conduit, a reservoir formed within the housing and having an aperture positioned to receive water discharged from the outlet of the water intake conduit with the water falling by the force of gravity from the outlet of the water intake conduit to the reservoir aperture, a water evacuating conduit having an inlet positioned to be in flow communication with water contained in the reservoir and an outlet for delivering water from the reservoir to the exterior of the housing, water atomizing means located within the housing and positioned relative to the outlet of the water intake conduit so that at least part of the water delivered therefrom must pass through the water atomizing means before gravitationally entering the reservoir to divide the water into subparts before entering the reservoir, and a gas intake conduit having an inlet for receiving gas external to the housing and an outlet for delivering gas to the enclosed volume between which gas enters the housing, the outlet of the gas conduit being in fluid communication with the water atomizing means to create a gas barrier through which the water subparts must pass before entering the reservoir.

5,569,417

# THERMOPLASTIC COMPOSITIONS COMPRISING FILLED, B-STAGED PITCH

Leonard S. Singer, Berea, and David T. Orient, Medina, both of Ohio, assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 141,219, Jan. 6, 1988, abandoned, which is a continuation-in-part of Ser. No. 40,301, Apr. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 755,775, Jul. 11, 1985, abandoned. This application Jul. 27, 1989, Ser. No. 386,803

Int. Cl.<sup>6</sup> C01B 31/00

U.S. Cl. 264—29.1

9 Claims

1. A method for making a filled thermoplastic pitch composition comprising the steps of:

- combining a particulate filler with a pitch and heating to provide a filled pitch mixture;
- heating said filled pitch mixture to polymerize and advance said pitch to a TMA deformation temperature of at least 400° C.

5,569,418

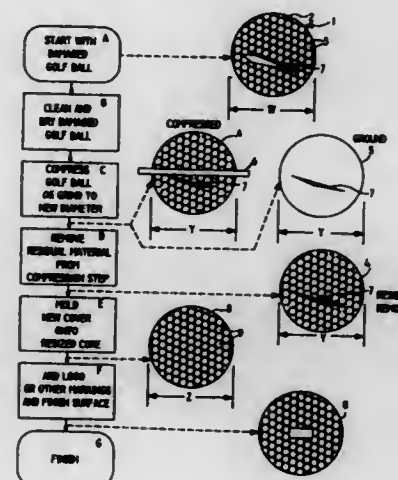
# METHOD FOR MAKING LIKE-NEW GOLF BALLS FROM RECLAIMED GOLF BALLS

Robert F. Russo, Sr., 16428 N. 66th St., Scottsdale, Ariz. 85254  
Division of Ser. No. 104,176, Aug. 9, 1993, Pat. No. 4,390,932, which is a continuation-in-part of Ser. No. 940,975, Sep. 4, 1992, abandoned. This application Feb. 15, 1995, Ser. No. 389,105

Int. Cl.<sup>6</sup> B32B 35/00

U.S. Cl. 264—36

6 Claims



1. A method for renewing an existing golf ball, said method comprising the steps of:

- providing an existing golf ball, said golf ball comprising a spherical inner solid elastomeric core having a first diameter, a separate elastomeric cover molded to said core, said cover having an outer spherical surface having a second diameter, and a plurality of dimples in said outer spherical surface,
- uniform surface grinding of said cover to remove a uniform spherical layer of said cover to provide an intermediate spherical ball having a third diameter greater than said first diameter and less than said second diameter, and then
- heat molding and bonding a new dimpled spherical cover around said intermediate ball, said spherical cover having a diameter substantially equal to said second diameter.

5,569,419

# CONTINUOUS FLOW PROCESS OF MOLD-MAKING OR DIE-MAKING USING A REUSABLE MIXTURE SUBSTANCE TO MAKE SELECTED FINISHED PRODUCTS

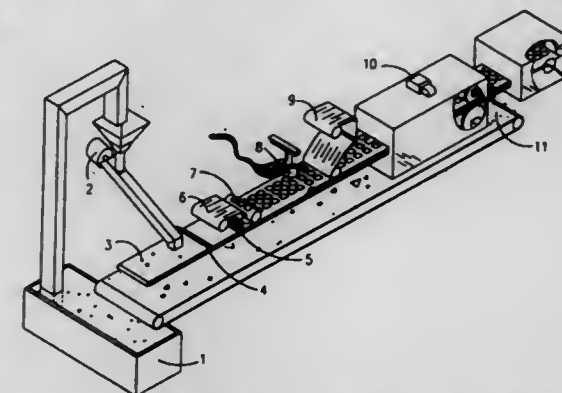
Stephen E. Brenot, R.R. 6, Box 114, Fergus Falls, Minn. 56537, and Arnold G. Althoff, 16870 Court Rd. 16, Hankinson, N. Dak. 58041, assignors to Stephen E. Brenot; Arnold G. Althoff, and Randy M. Schneider, all of Wahpeton, N. Dak.

Filed Aug. 12, 1994, Ser. No. 288,790

Int. Cl.<sup>6</sup> B29C 33/38; 33/68

U.S. Cl. 264—37

10 Claims



1. A continuous flow process of making molds or dies using a reusuable, bondable mixture substance to make finished products comprising the steps of:

- supplying said reusuable, bondable mixture substance;
- dispensing said bondable mixture substance onto a first conveyor belt;
- arranging said bondable mixture substance on said first conveyor belt;
- covering said bondable mixture substance with a first plastic sheet; making impressions in said bondable mixture substance and on said first plastic sheet to make said molds or dies;
- dispensing a liquified hardenable material onto said molds or dies;
- forming said finished products;
- separating said bondable mixture substance from said finished products; and
- reusing said bondable mixture substance to continue to make said molds or dies.

5,569,420

# METHOD OF FORMING A FOAM CORE COMPRISING A PLURALITY OF ARCuate ROWS

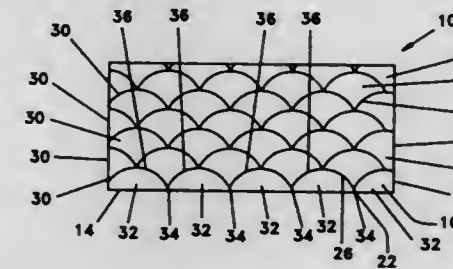
Bret L. Van Horne, 25252 Orellano Way, Laguna Hills, Calif. 92653

Filed Feb. 6, 1995, Ser. No. 384,138

Int. Cl.<sup>6</sup> B29C 44/06; 44/08

U.S. Cl. 264—46.4

11 Claims



1. A method of producing a plastic foam composition of matter comprising the steps of:

- preparing a first liquid plastic mixture that is capable of foaming to produce a first plastic foam composition of matter;



- (b) depositing on a generally planar surface said first liquid plastic mixture of step (a) in a form of a first row having essentially an arcuate top;
- (c) curing said first row of said first liquid plastic mixture of step (b) to produce a first row of foamed plastic having a first arcuate shell;
- (d) preparing a second liquid plastic mixture that is capable of foaming to produce a second plastic foam composition of matter;
- (e) depositing on said generally planar surface said second liquid plastic mixture of step (d) in a form of a second row juxtaposed to and in contact with said first arcuate shell of step (c);
- (f) curing said second row of said second liquid plastic mixture of step (e) to produce a second row of foamed plastic that is bound to said first row of step (c) and comprises a second arcuate shell that terminates in said first arcuate shell to form a first trough between said first arcuate shell and said second arcuate shell;
- (g) preparing a third liquid plastic mixture that is capable of foaming to produce a third plastic foam composition of matter;
- (h) depositing in said trough of step (f) said third liquid plastic mixture of step (g) in a form of a third row in contact with said first arcuate shell of step (c) and said second arcuate shell of step (f);
- (i) curing said third liquid plastic mixture of step (h) to produce a third row of foamed plastic that is bound to said first row of step (c) and to said second row of step (f) and comprises a third arcuate shell, and to further produce a plastic foam composition of matter comprising said second arcuate shell terminating in said first arcuate shell and said third arcuate shell terminating in said second arcuate shell and such that a vertical sectional view through said plastic foam composition of matter defines each of the first, second, and third arcuate shell as being convex.

5,569,421

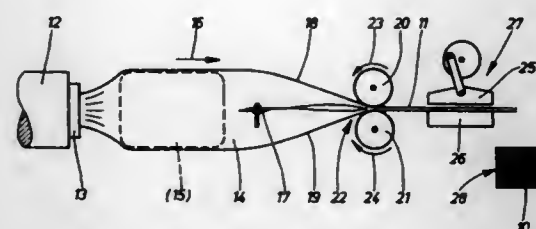
**PROCESS FOR THE PRODUCTION OF A FOLDABLE BLANK OF PLASTIC FOAM BY COLD FORMING**  
 Horst-Dittmar Grüne, Schwanewede, Germany, assignor to Lin Tec Verpackungstechnik GmbH, Ritterhude, Germany  
 Continuation of Ser. No. 620,941, Dec. 3, 1990, abandoned, which is a continuation-in-part of Ser. No. 199,651, May 27, 1988, abandoned. This application Nov. 18, 1993, Ser. No. 154,129

Claims priority, application Germany, May 30, 1987, 37 18 300.1

Int. Cl. B29C 44/20; 59/02

U.S. Cl. 264—51

13 Claims



1. A process for producing foldable blanks of plastic foam for forming cartons and insulations, comprising the steps of:  
 forming a web of material by extruding a foam film tube formed from plastic foam containing an expanding agent; cooling at least an inner side of said foam film tube by means of a cooling mandrel (15) located inside of said foam film tube; and, immediately after cooling of said web of material, with at least the most part of said expanding agent being still contained therein, embossing, by cold forming, folding or bending lines in said web of material.

5,569,422  
**METHOD OF MAKING PARTS OUT OF AN ALUMINA MATRIX COMPOSITE MATERIAL**

Jean-Pierre Astier, Pessac; Christian Bertone, Castelnau de Medoc, and Jean-Philippe Rocher, Le Haillan, all of France, assignors to Societe Europeenne de Propulsion, Suresnes, France

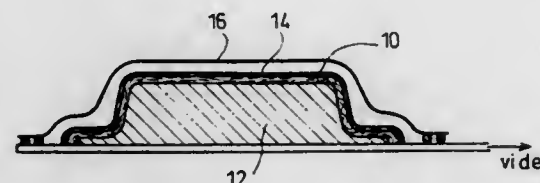
Continuation of Ser. No. 899,638, Jun. 16, 1992, abandoned.

This application Mar. 18, 1994, Ser. No. 210,646

Claims priority, application France, Jun. 17, 1991, 91 07393 Int. Cl. C04B 35/80

U.S. Cl. 264—60

6 Claims



1. A method of making a part of composite material comprising a fibrous reinforcing texture densified by an alumina matrix, the method comprising the steps of:  
 providing two-dimensional fibrous plies,  
 impregnating the two-dimensional fibrous plies with a fluid composition comprising a liquid precursor of alumina, alumina powder in suspension, and a thermoplastic resin, the fraction by weight of thermoplastic resin in the composition being greater than 5%,  
 draping and molding said impregnated plies,  
 heat treating the impregnated plies during molding to cause the thermoplastic resin to soften and bond together the impregnated plies, and  
 heat treating the molded plies to cause the precursor to be transformed into alumina and the resin to be pyrolyzed, whereby alumina resulting from the transformed precursor bonds the plies together to hold the part together mechanically.

5,569,423

**PROCESS FOR THE MANUFACTURE OF A SILICA FIBER BASED HEAT INSULATING MATERIAL**

Ludmila V. Belunova; Vladimir N. Gribkov; André I. Chernyak; Galina T. Milyurina; Oleg A. Mordovin, and Elena E. Mukhanova, all of Moscow, Russian Federation, assignors to Aerospaciale Societe Nationale Industrielle, Paris, France, and VIAM - All Russian Institut of Aviation Materials, Moscow, Russian Federation

Filed Feb. 17, 1995, Ser. No. 390,508

Claims priority, application France, Feb. 17, 1994, 94 01825 Int. Cl. B28B 1/26

U.S. Cl. 264—60

9 Claims

1. A process for the manufacture of a silica fiber based heat insulating material comprising:  
 (i) forming an aqueous suspension containing a fibrous ingredient, a binder, a substance containing boron as a sintering adjuvant and a surface-active agent;  
 (ii) molding, from said suspension, a green billet with partial removal of water; and  
 (iii) drying and firing the billet at high temperature, wherein:  
 the fibrous ingredient consists of quartz fiber formed by quartz spraying;  
 the fiber is pre-dispersed in water until there is formed a homogeneous flowing slurry from which is molded a green fibrous block, with simultaneous partial removal of water;

the green fibrous block is dispersed in water and mixed with an aqueous emulsion containing an organosilicon binder, a boron containing sintering adjuvant and a surface-active agent;  
 a green billet is molded from the suspension thus obtained, a portion of the water being removed by suction;  
 the green billet is compressed until a desired height is obtained and then it is dried, in the compressed state, at a temperature of up to 300° C.; and wherein  
 the billet is released from the pressure of compression and is fired at high temperature.

5,569,424

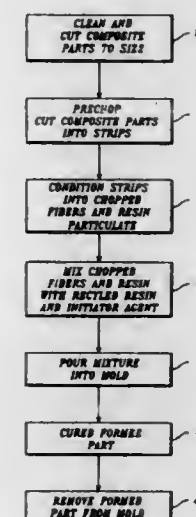
**METHOD AND APPARATUS FOR RECYCLING WASTE COMPOSITE MATERIAL**

William E. Amour, P.O. Box 741, Monroe, Wash. 98272  
 Filed Mar. 9, 1995, Ser. No. 401,419

Int. Cl. B29C 35/02

U.S. Cl. 264—115

23 Claims



1. A method of recycling waste hard composite materials formed of reinforcing fibers cured in a resin system into a recycled composite part comprising:  
 (a) reducing the cured hard composite materials into small strips of composite material;  
 (b) conditioning the strips of composite material with a rotating blade to form resin particulate and separate short loose reinforcing fibers;  
 (c) mixing the resin particulate and loose reinforcing fibers with an uncured resin to form a composite mixture;  
 (d) placing the composite mixture into a mold having a forming surface in the shape of the recycled composite part; and  
 (e) allowing the composite mixture to cure and form the recycled composite part.
8. An apparatus for conditioning waste composite materials into loose fibers and resin particulate for use in forming recycled composite parts, the apparatus comprising:  
 (a) a housing having an inlet through which waste composite materials are introduced and an outlet through which loose fibers and resin particulate exit the housing;  
 (b) a screen having a plurality of holes located within the housing; and  
 (c) a high-speed rotating blade mounted within the housing adjacent the screen so that waste composite material introduced through the inlet is contacted and conditioned by the blade to produce loose fibers and resin particulate that passes through the holes in the screen and out of the housing through the outlet.

5,569,425

**METHOD AND APPARATUS FOR MAKING FIBER-FILLED CUSHION**

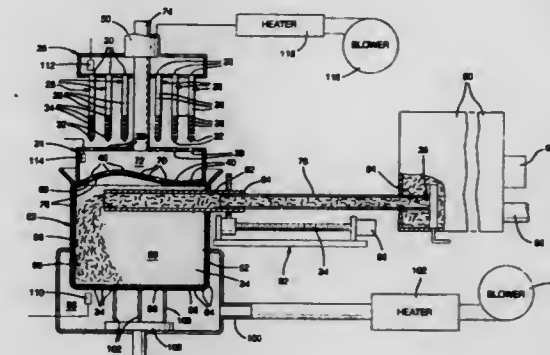
Prem P. Gill, Rochester Hills; Paul W. Chrenka, Shelby Township, and David W. Whitehead, Rochester Hills, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 18, 1995; Ser. No. 573,772

Int. Cl. B29C 35/04

U.S. Cl. 264—121

9 Claims



1. A method of molding a porous, breathable seat cushion having areas of varying thickness and/or density comprising the steps of:  
 a. dispensing a mixture of a polymeric matrix fiber having a first melting point and a polymeric bonding fiber having a second melting point lower than said first melting point into a mold having a cavity conforming substantially to the desired shape of said cushion;  
 b. closing said mold so as to compress said fibers in said mold cavity to a desired density;  
 c. piercing said mixture in said mold with a plurality of hollow, perforated ventilator spikes;  
 d. passing a heated gas through said ventilator spikes and said mixture for a time and at a temperature sufficient to soften said bonding fibers and unite them with said matrix fibers at their points of intersection;  
 e. passing a cooling gas through said mixture for a time and at a temperature sufficient to bond said bonding fibers to said matrix fibers such that said mixture retains said shape after said mold is opened; and  
 f. removing said cushion from said cavity.
4. Apparatus for molding and bonding a mixture of relatively high-melting point polymeric matrix fibers and relatively low-melting point polymeric bonding fibers together into a compressible, breathable cushion comprising:  
 a. a female mold member comprising a plurality of walls defining a mold cavity, at least one of said walls being gas-permeable;  
 b. at least one injector for dispensing said mixture into said cavity;  
 c. a source of said mixture connected to said injector for supplying said mixture to said injector;  
 d. a male mold member adapted for reciprocal movement into and out of said mold cavity for compressing said mixture in said cavity, said male mold member having a gas-permeable wall for shaping said cushion in said cavity;  
 e. a plurality of ventilator spikes moveable into and out of said mold cavity, said ventilator spikes each comprising a tube having a first open end; a second closed end adapted to pierce said mixture in said cavity, and a plurality of apertures in said tube proximate said second end;  
 f. a gas plenum system contiguous said gas-permeable walls and said open ends of said ventilator spikes for providing gas to said mold cavity via said spikes for heating and/or cooling said mixture in said cavity;  
 g. a first blower communicating with said plenum system for moving said gas through said system and said mixture; and  
 h. a heater for heating said gas in said system to a temperature sufficient to soften said low-melting fibers and unite them to said high-melting fibers.

5,569,426

**METHOD OF PRODUCING LIGHTWEIGHT CEMENT BLOCKS**

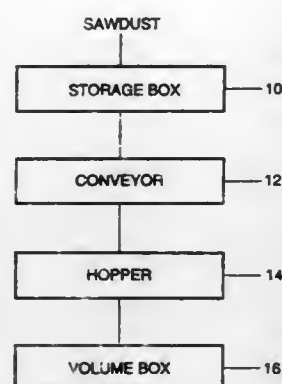
Frank X. Le Blanc, Dieppe, Canada, assignor to Enviro Products Ltd., Dieppe, Canada

Filed May 20, 1994, Ser. No. 246,444

Int. Cl.<sup>6</sup> B28C 7/04

U.S. Cl. 264—122

15 Claims



1. A method of producing a lightweight cement block, comprising the steps:
  - mixing three parts by volume sawdust with water to form a first mixture having a relative moisture content in the range of 40% to 44%, by volume;
  - adding one part by volume sand to the first mixture to form a second mixture;
  - mixing the second mixture with water until the relative moisture content of the second mixture is in the range of 40% to 44%, by volume;
  - adding one part by volume cement to the second mixture to form a third mixture;
  - mixing the third mixture with water until the relative moisture content is in the range of 40% to 44%, by volume;
  - forming the third mixture into a block.

5,569,427

**HIGH TEMPERATURE COATING ON CERAMIC SUBSTRATE AND NON-FIRING PROCESS FOR OBTAINING SAME**

Elena V. Semenova; Vladimir M. Tjurin; Stanislav S. Solntsev, and Alexei Y. Bersenev, all of Moscow, Russian Federation, assignors to Aerospaciale Societe Nationale Industrielle, Paris, France, and VIAM - All Russian Institut of Aviation Materials, Moscow, Russian Federation

Filed Mar. 16, 1995, Ser. No. 404,919

Claims priority, application France, Mar. 16, 1994, 94 03048

Int. Cl.<sup>6</sup> B29C 59/00; B05D 3/02

U.S. Cl. 264—129

3 Claims

1. A process for producing a low porosity, high temperature coating on a porous substrate based on ceramic fibers of refractory compounds, the coating comprising from 30.8 to 41.9 weight % of silica (SiO<sub>2</sub>) from a silica sol, from 30.2 to 49.4 weight % of alumina (Al<sub>2</sub>O<sub>3</sub>), from 4.0 to 16.3 weight % of silicon carbide (SiC), and from 11.6 to 16.6 weight % of molybdenum disilicide (MoSi<sub>2</sub>), and having an emissivity of not less than 0.8 and an operating temperature of up to 1500° C., the process is carried out without a firing step and comprises the steps of:
  - a) preparing a slurry comprising from 65 to 75 weight % of a silica sol having a content of 20 to 50 weight % of SiO<sub>2</sub> and from 25 to 35 weight % of a mixture of particles of the refractory compounds Al<sub>2</sub>O<sub>3</sub>, SiC, and MoSi<sub>2</sub>, the mixture having the following weight proportions:

Al <sub>2</sub> O <sub>3</sub> :	52 to 71%,
SiC:	6 to 28%, and
MoSi <sub>2</sub> :	20 to 25%;

- b) applying the slurry to the ceramic fiber based porous substrate to form a layer of the slurry on the substrate; and
- c) drying the layer in several steps, first at ambient temperature, then at a temperature of 90° to 100° C., and then at a temperature of 200° to 220° C. until a constant weight of the coated substrate is obtained.

5,569,428

**PROCESS FOR THE PREPARATION OF FIBERS OF SYNDIOTACTIC VINYLAROMATIC POLYMERS**

Stephen J. Nolan, Saginaw; Mark F. Sonnenschein, Midland; Craig J. Carriere, Midland; Brian G. Landes, Midland, and Robert P. Brentin, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 13, 1995, Ser. No. 403,026

Int. Cl.<sup>6</sup> D01D 5/16; D01F 6/22

U.S. Cl. 264—210.7

8 Claims

1. A process for the preparation of fibers of syndiotactic vinylaromatic polymers comprising:
  - A) heating the polymer to a temperature above its crystalline melting point;
  - B) extruding the molten polymer through a multiplicity of orifices in a spinnerette to form fibers;
  - C) drawing the fibers at a spin/draw ratio from 120:1 to 5000:1; and
  - D) cooling the fibers to ambient temperature.

5,569,429

**DYNAMIC SEAL AND SEALING METHOD**

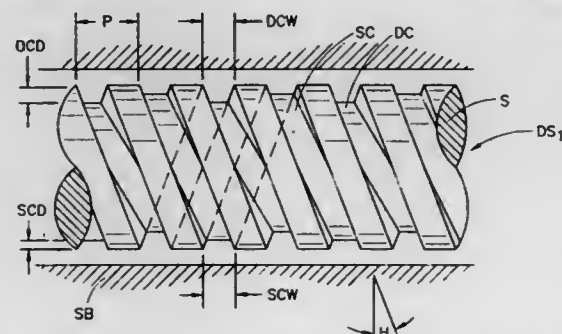
Keith Luker, Little Falls, N.J., assignor to Randcastle Extrusion Systems, Inc., Cedar Grove, N.J.

Filed May 5, 1995, Ser. No. 435,472

Int. Cl.<sup>6</sup> B29C 47/72; 47/92

U.S. Cl. 264—211.21

20 Claims



1. An apparatus for sealing a pressurized, flowable material to prevent flow of said material in a downstream direction, said apparatus comprising:
  - at least one rotatable part including at least two generally spiraling channels which are different from one another and have different material forwarding capabilities, said channels being oriented to urge said material in an upstream direction and prevent flow of said material to a position downstream of said channels;
  - a drive means attached to said at least one rotatable part to generate said different material forwarding capabilities in said channels; and
  - confining means adjacent said channels for confining at least a substantial portion of said material within said channels.
19. A method for sealing polymer against flow in a downstream direction, said method comprising the steps of:
  - providing at least one seal shaft sized to fit within a seal barrel;

- forming at least two different passageways adjacent one another between said at least one seal shaft and said seal barrel, said different passageways having different polymer forwarding capabilities;
- mounting said at least one seal shaft for rotational movement within said seal barrel; and
- causing said passageways to urge said polymer through said seal barrel in an upstream direction, thereby sealing polymer against flow to a position downstream of said passageways.

layers of structure of said object together to form said three-dimensional object from a plurality of adhered layers; and automatically separating said three-dimensional object from said body of medium.

5,569,432

**METHOD FOR MAKING A VIBRATION DAMPENER OF AN ELECTORRHEOLOGICAL MATERIAL**

Wendell C. Maciejewski, Salem, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

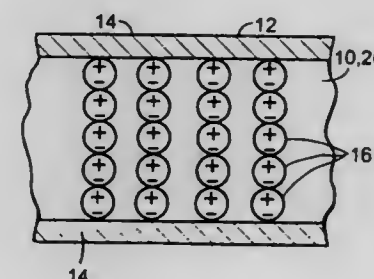
Division of Ser. No. 155,606, Nov. 22, 1993, Pat. No.

5,449,053. This application Apr. 14, 1995, Ser. No. 422,723

Int. Cl.<sup>6</sup> B29C 35/08

U.S. Cl. 264—439

3 Claims



1. Method for making a vibration dampener, said method comprising the steps of:
  - mixing a gelable fluid material with a second material having electrorheological response properties, to suspend said second material in said fluid material;
  - pouring the resulting mix into a mold, said mold being at least in part electrically conductive;
  - placing said mold under a vacuum;
  - applying electrical current flow through the mix in the mold to electrically align and pseudo-bond particles of said second material, thereby to stiffen said fluid;
  - maintaining electrical power to said mold for at least 30 minutes while the fluid material is permitted to cure to a gel consistency in said mold for a plurality of hours, said particles maintaining their alignment during the curing of said fluid material in said mold after said application of electric power to said mix, and removing said material from said mold as a gel material with said aligned and pseudo-bonded particles embedded therein; and
  - cutting said material removed from said mold into smaller gel bodies, each for use as a vibration dampener.

5,569,433

**LEAD-FREE LOW MELTING SOLDER WITH IMPROVED MECHANICAL PROPERTIES**

Ho S. Chen, Lebanon; Sungho Jin, Millington, and Mark T. McCormack, Summit, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Nov. 8, 1994, Ser. No. 335,619

Int. Cl.<sup>6</sup> C22C 13/00; 12/00

U.S. Cl. 420—557

2 Claims

1. A Pb-free solder alloy consists essentially of, by weight percent 40–60% Sn, about 0.25–0.5% Ag and the remainder Bi;

5,569,430

**METHOD OF MAKING A ROOFING MEMBRANE**

Brian Callaway, Moore, and Morris D. Moore, III, Spartanburg, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 199,585, Feb. 22, 1994, Pat. No.

5,474,838. This application Mar. 13, 1995, Ser. No. 403,171

Int. Cl.<sup>6</sup> B32B 31/04

U.S. Cl. 264—258

1 Claim

1. The method of manufacturing a roofing membrane comprising the steps of: supplying a non-woven fiberglass scrim fabric, tricot stitching a non-woven polyester mat to the scrim fabric with a textured polyester yarn and saturating the stitched fabric with a bituminous material to provide a roof membrane.

5,569,431

**METHOD AND APPARATUS FOR PRODUCTION OF THREE-DIMENSIONAL OBJECTS BY STEREOLITHOGRAPHY**

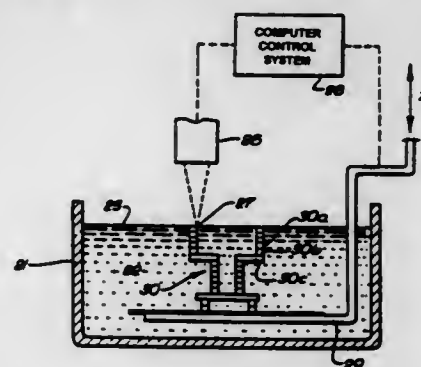
Charles W. Hull, Arcadia, Calif., assignor to 3D Systems, Inc., Valencia, Calif.

Continuation of Ser. No. 299,878, Sep. 1, 1994, abandoned, which is a division of Ser. No. 967,303, Oct. 20, 1992, Pat. No. 5,344,298, which is a continuation of Ser. No. 749,125, Aug. 23, 1991, Pat. No. 5,174,943, which is a continuation of Ser. No. 637,999, Jan. 4, 1991, abandoned, which is a continuation of Ser. No. 493,498, Mar. 14, 1990, abandoned, which is a division of Ser. No. 340,894, Apr. 19, 1989, Pat. No. 4,929,402, which is a continuation of Ser. No. 161,346, Feb. 19, 1988, abandoned, which is a continuation of Ser. No. 792,979, Dec. 9, 1985, abandoned, which is a division of Ser. No. 638,905, Aug. 8, 1984, Pat. No. 4,575,330. This application Jun. 7, 1995, Ser. No. 484,749

Int. Cl.<sup>6</sup> B29C 35/08; 41/02

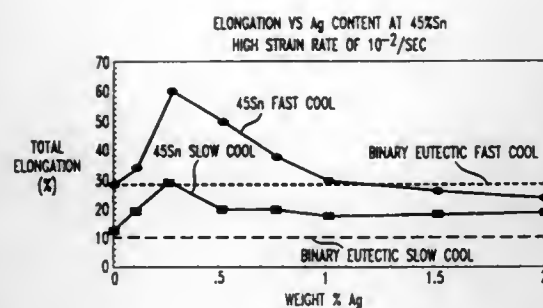
U.S. Cl. 264—401

8 Claims



2. A method of producing a three-dimensional object from a medium capable of solidification when subjected to synergistic stimulation, said method comprising the steps of:
  - providing a body of said medium;
  - forming successive layers of said medium adjacent to any previously formed cross-sectional layers of structure in preparation for forming successive cross-sectional layers of structure;
  - exposing said successive layers of medium to said synergistic stimulation to form and adhere successive cross-sectional





said solder alloy has a strain-rate ductility in tensile testing at a strain rate of  $10^{-2}$  sec $^{-1}$  which is at least 20% higher than that of a 58% Bi-42% Sn binary eutectic solder solidified at the same cooling rate.

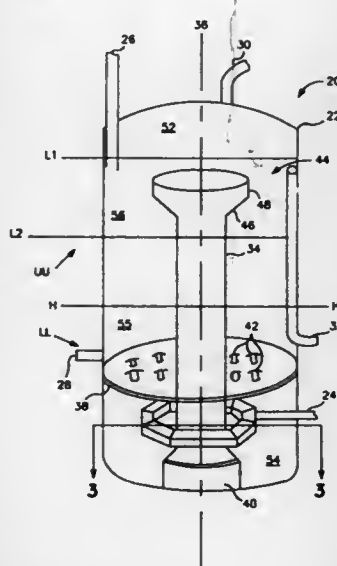
#### 5,569,434 HYDROCARBON PROCESSING APPARATUS AND METHOD

Narasimhan Devanathan, Aurora; Peter J. Klomans, Lockport, both of Ill.; William B. VanderHeyden, Los Alamos, N.M., and Robert D. Buttke, Houston, Tex., assignors to Amoco Corporation, Chicago, Ill.

Filed Oct. 10, 1994, Ser. No. 321,211  
Int. Cl.<sup>6</sup> B01J 8/18

U.S. Cl. 422-140

17 Claims



1. A hydrotreating reactor comprising:  
a reactor vessel having a generally vertical axis of symmetry and upper and lower reactor half portions;  
recirculation means for recirculating a partially reacted liquid feedstock mixture within the reactor vessel;  
feedstock sparger means separate from said recirculation means and located within the lower reactor half portion for discharging feedstock into the vessel in at least two separate reactor locations through at least two sparger discharge apertures; and  
baffle means for reducing the magnitude of an undesired momentum component of feedstock discharged from the sparger means, the baffle means located such that discharged feedstock impinges on the baffle means.

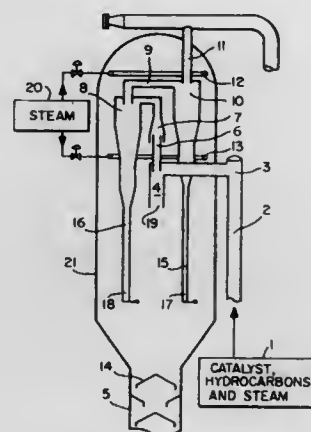
#### 5,569,435 SYSTEM TO SEPARATE SUSPENSIONS OF CATALYST PARTICLES AND REACTED MIXTURE OF HYDROCARBONS

Jose M. Fusco, Niteroi; Jose Geraldo F. Ramos, Rio de Janeiro; Valmor N. Vieira, Sao Mateus do Sul, and Eduardo Cardoso de Melo Guerra, Petropolis, all of Brazil, assignors to Petroleo Brasileiro S.A. - Petrobras, Rio de Janeiro, Brazil  
Filed Sep. 13, 1994, Ser. No. 305,399

Claims priority, application Brazil, Sep. 13, 1993, 9303773  
Int. Cl.<sup>6</sup> F27B 15/08; B01D 47/00

U.S. Cl. 422-147

5 Claims



1. A system for separating a suspension of catalyst particles and a reacted mixture of hydrocarbons in a catalytic cracking process comprising a separator vessel, a diplegless cyclone mounted in said vessel and provided with inlet means for receiving said suspension, said diplegless cyclone having an open lower end disposed in communication with an interior of said separator vessel, at least one additional cyclone mounted in said separator vessel and first and second pipes connected to said diplegless cyclone and said at least one additional cyclone respectively and disposed in overlapping spaced apart concentric relation to define an opening in communication with said interior of said vessel.

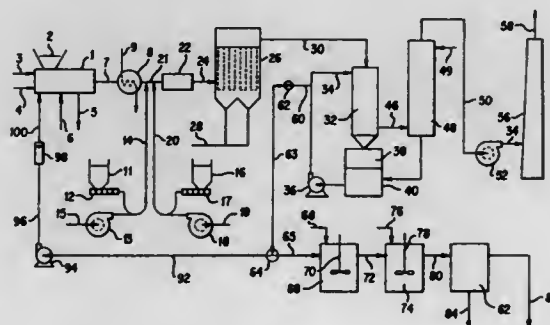
#### 5,569,436 REMOVAL OF MERCURY AND CADMIUM AND THEIR COMPOUNDS FROM INCINERATOR FLUE GASES

Bernard J. Lerner, Pittsburgh, Pa., assignor to Beco Engineering Company, Oakmont, Pa.

Continuation of Ser. No. 73,940, Jun. 10, 1993, abandoned.  
This application Mar. 20, 1995, Ser. No. 406,518  
Int. Cl.<sup>6</sup> B01D 50/00; C01B 7/00

U.S. Cl. 422-170

12 Claims



1. Apparatus for minimizing the environmental release of acid gas and toxic metal compounds in the exhaust gases from an incinerator, said apparatus comprising:

incinerator means having inlet means for introducing toxic-metal containing wastes to said incinerator and outlet means for discharge of exhaust gases,  
gas-cooling means communicating with said incinerator outlet means having an inlet means for receiving exhaust gases and an outlet means,

a first gas-treating means communicating with said gas-cooling outlet means for contacting said gas with substantially dry, finely-divided alkaline solids, a second gas treating means communicating with said gas-cooling outlet means for contacting gases with substantially dry, finely-divided high surface area sorbent,

solids separation means for removal of dry solids and fly ash particulate having an inlet means and an outlet means;  
conduit means communicating with said gas-cooling outlet means for passing gases contacted with said alkaline solids and high surface area sorbent to said inlet means of said solids separation means for the removal of dry solids and fly ash particulate in said solids separation means;

said outlet means of said solid separation means communicating with a third gas treating means for incremental removal of the toxic metals and acid gas comprising a quench/wet scrubber means for dissolution of residual toxic metal compounds and acid gases, means for storing acid liquor draining from said quench/wet scrubber means, means for circulating acid liquor to said quench/wet scrubber means from said liquor storage means, means for withdrawal of an acid blowdown stream containing dissolved toxic metals from said circulation means for further treatment,

and tail-gas wet scrubber means communicating with an outlet means from said quench/wet scrubber means.

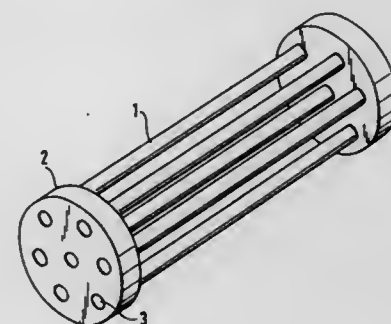
#### 5,569,437 OZONE GENERATING APPARATUS

Hans-Henrich Stiehl; Jurgen Schreckendiek, and Herbert Bestandig, all of Berlin, Germany, assignors to Sorbios Verfahrenstechnische Geräte und Systeme GmbH, Germany  
Filed Jan. 6, 1995, Ser. No. 369,715

Claims priority, application Germany, Jan. 7, 1994, 44 00 517.2

Int. Cl.<sup>6</sup> B01J 19/08  
U.S. Cl. 422-186.07

15 Claims

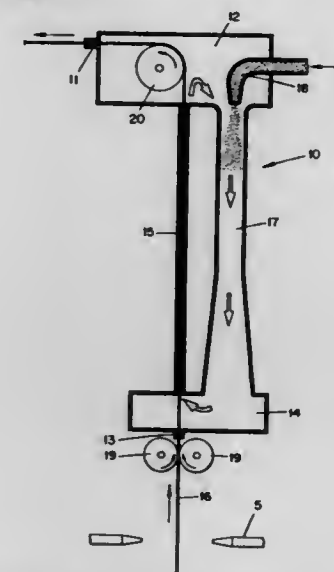


1. An apparatus for generating ozone comprising at least one ceramic tube forming a dielectric, a discharge electrode associated with the ceramic tube and connected to a high voltage supply and a counterelectrode, wherein at least one ceramic tube is cooled with a coolant and an oxygen-containing gas is passed proximate to the discharge electrode, the at least one ceramic tube is inserted in a ceramic molding and joined thereto with one of oxidic glass and ceramic solder and an encasing tube is embraced to the at least one ceramic tube and is sealed against the ceramic moldings.

#### 5,569,438 APPARATUS FOR STERILIZING A CONTINUOUS PACKAGING MATERIAL WEB

Anders Hilmersson, Lund, Sweden, assignor to Tetra Laval Holdings & Finance S.A., Pully, Switzerland  
Division of Ser. No. 115,787, Sep. 3, 1993, Pat. No. 5,424,034, which is a continuation of Ser. No. 913,054, Jul. 14, 1992, abandoned. This application Feb. 17, 1995, Ser. No. 390,503  
Claims priority, application Sweden, Jul. 17, 1991, 9102190  
Int. Cl.<sup>6</sup> A61L 2/06; B65B 55/06; F26B 3/04  
U.S. Cl. 422-293

13 Claims



1. An apparatus for treating, for purposes of sterilization, a continuous material web comprising:

a first treatment station including means for bringing a material web into contact with liquefied hydrogen peroxide; and

a second treatment station including means for simultaneously sterilizing the material web with hydrogen peroxide vapor and drying the material web with heated air after treatment of the material web in the first treatment station, the second treatment station including an elongate chamber having an inlet and outlet, the material web being dried and thereby generating hydrogen peroxide vapor as it is led through the elongate chamber from the inlet to the outlet,

an outer flow duct connecting the inlet and outlet of the elongate chamber for returning a circulating flow from the outlet to the inlet, and

means for supplying heated, hydrogen peroxide-free air into the outer flow duct such that hydrogen peroxide vapor generated by drying the material web and the heated air flows from the elongate chamber into the outer flow duct and mixes with the supplied heated, hydrogen peroxide-free air to form a mixture, and such that the mixture flows through the elongate chamber in the direction of movement of the material web.

#### 5,569,439 HEATLESS RESIN COATING SYSTEM AND METHOD

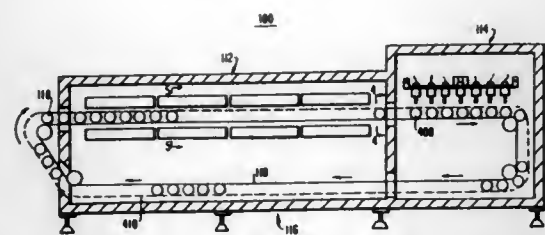
Giuseppe Cardini, and Alessandro Faraoni, both of Florence, Italy, assignors to Axis USA, Inc., Marlborough, Mass.  
Division of Ser. No. 50,832, Apr. 21, 1993, Pat. No. 5,443,643.  
This application Jun. 2, 1995, Ser. No. 458,380

Int. Cl.<sup>6</sup> B05D 3/02

28 Claims

1. A method for coating components in a resin coating system, said method comprising the steps of:

conveying components through said coating system on an endless conveyor;  
successively applying quantities of quick-hardening resin to uncoated components in a coating station so that said resin is gradually applied to said uncoated components;



passing components coated in said coating station through a gelification station to allow said resin to solidify; and exchanging coated components for uncoated components at a transfer station along said endless conveyor when (a) an uncoated component is available for transfer into said coating system and (b) further processing systems are ready to receive said coated component.

5,569,440

# PROCESS FOR THE REDUCTION OF CARBOCHLORINATION RESIDUE

James A. Sommers, Albany, Oreg., assignor to Teledyne Industries, Inc., Albany, Oreg.

Filed Sep. 14, 1994, Ser. No. 305,555  
Int. Cl.<sup>6</sup> C01G 25/00

U.S. Cl. 423—79

4 Claims

1. In a carbochlorination process for the production of volatile metal chlorides wherein chlorine gas contacts zirconium oxides in a reaction zone in the presence of carbon at elevated temperatures and builds up a carbochlorination residue containing carbon in the reaction zone, the improvement comprising reducing the volume of the carbochlorination residue in the reaction zone by periodically introducing, after the build up of a carbochlorination residue in the reaction zone, zirconium oxide or zircon into the reaction zone without introducing any carbon, to thereby react the carbon in the carbochlorination residue with the zirconium oxide or zircon.

5,569,441

# SYSTEM FOR ACCELERATING THE HEATING RATE OF A FIXED BED CATALYST BY SUPPLYING SUPPLEMENTAL ENERGY

Bernd Engler, White Plains, N.Y.; Egbert Lox, Hanau, and Andreas Niemann-Weber, Rheinfelden, both of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Germany

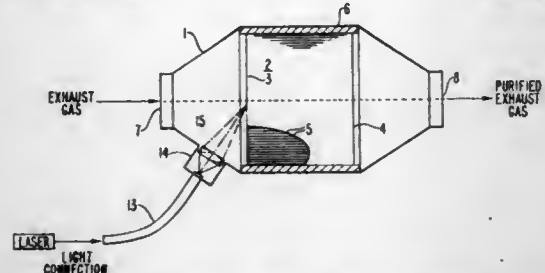
Filed Dec. 5, 1994, Ser. No. 341,198

Claims priority, application Germany, Dec. 4, 1993, 43 41 380.3

Int. Cl.<sup>6</sup> B01D 53/34; F01N 3/10

U.S. Cl. 423—212

10 Claims



1. The catalytic converter which provides enhanced emission conversion during start-up, said catalytic converter comprising: a gas tight housing having an inlet and an outlet; a catalyst carrier arranged within said housing between said inlet and said outlet such that exhaust gases pass through gas flow channels within said catalyst carrier, said catalyst carrier having a gas inlet area defined by a cross-section area of said gas flow channels; and

a supplemental energy delivery source connected to said housing in a spaced apart relationship to said gas inlet area for providing energy to a portion of said gas inlet area of the catalyst carrier less than the cross-sectional area of said gas inlet area in order to heat said portion to a light-off temperature of a catalyst embedded in said carrier; wherein said supplemental energy source is a laser and the light emitted by said laser is directed to said heated portion of said gas inlet area by at least one fiber optic guide and wherein said energy is delivered for a predetermined period during start-up.

5,569,442

# REACTIVE TRICALCIUM PHOSPHATE COMPOSITIONS AND USES

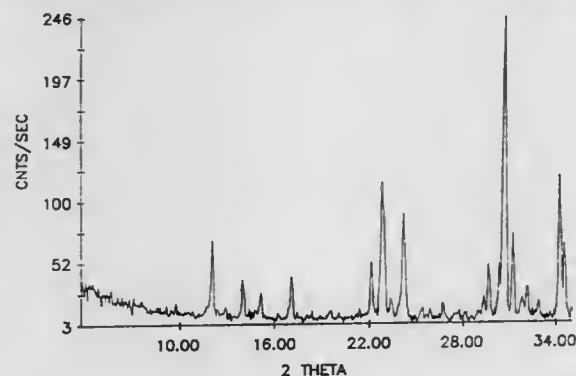
Mark Fulmer, San Jose; Brent R. Constantz, Los Gatos; Ira C. Ison, Campbell, and Bryan M. Barr, San Jose, all of Calif., assignors to Norian Corporation, Mountain View, Calif.

Filed Nov. 4, 1994, Ser. No. 334,519

Int. Cl.<sup>6</sup> C01B 25/32; C04B 12/02

U.S. Cl. 423—311

10 Claims



1. A method of preparing an  $\alpha$ -C<sub>3</sub>P product comprising: heating a tricalcium phosphate source to a first temperature sufficient to cause a substantially uniform transition to phase pure  $\alpha$ -C<sub>3</sub>P; and rapidly cooling said phase pure  $\alpha$ -C<sub>3</sub>P to a second temperature below about 700° C. in less than about 10 min.; whereby a room temperature stable, substantially phase pure  $\alpha$ -C<sub>3</sub>P product is produced.
4. A method of preparing an  $\alpha$ -C<sub>3</sub>P product comprising: heating a tricalcium phosphate source to a first temperature sufficient to cause a substantially uniform transition to phase pure  $\alpha$ -C<sub>3</sub>P; and temperature quenching said substantially phase pure  $\alpha$ -C<sub>3</sub>P to a second temperature between about 0° C. and 200° C.; whereby a room temperature stable, substantially phase pure  $\alpha$ -C<sub>3</sub>P is produced.
8. A room temperature stable, substantially phase pure  $\alpha$ -C<sub>3</sub>P product produced in accordance with the method of claim 4.

5,569,443

# METHOD FOR REMOVING HYDROGEN SULFIDE FROM A GAS USING POLYAMINO DISUCCINIC ACID

David A. Wilson, Richwood, and Druce K. Crump, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 342,391, Nov. 18, 1994. This application May 22, 1995, Ser. No. 445,837

Int. Cl.<sup>6</sup> B01D 53/52

U.S. Cl. 423—576.6

8 Claims

1. A process for removing H<sub>2</sub>S from a gas comprising contacting said gas with an aqueous solution having a pH from about 6 to about 10 to remove H<sub>2</sub>S wherein said solution contains at least one polyvalent metal chelate of a polyamino disuccinic acid.

5,569,444

# PROCESS OF OBTAINING A METAL HYDROXIDE POWDER AND POWDER OBTAINED BY THE PROCESS

Philippe Blanchard, 26, Chemin Lafon, 33160 St. Medard en Jalles, France, and Jean-Paul Klein, c/o Institut de Techniques Chimiques 6, rue Jean Massé, 69190 Saint Fons, France

Continuation of Ser. No. 6,198, Jan. 19, 1993, abandoned, which is a continuation of Ser. No. 772,420, Oct. 19, 1991, abandoned, which is a continuation-in-part of Ser. No. 612,158, Nov. 9, 1990, abandoned. This application Oct. 27, 1994, Ser. No. 330,034

Claims priority, application France, Jun. 18, 1990, 90 07583  
Int. Cl.<sup>6</sup> C01G 51/00; 53/00; 9/00; 11/00

U.S. Cl. 423—594

6 Claims

1. A process of preparing a metal hydroxide powder including primarily nickel hydroxide, for an electrode of an electrochemical cell having an alkaline electrolyte, the process comprising: introducing into a reactor, simultaneously and continuously;

- (a) a solution of nitrates or sulfates of nickel, of cobalt, and of cadmium and/or of zinc, the proportion of cobalt being between 1% and 8%, and the proportion of cadmium and/or zinc being about 3% to about 10%, by weight of the total metals present in the solution,
- (b) ammonium nitrate or an equivalent source of ammonium ions in an amount such that the ratio of ammonium ions to nickel ions of solution (a) is between about 0.3 and about 0.6, and
- (c) sodium hydroxide or an equivalent strong base in an amount such that the pH of the reaction medium is stabilized at a value of 9.2±0.1, the solution of nitrates or sulfates, the source of ammonium ions, and the strong base forming a mixture in the reactor; maintaining the temperature of the reactor at a value greater than about 80° C.; stirring the mixture in the reactor to form particles of precipitate; and filtering, washing, and drying the particles of precipitate obtained from the stirred mixture to obtain the metal hydroxide powder suitable for use directly as an active material in an alkaline storage cell.

5,569,445

# FINE ACICULAR ALPHA-FERRIC OXIDE AND PRODUCTION THEREOF

Yoshiaki Fukatsu, Fukushima; Shinji Nakahara, Osaka; Youichi Yamada, Fukushima; Hideji Yamamoto, Hiroshima; Tatsuya Hida, and Mizuo Wada, both of Hiroshima, all of Japan, assignors to Sakai Chemical Industry Co., Ltd., Osaka, Japan

Filed Dec. 29, 1994, Ser. No. 368,203

Claims priority, application Japan, Dec. 30, 1993, 5-355003; Feb. 14, 1994, 6-017586

Int. Cl.<sup>6</sup> C01G 49/02

U.S. Cl. 423—633

5 Claims

1. Fine acicular  $\alpha$ -ferric oxide which has a crystallite diameter ( $D_{10\text{height } 1}$ ) in the direction perpendicular to the (10 $\bar{1}$ 4) plane and a crystallite diameter ( $D_{11\text{height } 20}$ ) in the direction perpendicular to the (11 $\bar{2}$ 0) plane such that the ratio  $D_{10\text{height } 1}/D_{11\text{height } 20}$  is in the range of 1–2, and has a specific surface area in the range of 40–50 m<sup>2</sup>/g.

5,569,446

# RADIOHALOGENATION OF PROTEINS USING TRIHALOPHENYL DERIVATIVES

Marc Ogan, Somerset; Frank P. Tomasella, Englishtown, and Jan-I Tu, Lawrenceville, all of N.J., assignors to Bracco International B.V., Amsterdam

Division of Ser. No. 936,432, Aug. 27, 1992, Pat. No.

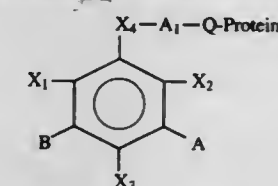
5,463,080. This application Jun. 6, 1995, Ser. No. 470,332

Int. Cl.<sup>6</sup> A61K 47/48; 43/00; 49/04; 49/02; 39/395

U.S. Cl. 424—1.49

10 Claims

1. A radiolabeled protein of the formula:



wherein X<sub>1</sub>, X<sub>2</sub> and X<sub>3</sub> are independently selected from halogen and where at least one of X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub> is a radiobalogen;

A<sub>1</sub> is a single bond or a C<sub>1-12</sub> alkyl spacer group;

Q is a functional group suitable for conjunction to a protein and has or lacks a leaving group;

A and B are independently hydrogen, —CH<sub>2</sub>—N—R<sub>2</sub>, —C—N—R<sub>2</sub> or —C—R<sub>3</sub> where

R<sub>1</sub> and R<sub>2</sub> are independently hydrogen, alkyl, hydroxyalkyl or acyloxyalkyl; and

R<sub>3</sub> is —OH, —O-alkyl, —O-hydroxyalkyl, O-alkoxyalkyl, O-aminoalkyl, —NH-hydroxyalkyl or —NH-carboxy alkyl.

10. A method for radiolabeling a protein comprising coupling a radiolabeled compound of claim 1 with a protein.

5,569,447

# STANNYLATED 3-QUINUCLIDINYL BENZILATES AND METHODS OF PREPARING RADIOHALOGENATED DERIVATIVES

Kan S. Lee, Rockville; Xiao-Shu He, Bethesda, both of Md., and Daniel R. Weinberger, Washington, D.C., assignors to The United States of America represented by the Secretary Department of Health and Human Services, Washington, D.C.

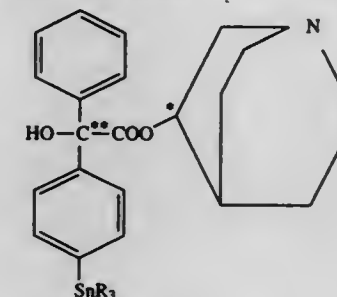
Filed Apr. 19, 1994, Ser. No. 229,837

Int. Cl.<sup>6</sup> A61K 51/04; C07D 453/02; A01N 43/90

U.S. Cl. 424—1.85

35 Claims

1. A compound of the formula



wherein R is selected from the group consisting of methyl, ethyl, propyl, butyl, and pentyl.



5,569,448

**SULFATED NONIONIC BLOCK COPOLYMER  
SURFACTANTS AS STABILIZER COATINGS FOR  
NANOPARTICLE COMPOSITIONS**

Sui-Ming Wong, Collegeville, Pa.; Ian M. Newington, Hazle-  
mere, England; Elaine M. Liversidge; Gregory L. McIntire,  
both of West Chester, Pa.; Alan R. Pitt, Sandridge, United  
Kingdom, and Jack M. Shaw, Aberdeen, Md., assignors to  
Nano Systems L.L.C., Collegeville, Pa.

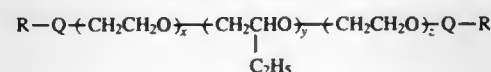
Filed Jan. 24, 1995, Ser. No. 378,022

Int. Cl.<sup>6</sup> A61K 9/14

U.S. Cl. 424—9.45

5 Claims

1. A composition comprised of nanoparticles containing a therapeutic or diagnostic agent having a surface modifier adsorbed on the surface thereof, wherein said composition is autoclavable and after autoclaving the nanoparticles have an average particle size of less than 500 nm, and wherein the surface modifier is a triblock copolymer having the structure



wherein Q is a sulfate group,  
R is H or a metal ion,  
x is 15–700,  
y is 5–200, and  
z is 15–700.

5,569,449

**GASEOUS MICROPARTICLES AS ULTRASOUND  
CONTRAST AGENTS**

Jo Klaveness, Oslo; Pål Rongved, Nesoddtangen, and Per  
Strande, Oslo, all of Norway, assignors to Nycomed Imaging  
AS, Oslo, Norway

Division of Ser. No. 146,115, Dec. 23, 1993. This application  
Jun. 5, 1995, Ser. No. 462,401

Claims priority, application United Kingdom, Jun. 3, 1991,  
9111890; Jul. 5, 1991, 9114570; Jan. 9, 1992, 9200409

Int. Cl.<sup>6</sup> A61K 49/00

U.S. Cl. 424—9.51

13 Claims

1. Ultrasound contrast agents in the form of microparticles comprising a biotolerable matrix in association with a gas or precursor thereof, the gas comprising SF<sub>6</sub> or a fluorinated low molecular weight hydrocarbon, in which the microparticles are stabilised by the presence of cross-linking groupings covalently attached to the matrix.

5,569,450

**AEROSOL FORMULATION CONTAINING AN ESTER-,  
AMIDE-, OR MERCAPTOESTER-DERIVED DISPERSING  
AID**

Daniel C. Duan, St. Paul; James S. Stefely, Woodbury; David  
W. Schultz, Pine Springs, and Chester L. Leach, Lake Elmo,  
all of Minn., assignors to Minnesota Mining And Manufac-  
turing Company, St. Paul, Minn.

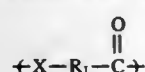
Continuation-in-part of Ser. No. 32,146, Mar. 17, 1993, aban-  
doned. This application Mar. 16, 1994, Ser. No. 213,555

Int. Cl.<sup>6</sup> A61L 9/04; A61K 31/74; C08G 63/02; 63/66

U.S. Cl. 424—45

42 Claims

1. A medicinal aerosol formulation, comprising:  
(i) a dispersing aid comprising a compound comprising a chain of units of the formula



wherein each R<sub>1</sub> is an independently selected organic moiety that links the —X— group to the carbonyl group, and X is —O—, —S—, or catenary nitrogen;

(ii) a propellant; and

(iii) a therapeutically effective amount of a particulate drug, wherein the formulation is readily redispersible and upon redispersion does not flocculate, cream, or settle so quickly as to prevent reproducible dosing of the drug.

5,569,451

**PHOTOPROTECTIVE/COSMETIC COMPOSITIONS  
COMPRISING TRIORGANOSILYLATED  
BENZOTRIAZOLES**

Hervé Richard, Villepinte; Madeleine Leduc, Paris, and Alain  
Lagrange, Couvray, all of France, assignors to L'Oreal,  
Paris, France

Filed Nov. 8, 1995, Ser. No. 555,334

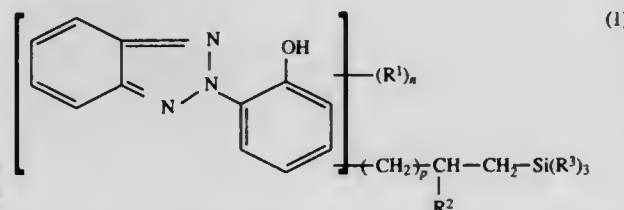
Claims priority, application France, Nov. 8, 1994, 94-13394

Int. Cl.<sup>6</sup> A61K 7/42; C07F 7/10; 7/08

U.S. Cl. 424—59

15 Claims

1. A triorganosilylated benzotriazole compound having the structural formula (1):



in which n is an integer ranging 0 to 3, inclusive; the radicals R<sup>1</sup>, which may be identical or different, are each a C<sub>1</sub>–C<sub>8</sub> alkyl radical; R<sup>2</sup> is a hydrogen atom or a C<sub>1</sub>–C<sub>4</sub> alkyl radical; the radicals R<sup>3</sup>, which may be identical or different, are each a C<sub>1</sub>–C<sub>8</sub> alkyl radical or a phenyl radical; and p is an integer ranging from 0 to 10, inclusive.

5,569,452

**PHARMACEUTICAL FORMULATION HAVING  
ENHANCED BILE ACID BINDING AFFINITY**

Gordon L. Amidon; Lizbeth B. Sherman, and John R. Crison,  
all of Ann Arbor, Mich., assignors to TSRL, Inc., Ann Arbor,  
Mich.

Continuation of Ser. No. 115,414, Aug. 31, 1993, abandoned.

This application May 30, 1995, Ser. No. 453,438

Int. Cl.<sup>6</sup> A61K 31/74; B29C 49/00

U.S. Cl. 424—78.1

16 Claims

1. A pharmaceutical formulation comprises a polymeric resin having bile acid binding properties selected from the group consisting of cholestyramine and colestipol in combination with at least one entrapped bile binding material for enhancing the bile acid binding affinity and/or capacity of the formulation.

5,569,453

Patent Not Issued For This Number

5,569,454

**METHODS OF TREATING INFECTION USING  
NATURAL KILLER STIMULATORY FACTOR**

Giorgio Trinchieri, Wynnewood; Bice Perussia, Philadelphia,  
both of Pa.; Steven C. Clark, Winchester, Mass.; Gordon G.  
Wong, Jamaica Plain, Mass.; Rodney Hewick, Lexington,  
Mass.; Michiko Kobayashi, Brookline, Mass., and Stanley F.  
Wolf, Arlington, Mass., assignors to Genetics Institute, Inc.,  
Cambridge, Mass.

Division of Ser. No. 584,941, Sep. 18, 1990, Pat. No. 5,457,038,  
which is a continuation-in-part of Ser. No. 307,817, Feb. 7,  
1989, abandoned, which is a continuation-in-part of Ser. No.  
269,945, Nov. 10, 1988, abandoned. This application Mar. 13,  
1995, Ser. No. 403,086

Int. Cl.<sup>6</sup> A61K 38/20; C07K 14/54

U.S. Cl. 424—85.2

4 Claims

1. A method for treating an infection comprising administering to a patient an effective amount of a composition comprising a pharmaceutically effective vehicle and natural killer cell stimulatory factor (NKSF), said factor comprising (1) a first subunit having an apparent molecular weight of approximately 40 kD under reducing conditions on SDS PAGE, and (2) a second subunit having an apparent molecular weight of approximately 30–35 kD under reducing conditions on SDS PAGE.

5,569,455

**EXHAUST GAS CATALYTIC PURIFIER CONSTRUCTION**

Isao Fukui, Uji; Masamitsu Takahashi, Hiroshima; Kazunori  
Ihara, deceased, late of Iwakuni, Japan; Hiroshi Murakami,  
Hiroshima; Tetsuhiro Tanaka, Hiroshima; Shinobu Miyaura,  
Hiroshima; Shinichi Kuroda, Ibaraki; Masahiro Hiraishi,  
Kyoto, and Koji Inoue, Ukyo-ku, all of Japan, assignors to  
Shimadzu Corporation, Kyoto, and Mazda Motor Corpora-  
tion, Hiroshima, both of Japan

Continuation of Ser. No. 73,432, Jun. 9, 1993, abandoned.

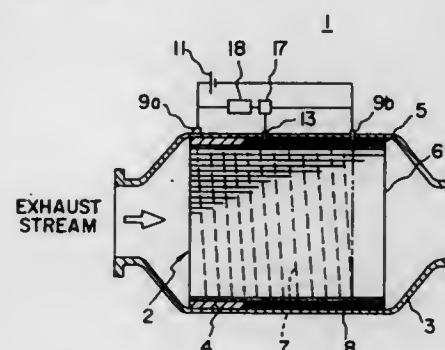
This application Jan. 3, 1995, Ser. No. 367,925

Claims priority, application Japan, Jun. 10, 1992, 4-177584;  
May 24, 1993, 5-121027; May 17, 1993, 5-139426

Int. Cl.<sup>6</sup> F01N 3/10

U.S. Cl. 422—174

22 Claims



1. A combination comprising:  
a source of exhaust gas containing noxious fumes;  
an exhaust gas catalytic purifier operatively associated with said source of said exhaust gas comprising:

- a housing containing:
  - a catalyst carrier;
  - a substantially uniform, electrically energizable bonding layer, in at least one form selected from the group consisting of a layer of gross structural crystals, a film of columnar shaped crystals, and an intermetallic compound,

wherein said bonding layer has been formed by chemical vapor deposition on said catalyst carrier,  
wherein said bonding layer is supported by said catalyst carrier,  
wherein said bonding layer has a heat capacity sufficient to generate heat upon being energized,

wherein said bonding layer has a substantially uniformly formed, sufficiently rough surface to firmly bond a catalyst layer thereto,

wherein said bonding layer comprises:

at least one carbide selected from the group consisting of tungsten carbide, molybdenum carbide, silicon carbide, and carbides of alloys of said metals, or  
at least one silicide selected from the group consisting of tungsten silicide, molybdenum silicide, tantalum silicide, titanium silicide, and silicides of alloys of said metals; and  
a catalyst layer disposed on and firmly bonded to said rough surface of said bonding layer disposed away from said catalyst carrier and supported by said catalyst carrier;  
means to energize said bonding layer which electromagnetic induction means comprising:

coil means disposed on a peripheral portion of said catalyst carrier, and  
high frequency generator means in operative contact with said coil means;

wherein said generator is sufficient to supply a current to said coil means of a frequency high enough to energize said bonding layer;

wherein said electromagnetic induction means is sufficient to generate heat which is sufficient to heat said catalyst to an operating temperature sufficient to cause the conversion of said noxious fumes and to thereby convert noxious fumes in said exhaust gas;

means to introduce said exhaust gas into operative association with said catalyst layer which has been heated by said energized bonding layer; and  
means to remove catalytically converted exhaust gas, containing less of said noxious fumes, from said purifier.

5,569,456

**BIOLOGICALLY ACTIVE RUPUNUNINES**

Conrad Gorinsky, c/o North Parade Chambers, 75 Banbury  
Road, Oxford, OX2 6PE, England

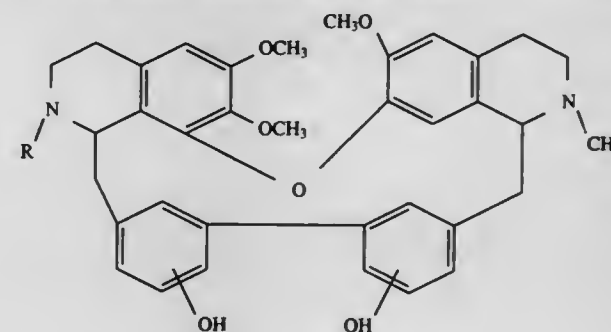
Filed Feb. 1, 1994, Ser. No. 189,781

Int. Cl.<sup>6</sup> A61K 35/78; 31/675

U.S. Cl. 424—195.1

2 Claims

1. A rupununine compound having the formula:



wherein R=H or —CH<sub>3</sub>.

5,569,457

**METHOD OF STIMULATING ANTIBODY FORMATION**

Austin L. Shug, 5322 Lighthouse Bay Dr., Madison, Wis.  
53704, and Stefan Gravenstein, 710 N. Meadow La., Madison,  
Wis. 53705

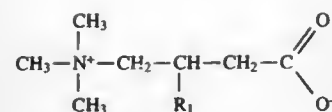
Filed Nov. 18, 1994, Ser. No. 341,758

Int. Cl.<sup>6</sup> A61K 31/205; 39/145

U.S. Cl. 424—278.1

16 Claims

1. A method for increasing antibody production in response to vaccine administration in an animal, comprising treating said animal with an effective amount of a compound of formula (I):



wherein R<sub>1</sub> is hydrogen or hydroxyl.

5,569,458

## NUTRITIONAL FORMULA

Mike Greenberg, 11633 San Vicente Bl. #214, Los Angeles, Calif. 90049

Filed Sep. 14, 1994, Ser. No. 306,001

Int. Cl.<sup>6</sup> A61K 35/78; 38/54; 38/44; 38/47

U.S. Cl. 424—195.1

1 Claim

1. In a capsule sized dietary supplement formulation comprising: at least one herb mixed into the nutrition formulation, and capable of increasing the rate of blood flow in the human body, the at least one herb being ginkgo biloba or capsicum; and

at least one digestive enzyme mixed into the nutrition formulation, and capable of increasing the rate of metabolism of the nutrition formulation in the human body, the at least one digestive enzyme being bromelain, pancreatin, papain, cellulase, lactase, chymotrypsin, or trypsin; and

at least one substance mixed into the nutrition formulation, and capable of balancing the chemical pH of the formulation as mixed with the at least one herb, and the at least one digestive enzyme, the at least one substance being goldenseal, dandelion or chamomile;

the at least one herb, at least one digestive enzyme, and the at least one pH balancing substance, together, making up not more than approximately 10% of the weight of the nutrition formulation.

5,569,459

PHARMACEUTICAL COMPOSITIONS FOR THE MANAGEMENT OF PREMENSTRUAL SYNDROME AND ALLEVIATION OF MENOPAUSAL DISORDERS

Mark Shlyankevich, Waterbury, Conn., assignor to Bio-Virus Research Incorporated, San Mateo, Calif.

Filed Feb. 15, 1995, Ser. No. 389,007

Int. Cl.<sup>6</sup> A61K 35/78

U.S. Cl. 424—195.1

10 Claims

1. A composition for controlling the stimulation of estrogen production, which comprises:

- 15 to 120 parts by weight of one or more phytoestrogen compounds calculated as a free aglycon form of isoflavone;
- up to 75 parts by weight of dried licorice root extract;
- 10 to 80 parts by weight of a sedative selected from the group consisting of Valerian root dry extract, passion flower dry extract, and Ginseng root powder;
- 10 to 50 parts by weight of beta-carotene;
- 15 to 200 parts by weight of pyridoxine hydrochloride;
- 12 to 50 parts by weight of Vitamin E;
- 100 to 600 parts by weight of calcium contained in a biologically acceptable calcium salt;
- 150 to 300 parts by weight of magnesium contained in a biologically acceptable magnesium salt;
- 10 to 100 parts by weight of zinc contained in a biologically acceptable zinc salt;
- up to 30 parts by weight of coumestrol; and
- up to 50 parts by weight of pantothenic acid; in admixture with a biologically acceptable inert carrier.

5,569,460

## SKIN-COLORING PREPARATION

Thekla Kurz, Gross-Zimmern; Sieglinde Stossel, Reinheim, and Andrea Spiller, Lemgo, all of Germany, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Germany

Filed Jun. 3, 1994, Ser. No. 254,003

Claims priority, application Germany, Jun. 4, 1993, 43 18 576.2

Int. Cl.<sup>6</sup> A61K 7/00; 7/021; 7/42

U.S. Cl. 424—401

17 Claims

1. In a skin-coloring composition comprising a compound having self-tanning properties which is dihydroxyacetone or methylglyoxal, and a cosmetologically acceptable carrier, the improvement wherein the composition contains at least one colorant which adheres to the skin, which is an eosin compound with at least one carbonyl group and at least one phenolic group with a hydrogen or metal atom which is not complexed intramolecularly by the carbonyl group.

5,569,461

TOPICAL ANTIMICROBIAL COMPOSITION AND METHOD

Jeffrey F. Andrews, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Feb. 7, 1995, Ser. No. 384,942

Int. Cl.<sup>6</sup> A61K 9/10

U.S. Cl. 424—405

7 Claims

1. A topical antimicrobial composition comprising effective amounts of:

- a primary antimicrobial component selected from the group consisting of propylene glycol monoesters of caprylic and capric acids and
- one or more secondary antimicrobial component(s) selected from the group consisting of propylene glycol monoesters of lauric, caprylic and capric acids, capric and caprylic acids, and
- a synergist selected from the group consisting of acidic chelating agents and food grade phenols and
- propylene glycol,
- surfactant, and
- a vehicle.

5,569,462

METHODS FOR ENHANCING VASCULARIZATION OF IMPLANT DEVICES

Laura A. Martinson; James H. Brauker, both of Lake Villa; Robert C. Johnson, Bartlett, and Thomas Loudovaris, Graylake, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Division of Ser. No. 126,540, Sep. 24, 1993, abandoned. This application Mar. 31, 1995, Ser. No. 414,061

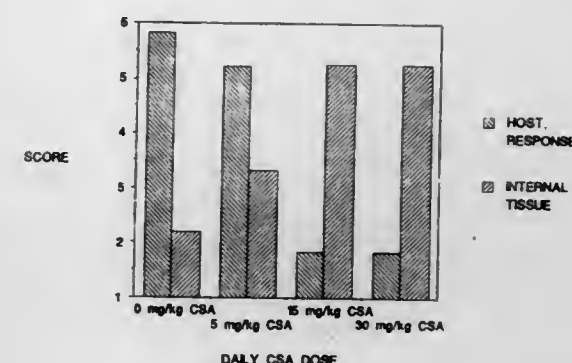
Int. Cl.<sup>6</sup> A61F 2/02; A61K 9/22; C12N 5/02

U.S. Cl. 424—424

14 Claims

1. A method for implanting cells in a patient, comprising the steps of:

- providing a population of viable cells;
- implanting into said patient an immunoisolation apparatus having structure defining a cell receiving chamber therein, said immunoisolation apparatus comprising an immunoisolation zone that immunisolates said cell receiving chamber;
- placing said population into said cell receiving chamber of said immunoisolation apparatus; and



(d) administering an immunomodulatory agent to said patient in an amount and for a time effective to enhance vascularization of said implanted apparatus.

5,569,463

## MEDICAL DEVICE POLYMER

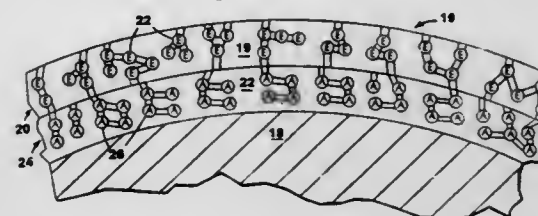
Michael N. Helmus, Worcester; M. Joshua Toloff, Brookline, and Carol L. Raleigh, Weston, all of Mass., assignors to Harbor Medical Devices, Inc., Jaffrey, N.H.

Division of Ser. No. 152,876, Nov. 15, 1993, Pat. No. 5,447,724, which is a continuation of Ser. No. 525,339, May 17, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 479,513

Int. Cl.<sup>6</sup> A61F 2/04; A61N 1/02; A61M 5/32

U.S. Cl. 424—426

13 Claims



1. A method for forming a medical device the function of which requires exposure to the tissue of a patient, comprising:

forming an internal polymer layer defining a reservoir for a therapeutic agent selected from the group consisting of anti-thrombotic agents, antiplatelet agents, prostaglandins, thrombolytic drugs, antiproliferative drugs, antirejection drugs, antimicrobial drugs, growth factors, and anticancer agents, that inhibits adverse reaction to the presence of the device, the internal polymer layer comprising a polymer selected from the group consisting of polyurethanes and its copolymers, silicone and its copolymers, ethylene vinylacetate, thermoplastic elastomers, polyvinylchloride, polyolefins, cellulose, polyamides, polytetrafluoroethylenes, polyesters, polycarbonates, polysulfones, acrylics, and acrylonitrile butadiene styrene copolymers, and,

forming a tissue-exposed overlying outer polymer metering layer supported by said internal polymer layer, said outer polymer metering layer having a stable, uniform, predetermined thickness covering the underlying reservoir so that no portion of the reservoir is directly exposed to body fluids, and incorporating a distribution of an elutable component which, upon exposure to body fluids, elutes from said outer polymer metering layer to form a predetermined porous network capable of exposing said therapeutic agent in said reservoir in said internal polymer layer to said body fluid, said elutable component being selected from the group consisting of polyethylene oxide, polyethylene glycol, polyethylene oxide/polypropylene oxide copolymers, polyhydroxyethylmethacrylate, polyvinylpyrrolidone, polyacrylamide and its

5,569,464

STABLE AQUEOUS DISPERSIONS CONTAINING LIPOSOMES

Kenji Endo, Fujisawa; Hidekazu Suzuki, Kanagawa-ken; Tsuru Oguma, Hadano, and Masayoshi Goto, Tokyo, all of Japan, assignors to Wakamoto Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 216,854, May 24, 1994, abandoned.

This application May 24, 1995, Ser. No. 448,972

Claims priority, application Japan, Apr. 2, 1993, 5-098367

Int. Cl.<sup>6</sup> A61K 9/127

U.S. Cl. 424—450

7 Claims

1. An aqueous dispersion containing liposomes comprising one or both of yolk lecithin and soybean lecithin as lipids for forming liposomes wherein the dispersion contains citric acid or a pharmaceutically acceptable salt thereof and one or more amino acids selected from the group consisting of methionine, histidine, arginine, glutamic acid, aspartic acid and pharmaceutically acceptable salts thereof, wherein said citric acid and amino acids or pharmaceutically acceptable salts thereof, if said particular amino acid or pharmaceutically acceptable salt thereof is present, are contained in the following parts by weight ranges wherein the part by weight of the amino acid salt refers to the amount by weight expressed in terms of the particular amino acid:

citric acid or a pharmaceutically acceptable salt is present in an amount ranging from 0.05 to 5 parts by weight based on a part by weight of the lipids used to form the liposomes and not more than 0.13 parts by weight of the aqueous dispersion containing liposomes in terms of citric acid;

histidine or pharmaceutically acceptable salts thereof, if present, is or are contained in an amount expressed in terms of histidine ranging from 0.0006 to 0.3 parts by weight based on one part by weight of the lipids used to form the liposomes and not more than 0.015 parts by weight based on one part by weight of the aqueous dispersion containing liposomes;

arginine or pharmaceutically acceptable salts thereof, if present, is or are contained in an amount expressed in terms of arginine, ranging from 0.02 to 4 parts by weight based on one part by weight of the lipids used to form liposomes and not more than 0.05 parts by weight based on one part by weight of the aqueous dispersion containing liposomes;

methionine or pharmaceutically acceptable salts thereof, if present, is or are contained in an amount ranging from 0.008 to 0.8 parts by weight based on one part by weight of the lipids and to make the liposomes and not more than 0.02 parts by weight based on one part by weight of the aqueous dispersion containing liposomes; and



wherein glutamic acid and aspartic acid or pharmaceutically acceptable salts thereof, if present, are contained in an amount by weight expressed in terms of glutamic acid and aspartic acid ranging from 0.015 to 3 parts by weight based on one part by weight of the lipids used to form the liposomes and not more than 0.08 parts by weight based on one part by weight of the aqueous dispersion containing liposomes; and wherein the amount of citric acid and the one or more amino acids or pharmaceutically acceptable salts thereof are sufficient to produce an aqueous dispersion containing liposomes which does not substantially change color during storage.

5,569,465

**AQUEOUS COSMETIC OR DERMO-PHARMACEUTICAL COMPOSITION CONTAINING IN SUSPENSION HYDRATED SPHEROIDS OF A HYDROPHILIC LIPIDIC SUBSTANCE**

Myriam Kauffmann, Lyons, France, assignor to L'Oreal, Paris, France

Continuation of Ser. No. 678,870, Apr. 4, 1991, Pat. No. 5,532,000. This application May 25, 1995, Ser. No. 450,083  
Claims priority, application France, Apr. 5, 1990, 90 04387  
Int. Cl.<sup>6</sup> A61K 9/127

U.S. Cl. 424—450

4 Claims

1. A process for preparing an aqueous composition for application to the skin, said composition having emollient and lubricating properties and comprising creamy spheroids in suspension in a continuous water-containing external phase, said phase comprising (a) water or a mixture of water and a hydroxylated organic solvent, said mixture containing at least 50 percent of water or (b) a gel, said gel containing a gelling agent present in an amount ranging from 0.02 to 70 percent by weight relative to the total weight of said composition, said creamy spheroids having an average particle diameter ranging from 100 to 5,000  $\mu$ m, said creamy spheroids resulting from the hydration of solid spheroids of a hydrophilic lipidic substance having a melting point greater than 20° C. and a hydration capacity such that said solid spheroids absorb 1.3 to 8 times their weight of water, and said hydrophilic lipidic substance being selected from the group consisting of:

- (1) a C<sub>12</sub>—C<sub>24</sub> fatty alcohol having a melting point between 20° and 80° C. and having a hydroxyl index ranging from 100 to 300,
- (2) a partial ester of a C<sub>12</sub>—C<sub>24</sub> fatty acid with a polyol or polyol oligomer, said partial ester having a melting point ranging from 20° to 80° C. and a hydroxyl index ranging from 50 to 500,
- (3) an oxyethylenated fatty body having 2 to 50 moles of ethylene oxide per mole of fatty body and having a melting point of 20° to 80° C.,
- (4) a product resulting from the alcoholysis reaction between a natural triglyceride and a polyoxethylenated glycol, having a melting point ranging from 20° to 80° C., and hydroxyl index ranging from 50 to 500,
- (5) a phospholipid and sphingolipid having a melting point ranging from 20° to 80° C., and hydroxyl index ranging from 50 to 500, and
- (6) an amphiphilic silicone having a melting point ranging from 20° to 80° C. and having 2 to 50 moles of ethylene oxide per mole of product,

said spheroids being present in an amount ranging from 0.1 to 50 percent by weight based on the total weight of said composition;

said process comprising incorporating in said continuous phase, solid spheroids of said hydrophilic lipidic substance, said spheroids being charged or not, so as to form a suspension

and submitting the resulting composition to a maturation step so as to cause hydration and swelling of said spheroids.

5,569,466

**FILL COMPOSITIONS FOR SOFT ELASTIC GEL CAPSULES**

Keith Tanner, Safety Harbor, Fla., assignor to R. P. Scherer Corporation, Troy, Mich.

Filed May 17, 1995, Ser. No. 446,891

Int. Cl.<sup>6</sup> A61K 9/48; 9/66; 9/64

U.S. Cl. 424—452

15 Claims

1. A dosage unit form comprising a biologically active agent dissolved or suspended in a carrier liquid encapsulated in a soft elastic gel capsule, wherein the carrier liquid comprises at least about 20% maltitol syrup.

5,569,467

**PROCESS FOR THE PREPARATION OF MICROBALLS AND MICROBALLS THUS OBTAINED**

Jean-Marc Ruiz, Vernouillet, France, assignor to Societe de Conseils de Recherches et d'Applications (S.C.R.A.S.), France

Continuation-in-part of Ser. No. 67,354, May 24, 1993, abandoned. This application May 16, 1994, Ser. No. 243,571

Claims priority, application United Kingdom, May 15, 1993, 9310030

Int. Cl.<sup>6</sup> A61K 9/14

U.S. Cl. 424—489

43 Claims

1. A method of preparing microballs, said method comprising the steps of:

- (a) stirring a mixture of a biocompatible polymer and an active ingredient in a solvent free liquid polymeric supporting phase, said biocompatible polymer and said active ingredient being separate components, said mixtures being stirred at a selected temperature above the glass transition temperature of the biocompatible polymer and below the temperature at which any one of the active ingredient, biocompatible polymer, and polymeric supporting phase degrades or vaporizes, said biocompatible polymer and said active ingredient being immiscible in said polymeric supporting phase;
- (b) continuing stirring for a period of time and at a shear rate that produces microballs of a desired average diameter;
- (c) cooling the mixture including the microballs, and
- (d) separate the microballs from the polymeric supporting phase.

5,569,468

**VACCINE DELIVERY SYSTEM FOR IMMUNIZATION, USING BIODEGRADABLE POLYMER MICROSPHERES**

Pankaj Modi, 1928 Main St. W. Apt. 608, Hamilton, Canada

Filed Feb. 17, 1994, Ser. No. 197,754

Int. Cl.<sup>6</sup> A61K 9/64; 9/58; 9/60

U.S. Cl. 424—491

28 Claims

1. A controlled release formulation comprising biodegradable polymer microspheres wherein an antigen is suspended in a polymer matrix, said polymer matrix being formed from at least two highly water soluble biodegradable polymers, and said microspheres being coated with a (d,l lactide-glycolide) copolymer.

5,569,469

**POORLY SOLUBLE MEDICAMENTS SUPPORTED ON POLYMER SUBSTANCES IN A FORM SUITABLE FOR INCREASING THEIR DISSOLVING RATE**

Mara L. Lovrelich, Trieste, Italy, assignor to Vectorpharma International, S.p.A., Trieste, Italy

Division of Ser. No. 952,474, Sep. 28, 1992, Pat. No. 5,225,192, which is a continuation of Ser. No. 421,943, Oct. 16, 1984, abandoned. This application Mar. 9, 1993, Ser. No. 28,214

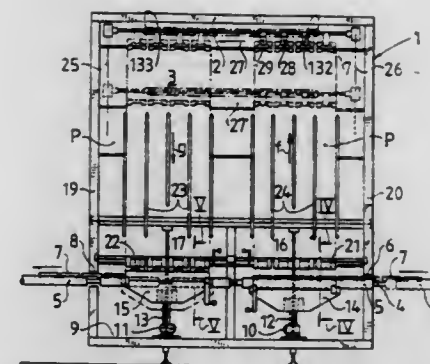
Int. Cl.<sup>6</sup> A61K 9/50; 9/22; 9/70; B05D 3/04

U.S. Cl. 424—501

5 Claims

1. A poorly soluble medicament supported on a polymer substance in a form capable of increasing the dissolving rate of said medicament, prepared by a method comprising:

- 1) bringing a medicament incorporated into particles of a crosslinked polymer which is swellable in water but insoluble in water by treating said polymer particles with a solution of said medicament in a non-aqueous organic solvent and drying, or by mixing said polymer particles with said medicament, heating to the medicament melting point, and then cooling at ambient temperature;
- 2) bringing the thus formed product into contact with a non-aqueous organic solvent, in gaseous or liquid form, which is capable of swelling said polymer, wherein said contact with said gaseous solvent is conducted for a period of time of between 0.5 and 48 hours, and wherein said contact with said non-aqueous organic liquid solvent is conducted for a period of time of between 1 minute and 96 hours; and
- 3) drying the product obtained in step 2) under vacuum to produce a medicament supported on a polymer substance wherein said medicament has been transformed from a metastable amorphous state to a stable high-energy crystalline state and is present in higher concentration in the surface layers of said polymer particles than in their inner layers.



- a) a housing having an entrance and an exit;
- b) means for moving the molds into the entrance, and for discharging the molds from the exit;
- c) stacking means for lifting and stacking the molds after entry into the housing;
- d) means for holding and releasing the lowest mold of the stacked molds in an ascending column in the housing;
- e) means for conveying the stacked molds upwardly from the stacking means along the ascending column to a carrier operative for horizontally conveying the molds to a top of a descending column in the housing;
- f) unstacking means for lowering and unstacking the molds along the descending column; and
- g) means for holding and releasing the lowest mold of the stacked molds in the descending column prior to discharge from the housing.

5,569,473

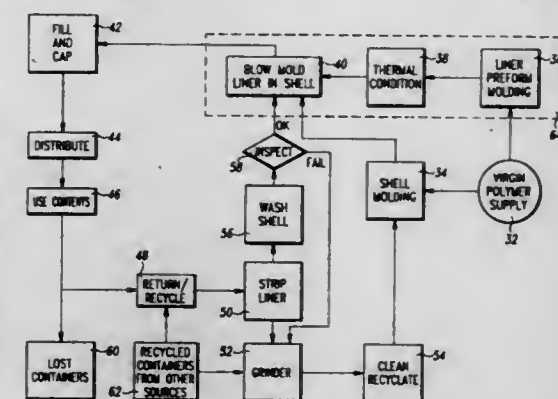
**APPARATUS FOR FORMING A RECYCLABLE LINED CONTAINER**

Stephen A. Bright, Troy, Ohio, assignor to Electra Form, Inc., Vandalia, Ohio

Filed May 23, 1995, Ser. No. 447,742  
Int. Cl.<sup>6</sup> B29C 49/22

U.S. Cl. 425—523

8 Claims



4. An apparatus for forming a recyclable container, the apparatus comprising
  - a cleaning assembly for sanitizing a previously used reusable shell,
  - a first station having a holding mechanism for positioning the shell,
  - a first moving mechanism for moving the shell from the cleaning assembly to the first station,
  - a second station for forming a liner preform by plastic injection molding,
  - a second moving mechanism for moving the liner preform to the first station to fit within the shell,
  - a blow forming assembly for expanding the liner preform within the shell to form a disposable liner so that the shell acts as a

5,569,470

Patent Not Issued For This Number

5,569,471

**MEDICINE FOR THE TREATMENT OF TUMOR**

Masao Oguro, 48, Ofunekura-machi, Sekiya, Niigata-shi, Japan

Filed Oct. 28, 1994, Ser. No. 328,774

Claims priority, application Japan, Oct. 29, 1993, 5-271769  
Int. Cl.<sup>6</sup> A61K 33/24; 31/70; 31/505; 31/445

U.S. Cl. 424—649

6 Claims

4. A method for treating tumors sensitive to treatment with the composition below, comprising administering to said patient an effective amount of an enhanced composition comprising effective amounts of 4-piperidino-piperidine or a physiologically acceptable salt thereof, and one or more antitumor components selected from the group consisting of 5-fluorouracil, methotrexate, adriamycin, cisplatin, vincristine, vindesine, aclacinomycin, daunomycin, mitoxantrone and etoposide.

5,569,472

**CONTINUOUSLY-OPERATING CHILLING CABINET FOR TREATING A MASS CONTAINED IN MOLDS**

Renzo Cerboni, Milan, Italy, assignor to Carte & Montanari S.p.A., Milan, Italy

Filed Dec. 5, 1994, Ser. No. 350,403

Claims priority, application Italy, Dec. 3, 1993, MI93A2549  
Int. Cl.<sup>6</sup> B29C 39/06; A23G 1/26

U.S. Cl. 425—404

7 Claims

1. A chilling cabinet for continuously chilling chocolate material contained in a plurality of molds, comprising:

mold defining the shape of the liner, the liner including a body portion contiguously situated in intimate contact with the shell, and  
a third station for ejecting a recyclable container formed by the combination of the liner and the shell.

5,569,474

# MOLD FOR INJECTION MOLDING OF PLASTICS USING THIN FILM ELECTRIC HEATER

Satoshi Kitaichi; Chiaki Nakamura; Michio Tanaka, and Atushi Fukuta, all of Moriguchi, Japan, assignors to Daiho Industrial Co., Ltd., Osaka, Japan

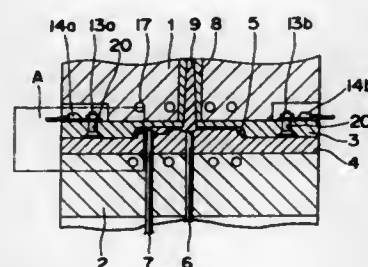
Filed Jun. 5, 1995, Ser. No. 462,790

Claims priority, application Japan, Jun. 6, 1994, 6-148630; Mar. 16, 1995, 7-86501

Int. Cl.<sup>6</sup> B29C 45/73

U.S. Cl. 425—547

5 Claims



1. A mold for injection molding of plastic material, said mold having a mold cavity defined by a wall surface, and further comprising:

- a thin film electric resistor formed directly on at least part of said wall surface;
- said thin film electric resistor having terminals to supply thereto electric power to thereby heat said wall surface;
- said thin film electric resistor having a surface resistivity  $r$  of a value defined by:

$$\frac{W_r}{\left(\frac{L}{D}\right)^2} \leq r \leq \frac{1}{W_r} \left(\frac{V_a}{L}\right)^2$$

wherein  $L$  is a length between said terminals as measured along said thin film electric resistor,  $D$  is length of said thin film electric resistor in a direction perpendicular to the direction between said terminals,  $V_a$  is a maximum value of allowable voltage applied between said terminals,  $I_a$  is a maximum value of allowable current flowing between said terminals, and  $W_r$  is an input power per unit area of said thin film electric resistor determined to obtain a desired rate of increase of temperature of said wall surface.

5,569,475

# INSULATOR FOR THERMOPLASTIC MOLDING NOZZLE ASSEMBLY

James O. Adas, Clinton Twp.; Fred W. Schroeder, Utica, and Fred Stell, Warren, all of Mich., assignors to D-M-E Company, Madison Heights, Mich.

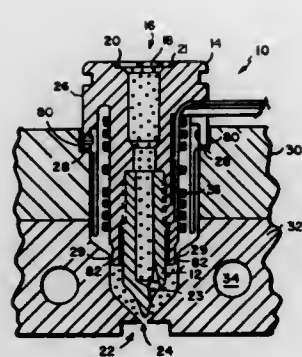
Continuation-in-part of Ser. No. 75,045, Jun. 10, 1993, abandoned. This application Nov. 22, 1994, Ser. No. 343,681

Int. Cl.<sup>6</sup> B29B 11/06; B05D 7/00

U.S. Cl. 425—549

22 Claims

- 1. A thermoplastic molding device comprising:
  - a mold having an opening;
  - a nozzle assembly within the opening, the nozzle assembly for receiving resin and for channeling resin to a cavity;



a thermal insulator formed as a layer on at least one of the nozzle assembly and mold for thermally insulating the mold and the nozzle assembly said insulator being formed only for the portions of contact therebetween; and  
a protective layer formed over the thermal insulator.

5,569,476

# INJECTION MOLDING MACHINE HAVING A ROTATABLE TURRET

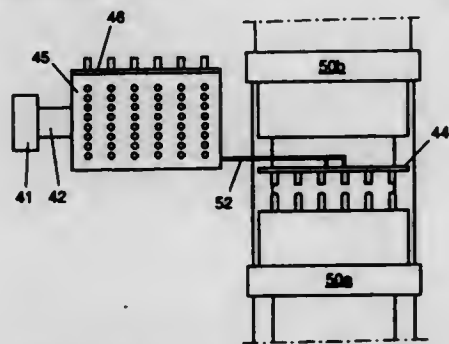
Dirk van Manen, and Hendrikus J. T. Albers, both of Dalen, Netherlands, assignors to Inter Tooling Services B.V., Emmen, Netherlands

Filed Apr. 10, 1995, Ser. No. 421,160

Int. Cl.<sup>6</sup> B29C 45/42

U.S. Cl. 425—556

14 Claims



1. An apparatus for injection moulding of synthetic products, comprising a die provided with a plurality of cavities, a discharge device and a robot device for receiving the products moulded in the cavities of the die and transferring said products to the discharge device, characterized in that the robot device comprises at least two receiving plates, each adapted to receive a number of moulded products equal to at least once the number of cavities of the die, and drive means for successively bringing each receiving plate into a receiving position next to the die, and for successively bringing each receiving plate from the receiving position into a take-away position inside the die and back again, in which take-away position the moulded products can be taken away from the die.

5,569,477

# CHEWING GUM CONTAINING VITAMINS OR OTHER ACTIVE MATERIALS

Regis J. Nesbitt, Ft. Thomas, Ky., assignor to McCready Consumer Products, Inc., Ft. Thomas, Ky.

Filed Apr. 28, 1995, Ser. No. 431,288

Int. Cl.<sup>6</sup> A23G 3/30

U.S. Cl. 426—5

20 Claims

- 1. A chewing gum comprising:
  - (a) a gum center comprising a water-insoluble gum base and a first active material that is water-soluble;

(b) a shell coated around said gum center, said shell comprising a second active material that is fat-soluble and is different from said first active material, wherein said first and second active materials are selected from the group consisting of vitamins and minerals.

5,569,478

# CLAMSHELL GRILL COOKING AND STAGING PROCESS

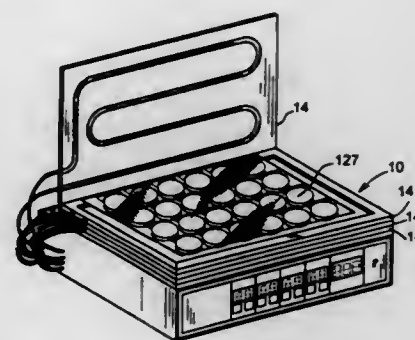
Benno E. Liebermann, 2805 Lime Kiln La., Louisville, Ky. 40222

Filed Apr. 19, 1994, Ser. No. 229,581

Int. Cl.<sup>6</sup> A23L 1/00

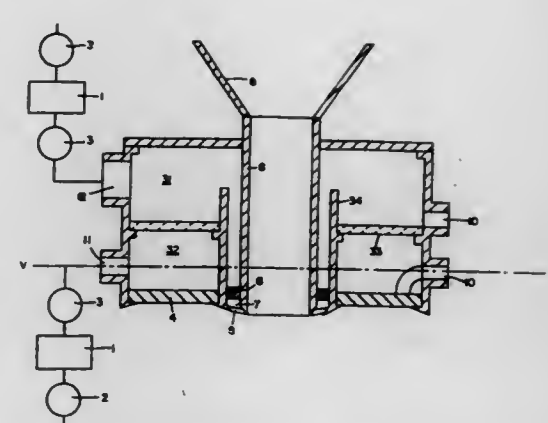
U.S. Cl. 426—232

20 Claims



1. A clamshell grill cooking and staging process for pathogenic risk management, comprising the steps of:

- placing at least one food article sealed within a heat conducting container between a first plate and a second plate of a clamshell cooking and staging grill, said first plate and said second plate being spaced apart equal distance and in alignment with one another, said first and second plate being hingedly mounted to a frame of said cooking and staging grill by a floating hinge;
- heating a heat transfer fluid contained within a reservoir of said clamshell cooking and staging grill to a selected temperature at less than 212° F., said heat transfer fluid in said reservoir being in fluid connection with said plates;
- controlling the selected temperature of said heat transfer fluid within said reservoir at  $\pm 2^\circ$  F.;
- recirculating said heat transfer fluid through said plates in fluid-connection with said reservoir;
- sensing the temperature of said heating fluid or said food article sealed within the heat conducting container for controlling the temperature thereof; and
- cooking said food article at a selected temperature for a selected period of time.



feeding a powder-form material to obtain a particulate material flow which extends and travels in a direction along a longitudinal axis, feeding steam through a sintered plate so that a flow of steam issues from the plate coaxially about the particulate material flow and in the direction of the longitudinal travel of the particulate flow and feeding a flow of a gas coaxially about and positioned between the particulate material flow and the steam flow so that the particulate material is contacted with steam to wet and agglomerate the particulate material of the particulate material flow.

5,569,480

# STARCH COMPOSITION

Valere L. M. P. De Coninck, Zelzate, and Freddy M. L. van der Schueren, Aalst, both of Belgium, assignors to Cerestar Holding B.V., Sas van Gent, Netherlands

Filed Mar. 30, 1995, Ser. No. 413,406

Claims priority, application United Kingdom, Apr. 5, 1994, 9406639

Int. Cl.<sup>6</sup> A23L 1/0522

U.S. Cl. 426—573

14 Claims

- 1. A composition suitable for use as a replacement for gum arabic, said composition comprising a mixture of 75.0 to 99.9% by weight of a thinned, hydroxypropyl tapioca starch and 25 to 0.1% by weight of enzymatically hydrolysed collagen.

5,569,481

# PROCESS FOR PRODUCING FLAKE STYLE FOOD

Hideyuki Takeda, Ootemachi, Japan, assignor to Maruha Corporation, Tokyo, Japan

Filed May 18, 1995, Ser. No. 443,490

Claims priority, application Japan, Sep. 19, 1994, 6-223067

Int. Cl.<sup>6</sup> A23L 1/311; 1/314

U.S. Cl. 426—574

5 Claims

- 1. A process for producing a flake style food which comprises adding a dehydrated vegetable and a polysaccharide thickener to a seasoning solution, emulsifying the obtained mixture by stirring at a high speed of from 1,000 to 10,000 rpm within a temperature range of from 10° to 80° C. for 1 to 10 minutes and mixing the emulsified product thus obtained with one or more of fish meat, poultry meat or cattle meat which is in the form of flakes.

5,569,479

# PROCESS FOR AGGLOMERATING POWDER-FORM MATERIALS

Hanspeter Maier, Moerfelden, and Klaus Zimmermann, Kornwestheim, both of Germany, assignors to Nestec S.A., Vevey, Switzerland

Division of Ser. No. 102,853, Aug. 6, 1993, Pat. No. 5,400,972, which is a continuation of Ser. No. 678,115, Apr. 1, 1991, abandoned. This application Feb. 14, 1995, Ser. No. 388,362

Claims priority, application European Pat. Off., May 18, 1990, 90109504

Int. Cl.<sup>6</sup> A23F 3/32; 5/12; 5/38; A23B 9/08

U.S. Cl. 426—453

17 Claims

- 1. A process for agglomerating a particulate material comprising:



5,569,482

**PROCESS FOR PRODUCING EDIBLE PROTEINACEOUS FILM**

Mitsuo Nagi; Shuitsu Kirihara; Yoshinori Tokugawa; Fumiaki Tsuda, all of Hiroshima; Toshiaki Saito, Sakai, and Motohiko Hirotsuka, Kaizuka, all of Japan, assignors to Fuji Oil Company, Limited, Osaka-fu, Japan

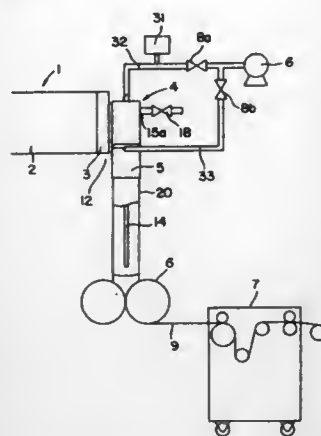
Filed Sep. 28, 1994, Ser. No. 313,879

Claims priority, application Japan, Oct. 1, 1993, 5-246822

Int. Cl.<sup>6</sup> A23J 1/00

U.S. Cl. 426—656

9 Claims



1. A process for producing an edible proteinaceous film which comprises:

- kneading and heating a raw material containing water and protein with an extruder to produce a melted raw material;
- extruding the melted raw material through a circular opening provided in a die to produce a tubular extrudate, said die being provided with a cooling jacket at the outer periphery of the circular opening which cools the die to a temperature lower than the temperature at which water in the tubular extrudate expands in the atmosphere;
- holding the tubular extrudate with a take-off means composed of rollers provided downstream of and apart from the die to define a closed space inside the tubular extrudate between the die and the take-off means;
- providing gas at a pressure above atmospheric pressure to the closed space inside the tubular extrudate, while exhausting the gas therefrom; and
- receiving the tubular extrudate as it is extruded from the die with the take-off means.

5,569,483

**DEGRADED POLYSACCHARIDE DERIVATIVES**

Maritta Timonen, Helsinki, Finland; ChoKyun Rha, Boston, Mass.; Timo Vaara, Helsinki, Finland; Lindsey Bagley, Berkshire, England; Sarah Bosdet, Berkshire, England; Michael Lindley, Berkshire, England; Tarja Lahtinen, Helsinki, Finland; Marja Turunen, Helsinki, Finland, and Martti Vaara, Helsinki, Finland, assignors to Alko Group Ltd., Helsinki, Finland

Continuation of Ser. No. 743,152, Aug. 9, 1991, Pat. No. 5,366,755, which is a continuation-in-part of Ser. No. 309,387, Feb. 10, 1989, abandoned, Ser. No. 370,629, Jun. 23, 1989, abandoned, Ser. No. 730,029, Jul. 12, 1991, abandoned, Ser. No. 464,291, Jan. 12, 1990, abandoned, and Ser. No. 565,346, Aug. 10, 1990, abandoned. This application Jun. 7, 1994, Ser. No. 255,181

Int. Cl.<sup>6</sup> A23G 3/00

U.S. Cl. 426—658

19 Claims

1. An enzymatically degraded product of a cellulose derivative comprising of a mixture of oligomers of the cellulose derivative, a majority of said oligomers having an average degree of polymerization of between about 5 and about 100.

5,569,484

**PROCESS FOR PRODUCING A FLAT ACTIVE SUBSTANCE ADMINISTRATION FORM**

Walter Müller, Neuwied, and Dieter Anhäuser, Melsbach, both of Germany, assignors to LTS Lohmann Therapie-Systeme GmbH & Co. KG, Neuwied, Germany

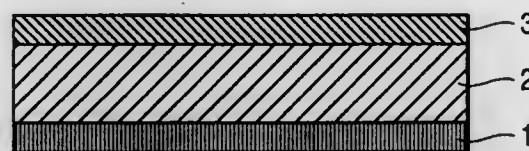
Filed May 19, 1995, Ser. No. 397,167

Claims priority, application Germany, Sep. 12, 1992, 42 30 589.6

Int. Cl.<sup>6</sup> A01N 25/00; A61J 13/00

U.S. Cl. 427—2.14

15 Claims



1. A process for the production of a flat administration form having a drug portion capable of being dosed or of a flat-shaped device for the dosable release of volatile substances to the ambient air by using a high-volatile or thermolabile dosing medium in liquid or semisolid state as ingredients of the administration form or of the flat-shaped device, said process comprising:

- providing a reservoir containing a flowable preparation of the dosing medium;
- providing a reciprocable printing plate having a dose-receiving cavity therein;
- knife-coating a measured amount of the dosing medium from the reservoir into the dose-receiving cavity by maintaining the reservoir in a fixed position and reciprocating the printing plate between a first position in which the reservoir is non-aligned with the dose-receiving cavity and a second position in which the reservoir is aligned with the dose-receiving cavity to fill the dose-receiving cavity with the measured amount of the dosing medium;
- guiding a tensioned web-shaped material along a travel path to a dosing station, the dose-receiving cavity of the printing plate being aligned under the web-shaped material at the dosing station when the printing plate is in said first position; and
- intermittently pressing a mechanical device against the web-shaped material to press the web-shaped material into the filled dose-receiving cavity when the filled dose-receiving cavity of the printing plate is aligned under the web-shaped material, whereby the web-shaped material takes up the dosing medium from the dose-receiving cavity of the printing block.

5,569,485

**METHOD FOR THE MANUFACTURE OF A RADIOGRAPHIC INTENSIFYING SCREEN WITH ANTISTAT**

John C. Dahlquist, Maplewood, and Subodh K. Kulkarni, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 7, 1994, Ser. No. 319,812

Int. Cl.<sup>6</sup> B05D 3/06

U.S. Cl. 427—65

2 Claims

1. A process for preparing a phosphor screen comprising the steps of:

- a) mixing particulate phosphors with a polymerizable binder composition to form a polymerizable mixture,
- b) coating said polymerizable mixture onto a substrate,
- c) polymerizing said polymerizable mixture, wherein the said polymerizable binder composition comprises less than 5% by weight of the total weight of said polymerizable binder composition of non-curable organic materials having a molecular weight less than 500, and
- d) securing an protective topcoat onto said phosphor screen, said protective topcoat containing an antistatic agent.

5,569,486

**ELECTROLUMINESCENCE ELEMENT AND PROCESS FOR FABRICATING SAME**

Masayuki Katayama, Handa; Atsushi Mizutani, Aichi; Yutaka Hattori, Okazaki, and Nobuei Ito, Chiryu, all of Japan, assignors to Nippondenso Co., Ltd, Kariya, and Research Development Corporation of Japan, Tokyo, both of Japan

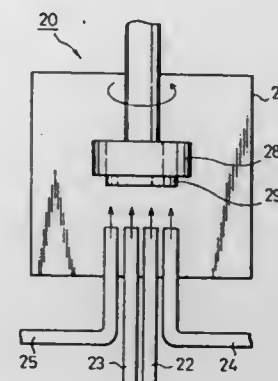
Filed Dec. 23, 1993, Ser. No. 172,219

Claims priority, application Japan, Dec. 25, 1992, 4-359405; Mar. 15, 1993, 5-081397

Int. Cl.<sup>6</sup> B05D 5/06

U.S. Cl. 427—66

11 Claims



1. A process for fabricating an electroluminescence element comprising an insulating substrate, a first electrode, a first insulating layer, a luminescent layer having at least one side constructed and arranged for allowing light to pass out of the electroluminescence element, a second insulating layer, and a second electrode in this order in a stack, and components on the at least one side of the luminescent layer being optically transparent, in which the luminescent layer is of a compound semiconductor containing a rare earth element, comprising the steps of:

- supplying at least one source gas containing at least one component of a luminescent center element to the vicinity of the insulating substrate;
- separately supplying a hydrogen chloride gas to the vicinity of the insulating substrate;
- preventing direct contact between the at least one source gas and the hydrogen chloride gas until the gases reach the vicinity of the insulating substrate for deposition;
- reacting the at least one source gas and the hydrogen chloride gas to form the compound semiconductor; and
- depositing the compound semiconductor.

5,569,487

**CAPACITOR DIELECTRICS OF SILICON-DOPED AMORPHOUS HYDROGENATED CARBON**

Michael W. DeVre, Scotia, and Steven M. Gasworth, Glenville, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 23, 1995, Ser. No. 376,564

Int. Cl.<sup>6</sup> B05D 5/12; 3/06; H05H 1/24

U.S. Cl. 427—81

11 Claims

1. A method for fabricating a capacitor which comprises providing a first conductive layer; depositing a dielectric layer on said conductive layer, said dielectric layer being of silicon-doped amorphous hydrogenated carbon having a silicon content of about 1-2 atomic percent; and depositing a second conductive layer on said dielectric layer.

5,569,488

**METHOD OF MAKING MULTI-DIELECTRIC LAMINATES**

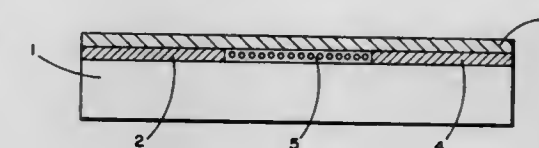
John C. Frankosky, Wilmington, Del., assignor to Arlon, Inc., Maitland, Fla.

Division of Ser. No. 508,803, Apr. 12, 1990, abandoned. This application Oct. 28, 1994, Ser. No. 330,531

Int. Cl.<sup>6</sup> H05K 1/16

U.S. Cl. 427—96

9 Claims



1. A method of assembling a multi-dielectric laminate comprising the steps of:  
providing a ground plane;  
bonding a first dielectric material of a given dielectric constant and a second dielectric material of another given dielectric constant onto the ground plane having a boundary therebetween; and  
bonding a common conductor over said dielectric materials to provide a constant impedance over the boundary between the two dielectric materials.

5,569,489

**MACHINE AND METHOD OF MAKING A FILTER**

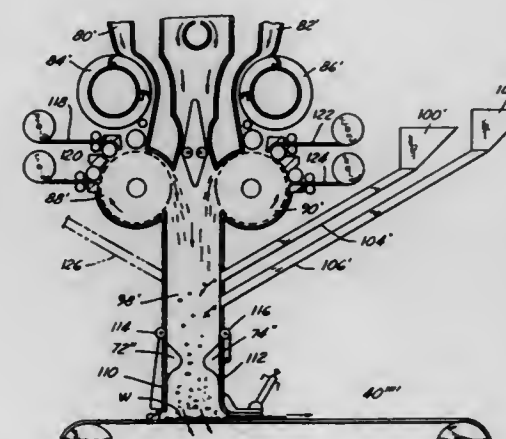
James W. Kasmark, Jr., 38267 Fern Hill, Mt. Clemens, Mich. 48044

Filed Jun. 6, 1995, Ser. No. 466,485

Int. Cl.<sup>6</sup> B05D 1/36; 5/00

U.S. Cl. 427—202

31 Claims



10. A method of making a thin bed filter comprising the steps of:  
combining sorbent particles with an adhesive;  
introducing fibers into a moving air stream;  
introducing the sorbent particles and adhesive into the air stream containing the fibers at an area downstream from the point at which the fibers are introduced;  
mixing the sorbent particles and adhesive with the fibers in the air stream;  
condensing the fibers and sorbent particles and adhesive in the air stream into a web; and  
treating the adhesive within the web to cause the sorbent particles to be retained in the web.

5,569,490

**TETRACALCIUM PHOSPHATE-BASED MATERIALS AND PROCESSES FOR THEIR PREPARATION**

Akitoshi Imura, Sakai; Toru Saito, Takatsuki, and Shiro Ikegami, Ibaragi, all of Japan, assignors to Osaka Cement Co., Ltd., Osaka, Japan

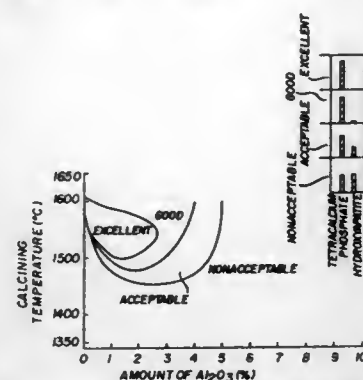
Division of Ser. No. 360,330, Dec. 21, 1994, which is a division of Ser. No. 74,154, Jun. 9, 1993, Pat. No. 5,409,982, which is a division of Ser. No. 728,683, Jul. 12, 1991, abandoned. This application Jun. 2, 1995, Ser. No. 458,713

Claims priority, application Japan, Jul. 27, 1990, 2-200071; Sep. 28, 1990, 2-262903

Int. Cl.<sup>6</sup> B05D 7/00

U.S. Cl. 427-212

10 Claims



1. A process for preparing tetracalcium phosphate particles, the process comprising the steps of (1) sintering or fusing a powder mixture at a temperature of not lower than 1,400° C., the mixture comprising a powder of calcium source and a powder of phosphorus source in a Ca/P molar ratio of 2:1, and about 0.005 to about 5 parts of an aluminum compound, calculated as Al<sub>2</sub>O<sub>3</sub>, per 100 parts of tetracalcium phosphate to be produced in terms of the theoretical amount, and (2) finely dividing the obtained product.

5,569,491

**METHOD AND APPARATUS FOR COATING STRIP ARTICLE UP TO STRIP EDGE**

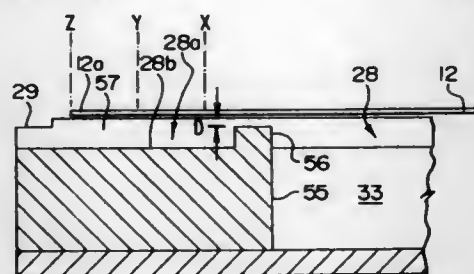
Robert A. Innes, Kingston, and Gary J. Smith, Glenburnie, both of Canada, assignors to Alcan International Limited, Montreal, Canada

Continuation-in-part of Ser. No. 68,990, May 27, 1993. This application Nov. 23, 1994, Ser. No. 344,568

Int. Cl.<sup>6</sup> B05D 3/12; B05C 3/02

U.S. Cl. 427-284

8 Claims



6. A method of extrusion coating a strip article with a liquid coating material, comprising:

extruding a liquid coating material having a viscosity greater than 30 centipoise from an interior channel in an elongated coating head through an elongated slot onto a surface of a strip article advancing past said slot; and contacting extruded coating material with a surface of said coating head to form a layer of coating material of desired thickness on said strip article;

wherein said surface has an edge region adjacent to a lateral edge of said strip article and wherein said edge region is coated substantially completely to said edge by advancing

said edge region past a longitudinal extension of said slot fed with coating material from said interior channel only through a constricted opening that restricts leakage of said coating material from said slot extension, said slot extension having substantially a constant depth inwardly of the coating head from said coating surface over a full longitudinal extent of the slot extension, said depth permitting coating material in said slot to coat said edge regions of said strip article.

5,569,492

**STRIFE INTERNAL EDGING METHOD AND APPARATUS**

William D. Devine, and Kenneth J. Ruschak, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

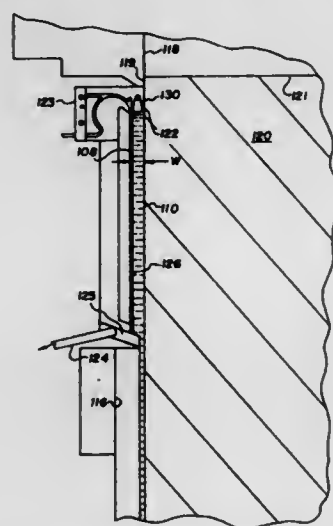
Continuation of Ser. No. 138,305, Oct. 19, 1993, abandoned.

This application Nov. 14, 1994, Ser. No. 339,307

Int. Cl.<sup>6</sup> B05D 1/30; B05C 5/00

U.S. Cl. 427-286

10 Claims



1. A method of curtain coating a support with one or more layers of a liquid coating composition comprising:

moving the support along a path through a coating zone; forming one or more flowing layers of coating liquids to form a composite layer;

forming a free falling curtain having a pair of edges from said composite layer within said coating zone which extends transversely of said path and impinges on said moving support; forming stripes of liquid coating composition having a viscosity between about 1 and 30 cP contiguous with each edge of said free falling curtain wherein the stripes are formed in the edge of said curtain and issue from a horizontal edge substantially the width of the stripes and positioned within 3 cm of the formation of the free falling curtain;

laterally guiding said stripes by edge guides arranged to coat less than a width of said support;

maintaining said stripes in wetting contact with said edge guides by distributing flushing liquid from said edge guides contiguous with said stripes wherein said stripes extend between each edge of said free falling curtain and the flushing liquid; and extracting liquids from the edge of said falling curtain by a vacuum source at the impingement of said falling curtain on said moving support.

5,569,493

**PREPARATION OF CURED CYANATE ESTER RESINS AND COMPOSITES FOR METAL PLATING**

Diana D. Granger, Thousand Oaks, and Leroy J. Miller, West Hills, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 14, 1994, Ser. No. 339,390

Int. Cl.<sup>6</sup> C23C 18/20

U.S. Cl. 427-306

19 Claims

15. A method of preparing the surface of a cured cyanate ester resin or cured cyanate ester resin composite for plating with metal, comprising:

(a) providing a material selected from the group consisting of a cured cyanate ester resin and a cured cyanate ester composite, said cured cyanate ester composite comprising graphite fibers embedded in a cured cyanate ester resin matrix, said material having a surface;

(b) immersing said surface in a preheated solution comprising an alkali metal salt of an alkoxide and at least one alcohol, said alkali metal salt of an alkoxide comprising an alkali metal ion and an alkoxide ion, said alkali metal selected from the group consisting of sodium and potassium, said alkoxide having from one to twelve carbon atoms, said alkali metal salt of an alkoxide present at a concentration ranging from about 1 to 50 wt %, said preheated solution having a temperature within the range of about 70° to 120° C.;

(c) removing said surface from contact with said preheated solution after a period of time ranging from about 10 seconds to 20 minutes in duration;

(d) rinsing said surface with deionized water; and

(e) drying said surface by exposing said surface to a stream of nitrogen, said surface thereby prepared to adhere to metal deposited by a subsequent metal plating process, the quality of adhesion ranging from about 2 to 5 as measured by ASTM method D3359B.

5,569,494

**METHOD FOR HIGH-SPEED APPLICATION OF A COATING WHILE ADJUSTING THE COAT THICKNESS**

Akihiro Suzuki; Norio Shibata; Shinsuke Takahashi, and Mikio Tomaru, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

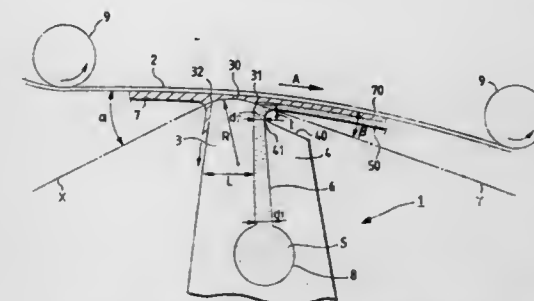
Filed Sep. 15, 1994, Ser. No. 306,328

Claims priority, application Japan, Oct. 20, 1993, 5-284125

Int. Cl.<sup>6</sup> B05D 3/12

U.S. Cl. 427-358

6 Claims



1. A method of applying one or more coating fluids to a face of a support using a non-pressurized head having a front edge and a rear edge disposed adjacent to the front edge, forming a slot therebetween, the rear edge having a top side opposite the support and a slot side along said slot meeting the top side forming an acute-angle tip, the acute-angle tip being recessed from the front edge top side in a direction opposite the support, the method comprising the steps of:

placing a non-pressurized coating head against the face of the support;

setting a tension T of the support within a range of 10 kg/m ≤ T ≤ 30 kg/m;

setting a lap angle α, where α is an angle between the support and a line tangent to a forward most tip of the front edge of the non-pressurized coating head, within a range of -0.5° ≤ α ≤ 2°;

setting a curvature R of the front edge within a range of 1 mm ≤ R ≤ 5 mm;

setting a speed of the support to 400 m/min or higher;

applying a precoat solution to the face of the support at a position upstream from the front edge with respect to a movement of the support; and

applying the one or more coating fluids extending from the slot to the face of the support at a position between the front and rear edges with respect to the movement of the support, wherein said placing step is performed such that said coating fluids do not contact said top side of the rear edge.

5,569,495

**METHOD OF MAKING VARISTOR CHIP WITH ETCHING TO REMOVE DAMAGED SURFACES**

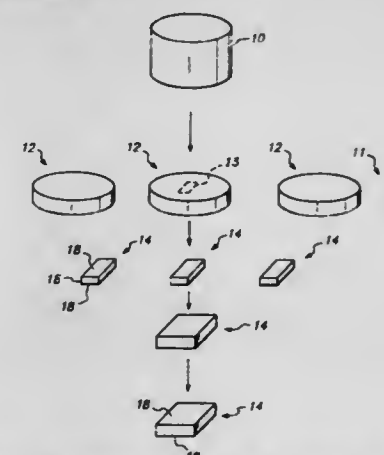
Anthony C. Evans, Woodside, Calif.; Takeshi Tsukada, Asaka Saitama, Japan; Shukri J. Souri, Mountain View, and Ryan W. Dupon, San Carlos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed May 16, 1995, Ser. No. 441,891

Int. Cl.<sup>6</sup> B05D 5/12

U.S. Cl. 427-446

11 Claims



1. A method of making varistor chips, comprising the steps of:

(a) providing a workpiece of varistor material, the varistor material having an average grain size;

(b) slicing the workpiece into a plurality of slices of varistor material, the slices having two laminar surfaces;

(c) electroding at least one laminar surface of the slices of varistor material;

(d) thereafter dicing the electroded slices into a plurality of varistor chips; and

(e) etching the chips with an etchant to remove varistor material damaged during the slicing and/or dicing steps.

5,569,496

**THERMAL DEPOSITION METHODS FOR ENHANCEMENT OF VEHICLE WHEELS**

Daniel C. Wei, Ann Arbor, and Romulo A. Prieto, Northville, both of Mich., assignors to Hayes Wheels International, Inc., Romulus, Mich.

Filed Dec. 15, 1994, Ser. No. 356,091

Int. Cl.<sup>6</sup> C23C 4/10

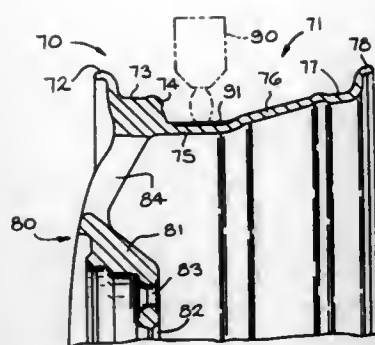
U.S. Cl. 427-450

16 Claims

1. A method for reducing porosity of a vehicle wheel comprising the steps of:

(a) providing a vehicle wheel formed from a material having a first density, the wheel including a wheel rim having an inner





surface and an outer surface, said outer wheel rim surface adapted to cooperate with a vehicle tire to define an air chamber; and  
 (b) depositing a layer of material with a thermal spray gun onto a portion of said outer surface of said wheel rim, the deposited layer having a second density that is greater than said first density.

5,569,497

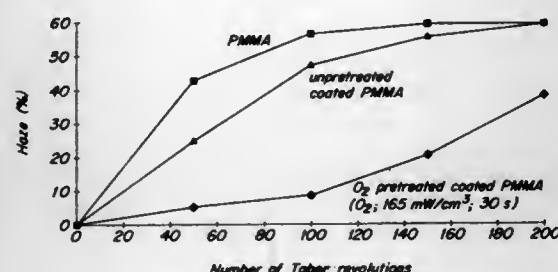
# PROTECTIVE COATING OF PLASTIC SUBSTRATES VIA PLASMA-POLYMERIZATION

Francis Verzaro, Serres-Castet, and Didier Ferry, Artix, both of France, assignors to Atohaas C.V., Haarlem, Netherlands  
 Filed Oct. 31, 1994, Ser. No. 332,113

Claims priority, application France, Oct. 29, 1993, 93 12946  
 Int. Cl.<sup>6</sup> C08J 7/18

U.S. Cl. 427-489

21 Claims



1. A process for the deposition of a thin protective layer or film onto a face surface of a plastic substrate, which comprises (a) placing said plastic substrate on a weakly or unpolarized electrode comprising a plasma-generating circuit, (b) plasma-pretreating said plastic substrate in an oxygen plasma, under primary vacuum, by a pulse of electrical power density of such minimum magnitude as to oxygen-activate a face surface thereof, and (c) plasma-polymerizing at least one organosilicon monomer onto the face surface of said plastic substrate, also under vacuum and from an oxygen/organosilicon monomer plasma, whereby depositing said thin protective layer or film thereon.

5,569,498

# PROCESS FOR THE PREPARATION OF SHAPED ARTICLES BASED ON ACRYLIC POLYMERS COATED WITH AN ANTISCRATCH AND ANTIABRASION FILM

Marco Rigamonti, and Donato Stanco, both of Milano, Italy, assignors to Atohaas Holding, C.V., Haarlem

Filed Jun. 6, 1995, Ser. No. 463,637

Claims priority, application Italy, Sep. 2, 1994, MI94A1811  
 Int. Cl.<sup>6</sup> B05D 3/06

U.S. Cl. 427-495

12 Claims

1. Process for preparing shaped articles having a surface, plates and films based on acrylic thermoplastic polymers, coated with an

antiscratch and abrasionresistant film, consisting in applying on the surface of said article an homogeneous layer of a mixture comprising:

- (A) from 55 to 95% by weight of a (meth)acrylic monomer and/or oligomer having at least two polymerizable double bonds,
- (B) from 5 to 25% by weight of monomers and/or oligomers of divinylethers,
- (C) from 0 to 20% by weight of monofunctional (meth)acrylic monomers, monofunctional (meth)acrylic oligomers, monofunctional monovinylethers, or mixtures thereof, said monomers, oligomers or monovinylethers having a polar group;
- (D) from 0.5 to 6 parts by weight for 100 parts of (A)+(B)+(C) of a radical photoinitiator,
- (E) from 0.1 to 3 parts by weight per 100 parts of (A)+(B)+(C) of a cationic photoinitiator,
- (F) from 0 to 8 parts by weight per 100 parts of (A)+(B)+(C) of colloidal silica or hydrophilic colloidal metal oxides,

with the proviso that the sum of the amounts (A)+(B)+(C) is 100, and that when the component (A) or component (B) does not contain a polar group the component (C) is always present, and in submitting the article so coated to UV radiation at temperatures from 30° to 70° C.

5,569,499

# METHOD FOR REFORMING INSULATING FILM

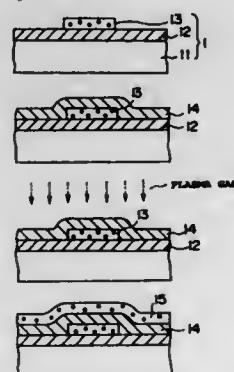
Kazuo Maeda; Noboru Tokumasu, and Yoshiaki Yuyama, all of Tokyo, Japan, assignors to Semiconductor Process Laboratory Co., Ltd.; Canon Sales Co., Inc., and Alcan-Tech Co., Inc., all of Japan

Filed Oct. 31, 1994, Ser. No. 331,736

Claims priority, application Japan, Nov. 10, 1993, 5-281158  
 Int. Cl.<sup>6</sup> H05H 1/00; 1/24; C23C 16/00

U.S. Cl. 427-539

10 Claims



1. A method for forming a reformed insulating film on a substrate, comprising the steps of:

- contacting the substrate with a deposition gas, containing a gaseous organometallic compound having Si—O—B bonds, to deposit a borosilicate glass film on the substrate; and
- contacting said borosilicate glass film with a plasma gas to reduce the moisture content and relative permittivity of said borosilicate glass film.

5,569,500

Patent Not Issued For This Number

5,569,501

# DIAMOND-LIKE CARBON FILMS FROM A HYDROCARBON HELIUM PLASMA

Fredric D. Bailey, Golden, Colo.; Douglas A. Buchanan, Cortlandt Manor, N.Y.; Alessandro C. Callegari; Howard M. Clearfield, both of Yorktown Heights, N.Y.; Fuad E. Doany, Katonah, N.Y.; Donis G. Flagello, Ridgefield, Conn.; Harold J. Hovel, Katonah, N.Y.; Douglas C. Latulipe, Jr., Danbury, Conn.; Naftali E. Lustig, Croton-on-Hudson, N.Y.; Andrew T. S. Pomerene, New Fairfield, Conn.; Sampath Purushothaman, Yorktown Heights, N.Y.; Christopher M. Scherpereel, Poughquag, N.Y.; David E. Seeger, Congers, N.Y., and Jane M. Shaw, Ridgefield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

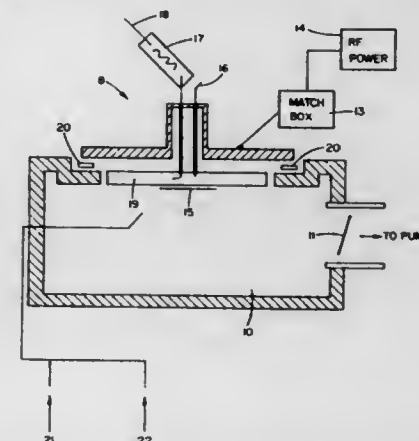
Division of Ser. No. 1,374, Jan. 7, 1993, Pat. No. 5,470,661.

This application Jun. 7, 1995, Ser. No. 483,685

Int. Cl.<sup>6</sup> B05D 3/06; H05H 1/24

U.S. Cl. 427-577

28 Claims



1. A method of depositing a diamond-like carbon film onto a substrate by plasma-enhanced chemical vapor deposition which comprises the steps of:

- (a) admixing a gas of a hydrocarbon and helium, wherein a gas mixture, comprising from about 50 to about 1% by volume, hydrocarbon and from about 50 to about 99%, by volume, helium, is formed;
- (b) providing a plasma chamber containing a substrate; and
- (c) introducing said gas mixture into said plasma chamber to deposit a diamond-like carbon film on said substrate, wherein said diamond-like carbon film has an optical density in the range of from about 1 to about 3 at a wavelength of from about 200 nm to about 365 nm and is thermally stable at a temperature of about 590° C.

5,569,502

# FILM FORMATION APPARATUS AND METHOD FOR FORMING A FILM

Hideomi Koinuma, Tokyo; Masashi Kawasaki, Kanagawa, and Masatomo Sumiya, Tokyo, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

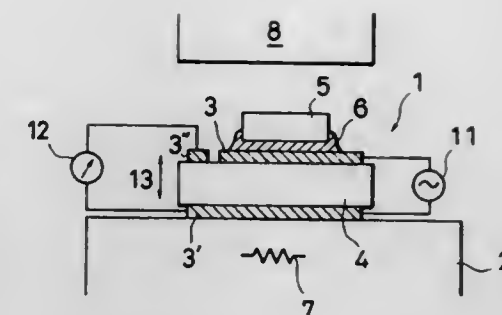
Filed Sep. 10, 1993, Ser. No. 118,829

Claims priority, application Japan, Sep. 11, 1992, 4-267932  
 Int. Cl.<sup>6</sup> B06B 1/00

U.S. Cl. 427-600

20 Claims

1. A method for forming a film comprising the steps of: providing a substrate in a film formation space; introducing a reaction gas into said film formation space; activating said reaction gas in said film formation space; and depositing an amorphous silicon film on said substrate by plasma chemical vapor deposition, wherein said substrate is vibrated at an ultrasonic frequency during the deposition of said film with conditions of the vibration being adjusted to obtain characteristics for said film



wherein said characteristics are a function of the vibration conditions.

5,569,503

# MOUNTING SUBSTRATE FOR DISPLAY OF ITEMS

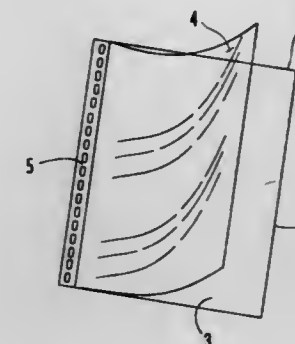
Edmund C. Piotroski, Darien, Conn., assignor to C.R. Gibson Company, Nashville, Tenn.

Filed May 31, 1995, Ser. No. 459,030

Int. Cl.<sup>6</sup> B32B 7/12

U.S. Cl. 428-41.8

21 Claims



1. A photograph album page for releasably mounting photographs thereon, said album page having a mounting surface and a transparent cover sheet between which said photographs are directly mounted on said mounting surface, wherein said mounting surface includes a releasable adhesive material coated thereon for releasably securing said photographs to said mounting surface which consists of a liquid phase including an aliphatic alkene glycol and water, and a solid phase including an aliphatic acrylic elastomer and an inorganic oxide filler material.

5,569,504

# OPTICAL RECORDING MEDIUM

Sumiko Kitagawa, Saitama; Masahiro Shinkai, Chiba, and Kenryo Namba, Tokyo, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Mar. 30, 1995, Ser. No. 413,879

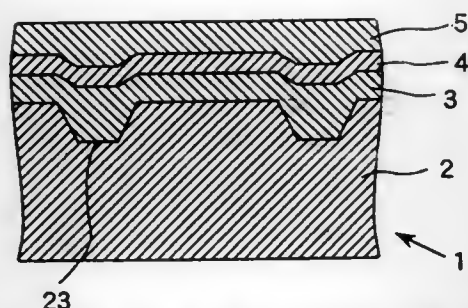
Claims priority, application Japan, Mar. 31, 1994, 6-087860; Mar. 9, 1995, 7-078097

Int. Cl.<sup>6</sup> B32B 3/00

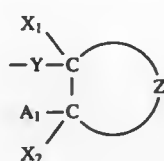
U.S. Cl. 428-64.1

53 Claims

1. An optical recording medium including a dye-containing recording layer on a substrate, wherein said dye is a phthalocya-



nine dye having at least one group represented by the following general formula:



wherein:

Y is an atom attached to the phthalocyanine ring and stands for an oxygen or sulphur atom,  
Z is the group of atoms required to complete a carbon or heterocyclic ring together with a carbon atom,  
 $A_1$  is a monovalent substituent bulkier than a hydrogen atom, and  
each of  $X_1$  and  $X_2$  is a hydrogen atom or a monovalent substituent or, in the alternative,  $X_1$  and  $X_2$ , taken together, form a single bond.

5,569,505

## DECORATIVE PANEL CONSTRUCTION

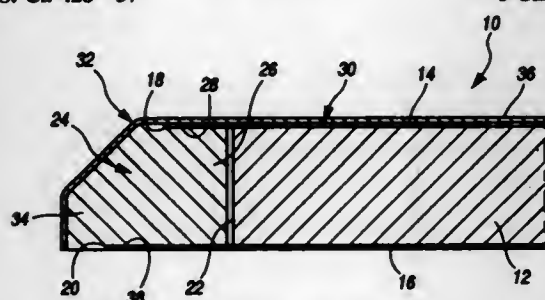
Robert K. Nichols, Muscatine, Iowa, assignor to Hon Industries, Inc., Muscatine, Iowa

Filed Jan. 9, 1995, Ser. No. 488,929

Int. Cl.<sup>6</sup> B32R 3/12

U.S. Cl. 428—57

6 Claims



1. A composite panel assembly comprising:
  - (a) a lightweight structural core with opposed face surface members and a peripheral edge surface;
  - (b) at least one of said face surface members having a marginal portion extending beyond said peripheral edge surface of said core thereby defining a recess along said edge surface;
  - (c) an elongated molding member having a contoured distal portion with an outer surface, said molding member also including a proximal portion, the proximal portion being received in said recess;
  - (d) said molding member having a stepped recess in its proximal portion, said stepped recess being dimensioned and configured to receive the marginal portion of said one face surface member and provide a smooth transition between the outer surface of said one face surface member and the outer surface of said contoured distal portion; and
  - (e) a decorative sheet surface member fixed to the outer surface of said one face surface member and to the outer surface of

said contoured distal portion of said molding member, said sheet surface member providing a seamless covering for said one face surface member and said molding member thereby to simulate an edge appearance of a solid unitary panel member.

5,569,506

## MAGNETIC RECORDING DISK AND DISK DRIVE WITH IMPROVED HEAD-DISK INTERFACE

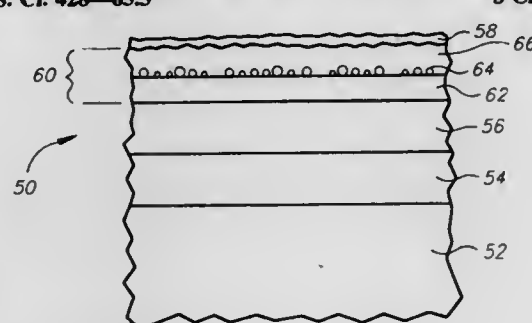
Christopher V. Jahnes, Monsey, N.Y.; James H. Kaufman, San Jose, Calif.; Serhat Metin, San Jose, Calif.; Mohammad T. Mirzamaani, San Jose, Calif., and Anthony W. Wu, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 6, 1993, Ser. No. 132,543

Int. Cl.<sup>6</sup> B32B 3/02; G11B 5/66; B32P 9/00

U.S. Cl. 428—65.3

8 Claims



1. A thin film magnetic recording disk comprising:
  - a rigid substrate;
  - an underlayer formed on the substrate;
  - a magnetic layer comprising a cobalt-based alloy formed on the underlayer; and
  - an essentially amorphous carbon overcoat formed on the magnetic layer, the overcoat comprising a first essentially amorphous carbon layer deposited directly on and in contact with the magnetic layer, a plurality of discontinuous generally rounded grains of a metal or metal alloy deposited on the surface of the first carbon layer, the grains being formed of a metal or an alloy of a metal selected from the group consisting of indium (In), gallium (Ga), silver (Ag), tin (Sn), aluminum (Al), gold (Au), bismuth (Bi), lead (Pb), cadmium (Cd), scandium (Sc), and tellurium (Te), and a second essentially amorphous carbon layer formed on the first carbon layer and the metal or metal alloy grains.

5,569,507

## PROTECTIVE COVERS WITH VIRUS IMPENETRABLE SEAMS

Brent I. Goodwin, Elkton, Md., and Francis J. Masley, Wilmington, Del., assignors to W. L. Gore & Associates, Inc., Newark, Del.

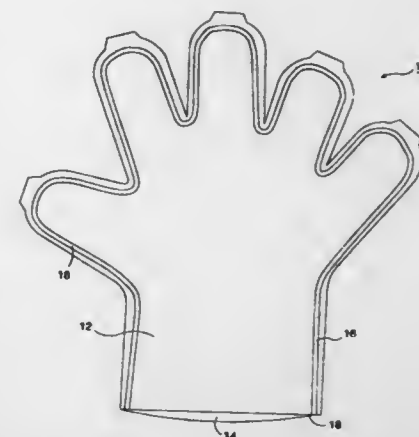
Filed Feb. 28, 1995, Ser. No. 396,300

Int. Cl.<sup>6</sup> B32B 1/04

U.S. Cl. 428—76

14 Claims

1. A protective cover comprising
  - laminar material including at least one layer of breathable and liquid resistant sheet material and at least one layer of fibrous material to which the sheet material is affixed, the sheet material being impenetrable to viruses, and including a first segment of laminar material and a second segment of laminar material;
  - at least one seam joining the first and second segments of the laminar material together, the laminar material oriented to adjoin a layer of fibrous material from the first segment to the layer of fibrous material from the second segment;
  - wherein the seam comprises a continuous layer of adhesive applied between the first and second segments of the laminar



material, the adhesive fully penetrating through each layer of fibrous material to the affixed layer of the sheet material; wherein the adhesive fully encapsulates fibers in the fibrous material layer; and wherein any voids present in a cross-section of the seam measure less than 10 micron across.

5,569,508

## RESIN TRANSFER MOLDING WITH HONEYCOMB CORE AND CORE FILLER

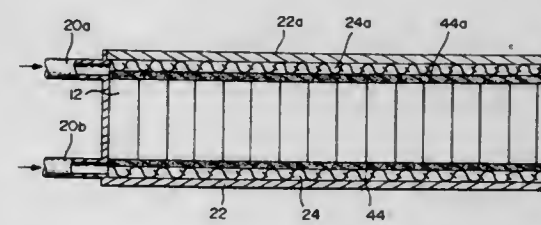
Thomas R. Cundiff, Puyallup, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 3, 1995, Ser. No. 368,063

Int. Cl.<sup>6</sup> B32B 3/12

U.S. Cl. 428—117

1 Claim



1. A strong and lightweight layered product made in a mold and having a honeycomb core having all cells filled with a foam material, said product comprised of:

- (a) a central honeycomb core having all cells filled with a foam material, said foam material having been cured inside said mold;
- (b) a first layer of a cured adhesive film above said central honeycomb core, and a second layer of a cured adhesive film below said central honeycomb core, said first and second layers of cured adhesive film having been cured inside said mold;
- (c) a first layer of a cured prepreg material above said first layer of cured adhesive film, and a second layer of a cured prepreg material below said second layer of cured adhesive film, said first and second layers of prepreg material having been cured inside said mold; and
- (d) a first layer of a cured dry fiber preform impregnated with a resin transfer molding (RTM) resin system above said first layer of cured prepreg material, and a second layer of a cured prepreg material below said second layer of cured prepreg material, said first and second layers of prepreg material impregnated with a resin transfer molding (RTM) resin system having been cured inside said mold, wherein said first and second prepreg materials prevent infiltration of the resin transfer molding resin into the honeycomb core.

5,569,509

## METHOD FOR IMPROVING THE ENERGY ABSORPTION OF A HIGH TENACITY FABRIC DURING A BALLISTIC EVENT

Louis Dischler, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

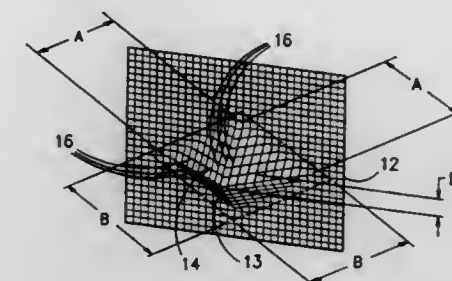
Division of Ser. No. 880,045, May 7, 1992, Pat. No. 5,466,503.

This application May 15, 1995, Ser. No. 441,243

Int. Cl.<sup>6</sup> B32B 5/14; 5/16; F41H 1/02

U.S. Cl. 428—113

10 Claims



1. A ballistic-resistant fabric comprising of at least one strip of fabric having a length and a width, made from fibers having a tenacity of at least ten grams/denier, said strip of fabric having a ballistic failure ratio less than one for an impact with a projectile having a velocity of about at least five hundred feet per second, and a ratio of said length of said strip of fabric to said width of said strip of fabric greater than a reciprocal squared of said ballistic failure ratio.

5,569,510

## PROCESS FOR THE PRODUCTION OF POLYESTER RESINS FOR FIBERS

Hussain A. K. Al Ghatta, Fuggi, and Mario Pizzetti, Colferro, both of Italy, assignors to Sinco Engineering S.p.A., Italy

PCT No. PCT/EP93/01447, § 371 Date Apr. 11, 1994, § 102(e)

Date Apr. 11, 1994, PCT Pub. No. WO93/25600, PCT Pub.

Date Dec. 23, 1993

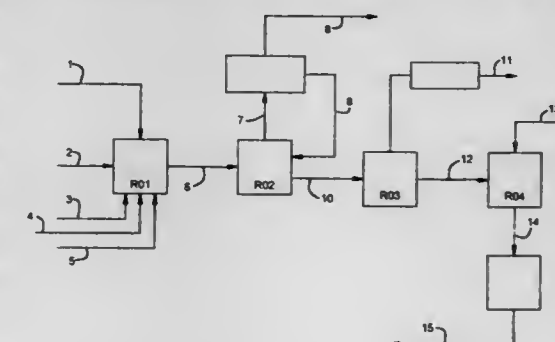
PCT Filed Jun. 11, 1993, Ser. No. 196,175

Claims priority, application Italy, Jun. 10, 1992, MI92A1424

Int. Cl.<sup>6</sup> D02G 3/00; C08G 69/26

U.S. Cl. 428—364

10 Claims



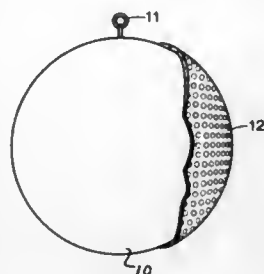
1. Process for the continuous production of high molecular polyester resins comprising an esterification phase of an aromatic dicarboxylic acid with an alkylenic glycol or of a transesterification of a diester of said dicarboxylic acid with an alkylenic glycol, a polycondensation of the diester and its oligomers to form a melt polymer with intrinsic viscosity between 0.25 and 0.5 dl/g, addition to the melt polymer of a dianhydride of a tetracarboxylic acid, and subsequent further polycondensation carried out in an agitated reactor where an inert gas stream is circulated on the melt polymeric mass kept under agitation.



5,569,511

**FRAGRANCE-EMITTING DECORATIVE OBJECT**  
 Donald Spector, 380 Mountain Rd., Union City, N.J. 07080  
 Filed Feb. 21, 1995, Ser. No. 391,545  
 Int. Cl.<sup>6</sup> A47G 33/08; A61K 7/46  
 U.S. Cl. 428—11

6 Claims

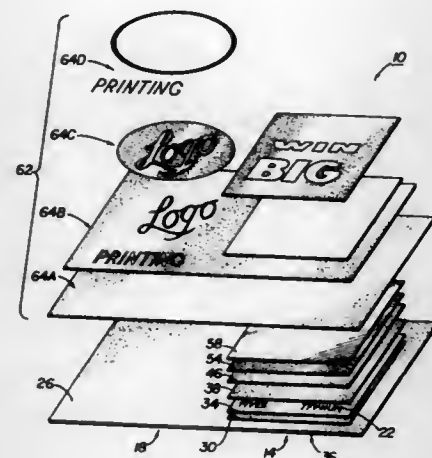


1. An aroma-generating object comprising:  
 A. a three-dimensional decorative shaped object; and  
 B. a transparent, liquid-impermeable, synthetic-plastic shrink film conforming to the contours of the shaped object to form a protective cladding therefor, said film being foraminated to create fine pores, and a volatile liquid fragrance impregnating the pores that is exuded therefrom for a prolonged period.

5,569,512

**CARD WITH INTEGRATED OVERPRINTING**  
 Jon M. Brawner, Duluth; James J. Carides, Lawrenceville; Benny R. Rich, Oakwood, and William F. Estep, Jr., Lula, all of Ga., assignors to Dittler Brothers Incorporated, Atlanta, Ga.  
 Continuation-in-part of Ser. No. 195,759, Feb. 14, 1994, abandoned, and a continuation-in-part of Ser. No. 260,699, Jun. 16, 1994. This application Mar. 21, 1995, Ser. No. 407,185  
 Int. Cl.<sup>6</sup> B42D 15/00; B44F 1/10  
 U.S. Cl. 428—29

14 Claims



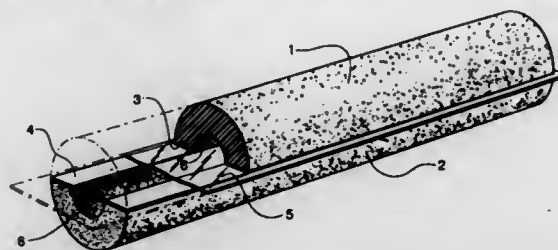
1. A card comprising:  
 a. a base comprising a first area and a second area;  
 b. symbols applied in the first area of the base;  
 c. removable means, in the form of an opaque coating applied in the first area, for obscuring the symbols from view; and  
 d. at least one ink of a specific formulation applied atop both the opaque coating and the second area of the base.

5,569,513

**AEROGEL-IN-FOAM THERMAL INSULATION AND ITS PREPARATION**  
 Carlee Fidler, and Thomas C. Simonton, both of Willow Street, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.  
 Filed Aug. 10, 1994, Ser. No. 288,617  
 Int. Cl.<sup>6</sup> B32B 5/18

U.S. Cl. 428—35.6

7 Claims



1. Thermal insulation which comprises a dried foam composite which includes hydrophobic silica aerogel particles at an amount of at least about 53% by total dry weight of the foam composite, and a dry gelatin foam which is present at an amount of at least about 2% by dry weight of the foam composite further providing that the thermal insulation has a thermal conductivity less than about 0.032 watt/meter-K°.

5,569,514

**METHOD OF FORMING A SAND BASE ARTICLE USING A DECOMPOSABLE BINDER AND THE ARTICLE FORMED THEREBY**  
 John Ayres, Lapeer, Mich., assignor to Nu-Tech & Engineering, Inc., Lapeer, Mich.  
 Division of Ser. No. 870,489, Apr. 16, 1992, Pat. No. 5,317,119, which is a division of Ser. No. 517,204, May 1, 1990, Pat. No. 5,108,677, which is a continuation-in-part of Ser. No. 258,373, Oct. 17, 1988, Pat. No. 4,921,250. This application Jan. 5, 1994, Ser. No. 177,556  
 Int. Cl.<sup>6</sup> H05B 6/80

U.S. Cl. 428—35.7

7 Claims



1. A sand based disposable article comprising:  
 a mixture of sand and a decomposable binder which is formed into a container shape and cured, said binder comprising of weight 30-40% starch, 20-30% salt, 1-3% oil, and water.

5,569,515

**PRINTABLE LINERLESS LABEL AND METHOD FOR MAKING SAME**  
 David K. Rice, II, Sanborn, and Joseph W. Langan, Cheektowaga, both of N.Y., assignors to Moore Business Forms, Inc., Grand Island, N.Y.  
 Filed Sep. 12, 1994, Ser. No. 304,239  
 Int. Cl.<sup>6</sup> C09J 7/02

U.S. Cl. 428—40.5

16 Claims

1. A label comprising a substrate, a pressure sensitive adhesive layer coated onto at least a portion of one side of said substrate, and a continuous protective layer of polyethylene or amide wax substantially overcoating the pressure sensitive adhesive layer, said protective layer having a thickness ranging from about 0.5 to about 2.5 microns, thereby forming a linerless pressure sensitive adhesive label that is substantially non-tacky.

5,569,516

**MEMBRANE AND MIXTURE COMPRISING A THERMOPLASTIC ELASTOMER**  
 Arnis U. Paeglis, 35 Foxhill La., Hillsborough, N.J. 08876; Robert L. Boysen, 41 Philhower Rd., Lebanon, N.J. 08833; Timothy R. Lynn, RD 3 Box 23, Hackettstown, N.J. 07840, and Jeffrey D. Collins, 72 Starling Dr., Branchburg, N.J. 08876  
 Filed Mar. 3, 1995, Ser. No. 398,571  
 Int. Cl.<sup>6</sup> B32B 25/16; 3/00

U.S. Cl. 428—58

5 Claims

1. A membrane comprising (i) a thermoplastic elastomer consisting essentially of a copolymer comprising a mixture of ethylene; one or more alpha-olefins having 3 to 12 carbon atoms; and, optionally, a diene, said copolymer being in an uncrosslinked state and having a crystallinity in the range of about 2 to about 40 percent by weight based on the weight of the copolymer wherein about 15 to about 85 percent by weight of the crystallinity melts at a temperature above 80° C.; about 15 to about 85 percent by weight of the crystallinity melts at a temperature below 80° C.; and the crystalline melting temperatures differ by at least about 30° C.; (ii) a filler; and (iii) a plasticizer oil.

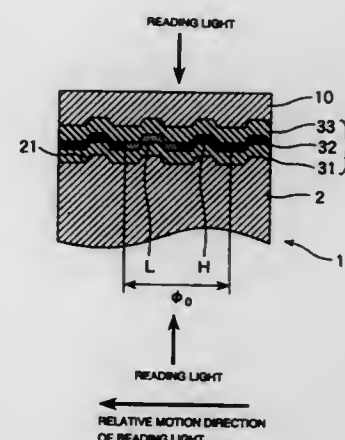
2. A mixture comprising bitumen or asphalt and a thermoplastic elastomer consisting essentially of a copolymer comprising a mixture of ethylene; one or more alpha-olefins having 3 to 12 carbon atoms; and, optionally, a diene, said copolymer being in an uncrosslinked state and having a crystallinity in the range of about 2 to about 40 percent by weight based on the weight of the copolymer wherein about 15 to about 85 percent by weight of the crystallinity melts at a temperature above 80° C.; about 15 to about 85 percent by weight of the crystallinity melts at a temperature below 80° C.; and the crystalline melting temperatures differ by at least about 30° C.

5,569,517

**OPTICAL INFORMATION MEDIUM**  
 Junji Tominaga, Nagano; Susumu Haratani, Chiba; Ryo Inaba, and Tsuneo Kuwahara, both of Nagano, all of Japan, assignors to TDK Corporation, Tokyo, Japan  
 Filed Jun. 5, 1995, Ser. No. 462,286  
 Claims priority, application Japan, Jun. 23, 1994, 6-164577  
 Int. Cl.<sup>6</sup> B32B 3/00

U.S. Cl. 428—64.1

14 Claims



1. An optical information medium comprising a substrate having pits formed on one surface for carrying information and a light transmittance control layer on the substrate surface including a lower dielectric layer, a mask layer and an upper dielectric layer, and further comprising:

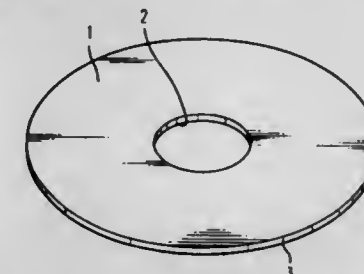
a reflecting layer of 3 to 150 nm thick formed at least one of above and below said light transmittance control layer, the mask layer having an original state before irradiation by reading light and is 3 to 100 nm thick, the mask layer undergoing a crystal-to-crystal transition upon irradiation by reading light to introduce a change in the reflectance of the reading light, the crystal-to-crystal transition taking place at a temperature of 200 to 450 degrees C, and the mask layer returning to the original state after irradiation by reading light.

5,569,518

**GLASS SUBSTRATE FOR A MAGNETIC DISK WITH ROUGHENED EDGES**  
 Ichiro Hayashi, Yokohama, Japan, assignor to AG Technology Co., Ltd., Yokohama, Japan  
 Filed Jul. 7, 1994, Ser. No. 271,628  
 Claims priority, application Japan, Jul. 7, 1993, 5-192787; Dec. 21, 1993, 5-322445  
 Int. Cl.<sup>6</sup> G11B 5/84

U.S. Cl. 428—141

4 Claims



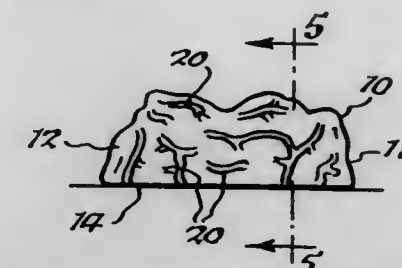
1. A glass substrate for a magnetic disk having an inner peripheral edge and an outer peripheral edge, wherein the surface of at least the inner peripheral edge is treated by etching to have a surface roughness such that, as measured by a three dimensional scanning electron microscope at randomly selected at least four places with a reference length of 240 μm and a cut-off wavelength of arithmetic mean roughness (Ra) of 80 μm, the mean value of arithmetic mean roughness (Ra) is from 1.0 to 6.0 μm, and the mean value of the number of peaks is within a range of from 8 to 30.

5,569,519

**LOOSE FILL PACKING ELEMENT**  
 Loren D. Ervay, Olean; Brownslaus L. Lewandowski, Black Creek, and Warren G. Vincent, Randolph, all of N.Y., assignors to Enviro-Pac Inc., dba FiberCell Corporation, Portville, N.Y.  
 Filed Mar. 13, 1991, Ser. No. 668,303  
 Int. Cl.<sup>6</sup> B32B 3/00

U.S. Cl. 428—156

2 Claims



1. A loose fill packing element comprising a hollow concave body including a wall of molded non-woven paper fibers and an open side, said wall including an outer surface, ridges of various sizes and shapes on said outer surface, said wall including a side wall portion which merges into a top wall portion, said side wall

portion terminating at an undulating edge which defines said open side, said open side including two spaced open portions which are defined by portions of said undulating edge and are connected by a smaller open gap portion therebetween which is defined by portions of said undulating edge, said body also comprising two bulbous end portions on opposite sides of a smaller size waist portion, said open side having a first perimeter, and said outer surface having a portion of a second perimeter which is larger than said first perimeter to preclude one loose fill packing element from nesting any substantial amount with adjacent similar loose fill packing elements with which it may be packed, an undulating irregular multiple curved edge on said wall defining said opening, and said undulating multiple curved edge having at least one portion which curves inwardly toward a portion of said undulating edge which lies on the opposite side of said opening from it.

**5,569,520**  
**RECHARGEABLE LITHIUM BATTERY FOR USE IN APPLICATIONS REQUIRING A LOW TO HIGH POWER OUTPUT**

John B. Bates, Oak Ridge, Tenn., assignor to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.  
Division of Ser. No. 180,231, Jan. 12, 1994. This application Jun. 7, 1995, Ser. No. 484,185  
Int. Cl.<sup>6</sup> H01M 10/38

U.S. Cl. 429—162

5 Claims



1. A battery including a cell comprising:
  - a thick layer of cathode material;
  - a thick layer of lithium anode material wherein each of the cathode layer and the anode has a surface having a texture and a length; and
  - a thin film of a ceramic electrolyte disposed between and separating the surfaces of the cathode and anode layers so as to provide a solid interface at the corresponding surfaces of the anode and cathode; and
- wherein the ceramic electrolyte film is thinner than either of the anode and cathode layers and is thin-film deposited so that each surface of the electrolyte film is in contact with and conforms to the shape and the texture of the corresponding surface of the cathode layer or the anode layer so that an enhanced electrical contact is provided between the contacting surfaces.

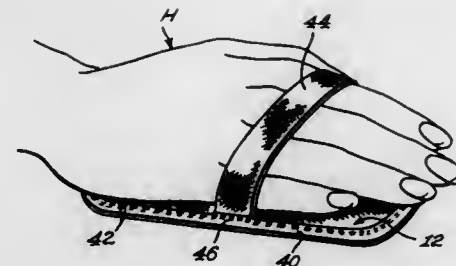
**5,569,521**  
**FLEXIBLE CLEANING PAD**  
Normand Francoeur, Sr.; Normand Francoeur, Jr., and Marc-André Francoeur, all of 992, Roseline, Laval, Quebec, Canada

Filed Apr. 21, 1995, Ser. No. 426,174  
Int. Cl.<sup>6</sup> B32B 9/10

U.S. Cl. 428—171

17 Claims

1. A cleaning pad comprising:
  - a first sheet of flexible material, said first sheet defining a hand contacting surface, an opposed first sheet fixing surface and a first sheet peripheral edge;
  - a second sheet of flexible material, said second sheet defining a second sheet cleaning surface, an opposed second sheet fixing surface and a second sheet peripheral edge, said second sheet cleaning surface having a dry particle collecting texture;



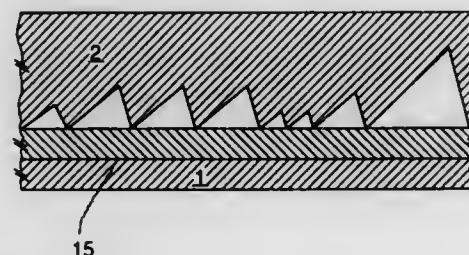
- a third sheet, said third sheet defining a third sheet fixing surface, an opposed second sheet fixing surface and a third sheet peripheral edge, said third sheet being made of a substantially rigid yet bendable and resilient material;
- a first layer of adhesive material adhesively fixing said first sheet fixing surface to said third sheet first fixing surface;
- a second layer of adhesive material adhesively fixing said second sheet fixing surface to said third sheet second fixing surface; said first and second layers of adhesive material having resilient characteristics, said resilient characteristics of said first and second layers of adhesive material allowing a relative sliding displacement between said third sheet and said first and second sheets when said pad is being bended.

**5,569,522**  
**ANTICOPYING FILM**  
Helmut Steininger, Worms, Germany; Alan Green, Royston, Great Britain; Michel Munch, Illkirch-Graffenstaden, France, and Peter Heilmann, Bad Duerkheim, Germany, assignors to BASF Magnetics GmbH, Mannheim, Germany  
Filed Aug. 24, 1994, Ser. No. 293,953  
Claims priority, application Germany, Aug. 24, 1993, 43 28 413.2

U.S. Cl. 428—195

Int. Cl.<sup>6</sup> B32B 3/00

8 Claims



1. An anticopying film for covering documents, consisting of a transparent film having top and bottom surfaces which has on its bottom surface a sawtooth structure facing the document to be covered, said film comprising a material having a first optical index of refraction comprising its sawtooth structure and a material having a second, different optical index of refraction filling the space between the sawteeth of said sawtooth structure, whereby in a first viewing angle relative to the top film surface said film appears opaque owing to a total reflection at the interface of the materials having the first and second optical indices of refraction, and appears transparent in a second viewing angle relative to the top film surface, wherein the sawtooth structure appears in cross-section as a series of triangles whose base lines are all parallel, whose angles are all identical, but whose areas vary randomly in magnitude.

**5,569,523**  
**MAGNETIC RECORDING MEDIUM HAVING A FERROMAGNETIC THIN FILM IN WHICH 70 TO 90 OF THE TOTAL MAGNETIC PARTICLES HAVE RESIDUAL MAGNETIZATION VECTORS WITHIN  $\pm 10^\circ$  OF THE EASY AXIS DIRECTION**

Kiyokazu Thoma, Hirakata; Kazunari Yoshimoto, Kyoto; Ryuji Sugita, Hirakata, and Tatsuki Ishida, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

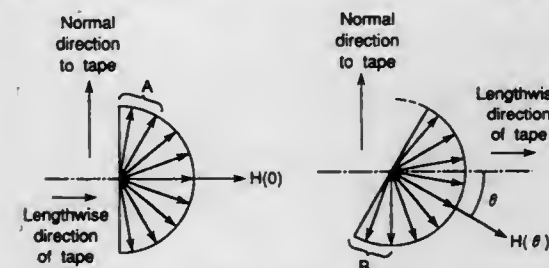
Filed Feb. 28, 1995, Ser. No. 395,818

Claims priority, application Japan, Feb. 28, 1994, 6-029582; Apr. 12, 1994, 6-073200

Int. Cl.<sup>6</sup> G11B 5/66

U.S. Cl. 428—213

6 Claims



1. A magnetic recording medium comprising a ferromagnetic thin-film as a magnetic layer in which, on the normal plane including the direction in which the tape runs, the magnetic particles that have residual magnetization vectors within  $\pm 10^\circ$  of the easy axis direction including the shape magnetic anisotropy of the medium are greater than or equal to 70% and less than or equal to 90% of the total amount of magnetic particles.

**5,569,524**  
**LAMINATED SHEET AND A BONDED LAMINATED SHEET**

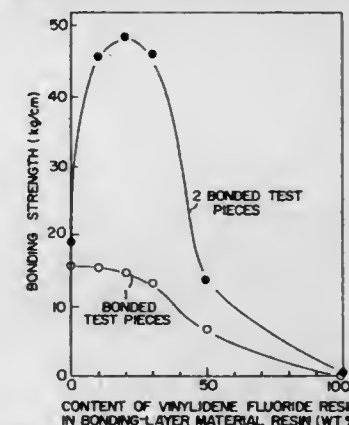
Masamichi Akatsu, Niihari-gun; Takeo Higashi, Tsuchiura; Hiromitsu Makita; Tomoo Susa, both of Iwaki, and Toshiya Mizuno, Tsuchiura, all of Japan, assignors to Kureha Chemical Industry Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1993, Ser. No. 163,754

Claims priority, application Japan, Dec. 7, 1992, 4-351320  
Int. Cl.<sup>6</sup> B32B 7/10; 27/08; 27/12; 27/30

U.S. Cl. 428—215

15 Claims



1. A laminated sheet suitable for bonding by high frequency welding comprising:
  - a vinylidene fluoride resin layer (A) 1–30  $\mu$ m thick;
  - a bonding layer (B) 1–20  $\mu$ m thick consisting essentially of:
    - (1) 70–90% by weight of copolymer resin comprising 60–90 mol % of methyl methacrylate and 40–10 mol % of alkyl ester of acrylate, whose alkyl group has 3–5 carbon atoms, and

- (2) 10–30% by weight of vinylidene fluoride resin; and a base layer (C) 10–100  $\mu$ m thick of vinyl chloride resin, which is bonded to said bonding layer (B).

**5,569,525**  
**ULTRA-BULKY FIBER AGGREGATE AND PRODUCTION METHOD THEREOF**

Yugoro Masuda, 17-6-341, Bessho-Honmachi, Takatsuki-shi, Osaka 569, and Makio Nagata, 2790-11, Oaza Mure, Bofu-shi, Yamaguchi 747, both of Japan

PCT No. PCT/JP93/01583,  $\S$  371 Date Jul. 1, 1994,  $\S$  102(e) Date Jul. 1, 1994, PCT Pub. No. WO94/10366, PCT Pub. Date May 11, 1994

PCT Filed Oct. 29, 1993, Ser. No. 256,321

Claims priority, application Japan, Nov. 2, 1992, 4-321275  
Int. Cl.<sup>6</sup> D04H 1/58

U.S. Cl. 428—219

17 Claims

1. An ultra-bulky block fiber aggregate comprising a blend of polyester fibers (A) and core-sheath type composite fibers (B) in which the sheath component of the core-sheath type composite fibers has a lower melting point than the core component, wherein the fibers are melt-adhered by the fusion of the sheath component of the core-sheath type composite fibers and the fiber aggregate has a thickness of at least about 200 mm and a density of from about 0.02 to about 0.1 g/cm<sup>3</sup> and the density of the fiber aggregate varies by no more than about  $\pm 5\%$  throughout the web.

**5,569,526**  
**ANODE STRUCTURE FOR CATHODIC PROTECTION OF STEEL-REINFORCED CONCRETE AND RELEVANT METHOD OF USE**

Michele Tettamanti, Como, and Marcello Biagioli, Milan, both of Italy, assignors to Oronzio De Nora S.A., Italy

Continuation of Ser. No. 928,874, Aug. 11, 1992, abandoned.

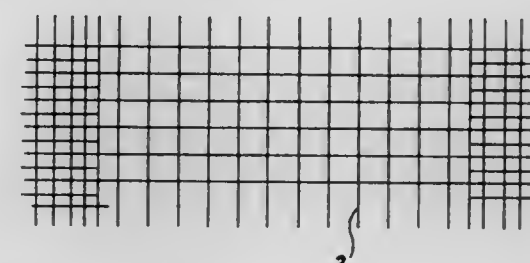
This application Aug. 23, 1994, Ser. No. 294,624

Claims priority, application Italy, Sep. 23, 1991, MI91A2527; Feb. 11, 1992, MI92A0271

Int. Cl.<sup>6</sup> B32B 5/16

U.S. Cl. 428—225

16 Claims



1. An anode for cathodic protection of a steel reinforcing cage of concrete structures to be applied to said cage before concrete is cast around, said anode comprising a plurality of valve metal or valve metal alloy elongated elements connected together by connectors, characterized in that each of said elongated elements is fixed to a stiff elongated spacer, said spacers in turn are fixed to said steel reinforcing cage to provide the anode with both electrical insulation with respect to said cage and mechanical resistance during casting of the concrete.



5,569,527

## ADHESIVE SYSTEM

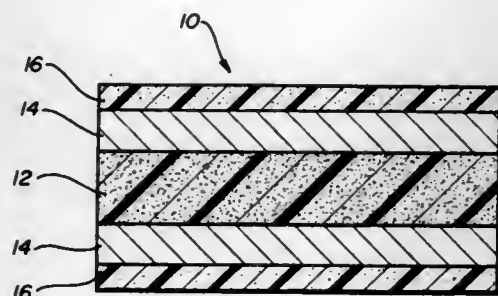
Judith A. Waterhouse, Wilmington; Christopher J. Van Remoortel, Marblehead, and Roy H. Caproni, Haverhill, all of Mass., assignors to Bixby International Corporation, Newburyport, Mass.

Filed Nov. 8, 1993, Ser. No. 148,376

Int. Cl.<sup>6</sup> C09J 7/02

U.S. Cl. 428—261

12 Claims



1. Adhesive structure comprising:  
a substrate having a core flanked by layers of a non-woven fabric, the core being an alloy of an ionomer and a high-impact polystyrene; and  
a coating on at least one surface of the substrate, the coating becoming tacky upon exposure to a solution of pH greater than 7.0.

5,569,528

## NON-WOVEN LAYER CONSISTING SUBSTANTIALLY OF SHORT POLYOLEFIN FIBERS

Leonardus L.H. Van der Loo, Beek, and René C. Van der Burg, Heerlen, both of Netherlands, assignors to DSM N.V., Netherlands

PCT No. PCT/NL93/00078, § 371 Date Oct. 3, 1994, § 102(e) Date Oct. 3, 1994, PCT Pub. No. WO93/20271, PCT Pub. Date Oct. 14, 1993

PCT Filed Mar. 31, 1993, Ser. No. 318,783

Claims priority, application Netherlands, Apr. 3, 1992, 9200625

Int. Cl.<sup>6</sup> G32B 5/06

U.S. Cl. 428—298

19 Claims

1. A non-woven layer comprising short polyolefin fibers having a tensile strength of at least 1.2 GPa and a modulus of at least 40 GPa, wherein the non-woven layer is a matrix-free felt comprising at least 80% (by volume) of short polyolefin fibers which are substantially randomly oriented in the plane of the non-woven layer and have a length of 40–100 mm.

5,569,529

## INK JET PRINTING MATERIAL

Dieter Becker, Georgsmarienhütte; Gerhard Dransmann, and Jürgen Graumann, both of Osnabrück, all of Germany, assignors to Felix Schoeller Jr. Foto-und Spezial-papiere GmbH & Co. KG, Osnabrück, Germany

Continuation of Ser. No. 261,155, Jun. 17, 1994, abandoned.

This application Jun. 30, 1995, Ser. No. 497,637

Claims priority, application Germany, Jul. 3, 1993, 43 22 179.3

Int. Cl.<sup>6</sup> B41M 5/00

U.S. Cl. 428—331

25 Claims

1. Ink jet printing material comprising a support and an ink receiving layer, said ink receiving layer containing:  
a pigment,

- a hydrophilic binder comprising a mixture of polyvinyl alcohol and a vinylpyrrolidone homopolymer and/or vinylpyrrolidone copolymer, and  
a water soluble compound containing aldehyde groups.

5,569,530

## LUMINESCENT ARTICLE WITH HIGH PHOSPHOR TO BINDER RATIO AND MANUFACTURE THEREOF

Philip Doms, Edegem; Jozef Aertbelien, Schilde, and Jan Van Havenbergh, Zwijndrecht, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

PCT No. PCT/EP93/01551, § 371 Date Nov. 2, 1994, § 102(e) Date Nov. 2, 1994, PCT Pub. No. WO94/00530, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 17, 1993, Ser. No. 331,559

Claims priority, application European Pat. Off., Jun. 23, 1992, 92201840

Int. Cl.<sup>6</sup> B32B 5/16; C09K 11/02

U.S. Cl. 428—323

12 Claims

1. A luminescent article comprising a self-supporting or supported layer of phosphor particles dispersed in a binding medium and a protective coating thereover wherein said binding medium consists essentially of one or more block copolymers having a saturated elastomeric midblock and a thermoplastic styrene end-block and having a bound polar functionality of at least 0.5% by weight, said layer of phosphor particles having a thickness in the range of from 10 to 1000 µm and the ratio by volume of phosphor to binding medium is 92:8 or less.

5,569,531

## INK RIBBON

Tsunemi Ohiwa, Osaka, and Yoshinori Yamamoto, Takatsuki, both of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Oct. 5, 1994, Ser. No. 318,117

Claims priority, application Japan, Oct. 5, 1993, 5-274937

Int. Cl.<sup>6</sup> B41M 5/26

U.S. Cl. 428—323

7 Claims

1. A ribbon comprising a base film and an infrared ray emitting layer having a thickness of from 1 to 10 µm, said infrared ray emitting layer containing infrared ray-emitting fluorescent particles having a size of at least 0.1 µm to less than 1 µm.

5,569,532

## BIAXIALLY ORIENTED POLYESTER FILM AND PROCESS FOR THE PREPARATION THEREOF

Kwang-Hyung Lee; Joon-Hee Han, both of Suwon-si, and Young-Jin Lee, Anyang-si, all of Rep. of Korea, assignors to SKC Limited, Kyungki-do, Rep. of Korea

Filed Sep. 13, 1994, Ser. No. 305,128

Claims priority, application Rep. of Korea, Sep. 14, 1993, 1993-18475

Int. Cl.<sup>6</sup> B32B 5/16; 27/36; 27/18; C08K 3/22

U.S. Cl. 428—327

1 Claim

1. A biaxially oriented polyester film comprising 0.1 to 0.3% by weight of calcium carbonate particles having an average particle diameter ranging from 0.4 to 1.45 µm, 0.1 to 0.25% by weight of alumina particles having an average particle diameter ranging from 0.1 to 0.40 µm and a Mohs' hardness of 7 or more and 0.14 to 0.25% by weight of melamine formaldehyde resin particles having an average particle diameter ranging from 0.28 to 1.55 µm.

5,569,533

## THIN-FILM MEDIUM WITH SUBLAYER

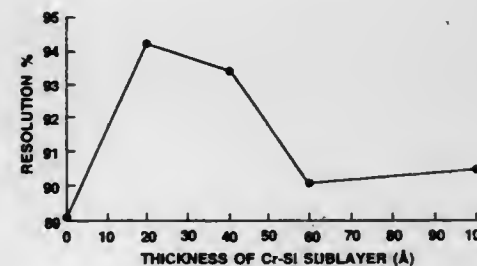
Brij B. Lal; Allen J. Bourez, both of San Jose, Calif., and Tadashi Shinohara, Niiharu-gun, Japan, assignors to HMT Technology Corporation, Fremont, Calif.

Filed Mar. 14, 1994, Ser. No. 212,151

Int. Cl.<sup>6</sup> G11B 5/66

U.S. Cl. 428—332

12 Claims



1. A magnetic recording medium, comprising  
a non-metallic substrate;  
formed on the substrate, a sputtered sublayer composed of chromium or a chromium-based alloy containing at least 50% chromium, said sublayer having a thickness between 3–50 Å;  
formed directly on the sublayer, a sputtered chromium underlayer having a thickness between 200–3,000 Å;  
formed on the underlayer, a sputtered cobalt-based magnetic layer having a thickness between 100–800 Å; and  
a wear-resistant overcoat.

5,569,534

## REACTANT IN THE FORM OF GRANULES FOR THERMOCHEMICAL SYSTEMS

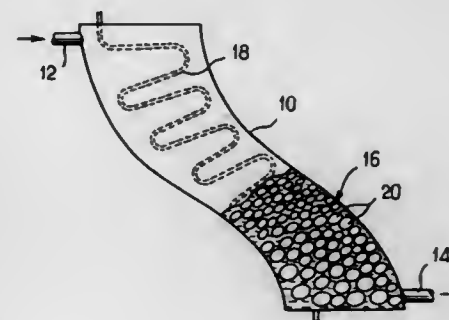
Benoit Lambotte, Vaucresson; Bernard Spinner, Corneilla Del Vercol; Charles Timoney, L'Etang La Ville, and Jacques Prosdocimi, Canohes, all of France, assignors to Elf Aquitaine, France

Filed Jan. 19, 1995, Ser. No. 374,869

Int. Cl.<sup>6</sup> B32B 5/16; B01J 20/02

U.S. Cl. 428—402

5 Claims



1. Reactant for thermochemical systems comprising a support and an active agent, said support being in the form of granules and said active agent being impregnated in said granules, wherein said granules comprise recompressed expanded graphite having a density of between 0.02 and 0.5 g/cm<sup>3</sup> and a diameter between 0.2 and 2.5 cm and wherein said support is capable of filling a reaction chamber of irregular or non-rectilinear shape.

5,569,535

## HIGH CHROMA MULTILAYER INTERFERENCE PLATELETS

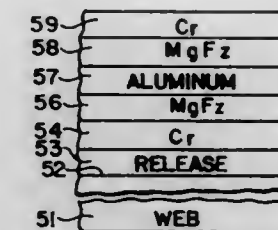
Roger W. Phillips; Shari P. Fisher, and Paul G. Coombs, all of Santa Rosa, Calif., assignors to Flex Products, Inc., Santa Rosa, Calif.

Continuation-in-part of Ser. No. 171,654, Dec. 22, 1993, which is a division of Ser. No. 902,693, Jun. 23, 1992, Pat. No. 5,279,657, which is a continuation of Ser. No. 719,166, Jun. 21, 1991, Pat. No. 5,171,363, which is a continuation of Ser. No. 251,034, Sep. 26, 1988, Pat. No. 5,059,245, which is a continuation of Ser. No. 812,814, Dec. 23, 1985, abandoned, which is a continuation-in-part of Ser. No. 567,638, Jan. 3, 1984, abandoned, which is a continuation of Ser. No. 314,695, Oct. 26, 1981, Pat. No. 4,434,010, which is a division of Ser. No. 108,004, Dec. 28, 1979, abandoned. This application Apr. 22, 1994, Ser. No. 231,396

Int. Cl.<sup>6</sup> B32B 15/02; 15/04; G02B 1/10; 5/28

U.S. Cl. 428—403

10 Claims



1. A collection of color shifting interference thin film platelets which change color as the angle of incident light or viewing changes for use in a medium for producing a color shifting coating, said collection of color shifting interference thin film platelets being characterized in that each platelet has first and second parallel planar outer surfaces and an edge thickness perpendicular to the first and second parallel planar outer surfaces, each of said platelets comprising a metal reflecting layer having first and second reflective surfaces and a multilayer interference thin film structure disposed on each of the first and second reflective surfaces, the multilayer interference thin film structure comprising a pair of layers consisting of a dielectric layer formed of a dielectric material and a semi-opaque metal layer, said pair being disposed so that the dielectric layer is directly adjacent to the metal reflecting layer and the semi-opaque metal layer faces away from the metal reflecting layer, each platelet having an aspect ratio of at least 2:1 for the longest dimension of the first and second outer surfaces in comparison to the edge thickness of the platelet, each platelet having a maximum dimension on any surface of about 2–200 microns.

5,569,536

## MANNICH BASE CURING AGENTS

Joe M. Hunter, Houston, and Derek S. Kincaid, Katy, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 13, 1995, Ser. No. 572,199

Int. Cl.<sup>6</sup> C08G 14/06; 59/62; C08L 63/00

U.S. Cl. 428—413

14 Claims

1. A curable composition comprising:  
(a) an epoxy resin having at least 1.5 epoxy groups per molecule, and  
(b) a Mannich base prepared by reacting (i) butyraldehyde (ii) a phenolic compound and (iii) a primary or a secondary polyamine, wherein the Mannich base has a viscosity of less than 1000 cP at 25°C.

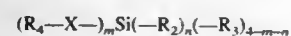
5,569,537

**LAMINATED GLASS WITH POLYURETHANE RESIN LAYER AND SILANE COUPLING AGENT LAYER**  
Seiichi Miyasaka, and Hiroyuki Watanabe, both of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan, and Saint Gobain Vitrage, Courbevoie, France  
Filed Jul. 28, 1994, Ser. No. 281,562  
Claims priority, application Japan, Jul. 28, 1993, 5-204482  
Int. Cl.<sup>6</sup> B32B 17/10; 27/40  
U.S. Cl. 428—425.5

12 Claims



1. A laminated glass having at least one glass sheet and at least one polyurethane resin film or sheet bonded with a silane coupling agent layer interposed therebetween, wherein said silane coupling agent layer is a layer of a mixture comprising at least one silane coupling agent capable of providing bond strength for the bonding between said glass sheet and said resin film or sheet, and at least one silane coupling agent incapable of providing bond strength for the bonding between said glass sheet and said resin film or sheet, which has a formula



wherein

X is a C<sub>2-6</sub> alkylene group,R<sub>2</sub> is an alkyl group, an aryl group, an arylalkyl group, an alkylaryl group or a hydrogen atom,R<sub>3</sub> is an alkoxy group, an aryloxy group or a chlorine atom,R<sub>4</sub> is a perfluoroalkyl group,

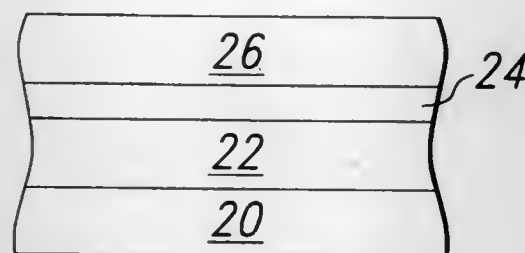
m is an integer of from 1 to 3, and

n is an integer of from 0 to 2, provided that m+n is at most 3.

5,569,538

**SEMICONDUCTOR-ON-INSULATOR STRUCTURE AND METHOD FOR PRODUCING SAME**  
Chih-Chen Cho, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.  
Division of Ser. No. 132,597, Oct. 6, 1993, Pat. No. 5,453,399.  
This application Oct. 14, 1994, Ser. No. 323,314  
Int. Cl.<sup>6</sup> B32B 17/06  
U.S. Cl. 428—427

12 Claims



1. A semiconductor-on-insulator structure, comprising:  
an epitaxial metal fluoride insulator layer;  
a layer comprising boron in a concentration effective to form a surfactant layer on said insulator layer; and  
an epitaxial semiconductor layer on said layer comprising boron.

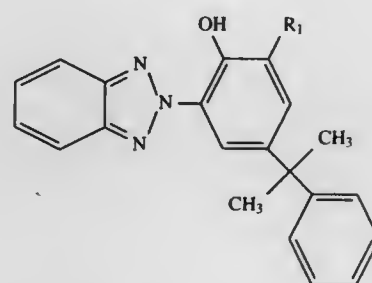
5,569,539

**POWDER COATING COMPOSITIONS**

Lajos Avar, Biel-Benken, Switzerland; Karl Bechtold, Schliengen, Germany, and Rainer Wolf, Allschwil, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland  
Filed Jan. 12, 1995, Ser. No. 371,728  
Claims priority, application United Kingdom, Jan. 14, 1994, 9400681  
Int. Cl.<sup>6</sup> C08K 5/3475  
U.S. Cl. 428—457

21 Claims

1. A powder coating composition comprising  
A) a binder system  
B) specific powder coating additives  
C) at least one compound of formula I



(I)

in which R<sub>1</sub> is methyl, ethyl, n-propyl, iso-propyl, n-butyl, sec-butyl or tert-butyl and optionally

- D) additional compounds selected from the group consisting of antioxidants, UV-stabilizers, UV-absorbers, acid scavengers, radical scavengers, pigments, dyes, UV-quenchers, processing stabilizers, fillers, and tribocharging additives.

5,569,540

**THERMAL TRANSFER SHEET**

Keiji Hirose, and Keiichi Ogawa, both of Tokyo, Japan, assignors to DAI Nippon Printing Co., Ltd., Japan  
Filed Jun. 17, 1994, Ser. No. 262,064  
Claims priority, application Japan, Jun. 18, 1993, 5-170901; Jun. 18, 1993, 5-170902  
Int. Cl.<sup>6</sup> B41M 5/00  
U.S. Cl. 428—500

9 Claims



1. A thermal transfer sheet for thermally printing an image on a plastic surface, comprising:  
a substrate film; and  
an ink layer provided on said substrate film, said ink layer comprising a colorant and a vinyl chloride/vinyl acetate copolymer resin having a T<sub>g</sub> of 60° to 90° C. and an average molecular weight of not less than 10,000.

5,569,541

**MODIFIED PLASTIC FILMS AND RECORDING MATERIALS UTILIZING THEM**

Yoshihisa Kimura, Urawa; Toshinori Kido, and Takashi Shimizu, both of Yono, all of Japan, assignors to Kimoto Co., Ltd., Japan  
Filed Dec. 27, 1994, Ser. No. 364,303  
Claims priority, application Japan, Dec. 28, 1993, 5-337182; Dec. 28, 1993, 5-337183  
Int. Cl.<sup>6</sup> B32B 27/08; C08J 7/18  
U.S. Cl. 428—520

8 Claims



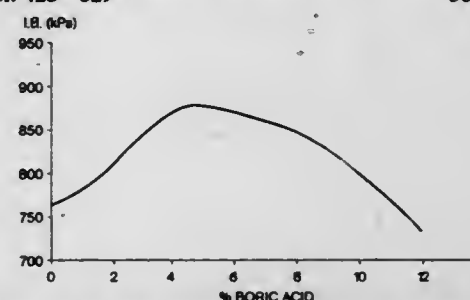
1. A modified plastic film comprising a plastic film provided on both of its surfaces with cured resin layers having a hardness equal to or harder than a pencil hardness of H, the cured resin layers being formed by coating an ionizing radiation curable mixture of a photopolymerizable prepolymer, a photopolymerizable monomer and a photopolymerization initiator on the plastic film and irradiating the mixture.

5,569,542

**COMPOSITE BOARD**

Peter J. Burton, and Brent P. Deale, both of Victoria, Australia, assignors to ACI Australia Limited, Australia  
Filed Jan. 17, 1995, Ser. No. 373,587  
Int. Cl.<sup>6</sup> B32B 27/42  
U.S. Cl. 428—529

38 Claims



1. A composite board including a core, the core comprising:  
a first cellulose material having a first dry weight;  
a first cured resin formed of an acid setting resin, the first cured resin binding the first cellulose material together; and  
a first weak acid having a weight and a steam volatility, the weight of the first weak acid being between 2% and 8% of the first dry weight, the steam volatility of the first weak acid being such that a solution containing 10 grams of the first weak acid per kilogram of water has a concentration of the first weak acid in steam of at most 40.0 mg per kilogram of steam at a pressure of 1.0 atmosphere.

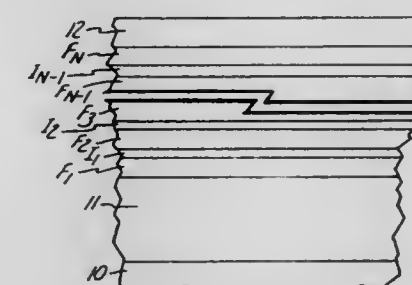
(b) thereafter applying to the rotor a coating composition comprising: (i) an aqueous-based inorganic alkali metal-silicate binder comprising an alkali metal-silicate, silicone and water, and (ii) a powdered metal,  
(c) drying the coating to remove the water therefrom; and  
(d) wherein the process is conducted in the absence of a treatment step intermediate the cleaning and the coating application.  
6. The method of claim 1 which further comprises curing the coating on the rotor after application thereonto.

5,569,544

**MAGNETORESISTIVE STRUCTURE COMPRISING FERROMAGNETIC THIN FILMS AND INTERMEDIATE LAYERS OF LESS THAN 30 ANGSTROMS FORMED OF ALLOYS HAVING IMMISCIBLE COMPONENTS**

James M. Daughton, Edina, Minn., assignor to Nonvolatile Electronics, Incorporated, Eden Prairie, Minn.  
Continuation-in-part of Ser. No. 976,905, Nov. 16, 1992, abandoned. This application Jan. 18, 1994, Ser. No. 182,614  
Int. Cl.<sup>6</sup> G11B 5/127; B32B 15/00  
U.S. Cl. 428—611

42 Claims



1. A magnetoresistive thin-film layered structure, said structure comprising:  
a substrate having a major surface portion;  
a magnetoresistive, anisotropic, first ferromagnetic thin-film provided on said substrate major surface portion;  
an intermediate layer provided on said first ferromagnetic thin-film with a thickness of less than 30 Å, said intermediate layer being formed of a substantially nonmagnetic, conductive alloy having two substantially immiscible components therein and a third at least partially miscible component therein; and  
a magnetoresistive, anisotropic, second ferromagnetic thin-film provided on said intermediate layer.

5,569,545

**COPPER CLAD LAMINATE, MULTILAYER PRINTED CIRCUIT BOARD AND THEIR PROCESSING METHOD**

Hitoshi Yokono, Toride; Haruki Yokono, Yono; Masahiro Mikano; Ryouichi Narushima, both of Shimodate; Takuya Iida, Yuuki, and Yasuhiro Endo, Shimodate, all of Japan, assignors to Nippon Denrai Ltd., Tokyo, Japan  
Filed Dec. 28, 1994, Ser. No. 365,081  
Claims priority, application Japan, Dec. 28, 1993, 5-349194; Mar. 28, 1994, 60-79197; Oct. 27, 1994, 6-263816  
Int. Cl.<sup>6</sup> B32B 15/08

U.S. Cl. 428—626

24 Claims

1. A copper clad laminate having a bonded side between a copper foil and an insulating layer adhered to each other by lamination, wherein the copper foil has a metal layer on a side to be bonded with the insulating layer, wherein the metal layer comprises an alloy selected from the group consisting of Cu—Zn alloy, Ni—Zn alloy, Ni—Sn alloy, Ni—Cu alloy, Pd—P alloy and

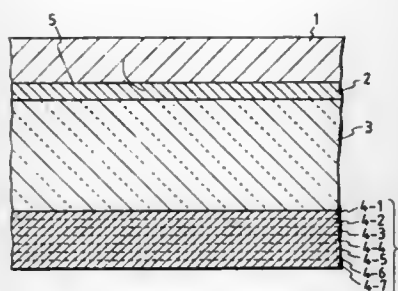
**METHOD FOR COATING A BRAKE ROTOR AND BRAKE ROTOR**

Parke Schaffer, Jr.; Thomas Laughlin, both of Malvern, Pa., and David M. Mann, Wolverine Lake, Mich., assignors to Inorganic Coatings, Inc., Malvern, Pa., and Ford Motor Company, Dearborn, Mich.  
Filed Oct. 31, 1994, Ser. No. 331,965  
Int. Cl.<sup>6</sup> B22F 3/00  
U.S. Cl. 428—552

13 Claims

1. A method of coating a brake rotor with a corrosion-resistant coating comprising the steps of:  
(a) cleaning the rotor to remove substantially all surface impurities therefrom;





Ni—P alloy, and the metal layer and insulating layer are cross linked with each other by chemical bonds through sulfur atoms.

5,569,546

# REPAIRED ARTICLE AND MATERIAL AND METHOD FOR MAKING

Stephen J. Ferrigno, Cincinnati, and David C. Fairbourn, Fairfield, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Mar. 10, 1995, Ser. No. 402,418

Int. Cl.<sup>6</sup> B23P 6/04; C22C 19/05; B23K 35/40; 35/30

U.S. Cl. 428—668 16 Claims

12. In a method for repairing an article of a Co base alloy at a surface discontinuity, wherein oxides are removed from the discontinuity and weld wire is used to provide a weld over the discontinuity, the improvement wherein:

the weld wire is a composite weld wire of a repair alloy which is the sintered product of a mixture of:

about 50–90 weight % of the Co base alloy; and, about 10–50 weight % of a Ni base alloy consisting essentially of, by weight, about: 1.5–2.5 % B, 2–5 % Al, 2–4 % Ta, 14–17 % Cr, 8–12 % Co, with the balance Ni and incidental impurities,

the total of amount of B in the weld wire being in the range of about 0.2–1.2 weight %; and,

welding the repair alloy over the discontinuity using the composite weld wire.

5,569,547

# CERAMIC COMPOSITE MATERIAL

Yoshiharu Waku, Hideki Ohtsubo, and Yasuhiko Kohzoku, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Oct. 4, 1994, Ser. No. 317,916

Claims priority, application Japan, Oct. 8, 1993, 5-284099; Jul. 12, 1994, 6-190861

Int. Cl.<sup>6</sup> B32B 18/00; C04B 35/50

U.S. Cl. 428—688 5 Claims



1. A ceramic composite material consisting essentially of a single crystal of  $\alpha\text{-Al}_2\text{O}_3$  and a single crystal of  $\text{Y}_3\text{Al}_5\text{O}_{12}$  and wherein each of said single crystals has a single diffraction peak from a particular crystal plane by X-ray diffraction.

# 5,569,548 ZINC OXIDE PIEZOELECTRIC CRYSTAL FILM ON SAPPHIRE PLANE

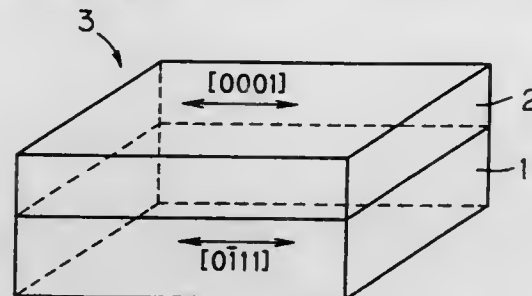
Jun Koike, and Hideharu Ieki, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Aug. 2, 1994, Ser. No. 284,889

Claims priority, application Japan, Aug. 5, 1993, 5-215091

Int. Cl.<sup>6</sup> B32B 18/00

U.S. Cl. 428—699 13 Claims



1. A (11 $\bar{2}$ 0)-plane zinc oxide piezoelectric crystal film being epitaxially grown on a surface of (01 $\bar{1}$ 2) sapphire and being substantially parallel to the (01 $\bar{1}$ 2) plane,

said zinc oxide piezoelectric crystal film containing Cu in an amount of 0.4 percent to not more than 4.5 percent by weight with respect to the total content of Zn and Cu.

5,569,549

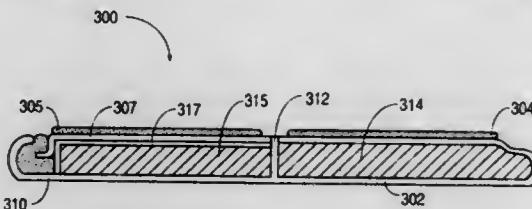
# METHOD AND STRUCTURE FOR ATTACHING A BATTERY TO AN ELECTRICAL DEVICE

Peter M. Redford, San Jose, Calif., assignor to TV Interactive Data Corporation, San Jose, Calif.

Filed Mar. 17, 1995, Ser. No. 405,645

Int. Cl.<sup>6</sup> H01M 2/20

U.S. Cl. 429—1 25 Claims



1. An electrical apparatus comprising: a battery having a first terminal and a second terminal; an electrical device having a first terminal corresponding to said first terminal of said battery and a second terminal corresponding to said second terminal of said battery; and a stick-on peel-off fastener comprising:

a first conductive sticky element sandwiched between said first terminals, said first conductive sticky element being permanently attached to one terminal of said first terminals, said first conductive sticky element electrically coupling said first terminals.

5,569,550

# BATTERY PACK HAVING UNDER-VOLTAGE AND OVER-VOLTAGE PROTECTION

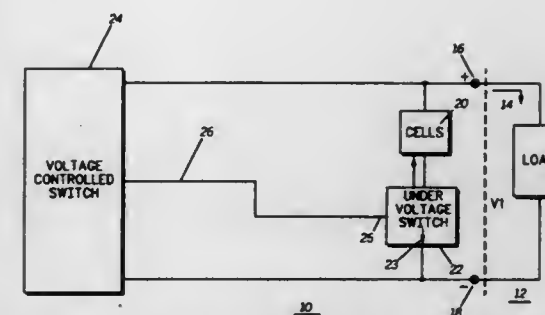
Scott M. Garrett, and Dipti V. Vashi, both of Lawrenceville, Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 3, 1995, Ser. No. 383,127

Int. Cl.<sup>6</sup> H01M 10/46

U.S. Cl. 429—7 16 Claims

1. A battery pack having a battery voltage, comprising: at least one battery cell having a positive battery terminal and a negative battery terminal;



one way blocking switch means responsive to a switch signal, and having a switch state having at least an on and off state, said blocking switch means being coupled in series with said at least one battery cell such that a discharge current applied to said battery pack will flow through said one way blocking switch means regardless of said switch state and blocking a recharge current when in said off state; and voltage controlled switch means responsive to said battery voltage for producing said switch signal.

5,569,551

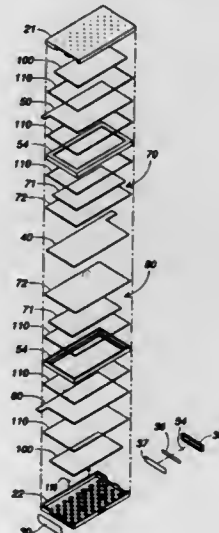
# DUAL AIR ELECTRODE CELL

Christopher S. Pedicini, Marietta; William C. Thibault, Powder Springs; Chris A. Turner, Chamblee, and Lawrence A. Tinker, Woodstock, all of Ga., assignors to AER Energy Resources Inc., Smyrna, Ga.

Filed Apr. 24, 1995, Ser. No. 428,540

Int. Cl.<sup>6</sup> H01M 8/18

U.S. Cl. 429—27 36 Claims



1. A dual air electrode metal-air cell, comprising: a casing including an upper cathode mask wall, a lower cathode mask wall, and a plurality of side walls; a metal anode including an upper side and a lower side positioned within said casing; said metal anode covered on at least said upper and lower sides with separator materials; an upper air cathode positioned between said upper cathode mask wall and said separator materials on said upper side of said anode; a lower air cathode positioned between said lower cathode mask wall and said separator materials on said lower side of said anode; a gas vent positioned on one or more of said plurality of said side walls of said casing; and a liquid electrolyte substantially trapped by said separator materials.

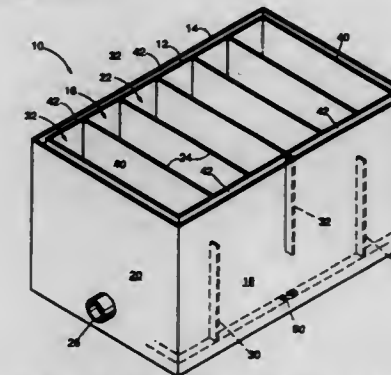
5,569,552

# LEAD-ACID BATTERY HAVING A FLUID COMPARTMENT FOR REDUCING CONVECTION-INDUCED HEAT TRANSFER

Purushothama Rao, Eagan; Thomas F. Uhlemann, Edina, and William H. Kump, West St. Paul, all of Minn., assignors to GNB Technologies, Inc., Mendota Heights, Minn. Continuation-in-part of Ser. No. 287,191, Aug. 8, 1994, Pat. No. 5,460,900. This application Jul. 12, 1995, Ser. No. 501,397

Int. Cl.<sup>6</sup> H01M 10/50

U.S. Cl. 429—72 14 Claims



1. A lead-acid storage battery comprising at least one inside plastic container having a bottom and top partitions dividing said inside container into cells,

an outside container spaced from said inner container to provide a fluid compartment annular space around the periphery of the battery defined by height and width and having end and side portions, at least one of said inside and outside containers having a series of fluid baffles spanning the width of said fluid compartment, each of said fluid baffles being less than the height of the fluid compartment and providing a fluid flow path through the fluid flow compartment and about the inside container,

a fluid inlet formed in said outside container and allowing ingress into said fluid compartment, said inside and outside containers being attached to each other, a cell element comprising positive and negative plates and separators positioned in said cells, said cells being electrically connected together, a cover sealed to at least said inside battery container, and terminals electrically connected to said cell elements.

5,569,553

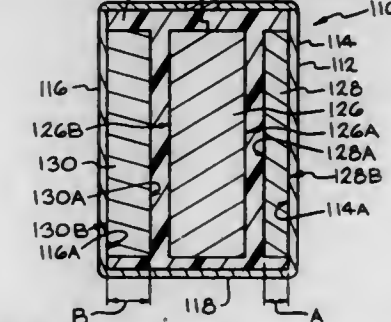
# BATTERY DESIGN FOR ACHIEVING END-OF-LIFE INDICATION DURING ELECTRICAL DISCHARGE

Sally A. Smesko, North Tonawanda; Esther S. Takeuchi, East Amherst, and Steven J. Ebel, Clarence, all of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.

Filed Mar. 8, 1995, Ser. No. 400,975

Int. Cl.<sup>6</sup> H01M 10/48

U.S. Cl. 429—90 45 Claims



1. An electrochemical cell comprising: a) a casing means of electrically conductive material;

- b) a first electrode means provided as a first continuous sheet comprising a first electrode active material;
- c) a second electrode means including a second electrode active material, wherein the second electrode means is provided as a second continuous sheet comprising at least two second electrode portions, each second electrode portion having a different thickness and a combined surface area substantially similar to and facing the first electrode means such that the first electrode means and the second electrode means are electrically associated with respect to each other in a jellyroll configuration; and
- d) an electrolyte operatively associated with the first and the second electrode means to generate an output voltage in an external electrical circuit connected to the cell during an electrochemical reaction, wherein the one second electrode component having the lesser thickness is rendered electrochemically unreactive prior to the other second electrode component having the greater thickness to produce a step change in the output voltage from a higher output voltage to a lower output voltage.

5,569,554

## SEALED RECHARGEABLE BATTERY WITH STABILIZER

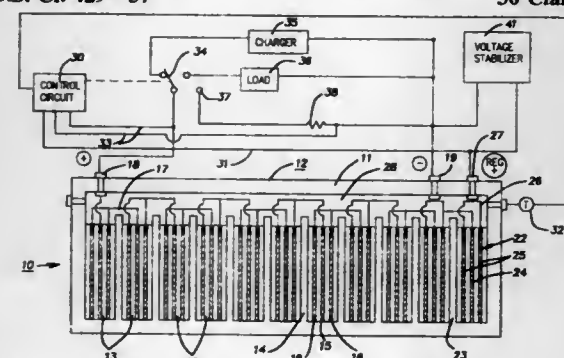
Boris Tsenter, Nayot, Israel, assignor to Acme Electric Corporation, East Aurora, N.Y.

Filed Sep. 15, 1994, Ser. No. 306,633

Int. Cl.<sup>6</sup> H01M 10/36; 10/50; 10/52

U.S. Cl. 429—57

30 Claims



1. A sealed rechargeable storage battery comprising:
- a sealed housing;
  - at least one rechargeable working cell within said sealed housing;
  - positive and negative terminals connected through the sealed housing to respective positive and negative ends of the working cell;
  - at least one regulator cell within said sealed housing; a common gas space inside said housing in communication with said rechargeable working cell and said regulator cell;
  - said regulator cell having a first electrode and a hydrogen electrode;
  - means to make external connection to said hydrogen electrode;
  - means to make external connection to said first electrode; and
  - a voltage stabilizer connected to said regulator cell capable of maintaining the voltage applied to said regulator cell within a preselected range.

5,569,555

## RECHARGING OF ZINC BATTERIES

Jonathan R. Goldstein; Inna Gektin, both of Jerusalem; Menachem Givon, HaNegev, and Yachin Yarchi, Jerusalem, all of Israel, assignors to Electric Fuel (E.F.L.) Ltd., Jerusalem, Israel

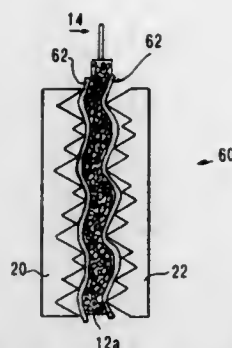
Filed Oct. 12, 1994, Ser. No. 321,788

Int. Cl.<sup>6</sup> H01M 10/54

U.S. Cl. 429—49

15 Claims

1. A process for removing discharged active zinc-containing material from a mechanically rechargeable zinc battery anode,



containing the same, said anode being of the type comprising a skeletal frame, including conductive metal and having a portion of a surface area thereof formed as open spaces, and an active zinc anode component compacted into a rigid static bed of active anode material encompassing the skeletal frame, and having two opposite major surfaces, said process comprising:

- introducing said anode in which said active zinc has been at least partly oxidized, between a pair of spaced-apart first and second crusher plates, each of said crusher plates being provided with a plurality of pointed projections of varying heights and a plurality of recesses of varying depths substantially complementary to said projections, said crusher plates being aligned with each other to the effect that tips of projections of said first crusher plate substantially mutually occlude with recesses provided on said second crusher plate and tips of projections of said second crusher plate substantially mutually occlude with recesses provided on said first surface;
- abruptly reducing the space between adjacent crusher plates while impacting at least indirectly on said anode bed positioned there-between to deform and crack said anode bed;
- moving said crusher plates away from each other and from said deformed anode bed and then displacing said deformed bed, along at least a first axis, by at least half the distance between adjacent projection tips of at least one of said crusher plates;
- once again abruptly reducing the space between adjacent crusher plates while impacting on and fragmenting said displaced anode bed; and
- repeating steps c and d until the fragmentation of said bed and the dislodgement of the resulting fragmented particles from said skeletal frame are achieved.

5,569,556

## BATTERY CHARGE INDICATOR

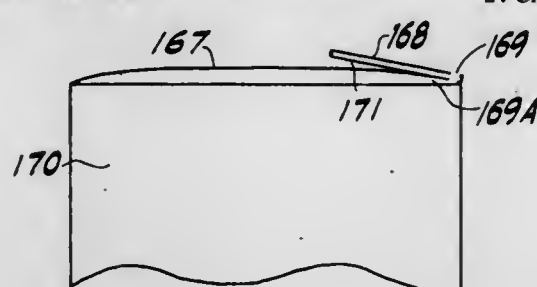
William Bohmer, Succasunna, N.J., assignor to Display Matrix Corporation, Randolph, N.J.

Filed Dec. 30, 1994, Ser. No. 368,269

Int. Cl.<sup>6</sup> H01M 10/48

U.S. Cl. 429—91

24 Claims



1. A battery charge indicator for a battery including a can having a wall portion and an end portion, the periphery of the end portion being attached to one end of the wall portion to close the can, the can having an internally contained chemical cathode and anode for generating an electrical current when connected to one another through an external load, the cathode expanding in an amount proportional to the amount of electrical energy delivered by the battery, the expansion of the cathode when applying pressure to the

inner surface of the end portion of the can causing the periphery of the end portion to deflect outwardly with respect to the interior of the can and the wall portion adjacent to the periphery of the end portion of the can, and an indicating element having a portion mounted on the periphery of the end portion of the can and extending with respect to the end portion adjacent to the periphery of the end portion of the can, the indicating element moving away from the end portion of the can in response to the outward deflection of the periphery of the end portion of the can when the battery is being discharged, the magnitude of the movement of the indicating element being a function of the degree of discharge of the battery.

5,569,557

## BATTERY CELL SPACER FOR EARTHQUAKE PROTECTED BATTERY RACKS

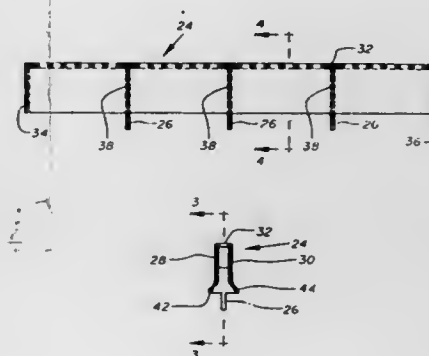
Franz M. Wagner, and Drew D. Helmer, both of Lansdale, Pa., assignors to C &amp; D Charter Power Systems, Inc., Conshohocken, Pa.

Filed Nov. 12, 1993, Ser. No. 152,351

Int. Cl.<sup>6</sup> H01M 2/10; 10/50

U.S. Cl. 429—99

14 Claims



1. An open-center longitudinally elongated spacer for keeping cell casings spaced from one another when supported side by side on a rack comprising a unitary member having a bottom adapted to rest on the rack supporting cells and sidewalls transversely spaced apart from one another by said open center the distance of desired spacing between adjacent cell casings, connected by and terminating in a top edge spaced from the bottom a greater distance than the spacing of the sidewalls and less than one-quarter of the casing height in which ventilating openings are provided through the spacer along the length of the spacer terminating at the top edge whereby air is enabled to pass through the spacer to more readily circulate between the adjacent spaced cells.

5,569,558

## REDUCED VOLTAGE DELAY ADDITIVE FOR NONAQUEOUS ELECTROLYTE IN ALKALI METAL ELECTROCHEMICAL CELL

Esther S. Takeuchi, East Amherst, and Karen M. Walsh, Marilla, both of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.

Filed Jun. 5, 1995, Ser. No. 462,175

Int. Cl.<sup>6</sup> H01M 6/00

U.S. Cl. 429—122

36 Claims

1. An electrochemical cell, which comprises:
- an anode comprising an alkali metal which is electrochemically oxidizable to form metal ions in the cell upon discharge to generate electron flow in an external electrical circuit connected thereto;

b) a cathode comprising a cathode active material wherein the electron flow is generated by intercalation of the metal ions formed by oxidation of the alkali metal anode into the cathode active material; and

c) a nonaqueous electrolyte operatively associated with the anode and the cathode, wherein the electrolyte comprises a mixture of a low viscosity solvent selected from either an ether or a dialkyl carbonate, and mixtures thereof, and a high permittivity solvent selected from either a cyclic carbonate or a cyclic amide, and mixtures thereof and wherein an alkali metal salt is dissolved in the solvent mixture, the alkali metal salt having the general formula  $MMF_6$ , wherein M is an alkali metal similar to the alkali metal comprising the anode and M' is an element selected from the group consisting of phosphorus, arsenic and antimony, the improvement comprising: a carbon oxide dissolved in the electrolyte sufficient to eliminate voltage delay at such time as the cell is discharged under current pulse conditions.

5,569,559

## ALKALINE SOLID POLYMER ELECTROLYTE, ELECTRODE AND ELECTROCHEMICAL GENERATOR CONTAINING SUCH AS ELECTROLYTE

Jean-Francois Fauvarque, Paris, France, assignor to Conservatoire National des Arts et Metiers and Electricite de France (Service National), Paris, France

PCT No. PCT/FR93/00838, § 371 Date Mar. 1, 1995, § 102(e) Date Mar. 1, 1995, PCT Pub. No. WO94/06166, PCT Pub. Date Mar. 17, 1994

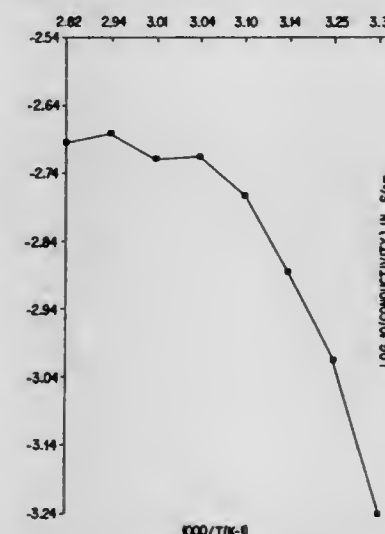
PCT Filed Sep. 2, 1993, Ser. No. 392,900

Claims priority, application France, Sep. 2, 1992, 92 10471

Int. Cl.<sup>6</sup> H01M 10/26; 10/28

U.S. Cl. 429—192

24 Claims



1. An aqueous alkaline polymer solid electrolyte consisting essentially of a mixture of a polar organic polymer matrix which is solid at ambient temperature, and a compound or a mixture of basic compounds chosen from alkali metal hydroxides or alkaline earth metal hydroxides or ammonium hydroxides, and water, the content of water being between 0.1 and 30% by weight, wherein the electrolyte is in the form of a liquid at a temperature in the range from 60° to 150° C., and is in the form of a solidified solution at ambient temperature.



5,569,560

# COMPLEXING AGENT FOR IMPROVED PERFORMANCE IN A LITHIUM BASED HYBRID ELECTROLYTE

Ib I. Olsen, 1800 Green Valley Park Way, Apt. 223, and Jerry L. Morris, 1882 Fairfield Ter., both of Henderson, Nev. 89014  
Filed Apr. 12, 1995, Ser. No. 422,183  
Int. Cl.<sup>6</sup> H01M 6/18

U.S. Cl. 429—192

16 Claims

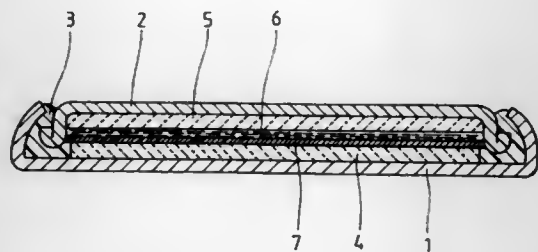
1. A solid electrolyte comprising: a solid polymeric matrix having complexing agents incorporated therein wherein the complexing agents comprise aza-ether moieties; an inorganic salt; and a solvent.

5,569,561

# PRIMARY OR SECONDARY ELECTROCHEMICAL GENERATOR HAVING A NANOPARTICULATE ELECTRODE

Ivan Exnar, Itingen; Michael Graetzel, St-Sulpice, and Jean-Paul Randin, Cortaillod, all of Switzerland, assignors to Renata A.G., Itingen, Switzerland  
Filed Jan. 20, 1995, Ser. No. 375,907  
Claims priority, application France, Jan. 21, 1994, 94 00648  
Int. Cl.<sup>6</sup> H01M 4/48

U.S. Cl. 429—218 10 Claims



1. A high capacity primary or secondary electrochemical generator having two electrodes supporting different electroactivated materials, said electrodes being connected together by an electrolyte, characterized in that the electroactive material used in the composition of at least one electrode includes an oxide of transition metals or their lithiated or partially lithiated forms selected from  $TiO_2$ ,  $Nb_2O_5$ ,  $HfO_2$ ,  $MnO_2$ ,  $Li_2NiO_2$ ,  $Li_2CoO_2$ ,  $Li_2(NiCo)O_2$ , or  $Li_2Mn_2O_4$  in the form of nanocrystalline particles having a size between 1 and 250 nm, said particles being electrically connected together.

5,569,562

# MANGANESE (III)-CONTAINING NICKEL (II) HYDROXIDE FOR THE PRODUCTION OF SECONDARY BATTERIES

Oskar Glemser, and Peter Axmann, both of Gottingen, Germany, assignors to H.C. Starck, GmbH & Co. KG, Goslar, Germany

Filed Jun. 16, 1994, Ser. No. 260,878

Claims priority, application Germany, Jul. 9, 1993, 43 23 007.5

Int. Cl.<sup>6</sup> H01M 4/52

U.S. Cl. 429—223

16 Claims

1. Manganese III-containing nickel (II) hydroxide powder, characterized in that the manganese ion is incorporated into the nickel hydroxide lattice and more than 50% of the manganese is present in the trivalent oxidation stage.

5,569,563

# NICKEL METAL HYBRIDE BATTERY CONTAINING A MODIFIED DISORDERED MULTIPHASE NICKEL HYDROXIDE POSITIVE ELECTRODE

Stanford R. Ovshinsky, 2700 Squirrel Rd., Bloomfield Hills, Mich. 48013; Dennis A. Corrigan, 3793 Burkoff Dr., Troy, Mich. 48084; Peter Benson, 490 Miller Ave., #105, Rochester, Mich. 48307, and Cristian A. Fierro, 528 E. Big Beaver Rd., Troy, Mich. 48083

Continuation-in-part of Ser. No. 27,973, Mar. 8, 1993, Pat. No. 5,348,822, which is a continuation-in-part of Ser. No. 975,031, Nov. 12, 1992, Pat. No. 5,344,728. This application Sep. 2, 1994, Ser. No. 300,610

Int. Cl.<sup>6</sup> H01M 4/32; 4/52

U.S. Cl. 429—223

17 Claims

1. A disordered positive electrode for use in an alkaline rechargeable electrochemical cell comprising: a nickel hydroxide material and carbon, where said nickel hydroxide material has at least one compositional modifier incorporated into it to promote a multiphase structure where each phase of said multiphase structure is a solid solution, said multiphase structure comprising at least one phase that is polycrystalline  $\gamma$ -phase material where cycling of said nickel hydroxide material and carbon takes place in disordered  $\alpha$  and  $\gamma$  phases, said  $\gamma$ -phase material comprising spacedly disposed plates having a chemical modifier incorporated around said plates, said plates having a range of stable intersheet distances corresponding to a 2<sup>+</sup> oxidation state and a 3.5<sup>+</sup>, or greater, oxidation state; and where said carbon provides for cycling of disordered  $\alpha/\gamma$  phases of said nickel hydroxide material by promoting stability of multiple disordered nickel hydroxide phases; increases surface area by creating density changes, and increases conductivity by the formation of filamentous conductive regions from areas of higher conductivity to individual nickel hydroxide particles.

5,569,564

# ALKALINE CELL HAVING A CATHODE INCLUDING A TITANATE ADDITIVE

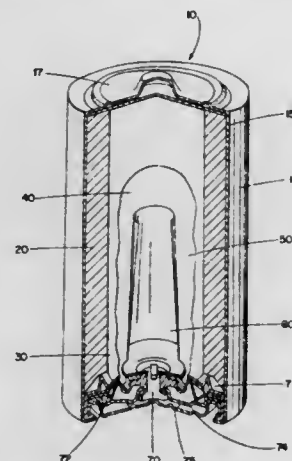
Wendi M. Swierbut, Westlake, and John C. Nardi, Brunswick, both of Ohio, assignors to Eveready Battery Company, Inc., St. Louis, Mo.

Filed Jun. 7, 1995, Ser. No. 479,591

Int. Cl.<sup>6</sup> H01M 4/50

U.S. Cl. 424—224

5 Claims



1. An electrochemical cell having a zinc anode, a cathode, and an alkaline electrolyte, said cathode comprising a manganese dioxide active material and an additive comprising a titanate.

5,569,565

# HOLOGRAM RECORDING MATERIAL

Tetsuji Kawakami, Katano; Katsuya Wakita, Nara; Tatsuro Kawamura, Takatsuki; Yusuke Ozaki, Toyonaka; Hisashi Minemoto, Ohtsu, and Nobuo Sonoda, Settu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 885,197, May 19, 1992, abandoned.

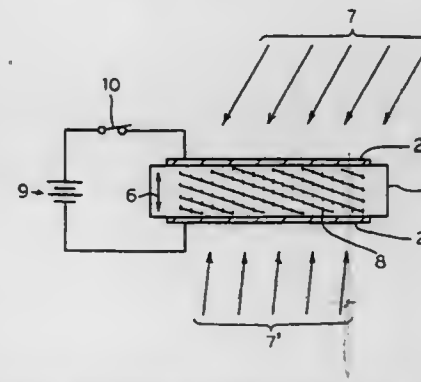
This application Jun. 22, 1994, Ser. No. 264,235

Claims priority, application Japan, May 23, 1991, 3-118587; Sep. 20, 1991, 3-241018

Int. Cl.<sup>6</sup> G03H 1/02; 1/04

U.S. Cl. 430—1

4 Claims



4. A method of hologram recording comprising (i) irradiating a coherent beam at each side of a recording layer comprising at least one polymer composition, said polymer composition having a non-centro symmetric structure and having a photoconductive component and a second-order super-polarization component, and (ii) applying a DC voltage during said coherent beam irradiation between transparent electrode layers provided on each side of said recording layer, wherein said polymer composition is:

- (I) a copolymer of 2-(N-carbazolyl) ethyl acrylate and 2-(4-( $\beta$ , $\beta$ -dicyanovinyl) phenoxy) ethyl methacrylate, dibutyl phthalate, and trinitrofluorenone;
- (II) a copolymer of 3-(N-ethylcarbazolylmethyl) acrylate and 2-(N-(4-( $\beta$ -cyano- $\beta$ -ethoxycarbonylvinyl))-N-methyl anilino) ethyl methacrylate, dibutyl phthalate, and trinitrofluorenone;
- (III) a copolymer of 2-(N-carbazolyl) ethyl acrylate and 2-(N-(4-( $\beta$ -cyano- $\beta$ -ethoxycarbonylvinyl))-N-methyl anilino) ethyl methacrylate, and trinitrofluorenone; or
- (IV) a copolymer of 2-(4-( $\beta$ , $\beta$ -dicyanovinyl) phenoxy) ethyl methacrylate and methyl methacrylate, polycarbonate, a vinylcarbazole oligomer, and N, N'-diphenyl-N,N'-bis(3-toluoyl)-4,4'-diaminobiphenyl.

5,569,566

# PHOTORECEPTOR FOR ELECTROPHOTOGRAPHY WITH LOW FREE CHLORINE CONTENT POLYCARBONATE RESIN IN ORGANIC PHOTOCONDUCTIVE LAYER

Satoshi Kanayama, Kanagawa-ken; Noriyoshi Ogawa, and Jun Tajima, both of Osaka, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

PCT No. PCT/JP94/01511, § 371 Date Apr. 14, 1995, § 102(e) Date Apr. 14, 1995, PCT Pub. No. WO95/08138, PCT Pub. Date Mar. 23, 1995

PCT Filed Sep. 13, 1994, Ser. No. 416,849

Claims priority, application Japan, Sep. 14, 1993, 5-229050 Int. Cl.<sup>6</sup> G03G 5/05

U.S. Cl. 430—58

4 Claims

1. A photoreceptor for electrophotography which comprises a conductive substrate and a photoconductive layer on the conductive substrate, a polycarbonate resin containing free chlorine of 2 ppm or below being contained in the photoconductive layer.

5,569,567

# NEGATIVELY CHARGED TONER POWDER FOR USE IN ELECTROSTATOGRAPHY

Serge Tavernier, Lint; Werner Op de Beeck, Keerbergen; Danny Van Wunsel, Nijlen, and Michel Vervoort, Antwerpen, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

PCT No. PCT/EP94/01321, § 371 Date Dec. 14, 1994, § 102(e) Date Dec. 14, 1994, PCT Pub. No. WO94/27192, PCT Pub. Date Nov. 24, 1994

PCT Filed Apr. 25, 1994, Ser. No. 356,216

Claims priority, application European Pat. Off., May 11, 1993, 93201351

Int. Cl.<sup>6</sup> G03G 9/007

U.S. Cl. 430—110

17 Claims

1. A dry toner powder the toner particles of which are triboelectrically negatively charged and are suited for development of an electrostatic charge pattern, wherein said toner particles contain: (1) one or more triboelectrically negatively chargeable thermoplastic resins serving as binder having a volume resistivity of at least  $10^{13} \Omega \cdot \text{cm}$ , and (2) at least one substance having a volume resistivity lower than the volume resistivity of said binder, and wherein said substance(s) (2) is (are) capable of lowering the volume resistivity of said binder by a factor of at least 3.3 when present in said binder in a concentration of 5% by weight relative to the weight of said binder, and wherein said toner powder containing particles including a mixture of said ingredients (1) and (2) under triboelectric charging conditions is capable of obtaining an absolute median (q/d) charge/diameter value (x) lower than 10 fC/10  $\mu\text{m}$  but not lower than 1 fC/10  $\mu\text{m}$ , and said toner powder under the same triboelectric charging conditions but free from said substance(s) (2) then has an absolute median q/d value (x) at least 50% higher than when said substance(s) (2) is (are) present, and wherein the distribution of the charge/diameter values of the individual toner particles is characterized by a coefficient of variation  $v \leq 0.33$ .

5,569,568

# METHOD FOR USING A LASER ABLATIVE RECORDING ELEMENT WITH LOW RED OR GREEN ABSORPTION AS A REPROGRAPHIC PHOTOMASK

Charles D. DeBoer, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 16, 1994, Ser. No. 357,970

Int. Cl.<sup>6</sup> G03F 9/00

U.S. Cl. 430—5

5 Claims

1. A single sheet process of forming a reprographic mask in the absence of a separate receiving element and using said reprographic mask comprising:

- a) imagewise-exposing by means of a laser, a dye-ablative recording element having high blue and ultraviolet contrast comprising a transparent support having thereon a dye layer comprising a blue-absorbing dye, an ultraviolet-absorbing dye and an image dye dispersed in a polymeric binder, said dye layer having an infrared-absorbing material associated therewith to absorb at a given wavelength of the laser used to expose said dye-ablative recording element, causing imagewise ablation of the dye layer, said image dye being substantially transparent in the infrared region of the electromagnetic spectrum and absorbing in the region of from about 450 to about 700 nm and not having substantial absorption at the wavelength of said laser used to expose said element, said laser exposure taking place through the dye layer side of said dye-ablative recording element, wherein said dye-ablative recording element has:
  - I) an optical density of greater than about 2.0 in each of the ultraviolet and blue regions of the spectrum; and
  - II) a sum of optical densities in the red and green regions of the spectrum of at least about 1 and up to about 3.0;
- b) removing the ablated dye layer areas by means of an air stream to obtain said reprographic mask;

- c) placing said reprographic mask over a photosensitive material; and  
d) exposing the masked photosensitive material to an ultraviolet or blue light source.

5,569,569

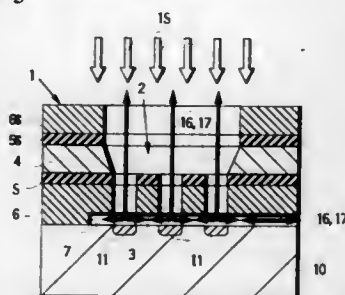
## STENCIL MASK

Takashi Goto, Ushiku, and Shingo Terakado, Tsukuba, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan  
Filed Jan. 24, 1995, Ser. No. 377,306

Claims priority, application Japan, Jan. 25, 1994, 6-006267  
Int. Cl.<sup>6</sup> G03F 9/00

U.S. Cl. 430—5

28 Claims



1. A stencil mask for use with a photochemical reaction process, comprising:

- a) a mask substrate having a front surface, a rear surface and a plurality of side surfaces, and a window, the window extending from the front surface to the rear surface of the mask substrate;  
b) an absorber film absorbing or reflecting photons, the absorber film being formed on the front surface of the mask substrate over at least a region corresponding to the window;  
c) a pattern depicted on the absorber film over the region corresponding to the window; and  
d) a path supplying a reactive medium and discharging an exhaust medium containing reaction products, the path extending from the pattern to at least one of the side surfaces of the mask substrate.

5,569,570

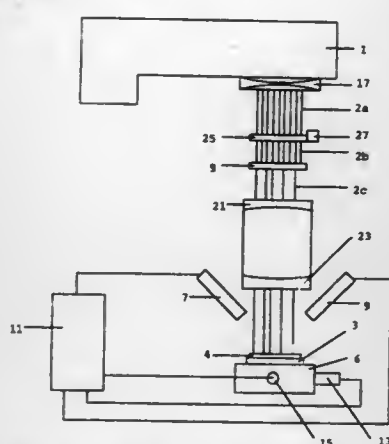
## AUTOMATED MASK ALIGNMENT FOR UV PROJECTION EXPOSURE SYSTEM

Peter L. Balzer, Chenango Forks, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.  
Division of Ser. No. 332,330, Oct. 31, 1994. This application Apr. 13, 1995, Ser. No. 421,447

Int. Cl.<sup>6</sup> G03F 9/00

U.S. Cl. 430—22

8 Claims



1. A method of aligning an image at a desired position on a substrate support, said method comprising the steps of:

- a) providing a radiation source producing desired wavelengths of radiation;  
b) providing a fluorescing medium on a substrate support;  
c) directing said radiation toward said substrate support;  
d) positioning at least one filter between said radiation source and said substrate support;  
e) positioning a mask between said radiation source and said substrate support, said mask selectively transmitting said radiation;  
f) irradiating said substrate support with said radiation, thereby causing said fluorescing medium to fluoresce;  
g) detecting a position of said radiation impacting upon said substrate support with at least one detector by detecting an image of the fluorescing medium;  
h) producing a signal corresponding to said detected position of said radiation;  
i) comparing said detected position of said radiation with a desired position of radiation impinging upon said substrate support to determine whether a deviation of said position of said radiation on said substrate support away from a desired position in a direction perpendicular to said radiation exists;  
j) producing a signal corresponding to said comparison;  
k) if said deviation exists, altering the position of said radiation source, said mask and said substrate support relative to each other in accordance with said signal in said direction perpendicular to said radiation so as to cause said position of said radiation on said substrate support to substantially correspond to said desired position.

5,569,571

## PROCESS FOR PREPARING BLACK MATRIX FOR A COLOR TUBE BY ETCHING

Ik-Cheol Lim; Su-Yeon Cho, both of Suwon, and Seung-Joon Yoo, Anyang, all of Rep. of Korea, assignors to Samsung Display Devices Co., Ltd., Kyunggi-do, Rep. of Korea  
Filed Jun. 6, 1995, Ser. No. 472,702

Claims priority, application Rep. of Korea, Dec. 27, 1994, 94-37462

Int. Cl.<sup>6</sup> G03C 5/00

U.S. Cl. 430—25

3 Claims

1. A process for preparing a black matrix comprising the steps of:  
coating, drying, exposing and developing a photoresist on a substrate to produce a developed substrate;  
drying the developed substrate to produce a dried developed substrate;  
coating a dye on the dried developed substrate and then drying the dye to produce a dye coated substrate;  
coating graphite on the dye coated substrate to produce a graphite-coated substrate; and  
etching the graphite-coated substrate to produce the black matrix.

5,569,572

## PROCESSES FOR CONTROLLING DEVELOPER AGING

John R. Laing, Rochester, and George W. Vianco, Walworth, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 18, 1995, Ser. No. 573,808

Int. Cl.<sup>6</sup> G03G 9/08

U.S. Cl. 430—137

24 Claims

1. A process for the preparation of developer compositions comprising providing a first developer comprised of carrier and first toner comprised of resin, pigment, polyolefin, compatibilizer, charge control agent, and metal oxide surface additive, and adding thereto a second replenisher comprised of carrier, and second toner comprised of resin, pigment, polyolefin, compatibilizer, charge control agent, and metal oxide surface additive, and wherein the

metal oxide surface additive of the second toner is present in a lesser amount than the metal oxide surface additive of the first toner.

5,569,573

## LITHOGRAPHIC PRINTING ORIGINAL PLATES AND PLATEMAKING PROCESS USING THE SAME

Gensho Takahashi, and Masaaki Kurihara, both of Fujii, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 2, 1994, Ser. No. 349,158

Claims priority, application Japan, Apr. 20, 1993, 5-115185  
Int. Cl.<sup>6</sup> G03F 7/00; B41N 1/00

U.S. Cl. 430—138

25 Claims

1. A thermosensitive lithographic printing original plate comprising a substrate, a hydrophilic layer containing a hydrophilic binder polymer, and an oleophilic material which forms an image area by heating.

wherein said oleophilic material is contained in a microcapsule, the hydrophilic binder polymer having a three-dimensional cross-link and a functional group which chemically combines with the oleophilic material in the microcapsule when the microcapsule is decomposed, and the microcapsuled oleophilic material having a functional group which chemically combines with the hydrophilic binder polymer when the microcapsule is decomposed.

5,569,574

## IMAGE-RECORDING MATERIALS

Peter Viskl, and David P. Waller, both of Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 13, 1995, Ser. No. 556,534

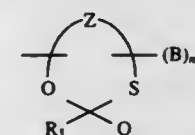
Int. Cl.<sup>6</sup> G03C 8/12; 8/40; 7/26; 1/34

U.S. Cl. 430—203

10 Claims

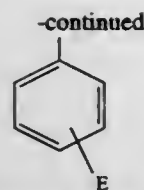
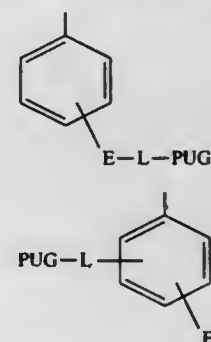
1. A heat-developable image-recording material for use in a diffusion transfer process comprising:

- one or more supports, each carrying in one or more layers:  
a source of silver ions;  
a reducing agent;  
a compound capable of releasing a diffusible reagent upon cleavage in the presence of silver ions or a soluble silver complex, said compound comprising at least one 1,3-sulfur-oxygen moiety represented by formula (I)



wherein:

R<sub>1</sub> is represented by any of the formulae below



E represents an electron donating substituent; L represents a divalent organic linking group containing at least one carbon atom; PUG represents a photographically useful group;

Q represents a hydrogen atom, alkyl, benzene, dimethylaminobenzene, alkoxy, or thioalkyl, or Q is the same as R<sub>1</sub> when R<sub>1</sub> is represented by formula (IIa) or formula (IIb), or Q is represented by formula (IIa) when R<sub>1</sub> is represented by formula (IIb), or Q is represented by formula (IIb) when R<sub>1</sub> is represented by formula (IIc), Q is -L-PUG-; provided that at least one of R<sub>1</sub> and Q includes PUG;

Z represents the carbon atoms necessary to complete an unsubstituted or substituted 5- or 6-membered heterocyclic ring system; and

B represents a ballast group which renders the compound substantially immobile and nondiffusible, n is an integer from 0 to 4.

5,569,575

## PROCESSING METHOD OF A SILVER HALIDE PHOTOGRAPHIC MATERIAL

Hirobumi Yamashita, Hino, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Feb. 10, 1995, Ser. No. 386,636

Claims priority, application Japan, Feb. 18, 1994, 6-021277  
Int. Cl.<sup>6</sup> G03C 5/31

U.S. Cl. 430—399

4 Claims

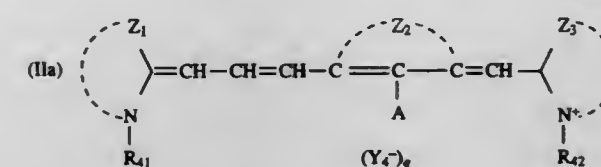
1. A method of processing, by use of an automatic processor, a silver halide photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer, the method comprising the steps of

- developing an exposed photographic material with a developer, fixing the developed photographic material with a fixer, washing the photographic material and drying the photographic material,

wherein said developer has a pH of 10.4 or more and is replenished by a developer replenisher at a rate of 50 to 220 ml/m<sup>2</sup> of photographic material, and wherein said silver halide emulsion layer contains a spectral sensitizing dye represented by Formula (IV),

- (I) said silver halide emulsion containing a silver halide grains comprising silver iodobromide or silver iodochlorobromide and comprising a high silver iodide phase, in the central portion thereof, having an iodide content of 20 to 40 mol %

Formula (IV)



wherein Z<sub>1</sub> and Z<sub>3</sub> independently represent a nonmetallic atom group necessary for forming benzothiazole, benzoxazole, naphthothiazole or naphthoxazole, each of which may be substituted; R<sub>41</sub> and R<sub>42</sub> represent each a substituted or unsubstituted alkyl group; Z<sub>2</sub> represents a carbon atom group necessary for forming a 5- or 6-membered carbon ring; A represents a hydrogen atom or a substituent; Y<sub>4</sub><sup>+</sup> represents a counter ion; q is 0 or 1, provided that, when an intramolecular salt is formed, q is 0.



**5,569,576**  
**PHOTOGRAPHIC MATERIALS CONTAINING**  
**POLYMERIC COMPOUNDS**

Jean-Marie Dewanckele, Drongen; Geert Vercruysse, Kluisbergen, both of Belgium, and Ralf Büscher, Lohmar, Germany, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium  
 Filed Feb. 27, 1995, Ser. No. 395,112

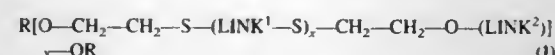
Claims priority, application European Pat. Off., Mar. 11, 1994, 94200639.6

Int. Cl.<sup>6</sup> G03C 1/46

U.S. Cl. 430—502

8 Claims

1. Photographic material comprising on at least one side of a support at least one light-sensitive silver halide emulsion layer, one or more intermediate layer(s) and an antistress topcoat, characterized in that the said material comprises at least one compound having the general formula (I)



wherein

each of LINK<sup>1</sup> and LINK<sup>2</sup> which may be the same or different represents a divalent linking group;

R represents H, an alkyl group, an aryl group or an acyl group;

x is 0, 1 or 2, and

y varies from 2 to 20.

**5,569,577**  
**SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL**  
 Kazunori Hasebe, Minami-Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 8, 1995, Ser. No. 400,573

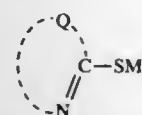
Claims priority, application Japan, Mar. 8, 1994, 6-37087; May 6, 1994, 6-117613

Int. Cl.<sup>6</sup> G03C 1/76

U.S. Cl. 430—523

12 Claims

1. A silver halide color photographic material having, on a reflective support composed of a substrate coated with waterproof resin layers, photographic constitutive layers comprising at least a silver halide emulsion layer containing cyan dye-forming coupler(s), a silver halide emulsion layer containing magenta dye-forming coupler(s), a silver halide emulsion layer containing yellow dye-forming coupler(s) and plural non-light-sensitive colloidal layers, which is characterized in that the number of said waterproof resin layers between said photographic constitutive layers and said substrate is at least three, at least one of said waterproof resin layers contains from 15% by weight to 45% by weight of a white pigment, the waterproof resin layer nearest to the substrate and that nearest to the photographic constitutive layers do not contain a white pigment or contain it in an amount of 20% by weight or less, the thickness of the waterproof resin layer nearest to the photographic constitutive layers is 5 µm or less, at least one silver halide emulsion to be in at least one of said silver halide emulsion layers contains high silver chloride emulsion grains having a silver chloride content of 95 mol % or more, and the layer containing said high silver chloride emulsion contains a compound of a general formula (I):



wherein Q represents an atomic group necessary for forming a 5-membered or 6-membered hetero ring or a 5-membered or 6-membered hetero ring condensed with benzene ring(s); and M represents a cation.

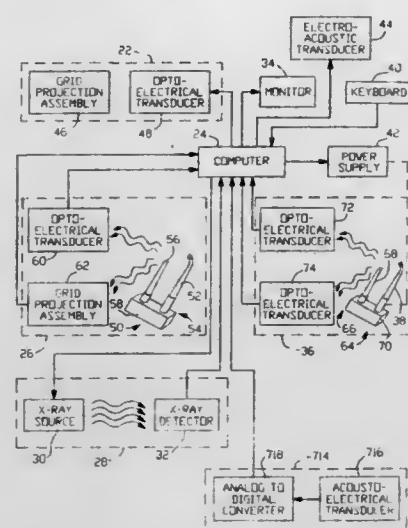
**5,569,578**  
**METHOD AND APPARATUS FOR EFFECTING CHANGE**  
**IN SHAPE OF PRE-EXISTING OBJECT**

David R. Mushabac, 919 Ocean Ave., Brooklyn, N.Y. 11226  
 Filed Apr. 10, 1990, Ser. No. 507,162

Int. Cl.<sup>6</sup> G06F 159/00

U.S. Cl. 433—215

77 Claims



1. A system for effecting a desired modification in the shape of a pre-existing object to which access is restricted, said system comprising:

a computer;

first data input means operatively connected to said computer for providing said computer with electrically encoded data specifying a three-dimensional surface of the object;

second data input means operatively connected to said computer for providing said computer with electrically encoded data specifying a curvilinear contour of said object;

display means operatively connected to said computer for displaying a three-dimensional graphic representation of said object in response to signals generated by said computer in accordance with data from said first data input means and said second data input means;

instruction input means operatively connected to said computer for instructing said computer to modify the three-dimensional representation of said object on said display means and for selecting a modification of said three-dimensional representation which represents a desired object preparation; and

output means operatively connected to said computer for issuing an output signal to effectuate a limitation in motion of a preparation instrument relative to said object so that said object is provided with said desired object preparation.

**5,569,579**  
**SYNTHETIC-BASED PLATELET STORAGE MEDIA**  
 Scott Murphy, Ardmore, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Continuation-in-part of Ser. No. 984,272, Dec. 1, 1992, Pat. No. 5,376,524, which is a continuation of Ser. No. 678,699, Apr. 1, 1991, abandoned. This application Mar. 17, 1994, Ser. No. 210,033

Int. Cl.<sup>6</sup> A01N 1/02

U.S. Cl. 435—2

8 Claims

1. A synthetic-based medium for the storage of platelets for intravenous transfusion to humans, consisting essentially of:

(a) a sugar capable of promoting the formation of adenosine triphosphate;

(b) from about 1 to about 80 mM phosphate;

(c) from about 1 to about 80 mM of an organic compound that acts as a substrate for oxidative phosphorylation and for

providing buffering in the medium upon oxidation selected from the group consisting of acetoacetate, beta-hydroxybutyrate, pyruvate, C<sub>3-4</sub> fatty acid anions, acetone, and mixtures thereof; and

(d) at least about 95 percent by weight of a physiologically compatible, aqueous electrolyte solution.

**5,569,580**  
**METHOD FOR TESTING THE TOXICITY OF**  
**CHEMICALS USING HYPERACTIVATED**  
**SPERMATOZOA**

Ronald J. Young, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 13, 1995, Ser. No. 390,454

Int. Cl.<sup>6</sup> A01N 1/02; C12Q 1/18

U.S. Cl. 435—2

15 Claims

1. A method of determining the reproductive toxicity of a chemical, comprising the steps of:

- forming a suspension of hyperactivated spermatozoa;
- exposing said suspension to the chemical; and
- monitoring the change in hyperactivity of the spermatozoa and determining reproductive toxicity based on any inhibition of said hyperactivity.

**5,569,581**  
**ALTERATION AND PREDICTION OF MALE FERTILITY**  
**USING SEMINAL PLASMA AND ITS COMPONENTS**

Gary Killian; David Chapman; Aida Cancel, all of State College, Pa., and Margaret A. Henault, Miami, Fla., assignors to The Penn State Research Foundation, University Park, Pa.

Filed Nov. 17, 1993, Ser. No. 154,226

Int. Cl.<sup>6</sup> C12Q 1/00

U.S. Cl. 435—4

2 Claims

1. A method of predicting bovine male fertility comprising the steps of:

- measuring the relative concentration of each of the following four proteins found in seminal plasma of a semen sample taken from a donor;
  - molecular weight 55 kDa and isoelectric point 4.5 pI
  - molecular weight 26 kDa and isoelectric point 6.2 pI
  - molecular weight 16 kDa and isoelectric point 6.7 pI
  - molecular weight 16 kDa and isoelectric point 4.1 pI
- correlating the concentrations of the four proteins to the fertility of the donor of the semen sample according to the following formula:

$$F = -2.12 + 3.58\sqrt{D_1} - 0.90\sqrt{D_2} + 1.61\sqrt{D_3} + 0.35\sqrt{D_4} - 1.69\sqrt{D_1\sqrt{D_4}}$$

wherein "F" is predicted fertility expressed as a deviation from the average fertility of bulls, and D<sub>1</sub>, D<sub>2</sub>, D<sub>3</sub> and D<sub>4</sub> represent the relative concentration of the proteins described in (a), (b), (c), and (d) respectively, wherein the relative concentration is represented as a fraction of said proteins to the concentration of the four measured proteins in the seminal plasma; and

(III) determining the fertility of the donor by comparing "F" to the average fertility values of a known bovine male population.

**5,569,582**  
**RAPID AMPLIFICATION AND DETECTION OF**  
**NUCLEIC ACIDS**

Nectarios Tavernarakis; George Hatzidakis, and Elias Krambovitis, all of Heraklion, Greece, assignors to Institute of Molecular Biology & Technology, Crete, Greece  
 Continuation of Ser. No. 729,579, Jul. 15, 1991, abandoned.

This application Dec. 22, 1993, Ser. No. 190,711

Int. Cl.<sup>6</sup> C12Q 1/70; 1/68; C07H 21/04

U.S. Cl. 435—5

18 Claims

1. A method for amplifying an HIV-1 DNA target nucleic acid sequence in a sample, wherein said target sequence consists of complementary strands having the nucleotide sequence 1317-1379 of pHB2, comprising the steps of:

(a) adding deoxynucleoside triphosphates, primer pairs comprising two oligonucleotide primers having the nucleotide sequences

5' GAAGGAGCCA CCCACAAG 3' (SEQ ID NO: 1)

and

5' GGCTGCTGA TGTCCCCC 3' (SEQ ID NO: 2)

and a nucleic acid polymerase to said sample;

(b) denaturing said target nucleic acid sequence to form separate strands; and

(c) maintaining a single reaction temperature selected from within a range from 68° C. to 80° C. and appropriate reaction conditions sufficient to permit specific hybridization and application through the following cycle: said primers hybridize to said strands of said target sequence, primer extension products, which are hybridized to said strands, are formed from said primers and said nucleoside triphosphates, said extension products separate from said strands to become templates for said primers, and new primer extension products are formed, wherein said hybridization, extension, and separation in said cycle occur at the same temperature.

**5,569,583**  
**RAPID AND SENSITIVE DETECTION OF**  
**CYTOMEGALOVIRUS**

Steven J. Greenberg, Orchard Park, and Mary J. Evans, East Amherst, both of N.Y., assignors to Health Research Inc., Buffalo, N.Y.

Filed Apr. 25, 1995, Ser. No. 428,370

Int. Cl.<sup>6</sup> C12Q 1/70; 1/68; C12P 19/34; C07H 21/04

U.S. Cl. 435—5

13 Claims



3. A method for detecting the presence or absence of cytomegalovirus, wherein the method comprises the steps of:

(a) lysing the cells in a specimen to release nucleic acid molecules;

(b) contacting the nucleic acid molecules with oligonucleotide primer pair SEQ ID NO:1 and SEQ ID NO:2 under suitable conditions permitting hybridization of the oligonucleotides to the nucleic acid molecules;

(c) enzymatically amplifying a specific region of the nucleic acid molecules comprising target sequences of the cytomegalovirus.

- lovirus immediate early antigen gene using oligonucleotides SEQ ID NO:1 and SEQ ID NO:2 as primers;
- (d) contacting amplified target sequences from step (c), if present, with a probe consisting of oligonucleotide SEQ ID NO:5 labeled with a detectable moiety under suitable conditions permitting liquid hybridization of the labeled oligonucleotide probe to amplified target sequences; and
- (e) detecting the presence of amplified target sequences by detecting the detectable moiety of the labeled oligonucleotide probe hybridized to amplified target sequences in a gel retardation assay, wherein the presence of the amplified target sequences correlates to the presence of cytomegalovirus in the specimen with a sensitivity of detection at least as low as 1 TCID<sub>50</sub>.
4. A method for detecting the presence or absence of cytomegalovirus, wherein the method comprises the steps of:
- (a) lysing the cells in a specimen to release nucleic acid molecules;
- (b) contacting the nucleic acid molecules with oligonucleotide primer pair SEQ ID NO:3 and SEQ ID NO:4 under suitable conditions permitting hybridization of the oligonucleotides to the nucleic acid molecules;
- (c) enzymatically amplifying a specific region of the nucleic acid molecules comprising target sequences of the cytomegalovirus late antigen gene using oligonucleotides SEQ ID NO:3 and SEQ ID NO:4 as primers;
- (d) contacting amplified target sequences from step (c), if present, with a probe consisting of oligonucleotide SEQ ID NO:6 labeled with a detectable moiety under suitable conditions permitting liquid hybridization of the labeled oligonucleotide probe to amplified target sequences; and
- (e) detecting the presence of amplified target sequences by detecting the detectable moiety of the labeled oligonucleotide probe hybridized to amplified target sequences in a gel retardation assay; wherein the presence of the amplified target sequences correlates to the presence of cytomegalovirus in the specimen with a sensitivity of detection at least as low as 1 TCID<sub>50</sub>.

5,569,584

# METHOD FOR DISTINGUISHING OR MONITORING THE STATE OF PREMALIGNANT OR MALIGNANT TRANSFORMED HUMAN COLONIC TISSUE

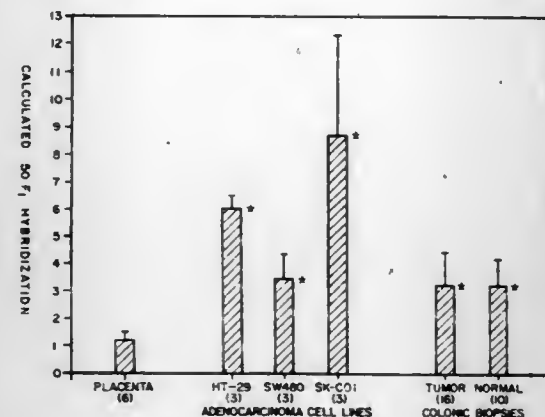
Leonard H. Augenlicht, Redding, Conn., assignor to Montefiore Medical Center, Bronx, N.Y.

Continuation of Ser. No. 63,358, May 17, 1993, abandoned, which is a continuation of Ser. No. 805,102, Dec. 10, 1991, abandoned, which is a continuation of Ser. No. 182,185, Apr. 15, 1988, abandoned. This application Mar. 14, 1994, Ser. No. 212,316

Int. Cl.<sup>6</sup> C12Q 1/68

U.S. Cl. 435—6

9 Claims



1. A method for distinguishing between benign or malignant transformed human colonic tissue and normal human colonic tissue

by detecting a decrease in the abundance of RNA in a first sample of human colonic tissue which is to be studied compared to a second sample of human colonic tissue which is normal human colonic tissue wherein said RNA hybridizes to 50F1 complementary DNA standard probe, which method comprises:

- (a) obtaining said first and second samples of human colonic tissue and RNA thereof;
- (b) immobilizing said RNA of said first and second samples separately and contacting said RNA in said first and second samples under hybridization conditions with said 50F1 complementary DNA standard probe consisting of the sequence set forth in FIG. 7 to form first and second hybridized RNA/DNA complexes, respectively;
- (c) measuring the quantity of said first and second hybridized RNA/DNA complexes; and
- (d) comparing said quantity of hybridized complex formed between the RNA in said first sample and said 50F1 complementary standard DNA probe with the quantity of hybridized complex formed between the RNA in said second sample and said 50F1 complementary DNA standard probe, wherein detecting a decrease in abundance of RNA in said first sample relative to the amount of RNA in said second sample distinguishes between human colonic tissue which is benign or malignant transformed and normal human colonic tissue.

5,569,585

# IN VITRO ASSAY MEASURING DEGREE OF ACTIVATION OF IMMUNE CELLS

Joseph J. Goodwin, Waltham; Barry I. Caplan, Newton, and Bruce P. Babbitt, North Easton, all of Mass., assignors to Cellcor, Inc., Newton, Mass.

Continuation-in-part of Ser. No. 30,607, Mar. 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 963,846, Oct. 21, 1996, abandoned. This application Mar. 16, 1994, Ser. No. 214,400

Int. Cl.<sup>6</sup> C12Q 1/02; 1/68

U.S. Cl. 435—6

44 Claims

1. A method for detecting a primed state of activation of ex-vivo activated (EVA) immune cells comprising:

- (a) providing a sample of EVA immune cells;
- (b) contacting the EVA immune cells with a single, intracellular-acting stimulant, wherein said stimulant at the dose used for stimulation will effectively stimulate primed immune cells to activity but wherein said stimulant does not effectively stimulate resting immune cells to activity;
- (c) measuring the activity of the EVA immune cells that were effectively stimulated by said stimulant;
- (d) contacting a sample of apheresis-derived peripheral blood mononuclear cells with said stimulant, wherein said stimulant at the dose used for stimulation will effectively stimulate primed immune cells to activity but wherein said stimulant does not effectively stimulate resting immune cells to activity;
- (e) measuring the activity of the peripheral blood mononuclear cells that were effectively stimulated by said stimulant; and
- (f) comparing the level of activity of the EVA immune cells with the level of activity of the peripheral blood mononuclear cells, wherein an increase in said level of activity of said EVA immune cells compared to said peripheral blood mononuclear cells indicates that said EVA immune cells are in a primed state of activation.

5,569,586

# NUCLEIC ACID PROBES FOR THE DETECTION OF BACTERIA OF THE GENUS LEGIONELLA AND METHODS FOR THE DETECTION OF THE ETIOLOGICAL AGENTS OF LEGIONNAIRES' DISEASE

Dale A. Pelletier, Southborough, and William G. Weisburg, Milford, both of Mass., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 66,373, May 24, 1993, abandoned.

This application Sep. 20, 1994, Ser. No. 309,560

Int. Cl.<sup>6</sup> C12Q 1/68; C07H 21/04

U.S. Cl. 435—6

19 Claims

1. An isolated nucleic acid which hybridizes preferentially to 23S or 16S rRNA or rDNA of *Legionella pneumophila* bacteria and not to non-*Legionella pneumophila* organisms, wherein said nucleic acid is fully complementary or identical to a nucleotide sequence of one of probes 2704 (SEQ ID NO: 1), 2705 (SEQ ID NO: 2), 2708 (SEQ ID NO: 3), 2690 (SEQ ID NO: 4), 2957 (SEQ ID NO: 5), 2929 (SEQ ID NO: 6), or 2954 (SEQ ID NO: 7).

5,569,587

# METHOD FOR LABELING AND DETECTING MATERIALS EMPLOYING LUMINESCENT ARYLSULFONATE CYANINE DYES

Alan S. Waggoner, Pittsburgh, Pa., assignor to Carnegie Mellon University, Pittsburgh, Pa.

Continuation of Ser. No. 882,802, May 14, 1992, abandoned, which is a division of Ser. No. 240,756, Sep. 2, 1988, abandoned, which is a continuation-in-part of Ser. No. 854,347, Apr. 18, 1986, abandoned. This application Apr. 19, 1995, Ser. No. 424,219

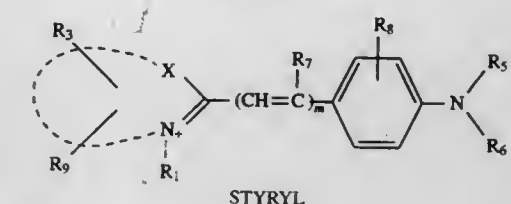
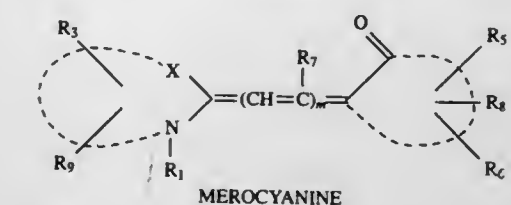
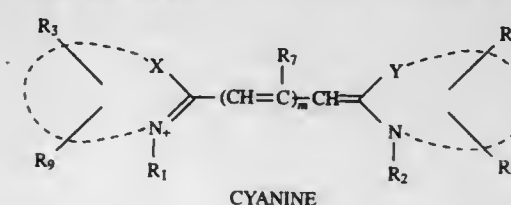
Int. Cl.<sup>6</sup> C12Q 1/68

U.S. Cl. 435—6

23 Claims

1. A method for labeling a component of an aqueous liquid comprising:

- (a) adding to a liquid which contains a component selected from the group consisting of proteins, sugars, cells, nucleic acids and combinations thereof, a luminescent dye selected from the group consisting of cyanine, merocyanine and styryl dyes having the structures



wherein:

the dotted lines each represent carbon atoms necessary for the formulation of said cyanine, merocyanine and styryl dyes; X and Y are selected from the group consisting of O, S, and CH<sub>3</sub>—C—CH<sub>3</sub>;

- m is an integer selected from the group consisting of 1, 2, 3 and 4;
- at least one of said R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub> and R<sub>7</sub> groups contains a reactive group to make said dye covalently reactive with an amine, aldehyde, sulfhydryl or hydroxy group on said component; and,
- at least one of said R<sub>8</sub> and R<sub>9</sub> groups comprises a sulfonic acid or sulfonate group attached to an aromatic nucleus of said dye; and
- (b) reacting said dye with said component so that said dye covalently binds to and labels said component.

5,569,588

# METHODS FOR DRUG SCREENING

Matthew Ashby, San Aselmo, and Jasper Rine, Moraga, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Aug. 9, 1995, Ser. No. 512,811

Int. Cl.<sup>6</sup> C12Q 1/68; C12N 15/00; C07H 21/04

U.S. Cl. 435—6

8 Claims

1. A method for modeling of the transcriptional responsiveness of an organism to a candidate drug which has an effect on gene transcription in cells of said organism, comprising steps:

- (a) detecting reporter gene product signals from each of a plurality of different, separately isolated cells of a target organism, wherein each of said cells contains a recombinant construct comprising a reporter gene operatively linked to a different endogenous transcriptional regulatory element of said target organism such that said transcriptional regulatory element regulates the expression of said reporter gene, wherein said plurality of cells comprises an ensemble of the transcriptional regulatory elements of said organism sufficient to model the transcriptional responsiveness of said organism to a drug;
- (b) contacting each of said cells with a candidate drug under conditions wherein said cells maintain homeostasis;
- (c) detecting reporter gene product signals from each of said cells;
- (d) comparing said reporter gene product signals from each of said cells before and after contacting each of said cells with said candidate drug to obtain a drug response profile; wherein said drug response profile provides a model of the transcriptional responsiveness of said organism to said candidate drug.

5,569,589

# IMMUNOASSAY ELEMENT AND PROCESS AND IMMUNOASSAY

Toshikage Hiraoka, Asaka; Tetsuji Tanimoto, Tokyo; Yoshihiko Makino, Asaka; Tadashi Ninomiya, Tokyo; Naofumi Hara, Asaka; Yoshihiro Ashihara, Tokyo; Yukio Sudo, and Toshihiro Mori, both of Asaka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, and Fujirebio Inc., Tokyo, both of Japan

Continuation of Ser. No. 957,628, Oct. 6, 1992, abandoned, which is a continuation of Ser. No. 684,283, Apr. 12, 1991, abandoned. This application Dec. 7, 1993, Ser. No. 163,405

Claims priority, application Japan, Apr. 13, 1990, 2-96499

Int. Cl.<sup>6</sup> G01N 33/53

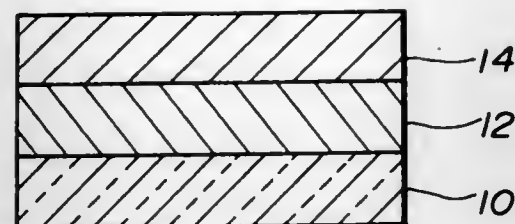
U.S. Cl. 435—7.9

21 Claims

1. An immunoassay element for quantitatively analyzing a ligand by determining a change in enzymatic activity of a labelling enzyme caused by a competitive reaction between

- the ligand and
- a linked product comprising
  - the ligand or a derivative thereof having a common antigenic determinant with the ligand and
  - a high molecular weight compound having a molecular weight of not less than 50,000 daltons for specific binding to





3. an enzyme labelled antibody which can react and bind specifically with the ligand and the linked product, wherein the high molecular weight compound sterically hinders enzymatic activity in specific binding complexes comprising the enzyme labelled antibody and the linked product;

said element comprising:

- (a) a substrate layer comprising a non-diffusible substrate composed of a polymer which is capable of being digested by the labelling enzyme into a diffusible oligomer, which is capable of migrating out of the substrate layer; and
- (b) a reagent layer comprising a fragmenting enzyme for further fragmenting the diffusible oligomer into a detectable monomer, the reagent layer also comprising a reagent composition which react with the detectable monomer to form a dye having an absorption peak in the visible wavelength range;

wherein the labelling enzyme is an endo-active hydrolase to digest the polymer into the diffusible oligomer and the fragmenting enzyme is an exo-active hydrolase which is capable of digesting the diffusible oligomer into detectable monomer.

13. An immunoassay process for quantitatively analyzing an amount of a ligand in a sample by determining a change in enzymatic activity of a labelling enzyme comprising contacting the sample with the immunoassay element of claim 1 which element comprises the linked product and the enzyme labelled antibody whereby a competitive reaction occurs to produce a detectable monomer, and measuring the amount of detectable monomer product.

5,569,590

#### INITIAL SCREEN FOR ABNORMAL PLATELET CONDITION

Roy E. Speck, Indianapolis, Ind., assignor to Analytical Control Systems, Inc., Fishers, Ind.

Continuation of Ser. No. 955,679, Oct. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 946,817, Sep. 16, 1992, abandoned, which is a continuation of Ser. No. 510,178, Apr. 17, 1990, abandoned. This application Feb. 16, 1995, Ser. No. 390,273

Int. Cl.<sup>6</sup> F41A 33/00; G01N 33/66

U.S. Cl. 435—13

18 Claims

1. An initial screen for an abnormal platelet condition in blood, comprising the steps of applying a platelet rich plasma specimen from the blood to a non-interfering test surface, contacting the platelet rich plasma specimen with an aqueous reagent which comprises a hydroxy-substituted aromatic-substituted aromatic compound selected from the group consisting of propyl gallate and tannin and a metal ion in concentration sufficient to cause Platelet aggregation in a normal platelet rich plasma specimen upon agitation, said metal ion selected from the group consisting of Ni<sup>++</sup>, Co<sup>++</sup>, Cu<sup>++</sup>, Cu<sup>+</sup> and Fe<sup>+++</sup>, agitating the platelet rich plasma specimen in contact with the reagent, and detecting for the presence of platelet aggregates in the specimen.

#### 5,569,591 ANALYTICAL OR MONITORING APPARATUS AND METHOD

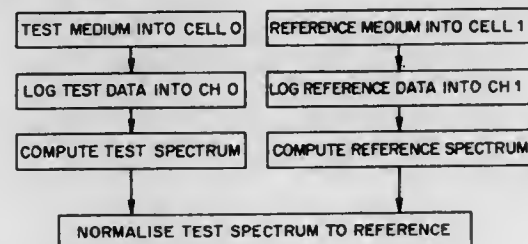
Douglas B. Kell, Aberystwyth, and Andrew M. Woodward, Anglesey, both of United Kingdom, assignors to University College of Wales Aberystwyth, Aberystwyth, United Kingdom

Continuation of Ser. No. 26,471, Mar. 4, 1993, which is a continuation-in-part of Ser. No. 975,928, Feb. 19, 1993, abandoned. This application Jul. 21, 1994, Ser. No. 278,725  
Claims priority, application United Kingdom, Aug. 3, 1990, 9018886; Jun. 3, 1991, 9111893; Mar. 4, 1992, 9204689

Int. Cl.<sup>6</sup> C12Q 1/02

U.S. Cl. 435—29

23 Claims



1. A method of analysing a metabolic state of cellular biological material, said method comprising applying an AC electric potential at one or more discrete frequencies to a sample of the cellular biological material, and determining a response at one or more response frequencies which were substantially absent from the applied AC potential, said one or more response frequencies resulting from a combination of the applied frequency or frequencies.

5,569,592

#### APPARATUS FOR TESTING MAI (MYCOBACTERIUM AVIUM-INTRACELLULARE) FOR ANTIMICROBIAL AGENT SENSITIVITY

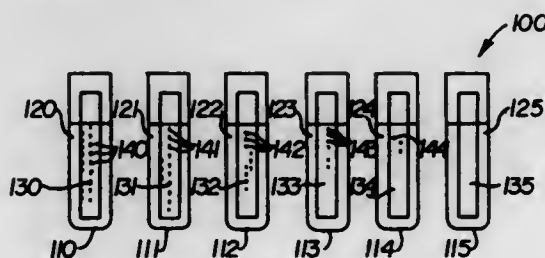
Robert A. Ollar, Milford, Pa., assignor to Infectech, Inc., Sharon, Pa.

Division of Ser. No. 841,937, Feb. 25, 1992, Pat. No. 5,316,918, which is a continuation-in-part of Ser. No. 426,573, Oct. 24, 1989, Pat. No. 5,153,119. This application Jun. 18, 1992, Ser. No. 900,275

Int. Cl.<sup>6</sup> C12Q 1/18

U.S. Cl. 435—32

3 Claims



1. An apparatus for determining the sensitivity of *Mycobacterium avium-intracellulare* ("MAI") to different antimicrobial agents and concentrations thereof comprising:

a plurality of test tubes which contain different amounts of antimicrobial agent to be tested and MAI complex organisms to be assayed; and

means for determining the concentration of said antimicrobial agent necessary to inhibit said MAI organisms from growing, said means comprising a plurality of paraffin coated slides, each of which is adapted to being placed in each one of said test tubes, whereby observation of the growth of said MAI organisms in each of said slides is used to determine the concentration of said antimicrobial agent necessary to inhibit the growth of said MAI organisms.

5,569,593

#### PILOCARPIN PRODUCTION PROCESS

Didier Courtois, Orleans; Vincent Petlard, Tours, and André-Touche, Monts, all of France, assignors to Nestec S.A., Vevey, Switzerland

Filed Mar. 14, 1995, Ser. No. 404,408

Claims priority, application European Pat. Off., Mar. 21, 1994, 94104402

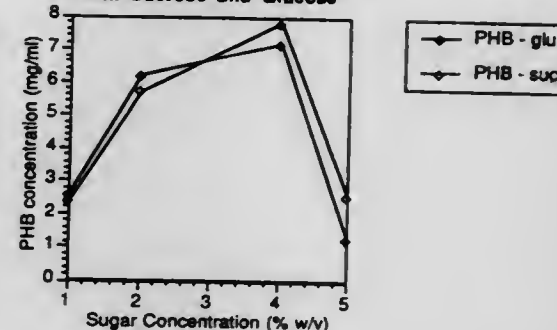
Int. Cl.<sup>6</sup> C12P 17/16; C12N 5/04; A01H 4/00

U.S. Cl. 435—118

19 Claims

1. A process for the production of pilocarpine, which comprises inducing root formation from a part of a plant of the genus *Pilocarpus*; cultivating only the roots in vitro in a culture medium; and isolating pilocarpine from the cultivated roots or culture medium.

Comparison of PHB production from Sucrose and Glucose



(c) isolating poly-β-hydroxybutyrate from said cultured host cell.

5,569,594

#### TRANSESTERIFICATION WITH LIPASE IMMOBILIZED ON A POLYMER CONTAINING EPOXY AND TERTIARY AMINO GROUPS

Yuzo Ikuta, Yokosuka; Satoshi Tashiro, Yokohama; Yoshiyuki Hatano, Yokohama; Tadasu Fujita, Yokohama; Noboru Andoh, Yokohama; Sachio Asaoka, Yokohama; Haruto Kobayashi, Yokohama; and Takeshi Minami, Yokohama, all of Japan, assignors to The Nissin Oil Mills, Ltd., Tokyo, and Chiyoda Corporation, Yokohama, both of Japan

Division of Ser. No. 65,496, May 24, 1993, Pat. No. 5,445,955.

This application May 10, 1995, Ser. No. 438,921

Claims priority, application Japan, May 25, 1992, 4-132475

Int. Cl.<sup>6</sup> C12P 7/64; 7/62; C12N 11/08; 11/06

U.S. Cl. 435—134

21 Claims

1. A process for transesterification which comprises: transesterifying a fat, or a fat and a fatty acid, by contacting the fat, or fat and fatty acid with an immobilized lipase which comprises a lipase from a microorganism genus selected from the group consisting of *Rhizopus*, *Mucor*, *Alcaligenes* and *Candida* and immobilized on the surface of a carrier comprising a hydrophobic, insoluble organic polymer having pores of an average diameter of 10 nm or larger and tertiary amino groups and epoxy groups on the surface thereof.

11. A process for transesterification which comprises: transesterifying a fat, or a fat and fatty acid, or a phospholipid by contacting the fat, or fat and fatty acid, or phospholipid with an immobilized lipase or phospholipase which comprises phospholipase A<sub>2</sub>, or a lipase from a microorganism genus selected from the group consisting of *Rhizopus*, *Mucor*, *Alcaligenes* and *Candida*, which has been immobilized on the surface of a polymer carrier in an aqueous solution, wherein said polymer carrier has tertiary amino groups and epoxy groups on the surface thereof.

5,569,595

#### PRODUCTION OF POLY-BETA-HYDROXYBUTYRATE IN PROKARYOTIC HOST CELLS

Douglas E. Dennis, Weyers Cave, Va., assignor to Center for Innovative Technology, Herndon, Va.

Continuation-in-part of Ser. No. 890,925, May 29, 1992, and Ser. No. 767,008, Sep. 27, 1991, Pat. No. 5,371,002. This application Mar. 24, 1993, Ser. No. 35,433

Int. Cl.<sup>6</sup> C12P 7/62; C12N 15/00; 1/20

U.S. Cl. 435—135

17 Claims

1. A method for the production of poly-β-hydroxybutyrate, comprising:

- (a) introducing into a prokaryotic host cell capable of metabolizing sucrose a vector construct which directs the expression of a sequence which encodes a poly-β-hydroxybutyrate biosynthetic pathway, said prokaryotic host cell selected from the group consisting of *E. coli* and *Klebsiella*;
- (b) culturing said host cell in medium containing sucrose; and

5,569,596

#### METHOD FOR BACTERIAL REDUCTION OF CHROMIUM (VI)

Frank Caccavo, Jr., and Michael J. McInerney, both of Norman, Okla., assignors to The Board of Regents of the University of Oklahoma, Norman, Okla.

Filed Jan. 4, 1995, Ser. No. 368,454

Int. Cl.<sup>6</sup> C12P 3/00

U.S. Cl. 435—168

25 Claims

1. A method of reducing Cr(VI) concentration in a waste stream under anaerobic conditions, comprising:

providing a culture of a Cr(VI)-resistant mutant strain of *Shewanella alga* having ATCC Accession No. 55627; and treating the waste stream with the mutant strain under anaerobic conditions wherein at least a portion of the Cr(VI) in the waste stream is reduced by the mutant strain forming a chromium precipitate.

5,569,597

#### METHODS OF INSERTING VIRAL DNA INTO PLANT MATERIAL

Nigel H. Grimsley, Saint Léon, France; Barbara Hohn; Thomas Hohn, both of Ariesheim, Switzerland; Jeffrey W. Davies, Norwich, and Margaret I. Boulton, Dereham, both of England, assignors to Ciba Geigy Corp., Ardsley, N.Y., and Mycogen Plant Sciences, Inc., San Diego, Calif.

Continuation of Ser. No. 966,248, Oct. 26, 1992, abandoned, and a continuation-in-part of Ser. No. 798,859, Nov. 22, 1991, abandoned, which is a continuation of Ser. No. 526,949, May 22, 1990, abandoned, which is a continuation of Ser. No. 211,080, Jun. 21, 1988, abandoned, which is a continuation of Ser. No. 859,682, May 5, 1986, abandoned, said Ser. No. 966,248 is a continuation-in-part of Ser. No. 497,799, Mar. 22, 1990, abandoned, which is a continuation of Ser. No. 118,094, Nov. 5, 1987, abandoned. This application Jul. 11, 1994, Ser. No. 272,958

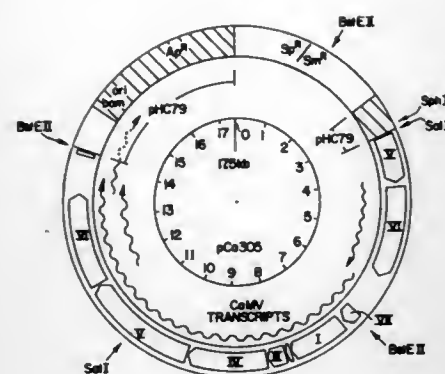
Claims priority, application Switzerland, May 13, 1985, 2026/85; Nov. 7, 1986, 4456/86; Jun. 16, 1987, 2255/87  
Int. Cl.<sup>6</sup> C12N 15/00; 15/05

U.S. Cl. 435—172.3

43 Claims

1. A method of transforming plants with cloned viral DNA, wherein said cloned viral DNA, normally not infectious upon mechanical inoculation, is amenable to this method for transformation by a transfer microorganism of the genus *Agrobacterium*, which method comprises

- (a) inserting cloned viral DNA capable of giving rise to a systemic infection and that may contain cargo DNA, into a T-replicon of an *Agrobacterium*, having one or more T-DNA border sequences, wherein the distance between said cloned viral DNA and the T-DNA border sequences is chosen such



- that cloned viral DNA, including any cargo DNA present, is genetically transferred to the plant material;
- (b) introducing the T-replicon into a transfer microorganism of the genus *Agrobacterium*, the replicon passing into the transfer microorganism;
- (c) preparing a microorganism-containing transforming suspension culture comprising the transfer microorganism obtained in step (b); and
- (d) infecting plant material with the transfer microorganism that has been modified in accordance with step (b).

5,569,598

#### EXTRACELLULAR AMINOPEPTIDASE ISOLATED FROM *STREPTOCOCCUS THERMONITRIFICANS* CULTURE

Soon J. Park; Young M. Lee; Teug Y. Won; Soon C. Kwon; Seung J. Lee; Jung H. Kim, and Bum J. Kim, all of Daejeon, Rep. of Korea, assignors to Lucky Limited Co., Seoul, Rep. of Korea

Filed Jun. 17, 1994, Ser. No. 261,525

Claims priority, application Rep. of Korea, Jun. 17, 1993, 93-11107

Int. Cl.<sup>6</sup> C12N 9/48; 9/52; 1/20

U.S. Cl. 435—212

3 Claims

1. A substantially pure aminopeptidase isolated from a culture medium of *Streptomyces thermotrophicus*, said aminopeptidase being a Zn<sup>2+</sup>-dependent metalloenzyme and comprising an amino acid sequence of Lys-Phe-Ser-Lys-Lys-Phe-Asn-Glu (SEQ ID NO: 3) at the N-terminal thereof and amino acid sequences of Glu-Pro-Gly-Thr-Gly-Ala-Leu-Glu-Pro (SEQ ID NO: 4) and Asn-Pro-Asp-Ile-Val-Tyr (SEQ ID NO: 5) at other regions thereof.

5,569,599

#### KERATINASE FROM *FERVIDOBACTERIUM PENNAVORANS* DSM 7003

Garabed Antranikian, Sevetal, Germany, assignor to Degussa Aktiengesellschaft, Frankfurt, Germany

PCT No. PCT/EP93/00569, § 371 Date Nov. 2, 1994, § 102(e) Date Nov. 2, 1994, PCT Pub. No. WO93/18134, PCT Pub. Date Sep. 16, 1993

PCT Filed Mar. 12, 1993, Ser. No. 290,762

Claims priority, application Germany, Mar. 13, 1992, 42 08 275.7

Int. Cl.<sup>6</sup> C12N 9/52; 1/12; C12P 21/06; C07G 17/00

U.S. Cl. 435—220

5 Claims

1. An isolated keratinase which has a molecular weight of approximately 200,000 daltons as measured by gel filtration and which is isolated from *Fervidobacterium pennavorans* DSM 7003 and has an optimal temperature range between 70° and 90° C. at a pH of 10 and an optimal pH range between 7 and 11 at 80° C.

#### 5,569,600 PURIFICATION, COMPOSITION AND SPECIFICITY OF HEPARINASE I, II, AND III FROM *FLAVOBACTERIUM HEPARINUM*

Ramnath Sasisekharan, Arlington, Mass.; Daniel L. Lohse, Bryan, Tex.; Charles L. Cooney, Brookline, Mass.; Robert J. Linhardt, Iowa City, Iowa, and Robert S. Langer, Newton, Mass., assignors to Massachusetts Institute of Technology, Iowa City, Iowa, and University of Iowa Research Foundation, Cambridge, Mass.

Division of Ser. No. 983,367, Nov. 30, 1992, Pat. No. 5,389,539. This application Jan. 26, 1995, Ser. No. 378,789

Int. Cl.<sup>6</sup> C12N 9/00; 9/52; 1/20

U.S. Cl. 435—220

2 Claims

1. A method for cleaving hexosamine-glucuronic acid linkages in linear polysaccharides of D-glucosamine linked to hexuronic acid comprising reacting heparin or heparan sulfate with a purified heparinase selected from the group consisting of heparinase II present in *Flavobacterium heparinum* free of lyase activity other than heparinase II activity, having a molecular weight of 84,100, cleaving heparin and heparan sulfate and having a pH optimum of 8.9–9.1 and heparinase III which is expressed in *Flavobacterium heparinum* free of lyase activity other than heparinase III activity, having a molecular weight of 70,800, cleaving heparan sulfate, and having a pH optimum of 9.9–10.1.

5,569,601

#### HUMAN DOPAMINE RECEPTOR AND ITS USES

Olivier Civelli, Portland, Oreg., assignor to State of Oregon; Acting by and Through the Oregon State Board of Higher Education on Behalf of the Oregon Health Sciences University, Portland, Oreg.

Continuation-in-part of Ser. No. 626,618, Dec. 7, 1990. This application Aug. 10, 1992, Ser. No. 928,611

Int. Cl.<sup>6</sup> C12N 5/00; 15/00; C12P 21/06; C07H 17/00

U.S. Cl. 435—240.1

7 Claims

1. An isolated nucleic acid having a nucleotide residue sequence encoding an amino acid residue sequence selected from the group consisting of the human D<sub>4</sub> dopamine receptor alleles D4.4 (SEQ ID No.: 20) and D4.7 (SEQ ID No.: 22).

5,569,602

#### FIRST IMMORTALIZED KAPOSI'S SARCOMA CELL LINE

Yanto Lunardi-Iskandar, Gaithersburg, and Robert C. Gallo, Bethesda, both of Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Aug. 20, 1993, Ser. No. 110,175

Int. Cl.<sup>6</sup> C12N 5/00; 5/08

U.S. Cl. 435—240.1

2 Claims

1. A Kaposi's sarcoma cell line, wherein the cell line is KS Y-1 identified as ATCC Accession No. 11448.

5,569,603

#### DIROFILARIA IMMITIS GP29 PROTEINS, NUCLEIC ACID MOLECULES AND USES THEREOF

Cynthia A. Tripp, Ft. Collins, Colo.; Murray E. Selkirk, London, England, and Robert B. Grieve, Windsor, Colo., assignors to Heska Corporation, Ft. Collins, Colo.

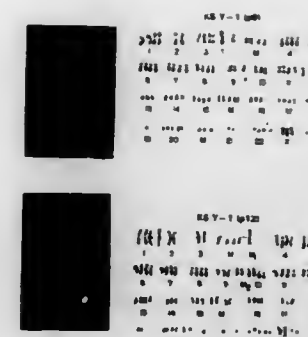
Filed Mar. 8, 1994, Ser. No. 208,885

Int. Cl.<sup>6</sup> C12N 15/53

U.S. Cl. 435—240.1

9 Claims

1. An isolated nucleic acid molecule having a nucleic acid



sequence encoding a *Dirofilaria immitis* Gp29 protein.

5,569,604

#### CALCITONIN/CALCITONIN GENE RELATED PEPTIDE ENHANCER ELEMENT AND ASSOCIATED DNA BINDING PROTEINS

Andrew F. Russo; Thomas M. Lanigan, and Lois A. Tverberg, all of Iowa City, Iowa, assignors to The University of Iowa Research Foundation, Iowa City, Iowa

Filed Sep. 3, 1993, Ser. No. 117,364

Int. Cl.<sup>6</sup> C07H 21/04; C12N 5/10; 15/11; 15/85

U.S. Cl. 435—240.2

13 Claims

1. A purified DNA consisting of a sequence which regulates transcription of the Calcitonin/Calcitonin Gene Related Protein genes, said sequence containing an enhancer element having the sequence of SEQ ID NO:1, wherein SEQ ID NO:1 has been isolated at both ends from the sequences with which it is immediately contiguous in the naturally occurring genome of the organism from which the DNA is derived.

5,569,605

#### ORGANIC WASTE DISPOSAL SYSTEM

Masayoshi Teramachi, Nagoya; Kinichi Kinoshita, Mie-ken; Yoshihiro Takakuwa, Nagoya; Eiji Fukui, Aichi-ken, and Tadashi Kamiyanagita, Mie-ken, all of Japan, assignors to The Chubu Electric Power Co., Inc., Nagoya, and Kabushiki Kaisha Toyodan, Aichi-ken, both of Japan

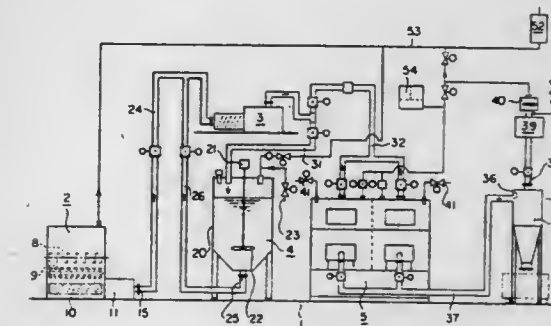
Filed Dec. 9, 1994, Ser. No. 353,441

Claims priority, application Japan, Dec. 16, 1993, 5-344324

Int. Cl.<sup>6</sup> C05F 9/02

U.S. Cl. 435—290.2

9 Claims



1. An organic waste disposal system comprising:  
a crusher for crushing organic wastes, including any solid waste material into a flowing waste material,  
a preparatory fermentor including an agitator blade;

a pump having an entrance and an outlet, said pump entrance being connected by a first pipe to said crusher and said pump outlet being connected by a second pipe to said preparatory fermentor for transferring the flowing waste material, said pump entrance being connected to an outlet of said preparatory fermentor by a third pipe;

a main fermentor having a heating means and a plurality of agitating blades, said main fermentor being connected to said pump outlet by a fourth pipe;

a cyclone separator for removing material from air having a suction port for receiving treated fermented material laden air from said main fermentor, and said suction port of said cyclone separator being connected to said main fermentor by a fifth pipe.

5,569,606

#### METHOD AND SYSTEM FOR SAMPLING AND DETERMINING THE PRESENCE OF CONTAMINANTS IN RECYCLABLE PLASTIC MATERIALS

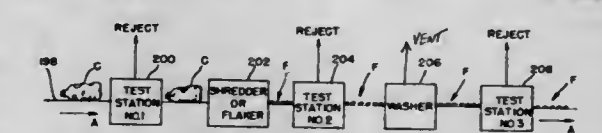
David H. Fine, Lincoln; Freeman W. Fraim, Lexington, both of Mass.; Stephen J. MacDonald, Salem, N.H.; Alex Malaspina, Atlanta, Ga.; Forrest L. Bayer, Norcross, Ga., and Dirk van Buren Myers, Atlanta, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 890,863, Jun. 1, 1992, Pat. No. 5,352,611. This application May 31, 1994, Ser. No. 251,373

Int. Cl.<sup>6</sup> G01N 21/90

U.S. Cl. 436—43

3 Claims



1. A method of determining whether plastic material obtained from used containers is free of volatiles of contaminants so that the material can be recycled to produce new containers, comprising the steps of:

providing a supply of materials from which used containers were fabricated;

washing the supply of materials in a heated fluid to remove a portion of contaminants therein;

maintaining the temperature of washed material below a level that would emit detectable levels of vapors derived from the plastic material itself but high enough to emit detectable levels of volatiles of the contaminants; and

testing the volatiles of the contaminants to determine the presence or absence of contaminants in the materials.

5,569,607

#### SLIDE FOR THE MICROSCOPIC EVALUATION OF LIQUID SPECIMENS

Thomas Simon, Bensheim; Ingo Kaiser, Mannheim, and Carsten Carstensen, Heuchelheim, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Filed Mar. 22, 1995, Ser. No. 407,997

Claims priority, application Germany, Mar. 22, 1994, 44 09 786.7

Int. Cl.<sup>6</sup> G01N 21/03; G02B 21/34

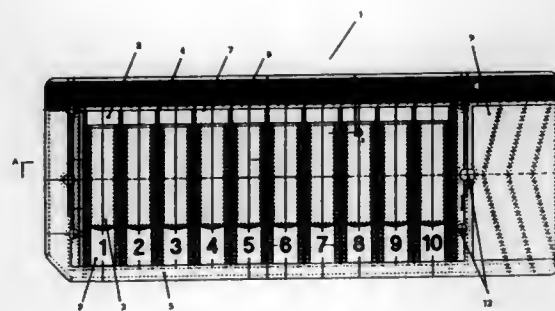
U.S. Cl. 436—46

20 Claims

1. A liquid specimen microscopic evaluation slide comprising a base plate having at least one evaluation chamber and at least two spacers;

said evaluation chamber having an evaluation plane with edges, one edge of the evaluation plane adjoining a specimen application zone which is inclined relative to the evaluation plane; the evaluation plane and the specimen application zone forming an area, with spacers located on two opposite sides of the area; and a cover foil mounted to the spacers in parallel to the





evaluation plane to form a capillary gap therebetween wherein the spacers have first edges, spaced from the evaluation plane, to which the cover foil is mounted, and the first edges are tapered.

5,569,608

### QUANTITATIVE DETECTION OF ANALYTES ON IMMUNOCHROMATOGRAPHIC STRIPS

Ronald G. Sommer, Elkhart, Ind., assignor to Bayer Corporation, Elkhart, Ind.

Filed Jan. 30, 1995, Ser. No. 380,119  
Int. Cl.<sup>6</sup> G01N 33/544

U.S. Cl. 436—518

16 Claims

1. A method for determining the concentration of one or more analyte in a fluid test sample which comprises:

- providing a test strip comprising a matrix through which the fluid test sample can flow by capillarity wherein a first region of the strip contains mobile specific binding partner for the analyte which bears a detectable label and can react with the analyte to form an analyte/labeled binding partner complex and at least one second region which contains immobilized analyte or analog thereof;
- developing the strip by applying the fluid test sample suspected of containing the analyte thereto thereby allowing the same contact the mobile, labeled specific binding partner for the analyte whereby analyte present in the fluid test sample binds to the labeled specific binding partner to form the complex leaving excess, unreacted labeled binding partner free to further react whereby the fluid test sample carries the analyte/labeled binding partner complex and unreacted labeled binding partner along the strip by capillarity to the second region containing the immobilized analyte or analog thereof in which region unreacted labeled binding partner is bound to the immobilized analyte in inverse relationship to the concentration of analyte in the fluid test sample;
- reading the developed strip on an instrument having a detector capable of measuring the signal from the detectable label to determine the concentration of the labeled binding partner in the second region; and
- determining the concentration of analyte in the fluid test sample by comparing the signal from the detectable label measured in step c) with the measurements of the signal made in the same manner using fluid samples containing known concentrations of analyte.

5,569,609

### BIDIRECTIONAL SHOCKLEY DIODE

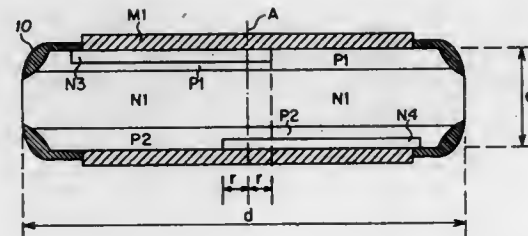
Jean-Claude Salbreux, Saint Cyr sur Loire, France, assignor to SGS-Thomson Microelectronics S.A., Saint Genis, France  
Division of Ser. No. 298,074, Aug. 30, 1994. This application  
Jun. 5, 1995, Ser. No. 465,228

Claims priority, application France, Sep. 7, 1993, 93 10883  
Int. Cl.<sup>6</sup> H01L 21/66

U.S. Cl. 437—8

2 Claims

1. A method for forming a protection component comprising the steps of:



forming a first layer of a second conductivity type in an entire upper surface of a substrate of a first conductivity type of said component;  
forming a second layer of said second conductivity type in an entire lower surface of said substrate of said component;  
forming a third layer of said first conductivity type in a portion of an upper surface of said first layer; and  
forming a fourth layer of said first conductivity type in a portion of a lower surface of said second layer;  
wherein said third and fourth layers extend over substantially complementary halves of said component and each overlap a distance  $r$  with respect to a median plane of said component wherein the distance  $r$  is less than  $0.5e$ , wherein  $e$  is the thickness of the component.

5,569,610

### METHOD OF MANUFACTURING MULTIPLE POLYSILICON TFTS WITH VARYING DEGREES OF CRYSTALLINITY

Hongyong Zhang; Toru Takayama, and Yasuhiko Takemura, all of Kanagawa, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

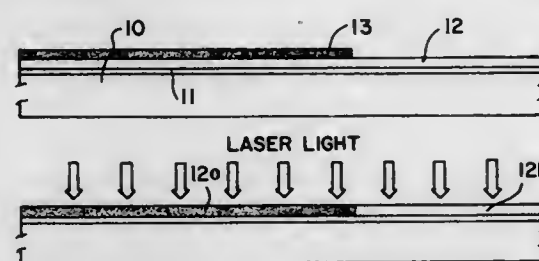
Filed Mar. 8, 1994, Ser. No. 207,185

Claims priority, application Japan, Mar. 12, 1993, 5-079004;  
Mar. 12, 1993, 5-079005

Int. Cl.<sup>6</sup> H01L 21/84

U.S. Cl. 437—21

13 Claims



1. A method of fabricating a semiconductor circuit comprising the steps of:  
forming a semiconductor film comprising silicon over an insulating surface of a substrate, said film having a first portion and second portion and a surface;  
selectively forming a substance containing at least one catalytic element in contact with only, said first portion of said semiconductor film for promoting crystallization of said semiconductor film; and  
irradiating all of said surface of said semiconductor film with light to promote crystallization of said semiconductor film, wherein the crystallinity of said semiconductor film is increased more in said first portion than in said second portion.

5,569,611

### METHOD OF MANUFACTURING A BIPOLAR TRANSISTOR OPERATING AT LOW TEMPERATURE

Kiyotaka Imai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

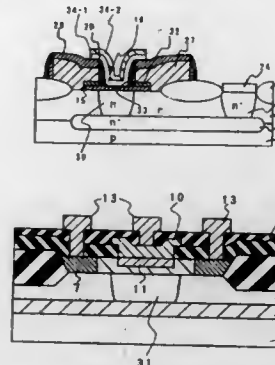
Filed Oct. 12, 1994, Ser. No. 330,361

Claims priority, application Japan, Dec. 27, 1993, 5-332154

Int. Cl.<sup>6</sup> H01L 21/265

U.S. Cl. 437—31

9 Claims



1. A method of manufacturing a bipolar transistor, comprising the steps of:

- forming a collector region of a first impurity concentration; selectively forming an oxide film pattern on said collector region;
- forming an impurity-concentration-enhanced region in said collector region under said oxide film pattern;
- forming a base electrode on said collector region and a part of said oxide film pattern;
- removing said oxide film pattern;
- forming a base region at a portion formed by removing said oxide film pattern on surfaces of said collector region and said impurity-concentration-region, such that said base region has an inversely graded impurity distribution profile in which a concentration of impurity is high at the surfaces of said collector region and said impurity-concentration-region and low at an opposite surface of said collector region and said impurity-concentration-region and such that said base region is coupled to said base electrode region; and
- forming an emitter region in said base region.

5,569,612

### PROCESS FOR MANUFACTURING A BIPOLAR POWER TRANSISTOR HAVING A HIGH BREAKDOWN VOLTAGE

Ferruccio Frisina, Sant Agata Li Battiati, and Salvatore Coffa, Trehestieri Etna, both of Italy, assignors to Consorzio per la Ricerca sulla Microelettronica Nel Mezzogiorno, Catanzaro, Italy

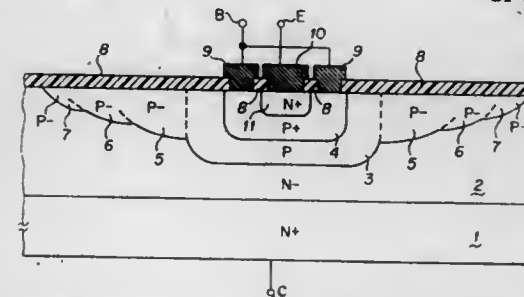
Division of Ser. No. 266,029, Jun. 27, 1994. This application  
Jun. 7, 1995, Ser. No. 481,890

Claims priority, application European Pat. Off., Jun. 28, 1993, 9380276

Int. Cl.<sup>6</sup> H01L 21/265

U.S. Cl. 437—31

21 Claims



1. A process for manufacturing a bipolar power transistor having a high breakdown voltage, the process comprising the steps of:

- growing a lightly doped N type epitaxial layer over a heavily doped semiconductor substrate of the N type;
- growing oxide over a top surface of said lightly doped N type epitaxial layer;
- masked implanting of aluminum atoms into said lightly doped N type epitaxial layer;
- drive-in diffusing said aluminum atoms into said lightly doped N type epitaxial layer to form a lightly doped P type base region;
- masked implanting of a high concentration of acceptor dopants into said lightly doped P type base region;
- drive-in diffusing said acceptor dopants into said lightly doped P type base region to obtain a heavily doped P type base region within said lightly doped P type base region;
- masked implanting of a high concentration of donor dopants into said heavily doped P type base region; and
- drive-in diffusing said donor dopants into said heavily doped P type base region to obtain a diffused heavily doped emitter region.

5,569,613

### METHOD OF MAKING BIPOLAR JUNCTION TRANSISTOR

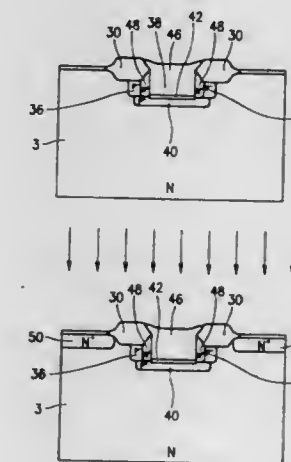
Sheng-Hsing Yang, Hsinchu, Taiwan, assignor to United Microelectronics Corp., Hsinchu, Taiwan

Filed Feb. 1, 1995, Ser. No. 382,387

Int. Cl.<sup>6</sup> H01L 21/822

U.S. Cl. 437—33

5 Claims



forming an insulating layer on the heavily-doped region of the second conductivity type in said recessed groove;  
forming an electrically conducting layer in said recessed groove and implanting impurities of the first conductivity type into said conducting layer, said impurities of the first conductivity type diffusing into said lightly-doped base region of the second conductivity type through side edges of said recessed groove, thereby forming a heavily-doped emitter region of the first conductivity type; and  
utilizing said electrically conducting layer and said field oxide as masking layers for implanting impurities of the first conductivity type into said substrate of a first conductivity type, thereby forming a contact for said collector region of the bipolar junction transistor.

# 5,569,614 METHOD OF FORMING METAL PATTERN INCLUDING A SCHOTTKY DIODE

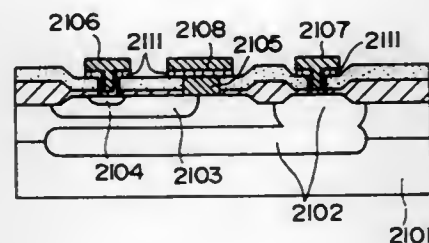
Yuzo Kataoka, Isehara; Tetsuo Asaba, Odawara; Kenji Makino, Yokohama; Hiroshi Yuzurihara, Isehara; Kei Fujita, Sagami; Seiji Kamei, Hiratsuka; Yutaka Akino, Isehara; Yutaka Yuge, Mishima; Mineo Shimotsusa, Atsugi, and Hideshi Kuwabara, Zama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Division of Ser. No. 327,799, Oct. 24, 1994, which is a division of Ser. No. 98,871, Jul. 29, 1993, abandoned. This application May 5, 1995, Ser. No. 435,834

Claims priority, application Japan, Jul. 30, 1992, 4-203889; Jul. 31, 1992, 4-205544; Aug. 20, 1992, 4-242591; Aug. 20, 1992, 4-242592

Int. Cl.<sup>6</sup> H01L 21/265

U.S. Cl. 437—39

7 Claims



1. A method of manufacturing a semiconductor apparatus including a Schottky diode and active devices wherein said Schottky diode on a same semiconductor base thereof is present in a mixed manner, wherein a contact metal layer in a Schottky diode portion between a contact hole and a semiconductor layer on said semiconductor base is made of aluminum and a contact metal layer in a portion other than said Schottky diode portion between a contact hole and a semiconductor layer on said semiconductor base is made of a barrier metal, said method comprising:

- a process for terminating a surface of said semiconductor layer with hydrogen in each of said contact hole after each of said contact hole has been formed;
- a process for irradiating said contact hole other than said Schottky diode portion with electron beams, ion beams or ultraviolet rays to dissociate hydrogen from said surface of said semiconductor layer in said contact hole terminated with hydrogen so as to be terminated with oxygen;
- a selective vapor chemical deposition process for selectively depositing aluminum in only said contact hole terminated with hydrogen; and
- a process for depositing said barrier metal after depositing said aluminum.

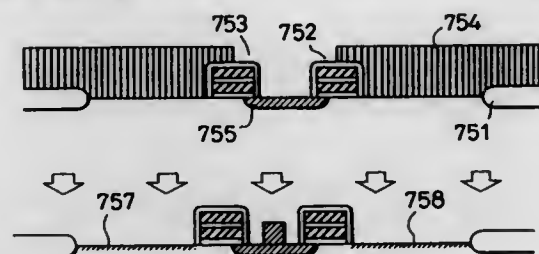
# 5,569,615 METHOD FOR FORMING A FLASH MEMORY BY FORMING SHALLOW AND DEEP REGIONS ADJACENT THE GATE

Shunpei Yamazaki, Tokyo, and Yasuhiko Takemura, Kanagawa, both of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan  
Division of Ser. No. 142,048, Oct. 28, 1993. This application Dec. 14, 1994, Ser. No. 355,652

Claims priority, application Japan, Oct. 30, 1992, 4-316138 Int. Cl.<sup>6</sup> H01L 21/8247

U.S. Cl. 437—43

33 Claims



1. A laser processing method comprising:  
forming a gate member on a semiconductor;  
implanting an impurity into one region of the semiconductor adjacent to the member by ion irradiation with the member and a mask material as masks;  
removing the mask materials; and  
doping another region of the semiconductor located adjacent to the member and opposite to the one region with an impurity having one conductivity type to form the another region to a depth shallower than that of the one region, wherein the one region is not in contact with the another region.

# 5,569,616 PROCESS FOR FORMING AN OUTPUT CIRCUIT DEVICE FOR A CHARGE TRANSFER ELEMENT HAVING TRIPARTITE DIFFUSION LAYER

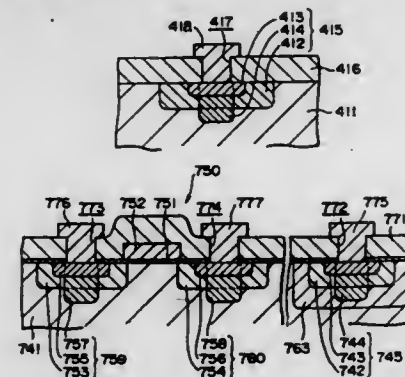
Hiroaki Ohki, Tokyo; Osamu Nishima; Hiroyuki Mori, both of Kanagawa, and Junya Suzuki, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan  
Division of Ser. No. 180,283, Jan. 12, 1994, Pat. No. 5,432,364. This application May 22, 1995, Ser. No. 446,251

Claims priority, application Japan, Jan. 12, 1993, 5-020549; Mar. 31, 1993, 5-098722

Int. Cl.<sup>6</sup> H01L 21/265; 21/22

U.S. Cl. 437—44

14 Claims



1. A method of forming a MOSFET output circuit device for a charge transfer element, comprising the steps of:  
providing a semiconductor body of a first conductivity type;  
forming a first diffusion region by diffusing into the semiconductor body a low concentration of a first impurity of a second conductivity type opposite to that of said semiconductor body and having a high diffusion coefficient;

forming a second diffusion region by diffusing into an upper surface portion of the first diffusion region a high concentration of a second impurity of said second conductivity type having a low diffusion coefficient, said second diffusion region having a depth that does not extend beneath a depth of said first diffusion region; forming a third diffusion region by diffusing into the first and second diffusion regions a high concentration of a third impurity of said second conductivity type having a high diffusion coefficient, such that the third diffusion region extends from a surface of said semiconductor body through said first and second diffusion regions to beneath said first diffusion region; and

forming a wiring line on the semiconductor body such that the first, second and third diffusion regions lie beneath the wiring line,

wherein the concentrations of the second and third impurities in the second and third diffusion regions, respectively, are higher than the concentration of the first impurity and the first diffusion region, and

wherein the first, second and third diffusion regions serve as a source or drain region of the MOSFET output circuit device.

# 5,569,617 METHOD OF MAKING INTEGRATED SPACER FOR MAGNETORESISTIVE RAM

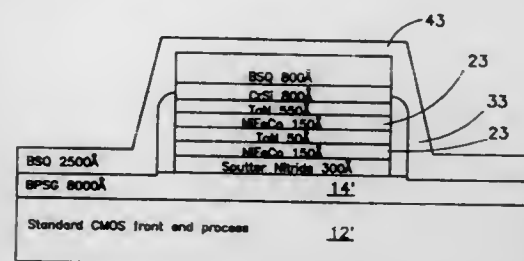
Tangshun Yeh, St. Paul; Allan T. Hurst, Anoka; Huang-Joung Chen, Eagan; Lonny L. Berg, Elk River, and William F. Witcraft, Minneapolis, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 21, 1995, Ser. No. 576,279

Int. Cl.<sup>6</sup> H01L 21/70

U.S. Cl. 437—48

11 Claims



1. A process for forming a magnetoresistive memory device on an insulative layer, comprising the steps of:

- forming a stack of a plurality of materials on said insulative layer, said stack including at least a first layer of a magnetic material;
- forming a first layer of an amorphous dielectric on said stack;
- selectively removing portions of said amorphous dielectric to define a pattern for a magnetic bit;
- removing portions of said stack according to said pattern to define a magnetic bit in said first layer of magnetic material, said magnetic bit having a bit edge with magnetization at said bit edge oriented to point in a first direction along said bit edge;
- forming a layer of a first material on said magnetic bit;
- removing portions of said first material to form a spacer adjacent said bit edge with said spacer maintaining said magnetization at said bit edge in a first direction;
- forming a second layer of an amorphous dielectric on said magnetic bit; and
- performing subsequent processing steps.

# 5,569,618 METHOD FOR PLANARIZING INSULATING FILM

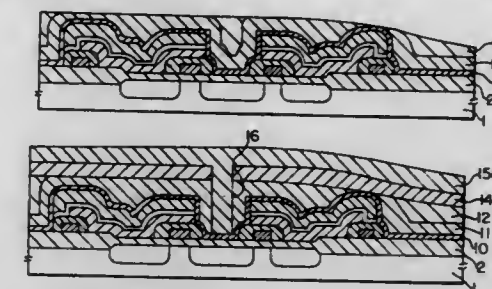
Yoshihisa Matsubara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan  
Filed Mar. 2, 1993, Ser. No. 25,389

Claims priority, application Japan, Mar. 3, 1992, 4-045093

Int. Cl.<sup>6</sup> H01L 21/8242

U.S. Cl. 437—52

9 Claims



1. A method for fabricating a semiconductor device, comprising:  
forming an insulating film on a semiconductor substrate;  
forming capacitor cells for a semiconductor memory device on said insulating film;  
forming a first oxide film over said insulating film and said capacitor cells using plasma-enhanced chemical vapor deposition;  
forming a second oxide film over said first oxide film using atmospheric-pressure chemical vapor deposition said second oxide film having an upper surface;  
forming a third oxide film directly atop the entire upper surface of said second oxide film using plasma-enhanced chemical vapor deposition;  
forming an organic spin-on-glass film on said third oxide film; and  
performing etchback until said organic spin-on-glass film is removed.

# 5,569,619 METHOD FOR FORMING A CAPACITOR OF A SEMICONDUCTOR MEMORY CELL

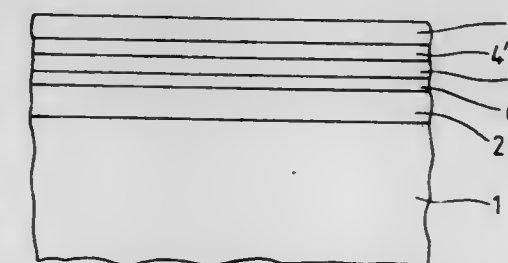
Jae-sung Roh, Kyunggi-do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Cheongju, Rep. of Korea  
Continuation-in-part of Ser. No. 83,120, Jun. 24, 1993, abandoned. This application Feb. 28, 1995, Ser. No. 395,260

Claims priority, application Rep. of Korea, Jun. 24, 1992, 92-11008

U.S. Cl. 437—52

Int. Cl.<sup>6</sup> H01L 21/8242

16 Claims



1. A method of making a capacitor in a semiconductor device comprising the steps of:  
(a) forming a first conductive layer on a substrate;  
(b) forming a tantalum oxide layer on the first conductive layer;  
(c) forming a silicon nitride layer on the tantalum oxide layer;  
(d) implanting titanium ions into the tantalum oxide layer;  
(e) carrying out a heat treatment, wherein a silicon oxide layer is formed between the first conductive layer and the tantalum oxide layer, wherein an oxide of titanium is formed in the



tantalum oxide layer, and wherein the silicon nitride is converted to comprise an oxynitride layer; and  
(f) forming a second conductive layer on the oxynitride layer.

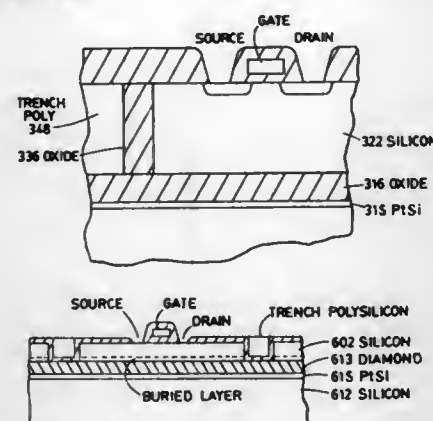
# **5,569,620** **BONDED WAFER PROCESSING WITH METAL SILICIDATION**

Jack H. Linn; Robert K. Lowry, Melbourne; George V. Rouse, Indiatlantic, all of Fla., and James F. Buller, Austin, Tex., assignors to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 939,786, Sep. 3, 1992, Pat. No. 5,387,555. This application Dec. 8, 1994, Ser. No. 351,933  
Int. Cl.<sup>6</sup> H01L 21/30; 21/46

U.S. Cl. 437—62

13 Claims



1. A method of fabrication of integrated circuits, comprising the steps of:

- providing a device wafer with a surface silicon layer covering a dielectric layer and a handle wafer with a surface silicon layer;
- depositing a refractory metal layer on one of said silicon surface layers and joining the device wafer surface silicon layer to the handle wafer surface silicon layer with the refractory metal layer therebetween;
- heating said wafers wherein said wafers bond together through formation of silicide-silicon bonds to both surface silicon layers;
- thinning said device wafer;
- forming trenches in said device wafer and extending through said device wafer to said dielectrically-coated layer;
- forming devices in the portions of said device wafer among said trenches.

6. A method of wafer bonding to a produce silicon-on-insulator structure; comprising the steps of:

- providing a device wafer and a handle wafer wherein said device wafer includes a silicon layer over a diamond layer;
- joining the silicon layer covering the diamond layer of said device wafer to a surface of said handle wafer with silicide precursors therebetween; and
- heating said wafers wherein said wafers bond together through silicide-silicon bond formation on both wafers.

# **5,569,621** **INTEGRATED CIRCUIT CHIP SUPPORTED BY A HANDLE WAFER AND PROVIDED WITH MEANS TO MAINTAIN THE HANDLE WAFER POTENTIAL AT A DESIRED LEVEL**

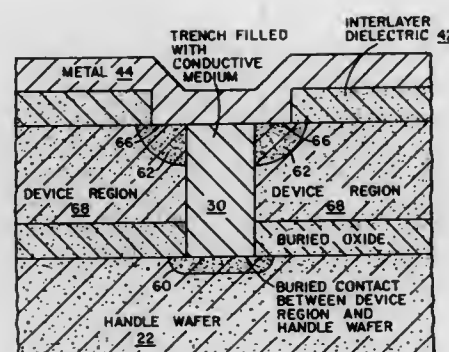
Kevin Yallop, and Oliver Creighton, both of Limerick, Ireland, assignors to Analog Devices, Incorporated, Norwood, Mass.

Division of Ser. No. 192,162, Feb. 4, 1994, Pat. No. 5,479,048.  
This application May 2, 1995, Ser. No. 431,677  
Int. Cl.<sup>6</sup> H01L 21/761

U.S. Cl. 437—62

5 Claims

1. The method of making integrated-circuit (IC) chips comprising the steps of, and not necessarily in the recited sequence:



forming a three-layer wafer with a lower layer of silicon serving as a handle wafer, an intermediate layer of dielectric insulation, and an upper layer of silicon;  
forming a plurality of trenches in said upper layer with each trench extending down to the upper surface of said intermediate layer;

forming an additional trench in said wafer extending down through said upper layer and through said intermediate layer to the upper surface of said lower layer, with the side walls of said additional trench free of dielectric insulation;

applying dielectric insulation over the upper surfaces of said upper layer and on the side walls of said plurality of trenches; applying non-conductive trench-filling material as a blanket over the wafer and filling said additional trench and the remaining portions of said plurality of trenches all of said trenches;

removing said trench-filling material from the upper surfaces of the wafer immediately adjacent said additional trench, leaving said filling material in said additional trench to a level coplanar with the upper surface of said upper layer of said wafer;

doping the trench-filling material of said additional trench to make it conductive whereby to establish low-resistance electrical contact between said material and the upper surface of said lower layer; and

applying metallization over said wafer to make contact with the upper surface of said doped filling in said additional trench.

5,569,622

Patent Not Issued For This Number

5,569,623

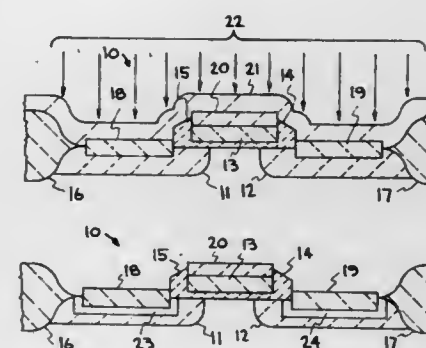
Patent Not Issued For This Number

# **5,569,624** **METHOD FOR SHALLOW JUNCTION FORMATION** Kurt H. Weiner, San Jose, Calif., assignor to Regents of the University of California, Oakland, Calif. Filed Jun. 5, 1995, Ser. No. 464,021 Int. Cl.<sup>6</sup> H01L 21/28

U.S. Cl. 437—200

19 Claims

1. Improved method for shallow junction formation in at least the source/drain regions of an integrated circuit, comprising:  
providing at least the source and the drain regions with a layer of undoped silicide,  
depositing a layer of doped dielectric material on at least the layer of undoped silicide,  
directing patterned pulsed laser energy onto the doped dielectric material covering at least the source and drain causing dopant in the dielectric material to diffuse into the silicide,  
removing the dielectric material, and



annealing at least the silicide over the source and drain regions to drive dopant from the silicide to form junctions of doped material having a thickness of less than 100 nm in the source and drain regions.

# **5,569,625** **PROCESS FOR MANUFACTURING A PLURAL STACKED LEADFRAME SEMICONDUCTOR DEVICE**

Yoshiyuki Yoneda; Kazuto Tsuji; Junichi Kasai, and Hideharu Sakoda, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

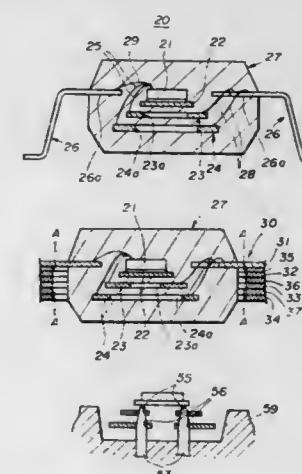
Division of Ser. No. 000,037, Jan. 4, 1993, Pat. No. 5,399,804.

This application Nov. 22, 1994, Ser. No. 345,755

Claims priority, application Japan, Jan. 8, 1992, 4-001560  
Int. Cl.<sup>6</sup> H01L 21/56; 21/58; 21/60

U.S. Cl. 437—217

8 Claims



1. A method of producing a semiconductor device comprising the steps of:

- forming a lead frame assembly which includes a plurality of lead frames which are spaced apart from one another and stacked, said lead frames including a first lead frame having leads formed thereon, a second lead frame arranged below the first lead frame and having a stage on which a semiconductor chip is mounted, said stage separated from said leads by a first gap, and third lead frames arranged below the second lead frame by second gaps and having electrode members;
- connecting wires between the semiconductor chip and the first lead frame, between the semiconductor chip and the third lead frames, and between the third lead frames and the first lead frame by a wire bonding;
- forming a resin package by a resin which fills the first and second gaps and which encapsulates the semiconductor chip, the stage, the electrode members and inner leads of the leads; and
- cutting off unwanted parts of the lead frame assembly located outside the resin package;

wherein step (a) interposes spacers only in said unwanted parts of the lead frame assembly so that the first and second lead frames and the third lead frames are spaced apart from one another.

# **5,569,626** **PIEZO-OPTICAL PRESSURE SENSITIVE SWITCH AND METHODS FOR FABRICATING THE SAME**

Anthony D. Kurtz, Teaneck, N.J.; Joseph S. Shor, Flushing, N.Y., and Alexander A. Ned, Bloomingdale, N.J., assignors to Kulite Semiconductor Products, Inc., Leonia, N.J.

Division of Ser. No. 78,392, Jun. 16, 1993, Pat. No. 5,387,803.

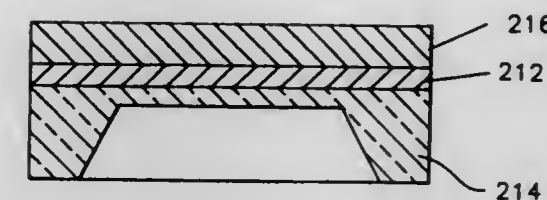
This application Apr. 28, 1994, Ser. No. 234,307

The portion of the term of this patent subsequent to Sep. 28, 2013, has been disclaimed.

Int. Cl.<sup>6</sup> H01C 21/306

U.S. Cl. 437—228

5 Claims



1. A method of forming a piezo-optical pressure sensing device comprising the steps of:

- providing a substrate of substantially transparent material;
- providing a layer of semiconductive material on said substrate;
- forming at least one porous region in said layer of semiconductive material, the pores in said porous region being dimensioned so that said porous region is adapted to undergo a change in light absorption proportional to a stress applied thereto; and depositing a layer of reflective material over said porous layer

# **5,569,627** **PROCESS FOR ETCHING COPPER CONTAINING METALLIC FILM AND FOR FORMING COPPER CONTAINING METALLIC WIRING**

Keiji Shinohara, Kanagawa; Junichi Sato, Tokyo; Yukihiko Kamide, and Toshiharu Yanagida, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

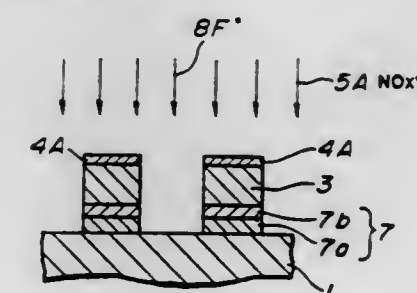
Division of Ser. No. 389,722, Feb. 15, 1995, Pat. No. 5,505,322, which is a continuation of Ser. No. 683,775, Apr. 11, 1991, abandoned. This application Jul. 25, 1995, Ser. No. 506,868

Claims priority, application Japan, Apr. 12, 1990, 097245/90

Int. Cl.<sup>6</sup> H01L 21/306

U.S. Cl. 437—228

3 Claims



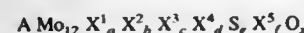
1. A method for forming a copper wiring in a semiconductor device, comprising the steps of:



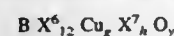


where

A is  $\text{Mo}_{12}\text{X}_1^a\text{X}_2^b\text{X}_3^c\text{X}_4^d\text{S}_e\text{X}_5^f\text{O}_x$   
 B is  $\text{X}_6^g\text{Cu}_h\text{X}_7^i\text{O}_y$   
 $\text{X}^1$  is phosphorus, arsenic, boron, germanium and/or silicon,  
 $\text{X}^2$  is vanadium, niobium and/or tungsten,  
 $\text{X}^3$  is hydrogen, of which up to 97 mol % may have been replaced by potassium, rubidium, cesium and/or ammonium ( $\text{NH}_4$ ),  
 $\text{X}^4$  is antimony and/or bismuth,  
 $\text{X}^5$  is rhenium and/or rhodium,  
 $\text{X}^6$  is molybdenum, tungsten, niobium and/or tantalum,  
 $\text{X}^7$  is lithium, sodium, potassium, rubidium, cesium and/or ammonium ( $\text{NH}_4$ ),  
 a is from 1 to 6,  
 b is from 0 to 6,  
 c is from 3 to 5,  
 d is from 0 to 6,  
 e is from 0 to 3,  
 f is from 0 to 3,  
 g is from 4 to 24,  
 h is from 0 to 20,  
 x and y are numbers determined by the valency and frequency of the elements other than oxygen in I, and  
 p and q are numbers other than zero whose ratio p/q is from 12:0.1 to 12:48,  
 which contains portion [A]<sub>p</sub> in the form of three-dimensionally extended regions A of the chemical composition



which are separated from their local environment due to their chemical composition which is different from their local environment, and component [B]<sub>q</sub> in the form of three-dimensionally extended regions B of the chemical composition



which are separated from their local environment due to their chemical composition which is different from their local environment, where the regions A and B are distributed relative to one another as in a mixture of finely divided A and finely divided B.

5,569,637

### FEATURING INFORMATION ON A RECORD USING COLOR

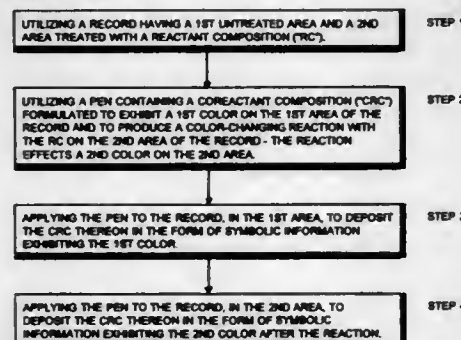
Martin S. Clegg, Onondaga County, N.Y., assignor to Cullman Ventures, Inc., New York, N.Y.

Filed Dec. 8, 1993, Ser. No. 164,013

Int. Cl. B41M 5/124

U.S. Cl. 503—201

24 Claims



22. A method of featuring information on a record with a writing implement, comprising the steps of:

- utilizing a record which has first and second areas disposed adjacent to each other, the second area being treated with a reactant composition;
- utilizing a writing implement containing a coreactant composition, said coreactant composition being formulated to exhibit a first marking color on the first area of said record without a

color-changing reaction and to exhibit a second marking color on the second area of said record after a color-changing reaction with the reactant composition on the second area, said first marking color being sufficiently different from said second marking color such that one can be contrasted with the other after the coreactant composition has been applied to the reactant composition;

applying said writing implement to the record, in the first area, to deposit the coreactant composition thereon in the form of symbolic information which exhibits the first marking color; and

applying said writing implement to the record, in the second area, to deposit the coreactant composition thereon in the form of symbolic information which exhibits the second marking color after the color-changing reaction, whereby the information is featured on said record by the contrast between the first marking color and the second marking color.

5,569,638

### ROLL-TYPE HEAT TRANSFER IMAGE-RECEIVING SHEET

Koichi Shirai; Kazunobu Imoto; Satoshi Narita; Yoshinori Kamikubo, and Mitsuhiro Hamashima, all of Tokyo-to, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

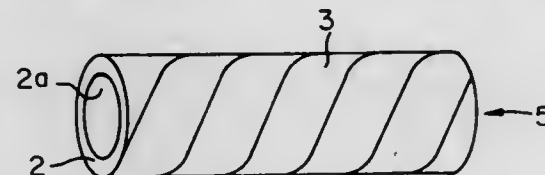
Filed Jun. 21, 1995, Ser. No. 493,172

Claims priority, application Japan, Jun. 23, 1994, 6-164483; Jul. 6, 1994, 6-177446; Jul. 18, 1994, 6-187821; Sep. 13, 1994, 6-244659; Oct. 14, 1994, 6-276098

Int. Cl. B41M 5/035; 5/38

U.S. Cl. 503—227

36 Claims



1. A roll-type heat transfer image-receiving sheet, comprising a wind-up cylinder, and a heat transfer image-receiving sheet which comprises a substrate and a coloring material-receiving layer provided thereon, the heat transfer image-receiving sheet being wound around the wind-up cylinder, the maximum surface roughness of the wind-up cylinder with respect to a longitudinal direction thereof being 40 micrometers or less.

5,569,639

### DRY FLOWABLE AGRICULTURAL COMPOSITIONS OF GLYPHOSATE AND SULFONYLUREA HERBICIDES MADE WITHOUT DRYING OF THE FINAL PRODUCT

George B. Beestman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

PCT No. PCT/US93/05370, § 371 Date Dec. 9, 1994, § 102(e) Date Dec. 9, 1994, PCT Pub. No. WO93/25081, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 10, 1993, Ser. No. 338,541  
 Int. Cl. A01N 57/04; 25/14

U.S. Cl. 504—128

9 Claims

1. A process for the preparation of a dry flowable agriculturally suitable composition whose pH when measured by a 1% by weight aqueous solution of the composition is 4 or higher comprising

- blending 0.1–40% of an anhydrous base salt with 1–70% wetcake glyphosate to form a blended mixture I,
- blending the following ingredients
  - 0–10% of an anti-caking agent,
  - 0–1% of an anti-foaming agent,
  - 0.1–20% of a stabilizer selected from sodium metasilicate and sodium carbonate,

(4) 0.1–40% of a sulfonylurea herbicide to form blended mixture II,

(c) milling blended mixture II to form a powder,

(d) blending mixtures I and II with 5–30% of a heat activated binder,

(e) heating to 60°–70° C., and

(f) cooling to 50° C. or lower wherein all of the above percentages are by weight based on the composition.

5,569,640

### SUBSTITUTED 1,3-BENZADIXOXANE-4-ONES AND 1,3-BENZATHIOXANE-4-ONES, THEIR PREPARATION AND THEIR CONVERSION TO CROP PROTECTION AGENTS

Joachim Rheinheimer, Merziger Str. 24, 67063 Ludwigshafen; Uwe J. Vogelbacher, Niedererdr. 56, 67071 Ludwigshafen; Ernst Baumann, Falkenstr. 6a, 67373 Dudenhofen; Hartmann König, Albert-Einstein-Allee 16; Matthias Gerber, Brandenburger Str. 24, both of 67117 Limburgerhof; Karl-Otto Westphalen, Mausbergweg 58, 67346 Speyer, and Helmut Walter, Grünstadter Stasse 82, 67283 Obrigheim, all of Germany

Filed Nov. 1, 1994, Ser. No. 332,083

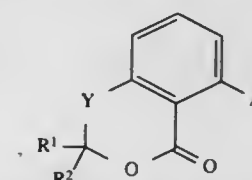
Claims priority, application Germany, Nov. 2, 1993, 43 37 321.6

Int. Cl. A01N 43/32; C07D 319/08; 339/08; 327/06

U.S. Cl. 504—288

1 Claim

1. A method for controlling undesired plant growth, which comprises applying a herbicidally active amount of a cyclic acetal of the formula I



where the substituents have the following meanings:

R<sup>1</sup> and R<sup>2</sup> are hydrogen;

C<sub>1</sub>–C<sub>4</sub>-alkyl, this radical in each case being able to carry one to five halogen atoms and/or one to two C<sub>1</sub>–C<sub>4</sub>-alkoxy groups; phenyl, this radical in each case being able to carry one to five halogen atoms and/or one to two of the following groups: C<sub>1</sub>–C<sub>4</sub>-alkyl, C<sub>1</sub>–C<sub>4</sub>-alkoxy, C<sub>1</sub>–C<sub>4</sub>-haloalkyl or nitro; in addition the two radicals together can be a C<sub>2</sub>–C<sub>6</sub>-alkylene chain which can be substituted by one to five halogen atoms and/or C<sub>1</sub>–C<sub>4</sub>-alkyl radicals;

Y is oxygen or sulfur;

A is a radical A<sup>1</sup> to A<sup>6</sup>;

A<sup>1</sup> is hydroxyl;

A<sup>2</sup> is a halogen atom, C<sub>1</sub>–C<sub>4</sub>-haloalkylsulfonyloxy, C<sub>1</sub>–C<sub>4</sub>-alkylsulfonyloxy or fluorosulfonyloxy;

A<sup>3</sup> is cyano, nitro or formyl;

A<sup>4</sup> is a phenyl ring or a 5- or 6-membered saturated or unsaturated heterocycle having up to four heteroatoms from the group consisting of nitrogen, sulfur and oxygen in the ring, each of which can be substituted by up to five radicals R<sup>31</sup> to R<sup>37</sup>;

naphthyl or a benzo-fused 5- or 6-membered heteroaromatic having 1 to 3 heteroatoms from the group consisting of nitrogen, sulfur and oxygen in the ring, which can be substituted by up to five radicals R<sup>31</sup> to R<sup>37</sup>;

A<sup>5</sup> is a C<sub>2</sub>–C<sub>6</sub>-alkenyl, C<sub>3</sub>–C<sub>8</sub>-cycloalkenyl, C<sub>3</sub>–C<sub>8</sub>-cycloalkadienyl or C<sub>2</sub>–C<sub>6</sub>-alkynyl group, each of which can carry up to seven substituents R<sup>31</sup> to R<sup>37</sup>;

A<sup>6</sup> is a C<sub>1</sub>–C<sub>8</sub>-alkyl or C<sub>3</sub>–C<sub>8</sub>-cycloalkyl group, each of which can carry up to seven substituents R<sup>31</sup> to R<sup>37</sup>;

R<sup>31</sup>, R<sup>32</sup>, R<sup>33</sup>, R<sup>34</sup>, R<sup>35</sup>, R<sup>36</sup> and R<sup>37</sup> are

- a C<sub>3</sub>–C<sub>8</sub>-cycloalkyl group which can carry one to three C<sub>1</sub>–C<sub>4</sub>-alkyl radicals;
- a C<sub>1</sub>–C<sub>8</sub>-alkyl group which can carry one to five halogen atoms and/or one of the following radicals: C<sub>1</sub>–C<sub>4</sub>-alkoxy, C<sub>1</sub>–C<sub>4</sub>-haloalkoxy, C<sub>1</sub>–C<sub>4</sub>-alkylthio, cyano, C<sub>3</sub>–C<sub>8</sub>-cycloalkyl or di-C<sub>1</sub>–C<sub>4</sub>-alkylamino;
- a C<sub>1</sub>–C<sub>8</sub>-alkoxy group or a C<sub>3</sub>–C<sub>8</sub>-cycloalkoxy group, each of which can carry one to five halogen atoms and/or one of the following radicals: C<sub>1</sub>–C<sub>4</sub>-alkoxy, C<sub>1</sub>–C<sub>4</sub>-haloalkoxy, C<sub>1</sub>–C<sub>4</sub>-alkylthio, C<sub>3</sub>–C<sub>8</sub>-cycloalkyl or di-C<sub>1</sub>–C<sub>4</sub>-alkylamino;
- a C<sub>1</sub>–C<sub>4</sub>-alkylthio group which can carry one to five halogen atoms and/or one of the following radicals: C<sub>1</sub>–C<sub>4</sub>-alkoxy, C<sub>1</sub>–C<sub>4</sub>-haloalkoxy, C<sub>1</sub>–C<sub>4</sub>-alkylthio, C<sub>3</sub>–C<sub>8</sub>-cycloalkyl or di-C<sub>1</sub>–C<sub>4</sub>-alkylamino;
- a di-C<sub>1</sub>–C<sub>4</sub>-alkylamino or di-C<sub>1</sub>–C<sub>4</sub>-alkylaminoxy group, a C<sub>3</sub>–C<sub>8</sub>-cycloalkaniminoxy group or a C<sub>1</sub>–C<sub>10</sub>-alkananiminoxy group;
- a C<sub>2</sub>–C<sub>6</sub>-alkenyl or a C<sub>2</sub>–C<sub>6</sub>-alkynyl group, which can carry one to five halogen atoms and/or one of the following radicals: C<sub>1</sub>–C<sub>4</sub>-alkoxy, C<sub>1</sub>–C<sub>4</sub>-haloalkoxy or C<sub>1</sub>–C<sub>4</sub>-alkylthio;
- hydrogen;
- nitro, halogen, cyano or tri-C<sub>1</sub>–C<sub>4</sub>-alkylsilyl to the plants or to their habitat.

5,569,641

### SYNTHESIS OF Bi<sub>1.8</sub>Pb<sub>0.2</sub>Sr<sub>2</sub>Ca<sub>2</sub>Cu<sub>3</sub>O<sub>x</sub> SUPERCONDUCTOR

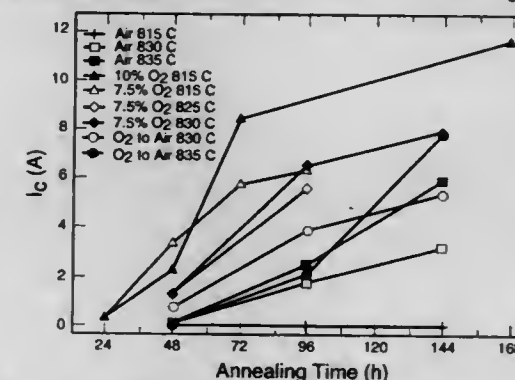
Michael G. Smith, Los Alamos, N.M., assignor to University of California

Filed Apr. 10, 1995, Ser. No. 419,485

Int. Cl. C04B 35/622; 35/64; H01B 12/00

U.S. Cl. 505—433

3 Claims



1. A method of synthesizing superconducting Bi<sub>1.8</sub>Pb<sub>0.2</sub>Sr<sub>2</sub>Ca<sub>2</sub>Cu<sub>3</sub>O<sub>x</sub>, comprising: (a) combining a first precursor mixture of Ca<sub>0.45</sub>Cu<sub>0.55</sub>O<sub>2</sub> and CaO with a second precursor mixture of Bi<sub>1.8</sub>Pb<sub>0.2</sub>Sr<sub>2</sub>CaCu<sub>2</sub>O<sub>2</sub> wherein x is 8 to 9 inclusive and Ca<sub>2</sub>PbO<sub>4</sub>, in the amounts necessary to achieve the desired stoichiometry of said superconducting Bi<sub>1.8</sub>Pb<sub>0.2</sub>Sr<sub>2</sub>Ca<sub>2</sub>Cu<sub>3</sub>O<sub>x</sub>, to form a homogenous mixture; (b) packing and sealing a silver tube with said homogenous mixture; (c) annealing said silver tube; and (d) drawing said tube to a desired thickness.

5,569,642

### SYNTHETIC PARAFFINIC HYDROCARBON DRILLING FLUID

Kaung-Far Lin, Baton Rouge, La., assignor to Albemarle Corporation, Richmond, Va.

Filed Feb. 16, 1995, Ser. No. 345,963

Int. Cl. C09K 7/02

U.S. Cl. 507—103

8 Claims

1. An invert drilling fluid which comprises at least 50 volume percent of a low toxicity base oil and at least one additive selected



from the group consisting of emulsifiers, viscosifiers, weighing agents, oil wetting agents and fluid loss preventing agents, said base oil:

- consisting essentially of a mixture of one or more synthetic linear paraffins and one or more synthetic methyl-branched paraffins, said paraffins individually having from about 14 to about 30 carbon atoms in the chain; and
- having a 96-hour Mysid shrimp toxicity,  $LC_{50}$ , of at least about 1,000,000 ppm in the SPP according to the 1985 test standard of the U.S. Environmental Protection Agency.

5,569,643

#### GREASE COMPOSITION FOR CONSTANT VELOCITY JOINT

Hirotsugu Kinoshita, Kanagawa-ken; Souichi Nomura, Tokyo, and Masaru Mishima, Kanagawa-ken, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 135,254, Oct. 12, 1993, Pat. No. 5,462,683, which is a continuation-in-part of Ser. No. 115,457, Sep. 1, 1993, abandoned, which is a continuation of Ser. No. 846,357, Mar. 5, 1992, abandoned. This application Jul. 10, 1995, Ser. No. 499,942

Claims priority, application Japan, Mar. 7, 1991, 3-42081 Int. Cl.<sup>6</sup> C10M 125/26; 123/02

U.S. Cl. 508—155

11 Claims

1. A grease composition for a constant velocity joint comprising a base oil containing (A) 2 to 25 wt. % of a thickener based on total weight of the composition, (B) 0.5 to 20 wt. % of boron nitride powders based on total weight of the composition, said boron nitride powders having mean particle size of more than 5  $\mu$ m and not more than 20  $\mu$ m, and (C) 0.1 to 10 wt. % of an extreme pressure agent based on total weight of the composition selected from the group consisting of molybdenum dithiocarbamate, a sulfur and phosphorus-containing extreme pressure agent, and mixtures thereof.

5,569,644

#### ADDITIVE COMBINATIONS FOR LUBRICANTS AND FUNCTIONAL FLUIDS

Rolf V. Geibach, Wickliffe, and Craig D. Tipton, Perry, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed May 18, 1995, Ser. No. 444,186 Int. Cl.<sup>6</sup> C10M 141/06; 141/10

U.S. Cl. 508—438

12 Claims

1. A lubricating composition having improved torque characteristics, said composition comprising:  
An oil of lubricating viscosity and a concentrate package mixed therewith, said concentrate package comprising:  
(A) 0.5–5 percent by weight of an acylated amine having total base number (TBN) of about 45–90;

- (B) 0.5–5 percent by weight of a borated acylated amine;  
(C) 0.05–5 percent by weight of an organic phosphorus acid or ester;  
(D) up to 2 percent by weight of a thiocarbamate; and  
(E) up to 7 percent by weight of a nitrogen-containing ester of a carbonyl-containing interpolymers,  
wherein the percents by weight are based on the weight of said lubricating compositions.

5,569,645

#### LOW DOSAGE DETERGENT COMPOSITION CONTAINING OPTIMUM PROPORTIONS OF AGGLOMERATES AND SPRAY DRIED GRANULES FOR IMPROVED FLOW PROPERTIES

Alan R. Dinniwel, Mason, and Matthew L. Wasserman, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 24, 1995, Ser. No. 427,532

Int. Cl.<sup>6</sup> C11D 1/12; 17/06

U.S. Cl. 510—276

8 Claims

1. A detergent composition comprising:

- from about 45% to about 55% by weight of spray dried detergent granules including, by weight of said granules,
  - from about 10% to about 30% of a surfactant system selected from the group consisting of anionics, nonionics and mixtures thereof;
  - from about 20% to about 30% of aluminosilicate;
  - from about 20% to about 30% of sodium carbonate; and
  - the balance water;
- from about 35% to about 45% by weight of detergent agglomerates including, by weight of said agglomerates,
  - from about 25% to about 40% of a mixture of alkyl sulfate surfactant and linear alkylbenzene sulfonate surfactant;
  - from about 35% to about 45% of aluminosilicate;
  - from about 20% to about 30% of sodium carbonate; and
  - the balance water; and
- from about 5% to about 15% by weight of adjunct ingredients selected from the group consisting of perfume, enzymes, soil release polymers, suds suppressors, pH adjusting agents, bleaching agents and mixtures thereof;

wherein the weight ratio of said granules to said agglomerates is about 3:2 and said composition has a density of at least about 650 g/l.

5,569,646

#### POLYPEPTIDE COMPOUND AND A PROCESS FOR PREPARATION THEREOF

Hidenori Ohki, Ikeda; Masaki Tomishima, Minoo; Akira Yamada, Fujiidera, and Hisashi Takasugi, Sakai, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed May 16, 1994, Ser. No. 242,854

Claims priority, application United Kingdom, May 17, 1993, 9310091; Dec. 10, 1993, 9325269

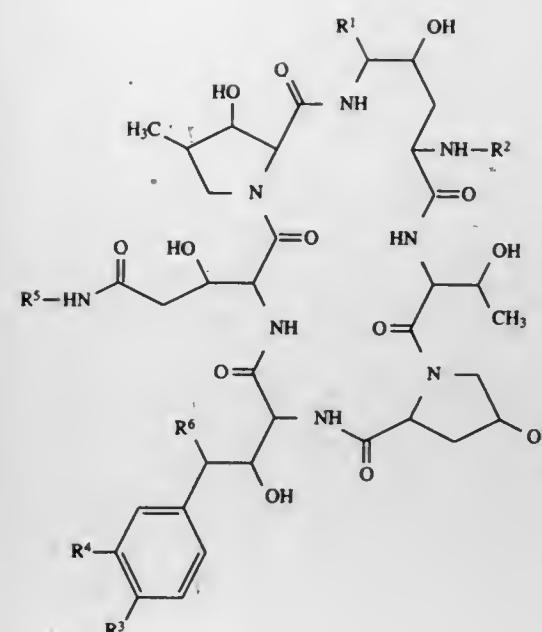
Int. Cl.<sup>6</sup> A61K 38/00; C07K 7/00; 7/06

U.S. Cl. 514—11

7 Claims

1. A polypeptide compound having improved antifungal activity of the following general formula:

its enantiomers, diastereoisomers and epimers, as well as its addition salts with a pharmaceutically-acceptable acid or base.



wherein

- $R^1$  is hydrogen,  
 $R^2$  is acyl group,  
 $R^3$  is hydroxy or acyloxy,  
 $R^4$  is hydroxy or hydroxysulfonyloxy,  
 $R^5$  is hydrogen or lower alkyl which may have one or more suitable substituent(s), and  
 $R^6$  is hydrogen, hydroxy or acyl (lower) alkylthio and a pharmaceutically acceptable salt thereof.

5,569,647

#### ANGIOPEPTIN CYCLOPEPTIDE COMPOUNDS

Jean-Luc Fauchere, Saint-Cloud; Christophe Thureau, Paris; Jean-Paul Vilaine, Chateaufort, and Philip Janiak, Clichy, all of France, assignors to Adir et Compagnie, Courbevoie, France

Continuation of Ser. No. 197,788, Feb. 16, 1994, abandoned.

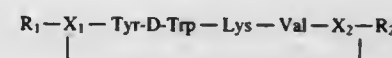
This application Jun. 6, 1995, Ser. No. 469,784

Claims priority, application France, Feb. 22, 1993, 93.01978 Int. Cl.<sup>6</sup> A61K 38/12

U.S. Cl. 514—11

3 Claims

1. A compound selected from those of formula (I):



in which:

- $R_1$  represents a 3-(2-naphthyl)-D-alanine (D-Nal) residue,  
 $R_2$  represents a threonine (Thr) residue,  
 $X_1$  and  $X_2$  are a glutamic acid residue (Glu) and a L-2,4-diaminobutyric acid residue (Dab), respectively which are connected by means of an amide bond and which confer on the ring so formed a number of atoms equal to 22,  
Tyr represents the L-tyrosine residue,  
D-Trp represents the D-tryptophan residue,  
Lys represents the L-lysine residue, and  
Val represents the L-valine residue.

171-209 O.G.-96-13: QL3

5,569,648

#### PREVENTION AND TREATMENT OF PERIPHERAL NEUROPATHY

Michael E. Lewis, West Chester, Pa.; Stuart C. Apfel, West Hempstead, N.Y., and John A. Kessler, New Canaan, Conn., assignors to Cephalon, Inc., West Chester, Pa., and Albert Einstein College of Medicine of Yeshiva University, Bronx, N.Y.

Continuation of Ser. No. 51,191, Apr. 16, 1993, Pat. No. 5,420,112, which is a continuation-in-part of Ser. No. 899,070, Jun. 12, 1992, abandoned. This application Dec. 29, 1994, Ser. No. 365,796

Int. Cl.<sup>6</sup> A61K 38/00; 38/04; 38/08; 38/22

U.S. Cl. 514—12

5 Claims

1. A composition comprising a substantially pure insulin-like growth factor-I and a chemotherapeutic agent, in a weight to weight ratio of between 1:400 and 75:1.

5,569,649

#### ANTI-INFLAMMATORY TREATMENT METHOD

Anthony C. Allison, Belmont, Calif.; Carl F. de Vos Albrecht, Durbanville, South Africa; Petrus B. Kruger, Cape Town, South Africa, and Marthinus J. van der Merwe, Bellville, South Africa, assignors to Phytopharm (NA) N.V., Netherlands Antilles

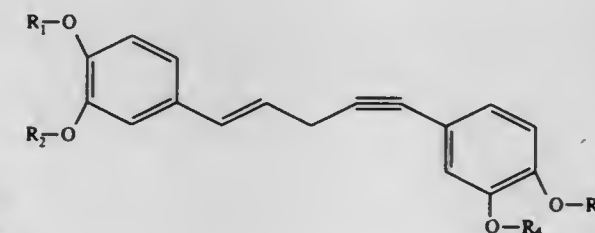
Filed Jun. 14, 1994, Ser. No. 259,961

Int. Cl.<sup>6</sup> A61K 31/70; C07H 15/00

U.S. Cl. 514—25

13 Claims

1. A method of treating an inflammatory disease in a subject comprising administering to a subject in need of such treatment, a therapeutically effective amount of a composition consisting essentially of a substantially pure compound having the structure:



wherein  $R_1$  to  $R_4$  are independently selected from the group consisting of H, a lower alkylacyl group, an arylacyl group, a lower arylalkylacyl group, or a C-1-linked saccharide.



5,569,650

## C-NUCLEOSIDE ISOSTERS OF ANALOGS THEREOF AND PHARMACEUTICAL COMPOSITIONS

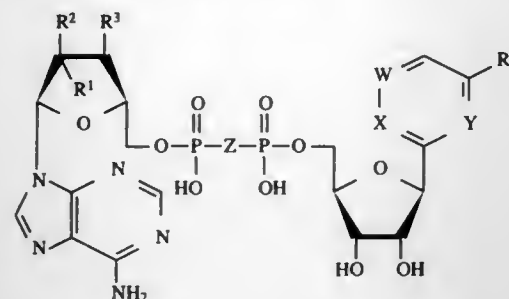
Kyolchi A. Watanabe, Rye-Brook, and Krzysztof W. Pankiewicz, Bronxville, both of N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, and The University of Rochester, Monroe, both of N.Y.

Filed Jun. 11, 1993, Ser. No. 75,746

Int. Cl.<sup>6</sup> A61K 31/70; C07H 19/207

U.S. Cl. 514—43

1. A compound having the structure:



wherein R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup> are same or different, and are hydrogen, hydroxyl, or fluorine; Z is O, CH<sub>2</sub>, or CF<sub>2</sub>; R is chlorine, bromine, iodine, carbonitrile, carboxylic ester, or carboxamide; and one of W, X and Y is N or N<sup>+</sup>R', wherein R' is methyl or ethyl, and all others are CH; provided that R<sup>1</sup> is not H when R<sup>2</sup> and R<sup>3</sup> are OH, Z is O, R is carboxamide and W is N or N<sup>+</sup>R'.

5,569,651

## GENTLE ANTI-ACNE COMPOSITION

Mark S. Garrison, White Plains, N.Y.; John A. Duffy, West Milford, N.J., and Janice J. Teal, Old Greenwich, Conn., assignors to Avon Products, Inc., Suffern, N.Y.

Filed Mar. 3, 1995, Ser. No. 397,784

Int. Cl.<sup>6</sup> A61K 7/48

U.S. Cl. 514—159

1 Claim

1. A topical formulation for treating adult acne and sensitive skin conditions complicated with acne, which consists of:

- (a) about 6.5% propylene glycol dicaprylate/dicaprate;
- (b) about 6.0% lactic acid;
- (c) about 5.0% glycerin;
- (d) about 3.0% ammonium hydroxide;
- (e) about 2.0% Peg 40 Stearate;
- (f) about 1.5% Steareth-2;
- (g) about 0.6% hydroxyethyl cellulose;
- (h) about 0.6% xanthan gum;
- (i) about 0.5% salicylic acid;
- (j) about 0.2% methylparaben;
- (k) about 0.2% disodium EDTA; and
- q.s. water.

5,569,652

## DIHYDROSPIRORENONE AS AN ANTIANDROGEN

Sybilie Beier; Walter Elger; Yukishige Nishino, and Rudolf Wiechert, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

Continuation of Ser. No. 835,000, Feb. 14, 1992, abandoned, which is a continuation of Ser. No. 524,396, May 16, 1990.

This application Dec. 7, 1993, Ser. No. 162,387

Claims priority, application Germany, May 16, 1989, 39 16 112.9

Int. Cl.<sup>6</sup> A61K 31/585

U.S. Cl. 514—173

27 Claims

1. A method of simultaneously achieving, during premenopause or menopause a gestagenic effect, antiandrogenic effect, and an antialdosterone effect in a female patient in need thereof compris-

ing administering an amount of dihydrospirorenone to said female patient, wherein said amount of dihydrospirorenone is effective to simultaneously achieve a gestagenic effect, antiandrogenic effect and antialdosterone effect in said patient.

5,569,653

## N-[(4-(HETEROARYL)-1-PYRROLIDINYL)ALKYL]-10,11-DIHYDRO-5H-DIBENZ[B,F]AZEPINES AND RELATED COMPOUNDS AND THEIR THERAPEUTIC UTILITY

Edward J. Glamkowski, Warren, and Yulin Chiang, Covent Station, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 329,000, Oct. 25, 1994, which is a continuation-in-part of Ser. No. 144,265, Oct. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 969,383, Oct. 30, 1992, Pat. No. 5,364,866, which is a continuation-in-part of Ser. No. 788,269, Nov. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 944,705, Sep. 5, 1991, abandoned, which is a continuation of Ser. No. 619,825, Nov. 29, 1990, abandoned, which is a continuation of Ser. No. 456,790, Dec. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 354,411, May 19, 1989, abandoned. This application

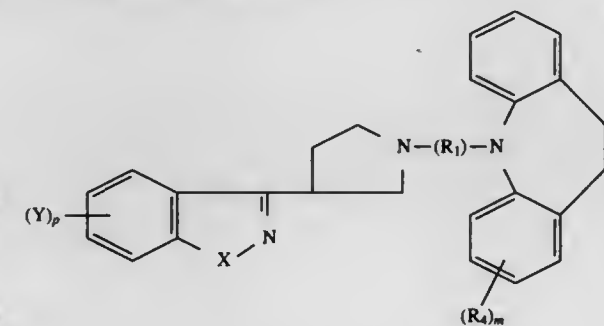
Jun. 6, 1995, Ser. No. 471,775

Int. Cl.<sup>6</sup> A61K 31/55; C07D 223/28

U.S. Cl. 514—217

14 Claims

1. A compound of the formula:



wherein

X is —O—, —S—, —NH—, or —N(R<sub>2</sub>);R<sub>2</sub> is selected from the group consisting of lower alkyl, aryl, lower alkyl, aryl, cycloalkyl, aroyl, alkanoyl, and phenylsulfonyl groups;

aryl is as defined hereinafter;

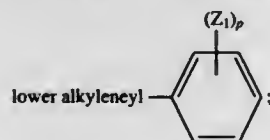
p is 1 or 2;

Y is hydrogen, lower alkyl, hydroxy, chlorine, fluorine, bromine, iodine, lower alkoxy, trifluoromethyl, nitro, or amino;

R<sub>1</sub> is —CR<sub>24</sub>R<sub>27</sub>—(CR<sub>23</sub>R<sub>27</sub>)<sub>n</sub>—, where n is 0, 1, 2 or 3; or—CHR<sub>24</sub>CH=CH—CHR<sub>24</sub>—,—CHR<sub>24</sub>—C≡C—CHR<sub>24</sub>—,—CHR<sub>24</sub>—CH=CH—CR<sub>23</sub>R<sub>24</sub>—CHR<sub>24</sub>—,—CHR<sub>24</sub>—CR<sub>23</sub>R<sub>24</sub>—CH=CH—CHR<sub>24</sub>—,—CHR<sub>24</sub>—C≡C—CR<sub>23</sub>R<sub>24</sub>—CHR<sub>24</sub>—, or—CHR<sub>24</sub>—CR<sub>23</sub>R<sub>24</sub>—C≡C—CHR<sub>24</sub>—,

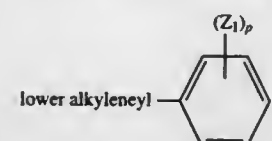
the —CH=CH— bond being cis or trans;

R<sub>23</sub> is hydrogen, (C<sub>1</sub>–C<sub>18</sub>) linear alkyl, phenyl, hydroxy, (C<sub>1</sub>–C<sub>18</sub>)alkoxy, aryloxy, aryl(C<sub>1</sub>–C<sub>18</sub>)alkoxy, (C<sub>1</sub>–C<sub>18</sub>)alkanoyloxy, hydroxy(C<sub>1</sub>–C<sub>6</sub>)alkyl, (C<sub>1</sub>–C<sub>18</sub>)alkoxy (C<sub>1</sub>–C<sub>6</sub>)alkyl, phenyl(C<sub>1</sub>–C<sub>6</sub>)alkoxy, aryl(C<sub>1</sub>–C<sub>18</sub>)alkoxy(C<sub>1</sub>–C<sub>6</sub>)alkyl, (C<sub>1</sub>–C<sub>18</sub>)alkanoyloxy(C<sub>1</sub>–C<sub>6</sub>)alkyl or



where Z<sub>1</sub> is lower alkyl, —OH, lower alkoxy, —CF<sub>3</sub>, —NO<sub>2</sub>, —NH<sub>2</sub>, or halogen, and p is as previously defined;

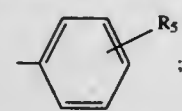
R<sub>24</sub> is hydrogen, (C<sub>1</sub>–C<sub>18</sub>) linear alkyl, phenyl, hydroxy(C<sub>1</sub>–C<sub>6</sub>)alkyl, (C<sub>1</sub>–C<sub>18</sub>)alkoxy(C<sub>1</sub>–C<sub>6</sub>)alkyl, phenyl(C<sub>1</sub>–C<sub>6</sub>)alkoxy, aryl(C<sub>1</sub>–C<sub>18</sub>)alkoxy(C<sub>1</sub>–C<sub>6</sub>)alkyl; (C<sub>1</sub>–C<sub>18</sub>)alkanoyloxy(C<sub>1</sub>–C<sub>6</sub>)alkyl or



where Z<sub>1</sub> and p as previously defined;

R<sub>27</sub> is hydrogen or R<sub>24</sub> and R<sub>27</sub> taken together with the carbon to which they are attached form C=O or C=S; fluorine, bromine, —O—C(=O)—(C<sub>1</sub>–C<sub>18</sub>)straight or branched chain alkyl or —C(=O)—aryl;

where aryl is phenyl or



where R<sub>5</sub> is hydrogen, lower alkyl, lower alkoxy, hydroxy, chlorine, fluorine, bromine, iodine, lower monoalkylamino, lower dialkylamino, nitro, cyano, trifluoromethyl, or trifluoromethoxy; and

m is 1, 2, or 3;

all geometric, optical, and stereoisomers thereof, or a pharmaceutically acceptable acid addition salt thereof.

5,569,654

## BENZODIAZEPINONES

Duncan R. Armour; Philip C. Box, and Pritom Shah, all of Hertfordshire, Great Britain, assignors to Glaxo Group Limited, London, England

PCT No. PCT/EP93/03381, § 371 Date Jun. 5, 1995, § 102(e) Date Jun. 5, 1995, PCT Pub. No. WO94/13648, PCT Pub. Date Jun. 23, 1994

PCT Filed Dec. 2, 1993, Ser. No. 446,728

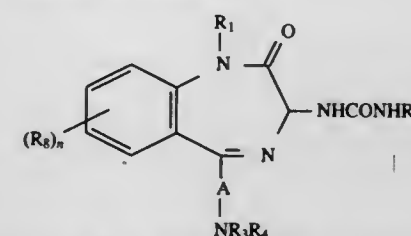
Claims priority, application United Kingdom, Dec. 5, 1992, 9225492

Int. Cl.<sup>6</sup> C07D 243/14; A61K 31/55

U.S. Cl. 514—221

12 Claims

1. A compound of formula (I)



and physiologically acceptable salts thereof, wherein:

R<sub>1</sub> represents CH<sub>2</sub>CONR<sub>5</sub>R<sub>6</sub> or CH<sub>2</sub>COR<sub>7</sub>;

R<sub>2</sub> represents a phenyl group optionally substituted by one or two substituents selected from the group consisting of halogen, C<sub>1</sub>–alkyl, nitro, cyano, trifluoromethyl, trifluoromethoxy, C<sub>1</sub>–alkylthio, C<sub>1</sub>–alkylsulphonyl, C<sub>1</sub>–alkylsulphonyl, amino, substituted amino, hydroxy, C<sub>1</sub>–alkoxy, methylenedioxy, C<sub>1</sub>–alkoxycarbonyl, oxazolyl and oxadiazolyl;

A represents a C<sub>1</sub>–alkyl straight or branched alkylene chain;

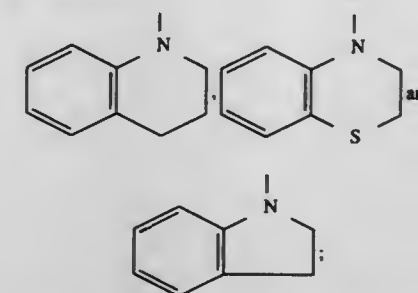
R<sub>3</sub> and R<sub>4</sub> independently represent hydrogen or C<sub>1</sub>–alkyl, or R<sub>3</sub> and R<sub>4</sub> together with the nitrogen atom to which they are attached form a saturated 5–7 membered heterocyclic ring selected from the group consisting of pyrrolidino, piperidino,

hexamethylenimino, morpholino, thiomorpholino and oxides thereof, piperazino, N-methylpiperazino and N-C<sub>1</sub>–alkoxycarbonyl piperazino;

R<sub>5</sub> represents hydrogen or C<sub>1</sub>–alkyl;

R<sub>6</sub> represents C<sub>1</sub>–alkyl or phenyl which is optionally substituted by halogen; or

R<sub>3</sub> and R<sub>5</sub> together with the nitrogen atom to which they are attached represent a saturated 5–7 membered heterocyclic ring selected from the group consisting of pyrrolidino, piperidino and hexamethylenimino which may be substituted by one or two methyl groups or by a group selected from the group consisting of:



R<sub>7</sub> represents C<sub>1</sub>–alkyl, phenyl or phenyl substituted by a methyl group;

R<sub>8</sub> represents hydrogen or a halogen atom; and

n is zero, 1 or 2.

5,569,655

## SUBSTITUTED HETEROCYCLYLISOQUINOLINIUM SALTS AND COMPOSITIONS AND METHOD OF USE THEREOF

John A. Dority, Jr., Upper Providence Township, Montgomery County; William G. Earley, East Vincent Township, Chester County; Virendra Kumar, Tredyffrin Township, Chester County; John P. Mallamo, Uwchlan Township, Chester County; Matthew S. Miller, Lower Makefield Township, Bucks County; and Chakrapani Subramanyam, Towamencin Township, Montgomery County, all of Pa., assignors to Sterling Winthrop Inc., New York, N.Y.

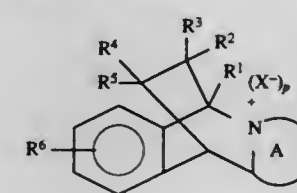
Continuation-in-part of Ser. No. 121,389, Sep. 14, 1993, abandoned. This application Jul. 29, 1994, Ser. No. 283,319

Int. Cl.<sup>6</sup> A61K 31/54; 31/495; 31/425; 31/415; C07D 763/52; 415/00; 417/02; 771/02

U.S. Cl. 514—226.8

36 Claims

1. A compound of the formula:



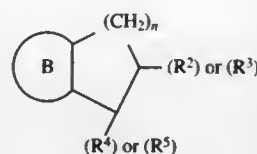
wherein:

R<sup>1</sup> is hydrogen, or lower-alkyl;

R<sup>2</sup> and R<sup>3</sup> are independently hydrogen, or lower-alkyl; or R<sup>2</sup> and R<sup>3</sup> together form a cycloalkyl ring, or a lower-alkylidene group;

R<sup>4</sup> and R<sup>5</sup> are independently lower-alkynyl, lower-alkoxy, phenyl (or phenyl substituted by lower-alkoxy, halogen, lower-alkyl, polyfluorolower-alkyl, polychlorolower-alkyl, or hydroxy), a 5- or 6-membered monocyclic aromatic heterocyclic ring system containing from one to three, the same or different, heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur (or said 5- or 6-membered monocyclic aromatic heterocyclic ring system substituted on any

available carbon atom thereof by hydroxy, lower-alkyl, oxo, nitro, halogen, or lower-alkoxy; or on any available nitrogen atom thereof by lower-alkyl, tri-lower-alkylsilyl, tri-lower-alkylsilyl-lower-alkoxy-lower-alkyl, or phenyl-lower-alkyl (or said phenyl-lower-alkyl group substituted on the phenyl group by lower-alkoxy, lower-alkyl or halogen)); a 9- or 10-membered bicyclic aromatic heterocyclic ring system containing from one to two, the same or different, heteroatoms selected from the group consisting of oxygen, nitrogen and sulfur (or said 9- or 10-membered bicyclic aromatic heterocyclic ring system substituted at any available carbon atom thereof by hydroxy, lower-alkyl, oxo, nitro, halogen, or lower-alkoxy; or on any available nitrogen atom thereof by lower-alkyl, tri-lower-alkylsilyl, tri-lower-alkylsilyl-lower-alkoxy-lower-alkyl, or phenyl-lower-alkyl (or said phenyl-lower-alkyl group substituted on the phenyl group by lower-alkoxy, lower-alkyl, or halogen)); or a 5- or 6-membered monocyclic nonaromatic heterocyclic ring system containing from one to two, the same or different, heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur (or said 5- or 6-membered nonaromatic heterocyclic ring system substituted on any available carbon atom thereof by hydroxy, lower-alkyl, oxo, nitro, halogen, or lower-alkoxy, or on any available nitrogen atom thereof by lower-alkyl, tri-lower-alkylsilyl, tri-lower-alkylsilyl-lower-alkoxy-lower-alkyl, or phenyl-lower-alkyl (or said phenyl-lower-alkyl group substituted on the phenyl group by lower-alkoxy, lower-alkyl or halogen)); or R<sup>2</sup> and R<sup>4</sup> and/or R<sup>3</sup> and R<sup>5</sup> taken together with the carbon atoms to which they are attached form a bicyclic ring system of the formula



wherein B is:

phenyl, or a 5- or 6-membered monocyclic aromatic heterocyclic ring system containing from one to three, the same or different, heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur, (or said B ring substituted on any available carbon atom thereof by lower-alkoxy, or lower-alkyl), and n is an integer from one to three;

R<sup>6</sup> is hydrogen, or from one to four, the same or different, substituents in any of the 7-, 8-, 9-, or 10-positions (if A is a six-membered ring), or in any of the 6-, 7-, 8-, or 9- position (if A is a five-membered ring) selected from the group consisting of lower-alkyl, lower-alkanoyloxy, halogen, nitro, hydroxy, lower-alkoxy, methylenedioxy, polychlorolower-alkyl, OCO(CH<sub>2</sub>)<sub>m</sub>, C(O)O alkyl, OC(O)alkyl, C(O)Oalkyl, CO<sub>2</sub><sup>-</sup>, carboxy, sulfo, SO<sub>3</sub><sup>-</sup>, PO<sub>3</sub>H, PO<sub>3</sub><sup>-</sup>, cyano, polyfluorolower-alkyl, OC(O) alkyl-CH=CH-alkyl, OC(O)-lower-alkenyl-C(O)alkyl, alkoxy, OC(O)alkylC(O)Oalkyl, amino, and lower-alkylsulfonylamino, wherein m is an integer from one to four;

A together with the carbon and nitrogen atoms to which it is attached forms a 5- or 6-membered monocyclic aromatic heterocycle containing from two to three, the same or different, heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur (or said 5- or 6-membered monocyclic aromatic heterocycle substituted on any available carbon atom thereof by hydroxy, OC(O)alkyl-CH=CH-alkyl, OC(O)alkyl, OC(O)lower-alkenyl-C(O)Oalkyl, alkoxy, OC(O)alkyl-C(O)Oalkyl, nitro, amino, lower-alkylsulfonylamino, lower-alkyl, lower-alkoxy, or halogen; or on any available nitrogen atom thereof by phenyl (or said phenyl group substituted by lower-alkoxy, lower-alkyl or halogen), diphenylmethyl, naphthyl-lower-alkyl (or said naphthyl-lower-alkyl group substituted on the naphthyl group by lower-alkoxy, lower-alkyl or

halogen), lower-alkyl, or phenyl-lower-alkyl (or said phenyl-lower-alkyl group substituted on the phenyl group by lower-alkoxy, lower-alkyl or halogen));

X<sup>-</sup> is an anion; and p is zero when R<sup>6</sup> is a negatively charged radical, and p is one when R<sup>6</sup> is other than a negatively charged radical; or a pharmaceutically acceptable acid-addition salt of basic members thereof; or a hydrate thereof; or a stereoisomer thereof.

5,569,656

## FUNGICIDAL COMPOSITIONS

Stefan Dutzmann, Hilden; Heinz-Wilhelm Dehne, Monheim; Karl-Heinz Kuck, Langenfeld; Wilhelm Brandes, Leichlingen, and Wolfgang Krämer, Burscheid, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany Division of Ser. No. 249,511, May 26, 1994, Pat. No.

5,439,926. This application May 2, 1995, Ser. No. 432,741

Claims priority, application Germany, Jun. 2, 1993, 43 18 285.2

Int. Cl.<sup>6</sup> A61K 31/535; A01N 43/12; 43/26; 43/40

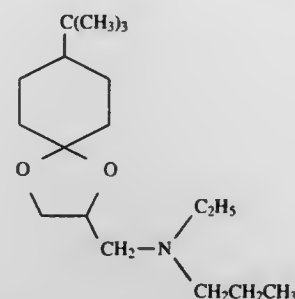
U.S. Cl. 514—231.2

4 Claims

1. A fungicidal composition comprising synergistic fungicidally effective amounts of a combination of

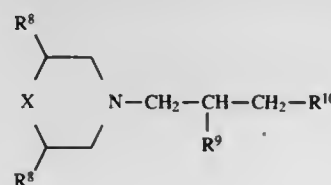
(A) 8-t-butyl-2-(N-ethyl-N-n-propylamino)-methyl-dioxaspiro[4.5]-decane of the formula

(I)



and  
(B) at least one heterocycle of the formula

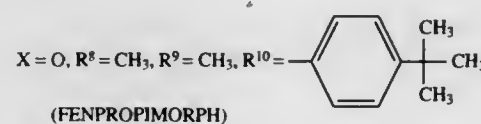
(IX)



(IX-1)

X = O, R<sup>8</sup> = CH<sub>3</sub>, R<sup>9</sup> = H, R<sup>10</sup> = C<sub>10</sub>H<sub>21</sub>  
(TRIDEMORPH)

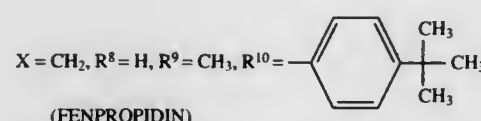
(IX-3)



(FENPROPIMORPH)

or

(IX-4)



(FENPROPIDIN)

wherein the weight ratio of A:B is from about 1:0.3 to 1:3.

5,569,657

(-)-[4-(1,4,5,6-TETRAHYDRO-4-METHYL-6-OXO-3-PYRIDAZINYL)PHENYL]-HYDRAZONO]PROPANEDINITRILE

Pentti Nore, Helsinki; Erkki Honkanen, Espoo; Reijo Bäckström, Helsinki; Tom Wikberg; Heimo Haikala, both of Espoo, and Jorma Haarala, Helsinki, all of Finland, assignors to Orion-yhtymä Oy, Espoo, Finland

Division of Ser. No. 81,360, Jun. 30, 1993, Pat. No. 5,424,428.

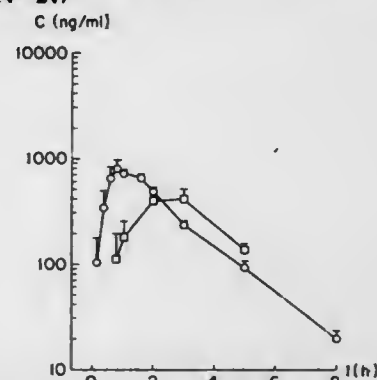
This application May 31, 1995, Ser. No. 454,856

Claims priority, application United Kingdom, Jan. 3, 1991, 9100049; Sep. 5, 1991, 91189473

Int. Cl.<sup>6</sup> A61K 31/50

U.S. Cl. 514—247

3 Claims



1. (-)-[4-(1,4,5,6-tetrahydro-4-methyl-6-oxo-3-pyridazinyl)phenyl]hydrazono]propanedinitrile and pharmaceutically acceptable salts thereof.

5,569,658

## TRICYCLIC DERIVATIVES

Andrew J. Barker, Macclesfield, United Kingdom, assignor to Zeneca Limited, London, United Kingdom

Filed Jul. 19, 1994, Ser. No. 275,754

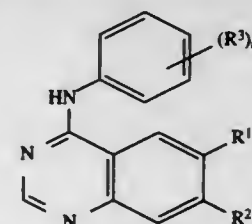
Claims priority, application United Kingdom, Jul. 19, 1993, 9314884

Int. Cl.<sup>6</sup> C07D 237/26; 239/70; A61K 31/495; 31/505

U.S. Cl. 514—250

15 Claims

1. A tricyclic derivative of the formula I



wherein R<sup>1</sup> and R<sup>2</sup> together form a group of the formula —N=CH—NH—, —N=N—NH—, —NH—N=CH—, —NH—CO—NH—, —NH—NH—CO—, —N=N—CH=CH—, —N=CH—N=CH—, —N=CH—CH=N—, or —N=CH—CO—NH— (with in each case a nitrogen atom being located at the 6-position of the quinazoline ring) and the 5- or 6-membered ring so formed may optionally bear one or two substituents, any substituent on an available carbon atom being selected from (1-4C)alkyl, (3-4C)alkenyl, (3-4C)alkynyl, halogeno-(1-4C)alkyl, hydroxy-(1-4C)alkyl, (2-4C)alkanoyloxy-(1-4C)alkyl, (1-4C)alkoxy-(1-4C)alkyl, cyano-(1-4C)alkyl, amino-(i-4C)alkyl, (1-4C)alkylamino-(1-4C)alkyl and di-[(1-4C)alkyl]amino-(1-4C)alkyl, and any substituent on an available carbon atom being selected from halogeno, amino, hydroxy, carbamoyl, cyano, (1-4C)alkyl, (2-4C)alkenyl, (2-4C)alkynyl, (1-4C)alkoxy, (1-4C)alkylthio, (1-4C)alkylsulphonyl, (1-4C)alkylsulphonyl, (1-4C)alkylamino, di-[(1-4C)alkyl]amino, (2-4C)alkanoyl, N-(1-4C)alkylcarbamoyl, N,N-di-[(1-4C)alkyl]carbamoyl, halogeno-(1-4C)alkyl, hydroxy-

(1-4C)alkyl, (2-4C)alkanoyloxy-(1-4C)alkyl, (1-4C)alkoxy-(1-4C)alkyl, cyano-(1-4C)alkyl, amino-(1-4C)alkyl, (1-4C)alkylamino-(1-4C)alkyl and di-[(1-4C)alkyl]amino-(1-4C)alkyl; and m is the integer 1, 2 or 3 and each R<sup>3</sup> is independently hydrogen, halogeno, trifluoromethyl, hydroxy, amino, nitro, cyano, (1-4C)alkyl, (1-4C)alkoxy, (1-4C)alkylamino, di-[(1-4C)alkyl]amino or (2-4C)alkanoylamino; or a pharmaceutically-acceptable salt thereof.

5,569,659

## 4-ARYLPIPERAZINES AND 4-ARYLPIPERIDINES

Allen B. Reitz, Lansdale, Pa., assignor to McNeilab, Inc., Spring House, Pa.

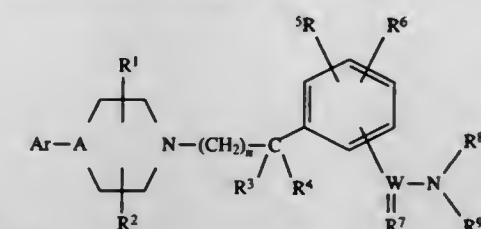
Continuation of Ser. No. 365,978, Dec. 28, 1994, abandoned, which is a continuation of Ser. No. 944,006, Sep. 11, 1992, abandoned, which is a continuation-in-part of Ser. No. 757,881, Sep. 11, 1991, abandoned. This application May 17, 1995, Ser. No. 442,600

Int. Cl.<sup>6</sup> A61K 31/495; 31/55; C07D 401/00; 403/00

U.S. Cl. 514—253

30 Claims

1. A compound represented by the formula 1:



wherein

Ar is selected from either of phenyl or naphthyl either which can be optionally substituted with one or more of C<sub>1</sub>-C<sub>8</sub> alkyl, cycloalkyl, C<sub>1</sub>-C<sub>8</sub> alkoxy, aryloxy, hydroxyl, trifluoromethyl, trifluoromethoxy, cyano, C<sub>1</sub>-C<sub>8</sub> alkylthio, halogen, nitro, C<sub>1</sub>-C<sub>8</sub> haloalkyl, amino or mono- or dialkylamino wherein each alkyl is C<sub>1</sub>-C<sub>8</sub>, or heteroaryl selected from any of pyrimidinyl, pyridinyl, pyridazinyl, pyrazinyl, imidazolyl, pyrrolyl, furanyl, thiophenyl, triazolyl and thiazolyl;

A is N;

W is C or SO;

R<sup>1</sup> and R<sup>2</sup> are H or C<sub>1</sub>-C<sub>4</sub> alkyl;

n=0-4

R<sup>3</sup> and R<sup>4</sup> are either both H, or one of them is H and the other is C<sub>1</sub>-C<sub>4</sub> alkyl or hydroxyl, or both are taken together as oxygen to constitute a carbonyl group, with the proviso that when n=0, R<sup>3</sup> and R<sup>4</sup> can not be taken together as oxygen;

R<sup>5</sup> and R<sup>6</sup> are independently selected from any one of H, C<sub>1</sub>-C<sub>8</sub> alkyl, C<sub>1</sub>-C<sub>8</sub> alkoxy, nitro, halogen, haloalkyl, C<sub>1</sub>-C<sub>8</sub> alkylthio, amino, C<sub>1</sub>-C<sub>8</sub> mono- or di-alkyl amino, or C<sub>1</sub>-C<sub>8</sub> alkylamido;

R<sup>7</sup> is O or S where W is C; R<sup>7</sup> is S where W is SO;

R<sup>8</sup> and R<sup>9</sup> are independently selected from any one of H, C<sub>1</sub>-C<sub>8</sub> alkyl, C<sub>1</sub>-C<sub>8</sub> aminoalkyl, phenyl, phenyl substituted with one or more of C<sub>1</sub>-C<sub>8</sub> alkyl, C<sub>1</sub>-C<sub>8</sub> alkoxy, halogen, trifluoromethyl, C<sub>1</sub>-C<sub>8</sub> alkylthio, dialkylamino (wherein each alkyl is C<sub>1</sub>-C<sub>8</sub>), C<sub>1</sub>-C<sub>8</sub> alkylamino, nitro or mono- or dialkylamino sulfonyl (wherein each alkyl is C<sub>1</sub>-C<sub>8</sub>), aralkyl wherein the alkyl portion is C<sub>1</sub>-C<sub>8</sub>, C<sub>1</sub>-C<sub>8</sub> acyl, C<sub>3</sub> to C<sub>10</sub> cycloalkyl; provided that when R<sup>1</sup>-R<sup>6</sup>, R<sup>8</sup> and R<sup>9</sup> are hydrogen, W is SO, R<sup>7</sup> is O and A is nitrogen, Ar is not pyridyl; or —NR<sup>8</sup>R<sup>9</sup> may be taken together to form a ring selected from any of pyrro-



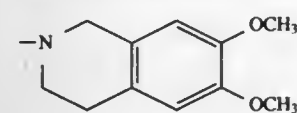
lidine, piperidine, hexahydroazepine, octahydroazocine, oxazine or 2,6-dimethylpiperidine; provided that when Ar is unsubstituted Ph, R<sup>8</sup>R<sup>9</sup> are not —(CH<sub>2</sub>)<sub>5</sub>—; when Ar is 2-pyrimidinyl, R<sup>8</sup>R<sup>9</sup> are not



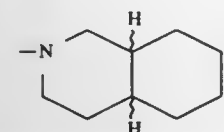
when Ar is 2(OiPr)Ph, R<sup>8</sup>R<sup>9</sup> are not



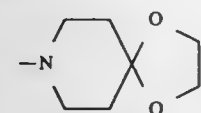
wherein Ar is 2,5(MeO)<sub>2</sub>Ph, R<sup>8</sup>R<sup>9</sup> are not —(CH<sub>2</sub>)<sub>4</sub>—; and when Ar is 2,6(MeO)<sub>2</sub>Ph, R<sup>8</sup>R<sup>9</sup> are not —(CH<sub>2</sub>)<sub>5</sub>—; or optionally —NR<sup>8</sup>R<sup>9</sup> may be taken together to form a fused bicyclic ring selected from either of formulas III or IV;



or



or optionally NR<sup>8</sup>R<sup>9</sup> may be a spirocycle ring system of the formula V;



when —NR<sup>8</sup>R<sup>9</sup> are taken together to form the 4–8 membered ring, the fused ring system or the spirocycle ring system, the rings may be optionally substituted with one or more of C<sub>1</sub>–C<sub>8</sub> alkyl, C<sub>1</sub>–C<sub>8</sub> alkoxy, phenyl, phenyl substituted with one or more of C<sub>1</sub>–C<sub>8</sub> alkyl, C<sub>1</sub>–C<sub>8</sub> alkoxy, halogen, trifluoromethyl, C<sub>1</sub>–C<sub>8</sub> alkylthio, dialkylamino (wherein each alkyl is C<sub>1</sub>–C<sub>8</sub>), C<sub>1</sub>–C<sub>8</sub> alkylamino, nitro, or mono- or di-alkylamino sulfonyl (wherein each alkyl is C<sub>1</sub>–C<sub>8</sub>), hydroxy, aralkyl wherein the alkyl portion is C<sub>1</sub>–C<sub>8</sub>; oxo or thioxo, or the pharmaceutically acceptable acid addition salt thereof.

5,569,660

#### UTILIZATION OF AN ALKYL-SUBSTITUTED PYRIDINE AS A PERFUMING INGREDIENT

Roger L. Snowden, Viry, France, and Pierre-Alain Blanc, Crassier, Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Filed May 17, 1995, Ser. No. 443,227

Claims priority, application Switzerland, Jun. 21, 1994, 1966/94

Int. Cl.<sup>6</sup> A61K 31/435

U.S. Cl. 514—277

4 Claims

1. A method to impart, improve, enhance or modify the odor properties of a perfuming composition or of a perfumed article, which method comprises adding to said composition or article 3-(2,2-dimethyl-propyl)-pyridine in an amount effective to impart, enhance or modify the fragrance thereof.

5,569,661

#### PROCESS FOR THE PRODUCTION OF B-CARBOLINES

Gregor Haffer, and Klaus Nickisch, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany  
PCT No. PCT/DE93/01116, § 371 Date Jun. 23, 1995, § 102(e)  
Date Jun. 23, 1995, PCT Pub. No. WO94/12498, PCT Pub. Date Jun. 9, 1994

PCT Filed Nov. 22, 1993, Ser. No. 436,414

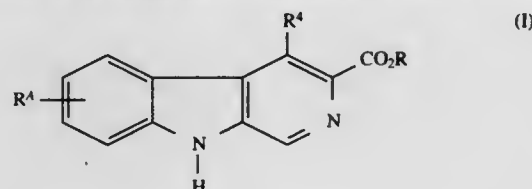
Claims priority, application Germany, Nov. 24, 1992, 42 40 672.2

Int. Cl.<sup>6</sup> A61K 31/44; C07D 221/06

U.S. Cl. 514—292

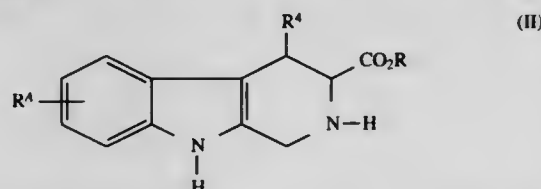
1 Claim

1. Process for the production of compounds of formula I



III in which

R<sup>4</sup> means hydrogen, halogen, —CHR<sup>1</sup>—R<sup>2</sup>; phenyl, hetaryl or OR<sup>5</sup> optionally substituted with halogen, C<sub>1</sub>–C<sub>4</sub> alkoxy or amino and can be single to double, and  
R<sup>1</sup> means hydrogen or C<sub>1</sub>–C<sub>4</sub> alkyl,  
R<sup>2</sup> means hydrogen, C<sub>1</sub>–C<sub>4</sub> alkyl, —O—C<sub>1</sub>–C<sub>4</sub> alkyl or an optionally substituted phenyl, benzyl or phenoxy radical, and  
R<sup>5</sup> means hydrogen, C<sub>1</sub>–C<sub>4</sub> alkyl, C<sub>3</sub>–7 cycloalkyl or an optionally substituted phenyl, benzyl, hetaryl or benzo-condensed hetaryl radical,  
R<sup>4</sup> means hydrogen, C<sub>1</sub>–C<sub>4</sub> alkyl or C<sub>1</sub>–C<sub>4</sub> alkoxy-C<sub>1</sub>–C<sub>2</sub> alkyl and  
R means C<sub>1</sub>–C<sub>6</sub> alkyl, characterized in that a compound of formula II



in which

R, R<sup>4</sup> and R<sup>4</sup> have the above meaning, is aromatized with trichloroisocyanuric acid in the presence of bases.

5,569,662

#### QUINUCLIDINE DERIVATIVES AS SUBSTANCE P ANTAGONISTS

Kunio Satake, Handa; Hiroaki Wakabayashi, Kariya, and Masami Nakane, Aichi, all of Japan, assignors to Pfizer Inc., New York, N.Y.

PCT No. PCT/US93/01810, § 371 Date Oct. 3, 1994, § 102(e)  
Date Oct. 3, 1994, PCT Pub. No. WO93/19064, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 5, 1993, Ser. No. 313,289

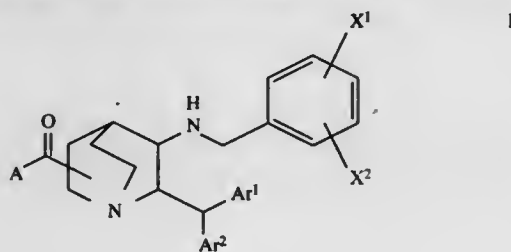
Claims priority, application Japan, Mar. 23, 1992, 4-065337

Int. Cl.<sup>6</sup> C07D 453/02; A61K 31/445

U.S. Cl. 514—305

14 Claims

1. A compound of the following chemical formula



and the pharmaceutically-acceptable salts thereof, wherein

X<sup>1</sup> is C<sub>1</sub>–C<sub>3</sub> alkoxy or halosubstituted (C<sub>1</sub>–C<sub>3</sub>) alkoxy;

X<sup>2</sup> is hydrogen, halogen, C<sub>1</sub>–C<sub>3</sub> alkyl, C<sub>2</sub>–C<sub>3</sub> alkenyl, C<sub>2</sub>–C<sub>3</sub> alkynyl, C<sub>1</sub>–C<sub>3</sub> alkoxy, C<sub>1</sub>–C<sub>3</sub> alkylthio, C<sub>1</sub>–C<sub>3</sub> alkylsulfinyl, C<sub>1</sub>–C<sub>3</sub> alkylsulfonyl, halosubstituted (C<sub>1</sub>–C<sub>3</sub>) alkyl, halosubstituted (C<sub>1</sub>–C<sub>3</sub>) alkoxy, C<sub>1</sub>–C<sub>3</sub> alkylamino, dialkylamino having from 1 to 5 carbon atoms in each alkyl moiety, C<sub>1</sub>–C<sub>3</sub> alkylsulfonylamino (which may be substituted by halogen), N-(C<sub>1</sub>–C<sub>3</sub>)alkyl-N-(C<sub>1</sub>–C<sub>3</sub>)alkylsulfonylamino (which may be substituted by halogen in the alkylsulfonyl moiety), C<sub>1</sub>–C<sub>3</sub> alkanoylamino (which may be substituted by halogen) or N-(C<sub>1</sub>–C<sub>3</sub>)alkyl-N-(C<sub>1</sub>–C<sub>3</sub>)alkanoylamino (which may be substituted by halogen in the alkanoyl moiety);

Ar<sup>1</sup> and Ar<sup>2</sup> are each, independently, thienyl, phenyl, fluorophenyl, chlorophenyl or bromophenyl;

A is Y—(CH<sub>2</sub>)<sub>m</sub>—CH(R<sup>1</sup>)—(CH<sub>2</sub>)<sub>n</sub>—NR<sup>1</sup>—;

R<sup>1</sup> is hydrogen, C<sub>1</sub>–C<sub>3</sub> alkyl, benzyl or —(CH<sub>2</sub>)<sub>p</sub>—Y;

R<sup>2</sup> is hydrogen, C<sub>1</sub>–C<sub>3</sub> alkyl (which may be substituted by the substituent which is selected from the group consisting of hydroxy, amino, methylthio and mercapto), benzyl, 4-hydroxybenzyl, 3-indolylmethyl or —(CH<sub>2</sub>)<sub>p</sub>—Y;

Y is —CN, —CH<sub>2</sub>Z or —COZ;

Z is hydroxy, amino, C<sub>1</sub>–C<sub>3</sub> alkoxy, C<sub>1</sub>–C<sub>3</sub> alkylamino or dialkylamino having from 1 to 5 carbon atoms in each alkyl moiety;

m, n and p are each, independently, 0, 1, 2 or 3; and

R<sup>1</sup> and R<sup>2</sup> may be connected to form a ring.

5,569,663

#### USE OF A SPIN TRAP IN A COSMETIC OR DERMATOLOGICAL COMPOSITION

Alain Ribler, Paris; Quang L. Nguyen, Antony; Jean-Thierry Simonnet, and Boudiaf Boussouira, both of Paris, all of France, assignors to L'Oréal, Paris, France

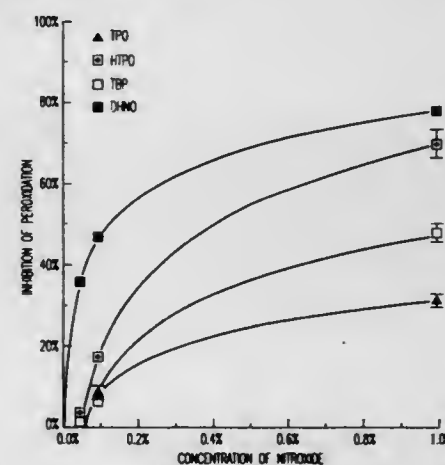
Filed Dec. 30, 1994, Ser. No. 366,748

Claims priority, application France, Dec. 30, 1993, 93 15869

Int. Cl.<sup>6</sup> A61K 31/445; 7/40; 7/42

U.S. Cl. 514—315

13 Claims



1. A cosmetic or dermatological composition for topical treatment, comprising;

- a first dispersion of spherules with deep-down action which are capable of diffusing into the deep layers of the skin and which contain a spin trap employed as an electron paramagnetic resonance measurement probe; and
- a cosmetically or dermatologically acceptable medium, wherein said spin trap is present in an amount of from 0.001% to 5% by weight relative to the total weight of the composition.

5,569,664

#### INSECTICIDAL N-(SUBSTITUTED ARYLMETHYL)-4-[BIS(SUBSTITUTED PHENYL) METHYL]PIPERIDINES

Ian R. Silverman, Maple Shade; Daniel H. Cohen, Princeton; John W. Lyga, Basking Ridge, all of N.J.; Steven W. Szczepanski, Philadelphia, Pa., and Syed F. Ali, Yardville, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 389,675, Feb. 16, 1995. This application

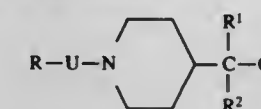
May 19, 1995, Ser. No. 445,315

Int. Cl.<sup>6</sup> A61K 31/445; C07D 211/20

U.S. Cl. 514—317

31 Claims

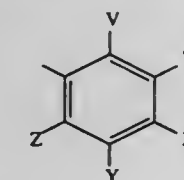
1. A compound of the formula:



in which

U is selected from —(CH<sub>2</sub>)<sub>n</sub>— and ethylidene;

Q is selected from hydrogen, hydroxy, sulfhydryl, and fluorine; R is



in which

V is selected from hydrogen, halogen, alkyl, haloalkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsilyloxy, dialkylamino, cyano, nitro, hydroxy, and phenyl;

W is selected from hydrogen, halogen, alkyl, haloalkyl, alkoxy, nitro, amino, phenoxy, and phenylalkoxy;

X is selected from hydrogen, hydroxy, halogen, alkyl, alkoxy-alkyl, alkoxy, cycloalkylalkoxy, haloalkoxy, alkenyloxy, haloalkenyloxy, alkynyloxy, alkylsilyloxy, alkylthio, haloalkylthio, cyano, cyanoalkoxy, nitro, amino, monoalkylamino, dialkylamino, alkylaminoalkoxy, alkylcarbonylamino, alkoxy-carbonylamino, alkylcarbonyl, alkoxy-carbonyl, alkylaminocarbonyl, aminocarbonyloxy, phenyl, phenylalkoxy, phenoxy, and phenoxyalkyl;

Y and Z are independently selected from hydrogen and alkoxy; R<sup>1</sup> and R<sup>2</sup> are independently selected from phenyl substituted with haloalkyl, haloalkoxy, alkoxyalkyl, dialkylaminosulfonyl, hydroxyalkylaminocarbonyl, alkylsulfonyloxy, and haloalkylsulfonyloxy, with the proviso that haloalkyl is not trifluoromethyl; and

n is 1, 2, or 3;

with the proviso that each aliphatic moiety contains not more than 6 carbon atoms, halogen means chlorine or fluorine, phenyl, or cycloalkyl moiety is optionally substituted with one or more halogen or alkyl or alkoxy of 1 to 3 carbon atoms, and each alkyl substituent on an amino nitrogen contains 1 to 3 carbon atoms;

and the corresponding N-oxides and agriculturally acceptable salts.

5,569,665

## PEPTIDYL DERIVATIVES AND THEIR USE AS METALLOPROTEINASE INHIBITORS

John R. Porter; John R. Morphy; Thomas A. Millican, all of Berkshire, and Nigel R. A. Beeley, Oxfordshire, all of United Kingdom, assignors to Celltech Limited, Berkshire, United Kingdom

PCT No. PCT/GB93/01186, § 371 Date Feb. 2, 1994, § 102(e) Date Feb. 2, 1994, PCT Pub. No. WO93/24449, PCT Pub. Date Dec. 9, 1993

PCT Filed Jun. 3, 1993, Ser. No. 185,781

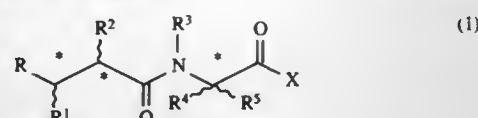
Claims priority, application United Kingdom, Jun. 3, 1992, 9211706

Int. Cl.<sup>6</sup> C07D 213/56; A61K 31/44

U.S. Cl. 514—357

8 Claims

1. A compound of formula (1)



wherein R represents —CONHOH;

R<sup>1</sup> represents a hydrogen atom or an optionally substituted alkyl, alkenyl, aryl, aralkyl, heteroaralkyl or heteroarylthioalkyl group;

R<sup>2</sup> represents a heteroaralkyl, heteroarylalkoxyalkyl or heteroarylthioalkyl group;

R<sup>3</sup> represents a hydrogen atom or an alkyl group;

R<sup>4</sup> represents a hydrogen atom or an alkyl group;

R<sup>5</sup> represents an optionally substituted alkyl or alkenyl group optionally interrupted by one or more —O— or —S— atoms or —N(R<sup>7</sup>)— groups, where R<sup>7</sup> is a hydrogen atom or a C<sub>1</sub>–C<sub>6</sub> alkyl group or a group —(Alk)<sub>n</sub>R<sup>6</sup> where Alk is an alkyl or alkenyl group optionally interrupted by one or more —O— or —S— atoms or —N(R<sup>7</sup>)— groups; n is zero or an integer 1, and R<sup>6</sup> is an optionally substituted cycloalkyl or cycloalkenyl group;

X represents an amino (—NH<sub>2</sub>), or substituted amino, hydroxyl or substituted hydroxyl group;

or a salt, solvate, or hydrate thereof.

5,569,666

## ANTI-NEOPLASTIC, ANTI-VIRAL AND RIBONUCLEOTIDE REDUCTASE ACTIVITY AFFECTING PHARMACEUTICAL COMPOSITIONS AND METHODS OF TREATMENT

Raymond J. Bergeron, Gainesville, Fla., assignor to University of Florida Research Foundation, Inc., Gainesville, Fla.

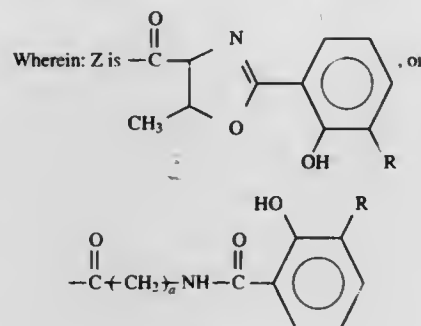
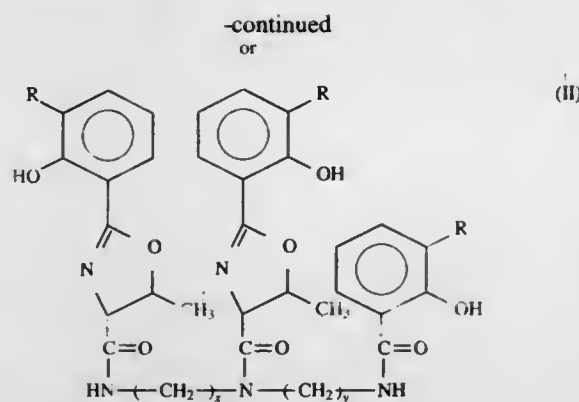
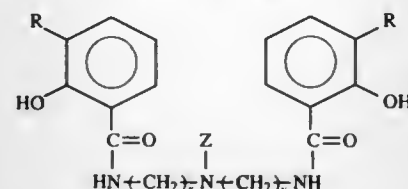
Division of Ser. No. 299,126, Sep. 2, 1994, Pat. No. 5,466,702, which is a division of Ser. No. 124,557, Sep. 22, 1993, Pat. No. 5,391,563, which is a division of Ser. No. 993,620, Dec. 21, 1992, Pat. No. 5,292,775, which is a division of Ser. No. 645,644, Jan. 25, 1991, Pat. No. 5,173,505, which is a division of Ser. No. 313,734, Feb. 22, 1989, Pat. No. 5,128,353, which is a continuation-in-part of Ser. No. 746,672, Jun. 20, 1985, abandoned. This application Jan. 20, 1995, Ser. No. 376,889

Int. Cl.<sup>6</sup> A61K 31/135; 31/13; A01N 43/36; 43/38

U.S. Cl. 514—374

3 Claims

1. A pharmaceutical composition in unit dosage form for administration to a human or non-human animal comprising a) an anti-psoriasis effective amount of a compound of the formula:



R is H or OH,  
x is 3 or 4,  
y is 3 or 4, and  
a is 1, 2 or 3 or

a pharmaceutically acceptable salt or complex and b) a pharmaceutically acceptable carrier therefor.

5,569,667

## TREATMENT OF PROSTATE CANCER

William R. Grove, Whitmore Lake, and Wilbur R. Leopold, Ann Arbor, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 375,889, Jan. 19, 1995, abandoned.

This application Sep. 8, 1995, Ser. No. 524,912

Int. Cl.<sup>6</sup> A61K 31/415

U.S. Cl. 514—403

3 Claims

1. A method for treating prostate cancer comprising administering to a subject in need of treatment an effective dose of 5-[(2-aminoethyl)amino]-2-[2-(diethylamino)ethyl]-2H-[1]benzothioipyran-4,3,2-cd]indazol-8-ol or a pharmaceutically acceptable salt thereof.

5,569,668

## INDOLE DERIVATIVES WITH ANTIBACTERIAL AND ANTIMYCOTIC PROPERTIES

John M. Webster, 5551 Molina Road., North Vancouver, B.C., Canada; Jianxiong Li, 117 Buckingham Dr., Port Moody, BC, Canada, and Genhui Chen, 725 Louis Riel, Burnaby Simon Fraser University, Burnaby, BC, Canada

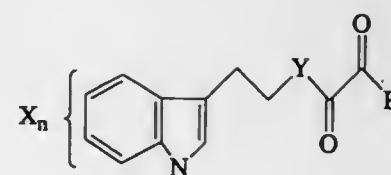
Filed Mar. 29, 1995, Ser. No. 412,455

Int. Cl.<sup>6</sup> A61K 31/40; C07D 209/14

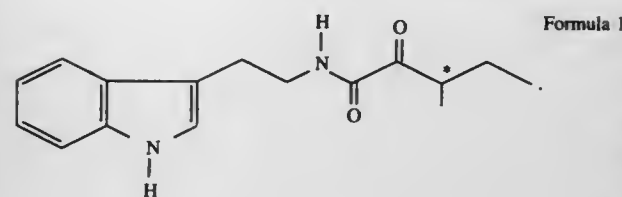
U.S. Cl. 514—419

3 Claims

1. The compound, 3-indoleethyl 3-methyl-2-oxo-pentamide, named as nematophin, which has the structure shown below in Formula 1



## Derivatives of Nematophin



Formula 1

5,569,669

## ALKYLAMINOINDANE COMPOUNDS

Gérald Guillaumet, St. Jean Leblanc; Marie-Claude Viaud, Orleans; Pierre Renard, Versailles; Gérard Adam, Le Mesnil Le Roi; Daniel-Henri Caignard, Paris; Béatrice Guardiola-Lemaitre, Saint-Cloud, and Marie-Claire Rettori, Courbevoie, all of France, assignors to Adir et Compagnie, Courbevoie, France

Filed Mar. 10, 1995, Ser. No. 401,768

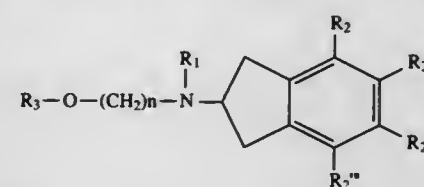
Claims priority, application France, Mar. 11, 1994, 94 02813

Int. Cl.<sup>6</sup> A61K 31/38

U.S. Cl. 514—432

10 Claims

1. A compound selected from those of formula (I):



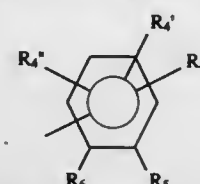
in which:

R<sub>1</sub> represents hydrogen or a radical selected from the group consisting of unsubstituted or substituted alkyl, cycloalkyl, cycloalkylalkyl, unsubstituted or substituted phenyl, and unsubstituted or substituted phenylalkyl.

R<sub>2</sub>, R<sub>2'</sub>, R<sub>2''</sub> and R<sub>2'''</sub> represent, independently of one another, hydrogen or a radical selected from the group consisting of halogen, unsubstituted alkyl, substituted alkyl, unsubstituted alkoxy, and substituted alkoxy.

n represents an integer of 1 to 6, inclusive

R<sub>3</sub> represents a group of formula (A):



in which:

R<sub>4</sub>, R<sub>4'</sub> and R<sub>4''</sub> represent, independently of one another, hydrogen or a radical selected from the group consisting of halogen, unsubstituted alkyl, substituted alkyl, unsubstituted alkoxy, and substituted alkoxy.

R<sub>5</sub> and R<sub>6</sub>, together with the benzene ring which carries them, form a ring system E<sub>1</sub> selected from the group consisting of indene, naphthalene, benzothiophene, benzofuran, indole,

benzimidazole, benzopyran, benzothiopyran, chroman, thiochroman, quinoline, isoquinoline, indazole, 2,3-dihydro-1,4-benzodithiin, quinoxaline, quinazoline, cinnoline, benzothiazole, benzisothiazole, benzoxazole, benzisoxazole, 2,3-dihydro-1,4-benzoxathiin, 1,4-benzoxazine, 1,4-benzothiazine, 1,3-benzodioxole, 1,3-benzodioxane, 1,4-benzodioxane, and 1,4-benzodioxin,

on the understanding that the portion of the ring system E<sub>1</sub> formed by R<sub>5</sub> and R<sub>6</sub> and the 2 carbon atoms of the benzene ring which carry them is:

unhydrogenated or partially hydrogenated,

and unsubstituted or substituted with one or more radicals selected from the group consisting of halogen, hydroxyl, lower alkyl, unsubstituted alkoxy, substituted alkoxy, lower alkoxy, carbonyl, and carboxyl,

on the understanding that, except where otherwise stated, the terms "alkyl" and "alkoxy" mean linear or branched groups containing 1 to 6 carbon atoms, inclusive, the term "substituted" associated with "alkyl" and "alkoxy" radicals means "substituted with one or more radicals selected from the group consisting of halogen, hydroxyl, and alkoxy", the term "cycloalkyl" denotes a cyclic group having 3 to 8 carbon atoms, inclusive,

the term "substituted" associated with "phenyl" and "phenylalkyl" radicals means that these radicals are substituted on the phenyl ring with one or more substituents selected from the group consisting of halogen, alkyl, alkoxy, hydroxyl, and polyhaloalkyl, and an optical isomer and also an addition salt thereof with a pharmaceutically-acceptable acid or base.

5,569,670

## COMBINATION MEDICATIONS CONTAINING ALPHA-LIPOIC ACID AND RELATED

Carl-Heinrich Weischer, Bonn; Heinz Ulrich, Niedernberg, and Klaus Wessel, Frankfurt, all of Germany, assignors to Asta Medica Aktiengesellschaft, Dresden, Germany

Division of Ser. No. 197,643, Feb. 10, 1994, abandoned, which is a continuation-in-part of Ser. No. 71,259, Jun. 4, 1993, abandoned. This application Mar. 14, 1995, Ser. No. 404,153

Claims priority, application Germany, Jun. 5, 1992, 42 185 72.6

Int. Cl.<sup>6</sup> A61K 31/385

U.S. Cl. 514—440

1 Claim

1. A method of treating diabetes mellitus Type I or Type II which comprises administering to a mammal having diabetes mellitus Type I or Type II a therapeutically effective amount of a composition comprising pure R-alpha-lipoic acid and vitamin E, or a pharmaceutically acceptable salt thereof.

5,569,671

## FUNGICIDALLY ACTIVE COMPOUNDS

Ruby I. Nielsen, Farum, and Frank W. Rasmussen, Valby, both of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Division of Ser. No. 95,785, Jul. 22, 1993, Pat. No. 5,409,951, which is a continuation-in-part of Ser. No. 714,107, Jun. 11, 1991, abandoned. This application Apr. 24, 1995, Ser. No. 427,012

Claims priority, application Denmark, Jun. 15, 1990, 1461/90

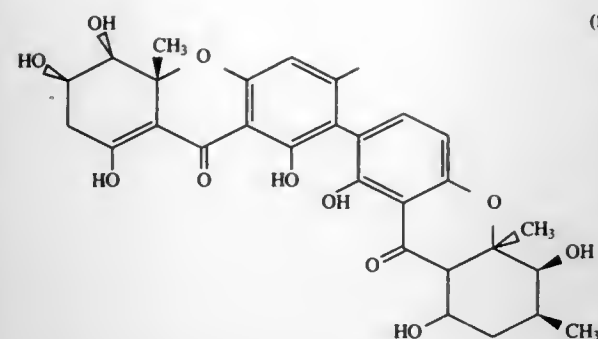
Int. Cl.<sup>6</sup> A01N 43/16; 57/00; A61K 31/35; 31/675

U.S. Cl. 514—455

18 Claims

1. A method for combating a fungus infestation at a locus infested with the fungus, comprising applying to the locus a composition comprising (a) a compound having the formula





and (b) an inert carrier in an amount effective to prevent the growth of the fungus at the infested locus.

#### 5,569,672 COMPOUNDS

Geoffrey H. Baker, Banstead, and Merle Beal, Horley, both of England, assignors to Beecham Group p.l.c., Brentford Division of Ser. No. 203,681, Feb. 28, 1994, Pat. No. 5,436,266, which is a continuation of Ser. No. 920,120, Jul. 24, 1992, abandoned, which is a division of Ser. No. 468,584, Mar. 12, 1990, Pat. No. 5,191,093, which is a division of Ser. No. 338,446, Apr. 13, 1989, Pat. No. 4,916,155, which is a continuation of Ser. No. 72,683, Jul. 13, 1987, abandoned, which is a continuation of Ser. No. 745,213, Jun. 17, 1985, abandoned. This application May 9, 1995, Ser. No. 437,357 Claims priority, application United Kingdom, Jun. 19, 1984, 8415579

Int. Cl.<sup>6</sup> A61K 31/35

U.S. Cl. 514—460

1 Claim

1. A method of treating bacterial or mycoplasmal infections of humans or non-human animals, which method comprises administering to a human or non-human animal in need thereof, an antibacterially or antimycoplasmally effective non-toxic amount of crystalline calcium pseudominate or a hydrate thereof.

#### 5,569,673

#### CAPSACINOID COMPOUNDS AS PROLIFERATION INHIBITORS

D. James Morré, and Dorothy M. Morré, both of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed May 24, 1994, Ser. No. 248,084

Int. Cl.<sup>6</sup> A01N 37/34; A61K 31/275

U.S. Cl. 514—522

9 Claims

1. A method for inhibiting proliferation of neoplastic cells, said method comprising administering to a cell population suspected of comprising neoplastic cells, a proliferation inhibiting amount of a purified N-acylated catecholmethylamine inhibitor of NADH oxidase of neoplastic cells, wherein said acyl group is from 6 to 26 carbon atoms, whereby proliferation of neoplastic cells is inhibited.

#### 5,569,674 HETEROACETIC ACID DERIVATIVES

Naokato Yokoyama, deceased, late of Cliffside Park; Gordon N. Walker, Mt. Kemble Lake, and Alan J. Main, Basking Ridge, all of N.J., assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

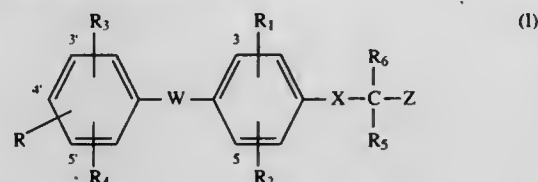
Division of Ser. No. 154,203, Nov. 18, 1993, Pat. No. 5,401,772, which is a continuation-in-part of Ser. No. 918,544, Jul. 21, 1992, abandoned. This application Dec. 16, 1994, Ser. No. 358,130

Int. Cl.<sup>6</sup> A61K 31/24

U.S. Cl. 514—539

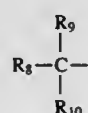
16 Claims

1. A compound of the formula



wherein

R is hydroxy, esterified hydroxy or etherified hydroxy;  
R<sub>1</sub> is halogen, trifluoromethyl or lower alkyl;  
R<sub>2</sub> is halogen, trifluoromethyl or lower alkyl;  
R<sub>3</sub> is halogen, trifluoromethyl, lower alkyl, aryl, aryl-lower alkyl, cycloalkyl or cycloalkyl-lower alkyl; or  
R<sub>3</sub> is the radical



wherein R<sub>8</sub> is hydrogen, lower alkyl, aryl, cycloalkyl, aryl-lower alkyl or cycloalkyl-lower alkyl; R<sub>9</sub> is hydroxy or acyloxy; R<sub>10</sub> represents hydrogen or lower alkyl; or R<sub>9</sub> and R<sub>10</sub> together represent oxo;

R<sub>4</sub> is hydrogen, halogen, trifluoromethyl or lower alkyl;  
X is —NR<sub>7</sub>;  
W is O or S;  
R<sub>5</sub> and R<sub>6</sub> together represent oxo;  
R<sub>7</sub> represents hydrogen or lower alkyl;  
Z represents carboxyl, carboxyl derivatized as a pharmaceutically acceptable ester or as a pharmaceutically acceptable amide; or a pharmaceutically acceptable salt thereof.

#### 5,569,675 METHODS OF USING CARBOXYLIC ACID ESTERS TO INCREASE FETAL-HEMOGLOBIN LEVELS

Ada Rephaeli, Palo Alto, Calif.; Abraham Nudelman, Rehovot, and Matityahu Shukla, Tel Aviv, both of Israel, assignors to Bar Ilan University, Ramat Gan, and Mor Research Applications Ltd., Givat Shmuel, both of Israel

Filed Mar. 7, 1994, Ser. No. 206,690

Int. Cl.<sup>6</sup> A61K 31/225

U.S. Cl. 514—547

22 Claims

1. A method of increasing the level of HbF in a subject comprising administering one or more compounds of the Formulae (I), (II), or (III):

(I) XCH<sub>2</sub>—CHX—CHX—C(=O)—O—Z  
(II) CH<sub>3</sub>—CO—CH<sub>2</sub>—C(=O)—O—Z  
(III) CH<sub>3</sub>—CH<sub>2</sub>—CO—C(=O)—O—Z

wherein:

X is H, or one of X only may be OH;  
Z is —CHR—O—C(=O)R' or —CHR—O—C(=O)—O—R';  
R is H, alkyl, aryl, arylalkyl; and

R' is alkyl, aminoalkyl, aralkyl, aryl, alkoxy, aralkoxy and aryloxy, in which aryl by itself, and aryl in aralkyl, aralkoxy and aryloxy are each selected from the group consisting of phenyl or naphthyl each of which is unsubstituted or substituted by at least one substituent selected from the group consisting of alkyl, alkoxy, or halogen; and pharmaceutically acceptable salts and prodrugs thereof.

#### 5,569,676

#### METHOD FOR THE TREATMENT OF OSTEOARTHRITIS

Harry W. Diehl, 4424 Oak Hill Rd., Rockville, Md. 20853

Filed May 24, 1995, Ser. No. 449,066

Int. Cl.<sup>6</sup> A61K 31/22; 31/23

U.S. Cl. 514—549

5 Claims

1. A method for treating osteoarthritis arthritis in mammals which comprises administering a therapeutically effective amount of cetyl myristoleate to a mammal having osteoarthritis arthritis.

#### 5,569,677

DIPHENYL-2-PROPENOATES FOR TREATING DISEASES ASSOCIATED WITH LEUKOTRIENE B<sub>4</sub>  
Robert A. Daines, Lansdale, Pa., assignor to SmithKline Beecham Corporation, Philadelphia, Pa.

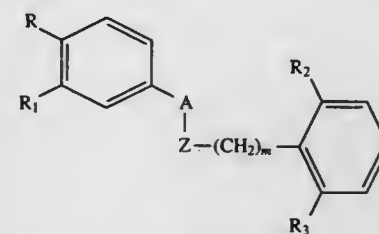
Filed Jun. 5, 1995, Ser. No. 464,174

Int. Cl.<sup>6</sup> A61K 31/19

U.S. Cl. 514—570

8 Claims

1. A compound of formula I



formula I

or a pharmaceutically acceptable salt, where

A is CH<sub>2</sub> and Z is S(O)<sub>q</sub> where q is 0, 1 or 2, CH<sub>2</sub>, CHOH, CO, NR<sub>x</sub>, or O, or

A is C=O and Z is NR<sub>x</sub>;

m is 0-5;

R<sub>1</sub> is hydrogen or lower alkyl;

R is C<sub>1</sub> to C<sub>20</sub>-aliphatic, unsubstituted or substituted five-membered heteroaryl-C<sub>1</sub> to C<sub>10</sub>-aliphatic—O—, unsubstituted or substituted phenyl-C<sub>1</sub> to C<sub>10</sub>-aliphatic where substituted phenyl has one or more radicals selected from the group consisting of lower alkoxy, lower alkyl, trihalomethyl, and halo, or R is C<sub>1</sub> to C<sub>20</sub>-aliphatic—O—, or R is unsubstituted or substituted phenyl-C<sub>1</sub> to C<sub>10</sub>-aliphatic—O— where substituted phenyl has one or more radicals selected from the group consisting of lower alkoxy, lower alkyl, trihalomethyl, and halo;

R<sub>1</sub> is R<sub>4</sub>, —(C<sub>1</sub> to C<sub>5</sub> aliphatic)R<sub>4</sub>, —(C<sub>1</sub> to C<sub>5</sub> aliphatic)CHO, —(C<sub>1</sub> to C<sub>5</sub> aliphatic)CH<sub>2</sub>OR<sub>5</sub>;

R<sub>2</sub> and R<sub>3</sub> are independently, halo, lower alkoxy, CF<sub>3</sub>, CN, or lower alkyl;

R<sub>4</sub> is tetrazol-5-yl or COOH; and

R<sub>5</sub> is H, lower alkyl, CH<sub>3</sub>(CH<sub>2</sub>)<sub>0-6</sub>CO or phenyl(CH<sub>2</sub>)<sub>0-3</sub>CO; or a pharmaceutically acceptable salt thereof.

#### 5,569,678

#### CONTROL OF WOUND SCAR PRODUCTION

Raphael C. Lee, Chicago, Ill., assignor to Massachusetts Institute of Technology, Cambridge, Mass., and Arch Develop., Chicago, Ill.

Continuation of Ser. No. 916,412, Jul. 20, 1992, abandoned, which is a continuation-in-part of Ser. No. 629,080, Dec. 17, 1990, Pat. No. 5,132,119, which is a continuation of Ser. No. 387,604, Jul. 31, 1989, abandoned. This application Feb. 1, 1994, Ser. No. 190,239

Int. Cl.<sup>6</sup> A61K 31/135; 31/44; 31/55; 31/56; 31/58; 31/54; 33/24

U.S. Cl. 514—654

26 Claims

1. A method of controlling scar production due to excessive fibroblast biosynthesis at the scar site in a mammal, comprising administering an effective amount of a calcium antagonist locally to the scar site for a period of time sufficient to cause extracellular matrix degradation at the scar site resulting in control of scar production.

#### 5,569,679

#### PHARMACOLOGIC MANAGEMENT OF SNORING

Stanley W. Jacob, Portland, Oreg., assignor to Russell A. Krueger Pharmaceuticals, Inc., Portland, Oreg.

Filed Dec. 30, 1994, Ser. No. 366,666

Int. Cl.<sup>6</sup> A61K 31/10; 31/045

U.S. Cl. 514—711

18 Claims

1. A method of managing snoring comprising the step of instilling a solution intranasally within a subject's nasal cavity wherein said solution includes a carrier solvent containing an effective amount of methylsulfonylmethane as a solute therein.

#### 5,569,680

#### METHOD OF TREATING INFLAMMATORY BOWEL DISEASE WITH TRIBUTYRIN

Gary D. Wu, Ardmore, Pa., assignor to Trustees of the Univ. of Penna

Filed Feb. 13, 1995, Ser. No. 387,116

Int. Cl.<sup>6</sup> A61K 31/215; C07C 69/003

U.S. Cl. 514—786

1 Claim

1. A method of treating inflammatory bowel disease in a patient by inhibiting the production of interleukin-8 in intestinal epithelial cells by administering to said patient through an enema an effective amount of tributyrin.

#### 5,569,681

#### FLAME-RETARDANT FOAMED PARTICLES OF POLYOLEFIN RESIN

Hisao Tokoro, Kawachi-gun; Kazuo Tsurugai, Utsunomiya; Satoru Shioya, Utsunomiya, and Masaharu Oikawa, Utsunomiya, all of Japan, assignors to JSP Corporation, Tokyo, Japan

Filed May 15, 1995, Ser. No. 440,926

Claims priority, application Japan, May 19, 1994, 6-129624 Int. Cl.<sup>6</sup> C08K 5/06; 5/41

U.S. Cl. 521—88

12 Claims

1. Flame-retardant foamed particles of a polyolefin resin, wherein the resin is mixed with a 2,2'-bis(4-alkoxy-3,5-dibromophenyl)-propane flame retardant and/or a 2,2'-bis(4-alkoxy-3,5-dibromophenyl)-sulfone flame retardant, and a synergist for the flame retardant.

5,569,682

**FIRE-RETARDANT POLYURETHANE FOAMS AND METHOD OF PRODUCING**

Graham D. Walmsley, Hickory, N.C., assignor to Hickory Springs Manufacturing Company, Hickory, N.C.

Continuation of Ser. No. 357,346, Dec. 15, 1994, Pat. No. 5,536,757, which is a continuation of Ser. No. 355,203, May 16, 1989, abandoned, which is a continuation of Ser. No. 166,750, Feb. 22, 1988, abandoned, which is a continuation of Ser. No. 766,703, Aug. 19, 1985, abandoned. This application Jun. 5, 1995, Ser. No. 463,266

Claims priority, application United Kingdom, Aug. 30, 1984, 8421967

Int. Cl.<sup>6</sup> C08J 9/04; C08K 5/04; 5/17; 5/29

U.S. Cl. 521—107

24 Claims

1. A method of producing a fire-retardant, high resilience flexible polyurethane foam, comprising reacting an isocyanate and a polymer-modified polyol together in the presence of a blowing agent and a fire-retardant additive consisting essentially of melamine in a proportion sufficient to impart effective fire-retardancy properties to the high-resilience flexible foam, the polymer-modified polyol comprising a polymeric substance and a carrier polyol wherein at least 50% of the hydroxyl groups of the carrier polyol are primary hydroxyl groups.

5,569,683

**GEL COMPOSITIONS**

Matthew W. Bootman, Medfield, and Randall E. Adams, Billerica, both of Mass., assignors to Thermedics, Inc., Woburn, Mass.

Filed May 22, 1995, Ser. No. 445,644

Int. Cl.<sup>6</sup> A61L 9/04; B01J 13/00

U.S. Cl. 523—102

14 Claims

1. A gel comprising a multi-component scented mixture in which the components act in concert to create a perceived scent, disposed in a polymer matrix comprising the polymerization product of one or more ethylenically unsaturated monomers,

said monomers being selected such that said gel (a) has sufficient mechanical integrity to retain its shape under ambient conditions, (b) releases the components of said scented mixture in a manner that substantially preserves the scent of said mixture upon release, and (c) is adapted for incorporation in a container manufactured according to a continuous process in a high speed line.

5,569,684

**HEAT CONDUCTIVE SILICONE RUBBER COMPOSITION**

Takehide Okami, and Tokio Sekiya, both of Gunma-ken, Japan, assignors to Takita Patent &amp; Engineering, Tokyo, Japan

Filed Mar. 3, 1995, Ser. No. 398,072

Claims priority, application Japan, Mar. 3, 1994, 6-060105

Int. Cl.<sup>6</sup> C08K 9/00

U.S. Cl. 523—209

17 Claims

1. A heat conductive silicone rubber composition comprising a cross-linkable organopolysiloxane composition and a filler having a content of from 30 to 70% by volume in said composition, said filler being magnesium oxide having a hydrophobic surface prepared by first treating magnesium oxide with steam to adsorb water molecules thereon, and then treating the resulting magnesium oxide having adsorbed water molecules with a silane, siloxane or silazane.

5,569,685

**AQUEOUS COATING AGENT AND ITS USE IN PROCESSES FOR COATING PLASTICS SUBSTRATES**

Peter Schreiber, Hattingen; Stefanie Goecke, Ennepetal, and Reinhard Windmann, Wuppertal, all of Germany, assignors to Herberts GmbH, Wuppertal, Germany

Filed Feb. 27, 1995, Ser. No. 395,122

Claims priority, application Germany, Mar. 4, 1994, 44 07 121.3

Int. Cl.<sup>6</sup> C08K 3/20; C08L 63/02

U.S. Cl. 523—406

14 Claims

1. Aqueous two component coating agents for coating plastics substrates, consisting essentially of:

7.5 to 25 wt. % of at least one epoxide resin in the form of a dispersion, wherein wt. % refers to resin solids,

1.5 to 15 wt. % of at least one water-miscible polyamine as cross-linking agent,

2 to 15 wt. % of at least one chlorinated polyolefin with a degree of chlorination of 15 to 40% wt. %,

0 to less than 5 wt. % of one or more non-aromatic organic solvents selected from the group consisting of ketones, hydrocarbons, alcohols and glycol ethers.

35 to 85 wt. % of water, and at least one additive selected from the group consisting of pigments and fillers,

wherein the epoxide resin and polyamine are present in separate components.

5,569,686

**POLYMERIC ADHESION PROMOTER AND LATEXES; AND POLYMERIC ADHESION PROMOTER, EPOXY RESINS AND LATEXES ARE USED TO IMPROVE ADHERENCE BETWEEN VARIOUS SUBSTRATES**

Ashok C. Makati; Charles S. Kan; Robert T. Iwamasa, and Do I. Lee, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 206,957, Jun. 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 177,804, Apr. 11, 1988, abandoned, which is a continuation-in-part of Ser. No. 50,117, May 15, 1987, abandoned, and a continuation-in-part of Ser. No. 206,958, Jun. 9, 1988, which is a continuation-in-part of Ser. No. 173,906, Mar. 28, 1988, abandoned. This application Mar. 19, 1990, Ser. No. 495,504

Int. Cl.<sup>6</sup> C08K 3/20

U.S. Cl. 523—409

10 Claims

1. An adhesive formulation for substrates which provides a bond between a substrate and a same or different substrate which consists essentially of: (i) a polymeric carboxylated styrene/butadiene latex; (ii) at least one polymeric adhesion promoter present in an amount sufficient to promote adherence of the surface of a first substrate to the surface of the same or different substrate, and (iii) an epoxy emulsion in an amount sufficient to improve adherence of the surface of the first substrate to the surface of the same or different substrate under humid conditions; whereby the adhesive formulation comprising (i), (ii) and (iii) provides an increase in percent retention between dry strength and wet strength of the bond over an adhesive formulation which does not comprise (i), (ii) and (iii).

5,569,687

**WATERBORNE ZINC-RICH PRIMER COMPOSITIONS**

Timothy P. Sanborn, Huntersville, N.C.; Joseph M. Beno, Jr., New Hope, and Roy W. Flynn, Warrington, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Mar. 16, 1995, Ser. No. 407,514

Int. Cl.<sup>6</sup> C08L 63/02; 63/04

U.S. Cl. 523—414

13 Claims

1. A multi-component corrosion-resistant waterborne coating composition comprising:

a polymeric component comprising an aqueous dispersion of particles of a latex polymer having a Tg in the range of -50°

C. to +50° C. and a stabilizing amount of an amine-functional curing agent having at least two primary or secondary amino groups;

a crosslinking component coreactable with said amine-functional curing agent; and

a corrosion protector component comprising a corrosion resisting amount of a zinc dust, wherein said stabilizing amount of said amine-functional curing agent is sufficient to stabilize said polymer particles in said aqueous dispersion in the presence of said corrosion protector component.

5,569,688

**HEAT-CURABLE SILICONE RUBBER COMPOSITIONS**

Noriyuki Meguriya, and Takeo Yoshida, both of Usui-gun, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1994, Ser. No. 327,789

Claims priority, application Japan, Oct. 21, 1993, 5-285787

Int. Cl.<sup>6</sup> C08K 5/54; C08L 83/07; C08G 77/06

U.S. Cl. 524—188

14 Claims

1. A heat-curable silicone rubber composition comprising

(a) an organopolysiloxane having at least two alkenyl groups each bonded to a silicon atom in a molecule,

(b) an organohydrogenopolysiloxane having at least two hydrogen atoms each bonded to a silicon atom in a molecule,

(c) a platinum catalyst, and

(d) ammonia or an ammonia precursor which will generate ammonia through thermal decomposition or chemical reaction,

said ammonia or ammonia precursor being blended so that ammonia is present in an amount of 20 to 200 parts by weight of nitrogen per million parts by weight of the total of components (a), (b) and (c) in a cured product of the heat-curable silicone rubber composition.

5,569,689

**ADDITION-CURABLE SILICONE ADHESIVE COMPOSITIONS**

Judith Stein, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 2, 1995, Ser. No. 538,150

Int. Cl.<sup>6</sup> C08G 77/20; C08K 5/54

U.S. Cl. 524—188

11 Claims

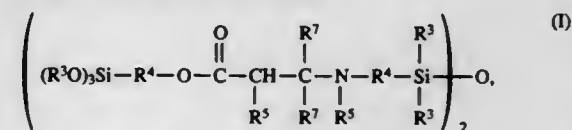
1. An addition-curable silicone composition comprising by weight:

(A) at least one polyorganosiloxane having alkenyl groups bonded to silicon,

(B) about 1–20 parts by weight, per 100 parts of reagent A, of at least one hydride polysiloxane comprising at least one organosiloxane unit having an Si—H moiety,

(C) a catalytic amount of a platinum group metal hydrosilylation catalyst, and

(D) an adhesion-promoting proportion of at least one silicon-nitrogen compound of the formula



wherein R<sup>3</sup> is C<sub>1–4</sub> alkyl, R<sup>4</sup> is C<sub>12–8</sub> alkylene, R<sup>5</sup> is hydrogen or C<sub>1–4</sub> alkyl and R<sup>7</sup> is hydrogen or C<sub>1–4</sub> alkyl.

5,569,690

**RUBBER COMPOSITION FOR TIRE**

Katsumi Terakawa; Kiyoshige Muraoka, both of Kobe; Minoru Ueda, Izumi; Naohiko Kikuchi, Akashi, and Toshiro Matsuo, Kakogawa, all of Japan, assignors to Sumitomo Rubber Industries Limited, Hyogo, Japan

Filed Apr. 20, 1995, Ser. No. 425,432

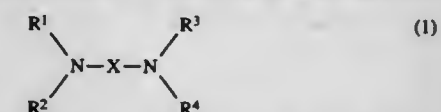
Claims priority, application Japan, Apr. 20, 1994, 6-081826; Dec. 16, 1994, 6-313521; Apr. 6, 1995, 7-081502

Int. Cl.<sup>6</sup> C08L 9/00

U.S. Cl. 524—251

17 Claims

1. A rubber composition for a tire comprising a diene rubber having 2 to 30 epoxy groups, relative to 100 monomer units constituting the rubber either a monoamine compound or a diamine compound having a structural unit represented by the formula (1):



(where R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> are each a hydrogen atom or an alkyl group having one to three carbon atoms, and X is a component selected from the group consisting of a straight or branched chain aliphatic alkyl group an alicyclical hydrocarbon, an aromatic hydrocarbon, a polycyclic compound and a carboxyl group, and carbon black,

wherein the rubber composition has a dissipation factor at -10° C. (tanδ (-10° C.)) and a dissipation factor at 70° C. (tanδ (70° C.)) which satisfy the following expressions:

$$0.03 \leq \tan\delta (70^\circ \text{C.}) \leq 0.35$$

$$\text{W.I.R.} = \{ \tan\delta (-10^\circ \text{C.}) - \tan\delta (-10^\circ \text{C.}) \} / \tan\delta (-10^\circ \text{C.})$$

$$\text{R.I.R.} = \{ \tan\delta (70^\circ \text{C.}) - \tan\delta (70^\circ \text{C.}) \} / \tan\delta (70^\circ \text{C.})$$

$$\text{T.I.R.} = \text{W.I.R.} + 2 \times (\text{R.I.R.}) \geq 0.3$$

(where tanδ (-10° C.) and tanδ (70° C.) are tanδ at -10° C. and 70° C. of a control rubber composition of the same formulation as the rubber composition for tire except that the control rubber composition includes a diene rubber having no epoxy group and is free of any amine compound).

5,569,691

**HYDROPHILIZED POLYETHERS**

Rainer Guggenberger, Herrsching; Erich Wanek, Kaufering, and Oswald Gasser, Seefeld, all of Germany, assignors to Thera Patent GmbH &amp; Co. KG Gesellschaft für Industrielle Schutzrechte, Seefeld, Germany

Filed Mar. 7, 1994, Ser. No. 206,853

Claims priority, application Germany, Mar. 5, 1993, 43 06 997.5

Int. Cl.<sup>6</sup> C08K 5/24

U.S. Cl. 524—261

15 Claims

1. A rubber-elastic composition, comprising a vulcanizable polyether material,

wherein the vulcanizable polyether material is selected from the group consisting of:

a polyether having an aziridino group,

a polyether having a vinyl end-group and a Si—H component,

a polyether having an allyl end-group and a Si—H component, and

a polyether having both a vinyl and an allyl end-group and a Si—H component;

said composition containing in the completely vulcanized and completely polymerized form, 0.1 to 15 wt. %, relative to the total weight of the composition, of at least one hydrophilic nature imparting agent that is selected from the group consisting of:



a hydrophilic silicone oil having one or more siloxane groups as a hydrophobic part and one or more ether groups as a hydrophilic part,  
 a fluorinated hydrocarbon,  
 a block copolymer of ethylene oxide/propylene oxide containing hydroxyl end groups,  
 a fatty alcohol derivative selected from the group consisting of C10 to C16 straight and branched chain alcohols that are reacted with an alkylene oxide in a mole ratio of 1:2 to 1:10 and then optionally methylated or reacted with a C2 to C4 monocarboxylic acid,  
 an ethoxylated alkyl phenol,  
 an ethoxylated fatty amine, and  
 an amine oxide; and  
 said composition having in the completely vulcanized and completely polymerized form a 10-second wetting angle of less than 55°.

5,569,692

# BIODEGRADABLE COMPOSITIONS AND FILMS OR MOULDED ARTICLES OBTAINED THEREFROM

Catia Bastioli; Roberto Lombi, both of Novara; Gianfranco Del Tredici, Sesto Calende, and Italo Guanella, Romentino, all of Italy, assignors to Novamont S.p.A., Milan, Italy  
 Continuation of Ser. No. 331,338, Oct. 28, 1994, Pat. No. 5,462,982, which is a continuation of Ser. No. 71,939, Jun. 3, 1993, abandoned, which is a continuation of Ser. No. 821,251, Jan. 10, 1992, abandoned, which is a continuation of Ser. No. 530,916, May 30, 1990, abandoned. This application Aug. 21, 1995, Ser. No. 517,398

Claims priority, application Italy, May 30, 1989, 67414/89  
 Int. Cl.<sup>6</sup> C08L 89/06; 101/00

U.S. Cl. 524—47 19 Claims  
 1. A biodegradable composition comprising destructured starch, a thermoplastic polymer, and a plasticizer having a boiling point higher than 150° C. in an amount from 20 to 100% based on the weight of starch, said destructured-starch being obtained by destructuring starch as it is, without the addition of water.

5,569,693

# HIGH STRETCH FILM FOR PALLET WRAPPING

Anil G. Doshi, East Hampstead; Frank T. Kos, Salem, both of N.H., and Dattaram C. Salkar, Tewksbury, Mass., assignors to Borden Inc., Columbus, Ohio

Filed Jun. 5, 1995, Ser. No. 463,859  
 Int. Cl.<sup>6</sup> C08J 3/18; C08K 5/10; B32B 27/32

U.S. Cl. 524—317 8 Claims  
 1. A two-sided cling wrap film, consisting of:  
 40 to 80% by weight of a linear low density polyethylene polymerized with an  $\alpha$ -olefin comonomer having a melt index range of 0.8 to 1.2 and a density range of 0.916 to 0.920;  
 60 to 20% by weight of a flexible semi-crystalline ethylene  $\alpha$ -olefin copolymer having a melt index of 0.8 to 2.0 and a density range of 0.86 to 0.91;  
 3 to 9% by weight of a liquid polyolefin; and  
 0.1 to 4.0% by weight of a sorbitan mono-oleate.

5,569,694

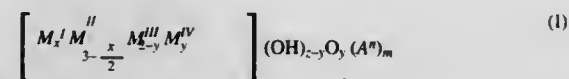
# GARNET-CONTAINING STABILIZER MIXTURES FOR POLYMERS

Peter Kuhm, Hilden; Frido Loeffelholz; Peter Wedel, both of Bremerhaven, and Bernd Wegemund, Haan, all of German Dem. Rep., assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP93/03114, § 371 Date Jun. 19, 1995, § 102(e) Date Jun. 16, 1995, PCT Pub. No. WO94/11431, PCT Pub. Date May 26, 1994

PCT Filed Nov. 8, 1993, Ser. No. 436,283  
 Claims priority, application Germany, Nov. 16, 1992, 42 38 567.9

Int. Cl.<sup>6</sup> C08K 5/098; 9/04; C09K 15/32  
 U.S. Cl. 524—399 17 Claims  
 1. A composition of matter useful as a stabilizer for a polymer based on a halogen-containing vinyl monomer, said composition being a mixture comprising:  
 a) calcium soaps of C<sub>8-32</sub> fatty acids,  
 b) zinc soaps of C<sub>8-32</sub> fatty acids, and  
 c) garnets of formula (I):



in which:  
 M<sup>i</sup> is at least one alkali metal ion  
 M<sup>ii</sup> is at least one divalent metal ion  
 M<sup>iii</sup> is at least one trivalent metal ion  
 M<sup>iv</sup> represents titanium and/or zirconium ions  
 A<sup>n</sup> is at least one n-valent acid anion with the charge n=1, 2, 3 or 4 and the following conditions apply:  
 0 ≤ x < 1, 0 ≤ y < 1, 0 ≤ z < 12, 0 < m, where y < z and n·m + z = 12, wherein said garnets are optionally surface-modified.

5,569,695

# SELF-FUSION TYPE DAMPING MATERIAL

Atsunori Kishimoto, Higashihiroshima; Takashi Fujii, deceased, late of Hiroshima; Kazutaka Ohshita, Hiroshima; Kazumi Yamamoto, Higashihiroshima; Yasuhiko Fujii, Ohtake, and Tetsuro Toda, Hiroshima, all of Japan, assignors to Toda Kogyo Corp., and Hirotani Co. Ltd., both of Japan

PCT No. PCT/JP92/00534, § 371 Date Mar. 23, 1994, § 102(e) Date Mar. 23, 1994, PCT Pub. No. WO93/22381, PCT Pub. Date Nov. 11, 1993

PCT Filed Apr. 24, 1992, Ser. No. 256,463  
 Int. Cl.<sup>6</sup> C08J 3/00; C08K 3/10; C08L 31/04

U.S. Cl. 524—435 2 Claims  
 1. A self-fusion damping material formed from ferrite powder as a filler with a binder, wherein an ethylene-vinyl acetate copolymer and a petroleum resin are used as the binder and said damping material comprises 100 parts by weight of the combined binder mixed with 150 to 600 parts by weight of said filler and wherein the ferrite powder has a coercive force of not less than 1000 Oe and a residual magnetization of not less than 15 emu/g.

5,569,696

# STAIN RESISTANT GROUT

Bella Abramson, Tarzana; Jose D. Barrera, Hawthorne; Zosimo D. Pamaran, Yorba Linda, and Anthony D. Pham, Costa Mesa, all of Calif., assignors to The W. W. Henry Company, Huntington Park, Calif.

Filed Jul. 13, 1995, Ser. No. 502,132  
 Int. Cl.<sup>6</sup> C08K 5/01; C08L 9/08; E04F 13/08; E04B 1/00

U.S. Cl. 524—487 7 Claims  
 1. A ceramic tile grout composition comprising a mixture of an acrylic latex, an aliphatic urethane and a paraffin.

5,569,697

# TIRE TREAD COMPOSITION

Mark P. Ferrandino, Danbury; Sung W. Hong, Chesire, and George T. McKenzie, Watertown, all of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Filed May 8, 1995, Ser. No. 437,260  
 Int. Cl.<sup>6</sup> C08K 3/04; 3/36

U.S. Cl. 524—492 11 Claims  
 1. A tire tread composition comprising:  
 a) a first rubber component comprising about 60–90 parts of styrene butadiene rubber (SBR) comprising less than 20 percent by weight of styrene, per hundred parts of rubber (phr);  
 b) a second rubber component comprising about 10–40 phr of nitrile-butadiene rubber (NBR);  
 c) 30–80 phr of carbon black;  
 d) 10–20 phr of silica;  
 e) 1–3 phr of a silane coupling agent; and, optionally,  
 f) a third rubber component comprising about 10–30 phr of a high cis polybutadiene rubber (cis BR).

5,569,698

# FLUORINATED POLYDIORGANOSILOXANE BASE COMPOSITION AND METHOD FOR PREPARATION

Myron T. Maxson, Sanford, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Nov. 13, 1995, Ser. No. 557,403  
 Int. Cl.<sup>6</sup> C08K 3/34

U.S. Cl. 524—493 26 Claims  
 1. A fluorinated polydiorganosiloxane base composition, the composition comprising:  
 (A) the reaction product of  
 (i) 100 parts by weight of a hydroxyl end-terminated polymethylvinyl(methylfluoroalkyl)siloxane having about 0.2 to 1.2 mole percent pendant vinyl substituted on silicon and a Williams plasticity number within a range of about 1.3 mm to 3.8 mm at 25° C., and  
 (ii) 0.05 to two parts by weight of a methylvinylidene(N-alkylacetamido)silane,  
 (B) (i) 0.5 to 10 parts by weight of a hydroxyl end-terminated polydimethylsiloxane having about one to six mole percent pendant vinyl substituted on silicon and a Williams plasticity number within a range of about 1.2 mm to 2.5 mm at 25° C.,  
 (B) (ii) one to 10 parts of a hydroxyl end-terminated polymethylfluoroalkylsiloxane fluid where the terminal hydroxyl substitution comprises about three to 10 weight percent of the fluid, and  
 (B) (iii) 20 to 50 parts of a reinforcing silica having a surface area within a range of about 50 m<sup>2</sup>/g to less than 200 m<sup>2</sup>/g.

5,569,699

# BIOLOGICAL TISSUE-EQUIVALENT POLYMER COMPOSITION HAVING A VERY HIGH RESISTIVITY

Jean Barthe, Massy, and Jean-Marc Bordy, Michelson Orge, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 1, 1995, Ser. No. 424,542

Claims priority, application France, Oct. 1, 1993, 93-11711  
 Int. Cl.<sup>6</sup> C08K 3/00

U.S. Cl. 524—496 11 Claims  
 1. Biological tissue-equivalent polymer composition with a high resistivity, which is formed from a polyamide, polypropylene, polypropylene mixed with approximately 1% carboxylic acid, fillers and carbon black and which has a mass atomic composition such that the hydrogen is between approximately 6 and 14%, the carbon between approximately 55.5 and 86.5% the nitrogen between approximately 2.5 and 4.5%, the oxygen between approximately 1.5 and 7.5%, the calcium between approximately 1.5 and 9.5% and the fluorine between approximately 1 and 9%, the sum of the quantities of carbon, oxygen and fluorine in the total atomic composition being between approximately 72 and 90%.

5,569,700

# THERMOPLASTIC RESIN COMPOSITION FOR PROFILE EXTRUSION

Tsuneaki Iwakiri, and Gorou Shimaoka, both of Kanagawa, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Apr. 3, 1995, Ser. No. 415,320

Claims priority, application Japan, Apr. 4, 1994, 6-066058  
 Int. Cl.<sup>6</sup> C08L 69/00; C08K 7/14

U.S. Cl. 524—504 11 Claims  
 1. A resin composition for profile extrusion comprising (a) from 10 to 90% by weight of a thermoplastic aromatic polycarbonate resin, (b) from 5 to 60% by weight of a graft copolymer obtained by copolymerizing an ethylene- $\alpha$ -olefin-diene copolymer and a monomer mixture comprising as main components an aromatic vinyl compound and a vinyl cyanide compound, (c) from 5 to 30% by weight of a glass filler and (d) from 0.5 to 30% by weight of carbon fiber.

5,569,701

# SOYBEAN OIL-BASED INTAGLIO INK AND METHOD FOR MAKING SAME

John T. Moynihan, Herndon, Va., assignor to Bureau of Engraving and Printing, Washington, D.C.

Filed May 31, 1995, Ser. No. 455,994

Int. Cl.<sup>6</sup> C08L 67/08; 61/10; C09D 11/26; 11/10  
 U.S. Cl. 524—539 20 Claims

1. An intaglio ink composition comprising:  
 about 5 to about 30 weight percent of a varnish,  
 the varnish comprising about 30 to about 100 weight percent alkyd, about 0 to about 70 weight percent of a thermoplastic novolak resin, about 0 to about 25 weight percent solvent, and an emulsifier,  
 the alkyd comprising, on a 100 parts by weight alkyd basis, the reaction product of reacting a mixture comprising about 5 to about 50 parts by weight soybean oil, about 0 to about 70 parts by weight tung oil or linseed oil, and about 2 to about 10 parts by weight pentaerythritol in the presence of about 0.05 to about 2 parts by weight alcoholysis catalyst to form alcoholized oil, and reacting the alcoholized oil with about 5 to about 30 parts by weight trimellitic anhydride.

5,569,702

# GRINDING AND/OR DISPERSING AGENT CONTAINING POLYMERS AND/OR COPOLYMERS PARTIALLY NEUTRALIZED BY MAGNESIUM FOR AQUEOUS SUSPENSIONS OF MINERAL SUBSTANCES, TO BE USED IN PIGMENTARY APPLICATIONS

Jean-Bernard Egraz, Ecully; Jacques Mongoin, Champagne-Au-Mont-D'Or; Georges Ravet, Saint-Genis-Les-Ollieres, and Jean-Marc Suan, Lyon, all of France, assignors to Coatex S.A., Genay, France

Continuation of Ser. No. 974,271, Nov. 10, 1992, Pat. No. 5,432,238. This application Feb. 6, 1995, Ser. No. 383,991

Claims priority, application France, Nov. 12, 1991, 91 14137; Nov. 12, 1991, 91 14140

The portion of the term of this patent subsequent to Feb. 6, 2015, has been disclaimed.

Int. Cl.<sup>6</sup> C08K 3/00 3 Claims  
 1. An aqueous suspension of fine mineral substances refined by a process for grinding an aqueous suspension of coarse mineral substances intended for pigmentary applications, comprising:  
 (i) preparing an aqueous suspension of a coarse mineral substance;  
 (ii) adding a grinding agent comprising: a polymer selected from the group consisting of acrylic polymers, vinyl polymers, acrylic and vinyl copolymers, and a mixture thereof: wherein said polymer contains acid groups which are partially or

completely neutralized and is obtained by treatment, using one or several polar solvents according to static or dynamic procedures, and by the selection of the fraction of having the desired molecular weight, wherein the active acid sites of said polymer are completely or partially neutralized such that the percentage of said active acid sites neutralized by magnesium ions ranges between 45 and 55, including terminals, and such that up to 55% of said active acid sites of said agent are neutralized by sodium ions.

(iii) adding a grinding substance to said suspension; and

(iv) grinding said mixture thus constituted; wherein the size of at least 90% of the particles in the ground substance is less than two microns, and the size of at least 65% of them is less than one micron.

#### 5,569,703 ADHESIVES

Yuuzi Yoshii; Yasuo Kaneshima; Masayoshi Nitta, and Tatsu-hiko Amano, all of Chiba, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 44,495, Apr. 9, 1993, abandoned.

This application Mar. 14, 1995, Ser. No. 403,581

Claims priority, application Japan, Apr. 10, 1992, 4-090768

Int. Cl.<sup>6</sup> C08L 31/02; 31/04; 23/08; 33/14

U.S. Cl. 524—558

8 Claims

1. An adhesive comprising an aqueous emulsion of a copolymer containing an ethylene unit (A), a vinyl ester unit (B), an acetoacetyl group-containing copolymerizable monomer unit (C) and a polyvinyl alcohol as a protective colloid (D) in a weight ratio of (A)/(B)/(C)/(D)=8.7 to 70/100/0.1 to 10/1 to 10, wherein said copolymer contains a toluene-insoluble content in an amount of from 52 to 70% by weight.

#### 5,569,704 CURING AGENT AND A CATIONIC ELECTRODEPOSITION COATING COMPOSITION

Mitsuo Yamada, Suita, and Yusaku Kobata, Higashiosaka, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

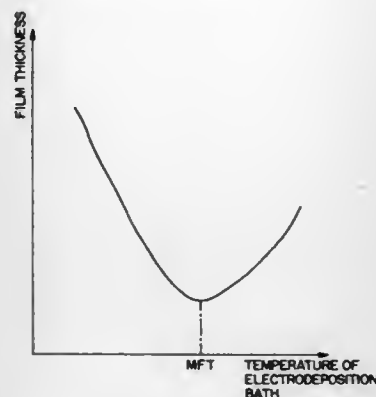
Filed Feb. 22, 1995, Ser. No. 392,171

Claims priority, application Japan, Feb. 22, 1994, 6-049808

Int. Cl.<sup>6</sup> C08J 3/00; C08K 3/20; C08L 75/00

U.S. Cl. 524—591

13 Claims



1. A curing agent which contains blocked isocyanate compound A and blocked isocyanate compound B, wherein the difference in the glass transition temperatures of said blocked isocyanate compound A and said blocked isocyanate compound B is at least 25° C., and the glass transition temperature of said blocked isocyanate compound A is higher than the glass transition temperature of said blocked isocyanate compound B.

5,569,705  
AQUEOUS DISPERSION OF POLYURETHANE RESINS,  
THE PRODUCTION THEREOF AND POLYURETHANE  
MACROMERS SUITABLE FOR THIS PURPOSE, AS  
WELL AS THEIR USE IN AQUEOUS COATING AGENTS  
Bettina Vogt-Birnbrich, Solingen; Hans-Peter Patzschke;  
Werner Lenhard, both of Wuppertal; Jürgen Döbert,  
Sprockhövel; Marcus Brunner, and Walter Schubert, both of  
Wuppertal, all of Germany, assignors to Herberts Gesell-  
schaft Mit Beschränkter Haftung, Wuppertal, Germany  
Filed Feb. 27, 1995, Ser. No. 394,826

Claims priority, application Germany, Feb. 28, 1994, 44 06 547.7

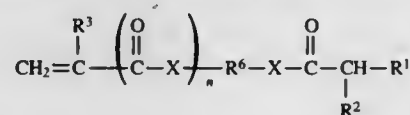
Int. Cl.<sup>6</sup> C08G 18/67

U.S. Cl. 524—591

21 Claims

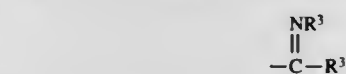
1. Aqueous dispersion of polyurethane resins, which is obtained from

- a) one or more polyurethanes which contain at least one CH acidic group, at least one ionic group, a group that is capable of being converted into an ionic group and/or a non-ionic hydrophilic group and optionally, OH and/or NH groups, by
- b) introduction of one or more olefinic double bonds by reaction with
- b<sub>1</sub> at least one compound which can react with at least two CH-acidic groups, and simultaneously or thereafter with one or more compounds which contain a CH acidic group and an olefinic double bond with the general formula

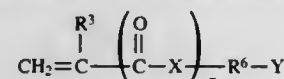


VI.

n=0 or 1,  
X=O or NH, whereby the groups X may be the same or different,  
R<sup>1</sup>=H, C<sub>1</sub>-C<sub>6</sub> alkyl, —COOR<sup>3</sup>,  
R<sup>2</sup>=CN, —COOR<sup>3</sup>, —CONR<sup>3</sup>,  
R<sup>3</sup>=H, linear or branched C<sub>1</sub>-C<sub>8</sub> alkyl, whereby the residues R<sup>3</sup> may be the same or different,  
R<sup>6</sup>=C<sub>1</sub>-C<sub>12</sub> alkylene, cycloalkylene, arylene or alkarylene and/or



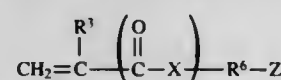
- b<sub>2</sub>) one or more compounds which contain an olefinic double bond and also a group that is capable of reacting with CH acidic groups and that has the general formula VII



VII.

n=0 or 1  
Y=NCO, CHO, CH(OR)<sub>2</sub>  
R<sup>6</sup>, X, R<sup>3</sup>=as defined under b<sub>1</sub>),  
R=alkyl with C<sub>1</sub> to C<sub>6</sub>,  
and/or

- b<sub>3</sub>) one or more compounds which contain an olefinic double bond and also a group that is capable of reacting with OH or NH groups and that has the general formula VIII



VIII.

- with n, R<sup>3</sup>, X, R<sup>6</sup>=as defined under b<sub>1</sub>) and Z=isocyanate or epoxide group,  
and/or  
b<sub>4</sub>) formaldehyde,  
in aqueous or non-aqueous phase whereupon a reaction product of a) and b) which is not yet present in aqueous phase is converted into the aqueous phase and in the aqueous phase is radically polymerized, optionally together with one or more

radically polymerisable unsaturated monomers, optionally in the presence of customary additives.

#### 5,569,706

#### AQUEOUS POLYUREA DISPERSIONS WITH IMPROVED HARDNESS AND SOLVENT RESISTANCE

Patricia B. Jacobs, Pittsburg, and Kenneth P. Yonek, McMurray, both of Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed Jun. 2, 1995, Ser. No. 458,935

Int. Cl.<sup>6</sup> C08J 3/00; C08K 3/20; C08L 75/00; B32B 27/00

U.S. Cl. 524—591

22 Claims

1. An aqueous polyurea dispersion wherein the polyureas contain 0.5 to 25% by weight, based on the weight of the polyureas, of en-urea groups (calculated as —NH—C(O)—N—, MW 57) obtained by the reaction of an isocyanate group with an aldimine group prepared from a cyclic polyamine containing (cyclo)aliphatically bound amino groups.

#### 5,569,707

#### AQUEOUS POLYESTER-POLYURETHANE DISPERSIONS AND THEIR USE IN COATING COMPOSITIONS

Harald Blum, Wachtendonk, and Joachim Petzoldt, Monheim, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 390,188, Feb. 17, 1995, abandoned.

This application Jan. 31, 1996, Ser. No. 594,742

Claims priority, application Germany, Feb. 25, 1994, 44 06 159.5

Int. Cl.<sup>6</sup> C08J 3/00; C08K 3/20; C08L 75/00

U.S. Cl. 524—591

12 Claims

1. An aqueous dispersion of polyester-polyurethanes having an acid number of 5 to 60 mg KOH/g, a hydroxyl group content of 0.25 to 6.5% by weight and a urethane group content (calculated as —NH—CO—O—) of 2 to 25% by weight, wherein these ranges are based on polyester-polyurethane solids and wherein the polyester-polyurethanes are reaction products, optionally at least partly neutralized by bases, of

- a) 15 to 90% by weight of one or more essentially linear, polyester polyols having a molecular weight of 500 to 4000, other than those which satisfy the requirements of component b), in which the polyester polyols are reaction products of
- a<sub>1</sub>) 30 to 65% by weight of an acid component selected from the group consisting of adipic acid, sebacic acid, azelaic acid, hydrogenated dimeric fatty acids and mixtures thereof,
- a<sub>2</sub>) 20 to 65% by weight of a diol component selected from the group consisting of ethylene glycol, 1,2- and 1,3-propanediol, 1,3- and 1,4-butanediol, 1,6-hexanediol, diethylene glycol, dipropylene glycol, neopentyl glycol and mixtures thereof and
- a<sub>3</sub>) 0 to 15% by weight of an acid component selected from the group consisting of phthalic anhydride, isophthalic acid, hexahydrophthalic anhydride, 1,4-cyclohexanedicarboxylic acid, dimeric fatty acids containing high proportions of trimeric fatty acids, hydrogenated fatty acids, isononanoic acid, 2-ethylhexanoic acid and mixtures thereof and
- a<sub>4</sub>) 0 to 7% by weight of a triol component selected from the group consisting of trimethylolpropane, glycerol and mixtures thereof,

wherein the sum of the percentages of components a<sub>1</sub>) to a<sub>4</sub>) is 100,

- b) 4 to 75% by weight of one or more essentially difunctional polyols selected from i) polycarbonates having a molecular weight of 400 to 6000 and ii) dimeric fatty alcohols obtained

by the hydrogenation of the carboxyl groups of dimeric fatty acids to hydroxyl groups, the alkoxylation of the carboxyl groups of dimeric fatty acids or the esterification of the carboxyl groups of dimeric fatty acids using low molecular weight diols,

- c) 1 to 10% by weight of one or more acidic components selected from i) hydroxycarboxylic acids, ii) amino acids, iii) aminosulphonic acids and iv) alkali salts of the acids of i), ii) and iii),
- d) 0 to 20% by weight of a low molecular weight component selected from compounds which have a molecular weight of 60 to 300 and contain at least two hydroxyl and/or amino groups,
- e) 0 to 20% by weight of one or more hydrophilic monovalent or divalent alcohols which have a molecular weight of 350 to 3000 and contain lateral and/or terminal ethylene oxide units and
- f) 5 to 50% by weight of a polyisocyanate component selected from organic polyisocyanates having a molecular weight of 168 to 1000, provided that at least 50% by weight of the polyisocyanate component is selected from linear aliphatic diisocyanates having a molecular weight of 168 to 300, wherein the sum of the percentages of components a) to f) is 100.

#### 5,569,708

#### SELF-DOPED POLYMERS

Fred Wudl, and Alan Heeger, both of Santa Barbara, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation of Ser. No. 636,915, Jan. 2, 1991, Pat. No.

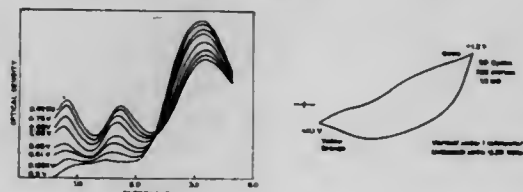
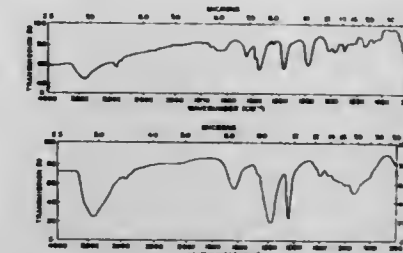
5,342,912, which is a division of Ser. No. 607,851, Nov. 1, 1990, abandoned, which is a continuation of Ser. No. 156,928, Dec. 14, 1987, abandoned. This application Aug. 29, 1994, Ser. No. 297,589

Claims priority, application Japan, Mar. 24, 1986, 61-64272

Int. Cl.<sup>6</sup> C08K 3/00

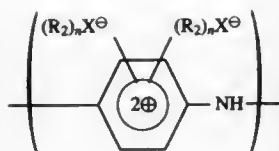
U.S. Cl. 524—607

20 Claims



1. An aqueous solution of the water-soluble self doped zwitterionic polymer comprised of from about 100 to about 500 monomer units, wherein 0.01 to 100% of the monomer units have the structure





wherein  $n$  is 0 or 1,  $R_2$  is a linear or branched alkyl, ester, ether or amide moiety having between 1 and about 10 carbon atoms, and  $X$  is a Bronsted acid anion.

5,569,709

# GRAFTING, PHASE-INVERSION AND CROSS-LINKING CONTROLLED MULTI-STAGE BULK PROCESS FOR MAKING ABS GRAFT COPOLYMERS

Chen-Youn Sue, Williamstown; Robert Koch, Parkersburg; John E. Pace, Washington, and Gregory R. Prince, Sandyville, all of W. Va., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 165,766, Dec. 10, 1993, Pat. No. 5,414,045. This application Dec. 27, 1994, Ser. No. 364,862

Int. Cl.<sup>6</sup> C08L 51/04

U.S. Cl. 525—52

20 Claims

1. A continuous mass polymerization method for making a thermoplastic composition comprising a rubber modified graft copolymer and non-grafted rigid polymer, said method comprising:

- (a) feeding a liquid feed composition into a grafting reactor, said grafting reactor being a first plug-flow reactor and said liquid feed composition comprising (i) at least one polymerizable vinylidene aromatic monomer and, (ii) at least one polymerizable unsaturated nitrile monomer and (iii) a rubbery synthetic butadiene polymer dissolved in said monomers;
- (b) reacting said liquid feed composition to a point prior to phase inversion in said grafting reactor to produce a first polymerization product having a monomer conversion of between 5 and 25 percent by weight based on the total weight of monomer in the liquid feed composition;
- (c) continuously withdrawing the first polymerization product from the grafting reactor;
- (d) continuously charging the first polymerization product to a phase inversion reactor, said phase inversion reactor being a stirred tank reactor;
- (e) inverting the rubber continuous phase of the first polymerization product into a dispersed phase in the phase inversion reactor and reacting the first polymerization product in the phase inversion reactor to a point after phase inversion to produce a second polymerization products having a monomer conversion of between 10 and 60 percent by weight based on the total weight of monomer in the liquid feed compositions;
- (f) continuously withdrawing the second polymerization product from the phase inversion reactor;
- (g) continuously charging the second polymerization product into the finishing reactor, said finishing reactor being a second plug-flow reactor;
- (h) reacting the second polymerization product in the finishing reactor to produce a third polymerization product having a monomer conversion of between 70 and 95 percent based on the total weight of monomer in the liquid feed;

- (i) continuously withdrawing the third polymerization product from the finishing reactor; and
- (j) charging the third polymerization reactor product to a devolatilizer to remove residual volatiles therefrom to produce the thermoplastic composition.

5,569,710

# POLYMERIC BLENDS

Edward E. LaFleur, Warminster; William J. Work, Huntingdon Valley, both of Pa.; Robert M. Amici, Berlin, Mass.; Newman M. Bortnick, Orelan, and Norman L. Holy, Penns Park, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 332,288, Oct. 31, 1994, Pat. No. 5,502,106, which is a continuation-in-part of Ser. No. 83,957, Jun. 25, 1993, which is a continuation-in-part of Ser. No. 928,878, Aug. 12, 1992, abandoned. This application May 1, 1995, Ser. No. 431,812

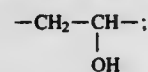
Int. Cl.<sup>6</sup> C08L 29/04; 33/10; 33/24; 71/02

U.S. Cl. 525—57

6 Claims

1. A polymeric blend comprising:

- (a) from about 25 to about 95 parts of at least one polar polymer;
- (b) from about 5 to about 75 parts of a polymeric composite of:
  - i) from about 40 to about 95 parts by weight of a first polymer containing at least 50 mol % of units of the structure



- ii) from about 5 to about 60 parts by weight of a second polymer formed from at least about 70 parts of at least one lower alkyl methacrylate or acrylate, and at least one of either up to about 25 parts of a vinyl or vinylidene monomer containing an amide group or up to about 25 parts of an unsaturated carboxylic acid or anhydride, the composite containing the second polymer dispersed in a continuous phase of the first polymer, wherein the polar polymer is a polyurethane, a phenoxy resin, an ethylene-vinyl alcohol copolymer containing less than 50 mol % vinyl alcohol units, an ethylene/carbon monoxide copolymer, a modified cellulosic or a poly(alkylene oxide).

5,569,711

# CYCLOOLEFIN RESIN COMPOSITION

Sanehiro Yamamoto; Toshio Kimura; Takasi Nakagawa, and Akinori Toyota, all of Waki-cho, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 333,337, Nov. 2, 1994, Pat. No. 5,439,973, which is a continuation of Ser. No. 940,316, Sep. 3, 1992, abandoned. This application Apr. 28, 1995, Ser. No. 431,025 Claims priority, application Japan, Sep. 12, 1991, 233139; Sep. 12, 1991, 233140; Sep. 12, 1991, 233141; Sep. 12, 1991, 233142

Int. Cl.<sup>6</sup> C08L 77/00

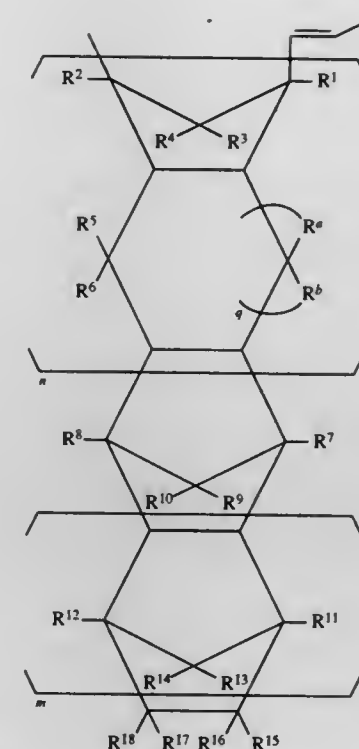
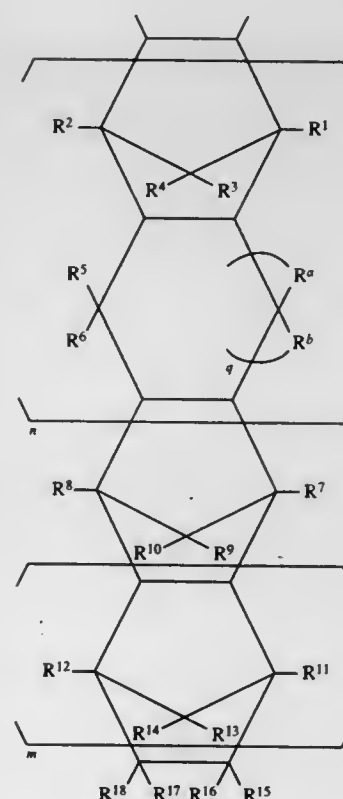
U.S. Cl. 525—66

4 Claims

1. A cycloolefin resin composition comprising:

- (A) (a-4) a graft-modified cycloolefin resin obtained by graft-modifying, with an unsaturated carboxylic acid or derivative thereof, at least one cycloolefin polymer selected from the group consisting of:

- (a-1) a random copolymer of ethylene and a cycloolefin comprising polymerized ethylene units and polymerized cycloolefin units, wherein said polymerized cycloolefin units are represented by the following formula (II)



wherein

$R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ ,  $n$ ,  $m$  and  $q$  have the same meanings as defined in formula (II), and (a-3) a hydrogenation product of said ring opening polymer or said ring opening copolymer;

(B) (b-1) an elastomer having a tensile modulus at 23° C. of 0.1 to 2,000 kg/cm<sup>2</sup>, a glass transition temperature of not higher than 0° C. and a crystallinity of not more than 30% in an amount of 0.5 to 50 parts by weight based on 100 parts by weight of the graft-modified cycloolefin resin (a-4), and a crystalline polyolefin composed of

(b-3) a polyolefin resin having a crystallinity of more than 30% and a tensile modulus at 23° C. of more than 2000 kg/cm<sup>2</sup>, and/or

(b-4) a graft-modified product obtained by modifying said polyolefin resin with an unsaturated carboxylic acid or its derivative,

wherein said crystalline polyolefin is present in said composition and the amount thereof does not exceed 150 parts by weight based on 100 parts by weight of the graft-modified cycloolefin resin (a-4); and

(C) a polyamide resin in an amount of 5 to 300 parts by weight based on 100 parts by weight of the graft-modified cycloolefin resin (a-4).

wherein

$n$  is 0 or 1;

$m$  is 0, 1 or 2;

$q$  is 0 or 1;

$R^1$  to  $R^{18}$  and  $R^a$  and  $R^b$  are each independently selected from the group consisting of hydrogen atom, halogen atom and hydrocarbon group;

with the proviso that  $R^{15}$  to  $R^{18}$  can link to each other to form a monocyclic or polycyclic group, and the monocyclic or polycyclic group can have a double bond; and

with the further proviso that  $R^{15}$  and  $R^{16}$  together can form an alkylidene group or  $R^{17}$  and  $R^{18}$  together can form an alkylidene group,

(a-2) a ring opening polymer or a ring opening copolymer of a cycloolefin comprising ring opened cycloolefin units represented by the following formula (III)

5,569,712

# LOW-HAZE IONOMERS OF COPOLYMERS OF $\alpha$ -OLEFINS, CARBOXYLIC ACID ESTERS, AND OPTIONAL COMONOMERS, AND PROCESSES FOR MAKING AND ACIDIFYING THESE IONOMERS

James E. Wang, Appleton, Wis.; David Rosendale, Mauriceville, Tex.; Victor P. Kurkov, San Rafael, Calif.; Leslie P. Theard, Houston, Tex.; Ta Y. Ching, Novato, Calif.; Lewis R. Compton; Tor H. G. Palmgren, both of Orange, Tex., and Mitchell P. Eichelberger, The Woodlands, Tex., assignors to Chevron Chemical Company, San Ramon, Calif.

Continuation of Ser. No. 379,411, Jan. 27, 1995, which is a continuation-in-part of Ser. No. 330,290, Oct. 27, 1994, which is a continuation-in-part of Ser. No. 144,173, Oct. 27, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 462,716

Int. Cl.<sup>6</sup> C08F 8/42

U.S. Cl. 525—123

8 Claims

1. A composition comprising the product of reacting

- (a) a copolymer comprising alpha-olefins having from two to eight carbon atoms, esters of alpha, beta-ethylenically-unsaturated carboxylic acids having from four to twenty-two carbon atoms, and metal salts of acrylic or methacrylic acid, wherein the copolymer has a haze of no more than ten percent as measured by ASTM method D 1003; and
- (b) a polymer selected from the group consisting of polyester, polyamide, polyurethane, and polycarbonate in the presence of sufficient acid to cross-link (a) and (b).

5,569,713

# BLEND COMPOSITION CONTAINING RECYCLED POLYCARBONATE AND RECYCLED POLYMETHYLMETHACRYLATE

Mark Lieberman, Bloomfield Hills, Mich., assignor to American Commodities, Inc., Flint, Mich.

Division of Ser. No. 324,373, Oct. 17, 1994, which is a division of Ser. No. 103,298, Aug. 9, 1993, Pat. No. 5,424,013. This application Jun. 5, 1995, Ser. No. 465,364

Int. Cl.<sup>6</sup> C08F 8/00

U.S. Cl. 525—146

11 Claims

1. An extruded blend composition containing recycled plastic, the blend composition consisting essentially of polycarbonate, polymethylmethacrylate and minor amounts of a compatibilizing agent, the blend composition formed by the process comprising the steps of:

- passing a recycled blend of plastic materials consisting essentially of polycarbonate and polymethylmethacrylate through a compounding type extruder;
- adding an amount of additional polycarbonate to the recycled blend in an amount sufficient to form a continuous phase with the polycarbonate component in the recycled blend; and
- adding a compatibilizing agent prior to compounding the recycled polycarbonate with additional polycarbonate in an amount of at least 1% by weight.

5,569,714

# ALLYL ESTER COPOLYMERS WITH ALLYLIC ALCOHOLS OR PROPOXYLATED ALLYLIC ALCOHOLS

Shao-Hua Guo, West Goshen, Pa., assignor to Arco Chemical Technology, L.P., Greenville, Del.

Division of Ser. No. 430,654, Apr. 28, 1995, Pat. No. 5,519,103, which is a division of Ser. No. 309,699, Sep. 21, 1994, Pat. No. 5,480,954. This application Jan. 11, 1996, Ser. No. 584,635

Int. Cl.<sup>6</sup> C08K 5/18

U.S. Cl. 525—162

1 Claim

1. An allylic copolymer derivative which comprises the reaction product of:

- (a) a copolymer which consists essentially of recurring units of:
- (1) an allyl ester of the formula  $\text{CH}_2=\text{CR}'-\text{CH}_2-\text{O}-\text{CO}-\text{R}$  in which R is hydrogen or a saturated linear, branched, or cyclic  $\text{C}_1-\text{C}_{30}$  alkyl, aryl, or aralkyl group, and R' is selected from the group consisting of hydrogen and  $\text{C}_1-\text{C}_3$  alkyl; and
- (2) an allylic alcohol of the formula  $\text{CH}_2=\text{CR}'-\text{CH}_2-\text{OH}$  in which R' is selected from the group consisting of hydrogen and  $\text{C}_1-\text{C}_3$  alkyl;

said copolymer having an average hydroxyl functionality within the range of about 2 to about 10, and a number average molecular weight within the range of about 300 to about 15,000; and

- (b) a member selected from the group consisting of:
- (1) an anhydride, to produce a thermoset polyester;
- (2) an isocyanate-terminated prepolymer, to produce a non-solvent polyurethane adhesive;
- (3) a styrene/maleic anhydride copolymer, to produce a crosslinked polymeric resin;
- (4) a melamine resin, to produce a melamine coating;
- (5) a fatty acid, to produce an alkyd coating;

- (6) a fatty acid, a low molecular weight polyol, and a polyisocyanate, to produce a polyurethane-modified alkyd coating; and
- (7) an acrylic acid or acrylic acid derivative, to produce an acrylate composition.

5,569,715

# PROCESS FOR OBTAINING HYDROPHOBICALLY MODIFIED EMULSION POLYMERS AND POLYMERS OBTAINED THEREBY

Sunitha Grandhee, Novi, Mich., assignor to BASF Corporation, Southfield, Mich.

Filed Jul. 24, 1995, Ser. No. 506,143

Int. Cl.<sup>6</sup> C08F 283/00; 285/00; 289/00

U.S. Cl. 525—7

25 Claims

1. Process for emulsion polymerization of hydrophobically modified emulsion polymers comprising the steps of

- A. forming a hydrophobically modified core polymer by
- i) forming a mixture of hydrophobic polymer,  $\alpha,\beta$ -ethylenically unsaturated monomers, surfactant and water,
- ii) subjecting the mixture to high stress techniques, wherein the stress exerted on the mixture is sufficient to form surfactant stabilized particles of the hydrophobic polymer and monomers, having an average particle size between 100 and 300 nm, in the aqueous phase,
- iii) co-polymerizing the  $\alpha,\beta$ -ethylenically unsaturated groups within the particles to form a hydrophobically modified core polymer, and

B. polymerizing a shell to form a core-shell polymer by adding to the polymer formed in step iii)  $\alpha,\beta$ -ethylenically unsaturated monomers including at least one hydrophilic  $\alpha,\beta$ -ethylenically unsaturated monomer, and co-polymerizing the monomers to form a hydrophilic shell polymer,

wherein the resultant polymer is a hydrophobically modified core-shell emulsion polymer.

23. A hydrophobically modified emulsion polymer prepared by a process comprising the steps of

- A. forming a hydrophobically modified core polymer by
- i) forming a mixture of hydrophobic polymer,  $\alpha,\beta$ -ethylenically unsaturated monomers, surfactant and water,
- ii) subjecting the mixture to high stress techniques, wherein the stress exerted on the mixture is sufficient to form surfactant stabilized particles of the hydrophobic polymer and monomers, having an average particle size between 100 and 300 nm, in the aqueous phase,
- iii) co-polymerizing the  $\alpha,\beta$ -ethylenically unsaturated groups within the particles to form a hydrophobically modified core polymer, and
- B. polymerizing a shell to form a core-shell polymer by adding to the polymer formed in step iii)  $\alpha,\beta$ -ethylenically unsaturated monomers including at least one hydrophilic  $\alpha,\beta$ -ethylenically unsaturated monomer, and emulsion polymerizing the monomers to form a hydrophilic shell polymer,

wherein the resultant polymer is a hydrophobically modified core-shell emulsion polymer.

5,569,716

# RUBBER COMPOSITION

Kohji Okamoto, Tokuyama; Kyoichi Inoue, Osaka, and Takayoshi Kutano, Tokuyama, all of Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1995, Ser. No. 407,109

Claims priority, application Japan, Jun. 2, 1994, 6-142221

Int. Cl.<sup>6</sup> C08L 23/26; 45/00; 7/00; 9/00

U.S. Cl. 525—192

14 Claims

1. A rubber composition comprising (A) a hydrocarbon rubber, (B) an agent for vulcanizing or crosslinking and (C) a hydroge-

nated petroleum resin having a bromine number of not greater than 10 (g/100 g) which is obtained by hydrogenating a copolymer of cyclopentadiene, dicyclopentadiene or a combination thereof with an aromatic group-containing vinyl monomer.

5,569,717

# COMPOSITION BASED ON PROPYLENE POLYMER PROCESS FOR OBTAINING IT AND ITS USE

Morand Lamba, Hoenheim, and Didier Graebing, Eckolsheim, both of France, assignors to Solvay (Société Anonyme), Brussels, Belgium

Filed Jun. 5, 1995, Ser. No. 463,105

Claims priority, application Belgium, Jun. 6, 1994, 09400558

Int. Cl.<sup>6</sup> C08L 23/04; 23/10

U.S. Cl. 525—193

18 Claims

1. A composition prepared by melt-blending of:

- (a) 35 to 98.98% by weight of a polymer selected from the group consisting of propylene homopolymer and propylene copolymers containing at least 50 mol % of propylene,
- (b) 1 to 50% by weight of a polymer selected from the group consisting of ethylene homopolymers and ethylene copolymers containing at least 90 mol % of ethylene, with
- (c) from 0.01 to 10% by weight of a functional compound selected from the group consisting of compounds including at least 3 acrylate groups; and
- (d) from 0.01 to 5% by weight of a compound capable of generating free radicals.

5,569,718

# SOLID ELASTOMERIC BLOCK COPOLYMERS

Thomas S. Coolbaugh, Morrisville; Frederick C. Loveless, Yardley, both of Pa., and Demetrios N. Matthews, Ewing, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 402,666, Mar. 13, 1995, Pat. No.

5,470,914, which is a division of Ser. No. 282,297, Jul. 29,

1994, Pat. No. 5,399,629, which is a division of Ser. No.

143,718, Nov. 1, 1993, Pat. No. 5,352,743, which is a division

of Ser. No. 836,577, Feb. 18, 1992, Pat. No. 5,276,100, and a

continuation-in-part of Ser. No. 466,233, Jan. 16, 1990, Pat.

No. 5,187,236, and Ser. No. 735,552, Jul. 25, 1991, Pat. No.

5,292,820. This application May 18, 1995, Ser. No. 443,747

Int. Cl.<sup>6</sup> C08F 297/04

U.S. Cl. 525—314

5 Claims

1. An essentially straight chain precursor block copolymer wherein the terminal blocks are each a polymer of at least one conjugated diene I, said diene containing at least five carbon atoms with at least one of each pair of double-bonded carbon atoms in the polymerized diene I units being additionally single-bonded to two carbon atoms; at least one middle or interior block is a polybutadiene composed of not more than about 65% of 1,4-units and at least about 35% of polymerized 1,2-units; and at least one middle or interior block is a polybutadiene composed of at least about 80% of 1,4-units.

5,569,719

# VULCANIZABLE PARTIALLY HYDROGENATED NITRILE RUBBER COMPOSITION CONTAINING PARTIALLY HYDROGENATED UNSATURATED NITRILE-CONJUGATED DIENE COPOLYMER SULFUR VULCANIZER AND TELLURIUM DITHIOCARBAMATE VULCANIZATION PROMOTOR

Sachio Hayashi, Tokyo; Isamu Miyauchi, Takaoka, and Moto-fumi Oyama, Yokosuka, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 38,099, Mar. 30, 1993, abandoned.

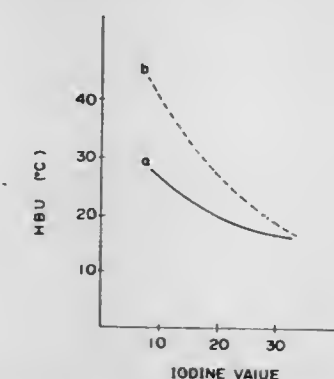
This application Dec. 19, 1994, Ser. No. 359,336

Claims priority, application Japan, Mar. 31, 1992, 4-106170

U.S. Cl. 525—329.3

Int. Cl.<sup>6</sup> C08C 19/20

8 Claims



1. A vulcanizable rubber composition comprising a partially hydrogenated unsaturated nitrile-conjugated diene copolymer having an iodine value of 10 to 25, wherein said partially hydrogenated copolymer is a hydrogenated product of a copolymer rubber selected from the group consisting of a butadiene-acrylonitrile copolymer rubber, an isoprene-butadiene-acrylonitrile copolymer rubber, an isoprene-acrylonitrile copolymer rubber, a butadiene-methyl acrylate-acrylonitrile copolymer rubber, a butadiene-acrylic acid-acrylonitrile copolymer rubber and a butadiene-di-n-butyl itaconate-acrylonitrile copolymer rubber; a vulcanizer consisting of sulfur; and tellurium diethyldithiocarbamate, tellurium diamyldithiocarbamate or tellurium pentamethylenedithiocarbamate, as a vulcanization promoter.

5,569,720

# POLYMER-BOUND PACLITAXEL DERIVATIVES

Nicola Mongelli; Francesco Angelucci, both of Milan; Enrico Pesenti, Cologno Monzese; Antonino Suarato, Milan, and Giovanni Biasoli, Gavirate, all of Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy

Division of Ser. No. 263,832, Jun. 22, 1994, Pat. No.

5,473,055, which is a division of Ser. No. 77,065, Jun. 16,

1993, Pat. No. 5,362,831. This application Jul. 27, 1995, Ser.

No. 508,210

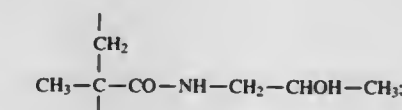
Claims priority, application United Kingdom, Jun. 19, 1992, 9213077

Int. Cl.<sup>6</sup> C08F 20/56; 8/30; 8/32

U.S. Cl. 525—329.4

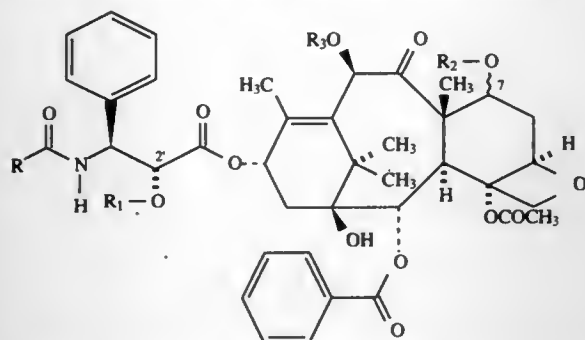
5 Claims

1. A process for preparing a polymer conjugate consisting essentially of: from 90 to 99.9 mol % of units represented by the formula

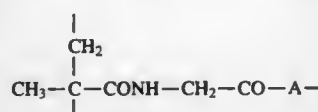




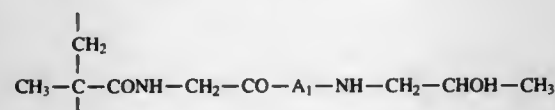
from 0.1 to 5 mol % of units represented by the formula



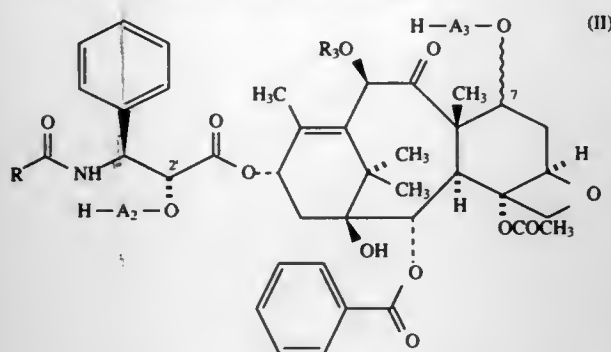
wherein one of  $R_1$  and  $R_2$  is a copolymer residue of the formula



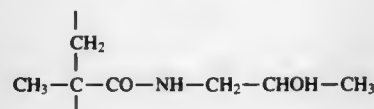
AND the other one is a hydrogen atom; from 0 to 9.9 mol % of units represented by the formula



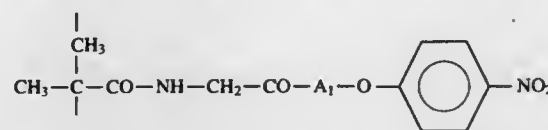
wherein R is a phenyl or t-butoxy group,  $R_3$  is H or an acetyl group, A and  $A_1$  which may be the same or different, represent a chemical single bond, an amino acid residue or peptide spacer selected from  $\beta$ Ala, Gly, Phe-Gly, Phe-Phe, Leu-Gly, Val-Ala, Phe-Ala, Leu-Phe, Leu-Ala, Phe-Leu-Gly, Phe-Phe-Leu, Leu-Leu-Gly, Phe-Tyr-Ala, Phe-Gly-Phe, Phe-Phe-Gly, Phe-Leu-Gly-Phe, Gly-Phe-Leu-Gly-Phe, Gly- $\beta$ Ala, Phe-Gly- $\beta$ Ala, Phe-Phe- $\beta$ Ala, Leu-Gly- $\beta$ Ala, Val-Ala- $\beta$ Ala, Phe-Ala- $\beta$ Ala, Leu-Phe- $\beta$ Ala, Leu-Gly- $\beta$ Ala, Phe-Leu-Gly- $\beta$ Ala, Phe-Phe-Leu- $\beta$ Ala, Leu-Leu-Gly- $\beta$ Ala, Phe-Tyr-Ala- $\beta$ Ala, Phe-Gly-Phe- $\beta$ Ala, Phe-Phe-Gly- $\beta$ Ala, Phe-Leu-Gly-Phe- $\beta$ Ala, or Gly-Phe-Leu-Gly-Phe- $\beta$ Ala, which process comprises reacting a compound of the formula II



wherein one of  $A_2$  and  $A_3$  is a chemical bond and the other one is A, and A, R and  $R_3$  are as defined above, with an activated polymer consisting essentially of from 90 to 99.9 mol % of units represented by the formula



and from 10 to 0.1 mol % of units represented by the formula



wherein  $A_1$  is as defined above and then treating the resultant polymer conjugate with 2-hydroxy-propylamine, wherein the reaction between said compound of formula II and said activated polymer is carried out in an anhydrous polar solvent at a temperature of from 15° to 40° C. for from 1 to 24 hours, in the presence of an organic or inorganic base.

5,569,721

#### SILICA-FILLED RUBBER COMPOUNDS CONTAINING MERCAPTOALKYL SILYL ETHERS AND GUANIDINES

Thomas Scholl, Bergisch Gladbach, and Hermann-Josef Weidenhaupt, Nörvenich, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 8, 1995, Ser. No. 436,650

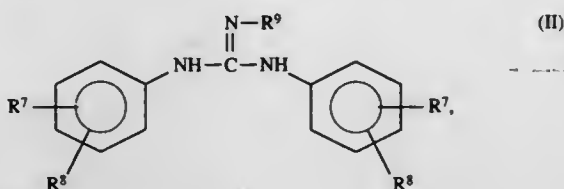
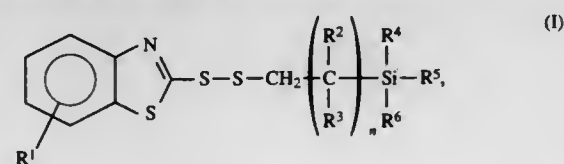
Claims priority, application Germany, May 18, 1994, 44 17 354.7

Int. Cl.<sup>6</sup> C08C 19/20; 19/22

U.S. Cl. 525—332.7

4 Claims

1. Rubber compounds comprising at least one natural or synthetic rubber, a crosslinking agent, a silica-containing filler, and compounds corresponding to the formulae (I) and (II):



in which

$R^1$  is hydrogen or  $C_{1-8}$  alkyl,  $R^2$  and  $R^3$  may be the same or different and represent hydrogen,  $C_{1-12}$ -alkyl, -alkenyl or -cycloalkyl or  $C_{6-12}$ -aryl which may optionally be substituted one or more times by hydroxyl-, carboxyl- or carboxy- $C_{1-8}$ -alkyl groups,  $R^4$ ,  $R^5$  and  $R^6$  may be the same or different and represent  $C_{1-18}$ -alkyl, -alkenyl or -cycloalkyl,  $O-C_{1-12}$ -alkyl,  $O-C_{6-12}$ -aryl which may be substituted one or more times by  $O-C_{1-8}$ -alkyl groups, with the proviso that at least one of the substituents  $R^4$ ,  $R^5$  and  $R^6$  is an  $O-C_{1-12}$ -alkyl or  $O-C_{6-12}$ -aryl group, n is an integer of 0 to 8,  $R^7$ ,  $R^8$  and  $R^9$  may be the same or different and represent hydrogen,  $C_{1-12}$ -alkyl or  $C_{6-12}$ -aryl, and wherein compound (I) is present in quantities of 0.1 to 15% by weight and compound (II) is present in quantities of 0.05 to 5% by weight, based on the amount of rubber.

5,569,722

#### LOW-HAZE IONOMERS OF COPOLYMERS OF ALPHA-OLEFINS, CARBOXYLIC ACID ESTERS, AND OPTIONAL COMONOMERS, AND PROCESSES FOR MAKING AND ACIDIFYING THESE IONOMERS

James H. Wang, Appleton, Wis.; David Rosendale, Mauriceville, Tex.; Victor P. Kurkov, San Rafael, Calif.; Leslie P. Theard, Houston, Tex.; Ta Y. Ching, Novato, Calif.; Lewis R. Compton; Tor H. G. Palmgren, both of Orange, Tex., and Mitchell P. Eichelberger, Woodlands, Tex., assignors to Chevron Chemical Company, San Ramon, Calif.

Continuation of Ser. No. 379,411, Jan. 27, 1995, which is a continuation-in-part of Ser. No. 330,290, Oct. 27, 1994, which is a continuation-in-part of Ser. No. 144,173, Oct. 27, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 463,373

Int. Cl.<sup>6</sup> C08F 8/42

U.S. Cl. 525—330.2

26 Claims

1. A composition comprising a copolymer of alpha-olefins having from two to eight carbon atoms, esters of alpha, beta-ethylenically-unsaturated carboxylic acids having from four to twenty-two carbon atoms, and metal salts of acrylic or methacrylic acid, wherein said copolymer has a haze of no more than ten percent as measured by ASTM method D 1003.

5,569,723

#### PROCESS FOR THE BROMINATION OF ALKYL RUBBERS

Wolfgang Baade, Wildeshausen; Heinrich Königshofen, Bergisch Gladbach, both of Germany, and Gabor Kaszas, Ontario, Canada, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 13, 1995, Ser. No. 543,138

Claims priority, application Germany, Oct. 24, 1994, 44 37 931.5

Int. Cl.<sup>6</sup> C08F 8/22

U.S. Cl. 525—357

5 Claims

1. Process for the bromination of  $C_4$ - $C_{16}$  alkyl rubbers, characterized in that the alkyl rubbers are reacted with bromine in the presence of organic azo compounds and/or alkali metal and/or alkaline earth metal hypochlorites and in the presence of linear, branched and/or cyclic alkanes and water at temperatures of 10° to 100° C., optionally under pressure, wherein the quantity of bromine is 0.2 to 1.2 times the molar quantity of double bonds contained in the rubber, 0.1 to 3 times the molar quantity of hypochlorite and/or azo compound is used relative to the quantity of bromine used, providing that the concentration of the hypochlorites in an aqueous solution is 2 to 20 wt. %, and wherein 5 to 20 wt. % of water, 60 to 90 wt. % of alkanes and 5 to 25 wt. % of alkyl rubber are used relative to 100 wt. % of the total of alkyl rubber, alkanes and water.

5,569,724

#### N-MENTHYLOL DERIVATIVES OF POLYCONDENSATION PRODUCTS, THEIR PREPARATION AND USE

Udo-Winfried Hendricks, Odenthal, and Ralf Heinen, Köln, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 27, 1995, Ser. No. 379,250

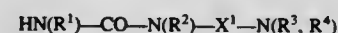
Claims priority, application Germany, Jan. 28, 1994, 44 02 532.7

Int. Cl.<sup>6</sup> C08L 77/08

U.S. Cl. 525—432

9 Claims

1. N-methylol derivatives of polycondensation products containing quaternary N atoms obtained from



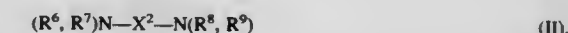
in which

$X^1$  denotes  $C_2$ - $C_4$ -alkylene.

$R^1$  and  $R^2$ , independently of one another, represent hydrogen or  $C_1$ - $C_4$ -alkyl or  $R^1$  and  $R^2$  together denote 1,2-ethylene or trimethylene and

$R^3$  and  $R^4$  independently of one another represent hydrogen,  $C_1$ - $C_4$ -alkyl or  $C_2$ - $C_4$ -hydroxyalkyl, and  $R^3$  and  $R^4$  together denote the radical  $-X^1-N(R^2)-CO-NHR^1$  and  $R^3$  and  $R^4$  together can denote one of the radicals  $-CH_2CH_2-O-CH_2CH_2-$  or  $-CH_2CH_2-N(R^5)-CH_2CH_2-$  where  $R^5$  denotes hydrogen,  $C_1$ - $C_4$ -alkyl,  $C_2$ - $C_4$ -hydroxyalkyl, the radical  $-X^1-N(R^2)-CO-NHR^1$  or the radical  $-CO-NH_2$ .

B) polyamines of the formula



in which

$X^2$  denotes  $C_2$ - $C_6$ -alkylene which may be interrupted by  $-O-$ ,  $-NR^{10}-$  where  $R^{10}$  represents hydrogen or  $C_1$ - $C_4$ -alkyl or by  $-NH-CO-NH-$ , and

$R^6$ ,  $R^7$ ,  $R^8$  and  $R^9$ , independently of one another, represent hydrogen,  $C_1$ - $C_4$ -alkyl or  $C_2$ - $C_4$ -aminoalkyl and  $R^6$  and  $R^7$  together and, independently thereof,  $R^8$  and  $R^9$  together or  $R^6$  and  $R^8$  together and, independently thereof,  $R^7$  and  $R^9$  together can denote 1,2-ethylene or trimethylene, and

C) bifunctional alkylating agents wherein said agents are dihalogenoalkanes, dihalogenoalkenes, dihalogenoalkyl ethers, dihalogenoalkanols, epihalogenohydrins bis-epoxy compounds,  $\alpha,\omega$ -dihalogenoalkenes and epihalogenohydrins.

5,569,725

#### N-VINYL-N-ACYL UREA RESINS

W. Eamon Carroll, Orefield; Walter L. Renz, Macungie; Andrew F. Nordquist, Whitehall, and Robert K. Pinschmidt, Jr., Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 14, 1994, Ser. No. 323,210

Int. Cl.<sup>6</sup> C08F 283/04; C08G 71/04

U.S. Cl. 525—454

17 Claims

1. An N-vinyl-N-acyl urea resin formed by reacting a secondary N-vinylamide with a polyisocyanate monomer that was previously or is subsequently reacted with at least one mono- or polyhydric alcohol to form a urethane linkage.

5,569,726

#### DIGUANAMINES AND PREPARATION PROCESS, DERIVATIVES AND USE THEREOF

Tetsuya Oishi, Kanagawa-ken; Jin Suzuki, Tokyo; Kouhei Ohkawa, Kanagawa-ken; Satoshi Furusawa, Chiba-ken; Hiroshi Ono, Osaka, and Kazuo Sugazaki, Kanagawa-ken, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 201,391, Feb. 24, 1994, which is a continuation-in-part of Ser. No. 186,550, Jan. 26, 1994, abandoned, which is a continuation of Ser. No. 963,855, Mar. 2, 1993, abandoned. This application Mar. 30, 1995, Ser. No. 414,008

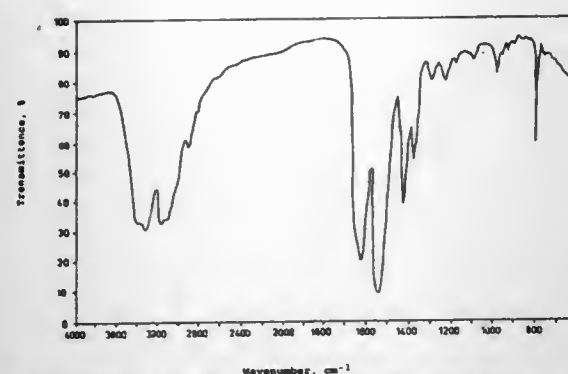
Claims priority, application Japan, Feb. 24, 1993, 5-035198; Feb. 24, 1993, 5-035199; Feb. 24, 1993, 5-035200; Mar. 3, 1993, 5-043048; Mar. 12, 1993, 5-051775; Apr. 14, 1993, 5-087499

Int. Cl.<sup>6</sup> C08F 283/00

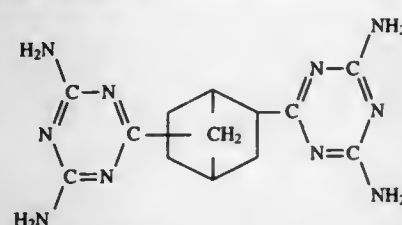
U.S. Cl. 525—472

17 Claims

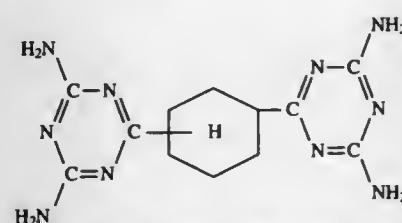
1. A method for making a resin retardant to flame, which comprises incorporating 3–50 wt. %, based on said resin, of at least



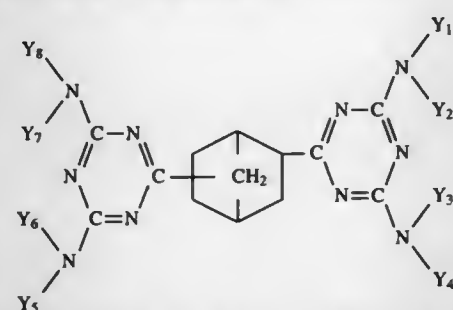
one diguanamine selected from diguanamines represented by the following formula (1):



wherein the bonding sites of the 4,6-diamino-1,3,5-triazin-2-yl groups are the 2,5- or 2,6-positions, or by the following formula (2):



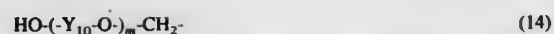
wherein the bonding sites of the 4,6-diamino-1,3,5-triazin-2-yl groups are the 1,2-, 1,3- or 1,4-positions, or of at least one diguanamine derivative selected from diguanamine derivatives represented by the following formula (11):



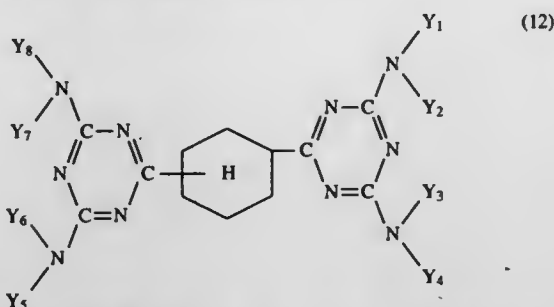
wherein the bonding sites of the 1,3,5-triazin-2-yl groups are the 2,5- or 2,6-positions, and  $Y_1, Y_2, Y_3, Y_4, Y_5, Y_6, Y_7$  and  $Y_8$  are the same or different and individually represent a substituent selected from the group consisting of a hydrogen atom and groups containing at least two carbon atoms, with the proviso that at least one of  $Y_1, Y_2, Y_3, Y_4, Y_5, Y_6, Y_7$  and  $Y_8$  is a group containing at least two carbon atoms, said group being selected from the group consisting of aliphatic groups, alicyclic groups, aromatic groups, heterocyclic groups containing 2 to 30 carbon atoms, groups represented by  $HO-Y_9$  in which  $Y_9$  is a divalent group containing at least 2 carbon atoms, groups represented by the following formula (13):



wherein  $Y_{10}$  is a group selected from the group consisting of ethylene, trimethylene and tetramethylene,  $m$  is an integer selected from 1 to 100, and  $Y_9$  has the same meaning as defined above, and groups represented by the following formula (14):



wherein  $Y_{10}$  and  $m$  have the same meanings as defined in formula (13), or by the following formula (12):



wherein the bonding sites of the 1,3,5-triazin-2-yl groups are the 1,2-, 1,3- or 1,4-positions and  $Y_1, Y_2, Y_3, Y_4, Y_5, Y_6, Y_7$  and  $Y_8$  have the same meanings as defined in formula (11) with the proviso that at least one of  $Y_1, Y_2, Y_3, Y_4, Y_5, Y_6, Y_7$  and  $Y_8$  is a group containing at least two carbon atoms, said group being selected from the group consisting of aliphatic groups, alicyclic groups, aromatic groups, heterocyclic groups containing 2 to 30 carbon atoms, groups represented by  $HO-Y_9$  in which  $Y_9$  is a divalent group containing at least 2 carbon atoms, groups represented by the following formula (13):



wherein  $Y_{10}$  is a group selected from the group consisting of ethylene, trimethylene and tetramethylene,  $m$  is an integer selected from 1 to 100, and  $Y_9$  has the same meaning as defined above and groups represented by the following formula (14):



wherein  $Y_{10}$  and  $m$  have the same meanings as defined in formula (13).

#### 5,569,727 ANTISTROSPIC POLYMERS AND METHOD OF PRODUCING THEM

Werner Mormann, Kreuztal, and Christoph Irie, Siegen, both of Germany, assignors to Europäische Wirtschaftsgemeinschaft, Luxembourg, Luxembourg

PCT No. PCT/EP94/02979, § 371 Date May 8, 1995, § 102(e) Date May 8, 1995, PCT Pub. No. WO95/07308, PCT Pub. Date Mar. 16, 1995

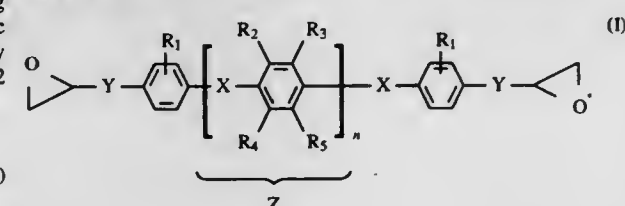
PCT Filed Sep. 7, 1994, Ser. No. 433,344

Claims priority, application Luxembourg, Sep. 8, 1993, 88405

Int. Cl. C08G 18/00; 18/77; C09K 19/38

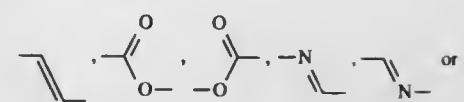
U.S. Cl. 525-528 16 Claims

1. Anisotropic polymers produced by reacting diepoxide A having the formula (I)



wherein  
Y represents  $O-CH_2$ ,  $CH_2$  or a C—C single bond;

X represents the structure element



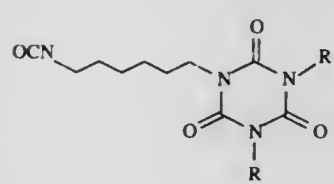
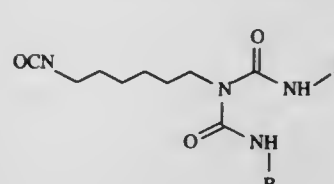
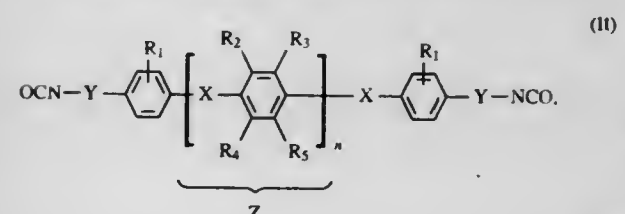
$R_1$  to  $R_5$  represent, independently, hydrogen, halogen, a methyl, ethyl, propyl or butyl group or  $R_2, R_3, R_4$  or  $R_5$  represent a benzene group.

$R_2$  to  $R_5$  represent hydrogen when  $R_1$  is not hydrogen,  $R_1$  represents hydrogen when  $R_2$  to  $R_5$  are not equal to hydrogen, and

$n$  is 1 to 3,

where the middle group Z can also be a heteroaromatic ring with one or two hetero-nitrogen atoms or a cycloaliphatic trans-1,4-cyclohexylene group; and

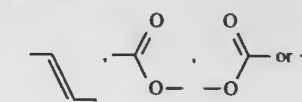
diisocyanate B having the formula selected from the group consisting of formulas (II), (III), (IV), (V), (VI) and (VII),



where

Y is a C—C bond,  $CH_2$  or  $C_2H_4$ ,

X is the structure element



$n$  is 0 or 1 and

$R_1$  to  $R_5$  are the atoms or groups indicated in formula (I), where the middle group Z can also be a cycloaliphatic trans-1,4-cyclohexylene group and

R is  $(CH_2)_6-NCO$ ,

wherein the molar ratio of diepoxide A to diisocyanate B is from about 2:1 to 1:4.

5,569,728

#### (CO)POLYMERIZATION PROCESS IN SUSPENSION FOR PREPARING HYDROGEN CONTAINING THERMOPLASTIC FLUOROPOLYMERS

Julio A. Abusleme, Saronno, and Piero Gavezotti, Milan, both of Italy, assignors to Ausimont, S.p.A., Milan, Italy

Filed Mar. 16, 1995, Ser. No. 405,811

Claims priority, application Italy, Mar. 21, 1994, M194A0521

Int. Cl. C08F 4/32

U.S. Cl. 526-231

16 Claims

1. (Co)polymerization process in suspension for preparing hydrogen containing thermoplastic fluoropolymers, wherein bis-dichlorofluoroacetylperoxide (DCFAP) is used as polymerization initiator.

5,569,729

#### DERIVATIVES OF POLYETHERS AND OF PENTACYCLIC HETEROCYCLES, THEIR POLYMERS AND THEIR APPLICATIONS, PARTICULARLY TO THE COMPLEXING OF METAL IONS

Olivier Leclerc, Moret Sur Loing, France, assignor to Electricite de France - Service National, Paris, France

Division of Ser. No. 274,784, Jul. 14, 1994. This application

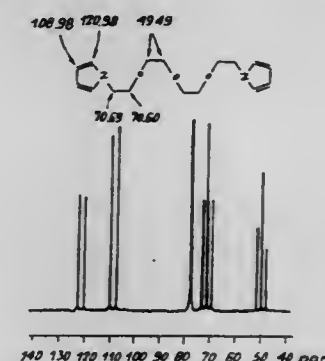
Jun. 7, 1995, Ser. No. 473,113

Claims priority, application France, Jul. 16, 1993, 93 08789

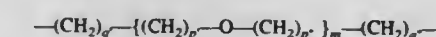
Int. Cl. C08F 128/06; 126/06; 116/12

U.S. Cl. 526-256

9 Claims



1. A polymer comprising repeating units containing a plurality of aliphatic polyether chains, each chain bonded at its ends with a heterocyclic unit consisting of at least one member selected from the group consisting of pyrrole and thiophene units, the heterocyclic units at each of different polyether chains being interconnected to each other via the 2,2'-positions of a heterocyclic unit and said aliphatic polyether chains having the formula:



with

$q'$  and  $q''$  being, independently of one another, equal to 1 or 2,  $p$  and  $p'$  being, independently of one another, equal to 1 or 2; and  $m$  being equal to 3, 4 or 5;

said chains being bonded either to the carbons at the 3,3'-positions respectively of the pyrrole or thiophene units or with regard to the pyrrole units to the nitrogen atoms.

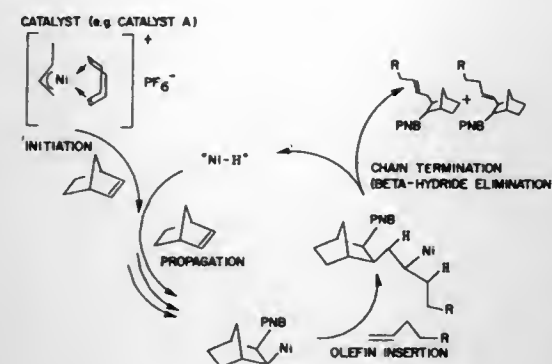


5,569,730

# ADDITION POLYMERS DERIVED FROM NORBORNENE-FUNCTIONAL MONOMERS AND PROCESS THEREFOR

Brian L. Goodall, Akron; George M. Benedikt, Solon; Lester H. McIntosh, III, Cuyahoga Falls; Dennis A. Barnes, Medina, and Larry F. Rhodes, Silver Lake, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio  
Continuation-in-part of Ser. No. 153,250, Nov. 16, 1993, Pat. No. 5,468,819. This application Nov. 15, 1994, Ser. No. 339,863

Int. Cl.<sup>6</sup> C08F 10/00; 34/00; 32/02; 32/08  
U.S. Cl. 526—282 19 Claims



1. An addition polymer consisting essentially of repeating units polymerized from one or more norbornene-functional monomers, and optionally one or more monocyclomonoolefins, terminated with an olefinic moiety introduced to said polymer via a chain transfer agent selected from a compound having a terminal olefinic double bond between adjacent carbon atoms, excluding styrenes, vinyl ethers, and conjugated dienes, and at least one of said adjacent carbon atoms has two hydrogen atoms attached thereto, wherein said olefinic moiety is exclusively located at a terminal end of said polymer.

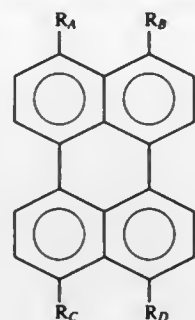
5,569,731

# N,N'-DISUBSTITUTED PERYLENE DIAMIDE

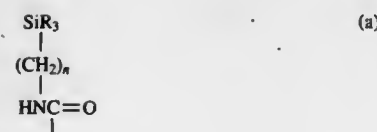
Harold G. Linde, HCR Box 188; Rosemary A. Previti-Kelly, RD 1, Box 213-7, both of Richmond, Vt. 05477, and Thomas J. Reen, 14 Williams St., Essex Junction, Vt. 05452  
Division of Ser. No. 250,224, May 27, 1994, Pat. No. 5,451,655. This application Jun. 7, 1995, Ser. No. 476,791

Int. Cl.<sup>6</sup> C08G 77/26  
U.S. Cl. 528—26 1 Claim

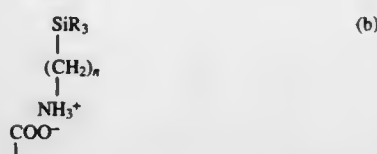
1. An N,N'-disubstituted perylene diamide of formula



where R<sub>A</sub>, R<sub>B</sub>, R<sub>C</sub> and R<sub>D</sub> are selected from the group consisting of (a) an amide and (b) a carboxylate of formula



and



wherein n is an integer from three to eight and R is the same or different residues chosen from the group consisting of hydroxy, alkoxy, phenoxy and the residue of a silsesquioxane polymer and with the proviso that only one of R<sub>A</sub> and R<sub>B</sub> is the amide and only one of R<sub>C</sub> and R<sub>D</sub> is the amide.

5,569,732

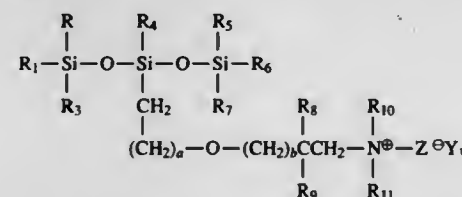
# ANTIMICROBIAL SILOXANE QUATERNARY AMMONIUM SALTS

Ronald S. Nohr, Roswell, and John G. MacDonald, Decatur, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 249,788, May 26, 1994, which is a continuation-in-part of Ser. No. 76,529, Jun. 11, 1993, abandoned. This application May 25, 1995, Ser. No. 450,451  
Int. Cl.<sup>6</sup> C08G 77/388; C07F 7/10

U.S. Cl. 528—27 10 Claims

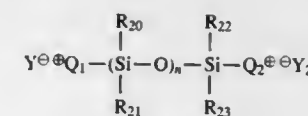
1. A siloxane quaternary ammonium salt having either the general formula A,



wherein:

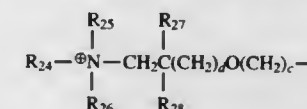
- (1) each of R<sub>1</sub>-R<sub>7</sub> is independently selected from the group consisting of monovalent C<sub>1</sub>-C<sub>20</sub> alkyl, phenyl, and phenyl-substituted C<sub>1</sub>-C<sub>20</sub> alkyl groups, in which each phenyl can be substituted or unsubstituted;
- (2) each of R<sub>8</sub> and R<sub>9</sub> is a monovalent group independently selected from the group consisting of (a) hydrogen and (b) monovalent alkyl, cycloalkyl, aryl, and heterocyclic groups and combinations thereof having up to about 30 carbon atoms, except that both R<sub>8</sub> and R<sub>9</sub> cannot be hydrogen; or, when taken together in combination with the carbon atom to which they are attached, R<sub>8</sub> and R<sub>9</sub> represent a carbonyl group;
- (3) each of R<sub>10</sub> and R<sub>11</sub> is a methyl group;
- (4) a represents an integer from 1 to about 20;
- (5) b represents an integer from 1 to about 20;
- (6) Z is a monovalent group having from about 8 to about 30 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, and heterocyclic groups, and combinations thereof, wherein Z is terminated by an alkyl moiety which includes at least about 8 carbon atoms in a single continuous chain;
- (7) Y<sub>1</sub> is an anion which does not cause thermal degradation of the siloxane quaternary ammonium salt to be more than 36 weight % when heated to 232° C. for 30 minutes under a nitrogen atmosphere; and
- (8) said siloxane quaternary ammonium salt has a molecular weight of from about 600 to about 1,700; or the general

formula B,



wherein:

- (1) each of R<sub>20</sub>-R<sub>23</sub> is independently selected from the group consisting of monovalent C<sub>1</sub>-C<sub>20</sub> alkyl, phenyl, and phenyl-substituted C<sub>1</sub>-C<sub>20</sub> alkyl groups, in which each phenyl can be substituted or unsubstituted;
- (2) n represents an integer of from 1 to about 19;
- (3) each of Q<sub>1</sub> and Q<sub>2</sub> represents an independently selected quaternary ammonium group having the general formula,



in which:

- (a) R<sub>24</sub> is a monovalent alkyl group having from about 8 to about 30 carbon atoms, at least about 8 carbon atoms of which make up a single continuous chain;
- (b) R<sub>25</sub> and R<sub>26</sub> methyl groups;
- (c) each of R<sub>27</sub> and R<sub>28</sub> is a monovalent group selected from the group consisting of (i) hydrogen and (ii) monovalent alkyl, cycloalkyl, aryl, and heterocyclic groups and combinations thereof having up to about 30 carbon atoms, except that both R<sub>27</sub> and R<sub>28</sub> cannot be hydrogen; or, when taken together in combination with the carbon atom to which they are attached, R<sub>27</sub> and R<sub>28</sub> represent a carbonyl group;
- (d) c represents an integer of from 2 to about 20; and
- (e) d represents an integer of from 2 to about 20;
- (4) Y<sub>2</sub> is an anion which does not cause thermal degradation of the siloxane quaternary ammonium salt to be more than 36 weight % when heated to 232° C. for 30 minutes under a nitrogen atmosphere; and
- (5) said siloxane quaternary ammonium salt has a polydispersity of up to about 3.0 and a weight-average molecular weight of from about 800 to about 2,000.

5,569,733

# TERTIARY AMINOUREA COMPOSITIONS AND THEIR USE AS CATALYSTS IN CURABLE COMPOSITIONS

Karen D. Donnelly, Allison Park, and Joseph M. Makhoul, Mars, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

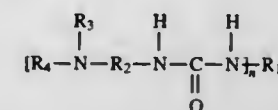
Filed Mar. 31, 1994, Ser. No. 220,659

Int. Cl.<sup>6</sup> C08G 18/32

U.S. Cl. 528—61

36 Claims

1. A composition comprising the reaction product of:  
(i) a material having the structure:



wherein R<sub>1</sub> is an organic radical having 6 to 25 carbon atoms, R<sub>2</sub> is alkylene having one to four carbon atoms; R<sub>3</sub> and R<sub>4</sub> are independently alkyl having one to four carbon atoms; and n is 2-4; and  
(ii) an acidic hydrogen-containing compound that provides a tertiary amino urea reaction product with a melting point to prevent melting before heating.

5,569,734

# CURABLE EPOXY RESIN MIXTURES CONTAINING METAL SALTS

Klaus Petschel, Hartheim, and Uwe Weinzierl, Jena, both of Germany, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed May 3, 1995, Ser. No. 432,112

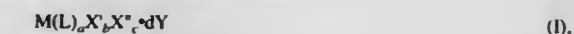
Claims priority, application Switzerland, May 10, 1994, 1458/94

Int. Cl.<sup>6</sup> C08G 59/68; 59/70

U.S. Cl. 528—92

13 Claims

1. A curable mixture comprising  
(a) an epoxy compound having on average more than one epoxy group per molecule,  
(b) a metal complex salt of formula I



wherein

M is a cation of a transition metal,  
L is a heterocyclic Lewis base,  
a is a number from 2 to 6,  
X<sup>+</sup> is an anion of an acid radical,  
X<sup>-</sup> is SCN<sup>-</sup> or OCN<sup>-</sup>,  
b and c are numbers greater than 0, and the sum of b and c corresponds to the valency of the cation of the transition metal,  
Y is a solvent molecule, and  
d is 0 to 5, and  
as an optional component  
(c) a hardener other than (b) for epoxy resins wherein X<sup>+</sup> and X<sup>-</sup> are not the same.

5,569,735

Patent Not Issued For This Number

5,569,736

# INORGANIC-ORGANIC COMPOSITE POLYMERS AND METHODS OF MAKING

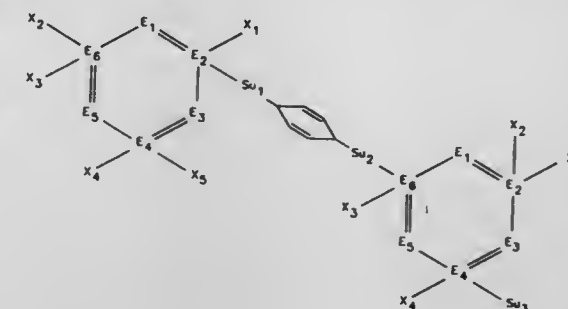
Mira A. Josowicz, and Gregory J. Exarhos, both of Richland, Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Nov. 22, 1994, Ser. No. 344,786

Int. Cl.<sup>6</sup> C08G 4/00; 16/00; C25B 1/00; 3/00

U.S. Cl. 528—223

24 Claims



10. An inorganic-organic composite polymer material, comprising:  
at least two molecules of a speciated inorganic heterocyclic compound bonded to at least one molecule of a cyclic organic radical anion urea compound wherein the bonding between said first and second compounds is by nucleophilic substitution.

5,569,737

**PROCESS FOR MAKING A POLYETHERESTER BY INSERTION OF A CARBOXYLIC ACID INTO A POLYETHER**

Lau S. Yang, Wilmington, Del., and Jeffrey A. Klang, Exton, Pa., assignors to Arco Chemical Technology, L.P., Greenville, Del.

Division of Ser. No. 228,845, Apr. 18, 1994, Pat. No. 5,436,314. This application Apr. 10, 1995, Ser. No. 419,323

Int. Cl.<sup>6</sup> C08G 63/82

U.S. Cl. 528—274

15 Claims

1. A process for making an unsaturated polyetherester resin from a polyether, said process comprising reacting the polyether with an unsaturated dicarboxylic acid in the presence of a protic acid having a pKa less than about 0 in an amount effective to promote random insertion of the dicarboxylic acid into polyether carbon-oxygen bonds and produce an unsaturated polyetherester resin.

5,569,738

**MELT PROCESSABLE ETHERIMIDEIMIDE/ ETHERIMIDE COPOLYMER**

Kil Y. Choi, Jong C. Won, Young T. Hong, all of Taejeon; Sang S. Woo, and Youn S. Don, both of Seoul, all of Rep. of Korea, assignors to Korea Research Institute of Chemical Technology, and Cheil Industries, Inc., both of Rep. of Korea

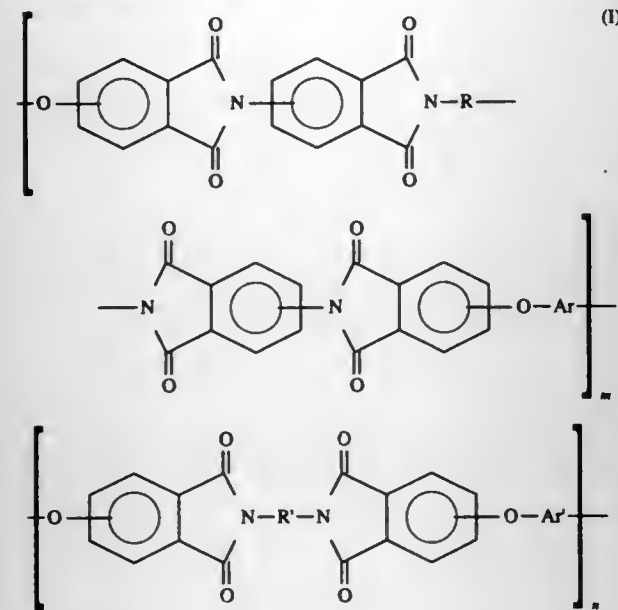
Continuation-in-part of Ser. No. 193,126, May 17, 1994, abandoned. This application Mar. 14, 1995, Ser. No. 403,315

Int. Cl.<sup>6</sup> C08G 73/10; 69/26

U.S. Cl. 528—170

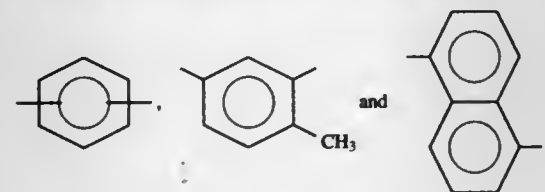
4 Claims

1. A copolymer of etherimideimide/etherimide with the following structural formula (I)

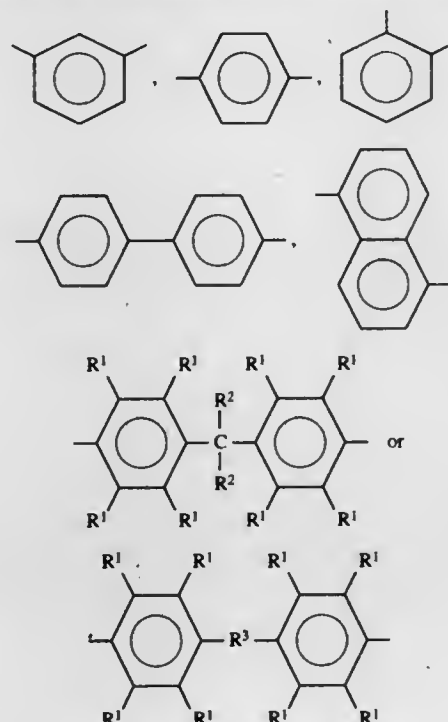


wherein,

R and R' are independently selected from the groups of



Ar and Ar' are independently selected from the groups of



(wherein,

R1 is H or C1-C6 alkyl group,

R2 is H or C1-C4 alkyl group, and

R3 is —O—, —CO—, —SO—, —SO2—; and

n and m are independently an integer between 5 and 500.

5,569,739

**ADHESIVE LAYER IN MULTI-LEVEL PACKAGING AND ORGANIC MATERIAL AS A METAL DIFFUSION BARRIER**

Eleftherios Adamopoulos, Bronx; Kang-Wook Lee, Yorktown Heights; Terrence R. O'Toole, Hopewell Junction; Sampath Purushothaman, Yorktown Heights, all of N.Y.; Jane M. Shaw, Ridgefield, Conn.; Alfred Viehbeck, Stormville, and George F. Walker, New York, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

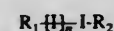
Division of Ser. No. 771,929, Oct. 7, 1991, Pat. No. 5,326,643. This application Feb. 17, 1994, Ser. No. 197,941

Int. Cl.<sup>6</sup> C08F 8/34

U.S. Cl. 528—353

16 Claims

1. A polyimide having the structure:



wherein I is an imide group, isoimide group, amic acid group or an ester of said amic acid with an organo hydroxy compound having from one to about six carbon atoms, I being made of a cyclic diamine and a cyclic tetracarboxylic acid anhydride, an unsaturated heterocyclic diamine or a diamino organo phosphine;

n is from about one to about 100;

R1 is an imide of an amino organo phosphine; an imide of an unsaturated heterocyclic amine an imide of an unsaturated heterocyclic dicarboxylic acid;

R2=R1 or an imide of an acetylene amine or an imide of a vinyl amine.

5,569,740

**DEPROTEINIZED NATURAL RUBBER LATEX AND ITS PRODUCTION PROCESS**

Yasuyuki Tanaka, Tokyo; Kazuhiko Shibata, Osaka; Kenichi Ikeda, Osaka; Yuji Nishida, Osaka; Masaharu Hayashi, Wakayama; Shinichi Nakade, Hyogo; Akihito Kuga, and Eiji Kanamaru, both of Tochigi, all of Japan, assignors to Nitto Denko Corporation, Osaka; Kao Corporation, Tokyo, and Sumitomo Rubber Industries, Ltd., Hyogo, all of Japan

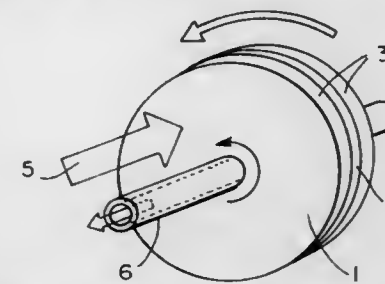
Filed Feb. 17, 1995, Ser. No. 390,031

Claims priority, application Japan, Feb. 25, 1994, 6-052989

Int. Cl.<sup>6</sup> C08F 3/26; C08C 1/04; 2/00; B01D 71/24

U.S. Cl. 528—502 F

9 Claims



1. A deproteinized natural rubber latex which comprises a purified product of proteolytically treated natural rubber latex and contains fine particles of natural rubber latex.

5,569,741

**CYCLIC OCTAPEPTIDE NEUROMEDIN B RECEPTOR ANTAGONISTS**

David H. Coy, New Orleans, La., and John E. Taylor, Upton, Mass., assignors to Biomeasure, Inc., Milford, Mass., and The Administrators of the Tulane Educational Fund, New Orleans, La.

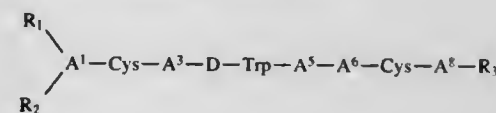
Continuation-in-part of Ser. No. 78,419, Jun. 17, 1993, Pat. No. 5,462,926, which is a continuation-in-part of Ser. No. 919,537, Jul. 27, 1992, abandoned. This application Dec. 8, 1994, Ser. No. 352,392

Int. Cl.<sup>6</sup> A61K 38/00; C07K 5/00; 7/00; 17/00

U.S. Cl. 530—311

24 Claims

1. A cyclic octapeptide of the formula:



wherein:

A<sup>1</sup> is D-Nal or D-Trp;

A<sup>3</sup> is Phe, F<sub>5</sub>-Phe, or X-Phe wherein X is a halogen, NO<sub>2</sub>, CH<sub>3</sub>, or OH;

A<sup>5</sup> is —NH—CH(Y)—CO— wherein Y is (CH<sub>2</sub>)<sub>m</sub>—R<sub>4</sub>—N(R<sub>5</sub>)(R<sub>6</sub>) or (CH<sub>2</sub>)<sub>m</sub>—R<sub>4</sub>—NH—C(R<sub>7</sub>)—N(R<sub>5</sub>)(R<sub>6</sub>);

A<sup>6</sup> is the D— or L— isomer of an amino acid selected from the group consisting of Thr, Leu, Ile, Nle, Val, and Abu;

A<sup>8</sup> is Nal or Trp;

m is 1, 2, or 3;

n is 1, 2, 3, 4 or 5;

each of R<sub>1</sub> and R<sub>2</sub>, independently, is H, E, COE, or COOE wherein E is C<sub>1-12</sub> alkyl, C<sub>2-12</sub> alkenyl, C<sub>2-12</sub> alkynyl, phenyl, naphthyl, C<sub>7-12</sub> phenylalkyl or alkylphenyl, C<sub>8-12</sub> phenylalkenyl or alkynylphenyl, C<sub>8-12</sub> phenylalkynyl or alkynylphenyl, C<sub>11-20</sub> naphthylalkyl or alkylphenyl, C<sub>12-20</sub> naphthylalkenyl or alkynylphenyl, or C<sub>12-20</sub> naphthylalkynyl or alkynylphenyl, provided that when one of R<sub>1</sub> or R<sub>2</sub> is COE or COOE, the other must be H;

R<sub>4</sub> is C<sub>6</sub>H<sub>4</sub> or absent;

R<sub>5</sub> is —NR<sub>6</sub>, —S, or —O; and

each of R<sub>3</sub>, R<sub>5</sub>, R<sub>6</sub>, and R<sub>8</sub>, independently, is H or E.

5,569,742

**CENTRALLY TRUNCATED NPY CYCLIC PEPTIDES**

Dean A. Kirby, San Diego, and Jean E. F. Rivier, La Jolla, both of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

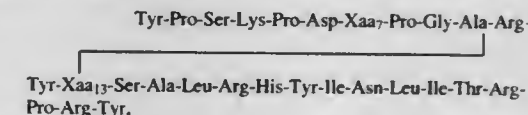
Filed Jun. 22, 1994, Ser. No. 264,030

Int. Cl.<sup>6</sup> C07K 7/64; A61K 38/12

U.S. Cl. 530—317

5 Claims

1. A cyclic peptide having selective bioactivity for NPY Y1 receptors of the formula (SEQ ID NO:3):



wherein the C-terminus is amidated and wherein residues Xaa<sub>7</sub> and Xaa<sub>13</sub> are selected from the group consisting of the pairs: Cys, Cys; Asp, Dpr; Asp, Dbu; and Asp, Agl, respectively.

5,569,743

**ANTI-OBESITY PROTEINS**

Richard D. DiMarchi, Carmel; David B. Flora, Greenfield; William F. Heath, Jr., Fishers; James A. Hoffman, Greenwood; James E. Shields, Noblesville, and David L. Smiley, Greenfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 31, 1995, Ser. No. 381,054

Int. Cl.<sup>6</sup> A61K 38/00; C07K 14/00

U.S. Cl. 530—324

12 Claims

1. A biologically active peptide of the formula: SEQ ID NO: 1 or a pharmaceutically acceptable salt thereof.

5,569,744

**ANTI-OBESITY PROTEINS**

Margret B. Basinski, Indianapolis; Richard D. DiMarchi, Carmel; David B. Flora, Greenfield; William F. Heath, Jr., Fishers; James A. Hoffmann, Greenwood; Brigitte E. Schoner, Monrovia; James E. Shields, Noblesville, and David L. Smiley, Greenfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 381,247, Jan. 31, 1995, abandoned. This application Feb. 6, 1995, Ser. No. 383,632

Int. Cl.<sup>6</sup> A61K 38/00; C07K 14/00

U.S. Cl. 530—324

22 Claims

1. A biologically active peptide of the formula: SEQ ID NO: 1 or a pharmaceutically acceptable salt thereof.

5,569,745

**PEPTIDE-CHELATOR CONJUGATES**

Anne Goodbody, and Alfred Pollak, both of Toronto, Canada, assignors to Resolution Pharmaceuticals Inc., Mississauga, Canada

Filed Feb. 25, 1994, Ser. No. 202,178

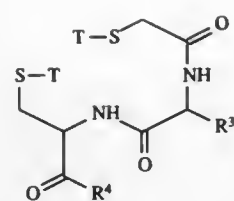
Int. Cl.<sup>6</sup> A61K 38/00; C07K 5/00; 7/00

U.S. Cl. 530—328

8 Claims

1. A peptide-metal chelator conjugate useful for imaging of sites of inflammation, wherein said metal chelator is coupled to the N-terminus of a peptide consisting of the sequence Thr-Lys-Pro-Pro-Arg (SEQ ID No: 2), wherein the metal chelator has the general formula:





wherein

R<sub>3</sub> is selected from H; alkyl; and alkyl substituted by a group selected from amine, aminoacyl, carboxyl, guanidiny, hydroxyl, thiol, phenyl, phenolyl, indolyl and imidazolyl; R<sub>4</sub> is selected from hydroxyl, alkoxy and a linking group; and T represents H or a sulfur protecting group.

5,569,746

# PROCESS FOR PREPARING ALKYL-SUBSTITUTED CYCLOPENTADIENYL METALLOCENE COMPOUNDS

John Y. Lee, and Edward A. Burt, both of Baton Rouge, La., assignors to Albemarle Corporation, Richmond, Va.

Filed Jan. 23, 1995, Ser. No. 376,973

Int. Cl.<sup>6</sup> C07F 5/00; 17/00; 7/00

U.S. Cl. 534—11

8 Claims

1. A process for making a metallocene, said process comprising the steps of (a) reacting an alkyl-substituted cyclopentadiene ligand, which contains a mixture of endo and exo isomers, with up to about a 10% excess over a stoichiometric amount of a deprotonation agent, based on the amount of endo-isomers, so as to form a salt of said endo-isomers, (b) reacting the endo-isomer salt with a transition or actinide metal compound so as to form said metallocene and (c) optionally separating said exo-isomer from said metallocene by distillation.

5,569,747

# REACTIVE DISAZO DYESTUFFS WHICH CONTAIN TWO HETEROCYCLIC REACTIVE GROUPS

Horst Jäger, Leverkusen, and Joachim Wolff, Odenthal, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 25, 1994, Ser. No. 296,309

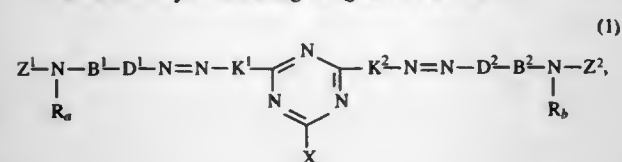
Claims priority, application Germany, Sep. 1, 1993, 43 29 420.0

Int. Cl.<sup>6</sup> C09B 62/03; 62/25; D06P 1/382

U.S. Cl. 534—630

11 Claims

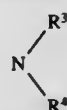
1. A reactive dyestuff having the general formula (1)



in which

K<sup>1</sup> and K<sup>2</sup> denote coupling components which are identical or different, D<sup>1</sup> and D<sup>2</sup>, independently of one another, represent a substituted or unsubstituted benzene or naphthalene radical, R<sub>4</sub> and R<sub>5</sub>, independently of one another, denote hydrogen or substituted or unsubstituted C<sub>1</sub>–C<sub>4</sub>-alkyl, B<sup>1</sup> and B<sup>2</sup>, independently of one another, represent a direct bond or a bridging member,

Z<sup>1</sup> and Z<sup>2</sup>, independently of one another, represent a pyrimidine reactive group containing chlorine or fluorine as the leaving group, or represent 2,3-dichloroquinoxaline-6-carboxyl, represents SR<sup>1</sup>, OR<sup>2</sup>, or



in which,

R<sup>1</sup> denotes substituted or unsubstituted C<sub>1</sub>–C<sub>4</sub>-alkyl, substituted or unsubstituted phenyl, naphthyl or 2-benzthiazolyl, R<sup>2</sup> represents hydrogen, substituted or unsubstituted C<sub>1</sub>–C<sub>4</sub>-alkyl or substituted or unsubstituted phenyl or naphthyl, R<sup>3</sup> represents hydrogen or an aliphatic, cycloaliphatic, heterocyclic or araliphatic radical, and R<sup>4</sup> has the meaning of R<sup>3</sup> or represents an aromatic radical, or in which R<sup>3</sup> and R<sup>4</sup>, with the inclusion of a further hetero atom, optionally form a 5- or 6-membered ring.

5,569,748

# 2-AMINO-8-HYDROXY-6-SULFONAPHTHALENE-CONTAINING MONOAZO REACTIVE DYES

Uwe Reiher, Hofheim, and Werner H. Russ, Flörsheim, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Jul. 28, 1994, Ser. No. 281,842

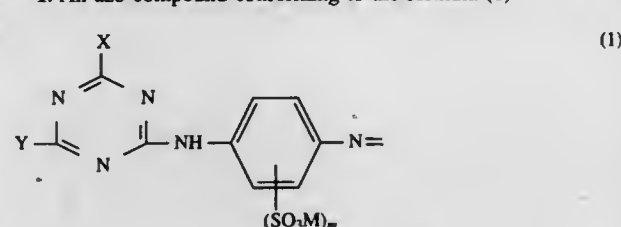
Claims priority, application Germany, Jul. 31, 1993, 43 25 784.4

Int. Cl.<sup>6</sup> C09B 62/51; 62/085; D06P 1/38

U.S. Cl. 534—642

7 Claims

1. An azo compound conforming to the formula (1)



where:

M is hydrogen or an alkali metal;

m is 1 or 2;

X is fluorine, chlorine or a group of the formula (2a) or (2b)

R<sup>4</sup>—O—

(2a)

R<sup>5</sup>—NH—

(2b)

where

R<sup>4</sup> is alkyl of 1 to 10 carbon atoms or cycloalkyl of 5 to 8 carbon atoms optionally substituted by 1 or 2 methyl groups, or is alkyl of 2 to 8 carbon atoms which is interrupted by one or two hetero groups selected from the groups of the formulae —O—, —NH—, —NH—CO—, —CO—NM—, —CO—, —SO<sub>2</sub>—, —NH—SO<sub>2</sub>— or —SO<sub>2</sub>—NH—, or is benzyl or sulfoalkyl of 1 to 4 carbon atoms, and

R<sup>5</sup> is hydrogen, alkyl of 1 to 10 carbon atoms or cycloalkyl of 5 to 8 carbon atoms which may be additionally substituted by 1 or 2 methyl groups, or is alkyl of 2 to 8 carbon atoms which

5,569,749

# ORGANIC PHOTOCONDUCTIVE MATERIAL AND A PHOTSENSITIVE MATERIAL FOR ELECTRONIC PHOTOGRAPHY USING IT

Hisao Kouno, Funabashi; Shyouichi Takahashi; Kazuhiro Higashide, both of Kawaguchi; Nakaji Komiyama, Urawa; Osamu Suda, Ohmiya, and Masaru Hasegawa, Tokyo, all of Japan, assignors to Dainichiseika Color & Chemicals Mfg. Co., Ltd., Tokyo, Japan

Division of Ser. No. 202,355, Feb. 28, 1994, Pat. No.

5,506,346. This application Jan. 18, 1996, Ser. No. 588,091

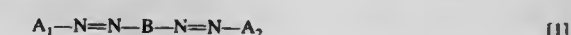
Claims priority, application Japan, Jun. 7, 1993, 5-163206

Int. Cl.<sup>6</sup> G03G 5/06; C07C 245/02

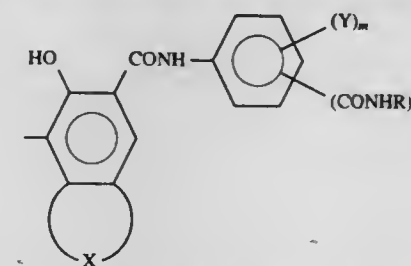
U.S. Cl. 534—653

2 Claims

1. A photosensitive material for electronic photography comprising a photosensitive layer containing azo compound represented by the general formula [1]



wherein B is a divalent organic group bonded to nitrogen atoms forming azo groups, A1 and A2 are groups different from each other, A<sub>1</sub> is represented by the following general formula [A1]:



where

M is as defined above,

Z is vinyl or is ethyl which is substituted in the β-position by a substituent which is eliminable by alkali to leave the vinyl group,

alk is alkylene of 2 to 4 carbon atoms,

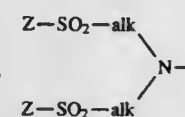
R<sup>1</sup> is hydrogen, carboxy, sulfo or a group of the formula —SO<sub>2</sub>—Z, wherein Z is as defined above,

R<sup>2</sup> is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, chlorine, bromine, carboxy, sulfo or nitro;

R<sup>3</sup> is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, chlorine or bromine, and

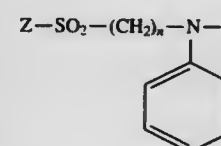
R<sup>4</sup> is hydrogen, sulfo or carboxy, or

Y is a group of the formula (3b)



where Z and alk are each as defined above, or

Y is a group of the formula (3c)



where

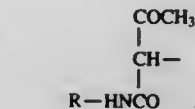
n is from 1 to 4, and

Z is vinyl or is ethyl which is substituted in the β-position by a substituent which is eliminated by alkali to leave the vinyl group.

(3b) (a<sub>1</sub>—HNOC)<sub>p</sub> OH

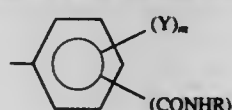
[A2]

(3c)



[A3]

wherein is a group selected from R, —N=CH—R and



R, X, Y, m and n are the same as those in the general formula [A1] and p is 0 or 1.

5,569,750

# RTV SILICONE COMPOSITIONS USING AMINOHYDROCARBYL-SUBSTITUTED KETOXIMINOSILANES

Jeffrey A. Knepper, Branchburg; Dale R. Flackett, Somerset, and Edward T. Asirvatham, Madison, all of N.J., assignors to AlliedSignal Inc., Morris County, N.J.

Filed May 24, 1994, Ser. No. 248,118

Int. Cl.<sup>6</sup> C08K 5/24; C08L 83/04; C08G 77/04

U.S. Cl. 524—731

21 Claims

1. A storage stable silicone composition which is curable to an elastomer in the presence of moisture which comprises:

(A) at least one silanol terminated diorganosiloxane polymer in an amount sufficient to form a silicone composition which is curable to an elastomer upon crosslinking;

(B) at least one silane crosslinking agent, present in an amount sufficient to crosslink the diorganosiloxane polymer in the presence of moisture, having the formula  $R_{4-n}Si(OR)_n(ON=CR^1R^2)_{n-p}$  wherein R and R' independently of each other may be any saturated straight chain or branched alkyl radical having 1 to 8 carbon atoms, n is 3 or 4, p is 0 to 3 wherein the sum of n and p is at least 3, and R<sup>1</sup> and R<sup>2</sup> independently of each other may be any saturated straight chain or branched alkyl radical of 1 to 8 carbon atoms;

(C) at least one filler in an amount sufficient to thicken the silicone composition; and

(D) at least one aminohydrocarbyl substituted ketoximinosilane adhesion promoter, present in an amount sufficient to increase the adhesion of the composition to a substrate, having the formula  $(R^3R^4C=NO)_2SiR^5NHR^6$ , wherein R<sup>3</sup> and R<sup>4</sup> are identical or different monovalent straight chain or branched hydrocarbon radicals containing from 1 to 8 carbon atoms, R<sup>5</sup> is a monovalent hydrocarbon radical, a monovalent fluorinated hydrocarbon radical, or an alkoxy group containing from 1 to 4 carbon atoms, provided that when more than one R<sup>5</sup> substituent is present, these substituents may be identical or different, R<sup>6</sup> is a divalent hydrocarbon radical containing from 2 to 20 carbon atoms, R<sup>7</sup> is a monovalent hydrocarbon radical or a hydrogen atom, and x is 1, 2, or 3.

5,569,751

# MONOAZO DYESTUFFS WHICH ARE FREE FROM IONIC GROUPS, THEIR PREPARATION AND THEIR USE

Ulrich Bühler, Alzenau, Germany, assignor to Hoechst Mitsubishi Kasei Co., Japan

Filed May 24, 1995, Ser. No. 447,540

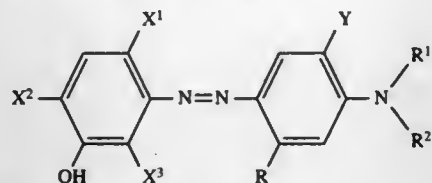
Claims priority, application Germany, Jun. 3, 1994, 44 19 622.9

Int. Cl.<sup>6</sup> C09B 29/01; 29/085; 39/00; D06P 1/18

U.S. Cl. 534—850

19 Claims

1. An azo dyestuff of the formula I



in which

X<sup>1</sup> and X<sup>2</sup> independently of one another are nitro, bromine, chlorine or hydrogen, and wherein at least one of the radicals X<sup>1</sup> and X<sup>2</sup> is nitro,

X<sup>3</sup> is hydrogen, chlorine or bromine,

R is hydrogen, hydroxyl, chlorine, methyl, methoxy, ethoxy, (C<sub>1</sub>-C<sub>4</sub>)-alkylcarbonylamino, (C<sub>1</sub>-C<sub>4</sub>)-alkylsulfonylamino,

(C<sub>1</sub>-C<sub>4</sub>)-alkoxycarbonylamino, (C<sub>1</sub>-C<sub>4</sub>)-alkylcarbonylamino which is substituted by hydroxyl, (C<sub>1</sub>-C<sub>4</sub>)-alkoxy, chlorine, bromine, cyano, phenyl or phenoxy, (C<sub>1</sub>-C<sub>4</sub>)-alkylsulfonylamino or (C<sub>1</sub>-C<sub>4</sub>)-alkoxycarbonylamino which are substituted by hydroxyl, (C<sub>1</sub>-C<sub>4</sub>)-alkoxy, chlorine, bromine or cyano,

Y is hydrogen, chlorine, methoxy, ethoxy, methoxyethoxy or ethoxyethoxy and

R<sup>1</sup> and R<sup>2</sup> independently of one another are (C<sub>1</sub>-C<sub>4</sub>)-alkyl; (C<sub>1</sub>-C<sub>4</sub>)-alkyl which is substituted by hydroxyl, (C<sub>1</sub>-C<sub>4</sub>)-alkoxy, alkoxyalkoxy having a total of up to 6 C atoms, hydroxyalkoxy having up to 4 C atoms, hydroxyalkoxyalkoxy having up to 6 C atoms, cyanoalkoxy having 2 to 5 C atoms, cyanoalkoxy having 2 to 5 C atoms, (C<sub>1</sub>-C<sub>4</sub>)-alkylcarbonyloxy, (C<sub>1</sub>-C<sub>4</sub>)-alkoxycarbonyloxy, (C<sub>1</sub>-C<sub>4</sub>)-alkoxycarbonyl or (C<sub>1</sub>-C<sub>4</sub>)-alkylcarbonyloxy, (C<sub>1</sub>-C<sub>4</sub>)-alkoxycarbonyloxy or (C<sub>1</sub>-C<sub>4</sub>)-alkoxycarbonyl which are substituted by hydroxyl, chlorine, bromine, cyano or (C<sub>1</sub>-C<sub>4</sub>)-alkoxy, or allyl or hydrogen, or one of the radicals R<sup>1</sup> or R<sup>2</sup> furthermore is phen-(C<sub>0</sub>-C<sub>3</sub>)-alkyl, phenoxyethyl or cyclohexyl.

5,569,752

# PROCESS FOR THE PRODUCTION OF LOWER ALKYL OLIGOGLUCOSIDES

Paul Schulz, Wuppertal; Herbert Esser, Troisdorf, and Rainer Eskuchen, Langenfeld, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP92/02748, § 371 Date Jun. 6, 1994, § 102(e) Date Jun. 6, 1994, PCT Pub. No. WO93/11142, PCT Pub. Date Jul. 10, 1993

PCT Filed Nov. 27, 1992, Ser. No. 244,647

Claims priority, application Germany, Dec. 6, 1991, 41 40 334.7

Int. Cl.<sup>6</sup> C07H 15/00; 17/00; 1/00; C07G 3/00

U.S. Cl. 536—18.6

20 Claims

1. A process for producing a lower alkyl oligoglucoside comprising the steps of:

- (1) adding an aqueous glucose sirup to a heated mixture of a lower alcohol and an acidic catalyst in an inline mixer;
- (2) removing the water of solution and the water of reaction from the resulting mixture by azeotropic distillation with said lower alcohol; and
- (3) heating the mixture following step (2) until at least 99% of the glucose is reacted.

5,569,753

# CANCER DETECTION PROBES

Michael Wigler, Lloyd Harbor, and Nikolai Lisitsyn, Cold Spring Harbor, both of N.Y., assignors to Cold Spring Harbor Laboratory, Cold Spring Harbor, N.Y.

Filed Dec. 20, 1994, Ser. No. 360,096

Int. Cl.<sup>6</sup> C07H 21/04; 19/00

U.S. Cl. 536—24.3

4 Claims

1. A DNA probe for detecting genomic lesions associated with cancer, said probe comprising:

- (a) a DNA sequence of 18 to 1000 bp selected from the group consisting of SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6, SEQ ID NO: 7, SEQ ID NO: 8, SEQ ID NO: 9, SEQ ID NO: 10, SEQ ID NO: 11, SEQ ID NO: 12, SEQ ID NO: 13, SEQ ID NO: 14, SEQ ID NO: 15, SEQ ID NO: 16, SEQ ID NO: 17, SEQ ID NO: 18, or the fully complementary sequence thereof, or
- (b) a labeled DNA sequence of 18 to 1000 bp selected from the group consisting of SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6, SEQ ID NO: 7, SEQ ID NO: 8, SEQ ID NO: 9, SEQ ID NO: 10, SEQ ID NO: 11, SEQ ID NO: 12, SEQ ID NO: 13, SEQ ID NO: 14, SEQ ID NO: 15, SEQ ID NO: 16, SEQ ID NO: 17, SEQ ID NO: 18, or the fully complementary sequence thereof, or

5,569,757

# 9-DEAZAADENOSINE AND ITS 5'-ALPHA-D-GLYCOPYRANOSIDE ISOLATED FROM THE CYANOBACTERIUM ANABAENA AFFINIS STRAIN VS-1

Kenneth L. Rinehart, 1306 S. Carle Ave., Urbana, Ill. 61801; Wayne W. Carmichael, 1331 Rise Rd., Yellow Springs, Ohio 45387, and Michio Namikoshi, 1826 C Orchard Pl., Urbana, Ill. 61801

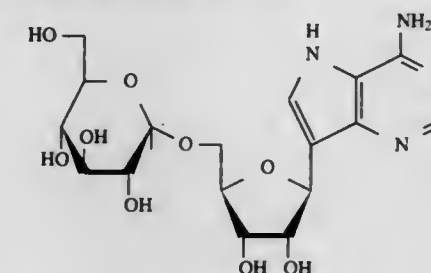
Filed Mar. 30, 1993, Ser. No. 39,984

Int. Cl.<sup>6</sup> C12N 1/12; C12P 19/60

U.S. Cl. 536—17.4

2 Claims

1. The compound having the formula 1:



substantially free of the cellular debris of the blue-green algae, *Anabaena affinis*, Strain VS-1.

5,569,755

# COLON MUCOSA GENE HAVING DOWN REGULATED EXPRESSION IN COLON ADENOMAS AND ADENOCARCINOMAS

Clifford W. Schweinfest, Hampstead, and Takis S. Papas, Potomac, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 26,045, Mar. 5, 1993, abandoned.

This application Apr. 17, 1995, Ser. No. 424,567

Int. Cl.<sup>6</sup> C12N 15/12; 15/11; C07K 14/435

U.S. Cl. 536—23.5

6 Claims

1. A polynucleotide encoding a polypeptide according to FIGS. 1A-1J (SEQ ID NO:2).

5,569,758

# PREPARATION OF METAL-FREE PHTHALOCYANINES

Ingo Klopp, Lamsheim; Peter Böttcher, Mutterstadt; Ulrich Frick, Dudenhofen, and Otto Schiller, Bobenheim-Roxheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Dec. 16, 1994, Ser. No. 356,954

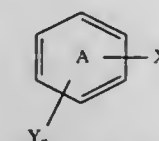
Claims priority, application Germany, Dec. 17, 1993, 43 43 302.2

Int. Cl.<sup>6</sup> C09B 47/30

U.S. Cl. 540—122

7 Claims

1. A process for preparing metal-free phthalocyanines which can carry up to 16 halogen atoms, cyano groups, carboxyl groups, sulfo groups, C<sub>1</sub>-C<sub>18</sub>-alkyl groups and aryl radicals as substituents by reductive cyclization of ortho-phthalodinitrile, substituted ortho-phthalodinitriles or mixtures thereof, which comprises effecting the cyclization in C<sub>2</sub>-C<sub>4</sub>-alkylene monoglycols, oligoglycols or polyglycols, their mono-C<sub>1</sub>-C<sub>8</sub>-alkyl or -aryl ethers or their mixtures in the presence of an aromatic compound acting as a redox catalyst of the formula I



where the substituents X can be identical or different and each denotes hydroxyl, mercapto, amino or C<sub>1</sub>-C<sub>6</sub>-alkylamino, the substituents Y can likewise be identical or different and each denotes halogen, C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>1</sub>-C<sub>6</sub>-alkoxy or C<sub>1</sub>-C<sub>6</sub>-alkoxycarbonyl, m is from 1 to 4 and n is from 0 to 5, subject to the proviso that m+n≤6, and the benzene ring A can be fused to a further benzene ring, and of an inorganic base.



5,569,759

## WATER SOLUBLE TEXAPHYRIN METAL COMPLEX PREPARATION

Jonathan L. Sessler; Gregory W. Hemmi, and Tarak D. Mody, all of Austin, Tex., assignors to Board of Regents, University of Texas System, Austin, Tex.

Division of Ser. No. 822,964, Jan. 2, 1992, Pat. No. 5,252,720, which is a continuation-in-part of Ser. No. 771,393, Sep. 30, 1991, abandoned, which is a continuation-in-part of Ser. No. 539,975, Jun. 18, 1990, Pat. No. 5,162,509, which is a division of Ser. No. 320,293, Mar. 6, 1989, Pat. No. 4,935,498. This application Jul. 28, 1993, Ser. No. 98,514

Int. Cl.<sup>6</sup> C07D 487/22

U.S. Cl. 540—472

46 Claims

1. A method for synthesizing an aromatic texaphyrin metal complex having at least one hydroxy substituent, the method comprising:

mixing a nonaromatic texaphyrin having at least one hydroxy substituent, a metal cation, a Brønsted base and an oxidant selected from the group consisting of air, oxygen, platinum oxide and 2,3-dichloro-1,4-benzoquinone, in an organic solvent that dissolves the nonaromatic texaphyrin; and stirring at ambient temperature or heating the mixture at reflux for at least two hours to form an aromatic texaphyrin metal complex having at least one hydroxy substituent.

5,569,760

## PROCESS FOR PREPARING NEVIRAPINE

Heinrich Schneider, and Albrecht Christmann, both of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Germany

Filed Jan. 12, 1995, Ser. No. 371,622

Claims priority, application Germany, Feb. 3, 1994, 44 03 311.7

Int. Cl.<sup>6</sup> C07D 471/14

U.S. Cl. 540—495

7 Claims

1. A process for preparing nevirapine which comprises reacting 2-chloro-N-(2-chloro-4-methyl-3-pyridyl)-3-pyridine carboxamide with cyclopropylamine followed by cyclisation of the product, wherein the reaction with cyclopropylamine is carried out in the presence of an oxide or hydroxide of an element of the second main or sub-group of the periodic table of elements.

5,569,761

## PROCESS FOR THE PREPARATION OF SULFONYLUREAS

Lothar Willms, Hillscheid; Stephen Lacchein, Hofheim am Taunus; Günter Schlegel, Liederbach, and Heinz Kehne, Hofheim am Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Division of Ser. No. 846,553, Mar. 5, 1992, Pat. No. 5,414,084.

This application Feb. 7, 1995, Ser. No. 384,761

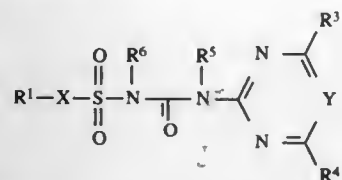
Claims priority, application Germany, Mar. 7, 1991, 41 07 326.6

Int. Cl.<sup>6</sup> C07D 239/69; 239/42; 251/42; 251/48

U.S. Cl. 544—213

10 Claims

1. A process for the preparation of a compound of the formula (I) or a salt thereof,



in which

X is oxygen,  
Y is nitrogen or CH, is (C<sub>1</sub>-C<sub>6</sub>)-alkyl, (C<sub>2</sub>-C<sub>6</sub>)-alkenyl or (C<sub>2</sub>-C<sub>6</sub>)-alkynyl, each of said three radicals are being unsub-

stituted or mono- or polysubstituted by radicals selected from the group consisting of halogen, (C<sub>1</sub>-C<sub>4</sub>)-alkoxy and (C<sub>1</sub>-C<sub>4</sub>)-alkoxycarbonyl, or is phenyl which is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, nitro, (C<sub>1</sub>-C<sub>4</sub>)-alkyl, (C<sub>1</sub>-C<sub>4</sub>)-haloalkyl, (C<sub>1</sub>-C<sub>4</sub>)-alkoxy, (C<sub>1</sub>-C<sub>4</sub>)-haloalkoxy and (C<sub>1</sub>-C<sub>4</sub>)-alkoxycarbonyl.

R<sup>3</sup>, R<sup>4</sup> are, independently of each other, hydrogen, (C<sub>1</sub>-C<sub>4</sub>)-alkyl or (C<sub>1</sub>-C<sub>4</sub>)-alkoxy, each of the last-mentioned two radicals being unsubstituted or mono- or polysubstituted by radicals selected from the group consisting of halogen, alkoxy and alkylthio, or halogen, (C<sub>1</sub>-C<sub>4</sub>)-alkylthio, (C<sub>1</sub>-C<sub>4</sub>)-alkylamino or di-(C<sub>1</sub>-C<sub>4</sub>)-alkylamino and

R<sup>5</sup>, R<sup>6</sup> are, independently of each other, hydrogen or (C<sub>1</sub>-C<sub>4</sub>)-alkyl, or their physiologically tolerated salts with acids, or, where at least one of the R<sup>5</sup> and R<sup>6</sup> radicals is hydrogen, with bases, which comprises reacting compounds of the formula II,



in which R<sup>1</sup>, R<sup>6</sup> and X are defined as in formula I, with compounds of the formula III,



in which R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup> and Y are defined as in formula I.

5,569,762

## ASYMMETRIC SYNTHESIS OF INTERMEDIATES FOR RETROVIRAL PROTEASE INHIBITOR COMPOUNDS

Allan Wissner, Ardsley, and Michael P. Trova, Salisbury Mills, both of N.Y., assignors to American Cyanamid Company, Madison, N.J.

Division of Ser. No. 181,924, Jan. 14, 1994, Pat. No. 5,428,167.

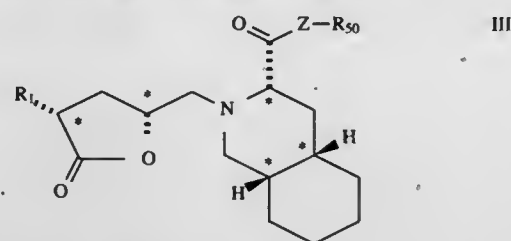
This application Mar. 22, 1995, Ser. No. 408,362

Int. Cl.<sup>6</sup> C07D 217/00

U.S. Cl. 546—146

2 Claims

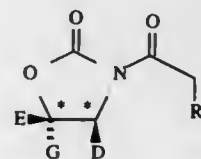
1. A method of making a compound of formula III:



wherein:

R<sub>50</sub> is a straight or branched (C<sub>1</sub>-C<sub>7</sub>)-alkyl;  
Z is a single bond, oxygen or NH;  
R<sub>1</sub> is hydrogen; straight or branched (C<sub>1</sub>-C<sub>7</sub>)-alkyl;  
—(CH<sub>2</sub>)<sub>n</sub>-cyclic(C<sub>3</sub>-C<sub>7</sub>)-alkyl, n=0-4; —(CH<sub>2</sub>)<sub>n</sub>-phenyl, n=0-4; or —(CH<sub>2</sub>)<sub>n</sub>-substituted phenyl, n=0-4, and substituted with F, Cl, Br, I, (C<sub>1</sub>-C<sub>4</sub>)-alkoxide, straight or branched (C<sub>1</sub>-C<sub>6</sub>)-alkyl or (C<sub>3</sub>-C<sub>6</sub>)-cycloalkyl which comprises:

a) deprotonating a compound of the formula:

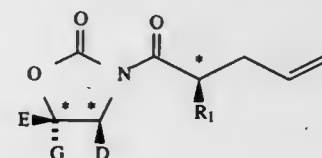


wherein

R<sub>1</sub> is as defined hereinabove;

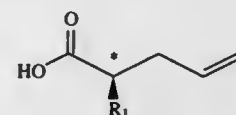
D is (C<sub>1</sub>-C<sub>7</sub>)-alkyl or —(CH<sub>2</sub>)<sub>n</sub>-phenyl, n=0-4; and

E and G are the same or different and are hydrogen, (C<sub>1</sub>-C<sub>7</sub>)-alkyl or —(CH<sub>2</sub>)<sub>n</sub>-phenyl, n=0-4; and then alkylating with allyl iodide to obtain a compound of the formula:



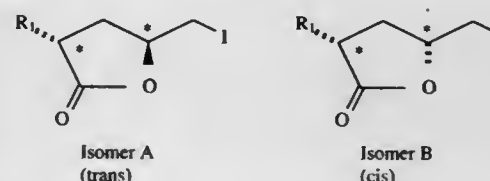
wherein R<sub>1</sub>, D, E, and G are as defined hereinabove;

b) hydrolyzing the compound obtained from step a to remove the oxazolidinone portion and obtain a compound of the formula:



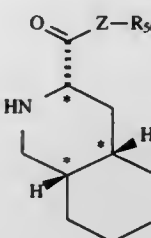
wherein R<sub>1</sub> is as defined hereinabove;

c) subjecting the compound obtained from step b to iodolactonization conditions to obtain a mixture of diastereomers, 3R-cis, 3R-trans, of the formula:



wherein R<sub>1</sub> is as defined hereinabove and separating the isomers to obtain a purified cis-iodolactone (isomer B); and

d) coupling the purified cis-iodolactone (isomer B) obtained from step c with a compound of formula:



via iodide displacement wherein R<sub>50</sub> and Z are as defined hereinabove; and obtaining a compound of formula III.

5,569,763

## HYDRAZONE COMPOUND AND THE USE THEREOF

Yoshiaki Kawamozon, Kawasaki, Japan, assignor to

Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 10, 1995, Ser. No. 401,684

Claims priority, application Japan, Mar. 15, 1994, 6-042980;

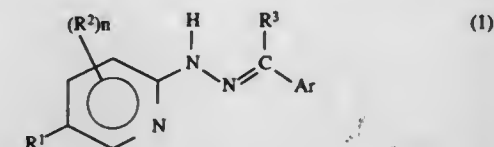
Sep. 27, 1994, 6-230840

Int. Cl.<sup>6</sup> C07D 401/02; 401/14

U.S. Cl. 546—256

6 Claims

1. A hydrazone compound represented by the following formula (1):



wherein

Ar is a nitrogen-containing aromatic heterocyclic group selected from the group consisting of 2-pyridyl, 2-imidazolyl, 4-imidazolyl, 3-pyrazolyl, 2-thiazolyl, 3-pyridazinyl, 2-pyrimidinyl, 4-pyrimidinyl, 1-phthalazinyl, 2-quinazolinyl, 2-benzothiazolyl, 2-benzimidazolyl, 2-quinolyl, 1-isoquinolyl, and 3-isoquinolyl, and said Ar binds to the hydrazone carbon at the α position with respect to a nuclear nitrogen atom; all of these groups being unsubstituted or substituted by methyl; R<sup>1</sup> is selected from the group consisting of nitro, cyano and trifluoromethyl;

R<sup>2</sup> is selected from the group consisting of nitro, cyano, trifluoromethyl, halogen and substituted or non-substituted alkyl; R<sup>3</sup> is selected from the group consisting of alkyl, aryl, 2-pyridyl, 2-imidazolyl, 4-imidazolyl, 3-pyrazolyl, 2-thiazolyl, 2-pyrrolyl, 3-indolyl, 2-furyl, 2-thienyl, 3-pyridyl, 4-pyridyl, 3-pyridazinyl, 2-pyrimidinyl, 4-pyrimidinyl, 2-pyrazinyl, 3-cinnolyl, 1-phthalazinyl, 2-quinazolinyl, 4-quinazolinyl, 2-quinolyl, 1-isoquinolyl, 3-isoquinolyl, 6-phenanthridinyl and hydrogen; all these groups except hydrogen being either substituted or not substituted; and

n is zero or an integer ranging from 1 to 3, with the provisos that when Ar is a 2-pyridyl, R<sup>1</sup> is nitro, and R<sup>3</sup> is hydrogen, n cannot be zero and that when Ar is 2- or 4-imidazolyl, R<sup>2</sup> is trifluoromethyl or halogen, and R<sup>3</sup> is hydrogen, R<sup>1</sup> can not be trifluoromethyl.

5,569,764

## N-BENZYL DIHYDROINDOLE LTD, ANTAGONISTS

J. Scott Sawyer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 166,489, Dec. 14, 1993, Pat. No.

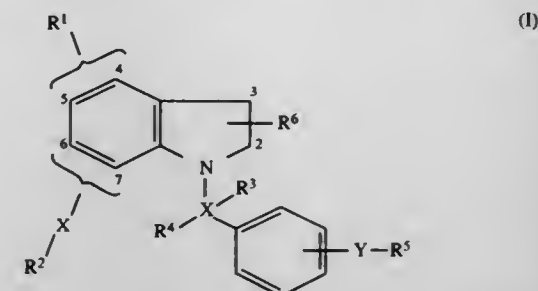
5,486,612. This application Mar. 31, 1995, Ser. No. 414,269

Int. Cl.<sup>6</sup> C07D 401/14; 409/14; A61K 31/425; 31/44

U.S. Cl. 546—268.4

7 Claims

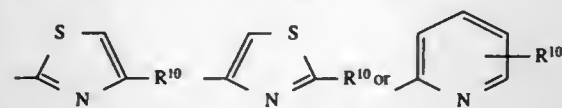
1. A compound of formula (I) or a pharmaceutically acceptable salt thereof;



wherein

R<sup>1</sup> is hydrogen, halo, C<sub>1-4</sub> alkyl, C<sub>1-4</sub> alkoxy, nitrile, optionally protected carboxy, optionally protected tetrazolyl, trihalom-

ethyl, hydroxy-C<sub>1-4</sub> alkyl, aldehyde, —CH<sub>2</sub>Z, —CH=CH—Z or —CH<sub>2</sub>CH<sub>2</sub>Z, where Z is optionally protected carboxy or optionally protected tetrazolyl;  
 R<sup>2</sup> is halo, nitrile, an optionally protected acid group, C<sub>1-4</sub> alkoxy-carbonyl, or —CONR<sup>7</sup>R<sup>8</sup> where R<sup>7</sup> and R<sup>8</sup> are each hydrogen or C<sub>1-4</sub> alkyl;  
 R<sup>3</sup> and R<sup>4</sup> are each hydrogen, C<sub>1-4</sub> alkyl, optionally substituted phenyl, or C<sub>1-4</sub> alkyl substituted by —CONR<sup>7</sup>R<sup>8</sup> or an optionally protected acid group;  
 R<sup>5</sup> is selected from the following three formulae:



where  
 R<sup>10</sup> is hydrogen, C<sub>1-4</sub> alkyl, C<sub>2-6</sub> alkenyl, C<sub>3-6</sub> cycloalkyl or C<sub>1-4</sub> alkyl-C<sub>3-6</sub> cycloalkyl; R<sup>6</sup> is hydrogen or C<sub>1-4</sub> alkyl;  
 each X is independently selected from, —O—(CH<sub>2</sub>)<sub>n</sub>—CR<sup>11</sup>R<sup>12</sup>—, —S—(CH<sub>2</sub>)<sub>n</sub>—CR<sup>11</sup>R<sup>12</sup>—, —CR<sup>11</sup>R<sup>12</sup>—(CH<sub>2</sub>)<sub>n</sub>—, —CR<sup>13</sup>R<sup>14</sup>— or —CR<sup>11</sup>—CR<sup>12</sup>—, where R<sup>11</sup>, R<sup>12</sup>, R<sup>13</sup> and R<sup>14</sup> are each hydrogen or C<sub>1-4</sub> alkyl; n is 0, 1 or 2; and  
 Y is —O—CR<sup>15</sup>R<sup>16</sup>—, —S—CR<sup>15</sup>R<sup>16</sup>—, —CR<sup>15</sup>—CR<sup>16</sup>— or —CR<sup>15</sup>R<sup>16</sup>—CR<sup>17</sup>R<sup>18</sup>— where R<sup>15</sup>, R<sup>16</sup>, R<sup>17</sup> and R<sup>18</sup> are each hydrogen or C<sub>1-4</sub> alkyl.

5,569,765

## 2-ANILINOPYRIDINE PESTICIDES

Oliver Wagner, Bexbach; Karl Eicken, Wachenheim; Eberhard Ammermann, Heppenheim, and Gisela Lorenz, Neustadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

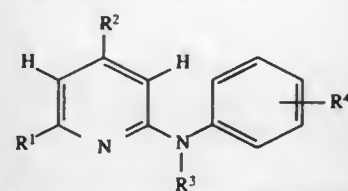
Division of Ser. No. 208,816, Mar. 11, 1994, Pat. No. 5,453,432. This application Apr. 17, 1995, Ser. No. 422,862  
 Claims priority, application Germany, Mar. 17, 1993, 43 08 395.1

Int. Cl.<sup>6</sup> C07D 213/74

U.S. Cl. 546—304

3 Claims

1. A 2-anilinyridine of the formula I



where the substituents have the following meanings:

R<sup>1</sup> is C<sub>1-6</sub>-alkyl, C<sub>2-4</sub>-alkenyl, C<sub>2-4</sub>-alkynyl, C<sub>1-6</sub>-haloalkyl, C<sub>1-6</sub>-alkoxy-C<sub>1-6</sub>-alkyl, C<sub>1-6</sub>-alkylthio-C<sub>1-6</sub>-alkyl or C<sub>3-6</sub>-cycloalkyl; C<sub>3-6</sub>-cycloalkyl, C<sub>1-6</sub>-alkoxy or C<sub>1-6</sub>-haloalkoxy substituted up to three times by identical or different C<sub>1-3</sub>-alkyl or halogen substituents; C<sub>1-2</sub>-alkyl, C<sub>2-4</sub>-alkenyl or C<sub>2-4</sub>-alkynyl substituted by hydroxyl; halogen, CN, SCN, formyl, CH=NOR<sup>6</sup>, CH=NR<sup>6</sup> or CH<sub>2</sub>NHR<sup>6</sup>;  
 R<sup>2</sup> is hydrogen or C<sub>1-6</sub>-alkyl;  
 C<sub>1-4</sub>-alkyl which is substituted by halogen, hydroxyl, cyano, C<sub>1-4</sub>-alkoxy, COOC<sub>1-3</sub>-alkyl or by phenyl, it being possible for the phenyl to be substituted by halogen, C<sub>1-3</sub>-alkyl, C<sub>1-3</sub>-alkoxy or nitro;  
 C<sub>3-6</sub>-alkenyl, C<sub>3-6</sub>-alkenyl substituted by halogen, C<sub>3-6</sub>-alkynyl or C<sub>3-6</sub>-alkynyl substituted by halogen, phenyl or phenyl substituted one to three times by halogen, C<sub>1-3</sub>-alkyl, C<sub>1-3</sub>-alkoxy or nitro or an acyl radical COR<sup>7</sup> where R<sup>7</sup> is C<sub>1-6</sub>-alkyl or C<sub>1-6</sub>-alkyl substituted by halogen or C<sub>1-3</sub>-alkoxy, C<sub>3-6</sub>-alkenyl or C<sub>3-6</sub>-alkenyl substituted by halogen;

R<sup>6</sup> is hydrogen or C<sub>1-6</sub>-alkyl,  
 C<sub>1-4</sub>-alkyl which is substituted by halogen, hydroxyl, cyano, C<sub>1-4</sub>-alkoxy, C<sub>1-4</sub>-alkylamino, C<sub>3-6</sub>-cycloalkyl or by phenyl, it being possible for the phenyl to be substituted by halogen, C<sub>1-3</sub>-alkyl, C<sub>1-3</sub>-alkoxy or nitro;  
 C<sub>3-6</sub>-cycloalkyl or C<sub>3-6</sub>-cycloalkyl substituted by methyl, C<sub>3-6</sub>-alkenyl or C<sub>3-6</sub>-alkenyl substituted by halogen, C<sub>3-6</sub>-alkynyl or C<sub>3-6</sub>-alkynyl substituted by halogen;  
 phenyl or phenyl substituted by halogen, C<sub>1-3</sub>-alkyl, C<sub>1-3</sub>-alkoxy, C<sub>1-2</sub>-haloalkyl, C<sub>1-2</sub>-haloalkoxy or nitro;  
 R<sup>2</sup> is C<sub>1-6</sub>-alkyl, C<sub>2-4</sub>-alkenyl, C<sub>2-4</sub>-alkynyl, C<sub>1-6</sub>-haloalkyl, C<sub>3-6</sub>-cycloalkyl or C<sub>3-6</sub>-cycloalkyl substituted up to three times by identical or different C<sub>1-2</sub>-alkyl or halogen substituents,

R<sup>8</sup> is hydrogen, CN, S(O)<sub>n</sub>R<sup>8</sup> where n=0, 1 or 2, or COR<sup>9</sup>  
 R<sup>8</sup> is C<sub>1-3</sub>-alkyl, or phenyl, optionally substituted 1 to 3 times by halogen, C<sub>1-2</sub>-alkyl, C<sub>1-2</sub>-haloalkyl, methoxy or nitro,  
 R<sup>9</sup> is hydrogen, C<sub>1-6</sub>-alkyl, C<sub>1-6</sub>-haloalkyl, C<sub>3-6</sub>-cycloalkyl, phenyl or benzyl, or phenyl substituted 1 to 3 times by halogen, C<sub>1-3</sub>-alkyl, C<sub>1-3</sub>-haloalkyl, C<sub>1-3</sub>-alkoxy, nitro or cyano, or benzyl substituted by these radicals,  
 R<sup>4</sup> is hydrogen, halogen, C<sub>1-3</sub>-alkyl, C<sub>1-2</sub>-haloalkyl, C<sub>1-3</sub>-alkoxy or C<sub>1-3</sub>-haloalkoxy or cyano

with the proviso that:

- R<sup>1</sup> is not C<sub>1-4</sub>-alkyl, C<sub>1-4</sub>-alkoxy, C<sub>1-4</sub>-haloalkyl, C<sub>1-4</sub>-haloalkoxy, C<sub>3-6</sub>-cycloalkyl, halogen or cyano, when R<sup>2</sup> is C<sub>1-4</sub>-alkyl, C<sub>1-4</sub>-haloalkyl or C<sub>3-6</sub>-cycloalkyl and R<sup>3</sup> is hydrogen,
- R<sup>1</sup> is not methyl, when R<sup>2</sup> is methyl, R<sup>3</sup> is cyano and R<sup>4</sup> is hydrogen, and
- R<sup>1</sup> is not methyl, when R<sup>2</sup> is methyl, R<sup>3</sup> is phenyl—CO— and R<sup>4</sup> is hydrogen.

5,569,766

## METHOD FOR LABELING AND DETECTING MATERIALS EMPLOYING ARYLSULFONATE CYANINE DYES

Alan S. Waggoner; Lauren A. Ernst, both of Pittsburgh, and Ratnakar B. Mujumdar, Glenshaw, all of Pa., assignors to Carnegie Mellon University, Pittsburgh, Pa.

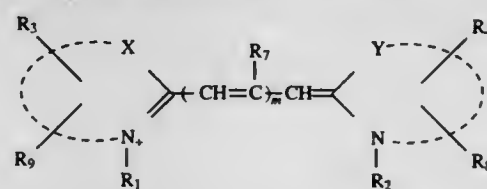
Division of Ser. No. 884,636, May 15, 1992, Pat. No. 5,268,486, which is a continuation of Ser. No. 240,756, Sep. 2, 1988, abandoned, which is a continuation-in-part of Ser. No. 854,347, Apr. 18, 1986, abandoned. This application Nov. 29, 1993, Ser. No. 158,953

Int. Cl.<sup>6</sup> C07D 417/06

U.S. Cl. 548—150

9 Claims

1. A water soluble luminescent dye consisting of:  
 a cyanine having the structure



wherein:

the dotted lines each represent carbon atoms necessary for the formation of one ring to three fused rings having 5 to 6 atoms in each ring and said R<sub>3</sub>, R<sub>4</sub>, R<sub>6</sub> and R<sub>9</sub> groups are attached to said rings;  
 X and Y are S;  
 m is an integer selected from the grouping consisting of 1, 2 and 3;  
 at least one of said R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> and R<sub>7</sub> groups reacts with amino, hydroxy or sulfhydryl nucleophiles and is a reactive moiety selected from a group containing

5,569,767

## PROCESS FOR THE PRODUCTION OF LOW-VISCOSITY STORABLE AMPHOTERIC SURFACTANTS FROM IMIDAZOLINES

Guenter Uphues, Monheim; Uwe Ploog; Renate Schick, both of Haan; Hans-Juergen Schwark, Monheim, and Sandra Witt, Langenfeld, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

Filed Jul. 25, 1995, Ser. No. 436,324

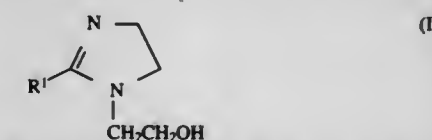
Claims priority, application Germany, Nov. 30, 1992, 42 40 154.2

Int. Cl.<sup>6</sup> C07D 233/04; 233/14; C11D 1/88

U.S. Cl. 548—352.1

14 Claims

1. A process for the production of a low-viscosity, storable amphoteric surfactant comprising the steps of: (1) simultaneously reacting a 1-hydroxyethyl-2-alkyl-2-imidazoline of the formula (I):



wherein R<sup>1</sup> is an alkyl radical having from about 5 to about 21 carbon atoms with a halogenated carboxylic acid salt in the presence of an aqueous base and maintaining the pH of the reaction mixture at a value of from about 7.5 to about 9 until completion of the reaction and then, (2) adjusting the pH of the reaction mixture to a value of from about 5 to about 7.

5,569,768

## ANGIOTENSIN II ANTAGONISTS

Donald B. Boyd, Greenwood; Sherry L. Lifer, Indianapolis; Winston S. Marshall, Bangersville; Alan D. Palkowitz; William Pfeifer, both of Indianapolis; Jon K. Reel, Carmel; Richard L. Simon, Greenwood; Mitchell I. Steinberg, Indianapolis; K. Jeff Thrasher, Indianapolis; Venkatraghavan Vasudevan, Indianapolis, and Celia A. Whitesitt, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 49,916, Apr. 20, 1993, which is a continuation-in-part of Ser. No. 892,854, Jun. 3, 1992, abandoned. This application May 31, 1995, Ser. No. 455,239

Int. Cl.<sup>6</sup> C07D 403/12; 417/10; 487/04; 231/54; 233/04

U.S. Cl. 548—253

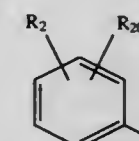
2 Claims

1. A compound of the formula

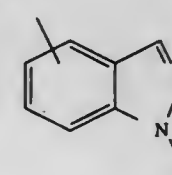


wherein:

R<sub>1</sub>' is



R<sub>2</sub>' is



(c)

wherein Q is Br or Cl, and n=0, 1, 2, 3, 4, 5, 6, 7 or 8 for R<sub>3</sub>, R<sub>4</sub> and R<sub>7</sub>, and n=1, 2, 3, 4, 5, 6, 7 or 8 for R<sub>1</sub> and R<sub>2</sub>;

and when any one of said R<sub>3</sub>, R<sub>4</sub>, and R<sub>7</sub> groups is not selected from one said reactive moiety, said remaining R<sub>3</sub>, R<sub>4</sub>, and R<sub>7</sub> are hydrogen or E-F, a polar group wherein E is a spacer group having the structure —(CH<sub>2</sub>)<sub>n</sub>— and n of said spacer group=0, 1, 2, 3, or 4, and F is hydroxy, sulfonate, sulfate, carboxylate, or a lower alkyl substituted amino;

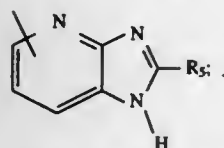
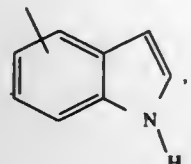
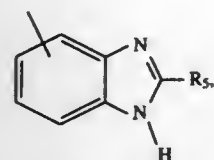
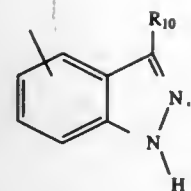
and when any one of said R<sub>1</sub> and R<sub>2</sub> groups is not selected from one said reactive moiety, said remaining R<sub>1</sub> or R<sub>2</sub> are a lower alkyl or said E-F and n of said spacer group=1, 2, 3, or 4;

at least one said R<sub>6</sub> and R<sub>9</sub> groups is selected from the group consisting of a sulfonic acid and sulfonate moiety attached directly to one of said one ring to three fused rings, for conferring luminescence to said dye, wherein said ring or rings to which said sulfonic acid or sulfonate moiety is attached is an aryl ring; and

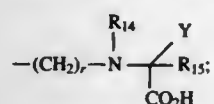
when one of said R<sub>6</sub> or R<sub>9</sub> group is not said sulfonic acid or sulfonate moiety, said remaining R<sub>6</sub> or R<sub>9</sub> group is a hydroxy-



-continued



$R_2$  is H, —OH, —OCOCH<sub>3</sub>, halo, C<sub>1</sub>–C<sub>4</sub> alkyl, or C<sub>1</sub>–C<sub>4</sub> alkoxy;  
 $R_3$  is H, C<sub>1</sub>–C<sub>5</sub> alkyl, C<sub>1</sub>–C<sub>5</sub> trifluoroalkyl, (CF<sub>3</sub>)<sub>n</sub>CF<sub>3</sub>, benzyl, —(CH<sub>2</sub>)<sub>m</sub>–N(C<sub>1</sub>–C<sub>3</sub> alkyl)<sub>2</sub>, —(CH<sub>2</sub>)<sub>m</sub>–NH(C<sub>1</sub>–C<sub>3</sub> alkyl),



—(CH<sub>2</sub>)<sub>r</sub>–N(C<sub>1</sub>–C<sub>3</sub> alkyl)<sub>2</sub>,  
 —CH<sub>2</sub>–pyrrolidine, —(CH<sub>2</sub>)<sub>n</sub>CO<sub>2</sub>H, or  
 $R_{10}$  is H or C<sub>1</sub>–C<sub>3</sub> alkyl;  
 $R_{14}$  is H or CH<sub>3</sub>;  
 $R_{15}$  is H or —(CH<sub>2</sub>)<sub>r</sub>R<sub>16</sub>;  
 $R_{16}$  is OH, NH<sub>2</sub>, or CO<sub>2</sub>H;  
 $R_{20}$  is a protected carboxy group, cyano, nitro or methoxy, located ortho or para to  $R_2$ ;  
 Y is a R group of a naturally occurring amino acid;  
 m is independently 0 or 1;  
 n is independently 1, 2 or 3;  
 r is 0, 1, 2, or 3.

5,569,769

**PREPARATION OF PYRAZOLE AND ITS DERIVATIVES**  
 Hans R. Merkle, Ludwigshafen, and Erich Fretschner, Neckarsteinach, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP94/02708, § 371 Date Feb. 15, 1996, § 102(e) Date Feb. 15, 1996, PCT Pub. No. WO95/06036, PCT Pub. Date Mar. 2, 1995

PCT Filed Aug. 13, 1994, Ser. No. 596,376

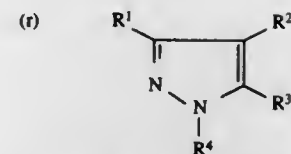
Claims priority, application Germany, Aug. 23, 1993, 43 228.8

Int. Cl.<sup>6</sup> C07D 231/12

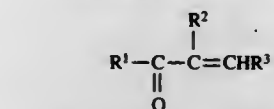
U.S. Cl. 548—373.1

6 Claims

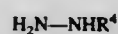
1. A process for preparing pyrazole and its derivatives of the formula I



where  $R^1$ ,  $R^2$ ,  $R^3$  and  $R^4$  are each hydrogen, halogen, nitro, carboxyl, sulfonyl or C-organic radicals, from alpha,beta-unsaturated carbonyl compounds of the formula II



(s) and hydrazine or hydrazine derivatives of the formula III



wherein, initially without additional diluent, an alpha,beta-unsaturated carbonyl compound of the formula II is reacted with hydrazine or a hydrazine derivative of the formula III, and the resulting reaction mixture is reacted in another step with a mixture of sulfuric acid and iodine or a compound which liberates iodine or hydrogen iodide.

5,569,770

**METHOD FOR THE PRODUCTION OF N-VINYL-2-PYRROLIDONE BY GAS-PHASE DEHYDRATION REACTION AT ATMOSPHERIC PRESSURE**

Pine-Sci Kuo, Hsinchu Hsien; Shiao-Jung Chu, Hsinchu; Chu-Chang Dai, Hsinchu Hsien; Hsi-Yen Hsu, Taipei; Ching-Tang Lin, Hsinchu, and Yi-Yun Lin, Hsinchu, all of Taiwan, assignors to Industrial Technology Research Institute, Chung-tung Hsinchu, Taiwan

Filed Jan. 31, 1996, Ser. No. 594,549

Int. Cl.<sup>6</sup> C07D 207/267

U.S. Cl. 548—543

25 Claims

1. A method for the production of N-vinyl-2-pyrrolidone, comprising the following steps:

- subjecting N-(β-Hydroxyethyl)-2-pyrrolidones to dehydration in gaseous phase, at atmospheric pressure, at a temperature of 300°–450° C., at a space velocity of 500–4500 hr<sup>-1</sup> in the presence of a mixed oxide of group IV elements, to form N-vinyl-2-pyrrolidone and 2-pyrrolidone; and
- separating said N-vinyl-2-pyrrolidone.

5,569,771

**(HALOALKYL) DIBENZONIUMSULFONATE AND ITS PRODUCTION METHODS: AND A HALOALKYLATING AGENT AND HALOALKYLATING METHODS**

Teruo Umemoto; Sumi Ishihara, and Kenji Adachi, all of Tsukuba, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

PCT No. PCT/JP94/00582, § 371 Date Dec. 13, 1994, § 102(e) Date Dec. 13, 1994, PCT Pub. No. WO94/24122, PCT Pub. Date Oct. 27, 1994

PCT Filed Apr. 6, 1994, Ser. No. 347,469

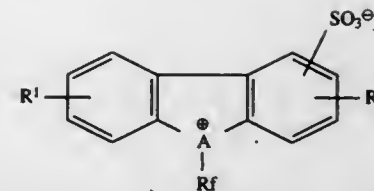
Claims priority, application Japan, Apr. 14, 1993, 5-111099; May 21, 1993, 5-142648

Int. Cl.<sup>6</sup> C07D 333/76;345/00

U.S. Cl. 549—44

10 Claims

1. (Haloalkyl)dibenzoniumsulfonate represented by the following general formula (I):



wherein R<sub>f</sub> is a haloalkyl group with 1 to 10 carbons; A is a sulfur atom, a selenium atom or a tellurium atom; R<sup>1</sup> and R<sup>2</sup> are hydrogen atoms, nitro groups or lower alkyl groups with 1 to 4 carbons.

5,569,772

**PROCESS FOR THE SYNTHESIS OF BENZO[B]THIOPHENES**

David W. Hoard, Lafayette, and Wayne D. Luke, West Lafayette, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

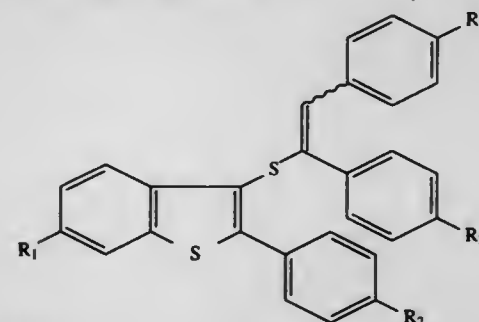
Filed Jun. 7, 1995, Ser. No. 486,873

Int. Cl.<sup>6</sup> C07D 333/64;333/66;333/62

U.S. Cl. 549—52

16 Claims

1. A compound of the formula



wherein:

$R_1$  is hydrogen, C<sub>1</sub>–C<sub>4</sub> alkoxy, arylalkoxy, halo, or amino; and  
 $R_2$  is hydrogen, C<sub>1</sub>–C<sub>4</sub> alkoxy, arylalkoxy, halo, or amino.

5,569,773

**PROCESS FOR PRODUCING A COMPOSITION COMPRISING EPOXY COMPOUNDS HAVING HYDROXYL GROUP**

Takaaki Fujiwa, Hiroshima, and Tomohisa Isobe, Yamaguchi, both of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 123,980, Sep. 21, 1993, Pat. No. 5,367,088, which is a continuation of Ser. No. 925,618, Aug. 6, 1992, abandoned, which is a division of Ser. No. 773,653, Oct. 15, 1991, Pat. No. 5,155,243. This application Jul. 15, 1994, Ser. No. 275,244

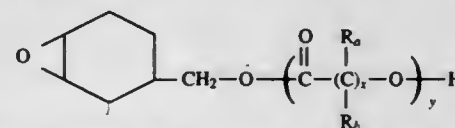
Claims priority, application Japan, Feb. 15, 1990, 2-34511

Int. Cl.<sup>6</sup> C07D 301/14;301/16;301/12;301/19

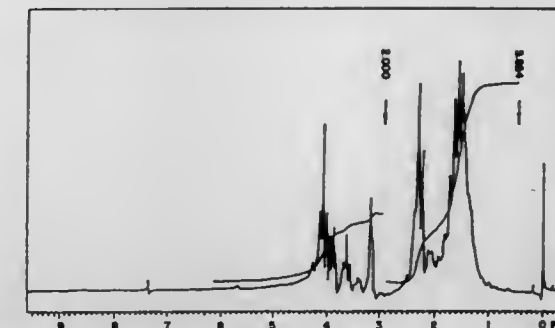
U.S. Cl. 549—525

6 Claims

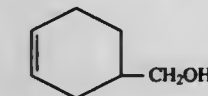
1. A process for producing a composition comprising compounds having the following structural formula (I):



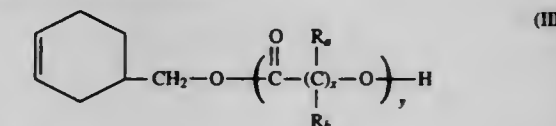
wherein x represents an integer of 3 to 7, y represents a statistical distribution of integers of 0 to 50, R<sub>a</sub> and R<sub>b</sub> each independently represents a hydrogen atom, a methyl group or a propyl group, comprising the steps of:



addition-reacting a lactone compound to



to synthesize a composition comprising compounds having the following structural formula:



and;

epoxidizing the composition comprising compounds having structural formula (III) at 0° to 80° C. using a peroxide.

5,569,774

**PROCESS FOR THE PREPARATION OF CHLORINE-SUBSTITUTED OLEFINS**

Bernd Schaefer, Dierbach, and Irene Troetsch-Schaller, Frankfurt, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP93/00586, § 371 Date Sep. 20, 1994, § 102(e) Date Sep. 20, 1994, PCT Pub. No. WO93/19034, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 13, 1993, Ser. No. 307,659

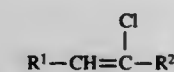
Claims priority, application Germany, Mar. 24, 1992, 42 09 497.6

Int. Cl.<sup>6</sup> C07D 303/38

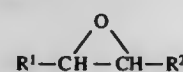
U.S. Cl. 549—548

6 Claims

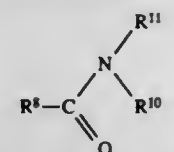
1. A process for preparing chlorine-substituted olefins of the formula I



where  $R^1$  is a C-organic radical and  $R^2$  is one of the following groups: —CN, —CO—R<sup>3</sup>, —CO—S—R<sup>3</sup>, —CO—O—R<sup>3</sup> or —CO—NR<sup>4</sup>R<sup>5</sup>, where R<sup>3</sup> is a C-organic radical and R<sup>4</sup> and R<sup>5</sup> are each hydrogen or a C-organic radical, which comprises reacting an oxirane of the formula II

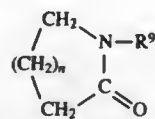


in the presence of a carboxamide (IIIa)



where the substituents have the following meaning:  
 $R^6$  is hydrogen, C<sub>1</sub>–C<sub>6</sub>-alkyl or phenyl and

R<sup>10</sup> and R<sup>11</sup> are each C<sub>1</sub>-C<sub>6</sub>-alkyl or phenyl or R<sup>10</sup> and R<sup>11</sup> form, together with the common nitrogen atom, pyrrolidinyl, piperidinyl or morpholinyl; or a lactam IIIb



where n is 0, 1 or 2 and R<sup>9</sup> is C<sub>1</sub>-C<sub>6</sub>-alkyl or phenyl in liquid phase with a chlorinating agent.

5,569,775

### PROCESS FOR SEPARATION OF DIMETHYLDICHLOROSILANE FROM METHYLTRICHLOROSILANE

Michael Diaz, Lexington, Ky.; Roland L. Halm; Michael A. McIntyre, both of Midland, Mich., and Oliver K. Wilding, Lagrange, Ky., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 29, 1995, Ser. No. 564,529

Int. Cl.<sup>6</sup> C07F 7/08

U.S. Cl. 556—466

10 Claims

1. A process for separation of dimethyldichlorosilane from methyltrichlorosilane, the process comprising:

- (A) contacting a mixture comprising methyltrichlorosilane and dimethyldichlorosilane with silica gel, where the dimethyldichlorosilane is selectively removed by the silica gel and  
(B) recovering methyltrichlorosilane reduced in dimethyldichlorosilane concentration.

5,569,776

### PROCESS FOR THE PREPARATION OF 4-FLUOROALKOXYCINNAMONITRILES

Matthias Beller, Niedernhausen, and Klaus Forstinger, Kelsterbach, both of Germany, assignors to Hoechst AG, Germany

Filed Mar. 8, 1995, Ser. No. 400,976

Claims priority, application Germany, Mar. 10, 1994, 44 08 083.2

Int. Cl.<sup>6</sup> C07C 255/07

U.S. Cl. 558—373

20 Claims

1. A process for the preparation of fluoroalkoxycinnamionitriles of the formula (I)



in which n is 1 to 8 and m is 1 to 17, where m ≤ 2n+1, which comprises reacting 4-fluorobenzaldehyde with a fluoroalkanol of the formula (II)



in which m and n are as defined above, in the presence of a base and, optionally a solvent, and reacting the resulting 4-fluoroalkoxybenzaldehyde with cyanoacetic acid or an alkyl cyanoacetate in the presence of a base and, optionally a solvent.

### PROCESS FOR THE PREPARATION OF A SUBSTITUTED 2,5-DIAMINO-3-HYDROXYHEXANE

Timothy L. Stuk, Lindenhurst; Anthony R. Haight, Mundelein; Howard E. Morton; Timothy A. Robbins, both of Gurnee; David Scarpetti, Evanston, and Jien-Heh J. Tien, Libertyville, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

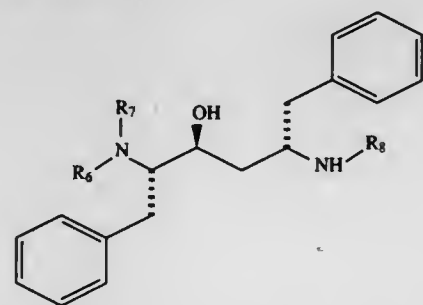
Division of Ser. No. 281,502, Jul. 27, 1994, Pat. No. 5,491,253, which is a continuation-in-part of Ser. No. 141,795, Oct. 22, 1993, abandoned. This application Apr. 7, 1995, Ser. No. 418,727

Int. Cl.<sup>6</sup> C07C 261/00; 233/00; C07D 209/04

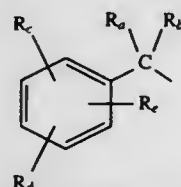
U.S. Cl. 560—24

2 Claims

1. A process for the preparation of a substantially pure compound of the formula:

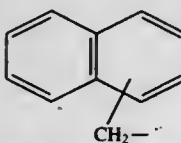


wherein R<sub>6</sub> and R<sub>7</sub> are each hydrogen or R<sub>6</sub> and R<sub>7</sub> are independently selected from



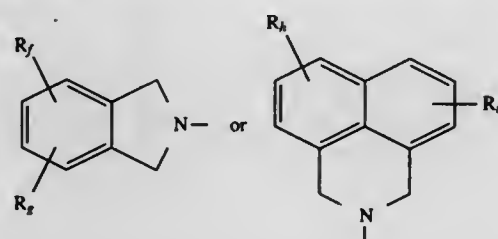
(i)

wherein R<sub>a</sub> and R<sub>b</sub> are independently selected from hydrogen, loweralkyl and phenyl and R<sub>c</sub>, R<sub>d</sub> and R<sub>e</sub> are independently selected from hydrogen, loweralkyl, trifluoromethyl, alkoxy, halo and phenyl; and



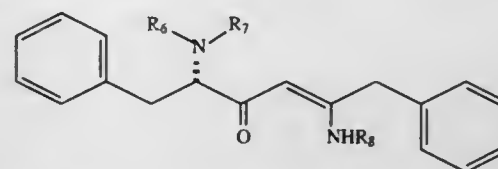
(ii)

wherein the naphthyl ring is unsubstituted or substituted with one, two or three substituents independently selected from loweralkyl, trifluoromethyl, alkoxy and halo; or R<sub>6</sub> is as defined above and R<sub>7</sub> is R<sub>7a</sub>OC(O)— wherein R<sub>7a</sub> is benzyl; or R<sub>6</sub> and R<sub>7</sub> taken together with the nitrogen atom to which they are bonded are

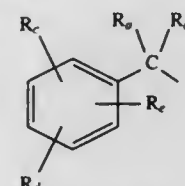


wherein R<sub>a</sub>, R<sub>b</sub>, R<sub>c</sub>, R<sub>d</sub> and R<sub>e</sub> are independently selected from hydrogen, loweralkyl, alkoxy, halogen and trifluoromethyl and R<sub>8</sub> is hydrogen or —C(O)R<sup>\*</sup> wherein R<sup>\*</sup> is loweralkyl, alkoxy, benzyloxy or phenyl wherein the phenyl ring is unsubstituted or substituted with one, two or three substituents independently selected

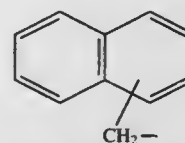
from loweralkyl, trifluoromethyl, alkoxy and halo; or an acid addition salt thereof comprising reacting a compound of the formula:



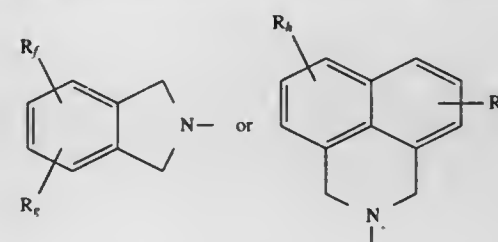
wherein R<sub>6</sub> and R<sub>7</sub> are each hydrogen or R<sub>6</sub> and R<sub>7</sub> are independently selected from



wherein R<sub>a</sub> and R<sub>b</sub> are independently selected from hydrogen, loweralkyl and phenyl and R<sub>c</sub>, R<sub>d</sub> and R<sub>e</sub> are independently selected from hydrogen, loweralkyl, trifluoromethyl, alkoxy, halo and phenyl; and



wherein the naphthyl ring is unsubstituted or substituted with one, two or three substituents independently selected from loweralkyl, trifluoromethyl, alkoxy and halo; or R<sub>6</sub> is as defined above and R<sub>7</sub> is R<sub>7a</sub>OC(O)— wherein R<sub>7a</sub> is benzyl; or R<sub>6</sub> and R<sub>7</sub> taken together with the nitrogen atom to which they are bonded are



wherein R<sub>a</sub>, R<sub>b</sub>, R<sub>c</sub>, R<sub>d</sub> and R<sub>e</sub> are independently selected from hydrogen, loweralkyl, alkoxy, halogen and trifluoromethyl and R<sub>8</sub> is hydrogen with a borohydride reducing agent, followed by the addition of R<sub>25</sub>—COOH wherein R<sub>25</sub> is loweralkyl, haloalkyl, phenyl or haloalkyl.

R<sup>1</sup>COCFR<sup>2</sup>COR<sup>3</sup>

(II)

wherein R<sup>1</sup> is a hydrogen atom, or a substituted or unsubstituted alkyl or aryl group; R<sup>2</sup> is a hydrogen atom, a halogen atom, or a substituted or unsubstituted alkyl or aryl group; and R<sup>3</sup> is a hydrogen atom, or a substituted or unsubstituted alkyl, aryl, alkoxy or aryloxy group, provided that at least two of R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> may together form a part of a cyclic structure with or without a hetero atom, comprising reacting a dicarbonyl compound of the formula:

R<sup>1</sup>COCHR<sup>2</sup>COR<sup>3</sup>

(I)

wherein R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are the same as defined above with fluorine (F<sub>2</sub>) in at least one solvent selected from the group consisting of halogenated hydrocarbons having 1 to 5 carbon atoms and nitrile compounds.

5,569,779

### POLYFUNCTIONAL MICHAEL ADDITION PRODUCTS

Mahmood Sabahi, Baton Rouge, La., and Matthew L. Hurst, Warren, Ohio, assignors to Albemarle Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 169,287, Dec. 20, 1993, abandoned, which is a division of Ser. No. 947,629, Sep. 21, 1992, abandoned, which is a continuation-in-part of Ser. No.

812,398, Dec. 23, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 481,953

Int. Cl.<sup>6</sup> C07C 69/34

U.S. Cl. 560—190

14 Claims

1. A mixture of compounds corresponding to the formula Z—C(E)(E')—Q, wherein Z is alkyl, cycloalkyl, or —(CTT—CT\*G)<sub>n</sub>—CTTCHT\*G; Q is —(CTT—CT\*G)<sub>p</sub>—CTT—CHT\*G; T, T', and T\* are independently selected from hydrogen, G', and hydrocarbyl or predominantly hydrocarbyl organic groups containing up to 10 carbons, with the proviso that at least one of T, T', and T\* must be hydrogen; E, E', G, and G' are independently selected from —COOR, —C(O)R', and —CN electron withdrawing groups in which R and R' represent alkyl or cycloalkyl groups of up to 10 carbons; p is zero or one; s is respectively two or one; and each of t and w represents zero or a positive integer; at least two compounds in the mixture containing a different number of G groups and at least 25% of the molecules of the compounds containing at least three G groups.

5,569,780

### DIALKYL 2-HALOETHYL MALONATES

Klaus-Dieter Steffen, Hennef, Germany, assignor to Hüls Aktiengesellschaft, Marl, Germany

Division of Ser. No. 287,157, Aug. 8, 1994, Pat. No. 5,463,111.

This application Jun. 21, 1995, Ser. No. 493,169

Claims priority, application Germany, Aug. 11, 1993, 43 26 918.4

Int. Cl.<sup>6</sup> C07C 69/38

U.S. Cl. 560—192

1 Claim

1. A dialkyl 2-haloethyl malonate selected from the group consisting of dimethyl 2-chloroethyl malonate, diisopropyl 2-chloroethyl malonate, di-n-butyl 2-chloroethyl malonate, and dimethyl 2-chloroethyl-2-vinyl malonate.

5,569,778

### PROCESS FOR PREPARING FLUORINE-CONTAINING DICARBONYL COMPOUND

Teruo Umemoto, and Ginjiro Tomizawa, both of Tsukuba, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

PCT No. PCT/JP93/01584, § 371 Date Apr. 28, 1995, § 102(e) Date Apr. 28, 1995, PCT Pub. No. WO94/10120, PCT Pub. Date May 11, 1994

PCT Filed Nov. 1, 1993, Ser. No. 428,133

Claims priority, application Japan, Oct. 30, 1992, 4-315800

Int. Cl.<sup>6</sup> C07C 67/287

U.S. Cl. 560—121

13 Claims

1. A process for preparing a fluorine-containing dicarbonyl compound of the formula:



**5,569,781**  
**PROCESS FOR THE PREPARATION OF**  
**1-AMINOCYCLOPROPANECARBOXYLIC ACID**  
**HYDROCHLORIDE**

Wolfgang Kleemiss, Haltern, and Marcel Feld, Köln, both of Germany, assignors to Huels Aktiengesellschaft, Marl, Germany

Filed Apr. 5, 1995, Ser. No. 416,989

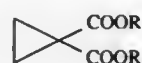
Claims priority, application Germany, Apr. 6, 1994, 44 11 777.9

Int. Cl.<sup>6</sup> C07C 61/04

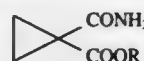
U.S. Cl. 562—506

8 Claims

1. A process for the preparation of 1-aminocyclopropanecarboxylic acid hydrochloride, comprising reacting a cyclopropane-1,1-dicarboxylic acid diester of the formula

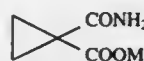


with ammonia to form a 1-aminocyclopropanecarboxylic acid ester of the formula 7



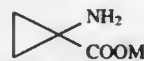
wherein R is a C<sub>1</sub>–C<sub>8</sub> alkyl group,

hydrolyzing said 1-aminocyclopropanecarboxylic acid ester of the formula 7 to form an 1-aminocyclopropanecarboxylic acid salt of the formula 8



wherein M is an alkali metal or alkaline earth metal,

reacting said 1-aminocyclopropanecarboxylic acid salt of the formula 8 with a mixture of an alkali metal hypochlorite and an alkali metal hydroxide to form an 1-cyclopropanecarboxylic acid salt of the formula 9



and adding a sufficient amount of hydrochloric acid to said 1-aminocyclopropanecarboxylic acid salt to form said 1-aminocyclopropanecarboxylic acid hydrochloride.

**5,569,782**

**PROCESS FOR PREPARING**  
**POLYFLUOROCHLOROCARBONYL CHLORIDES AND**  
**PERFLUOROCARBONYL CHLORIDES WITH ADDITION**  
**OF CHLORINE**

Max Braun, Wedemark; Werner Rudolph, Hanover, and Kerstin Eichholz, Langenhagen, all of Germany, assignors to Solvay Fluor und Derivate GmbH, Hanover, Germany

Filed Dec. 20, 1994, Ser. No. 360,026

Claims priority, application Germany, Dec. 23, 1993, 43 44 241.2; Jun. 15, 1994, 44 20 763.8

Int. Cl.<sup>6</sup> C07C 51/58

U.S. Cl. 562—863

14 Claims

1. A process for preparing a compound corresponding to the formula



in which R is fluorine or perfluorinated alkyl having 1 to 10 carbon atoms and X is chlorine or fluorine, said process comprising reacting a starting compound corresponding to the formula



in which R and X have the above meanings, with oxygen in the gas phase in the presence of added elemental chlorine and under exposure to activating irradiation with light having a wavelength  $\lambda \geq 290$  nm.

**5,569,783**

**VICARIOUS NUCLEOPHILIC SUBSTITUTION TO**  
**PREPARE 1,3-DIAMINO-2,4,6-TRINITROBENZENE OR**  
**1,3,5-TRIAMINO-2,4,6-TRINITROBENZENE**

Alexander R. Mitchell; Phillip F. Pagoria, and Robert D. Schmidt, all of Livermore, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed May 12, 1995, Ser. No. 440,017

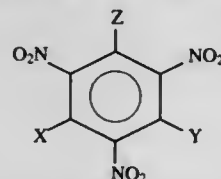
Int. Cl.<sup>6</sup> C07C 45/00

U.S. Cl. 74—395

20 Claims

1. A process to produce 1,3-diamino-2,4,6-trinitrobenzene (DATB) or 1,3,5-triamino-2,4,6-trinitrobenzene (TATB), which process comprises:

(a) reacting at ambient pressure and a temperature of between about 0° and 50° C. for between about 0.1 and 24 hr, a trinitroaromatic starting material compound V:



(V)

wherein X, Y, and Z are each independently selected from the group consisting of —H, —CH<sub>3</sub>, and —NH<sub>2</sub>, with the proviso that at least 1 of X, Y, and Z is hydrogen,

with an amount of 1,1,1-trialkylhydrazinium halide effective to produce DATB or TATB, wherein alkyl is selected from methyl, ethyl, propyl, butyl or benzyl and halide is selected from chloride, bromide or iodide.

in the presence of a strong base selected from sodium butoxide, potassium butoxide, potassium propoxide, sodium propoxide, sodium ethoxide, potassium ethoxide, sodium methoxide, potassium methoxide, and combinations thereof;

in a solvent selected from the group consisting of methanol, ethanol, propanol, butanol, dimethylsulphoxide, N-methylpyrrolidone, hexamethylphosphoramide, dimethylformamide, dimethylacetamide and mixtures thereof; provided that when alcohols are present primarily DATB and picramide are formed; and

(b) isolating the DATB or TATB produced.

**5,569,784**

**SULFONIUM SALT AND RESIST COMPOSITION**  
 Satoshi Watanabe; Junji Shimada; Youichi Ohsawa; Katsuya Takemura; Toshinobu Ishihara, and Kazumasa Maruyama, all of Nakakubiki-gun, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1995, Ser. No. 379,987

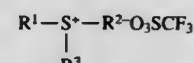
Claims priority, application Japan, Jan. 28, 1994, 6-026170

Int. Cl.<sup>6</sup> C07C 217/48

U.S. Cl. 564—430

24 Claims

1. A sulfonium salt of the following general formula (1):



(1)

wherein R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup> are each independently a substituted or unsubstituted aromatic group, at least one of R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup> is a substituted aromatic group having an acid labile group, and at least one of the remaining R groups is a nitrogenous aromatic group, or all of R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are nitrogenous aromatic groups.

**5,569,785**  
**ATTRITION RESISTANT ZEOLITE CATALYSTS FOR**  
**PRODUCTION OF METHYLAMINES IN FLUIDIZED**  
**BED REACTORS**

Konstantinos Kourtakis, Hockessin; Horacio E. Bergna; George C. Sonnichsen, both of Wilmington, all of Del.; David R. Corbin, West Chester, Pa., and Loren D. Brake, Wilmington, Del., assignors to E.I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 169,933, Jan. 11, 1994, abandoned.

This application May 30, 1995, Ser. No. 454,470

Int. Cl.<sup>6</sup> C07C 209/16

U.S. Cl. 564—474

5 Claims

1. A process for producing a methylamine compound comprising reacting methanol and/or dimethylether and ammonia, in amounts sufficient to provide a carbon/nitrogen ratio from about 0.2 to about 2.5, and at a temperature from about 220° C. to 450° C., in the presence of a catalytic amount of an attrition resistant catalyst composition comprising one or more acidic zeolites selected from the group consisting of rho and chabazite;

said zeolite being uniformly admixed to a ratio of from about 25 to about 75 weight % with one or more particulate binders selected from the group consisting of kaolin, bentonite, alpha-alumina, and titania; and wherein the admixed binder is relatively catalytically inert in the process.

**5,569,786**

**ISOLATION, STRUCTURAL ELUCIDATION AND**  
**SYNTHESIS OF NOVEL ANTINEOPLASTIC**  
**SUBSTANCES DENOMINATED "COMBRETASTATINS"**

George R. Pettit, Paradise Valley, and Sheo B. Singh, Tempe, both of Ariz., assignors to Arizona Board of Regents acting on behalf of Arizona State University, Tempe, Ariz.

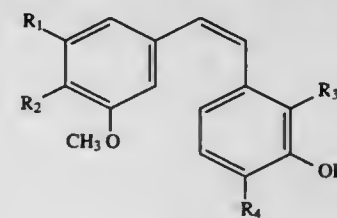
Continuation of Ser. No. 832,998, Feb. 10, 1992, Pat. No. 5,409,953, which is a continuation of Ser. No. 590, Oct. 26, 1987, abandoned. This application Nov. 15, 1994, Ser. No. 340,156

Int. Cl.<sup>6</sup> C07C 43/205; C07D 317/54; A61K 31/09; 31/36

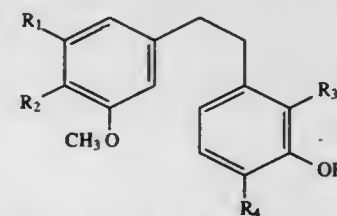
U.S. Cl. 568—646

14 Claims

1. A substantially pure substance having the structure of either:



or



wherein: R<sub>1</sub> is OH or OCH<sub>3</sub> and R<sub>2</sub> is H or OCH<sub>3</sub> or R<sub>1</sub>R<sub>2</sub> is —OCH<sub>2</sub>O—, R<sub>3</sub> is H or OH, and R<sub>4</sub> is OH or OCH<sub>3</sub>, with the proviso that when structure (I) is selected and R<sub>1</sub> is OCH<sub>3</sub>, R<sub>2</sub> is OCH<sub>3</sub>, R<sub>3</sub> is OH and R<sub>4</sub> is OCH<sub>3</sub>; and that when structure (I) is selected and R<sub>1</sub>R<sub>2</sub> is —OCH<sub>2</sub>O—, R<sub>3</sub> is H and R<sub>4</sub> is OCH<sub>3</sub>; and that when structure (I) is selected and R<sub>1</sub> is OH, R<sub>2</sub> is OCH<sub>3</sub>, R<sub>3</sub> is H and R<sub>4</sub> is OCH<sub>3</sub>; and that when structure (II) is selected and R<sub>4</sub> is OH, R<sub>1</sub> is OCH<sub>3</sub>, R<sub>2</sub> is H or OCH<sub>3</sub> and R<sub>3</sub> is H; and that when structure (II) is selected and R<sub>1</sub>R<sub>2</sub> is —OCH<sub>2</sub>O—, R<sub>3</sub> is OH and R<sub>2</sub> is OCH<sub>3</sub>; and that when structure (II) is selected and R<sub>3</sub> is OH, R<sub>4</sub> is OCH<sub>3</sub>, R<sub>1</sub> is H and R<sub>2</sub> is OCH<sub>3</sub>.

**5,569,787**  
**PROCESS FOR THE PRODUCTION OF ETHYL TERT-**  
**ALKYL ETHERS**

Henry Rastelli, New Fairfield, Conn.; Carmen M. Yon, Carmel, N.Y., and Stanley J. Frey, Palatine, Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 201,590, Feb. 25, 1994, Pat. No. 5,401,887. This application Nov. 30, 1994, Ser. No. 346,951

Int. Cl.<sup>6</sup> C07L 41/00

U.S. Cl. 568—697

15 Claims

1. A cyclic process for preparing ethyl tert-alkyl ethers comprising the steps:

- contacting and reacting in a reaction zone, preferably in the liquid phase, a reaction mixture formed by combining a feedstream comprising hydrocarbons having from 4 to 5 carbon atoms and containing isoalkene with a near stoichiometric ratio of ethanol with respect to said isoalkene to produce a reaction product effluent comprising ethyl tert-alkyl ether, at least 10,000 ppm (wt.) unreacted ethanol and unreacted C<sub>4</sub>–C<sub>5</sub> hydrocarbons;
- separating the reaction product effluent from the reaction zone in a distillation column to provide an overhead effluent stream comprising unreacted ethanol and unreacted C<sub>4</sub>–C<sub>5</sub> hydrocarbons and a bottoms effluent stream comprising ethyl tert-alkyl ether and unreacted ethanol;
- passing the bottoms effluent stream to an adsorption zone containing a selective adsorbent to adsorb ethanol and recovering an ether product stream comprising substantially pure ethyl tert-alkyl ether; and
- regenerating the selective adsorbent with a regenerant stream to recover ethanol and to provide a recycle stream comprising ethanol, and returning said recycle stream to said reaction zone.

**5,569,788**

**PROCESS FOR REMOVAL OF IMPURITIES FROM**  
**ETHERIFICATION FEEDSTOCKS**

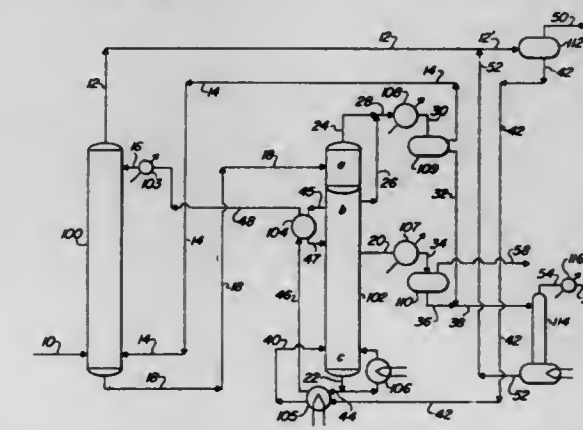
Paulino Forte, Yonkers, N.Y., and Stanley J. Frey, Palatine, Ill., assignors to UOP, Des Plaines, Ill.

Filed Mar. 20, 1995, Ser. No. 406,441

Int. Cl.<sup>6</sup> C07C 41/06; 43/04

(I) U.S. Cl. 568—697

10 Claims



1. A process for the removal of impurities comprising at least one of sulfur compounds oxygenates, and olefins from a C<sub>4</sub>–C<sub>6</sub> hydrocarbon feedstream comprising said impurities, said process comprising:

- passing said feedstream to a removal zone and therein contacting said feedstream with a lean selective solvent selected from the group consisting of diethylene glycol, triethylene glycol, tetraethylene glycol, pentaethylene glycol, 1,3-butane glycol, 1,2-butane glycol, 1,5-pentane glycol, sulfolane, furfural, n-formyl morpholine, n-methyl-2 pyrrolidone, water,

and mixtures thereof to provide a treated feedstream depleted in said impurities relative to said feedstream and a rich solvent stream;

- passing said rich-solvent stream to a stripping zone and therein contacting said rich solvent stream with a stripping medium to provide an extract stream enriched in said impurities relative to said feedstream and a regenerated selective solvent stream;
- returning at least a portion of said regenerated selective solvent stream to said removal zone as said lean selective-solvent; and,
- passing at least a portion of said extract stream to an etherification zone to produce an ether product.

5,569,789

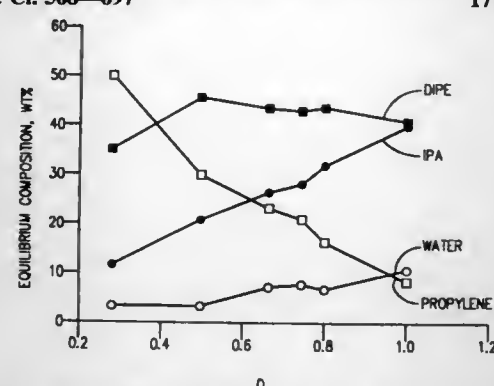
# MULTISTAGE INDIRECT PROPYLENE HYDRATION PROCESS FOR THE PRODUCTION OF DIISOPROPYL ETHER AND ISOPROPANOL

Weldon K. Bell, Pennington; Stephen H. Brown, Princeton, both of N.J., and Jeffrey C. Trewella, Kennett Square, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.  
Continuation-in-part of Ser. No. 347,933, Dec. 1, 1994, abandoned. This application Aug. 2, 1995, Ser. No. 510,371

Int. Cl.<sup>6</sup> C07C 29/00; 31/10; 41/06; 43/04

U.S. Cl. 568—697

17 Claims



1. A multistaged fixed catalyst bed process for the production of diisopropyl ether and isopropanol comprising:

- providing said fixed bed comprising serially connected stages containing zeolite Beta catalyst;
- introducing a feedstream comprising propylene and water equivalents, wherein said water equivalents are selected from the group consisting of water, isopropanol and diisopropyl ether, into each stage at a rate sufficient to provide a mole ratio of water equivalents to propylene equivalents that increases in increments by stage from at least 0.1 in a first stage to at most 1.2 in a final stage, wherein said feedstream is introduced at a temperature between 50° and 450° C., pressure between 700 and 2400 kPa, and weight hourly space velocity between 0.10 and 30, based on catalyst, whereby a single non-aqueous liquid phase is maintained in said fixed bed; and

recovering an effluent product stream comprising diisopropyl ether, isopropanol and water from said final stage.

5,569,790

# PROCESS FOR REMOVAL OF NITRILES FROM ETHERIFICATION FEEDSTOCKS

Stanley J. Frey, Palatine; Paul R. Cottrell, Arlington Heights, and David A. Hamm, Hinsdale, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed May 3, 1994, Ser. No. 237,532

Int. Cl.<sup>6</sup> C07C 41/00

U.S. Cl. 568—699

6 Claims

- An etherification process comprising:

- passing a feedstream comprising C<sub>4</sub>—C<sub>6</sub> hydrocarbons and nitriles to a water wash column and contacting the feedstream

therein with a regenerated water stream to absorb said nitriles and to provide a hydrocarbon feedstream depleted in said nitriles and a spent water stream enriched in said nitriles relative to said regenerated water stream;

- admixing the hydrocarbon feedstream with an alcohol stream to provide a reaction mixture and passing said reaction mixture to an etherification reaction zone to provide a reaction product comprising an ether and unreacted C<sub>4</sub>—C<sub>6</sub> hydrocarbons;
- separating the reaction product from said reaction zone in a distillation column, said distillation column containing at least a portion of said reaction zone, said distillation column providing an overhead stream comprising unreacted alcohol and unreacted C<sub>4</sub>—C<sub>6</sub> hydrocarbons, and a bottoms stream comprising said ether;
- passing the overhead stream to a raffinate wash column and contacting the overhead stream therein with a raffinate wash water stream to absorb at least a portion of the unreacted alcohol into a raffinate waste water stream and provide a raffinate stream essentially free of said alcohol comprising said unreacted C<sub>4</sub>—C<sub>6</sub> hydrocarbons;
- passing the raffinate stream to a water regeneration column and contacting the raffinate stream therein with at least a portion of said spent water stream to desorb at least a portion of said nitriles from said spent water stream and provide a nitrile enriched raffinate stream and a nitrile-lean water stream; and
- admixing at least a portion of the nitrile-lean water stream with a make up water stream to provide the regenerated water stream.

5,569,791

# PRODUCTION OF PHENOL FROM A HYDROCARBON FEEDSTOCK

John I. Hammerman, Arlington Heights, and Peter R. Pujado, Palatine, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Apr. 25, 1995, Ser. No. 428,602

Int. Cl.<sup>6</sup> C07C 37/00

U.S. Cl. 568—803

21 Claims

1. A process combination for the production of a hydroxylaromatic compound from a mixed hydrocarbon feedstock comprising the steps of:

- contacting the feedstock with an aromatization catalyst in an aromatization zone at reforming conditions to obtain an aromatics-rich effluent stream and a hydrogen concentrate;
- separating the aromatics-rich effluent into an aromatics concentrate and a nonaromatics stream in an aromatics-recovery zone and partitioning the concentrate to obtain an aromatic compound;
- processing the hydrogen concentrate in a peroxidation zone at peroxidation conditions to obtain a peroxide; and,
- hydroxylating the aromatic nucleus of the aromatic compound comprising reacting the aromatic compound with the peroxide in the presence of a hydroxylation catalyst at hydroxylation conditions in a hydroxylation zone to obtain a hydroxylaromatic product.

5,569,792

# HYDROGENATION OF ALDEHYDES, KETONES, CARBOXYLIC ACIDS AND ESTERS

Gregor Deckers, Xanten, and Gerhardt Hörn, Oberhausen, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Division of Ser. No. 172,049, Dec. 22, 1993, Pat. No.

5,453,412. This application Mar. 17, 1995, Ser. No. 407,754

Claims priority, application Germany, Dec. 28, 1992, 42 44 273.7

Int. Cl.<sup>6</sup> C07C 29/14; 29/145; 29/149; 31/12

U.S. Cl. 568—881

9 Claims

1. A method of hydrogenating organic compounds selected from the group consisting of aldehydes, ketones, carboxylic acids, carboxylic esters, and mixtures thereof, said method comprising,

contacting said compounds, under hydrogenation conditions, with a catalyst comprising, per 100 parts copper oxide, 40 to 130 parts zinc oxide, 2 to 50 parts aluminum oxide, and 1 to 4 parts sodium oxide, said catalyst having a total BET surface area of 50 to 110 m<sup>2</sup>/g, wherein 75% to 95% of said total surface area is made up by pores having radii of 9 to 1000 nm, the remainder of said total surface area being pores having radii of less than 9 nm.

5,569,793

# PROCESS FOR THE PRODUCTION OF 1,1,1- CHLORODIFLUOROETHANE

Michel Bergougnan, Pierre-Benite; Jean-Michel Galland, and Sylvain Perdrieux, both of Vernaison, all of France, assignors to Societe Atochem, Paris, France

Continuation of Ser. No. 181,480, Jan. 14, 1994, abandoned, which is a continuation of Ser. No. 876,691, Apr. 28, 1992, abandoned, which is a continuation of Ser. No. 592,387, Oct. 3, 1990, abandoned. This application Jun. 7, 1995, Ser. No.

480,703

Claims priority, application France, Oct. 3, 1989, 89 12918

Int. Cl.<sup>6</sup> C07C 17/08

U.S. Cl. 570—167

10 Claims

1. Process for the continuous production of 1,1,1-chlorodifluoroethane from 1,1,1-trichloroethane and hydrofluoric acid by reaction in liquid phase in the presence of at least one fluorination catalyst, comprising, conducting the reaction under an absolute pressure of between 10 and 30 bars, with a content of catalyst, expressed as a percentage by weight of metal in the liquid reaction mixture, of between 0.05 and 10% at a temperature of between 50° and 120° C., and with the content of organohalogenated compounds in the liquid reaction mixture other than 1,1,1-trichloroethane, 1,1,1-dichlorodifluoroethane, 1,1,1-chlorodifluoroethane and 1,1,1-trifluoroethane being controlled at less than 40% by weight by relative adjustment of the removals in gaseous and liquid form of the reaction products from the reaction system.

5,569,794

# VAPOR PHASE PROCESS FOR PRODUCING HYDROFLUOROCARBONS FROM PERCHLOROETHYLENE HAVING A PHENOLIC INHIBITOR

Hsueh S. Tung, Getzville, N.Y., assignor to AlliedSignal Inc., Morris County, N.J.

Continuation of Ser. No. 248,127, May 24, 1994, abandoned.

This application Aug. 30, 1995, Ser. No. 521,258

Int. Cl.<sup>6</sup> C07C 17/08; 17/42

U.S. Cl. 570—168

12 Claims

1. A process for producing hydrofluorocarbons and hydrochlorofluorocarbons which comprises reacting anhydrous hydrogen fluoride in the vapor phase and in the presence of a fluorination catalyst with an admixture of perchloroethylene and an oxidation inhibitor, wherein the oxidation inhibitor is selected from the group consisting of hydroquinone monomethyl ether and hydroquinone in an amount of from about 1 ppm to about 50 ppm based on the weight of perchloroethylene.

5,569,795

# FLUORINATION CATALYST AND FLUORINATION PROCESS

Katsuyuki Tsuji; Kimitaka Oshiro, and Tetsuo Nakajo, all of Kawasaki, Japan, assignors to Showa Denko K. K., Tokyo, Japan

Division of Ser. No. 262,496, Jun. 20, 1994, Pat. No.

5,494,876. This application Nov. 7, 1995, Ser. No. 554,836

Claims priority, application Japan, Jun. 18, 1993, 5-147897

Int. Cl.<sup>6</sup> C07C 17/20; 19/08

U.S. Cl. 570—168

17 Claims

1. A process for fluorinating a halogenated hydrocarbon comprising the step of: contacting a halogenated hydrocarbon with hydrogen fluoride in a gaseous phase in the presence of a fluorination catalyst, wherein the fluorination catalyst comprises indium, chromium, oxygen and fluorine as essential constituent elements thereof.

5,569,796

# PROCESS FOR PRODUCING FLUORINATED SATURATED HYDROCARBON

Toshiro Yamada, Fujisawa, and Yasuhiro Mitsuda, Yokohama, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/01395, § 371 Date Mar. 29, 1995, § 102(e) Date Mar. 29, 1995, PCT Pub. No. WO94/07829, PCT Pub. Date Apr. 14, 1994

PCT Filed Sep. 30, 1993, Ser. No. 406,904

Claims priority, application Japan, Sep. 30, 1992, 4-285069

Int. Cl.<sup>6</sup> C07C 19/08

U.S. Cl. 570—175

10 Claims

1. A process for producing a fluorinated saturated hydrocarbon represented by the formula (2):



wherein R and R<sup>1</sup> represent a perfluoroalkyl group or both R and R<sup>1</sup> are bonded together to form a perfluoroalkylene group which is a part of a ring, which comprises reacting a fluorinated unsaturated hydrocarbon represented by the formula (1):



wherein R and R<sup>1</sup> are as defined above, with hydrogen in the presence of a platinum catalyst and in the absence of a base.

5,569,797

# METHOD OF REMOVING OLEFINIC IMPURITIES FROM HYDROCHLOROFLUOROCARBONS

Ta-Wei Fu, Newark, and Vellyur N. M. Rao, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 7, 1992, Ser. No. 817,628

Int. Cl.<sup>6</sup> C07C 17/38

U.S. Cl. 570—177

14 Claims

1. A process for removing an olefinic impurity from a mixture comprising a hydrochlorofluorocarbon wherein said hydrochlorofluorocarbon comprises at least one compound having a structure corresponding to



wherein R is a perfluoroalkyl or hydroperfluoroalkyl, and X and Y comprise at least one member from the group of H, Cl, and F, said process comprising:

- contacting said mixture with a source of hydrogen in the presence of a hydrogenation catalyst, whereby said contacting selectively hydrogenates substantially only said olefinic impurity, and



recovering a mixture in which the olefinic impurity has been substantially removed.

5,569,798

# CHLORINATION OF HALOGENATED CARBON COMPOUNDS FOR PURIFICATION PURPOSES

Andrew Jackson, Baton Rouge, La., assignor to LaRoche Industries, Inc., Baton Rouge, La.

Filed Apr. 17, 1995, Ser. No. 423,080

Int. Cl.<sup>6</sup> C07C 17/38; 17/04

U.S. Cl. 570—178

27 Claims

1. A method of chlorinating vinylidene chloride contained in a solution 1,1-dichloro-1-fluoroethane to provide a chlorinated compound having a boiling point different from the 1,1-dichloro-1-fluoroethane to permit separation therefrom, the method comprising:

- providing a solution containing 1,1-dichloro-1-fluoroethane and vinylidene chloride; and
- contacting said solution with chlorine and an alumina catalyst having a surface area of at least 80 m<sup>2</sup>/gm to effect chlorination of said vinylidene chloride to produce a chlorinated compound having a boiling point different than said 1,1-dichloro-1-fluoroethane.

5,569,799

# PROCESS FOR THE PRODUCTION OF CHLORINATED HYDROCARBONS AND ALKENES

Wu-Chi Chen, and Harvey R. Chen, both of 859 Brittmoore Rd., Houston, Tex. 77079-3601

Filed Apr. 27, 1995, Ser. No. 429,790

Int. Cl.<sup>6</sup> C07C 17/16

U.S. Cl. 570—261

16 Claims

1. A process for the manufacture of C<sub>2</sub>H<sub>2</sub>Cl<sub>2</sub> consisting essentially of

- the reaction of C<sub>2</sub>H<sub>2</sub>Cl with a chlorinating stream which contains a highly chlorinated ethene which is C<sub>2</sub>H<sub>2</sub>Cl<sub>2</sub>, C<sub>2</sub>HCl<sub>3</sub>, or C<sub>2</sub>H<sub>4</sub>Cl<sub>4</sub>, to produce C<sub>2</sub>H<sub>2</sub>Cl<sub>2</sub> and a corresponding less chlorinated ethene, which is C<sub>2</sub>H<sub>2</sub>Cl, C<sub>2</sub>H<sub>2</sub>Cl<sub>2</sub>, or C<sub>2</sub>HCl<sub>3</sub>, respectively; and
- the separation of the effluent from the reaction in order to recover C<sub>2</sub>H<sub>2</sub>Cl<sub>2</sub> as a product, recover unreacted C<sub>2</sub>H<sub>2</sub>Cl and highly chlorinated ethene for recycling, and recover the less chlorinated ethene as a byproduct.

5,569,800

# ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR, PYRENE-RING-CONTAINING OLEFIN COMPOUND FOR USE IN THE SAME, INTERMEDIATE FOR SYNTHESIZING THE OLEFIN COMPOUND, AND METHOD OF SYNTHESIZING THE OLEFIN COMPOUND

Tamotsu Aruga, Mishima; Masaomi Sasaki, Susono; Tomoyuki Shimada, and Hiroshi Adachi, both of Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 397,729, Mar. 2, 1995, abandoned, which is a continuation of Ser. No. 94,898, Jul. 22, 1993, abandoned, which is a division of Ser. No. 682,324, Apr. 9, 1991, Pat. No. 5,268,246, which is a continuation-in-part of Ser. No. 641,903, Jan. 16, 1991, Pat. No. 5,059,708. This application May 2, 1995, Ser. No. 433,714

Claims priority, application Japan, Apr. 9, 1990, 2-94812; Apr. 27, 1990, 2-113510; Jul. 31, 1990, 2-204599; Jul. 31, 1990, 2-204600

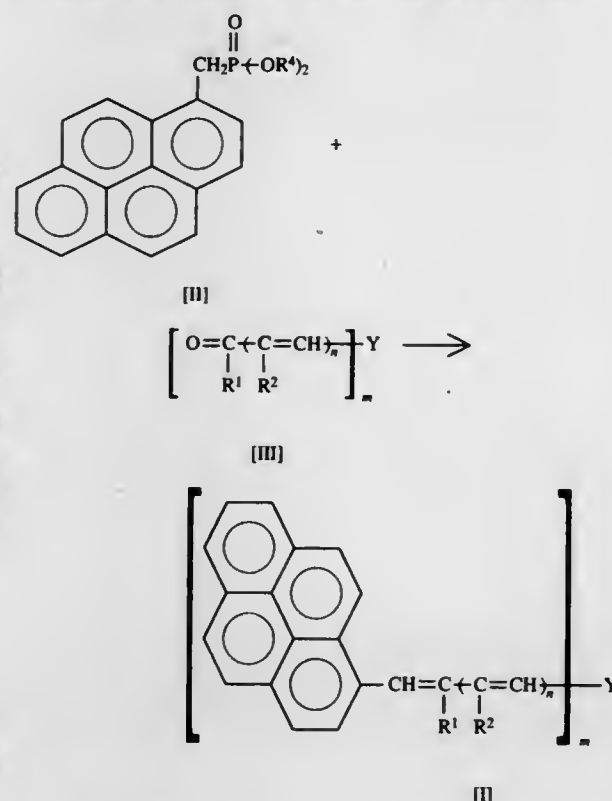
Int. Cl.<sup>6</sup> C07C 1/32; 15/38

U.S. Cl. 585—26

2 Claims

1. A method of producing a pyrene-ring-containing compound of formula [I] by reacting a phosphonic acid ester of formula [II] with

a carbonyl compound of formula [III] in the presence of a basic compound in accordance with the following reaction scheme:



wherein R<sup>1</sup> and R<sup>2</sup> each represent hydrogen or an alkyl group which may have a substituent; Y is an aliphatic hydrocarbon group which may have a substituent, a cyclic hydrocarbon group which may have a substituent, or an aromatic group which may have a substituent; n is 1, and m is an integer of 1 to 3, and Y and R<sup>1</sup> may be bonded to form a ring, and R<sup>4</sup> is an alkyl group having 1 to 4 carbon atoms.

5,569,801

# POLYMER CONVERSION PROCESS

Axel de Broqueville, Kraainem, Belgium, assignor to Fina Research, S.A., Feluy, Belgium

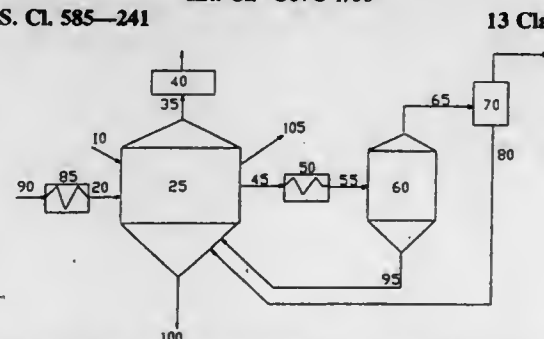
Continuation-in-part of Ser. No. 937,637, Aug. 27, 1992, Pat. No. 5,288,934. This application Nov. 23, 1993, Ser. No. 156,481

Claims priority, application Belgium, Nov. 24, 1992, 09201018

Int. Cl.<sup>6</sup> C07C 1/00

U.S. Cl. 585—241

13 Claims



1. A process for the conversion of polymers into lighter hydrocarbon streams comprising the steps of:

- contacting the polymers with a solvent comprising a hydrocarbon cut having a boiling temperature higher than 180° C.

- and composed predominantly of aromatic hydrocarbons, the polymers comprised of one or more members selected from the group consisting of polyethylene, polypropylene, polystyrene, polyvinyl chloride and polyethylene terephthalate;
- dissolving a portion of the polymers in the solvent;
- recovering (i) a top layer of undissolved particles, (ii) a bottom layer of undissolved heavy particles, and (iii) a solvent layer containing dissolved polymers and suspended particles of polymers; and
- cracking the solvent layer to recover lower molecular weight products.

5,569,802

# CATALYST, PROCESS FOR THE PREPARATION THEREOF AND PROCESS FOR THE SELECTIVE HYDROGENATION OF UNSATURATED COMPOUNDS

Hans-Gerd Lükens; Lothar Fischer; Wilhelm Droste, and Bernd Nowitzki, all of Marl, Germany, assignors to Huels Aktiengesellschaft, Marl, Germany

Division of Ser. No. 82,450, Jun. 25, 1993, abandoned. This application Sep. 28, 1994, Ser. No. 313,835

Claims priority, application Germany, Jun. 27, 1992, 42 21 139.5

Int. Cl.<sup>6</sup> C07C 5/00; 5/03; 5/05

U.S. Cl. 585—269

8 Claims

1. A process for selectively hydrogenating an ethylenically unsaturated carbon-carbon double bond of an aromatic compound containing the same, which process comprises:

- contacting a feedstock containing an aromatic compound having a substituent containing an ethylenically unsaturated carbon-carbon double bond with a catalyst in the presence of hydrogen, said catalyst comprising (i) an aluminum oxide support, and (ii) one or more noble metals or noble metal oxides or both, under conditions effective for hydrogenating said ethylenically unsaturated carbon-carbon double bond of said aromatic compound, said catalyst having the following X-ray diffraction pattern prior to its initial use:

d[10 <sup>-10</sup> m]	I/I <sub>0</sub>
4.51	5-10
2.76	15-40
2.64	
2.37	40-45
2.27	25-35
2.15	up to 15
1.97	55-70
1.66	up to 15
1.52	15-30
1.39	100
1.31	up to 15.

5,569,803

# METHOD FOR PRODUCING A CYCLOOLEFIN

Takahiko Takewaki; Naoko Fujita; Toshiharu Yokoyama, all of Yokohama, and Takao Maki, Fujisawa, all of Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Dec. 23, 1994, Ser. No. 363,034

Claims priority, application Japan, Dec. 24, 1993, 5-328456; Jan. 11, 1994, 6-001179; Feb. 28, 1994, 6-029804

Int. Cl.<sup>6</sup> C07C 5/11

U.S. Cl. 585—269

18 Claims

1. A method for producing a cycloolefin, which comprises partially hydrogenating a monocyclic aromatic hydrocarbon in the presence of water and a ruthenium catalyst supported on silica having zirconium oxide in an amount of from 0.1 to 20 wt %, based on the silica, supported in a uniformly dispersed state on the entire surface of said silica, wherein the zirconium oxide has an average crystallite size of from 10 to 200 Å, and wherein the

partial hydrogenation is conducted at a reaction temperature of from 50° to 250° C. under a hydrogen pressure of from 0.1 to 20 MPa.

5,569,804

# METHOD TO RECOVER CYCLIC DIOLEFIN MONOMER FROM ITS DIMER IN THE PRODUCTION OF ALKENYL BRIDGED RING COMPOUNDS

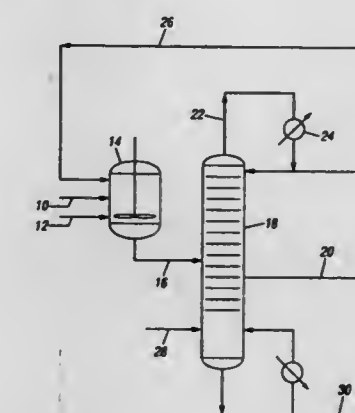
James R. Lattner, Seabrook, Tex., and Leonel E. Sanchez, Guatemala, Guatemala, assignors to Exxon Chemical Patents Inc (ECPI), Wilmington, Del.

Filed Dec. 30, 1993, Ser. No. 175,443

Int. Cl.<sup>6</sup> C07C 2/50; 7/00

U.S. Cl. 585—361

32 Claims



1. A method for using a single distillation column to recover the reactants and products from the reaction of a cyclic diolefin and an olefin to produce an alkenyl bridged ring compound comprising:

- feeding an effluent from the reaction of said cyclic diolefin with said olefin to a distillation column;
- removing said alkenyl bridged ring compound from said distillation column as a side stream at a location below said effluent feed;
- removing an overhead from said column comprising said cyclic diolefin, predominantly in monomeric form, leaving a bottoms comprising said cyclic diolefin, predominantly in dimerized form, and heavy byproduct; and
- cracking the dimerized cyclic diolefin in said bottoms whereby additional monomeric cyclic diolefin is recovered.

5,569,805

# CATALYTIC CONVERSION OF AROMATIC COMPOUNDS

Jeffrey S. Beck, Princeton, N.J.; Ernest W. Valyocsik, Yardley, Pa., and Chaya R. Venkat, Princeton, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 205,437, Mar. 4, 1994, Pat. No. 5,437,855, which is a continuation-in-part of Ser. No. 137,705, Oct. 18, 1993, abandoned. This application May 15, 1995, Ser. No. 441,502

Int. Cl.<sup>6</sup> C07C 2/66; 5/22

U.S. Cl. 585—446

23 Claims

1. A process for converting feedstock comprising aromatic compounds to product comprising aromatic compounds which differs from said feedstock which comprises contacting said feedstock at conversion conditions with a catalyst composition comprising a porous crystalline material having the structure of MCM-58.

5,569,806

# OLEFIN ISOMERISATION PROCESS USING METALLIC CATALYSTS IMPREGNATED WITH ORGANIC SULPHUR-CONTAINING COMPOUNDS BEFORE LOADING INTO THE REACTOR

Charles Cameron, Paris, France; Jean-Luc Nocca, Houston, Tex.; Patrick Sarrazin, Rueil Malmaison, and Alain Forestiere, Vernaison, both of France, assignors to Institut Français Du Pétrole, Rueil Malmaison, France

Filed Jul. 29, 1994, Ser. No. 282,470

Claims priority, application France, Jul. 30, 1993, 93 09528  
Int. Cl.<sup>6</sup> C07C 5/23

U.S. Cl. 585—668

17 Claims

1. A process for the isomerization of external olefins to produce internal olefins and more substituted external olefins, comprising subjecting to isomerization conditions in the presence of an activated catalyst a feedstock comprising external olefins, said liquid feedstock being substantially free of diolefins, in the presence of a palladium based catalyst and in the presence of hydrogen, the isomerization conditions of the process corresponding to a temperature of between 20° C. and 200° C., a pressure of between 1 and 50 bars, a VVH of between 0.5 and 10 h<sup>-1</sup> and an H<sub>2</sub>/olefin molar ratio of between 0.01 and 1, wherein the catalyst is treated, before loading into the isomerization reactor, with at least one sulfide or disulfide dissolved in a solvent, the catalyst, which contains 0.05% to 10% by weight of sulfur is loaded into the reactor and activated in a neutral or reducing atmosphere at a temperature of between 20° C. and 300° C., a pressure of between 1 and 50 bars and a VVH of between 50 and 600 h<sup>-1</sup>.

5,569,807

# ISOPARAFFIN-OLEFIN ALKYLATION

Ronald G. Abbott, and Bruce B. Randolph, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 1, 1992, Ser. No. 877,336

Int. Cl.<sup>6</sup> B01J 27/12; C07C 2/60

U.S. Cl. 585—724

33 Claims

1. A composition suitable as an alkylation catalyst consisting essentially of:  
a hydrogen halide;  
a sulfone compound; and  
water.

5,569,808

# METHOD FOR REGULATING A PROCESS FOR THE SEPARATION OF ISOMERS OF AROMATIC HYDROCARBONS HAVING FROM 8 TO 10 CARBON ATOMS

François Cansell, Montreuil; Gérard Hotier, Rueil Malmaison; Philippe Marteau, Paris, and Nathalie Zanier, Rueil Malmaison, all of France, assignors to Institut Français Du Pétrole, Rueil-Malmaison, France

Filed Jun. 29, 1994, Ser. No. 268,174

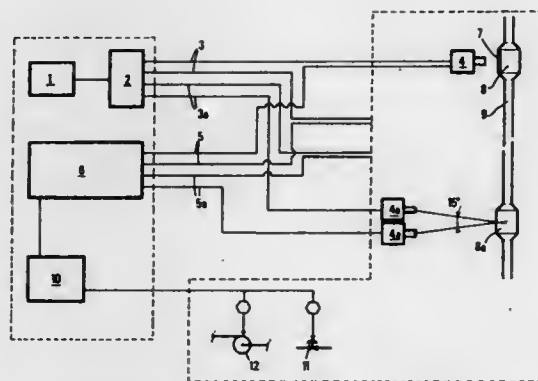
Int. Cl.<sup>6</sup> C07C 7/00

U.S. Cl. 585—800

11 Claims

1. A method of regulating a process for the separation of at least one isomer of aromatic hydrocarbon having from 8 to 10 carbon atoms which is contained in a mixture comprising at least two of said isomers, said process comprising a separation step in a separation zone, said method comprising:

a) sending a monochromatic light signal of a wavelength of between 400 and 1300 nanometers simultaneously to at least two points of said separation zone, other than points at which effluents are taken off,



- recovering a diffused polychromatic signal corresponding to the Raman effect between 400 and 3500 cm<sup>-1</sup>, substantially at the level of said points of said separation zone of a),
- sending at least two recovered signals simultaneously to a multi-channel spectrometer and delivering the corresponding Raman spectra,
- determining the chemical composition of the mixture at each of the two points from the two spectra,
- repeating the sequence of steps a, b, c, and d so as to reconstitute profiles with respect to the concentration of the two isomers contained in the mixture, and
- comparing the profiles with respect to the concentration obtained to a predetermined reference concentration profiles and
- adjusting at least one operational variable of the separation process for regulating the process.

5,569,809

# METHOD FOR DESTRUCTION OF CHLORINATED HYDROCARBONS

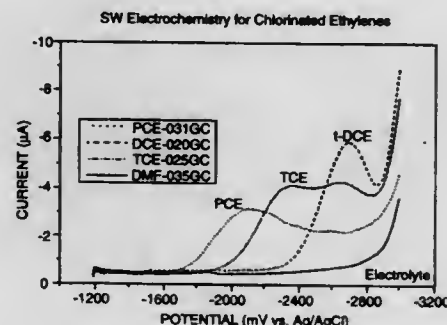
John Y. Gui, Colonie, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 3, 1995, Ser. No. 497,828

Int. Cl.<sup>6</sup> C02F 1/461

U.S. Cl. 588—204

12 Claims



1. A method to destruct electrochemically chlorinated hydrocarbons pollutants or unsaturated hydrocarbons found in gaseous media, aqueous solutions, and solid material in an electrochemical cell comprising the steps of: concentrating the chlorinated hydrocarbons or unsaturated hydrocarbons in a solvent by liquid-gas, liquid-solid, or liquid-liquid extraction, and then passing current in the electrochemical cell at a controlled potential through a solvent extractant containing the chlorinated hydrocarbons or unsaturated hydrocarbons for a period of time to electrochemically remove chlorine from the chlorinated hydrocarbons or hydrogenate the unsaturated hydrocarbons at a working electrode, where said electrolysis cell contains three electrodes consisting of a working

electrode, an auxiliary electrode, and a reference electrode, and where said working electrode is in-situ reactivated for reuse through electrochemical oxidation and reduction.

5,569,810

# METHOD OF AND SYSTEM FOR PROCESSING HALOGENATED HYDROCARBONS

Osamu Tsuji, Ohotsu, Japan, assignor to Samco International, Inc., Kyoto, Japan

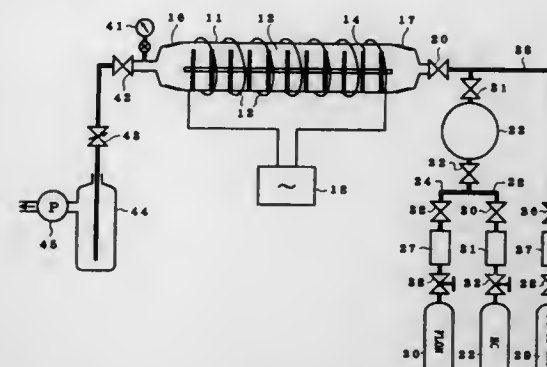
Filed Mar. 2, 1995, Ser. No. 398,178

Claims priority, application Japan, Mar. 18, 1994, 6-074362;  
May 10, 1994, 6-121923

Int. Cl.<sup>6</sup> A62D 3/00

U.S. Cl. 588—227

7 Claims



1. A method of processing a chlorofluorocarbon gas waste material comprising the steps of:

- mixing a hydrocarbon gas with the chlorofluorocarbon gas waste material to create a mixed gas; and
- exciting the mixed gas to a plasma state for plasma copolymerization, generating a copolymer of molecules of the chlorofluorocarbon gas waste material and the hydrocarbon gas, the copolymer being accumulated on a fixation member, wherein a majority of chlorofluorocarbons in said chlorofluorocarbon gas waste material is prevented by said method of processing from being atmospherically released.

5,569,811

# METHOD FOR ISOLATING, IMMOBILIZING AND RENDERING WASTE NON-LEACHABLE

Miles W. Dean, P.O. Box 201341, Anchorage, Ak. 99520

Filed Oct. 6, 1994, Ser. No. 319,169

Int. Cl.<sup>6</sup> A62D 3/00; B09B 3/00; G21F 9/34

U.S. Cl. 588—252

48 Claims

1. A process for treating a contaminated solid unacceptable for disposal in the environment to isolate the contaminant and render the solid immobile and environmentally benign, comprising the steps of:

- contacting said contaminated solid in a bath of molten paraffinic hydrocarbon, normally solid at room temperature, for a time sufficient to coat such solid with paraffin to produce a solids/liquids mixture comprising a liquids phase and a solids phase, whereby any volatile contaminants in said contaminated solid are expelled into the liquid phase of said solids/liquids mixture and the solids phase and the liquids phase of said solids/liquids mixture are readily separable.

5,569,812

# NUDE MOUSE MODEL FOR HUMAN NEOPLASTIC DISEASE

Ann Monosov, and Xinyu Fu, both of San Diego, Calif., assignors to Anticancer Incorporated, San Diego, Calif.

Continuation of Ser. No. 169,735, Dec. 17, 1993, Pat. No.

5,491,284, which is a continuation of Ser. No. 719,814, Jun.

24, 1991, abandoned, which is a continuation-in-part of Ser.

No. 253,990, Oct. 5, 1988, abandoned. This application Jun.

2, 1995, Ser. No. 459,730

Int. Cl.<sup>6</sup> A61K 35/00; 49/00

U.S. Cl. 800—2

12 Claims

1. A nude mouse model for human neoplastic disease, wherein said mouse is characterized by:  
having histologically intact human neoplastic tissue of at least 1 mm<sup>3</sup> in size transplanted onto an organ of said mouse which corresponds to the human organ from which said tissue is originally obtained; and  
having sufficient immuno-deficiency to allow said transplanted neoplastic tissue to grow and mimic the progression of the neoplastic disease in the human donor.

5,569,813

# INBRED CORN LINE DESIGNATED ZS0223

Raymond J. LeRette, Greeley, Colo., assignor to Zeneca Limited, London, England

Filed Feb. 22, 1994, Ser. No. 200,777

Int. Cl.<sup>6</sup> A01H 1/02; 4/00; 5/00; C12N 5/04

U.S. Cl. 800—200

12 Claims

1. An inbred corn line designated ZS0223, seed of which have been deposited under ATCC Accession No. 75691.

5,569,814

# SOYBEAN CULTIVAR 003394768

William H. Eby, Adel, Iowa, assignor to Stine Seed Farm Inc., Adel, Iowa

Filed Jan. 17, 1995, Ser. No. 373,838

Int. Cl.<sup>6</sup> A01H 5/00; 5/10; C12N 5/04

U.S. Cl. 800—200

9 Claims

1. A soybean seed designated 003394768, having ATCC Accession No. 97018.

5,569,815

# SOYBEAN CULTIVAR 1572432

William H. Eby, Adel, Iowa, assignor to Stine Seed Farm Inc., Adel, Iowa

Filed Jan. 17, 1995, Ser. No. 373,923

Int. Cl.<sup>6</sup> A01H 5/00; 5/10; C12N 5/04

U.S. Cl. 800—200

9 Claims

1. A soybean seed designated 1572432, having ATCC Accession No. 97017.

5,569,816

# INBRED MAIZE LINE PHAJO

Hartwig J. B. Wehrmann, Staufen, Germany, assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Jan. 31, 1995, Ser. No. 380,982

Int. Cl.<sup>6</sup> A01H 1/02; 4/00; 5/00; C12N 5/04

U.S. Cl. 800—200

13 Claims

1. Seed of maize inbred line designated PHAJO and having ATCC Accession No. 97574.  
2. A maize plant produced by the seed of claim 1 and its plant parts.



5,569,817

## INBRED MAIZE LINE PHJ3

James A. Wright, Wilson, N.C., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Jan. 31, 1995, Ser. No. 381,252

Int. Cl.<sup>6</sup> A01H 1/02; 4/00; 5/00; C12N 5/04

U.S. Cl. 800—200 13 Claims

1. Seed of maize inbred line designated PHJ3 and having ATCC Accession No. 97497.

2. A maize plant produced by the seed of claim 1 and its plant parts.

5,569,818

## INBRED MAIZE LINE PHAP8

Louis B. Chapko; Donald E. Westerhof, both of Alma, Mich., and David S. Ertl, Waukegan, Iowa, assignors to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Jan. 31, 1995, Ser. No. 381,457

Int. Cl.<sup>6</sup> A01H 1/02; 4/00; 5/00; C12N 5/04

U.S. Cl. 800—200 13 Claims

1. Seed of maize inbred line designated PHAP8 and having ATCC Accession No. 97505.

2. A maize plant produced by the seed of claim 1 or its plant parts.

5,569,819

## INBRED MAIZE LINE PHPP8

Theron E. Roundy, Lincoln County, Nebr., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Jan. 31, 1995, Ser. No. 381,460

Int. Cl.<sup>6</sup> A01H 1/02; 4/00; 5/00; C12N 5/04

U.S. Cl. 800—200 13 Claims

1. Seed of maize line designated PHPP8 and having ATCC Accession No. 97501.

2. A maize plant produced by the seed of claim 1 and its plant parts.

5,569,820

## INBRED CORN LINE ZS1284

Richard G. Stelpflug, Slater, and Mark J. Messmer, Ankeny, both of Iowa, assignors to Zeneca Limited, London, England

Filed Mar. 28, 1995, Ser. No. 413,203

Int. Cl.<sup>6</sup> A01H 5/00; 4/00; 1/00; C12N 5/04

U.S. Cl. 800—200 11 Claims

1. Inbred corn seed designated ZS1284 seed of which has been deposited in the ATCC under deposit number X.

5,569,821

## INBRED CORN LINE PHT11

Loren J. Hoffbeck, Tipton, Ind., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Continuation of Ser. No. 70,488, Jun. 2, 1993, Pat. No.

5,434,346, which is a continuation of Ser. No. 649,789, Feb. 1, 1992, abandoned. This application Jul. 7, 1995, Ser. No. 499,517

Int. Cl.<sup>6</sup> A01H 4/00; 5/00; C12N 5/04

U.S. Cl. 800—200 2 Claims

1. Plant parts of a plant produced by a seed designated PHT11 and having ATCC accession number 75962.

5,569,822

## INBRED CORN LINE PHT4

Michael A. Chapman, Madison Lake, Minn., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Continuation of Ser. No. 414,477, Mar. 31, 1995, Pat. No.

5,495,069, which is a continuation of Ser. No. 186,730, Jan.

24, 1994, Pat. No. 5,453,564. This application Jul. 10, 1995,

Ser. No. 500,286

Int. Cl.<sup>6</sup> A01H 1/02; 5/00

U.S. Cl. 800—200 2 Claims

1. Parts of a plant produced by a seed designated PHT4 and having ATCC accession number 97065.

5,569,823

## DNA COMPRISING PLUM POX VIRUS AND TOMATO SPOTTED WILT VIRUS CDNAS FOR DISEASE RESISTANCE

Peter H. Schreier, Köln; Klaus Stenzel, Düsseldorf; Günter Adam, and Edgar Maiss, both of Brunswick, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 23, 1994, Ser. No. 247,809

Claims priority, application Germany, May 28, 1993, 43 17 845.6

Int. Cl.<sup>6</sup> A01H 5/00; C12N 15/33; 15/82

U.S. Cl. 800—205 55 Claims

1. DNA comprising a combination of fragment A linked directly or indirectly to fragment B, wherein:

fragment A consists of a double-stranded cDNA fragment derived from the RNA of the plum pox virus; and

fragment B consists of a double-stranded cDNA fragment derived from the S RNA of the N structural gene of the tomato spotted wilt virus;

said combination, when expressed in a plant, conferring on said plant an increased resistance, as compared to a natural plant of the same species, to tomato spotted wilt virus and another tospovirus.

33. A transformed whole plant, said whole plant containing in its genome DNA in addition to the DNA naturally constituting the genome of said whole plant, said whole plant expressing said additional DNA, said additional DNA comprising DNA according to claim 1, and said transformed whole plant, as a result of the expression of said additional DNA, exhibiting an increased resistance, as compared to a whole plant of the same plant species that is not so transformed, to tomato spotted wilt virus and another tospovirus, or propagation material of said transformed whole plant.

5,569,824

## TRANSGENIC MICE CONTAINING A DISRUPTED P53 GENE

Lawrence A. Donehower; Allan Bradley; Janet S. Butel, all of Houston, and Betty Slagle, Bellaire, all of Tex., assignors to Baylor College of Medicine, Houston, Tex.

Continuation of Ser. No. 816,740, Jan. 3, 1992, abandoned, which is a continuation-in-part of Ser. No. 637,563, Jan. 4,

1991, abandoned. This application Jul. 21, 1994, Ser. No. 278,588

Int. Cl.<sup>6</sup> C12N 5/00; 15/00; A61K 49/00

U.S. Cl. 800—2 4 Claims

1. A transgenic mouse whose somatic and germ line cells contain a genome comprised of two alleles of the tumor suppressing p53 gene, one of the alleles being disrupted by a selectable marker sequence, wherein the mouse is more susceptible to developing tumors than the wild type mouse.

5,569,825

## TRANSGENIC NON-HUMAN ANIMALS CAPABLE OF PRODUCING HETEROLOGOUS ANTIBODIES OF VARIOUS ISOTYPES

Nils Lönberg, and Robert M. Kay, both of San Francisco, Calif., assignors to GenPharm International, Mountain View, Calif.

Continuation-in-part of Ser. No. 575,962, Aug. 31, 1990, abandoned, which is a continuation-in-part of Ser. No. 574,748, Aug. 29, 1990, abandoned. This application Dec. 17, 1991, Ser. No. 810,279

The portion of the term of this patent subsequent to Dec. 16, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> C12N 15/00; C07H 21/04

U.S. Cl. 800—2 8 Claims

1. A transgenic mouse having a genome comprising a germline copy of an unrearranged human heavy chain immunoglobulin minilocus transgene comprising a plurality of human VH gene segments, a plurality of human D gene segments, a plurality of human JH gene segments, an immunoglobulin heavy chain enhancer, a mu constant region comprised of a mu switch region located upstream from a mu constant gene segment, a gamma constant region comprised of a gamma switch region located upstream from a human gamma constant gene segment, and wherein B lymphocytes of said transgenic mouse rearrange said unrearranged human heavy chain transgene by V-D-J joining to produce a V-D-J gene joined in-frame encoding a heavy chain variable region expressed in polypeptide linkage to the constant region encoded by said human gamma constant gene segment on said transgene by intratransgene isotype switching, and wherein said minilocus transgene has at least one discontinuity of at least 2 kb between said mu and gamma gene segments as compared to a human germline heavy chain locus, wherein said mouse expresses human IgM heavy chains, and as a result of isotype switching, human IgG heavy chains.

5,569,826

## INBRED CORN LINE DESIGNATED ZS0114

Grant L. Metz, New Ulm, Minn., assignor to Zeneca Limited, London, England

Filed Feb. 22, 1994, Ser. No. 200,477

Int. Cl.<sup>6</sup> A01H 1/02; 4/00; 5/00; C12N 5/04

U.S. Cl. 800—200 11 Claims

1. An inbred corn line designated ZS0114, seed of which have been deposited under ATCC Accession No. 75689.

5,569,827

## TRANSGENIC MOUSE FOR THE NEURONAL EXPRESSION OF HIV GP160

Aliégria Kessous-Elbaz, Côte St-Luc; Jean Michaud, and Fouad Berrada, both of Montréal, all of Canada, assignors to Université de Montréal, Montréal, Canada

Filed Jun. 6, 1994, Ser. No. 254,395

Int. Cl.<sup>6</sup> C12N 15/00; C07H 21/02

U.S. Cl. 800—2 1 Claim

1. A transgenic mouse whose germ cells and somatic cells contain a recombinant HIV-1 env gene sequence which is operably linked to a neuron specific promoter of human neurofilament light gene (NFL) effective for the expression of said HIV-1 env gene sequence in the neuronal tissues of said mouse and wherein expression of said env gene produces neuropathological changes associated with HIV-1 wherein said neuropathological changes are selected from the group consisting of HIV-1 immunoreactive axonal swelling, dendritic swelling, and astrogliosis in the central nervous system; wherein said env gene is introduced into said mouse or an ancestor of said mouse at an embryonic stage.

5,569,828

## MAIZE CHLOROTIC DWARF VIRUS AND RESISTANCE THERE TO

Michael D. McMullen, Wooster, Ohio; Bradley A. Roth, Grimes, and Rod Townsend, Des Moines, both of Iowa, assignors to Pioneer Hi-Bred International, Inc., Des Moines, Iowa, and The United States of America as represented by the Department of Agriculture, Washington, D.C.

Filed Mar. 24, 1993, Ser. No. 38,768

Int. Cl.<sup>6</sup> A01M 1/02; 4/00; 5/00; C12N 5/04; 7/00; 15/33; 15/34

U.S. Cl. 800—205 20 Claims

1. A DNA clone coding substantially solely for a coat protein of maize chlorotic dwarf virus.

2. An expression cassette comprising a DNA clone according to claim 1, operably linked to plant regulatory sequences which cause the expression of the DNA clone in plant cells.

11. A transformed maize plant, the cells of which contain as foreign DNA at least one copy of the DNA sequence of an expression cassette according to claim 2.

5,569,829

## TRANSFORMED TOMATO PLANTS

Colin R. Bird, Bracknell; Jeremy M. Boniwell, Marston; Donald Grierson, Shepshed; John A. Ray, Wooden Hill, and Wolfgang W. Schuch, Crowthorne, all of United Kingdom, assignors to Imperial Chemical Industries, London, England

Continuation-in-part of Ser. No. 598,873, Oct. 19, 1990, Pat. No. 5,254,800. This application Jun. 9, 1993, Ser. No. 73,425

Claims priority, application United Kingdom, Oct. 20, 1989, 8923716; Jan. 10, 1992, 9200520

Int. Cl.<sup>6</sup> A01H 4/00

U.S. Cl. 800—205 2 Claims

1. A method of producing fruit having increased solids content which comprises transforming fruit-bearing plants with a DNA construct adapted to inhibit expression of the pTOM36 gene during ripening, selecting transgenic plants in which expression of the pTOM36 gene is at least partially inhibited when compared to expression in non-transformed plants, cultivating said transgenic plants or progeny thereof and harvesting the fruit which shows an increase in dry weight to fresh weight ratio of about 5–14%.

wherein the DNA construct comprises a DNA sequence encoded by the clone pTOM36 under control of a promoter functional in plants so that the DNA sequence generates RNA during ripening, said RNA being sense or antisense RNA and wherein the fruit is tomato.

5,569,830

## PLANT INHIBITORS OF FUNGAL POLYGALACTURONASES AND THEIR USE TO CONTROL FUNGAL DISEASE

Alan Bennett; John M. Labavitch; Ann Powell, all of Davis, and Henrik Stotz, Menlo Park, all of Calif., assignors to Regents of the University of California, Oakland, Calif.

Filed May 3, 1994, Ser. No. 238,163

Int. Cl.<sup>6</sup> A01H 1/04; C12N 5/14; 15/00; C07H 17/00

U.S. Cl. 800—205 26 Claims

1. An isolated DNA construct comprising a polynucleotide sequence encoding a pear polygalacturonase inhibitor protein (PGIP), wherein the polynucleotide sequence hybridizes to SEQ. ID. NO. 1 under hybridization conditions which include washing at 55° C. and 0.2x SSC.

3. An isolated DNA construct comprising a polynucleotide sequence encoding a tomato polygalacturonase inhibitor protein (PGIP), wherein the polynucleotide sequence hybridizes to SEQ. ID. NO. 3 under hybridization conditions which include washing at 55° C. and 0.2x SSC.

9. A transgenic plant comprising a recombinant expression cassette comprising a plant promoter operably linked to the polynucleotide sequence of claim 1 or claim 3.

5,569,831

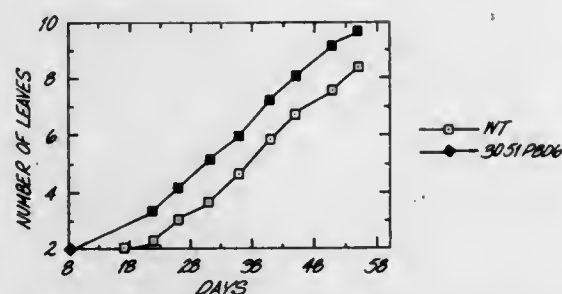
**TRANSGENIC TOMATO PLANTS WITH ALTERED POLYGALACTURONASE ISOFORMS**

Dean DellaPenna, Tucson, Ariz., assignor to The Arizona Board of Regents on behalf of the University of Arizona, Tucson, Ariz.

Continuation-in-part of Ser. No. 880,915, May 8, 1992, abandoned. This application Jul. 11, 1994, Ser. No. 273,538  
Int. Cl.<sup>6</sup> A01H 4/00; C12N 1/21; 5/14; 15/82

U.S. Cl. 800—205 24 Claims

10. A transgenic tomato plant comprising in its genome a foreign genetic construction comprising 5' to 3' a promoter effective in tomato, a coding region encoding an RNA of at least 15 nucleotides complementary to the mRNA of the tomato polygalacturonase beta-subunit gene, and a transcriptional terminator, the genetic construction effective in vivo in the tomato fruit to lower the level of production of the polygalacturonase beta-subunit protein.



into the genome of the plant under conditions permitting its expression, a foreign gene coding for nitrate reductase to induce an over expression of nitrate reductase in the plant.

9. Plant displaying enhanced earliness, obtained by the method of claim 1.

5,569,832

**GENETIC SEQUENCES ENCODING FLAVONOID PATHWAY ENZYMES AND USES THEREFOR**

Timothy A. Holton, Northcote; Edwina C. Cornish, Upper Beaconsfield; Filipina Kovacic, Preston; Yoshikazu Tanaka, Rosanna, and Diane R. Lester, Triabunna, all of Australia, assignors to International Flower Developments Pty. Ltd., Victoria, Australia

Continuation of Ser. No. 912,900, Jul. 13, 1992, Pat. No. 5,349,125. This application Aug. 3, 1994, Ser. No. 285,309  
Claims priority, application Australia, Jul. 11, 1991, PK7173; Feb. 17, 1992, PL0923

U.S. Cl. 800—205 13 Claims

1. A transgenic plant comprising a non-native nucleic acid encoding a 3',5'-hydroxylase capable of hydroxylating DHK wherein said transgenic plant is capable of expressing said nucleic acid and wherein said transgenic plant exhibits altered pigment production relative to native pigment production and wherein said altered pigment production is conferred by said nucleic acid.

5,569,833

**METHOD FOR ENHANCING THE EARLINESS OF A PLANT AND/OR LOWERING THE CONTENT OF NITRATES STORED IN THE PLANT**

Michel Vincentz, Paris; François Dorlhac, Meudon; Yves Chapeau, Richebourg; Jean-François Morot-Gaudry, Gif-sur-Yvette, and Michel Caboche, Maurepas, all of France, assignors to Institut National de la Recherche Agronomique, Paris, France

PCT No. PCT/FR93/00222, § 371 Date Dec. 6, 1994, § 102(e) Date Dec. 6, 1994, PCT Pub. No. WO93/18154, PCT Pub. Date Sep. 16, 1993

PCT Filed Mar. 5, 1993, Ser. No. 295,882

Claims priority, application France, Mar. 5, 1992, 92 02658

Int. Cl.<sup>6</sup> A01H 5/00; C12N 15/53; 15/84; 15/29

U.S. Cl. 800—205 12 Claims

1. Method for enhancing the earliness of a plant and/or lowering the content of nitrates stored in the plant, comprising introducing

**5,569,834  
METHOD FOR SOYBEAN TRANSFORMATION AND REGENERATION**

Maud A. Hinchey, Manchester, and Dannette Connor-Ward, Olivette, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 156,611, Nov. 23, 1993, Pat. No. 5,416,011, which is a continuation of Ser. No. 18,347, Feb. 16, 1993, abandoned, which is a continuation of Ser. No. 223,147, Jul. 22, 1988, abandoned. This application Feb. 14, 1995, Ser. No. 388,642

U.S. Cl. 800—205 2 Claims

1. A soybean plant comprising a chimeric gene and associated DNA resulting from an *Agrobacterium tumefaciens*-mediated transformation, said chimeric gene capable of conferring kanamycin resistance to said soybean plant, produced by the method which comprises:

- preparing a cotyledon explant from a soybean seedling by:
  - removing the hypocotyl region by cutting just below the cotyledonary node,
  - separating the two cotyledons at the cotyledonary node, and
  - removing the epicotyl from the cotyledon to which it remains attached,
- inserting a chimeric gene into the explant of part (a) by inoculation and co-cultivation of the explant with a disarmed *Agrobacterium tumefaciens* vector containing said chimeric gene;
- selecting transformed explant tissue, and
- regenerating a differentiated transformed plant from the transformed explant tissue of part (c).

## ELECTRICAL

**5,569,835  
REFERENCE WIRE COMPENSATION METHOD AND APPARATUS**

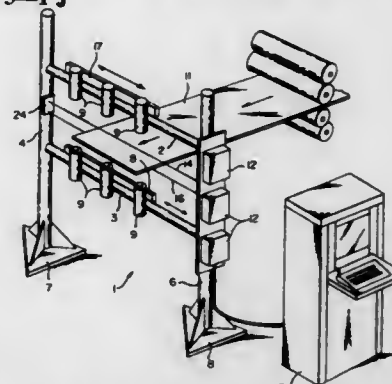
Martin J. Kenney, Sandpoint, Id., and John K. Billings, Snohomish, Wash., assignors to Ultrasonic Arrays, Inc., Woodinville, Wash.

Continuation of Ser. No. 288,299, Aug. 10, 1994, abandoned.

This application Sep. 1, 1995, Ser. No. 522,760

Int. Cl.<sup>6</sup> G01N 21/86; 37/00

U.S. Cl. 73—1 J 18 Claims



1. In combination with a frame for mounting sensor apparatus in fixed relation with an object to be sensed, said frame being subject to stress distortion, a constant reference comprising: a thin elongated flexible reference member, mounting structure for positioning said reference member between said sensor in the sensing path thereof and the surface of the object and unaffected by stress distortion of said frame, adjustable tensioning apparatus for maintaining constant tension on said reference member, whereby said reference member remains in fixed position relative to the object independent of movement of said frame.

5,569,836

**SUSPENSION TESTING APPARATUS AND METHOD**

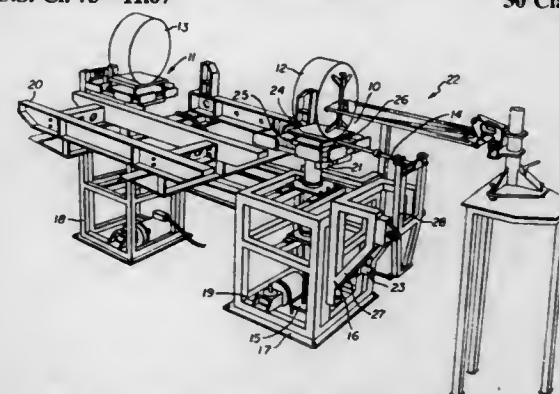
Raymond L. Hill, Attleborough, United Kingdom, assignor to Lotus Cars Limited, Norfolk, England  
PCT No. PCT/GB93/00352, § 371 Date Nov. 4, 1994, § 102(e) Date Nov. 4, 1994, PCT Pub. No. WO93/17319, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 19, 1993, Ser. No. 244,971

Claims priority, application United Kingdom, Feb. 19, 1992, 9203651

Int. Cl.<sup>6</sup> G01M 17/00

U.S. Cl. 73—11.07 30 Claims



1. Vehicle suspension testing apparatus comprising: wheel support means for supporting thereon a vehicle wheel, actuator means for applying force to the wheel support mean in at least two directions selected from the group of directions vertical to, transverse to, and longitudinally along the vehicle, and sensor means for measuring the displacement of the vehicle wheel,

wherein the actuator means is connected to the wheel support means by pivotal connection means directly below the center of the vehicle wheel, said pivotal connection means allowing free pivotal motion of the wheel support means in at least one plane.

5,569,837

**DETECTOR APPARATUS OF DESORPTION GAS AND METHOD THEREFOR**

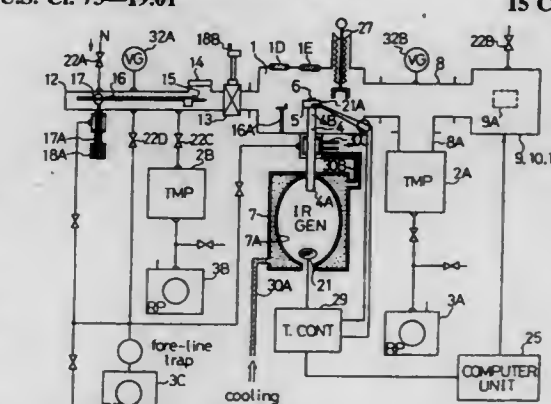
Yasushi Hinaga, Machida, Japan, assignor to ESCO LTD, Tokyo, Japan

PCT No. PCT/JP91/01684, § 371 Date Sep. 20, 1994, § 102(e) Date Sep. 20, 1994

PCT Filed Dec. 3, 1991, Ser. No. 94,116

Int. Cl.<sup>6</sup> G01N 1/00

U.S. Cl. 73—19.01 15 Claims



1. A desorption gas detection apparatus comprising: a vacuum chamber; a vacuum pump that maintains a vacuum in said vacuum chamber, said vacuum pump being connected to said vacuum chamber by a first line; a sample stage located at a fixed position inside said vacuum chamber; a heater for heating a sample placed on said sample stage while not substantially heating components defining said vacuum chamber; a mass spectrometer connected to said vacuum chamber; a loading lock mechanism housed in a space having a volume that is smaller than that of said vacuum chamber, said loading lock mechanism including a gate valve connecting said space to said vacuum chamber; and an evacuating means connected to said space via a second line different from said first line to maintain a vacuum in said space, wherein said loading lock mechanism transports and mounts a sample on said sample stage without breaking said vacuum in said vacuum chamber.

5,569,838

**PROCESS AND DEVICE FOR MEASURING A GAS MEDIUM WITH A CHEMICAL SENSOR**

Axel Broedel, Lenzkirch; Thomas Springmann; Reinhold Münch, both of Freiburg, and Armin Bader, Braunlingen, all of Germany, assignors to Testo GmbH & Co., Lenzkirch, Germany

Filed Mar. 6, 1995, Ser. No. 398,928

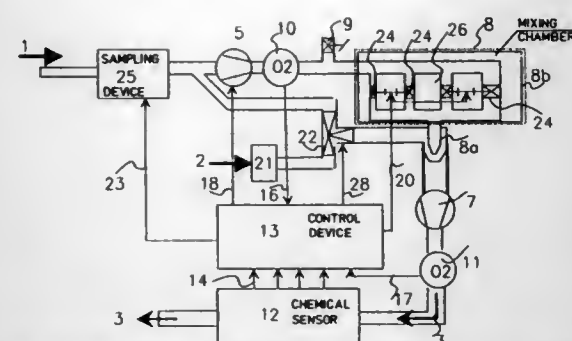
Claims priority, application Germany, Mar. 5, 1994, 44 07 345.3

Int. Cl.<sup>6</sup> G01N 27/416; 1/22

U.S. Cl. 73—23.31 18 Claims

1. A process for sampling and introducing a sample of an unknown gaseous medium to a chemical sensor, the gaseous medium potentially comprising a particular gaseous substance, the chemical sensor responsive to the presence of the particular gas-





eous substance to provide a first electrical signal indicative of its concentration within the sample and having a nominal measuring range, said process comprising the following steps:

- taking a sample of said unknown gaseous medium;
- taking and mixing a dilution gas with the sample of the unknown gaseous medium to obtain a mixture thereof in accordance with an adjustable dilution ratio, said dilution gas comprising at least one known substance component of a predetermined concentration of said dilution gas;
- measuring the concentration of said one known substance within said mixture to provide a second electrical signal indicative thereof;
- introducing said mixture to the chemical sensor and operating said sensor to provide the first electrical signal;
- adjusting in accordance with said second electrical signal said dilution ratio;
- readjusting in accordance with said first electrical signal said dilution ratio to maintain the operation of the chemical sensor within its nominal measuring range; and
- evaluating said first and second electrical signals to provide a measure of the concentration of the particular gaseous substance in a manner to compensate for the adjustable dilution ratio.

5,569,839

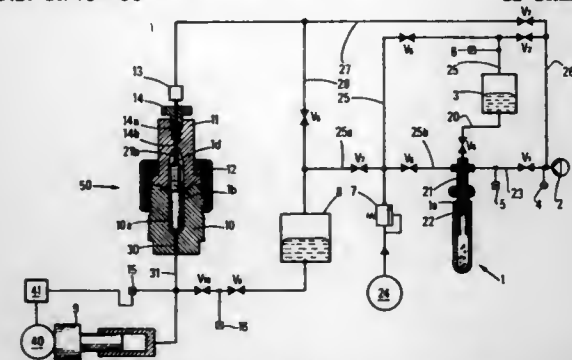
#### METHOD AND APPARATUS FOR DETERMINING PORE VOLUME IN A SOLID SAMPLE

Hubert Ajot, deceased, late of Rueil Malmaison; by Laure Ajot, legal representative, Argenteuil; by Alexandra Ajot, legal representative, Rueil Malmaison; by Vincent Ajot, legal representative, Le Vesinet; Colette Russmann, Eaubonne; Jose Brandely, Savigny Sur Orge; Dominique Garnier, Orgeval, and Pierre Gonzalez, Rueil Malmaison, all of France, assignors to Institut Francais Du Petrole, Rueil Malmaison, France  
Filed Nov. 17, 1994, Ser. No. 342,034

Claims priority, application France, Nov. 17, 1993, 93 13817  
Int. Cl.<sup>6</sup> G01N 15/08

U.S. Cl. 73—38

11 Claims



1. Apparatus for determining the pore volume parameters of a solid sample comprising a substantially sealed high pressure cell (50) containing a chamber (10a), a sample holder (1b) provided with a closure including a tube (21b) which is open at its two extremities and of a suitable diameter, the sample holder being mounted in said chamber and communicating therewith via said

tube, means (2) for creating a vacuum connected to said chamber, and means (8) for supplying a non wetting liquid such as mercury connected to the chamber, the apparatus being characterised in that it includes pump means (9) connected to the chamber and to the liquid supply means for delivering said liquid under pressure, means (40) connected to the pump for programming a steady supply rate over a set period of time, at least one pressure sensor (15) downstream of the pump means adapted to read the pressure continuously, and means (41) for signal collection and processing connected to the pressure sensor and to the means for programming the liquid supply, adapted to determine the pore volume parameters of the sample.

5,569,840

#### SCREENED ELECTRICAL LINE CONTROL DEVICE

Edmond Thurles, Meyzieu, France, assignor to GEC Alsthom T & D SA, Paris, France

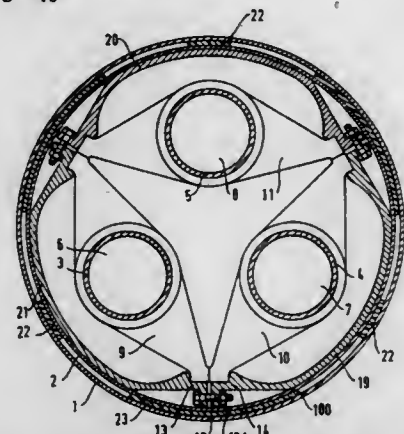
Filed Mar. 15, 1995, Ser. No. 404,734

Claims priority, application France, Mar. 16, 1994, 94 03058; Mar. 16, 1994, 94 03057

Int. Cl.<sup>6</sup> G01M 3/28

U.S. Cl. 73—40

12 Claims



1. Control device for a pressurized gas insulated screened line comprising a plurality of sections, two adjacent sections being separated by a junction enabling demounting of a section and each section comprising at least one conductor held in place in a cylindrical enclosure, in which device each section is equipped with at least one optical fiber running from one end to the other of the section and disposed inside said enclosure and with a control arrangement connected to said fiber and accommodated inside said enclosure, the optical fibers of N adjacent sections forming a module being connected to each other, and one end of the N interconnected optical fibers being connected to a control station.

5,569,841

#### CYLINDER COMBUSTION GAS LEAKAGE TESTING

Patrick J. Hoban, and Michael C. Plaza, both of North Platte, Nebr., assignors to General Electric Company, Erie, Pa.

Filed Dec. 13, 1994, Ser. No. 354,986

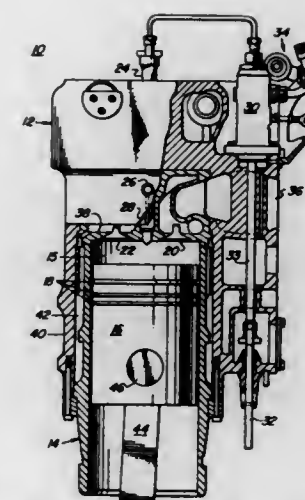
Int. Cl.<sup>6</sup> G01M 15/00

U.S. Cl. 73—47

3 Claims

1. A method for determining combustion gas leakage in a diesel engine cylinder having a piston reciprocally movable therein, the cylinder including a compression relief adapter port, the method comprising the steps of:

- advancing the piston to substantially top dead center on a compression stroke;
- connecting one end of a selected length of air hose to the compression relief adapter port;
- connecting another end of the air hose to an orifice meter, the meter having a first pressure gauge for measuring inlet air pressure to the meter, an inlet air pressure regulator, and a



second pressure gauge for measuring outlet air pressure to the cylinder supplied through the air hose; supplying a flow of air to the orifice meter; adjusting the regulator to establish a preselected inlet air pressure at the first pressure gauge; and reading the outlet air pressure on the second pressure gauge to determine the leakage rate of the cylinder.

5,569,842

#### AUTOMATED SYSTEM FOR IDENTIFYING AND ANALYZING DIFFERENT TYPES OF USED LUBRICANTS

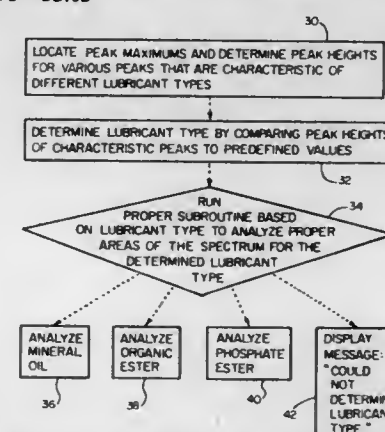
Regan L. Silvestri, Orange Village, Ohio, assignor to Man-Gill Chemical Company, Cleveland, Ohio

Filed Mar. 28, 1995, Ser. No. 412,079

Int. Cl.<sup>6</sup> G01N 7/00; 1/10; B01D 17/02

U.S. Cl. 73—53.05

25 Claims



20. An apparatus for automatically identifying and analyzing different types of used lubricants, comprising:

- means for obtaining electromagnetic absorption spectrum data for a lubricant;
- automated means for processing the electromagnetic absorption spectrum data to determine at least one characteristic chemical property of the lubricant, for identifying a lubricant type based on the at least one characteristic chemical property, and for analyzing the electromagnetic absorption spectrum data as a function of the lubricant type to indicate and evaluate a use characteristic of the lubricant indicative of the condition of the lubricant;
- means for outputting information relating to the use characteristic of the lubricant; and
- wherein the lubricant type can include mineral lubricants, synthetic organic ester lubricants and phosphate ester lubricants.

5,569,843

#### UNIT USED IN AN APPARATUS FOR MEASURING THE VISCOSITY OF A FLUID

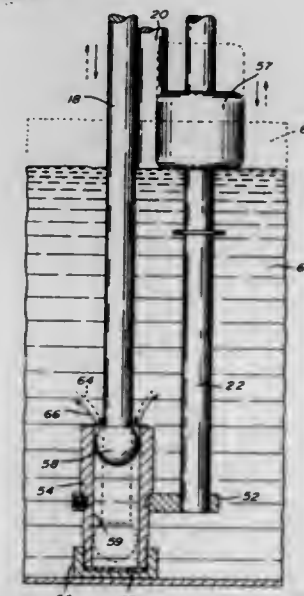
Daniel Poissant, St-Hubert, Canada, assignor to PAD Peripheral Advanced Design, Inc., Canada

Filed Apr. 11, 1995, Ser. No. 419,818

Int. Cl.<sup>6</sup> G01N 11/06

U.S. Cl. 73—54.07

10 Claims



1. In an apparatus for measuring the viscosity of a fluid contained within a recipient, the improvement comprising a unit including:

- vertically displaceable piston means having an upper part and a lower part; said upper part including a switch contacting means; said lower part being immergably receivable within the fluid containing recipient and displaying a spherical head at a lower end thereof;
- cup means receiving said spherical head therein and displaying an inner cylindrical wall having an inner diameter slightly greater than the diameter of the spherical head to thereby provide a linear clearance between said head and said wall;
- means associated with the upper part of said piston means for lifting said piston means to an uppermost position and for allowing, at said uppermost position, said piston means to fall under gravity to a lower switch contacting position whereby the time for said piston means to reach said lower position, as said fluid is expelled through the clearance from the cup means, is proportional to the viscosity of the fluid.

5,569,844

#### METHOD AND APPARATUS FOR DETERMINING THE PARTICLE SIZE DISTRIBUTION, THE SOLIDS CONTENT AND THE SOLUTE CONCENTRATION OF A SUSPENSION OF SOLIDS IN A SOLUTION BEARING A SOLUTE

Brian D. Sowerby, Kareela, Australia, assignor to Commonwealth Scientific and Industrial Research Organisation, Campbell, Australia

PCT No. PCT/AU93/00419, § 371 Date Feb. 8, 1995, § 102(e) Date Feb. 8, 1995, PCT Pub. No. WO94/04907, PCT Pub. Date Mar. 3, 1994

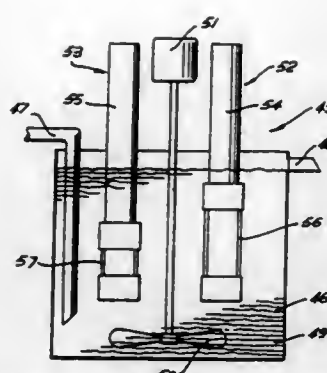
PCT Filed Aug. 16, 1993, Ser. No. 379,673

Claims priority, application Australia, Aug. 17, 1992, PL4150  
Int. Cl.<sup>6</sup> G01N 15/02; 23/10; 29/18; 29/20

U.S. Cl. 73—61.75

15 Claims

1. A method of determining the particle size distribution of a suspension of solids in a solution bearing a solute, said method including the step of:



- (i) measuring the velocity of ultrasound on transmission through a sample of the solution;
- (ii) measuring the attenuation of ultrasound on transmission through the sample;
- (iii) measuring the attenuation of electromagnetic radiation on transmission through the sample to obtain a measure of the density of the sample;
- (iv) deriving from the measure of density and the measure of said velocity an estimate of the concentration of solids in suspension;
- (v) deriving from the measure of density and the measure of said velocity an estimate of the solute concentration; and
- (vi) deriving from the measure of ultrasonic attenuation, ultrasonic velocity and density the measure of particle size distribution.

5,569,845

# **APPARATUS AND METHOD FOR DETECTING MOLTEN SALT IN MOLTEN METAL**

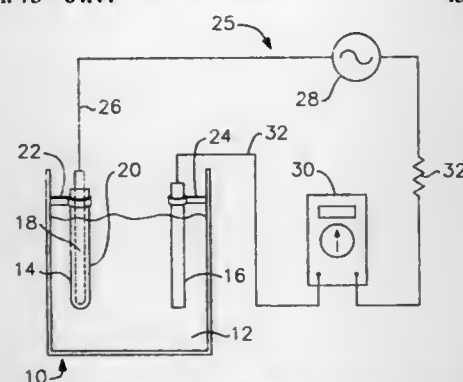
Kenneth R. Butcher, and Giulio A. Rossi, both of Hendersonville, N.C., assignors to Selee Corporation, Hendersonville, N.C.

Filed May 16, 1995, Ser. No. 442,478

Int. Cl.<sup>6</sup> G01N 27/04

U.S. Cl. 73—64.44

43 Claims



1. A device for use in detecting the presence of molten salt in molten metal comprising:
  - a substrate adapted to at least be partially submerged in molten metal; said substrate including an electrically conductive surface; said conductive surface of said substrate being coated with an electrically nonconductive porous material; said nonconductive material being wettable by the molten salt but nonwetttable by the molten metal, whereby a conductive path through said nonconductive material is created by the presence of the salt in the molten metal.

## **5,569,846 MODULAR APPARATUS FOR ITERATIVELY EVALUATING COMBUSTION FLOW PROCESS**

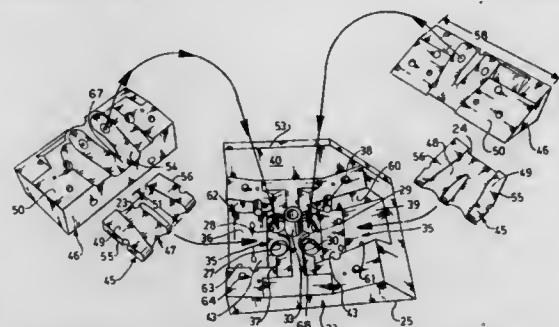
Robert W. Grenkowitz, Washington, and Randolph C. King, Imley City, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 3, 1995, Ser. No. 433,185

Int. Cl.<sup>6</sup> G01M 15/00

U.S. Cl. 73—116

10 Claims



1. An apparatus for evaluating flow processes, comprising:
  - (a) a closure for a chamber, the closure defining at least one aperture and at least one seating basin facing away from said chamber; and
  - (b) at least two stacking elements cooperatively associated with each aperture for defining at least one fluid passage having walls communicating with said aperture when stacked on said one basin, the elements when stacked having mating walls meeting at a parting plane or line along the length of the passage, each element sealingly mating with each other, and one of the elements sealingly mating with said basin, the passage walls of one or more of said stacking elements being reshapable in response to flow evaluation without remaking said closure.

5,569,847

# **AIR-FUEL RATIO ESTIMATOR FOR INTERNAL COMBUSTION ENGINE**

Yusuke Hasegawa; Yoichi Nishimura; Isao Komoriya; Shusuke Akazaki, and Eisuke Kimura, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 305,191, Sep. 13, 1994, abandoned.

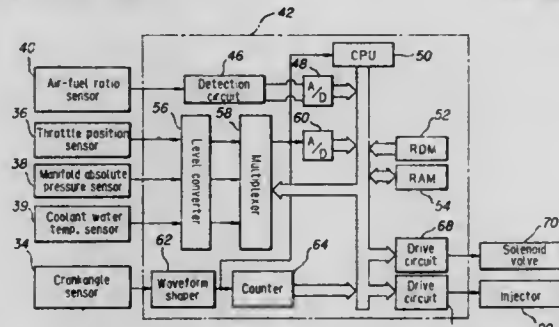
This application Aug. 22, 1995, Ser. No. 517,855

Claims priority, application Japan, Sep. 13, 1993, 5-251140

Int. Cl.<sup>6</sup> G01L 3/26; 5/13

U.S. Cl. 73—117.3

9 Claims



1. An air-fuel ratio estimator for estimating air-fuel ratio of an air and fuel mixture supplied to an internal combustion engine from an output of an air-fuel ratio sensor, comprising:
  - response lag time detection means for approximating detection response lag time of the air-fuel ratio sensor;
  - air-fuel ratio determining means for determining an actual air-fuel ratio based upon said detection response lag time;
  - real-time estimator means for determining a real-time estimate of the air-fuel ratio based upon the actual air-fuel ratio and a correction coefficient; and

correction coefficient determining means for determining said correction coefficient to correct the real-time estimate of the air-fuel ratio of the air and fuel mixture supplied to the engine, wherein said correction coefficient determining means for determining said correction coefficient with respect to engine speed and for making said correction coefficient zero at or below a predetermined engine speed wherein said predetermined engine speed is an idling engine speed, and, wherein said correction coefficient increases with increasing engine speed.

5,569,848

# **SYSTEM, METHOD AND APPARATUS FOR MONITORING TIRE INFLATION PRESSURE IN A VEHICLE TIRE AND WHEEL ASSEMBLY**

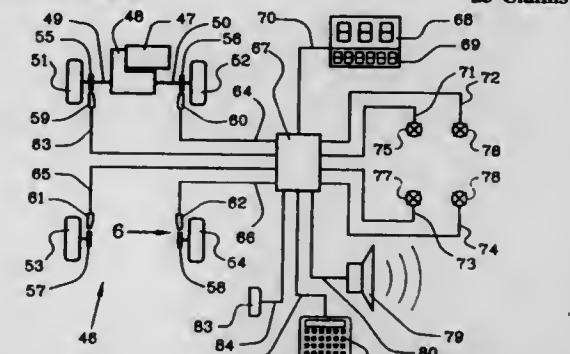
Everett H. Sharp, 344 E. Maryknoll Rd., Rochester Hills, Mich. 48309

Filed Jan. 6, 1995, Ser. No. 369,661

Int. Cl.<sup>6</sup> B60C 23/06; G01P 3/00

U.S. Cl. 73—146.2

25 Claims





5,569,851

**METER FOR MEASURING AIR FLOW BY RESISTANCE HEATING**

Masahiro Ichimaru, and Izumi Watanabe, both of Katsuta, Japan, assignors to Hitachi, Ltd., and Hitachi Automotive Engineering Co., Ltd., both of Japan

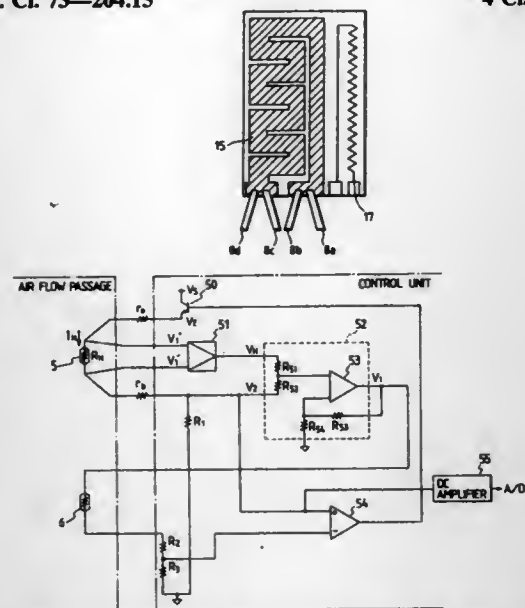
Filed Jun. 22, 1994, Ser. No. 264,067

Claims priority, application Japan, Jun. 22, 1993, 5-150103

Int. Cl.<sup>6</sup> G01F 1/68

U.S. Cl. 73—204.15

4 Claims



1. A meter for measuring air flow by resistance heating comprising:

- a heating resistor,
- a temperature sensing resistor,
- a control device,
- a first pair of leads operatively connecting first and second parts of the heating resistor to the control device, and a second pair of leads operatively connecting the temperature sensing resistor to the control device, the control device being arranged to apply a controlled current to the heating resistor via the first pair of leads;
- a third pair of leads connecting the first and second parts to a differential amplifier of the control device to measure a voltage drop across the first and second parts and minimize in air flow measurement and influence of resistance in the first pair of leads.

5,569,852

**CAPACITIVE ACCELEROMETER SENSOR AND METHOD FOR ITS MANUFACTURE**

Jiri Marek, Reutlingen; Frank Bantien, Ditzingen; Horst Muenzel, Reutlingen, and Michael Offenberger, Tuebingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 14, 1994, Ser. No. 355,760

Claims priority, application Germany, Jan. 5, 1994, 44 00 127.4

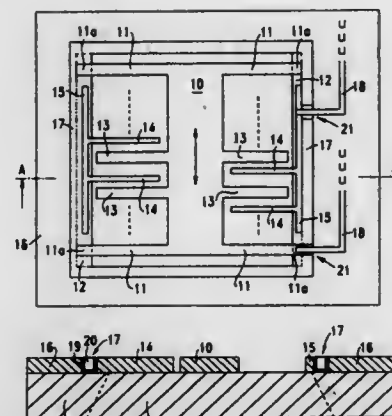
Int. Cl.<sup>6</sup> G01P 15/125

U.S. Cl. 73—514.32

9 Claims

1. A capacitive accelerometer sensor having a structure etched out of a conductive monocrystalline layer arranged on a substrate, comprising:

- a seismic mass movable in a longitudinal direction in a plane of the seismic mass in response to an occurrence of an acceleration;
- suspension segments coupling the seismic mass to the substrate, the suspension segments being coupled at first ends to the seismic mass and at second ends to the substrate, the suspen-



sion segments being coupled such that the seismic mass is movable in the longitudinal direction;

parallel, plate-like first fingers extending from the seismic mass at substantially right angles to the longitudinal direction;

plate-like second fingers, running parallel and opposed to the first fingers, and being coupled at first ends to the substrate;

an isolation strip electrically isolating the second fingers and the suspension segments from a surrounding layer of the conductive monocrystalline layer;

a passivation layer extending over the isolation strip and at least partially over the surrounding layer; and

conductors arranged on the passivation layer and running across the isolation strip, the conductors being coupled to the second fingers and the suspension segments.

5,569,853

**ULTRASONIC MEASURING APPARATUS WHICH MINIMIZES THE NUMBER OF DIGITAL VALUES TREATED BY PROCESSING MEANS**

Jean-Pierre Mignot, Peseux, Switzerland, assignor to Asulab S.A., Bienne, Switzerland

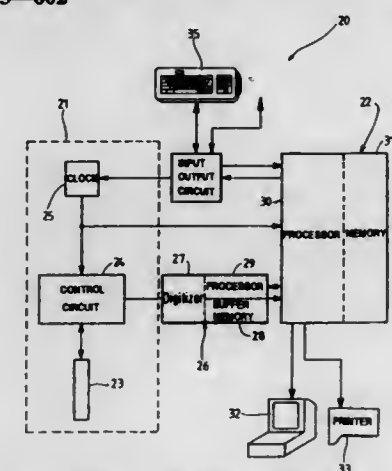
Filed Nov. 1, 1993, Ser. No. 146,404

Claims priority, application France, Nov. 2, 1992, 92 13351

Int. Cl.<sup>6</sup> G01N 29/04

U.S. Cl. 73—602

10 Claims



1. Ultrasonic measuring apparatus comprising:

an ultrasonic transducer for emitting ultrasonic pulses at a pre-determined repetition frequency towards an object having a plurality of walls, receiving echoes reflected from said walls, and producing echo signals having a plurality of elementary echo components ( $E_{\text{echo}}$ ,  $E_{\text{pilot}}$ );

digitizing means for digitizing each one of said echo signals into a series of digital values;

a buffer memory coupled to said digitizing means for receiving and storing said digital values directly from said digitizing means.

5,569,855

**METHOD OF MANUFACTURING A FRAME-MOUNTED MEMBRANE**

Werner Schomburg, Pfalzthal; Richard Rapp, Stutensee, and Klaus Kadel, Dortmund, all of Germany, assignors to Forschungszentrum Karlsruhe GmbH, Karlsruhe, Germany

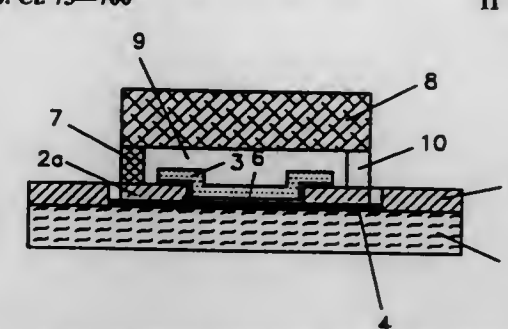
Filed Jun. 19, 1995, Ser. No. 492,833

Claims priority, application Germany, Nov. 16, 1992, 42 38 571.7

Int. Cl.<sup>6</sup> G01L 7/00

U.S. Cl. 73—700

11 Claims



1. A method of manufacturing frame-mounted membranes comprising the steps of:

- a) providing a substrate,
- b) applying to said substrate a first membrane layer in such a way that it can be separated from said substrate,
- c) forming at least one opening into said first membrane layer,
- d) covering said opening with a second membrane layer,
- e) forming a frame structure on said first and second membrane layers so as to extend around said at least one opening, and
- f) separating said membrane layers with said frame structure from said substrate.

5,569,854

**APPARATUS AND METHOD FOR TRANSMITTING AND RECEIVING ULTRASONIC WAVES HAVING AN ACOUSTOELECTRIC, ULTRASONIC TRANSDUCER**

Yoshihiko Ishida, Nagoya, and Makoto Tani, Inazawa, both of Japan, assignors to NGK Insulators, Ltd., Japan

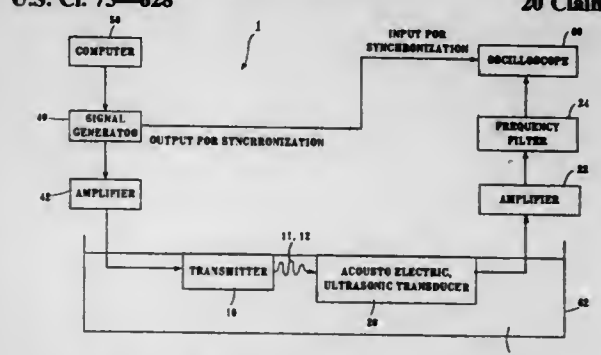
Filed Jun. 6, 1995, Ser. No. 469,995

Claims priority, application Japan, Oct. 4, 1994, 6-239814

Int. Cl.<sup>6</sup> G01N 29/04

U.S. Cl. 73—628

20 Claims



1. An apparatus for transmitting and receiving ultrasonic waves comprising:

- a transmitter for sending a first pair of ultrasonic waves to a sample, the first pair of ultrasonic waves being separated from one another and having substantially symmetric waveforms with respect to zero sound pressure;
- an acoustoelectric, ultrasound transducer for receiving a second pair of ultrasonic waves affected by the sample, said acoustoelectric, ultrasonic transducer converting the second pair of ultrasonic waves into a pair of first electric signals accompanied by phonon-charge carrier interaction, each of the first electric signals including an acoustoelectric signal and a piezoelectric signal; and
- a processing device for processing the pair of first electric signals so as to remove the piezoelectric signal and obtain the acoustoelectric signal.

5,569,856

**DIFFERENTIAL PRESSURE TRANSDUCER WHEREIN A BRIDGE CONNECTS TWO PRESSURE DIAPHRAGMS**

Alan J. Jacobs-Cook, Birmingham, England, assignor to Lucas Industries public limited company, West Midlands, England

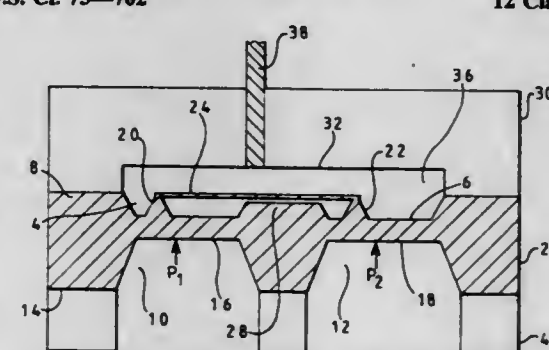
Filed Aug. 16, 1994, Ser. No. 291,101

Claims priority, application United Kingdom, Oct. 16, 1993, 9321398

Int. Cl.<sup>6</sup> G01L 11/00; 13/02

U.S. Cl. 73—702

12 Claims



1. A differential pressure transducer, comprising first and second diaphragms, first and second supports, and a bridge having a resonant frequency, said bridge being supported at a first position by said first support and at a second position by said second support, said first and second supports being movable in response to deflection of said first and second diaphragms, respectively, such that a force acting on said bridge, and consequently the resonant frequency thereof, is a function of a difference in deflection of said first and second diaphragms.

**5,569,857**  
**VEHICLE STRESS DETECTING AND MEASURING METHOD AND STRESS DETECTING DEVICE USING SAID METHOD**

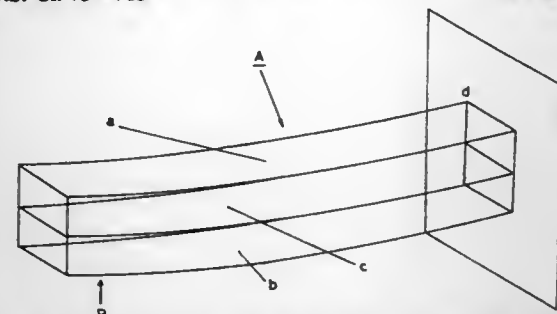
Nagao Miyazaki, Osaka, Japan, assignor to Japan Electronics Industry, Limited, Osaka, Japan

Filed Jan. 13, 1995, Ser. No. 372,092

Claims priority, application Japan, Nov. 29, 1994, 6-331999  
 Int. Cl.<sup>6</sup> G01N 3/00

U.S. Cl. 73—785

8 Claims



1. A vehicle stress detecting and measuring method for measuring a stress of interest in a structure due to an external force to be measured, comprising the steps of:
  - determining directions of extraneous external forces acting on the structure;
  - determining a stress distribution resulting from application of said external force to be measured using a known direction of said external force to be measured;
  - determining a stress distribution resulting from application of said extraneous external forces using said directions of said extraneous external forces;
  - finding a position in said structure where stress values due to said extraneous external forces are lowest or minimum and said stress of interest of said external force to be measured exists; and
  - mounting a stress sensor in said position to minimize noise due to crosstalk sensed by said stress sensor.

**5,569,858**  
**VISCOELASTIC MATERIAL TESTING SYSTEM**

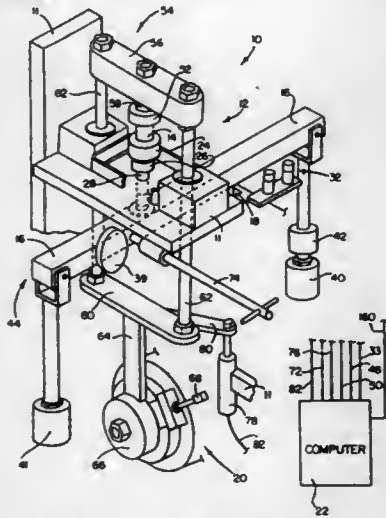
Donald W. Askea, Akron, and Jeffrey W. Johnson, Dalton, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 243,254, May 16, 1994, Pat. No. 5,458,002. This application Aug. 22, 1995, Ser. No. 517,637

Int. Cl.<sup>6</sup> G01N 3/00

U.S. Cl. 73—789

17 Claims



1. A system for performing a flexometer test, comprising:

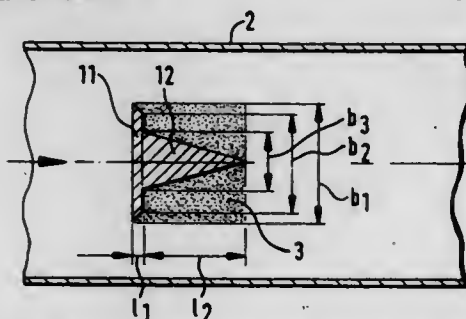
a balanced beam supporting an anvil upon which a viscoelastic material is placed, the balanced beam being balanced upon a rotatable shaft and pivotable about the axis of the rotatable shaft;  
 an assembly for applying a static load to the material;  
 a hammer opposite the anvil for applying a dynamic strain to the material; and  
 a sensor which senses permanent dimensional changes in the material.

**5,569,859**  
**VORTEX FLOW SENSOR WITH A DRAG BODY**  
 Heinz Gatzmanga, Köthen, and Andreas Breler, Dessau, both of Germany, assignors to Endress & Hauser Flowtec AG, Reinach, Switzerland  
 Filed Dec. 22, 1994, Ser. No. 361,942  
 Claims priority, application Germany, Dec. 28, 1993, 43 44 747.3

U.S. Cl. 73—861.22

Int. Cl.<sup>6</sup> G01F 1/32

3 Claims



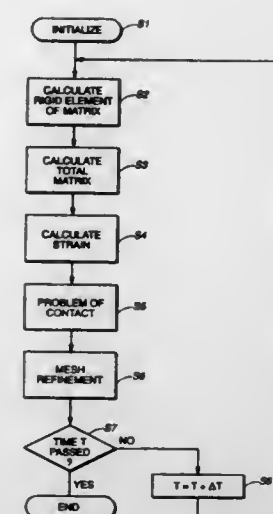
1. A vortex flow sensor for use in a fluid-conducting measuring tube of inside diameter D, the vortex flow sensor comprising a drag body adapted to be at least one of permanently connected to an internal wall of a fluid-conducting measuring tube and fixed in a frame set in the measuring tube, the drag body including an upstream side, a downstream side, an upstream-side flat trapezoidal part of length  $l_1$ , a base width  $b_1$  on the upstream side, and base width  $b_2$  on the downstream side, and a wake part adjoining the trapezoidal part without a gap and having a cross section in the form of a triangle of length  $l_2$  and base width  $b_3$ , wherein  $0.1 \leq b_1/D \leq 0.35$ ,  $0.6 \leq b_2/b_1 \leq 0.95$ ,  $0.1 \leq l_1/b_1 \leq 0.2$ ,  $0.75 \leq l_2/b_1 \leq 1.5$ , and  $0.5b_2/b_1 \leq b_3/b_1 \leq b_2/b_1$ .

**5,569,860**  
**METHOD OF ANALYTICALLY DETERMINING OPTIMUM CONDITIONS FOR POWDER FORGING**  
 Tatsuhiko Aizawa, Tokyo, and Takeshi Inao, Shiga, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan  
 Filed Apr. 13, 1995, Ser. No. 422,126  
 Claims priority, application Japan, May 10, 1994, 6-096553  
 Int. Cl.<sup>6</sup> G01N 1/00

U.S. Cl. 73—863

20 Claims

1. A method of determining optimum conditions for extrusion forging by using a ceramic powder material, said method comprising the steps of:
  - deriving a formula for a material characteristic of said powder material by measuring strain and time-rate of change in strain of a billet formed with said powder material;
  - obtaining an equation of motion by the principle of virtual power by incorporating said derived formula and including bulk power in said virtual power;
  - solving said equation of motion by a finite element method to carry out simulation calculation of said extrusion forging; and
  - outputting data obtained by said simulation calculation; and

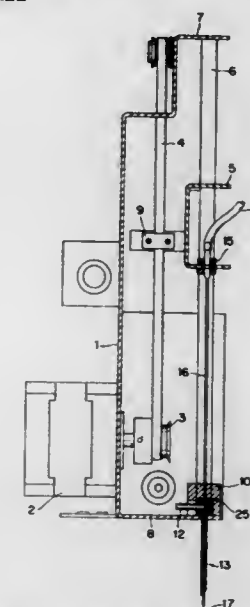


repeating the steps above by comparing said outputted data and thereby determining optimum conditions for said extrusion forging.

**5,569,861**  
**DEVICE FOR CLEANING A NEEDLE FOR SAMPLING A LIQUID FROM A CLOSED FLASK**  
 Roger Le Comte, Carnon; Guilhem Couderc, St Jean De Vedas, and Henri Champseix, Montpellier Sur Lez, all of France, assignors to ABX, Montpellier, France  
 Filed Jul. 15, 1994, Ser. No. 275,451  
 Claims priority, application France, Jul. 15, 1993, 93 08671  
 Int. Cl.<sup>6</sup> G01N 35/06

U.S. Cl. 73—864.22

4 Claims



1. In a fluid sampling apparatus for sampling a liquid from a flask closed by a bung, wherein the apparatus has a sampling needle, a piercing needle for piercing the bung, the sampling needle passing through the piercing needle, and a support bracket, a device for cleaning the sampling needle (16) comprising a mobile mechanism upon which the sampling needle is mounted for moving downward to ensure the sampling of liquid from the flask, and a guide member (10, 20) for guiding the sampling needle, said guide member being mounted below the mobile mechanism on the support bracket (1), and said guide member having at least one opening and at least one conduit (12, 26, 29) for discharging and rinsing and being a percussion head through which a bore extends, the piercing needle (13) being fixed within said bore, and charac-

terized in that the inside of said piercing needle communicates with the outside via said at least one conduit.

**5,569,862**  
**HIGH-PRESSURE PHASE BORON NITRIDE SINTERED BODY FOR CUTTING TOOLS AND METHOD OF PRODUCING THE SAME**

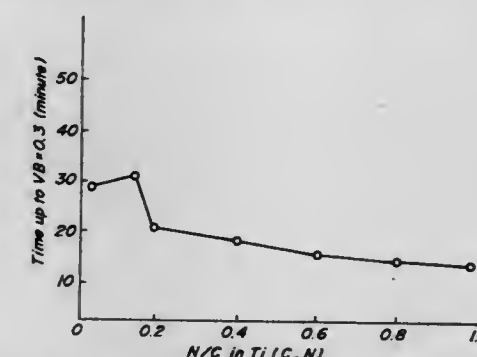
Yutaka Kuroyama, Chita-Gun, and Mitsuhiro Furuta, Tokoname, both of Japan, assignors to NOF Corporation, Tokyo, Japan

Filed Mar. 13, 1995, Ser. No. 403,264

Claims priority, application Japan, Apr. 21, 1994, 6-083033  
 Int. Cl.<sup>6</sup> C22C 29/16

U.S. Cl. 75—238

1 Claim

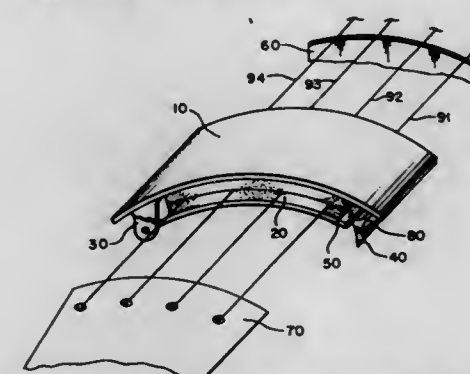


1. A high-pressure phase boron nitride sintered body for cutting tools consisting of (1) 20–80% by weight of a high-pressure phase boron nitride and (2) 80–20% by weight of an intermetallic compound containing a titanium carbonitride  $Ti(C,N)$  in which an atomic weight ratio of nitrogen (N) to carbon (C) is  $0.02 \leq N/C \leq 0.15$  and at least one metal selected from the group consisting of Al, W, Co and Zr, the content of metal being 18–20% the content of Al being 18–20% by weight and the content of W, Co or Zr being not more than 1% by weight.

**5,569,863**  
**TONE ENHANCER ATTACHMENT FOR STRING-MUSICAL INSTRUMENTS**  
 Donald J. Lem, 26 Ridgcrest East, Scarsdale, N.Y. 10583-2012  
 Filed Mar. 6, 1995, Ser. No. 399,237  
 Int. Cl.<sup>6</sup> G10D 3/14

U.S. Cl. 84—312R

2 Claims



1. An attachment for musical-string instruments for improving tone color when placed on string segment E, string segment A, string segment D, and string segment G between a bridge and tailpiece of said musical-string instrument and effecting a tight coupling means of all said string segments together to enhance wanted common vibrations of said string segments in synchronism, comprising:
  - a frame and arm member both comprising first and second ends and shaped to contour said string segments, said frame and



arm connected together on said first end by a hinge while releasably connected together on their second ends;  
 a flexible post that is flexed to release said second end of the arm member from said second end of the frame to allow said arm to swing on said hinge to release said attachment member from said string segments;  
 and an acoustic material tightly clamped and compressed between the frame and arm member to enhance common vibration between all string segments.

5,569,864

# MUTE ATTACHED TO BRASS INSTRUMENT WITHOUT CHANGE OF PITCH OF SOUND

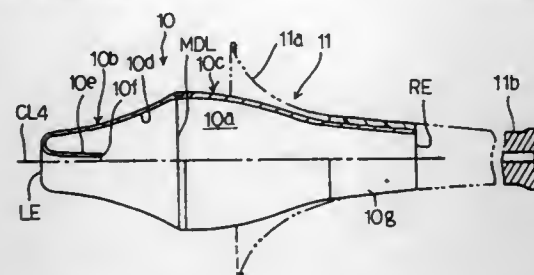
Shinji Hamanaga, and Yoshihiko Matsukuma, both of Shizuoka, Japan, assignors to Yamaha Corporation, Japan  
 Filed Nov. 14, 1995, Ser. No. 557,455

Claims priority, application Japan, Nov. 14, 1994, 6-278893; Aug. 25, 1995, 7-217374

Int. Cl.<sup>6</sup> G10D 9/06

U.S. Cl. 84—400

14 Claims



1. A mute attached to a bell portion of a brass instrument, comprising:

- a case member including a first inner surface defining a first inner space having a first end connected to an air passage of said brass instrument and a second end open to the outside; and
- a frusto-conical tube member connected to said case member at said second end, and projecting into said first inner space, said frusto-conical tube member including a second inner surface defining a second inner space decreasing in cross section toward a leading end thereof.

5,569,865

# GAS FLOW THROUGH INJECTOR JET

Hans Jürgen Profé, Bobingen, and Norbert Rabe, Berlin, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Aug. 16, 1994, Ser. No. 291,100

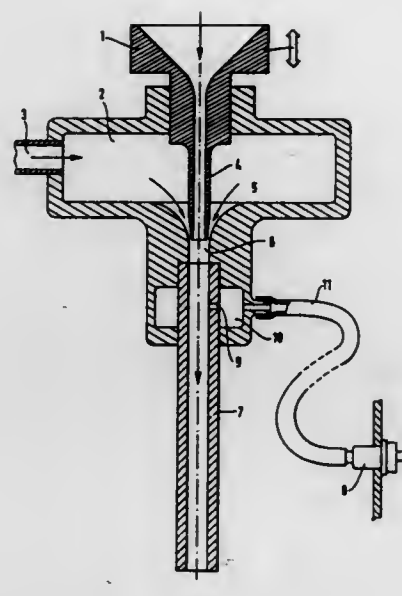
Claims priority, application Germany, Aug. 18, 1993, 43 27 693.8

Int. Cl.<sup>6</sup> G01F 1/37

U.S. Cl. 73—861.52

11 Claims

9. An injector jet for drawing and transporting filaments comprising a feed funnel extended by an injector tube opening into a gas distributor chamber, the gas distribution chamber having a gas feed line and being connected by a curved surface of revolution to an outlet duct, a drawing tube downstream from the outlet duct, both the injector tube and the outlet duct each having a longitudinal axis coinciding with one another, and the downstream end of the injector tube being situated at a junction of the outlet duct with the curved surface of revolution, and a pressure measuring device connected to the drawing tube.



5,569,866

# FORCE MEASURING DEVICE

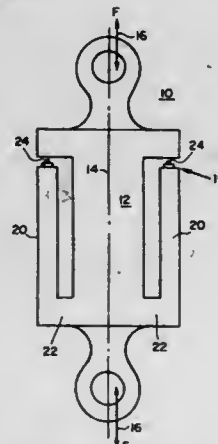
Malcolm M. Allison, 24 Deerfoot Trail, Harvard, Mass. 01451

Filed Nov. 2, 1994, Ser. No. 333,211

Int. Cl.<sup>6</sup> G01L 1/00

U.S. Cl. 73—862.626

3 Claims



1. A force sensor comprising:

- a columnar member having a longitudinal axis and being deformable in the direction of said longitudinal axis in response to a force applied to said columnar member in the direction of said longitudinal axis said columnar member having a portion extending transversely with respect to said longitudinal axis;
- a reference member having a free end and having its other end connected to said columnar member, said reference member extending beside said columnar member in the direction of said longitudinal axis;
- the free end of said reference member defining a gap between said reference member and the transversely extending portion of said columnar member, said gap orientated to open and close in the direction of said longitudinal axis in response to a force applied to said columnar member in the direction of said longitudinal axis; and
- means for measuring the amount of opening and closing of said gap in response to a force applied to said columnar member in the direction of said longitudinal axis.

5,569,867

# MUSICAL EDUCATION TOY

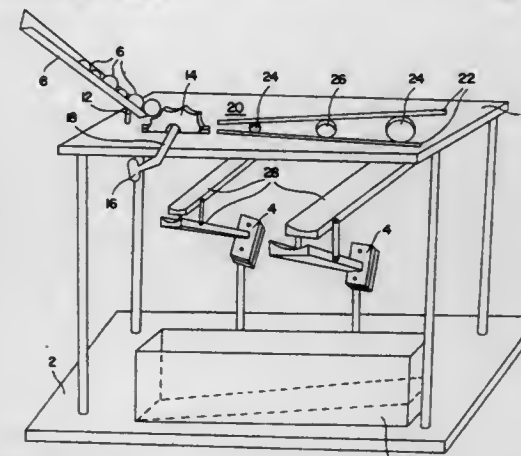
Jeffrey D. Levine, 838 S. Bond St. #2, Baltimore, Md. 21231

Filed Jul. 11, 1995, Ser. No. 500,499

Int. Cl.<sup>6</sup> G07B 15/00

U.S. Cl. 84—470 R

20 Claims



1. A musical toy comprising:

- a base;
- a plurality of percussion-responsive sound producing devices disposed on the base;
- a plurality of droppable strikers, each striker having a property distinguishing at least one of the strikers from each of the other strikers;
- sequencing means for holding the plurality of strikers in a prearranged sequence and serially releasing the strikers in the prearranged sequence; and
- sorting means disposed above the plurality of sound producing devices for receiving strikers released from the sequencing means, sorting the strikers with respect to the distinguishing property of each striker, and directing each of the sorted strikers to drop onto one of the plurality of sound producing devices in correspondence with the distinguishing property of each striker.

5,569,868

# SOUND GENERATING BOOK

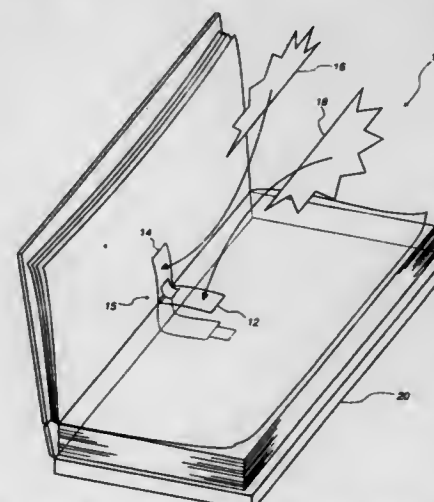
Chun S. Leung, Tsuen Wan, Hong Kong, assignor to Tiger Electronics, Inc., Vernon Hills, Ill.

Filed Aug. 24, 1994, Ser. No. 294,965

Int. Cl.<sup>6</sup> G09B 5/00; G10H 1/00; 5/00

U.S. Cl. 84—600

23 Claims



21. A book for generating sounds associated with particular pages within the book comprising

- a plurality of pages connected together;
- a plurality of page position sensors associated with at least some of said pages, said page position sensors generating a page closed signal when successive pages are in contact with each other and a page open signal when particular pages are not in contact and in the open position;
- a sound generator for generating a first sound in response to a page open signal from a first page sensor and for generating a second sound in response to a page open position from a second page sensor.

5,569,869

# KARAOKE APPARATUS CONNECTABLE TO EXTERNAL MIDI APPARATUS WITH DATA MERGE

Takuro Sone, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

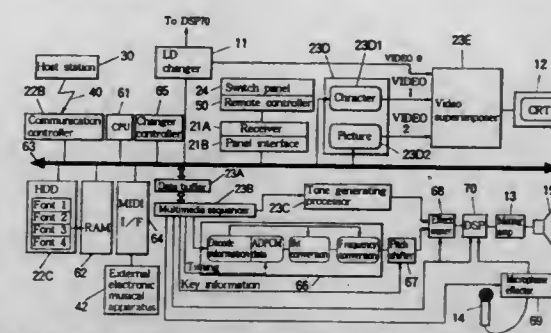
Filed Apr. 20, 1994, Ser. No. 230,336

Claims priority, application Japan, Apr. 23, 1993, 5-120708

Int. Cl.<sup>6</sup> G10H 1/00; 1/36

U.S. Cl. 84—609

13 Claims



- 6. A method of merging MIDI data from separate sources to eliminate data clashing, the method comprising the steps of: receiving internal MIDI data packets from an internal source; transferring the internal MIDI data to a data bus; receiving external MIDI data packets from an external source; monitoring the data bus to ascertain the presence of an internal MIDI data packet on the data bus; and delaying the transfer of external MIDI data to the data bus until the last byte of the internal MIDI data packet passes.

5,569,870

# KEYBOARD ELECTRONIC MUSICAL INSTRUMENT HAVING PARTIAL PEDAL EFFECT CIRCUITRY

Sayoko Hirano, Shizuoka-ken, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

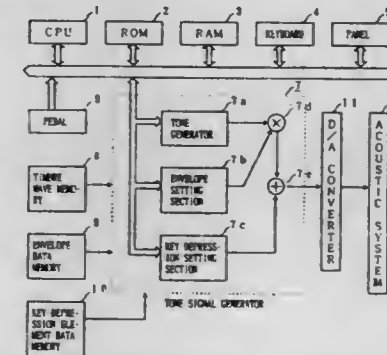
Filed Sep. 8, 1994, Ser. No. 302,546

Claims priority, application Japan, Sep. 14, 1993, 5-250913

Int. Cl.<sup>6</sup> G10H 1/057; 1/06; 1/18

U.S. Cl. 84—615

8 Claims



1. In an electronic musical instrument having keys which are operated to generate musical notes from tone generating means,

171-209 O.G.-96-15: OL3



5,569,878

## DOOR ASSEMBLY FOR SHIELDED ROOM

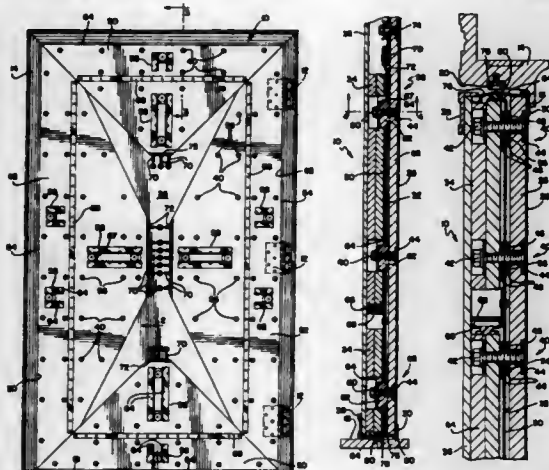
Stanley J. Zielinski, 348 E. Rolland Dr., Glendale Heights, Ill. 60139

Filed Nov. 29, 1994, Ser. No. 346,082

Int. Cl.<sup>6</sup> H05K 9/00

U.S. Cl. 174—35 R

5 Claims



1. A door assembly for an EMI shielded room having an electrically conductive room shield and a doorway bounded by a jamb including an electrically conductive contact area connected to the room shield, said door assembly comprising:

a door structure including a support frame defining a door edge and opposed door face panels supported by said frame;

means mounting said door structure for movement relative to the jamb to the closed position;

a gap defined between the jamb and said door edge in said closed position;

an electrically conductive door shield supported by said door structure and extending parallel with said face panels; and

a thin, flexible sheet metal contact electrically connected to said door shield and mounted on said door structure adjacent said door edge for flexing movement in said gap toward and away from the contact area of the jamb, said contact comprising an elongated web extending along said gap;

said door assembly being characterized by:

a pusher assembly supported by said frame;

said pusher assembly including a relatively rigid base mounted adjacent said door edge for movement toward and away from said gap and a foam rubber like bumper between said base and said contact; and

means for moving said base toward said gap in order to press said bumper against said contact and force said contact into engagement with said contact area of the jamb.

5,569,879

## INTEGRATED CIRCUIT MICROMODULE OBTAINED BY

## THE CONTINUOUS ASSEMBLY OF PATTERNED STRIPS

Jean-Pierre Gloton, La Ciotat; Damien Laroche, Chateaufort le Rouge; Joël Turin, Marseille, and Michel Fallah, Carnoux, all of France, assignors to Gemplus Card International, Gemenos, France

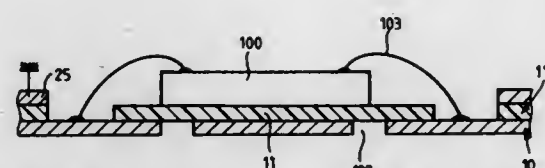
Division of Ser. No. 107,710, Oct. 25, 1993, Pat. No. 5,470,411. This application Mar. 30, 1995, Ser. No. 413,379

Claims priority, application France, Feb. 19, 1991, 91 01934 Int. Cl.<sup>6</sup> H01L 23/28

U.S. Cl. 174—52.2

20 Claims

1. A micromodule comprising a slotted metal strip bonded to a perforated dielectric strip having a thickness of less than 70 micrometers, and a chip bonded to one of the dielectric strip and



the metal strip and connected to the metal strip through the perforations of the dielectric strip.

5,569,880

## SURFACE MOUNTABLE ELECTRONIC COMPONENT AND METHOD OF MAKING SAME

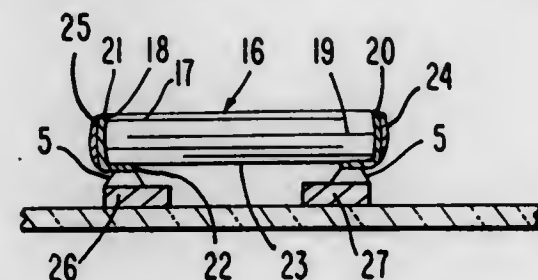
John Galvagni, Surfside Beach, and Sara P. E. Randall, Myrtle Beach, both of S.C., assignors to AVX Corporation, Myrtle Beach, S.C.

Filed Dec. 2, 1994, Ser. No. 348,293

Int. Cl.<sup>6</sup> H01L 23/02

U.S. Cl. 174—52.4

3 Claims



1. A tombstoning resistant surface mount electronic component in the configuration of a right parallelepiped, said component including top and bottom surfaces, side surfaces and parallel end surfaces, conductive termination means exiting at said end surfaces and a conductive termination coating overlying said end surfaces and abutting portions of at least one of said top and bottom surfaces, the portions of said termination coating overlying said top and bottom surfaces defining spaced terminal pads formed of a metal wettable by solder, the outermost portions of said coating overlying said end surfaces having a further coating of a non-solder wettable conductive metal.

5,569,881

Patent Not Issued For This Number

5,569,882

## WATERPROOF PROTECTIVE COVER

Kazuaki Yokoyama; Michitaka Kinoshita; Yukio Ohashi, and Yasuhiro Suzuki, all of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan

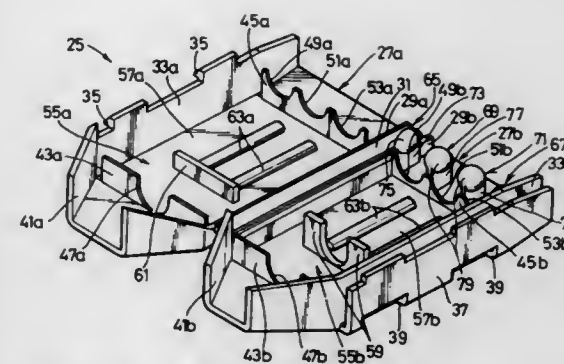
Filed Nov. 10, 1994, Ser. No. 338,765

Claims priority, application Japan, Nov. 10, 1993, 5-281053 Int. Cl.<sup>6</sup> H02G 15/113

U.S. Cl. 174—76

20 Claims

1. A waterproof protective cover for protecting a connection portion of electrical wires in a waterproof manner, comprising: first and second casing members each having at least one side wall, closable together to form a common interior chamber having an aperture at each end to pass electrical wires there-through, wherein the first and second casing member side walls are joined along a common edge extending in an axial dimension by a hinge;



an insulating sealant filling said chamber; and

at least one rib means having a semi-circular cross section, extending axially along and formed on an interior side of at least one of said casing members, for reinforcement of said at least one of said casing members.

5,569,883

## JOINT FOR PROVIDING A SECURE CONNECTION BETWEEN A WOUND ELEMENT AND A MATING PART IN A BODY IMPLANTABLE LEAD ASSEMBLY AND METHOD FOR MAKING SUCH JOINT

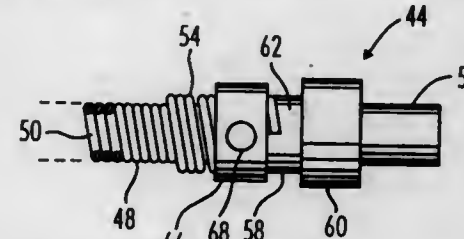
Jeryle L. Walter, Newhall; Robert J. Hodge, Jr., Valencia, and Stephen M. Jones, Canyon Country, all of Calif., assignors to Pacesetter, Inc., Sylmar, Calif.

Filed Aug. 31, 1994, Ser. No. 299,710

Int. Cl.<sup>6</sup> H01R 4/02

U.S. Cl. 174—84 R

13 Claims



8. A joint connecting a longitudinally extending wound element and a mating component of a body implantable lead assembly, the wound element having an interior passage and an end portion, the mating component having a post for receiving the end portion of the wound element, the post having an outer surface, the end portion of the wound element being disposed about the post and being in engagement with the outer surface thereof, the joint further comprising a ring disposed about the end portion of the wound element; the ring, the end portion of the wound element and the post being joined at at least one location along the circumference of the ring.

5,569,884

## TRUNKING WITH COVER JOINTING MEMBERS, SUITABLE FOR ELECTRICAL APPARATUS

Bertrand Decore, La Chapelle Saint Aubin, France, assignor to Legrand, and Legrand SNC, both of Limoges, France

Filed Apr. 28, 1994, Ser. No. 234,833

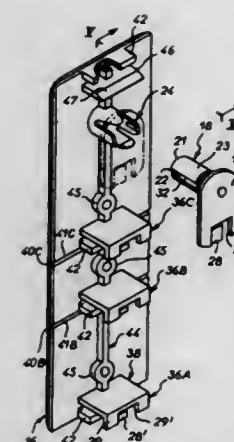
Claims priority, application France, May 14, 1993, 93 05854

Int. Cl.<sup>6</sup> H02G 3/04

U.S. Cl. 174—101

18 Claims

1. Trunking including a body with inwardly directed lips, a cover snap-fastenable to said lips and a cover jointing member extending transversely between said lips of said body to overlie an end of said cover and having at least at one end a latch including a



retaining member, said latch being mounted to move between a lock position in which said retaining member is engaged under a respective one of said lips of said body and an unlocked position in which said retaining member is spaced from and out of engagement with the respective one of said lips said latch being mounted to rotate on said cover jointing member and having an actuator head at a surface of said cover jointing member accessible to a user.

5,569,885

## INSULATED LINK

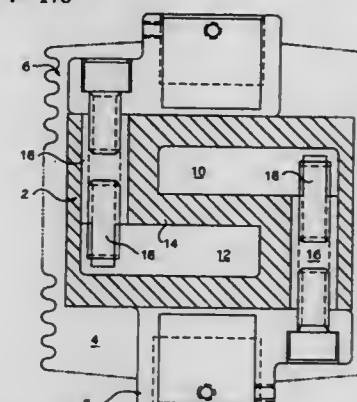
Theodore E. Petit, Jr., Warwick, R.I., and Leonard L. Ivel, Leicester, Mass., assignors to GHM Industries, Worcester, Mass.

Filed Oct. 12, 1994, Ser. No. 322,914

Int. Cl.<sup>6</sup> H01B 17/00

U.S. Cl. 174—178

3 Claims



I. An insulated link, comprising:

a) an insulating core;

b) a first end plate having a bottom end and a top end, the bottom end attached to the insulating core;

c) a second end plate having a bottom end and a top end, the bottom end attached to the insulating core, the second end plate opposed and in asymmetrical alignment to the first end plate; and

d) a removable outer jacket encapsulating the insulating core, at least a portion of the first end plate, and at least a portion of the second end plate, the removable outer jacket comprising a molded dielectric casing, wherein the removable outer jacket encapsulates the insulating core, at least a portion of the first end plate, and at least a portion of the second end plate.

5,569,886

## FLEXIBLE PRINTED CIRCUIT BOARD

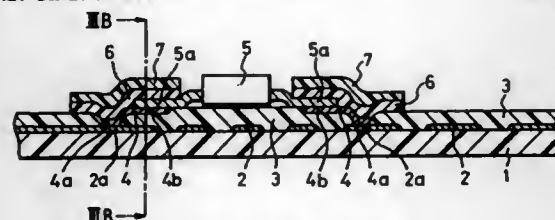
Kouji Tanabe, Katano, and Noahiro Nishioka, Yawata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 230,033, Apr. 19, 1994. This application Apr. 18, 1995, Ser. No. 423,907

Claims priority, application Japan, Apr. 27, 1993, 5-100911 Int. Cl.<sup>6</sup> H05K 1/14

U.S. Cl. 174-260

1 Claim



1. A flexible printed circuit board comprising:
  - a first insulation film,
  - a first printed circuit having a first connecting part, said first printed circuit being formed on one face of said first insulation film,
  - a first insulating resist layer having an insertion opening, said first insulating resist layer being formed on one face of said first insulation film and said first printed circuit such that said insertion opening is disposed on said first connecting part,
  - a second printed circuit having a second connecting part and a third connecting part, said second printed circuit being formed on one face of said first insulating resist layer such that said second connecting part is in electrical and mechanical contact with said first connecting part,
  - an electronic component having a terminal, said electronic component being disposed on said second printed circuit in a manner that said terminal is in electrical and mechanical contact with said third connecting part, and
  - a second insulation film having a second insulating resist layer, said second insulating resist layer being formed on one face of said second insulation film, said second insulation film and said second insulating resist layer being disposed on at least said terminal, and said second insulating resist layer being mechanically connected with said one face of said first insulating resist layer, said second insulating resist layer and said first insulating resist layer having a welded interface therebetween.

5,569,887

## LOAD CELL FOR DETECTING VIBRATIONS AND WEIGHING DEVICE COMPRISING SAME

Kazufumi Naito, Yoshihiro Nakamura, and Hiroyuki Konishi, all of Shiga, Japan, assignors to Ishida Co., Ltd., Japan

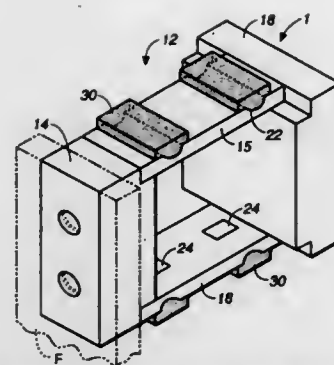
Filed Feb. 17, 1995, Ser. No. 390,346

Claims priority, application Japan, Mar. 9, 1994, 6-066589 Int. Cl.<sup>6</sup> G01G 21/10; G01L 1/04

U.S. Cl. 177-184

9 Claims

1. A load cell comprising:
  - a load-sensitive element set to a floor, having strain-generating parts and being thereby capable of undergoing deformation according to vertical displacement of said floor, said load-sensitive element comprising a fixed part supported by said floor, an upper beam, a lower beam, and a weight part which is supported by said fixed part through said upper and lower beams;
  - strain sensors attached to said strain-generating parts of said load sensitive element for measuring strains of said load-sensitive element; and



attenuation-adjusting members which are adhesively attached to said strain-generating parts of said load sensitive element, said attenuation-adjusting members being capable of increasing the vibration-attenuation constant of said load cell.

5,569,888

## ULTRASONIC ELEVATOR DOOR SAFETY SYSTEM

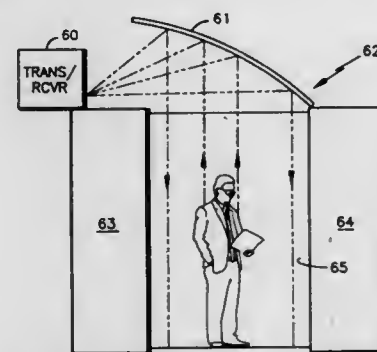
Sanjay Kamani, Unionville, and John K. Salmon, South Windsor, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed May 26, 1994, Ser. No. 249,313

Int. Cl.<sup>6</sup> B66B 13/24; 13/26

U.S. Cl. 187-317

15 Claims



1. An elevator door safety system for detecting objects and/or passengers in a door opening space through which said doors pass as they open and close, comprising:
  - a transceiver including a reflector having hyperbolic camber with an elongated focal line above said space for transmitting ultrasonic waves into said space and for receiving ultrasonic waves reflected back to said transceiver from within said space; and
  - means for generating a door reversal signal in response to ultrasonic waves received at said transceiver within a predetermined range of time from the initiation of transmission of said ultrasonic waves.

5,569,889

## KEY ASSEMBLY AND KEYBOARD COMPRISING KEY RETRACTION AND STABILIZATION MEANS

David A. Bruner, Cary, N.C., assignor to Ericsson GE Mobile Communications Inc., Research Triangle Park, N.C.

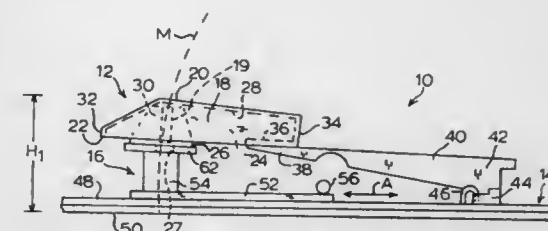
Filed Mar. 28, 1994, Ser. No. 218,576

Int. Cl.<sup>6</sup> H01H 13/70

U.S. Cl. 200-5 A

19 Claims

1. A key assembly having utility in a keyboard or key pad, and comprising:
  - a base;



- a keying structure mounted on the base and including a keytop and a pivot arm coupled to the keytop;
- said pivot arm extending exteriorly from the keytop to an exterior extremity;
- means joined to said exterior extremity for mounting said pivot arm on the base and allowing pivotable translation of the keytop and pivot arm;
- and means for selectively retracting the keying structure from (i) an active state in which the keytop is selectively depressible between an upper non-actuated position and a lower actuating position, and (ii) a retracted position in which the keytop is positioned in an inactive state on the base.

5,569,890

## SEQUENCE SWITCH WITH FORCED DISCONNECT MECHANISM

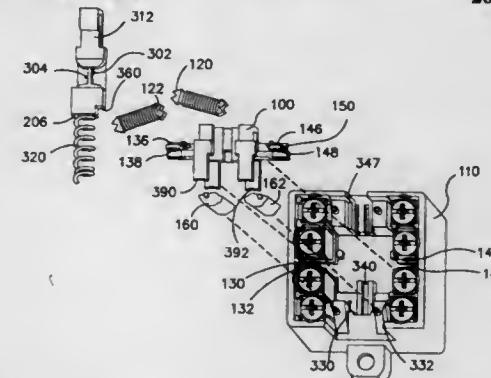
David E. Olsen, Stephenson County, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 17, 1995, Ser. No. 390,727

Int. Cl.<sup>6</sup> H01H 15/18; 5/30

U.S. Cl. 200-16 A

20 Claims



1. A switch, comprising:
  - a housing;
  - a carrier disposed within said housing, said carrier being movable within said housing;
  - a plunger disposed within said housing, said plunger being movable relative to said carrier, said plunger being movable relative to said housing;
  - a first stationary electrical contact structure attached to said housing at a first side of said carrier;
  - a second stationary electrical contact structure attached to said housing at a second side of said carrier;
  - a first movable electrical contact structure attached to said carrier at said first side of said carrier;
  - a second movable electrical contact structure attached to said carrier at said second side of said carrier;
  - first means for causing said first movable electrical contact structure to move from a first position relative to said first stationary electrical contact structure to a second position relative to said first stationary electrical contact structure;
  - second means for causing said second movable electrical contact structure to move from a first position relative to said second stationary electrical contact structure to a second position relative to said second stationary electrical contact structure;

5,569,891

## HIGH PERFORMANCE CIRCUIT BREAKER WITH INDEPENDENT POLE OPERATION LINKAGE AND CONICAL COMPOSITE BUSHINGS

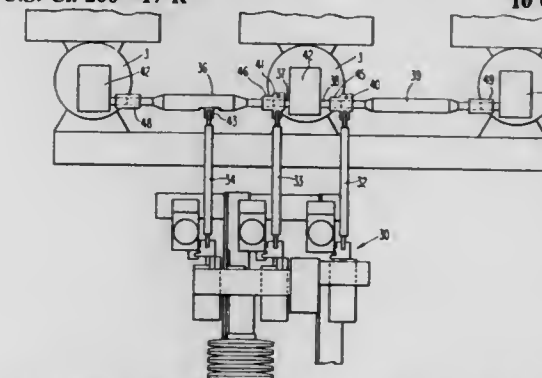
Willie B. Freeman, Irwin; David S. Johnson, and Jeffrey R. Meyer, both of Greensburg, all of Pa., assignors to ABB Power T&D Company, Inc., Raleigh, N.C.

Continuation-in-part of Ser. No. 196,590, Feb. 11, 1994. This application Apr. 8, 1994, Ser. No. 225,245

Int. Cl.<sup>6</sup> H01H 33/12; 33/46; 33/53

U.S. Cl. 200-17 R

10 Claims



1. A three phase independent pole operation circuit breaker comprising:
  - a plurality of switches, each switch being associated with one of the phases of a protected circuit and operatively interfaced with such protected circuit to form a high voltage interface, each said switch having a set of contacts for opening and closing said associated phase of said protected circuit;
  - an independent pole operation linkage mechanically connected to each switch and being capable of independently opening or closing each switch based on a condition of the protected circuit said linkage comprising a plurality of independent linking elements, each linking element being operatively coupled to one set of contacts to open and close said associated phase; and means for rotationally supporting each of said linking elements;
  - driving means having at least two connecting rods, each connecting rod being mechanically interfaced with at least one linking element so that said linking elements rotate independently with respect to each other thereby independently opening and closing said associated phases of said protected circuit; and



at least one composite bushing interfaced with said protected circuit and interfaced with each said switch for insulating said high voltage interface.

5,569,892

**MAGNET SWITCH FOR STARTER**

Tsutomu Shiga, Nukata-gun; Nobuyuki Hayashi, Nagoya, and Masanori Ohmi, Anjo, all of Japan, assignors to Nippon-denso Co., Ltd., Kariya, Japan

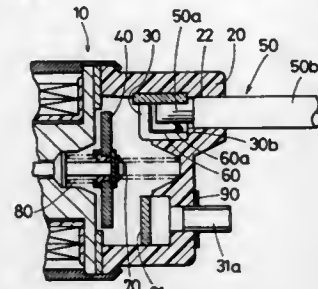
Filed Feb. 8, 1995, Ser. No. 385,549

Claims priority, application Japan, Oct. 5, 1994, 6-241143

Int. Cl.<sup>6</sup> H01H 1/38; H01R 4/48

U.S. Cl. 200—19 R

11 Claims



1. A magnet switch for a starter comprising: a fixed contact; a movable contact movable to contact said fixed contact; a cover made of an insulating material and having a bottom for supporting said fixed contact; and an external power feed wire for supplying electric power from a battery to the fixed contact, said electric power feed wire having a tip portion connected with said fixed contact and being covered with an insulating type coating except for said tip portion, said movable contact supplying electric power from the battery to a starter; wherein said tip portion of said external power feed wire is encased within said cover with said coating.

5,569,893

**DRIVER AIR BAG COVER WITH INTEGRAL HORN AND REDUNDANT SWITCHES**

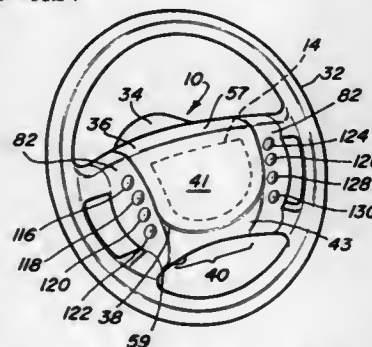
Brian T. Seymour, Royal Oak, Mich., assignor to Takata Inc., Auburn Hills, Mich.

Filed Apr. 10, 1995, Ser. No. 419,134

Int. Cl.<sup>6</sup> B60R 21/16; H01H 9/00

U.S. Cl. 200—61.54

20 Claims



1. A cover for use with a driver air bag module of the kind including an air bag, a base plate, and an inflator which is mounted to a driver's side steering wheel hub, the cover comprising: a resilient front panel having a central portion and a peripheral edge portion; at least one side wall rearwardly extending from a back face of said front panel generally about a region disposed between the

central and peripheral edge portions of said front panel, said side wall also constructed and arranged for engagement with the base plate during assembly;

a membrane horn switch operably connected to said front panel beneath said front panel central portion and constructed and arranged for actuation in response to deformation of said front panel central portion by a user; and

at least one membrane accessory switch operably connected to said front panel beneath said front panel peripheral edge portion and constructed and arranged for manual actuation in response to deformation by a user of said front panel peripheral edge portion proximal said accessory switch.

5,569,894

**CIRCUIT BREAKER ARC QUENCHING DEVICE WITH VENTING STRUCTURE INCLUDING FLAPPER VALVE**

Naoshi Uchida; Akihiko Kohanawa; Masao Miura; Jun Oyama, and Koji Asakawa, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

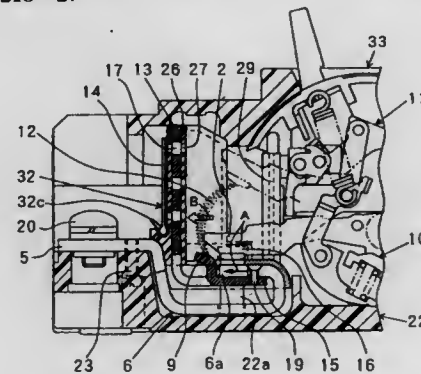
Filed May 16, 1995, Ser. No. 441,835

Claims priority, application Japan, May 24, 1994, 6-133662

Int. Cl.<sup>6</sup> H01H 9/36; 33/53

U.S. Cl. 218—27

8 Claims



1. Arc quenching device for a circuit breaker having a stationary contact member and a moving contact member, comprising: a magnetic element including an arc quenching core having a back wall with lateral sides and a lower side, and two side walls extending from the lateral sides of the back wall in a direction away from the back wall; and a base plate extending substantially perpendicularly from the lower side of the back wall in a direction as in the side walls, said base plate being fixed to said stationary contact member to connect the magnetic element thereto and having a U-shaped magnetic driving core situated near a stationary contact point of the stationary contact member and extending directly upwardly from the base plate to surround the stationary contact point, arc formed between the stationary contact member and the moving contact member being moved by magnetic driving force formed by the magnetic driving core to the arc quenching core to be quenched therein.

5,569,895

**I/O ASSEMBLY FOR USE WITH POINT OF SALE TERMINALS AND OTHER COMPUTING SYSTEMS**

Robert C. Lynch, Cary; Kevin H. Myers, Durham; Ronald A. Smith, Apex; William L. Talley, Raleigh, all of N.C., and Edward R. Veals, Pawleys Island, S.C., assignors to International Business Machines Corporation, Armonk, N.Y.

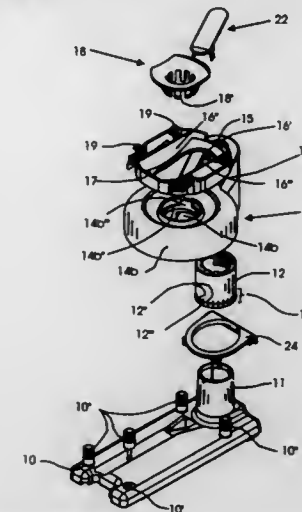
Continuation of Ser. No. 68,323, May 27, 1993, abandoned.

This application May 23, 1995, Ser. No. 448,023

Int. Cl.<sup>6</sup> G07G 1/00; F16M 11/12

U.S. Cl. 235—1 R

3 Claims



1. A bearing comprising: a cylindrical member having on one end tabs for providing retention and rotation indexing to a first structure mounted on said one end and, disposed relative to another end on an inside surface of said cylindrical member, snap fingers for coacting with a second structure on which said bearing is mounted to prevent the bearing from rotating relative to the second structure and stop means for limiting rotation of the first structure molded on said one end.

5,569,896

**METHOD AND APPARATUS FOR DETERMINING THE EXPONENTIAL POWERS OF "I"**

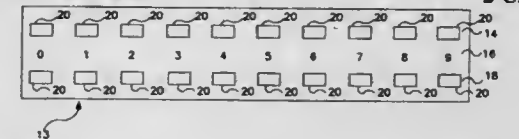
Ruben V. Marcelo, 765 Bronx River Rd., Bronxville, N.Y. 10708

Filed Mar. 24, 1994, Ser. No. 217,448

Int. Cl.<sup>6</sup> G06G 1/02

U.S. Cl. 235—70 R

2 Claims



1. An apparatus for determining powers of the imaginary number "i", said apparatus including a sleeve defining at least two separate laterally extending rows of openings, and a laterally extending scale disposed between said two rows of openings; a slide element removably received within said sleeve and laterally movable relative to said sleeve; said slide element including at least two rows of laterally extending scales which are offset from each other; said at least two rows of openings being arranged on said sleeve so as to be oriented relative to said at least two rows of scales on said slide element such that when one of said rows of scales is visible through one of said rows of openings in said sleeve, another of said rows of scales is not visible through said other of said rows of openings in said sleeve; said scales on said

slide element corresponding respectively to the powers of said imaginary number "i" when a tens digit of an exponent to which said imaginary number "i" is raised is even, and when a tens digit of an exponent to which said imaginary number "i" is raised is odd; said powers of said imaginary number "i" being determined by aligning one digit on one of said scales being observed through one opening in one of said rows on said sleeve with a corresponding number on said laterally extending scale on said sleeve disposed between said separate rows of openings.

5,569,897

**CREDIT CARD SYSTEM AND METHOD OF ISSUING CREDIT CARD USING SUCH A SYSTEM**

Hidehiro Masuda, Tokyo, Japan, assignor to Nippon Shuppan Co., Ltd., Tokyo, Japan

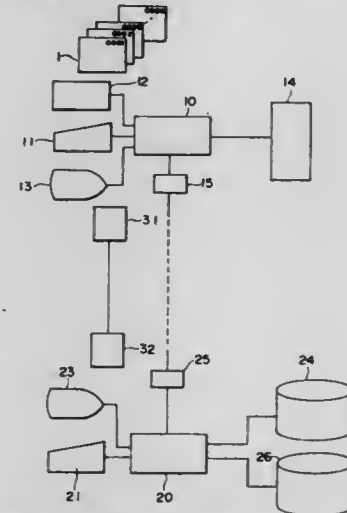
Filed Jan. 19, 1995, Ser. No. 375,370

Claims priority, application Japan, Jan. 26, 1994, 6-023491

Int. Cl.<sup>6</sup> G06F 15/30

U.S. Cl. 235—379

10 Claims



1. A credit card system comprising: a card having first identification information encoded thereon; a card reader configured to read the first identification information from the card; an input device configured to supply second identification information and a first check code; and a processor connected to the card reader and the input device and configured to generate a second check code based on the first identification information read from the card by the card reader and the second identification information supplied by the input device, to compare the first check code to the second check code, and to indicate whether the first and second check codes are identical.

5,569,898

**SELECTIVE CARD ENTRY GATE WITH RIDGED PROFILE**

Richard G. Fisher, San Pedro, and Lawrence R. Meyers, Hermosa Beach, both of Calif., assignors to Mag-Tek, Inc., Carson, Calif.

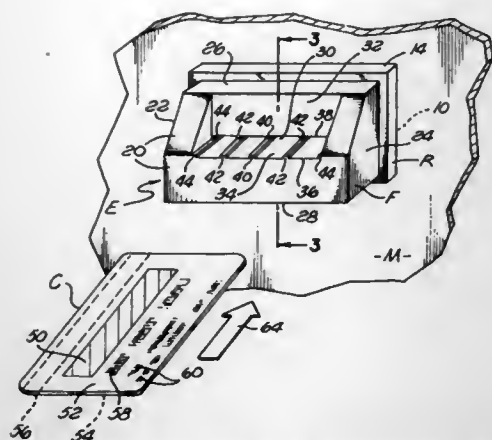
Filed Jun. 7, 1995, Ser. No. 475,553

Int. Cl.<sup>6</sup> G06K 7/04

U.S. Cl. 235—448

10 Claims

1. A card entry gate for use with a data-bearing card primarily of a first thickness and having at least one portion with a larger second thickness, comprising: a card processing apparatus to receive said card; a gate block affixed to said apparatus defining an entry slot into said apparatus, said slot having a front, an upper surface, an



opposed lower surface, and a height therebetween at the front capable of embracing said second thickness; and at least one upper ridge defined by said upper surface and at least one lower ridge defined by said lower surface, said ridges protruding at least partially into said entry slot and defining a gap therebetween having a height capable of embracing said first thickness, wherein said ridges are arranged in such a manner that the data-bearing card may be inserted into said entry slot between said upper and lower ridges in any of a plurality of orientations.

5,569,899

## ON-LINE BAR CODE VERIFICATION SYSTEM

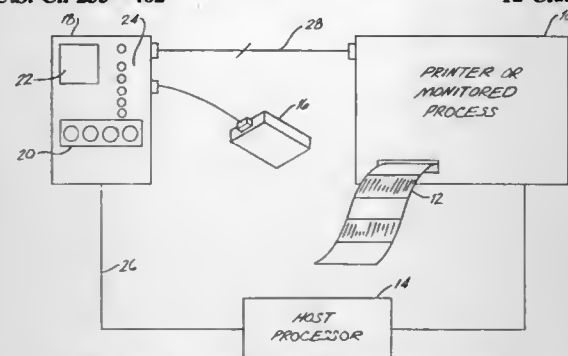
Jack Tedesco, Manhattan Beach, Calif., assignor to RJS, Inc., Monrovia, Calif.

Continuation of Ser. No. 195,736, Feb. 14, 1994, abandoned. This application Dec. 8, 1995, Ser. No. 569,522

Int. Cl.<sup>6</sup> G06K 7/10

U.S. Cl. 235-462

12 Claims



1. An on-line bar code verification system comprising: a single scanner having a control input for initiating a scan and a data output for multiple bar codes within a single scan line; a controller providing the control input to the scanner and having: a means for sensing an external synchronization signal; a means for inputting a selection of a predetermined verification requirement for multiple bar codes within a single scan line; a means for directing output of a signal to the control input of the scanner; a means for receiving scanned data from said multiple bar codes within a single scan line, said receiving means connected to said scanner data output; a comparison means connected to the receiving means and responsive to said selection for comparing said scanned data for each of said multiple bar codes to said predetermined verification requirement; said directing means, receiving means and comparison means operable in a first mode responsive to said sensing means

for synchronized scanning and in a second mode for continuous scanning; and, at least one signal output means responsive to said comparison means for generating a control signal output upon failure of a verification from any of said multiple bar codes.

5,569,900

## METHOD AND OPTICAL SCANNING APPARATUS FOR THE IDENTIFICATION OF A CODE CONSISTING OF SEQUENTIAL LIGHT AND DARK FIELDS

Frank Blöbbaum, Bad Krozingen, Germany, assignor to Erwin Sick GmbH, Optik-Elektronik, Waldkirch, Germany

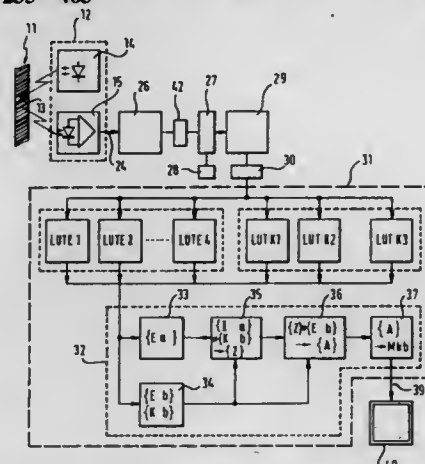
Filed Jul. 11, 1994, Ser. No. 273,561

Claims priority, application Germany, Jul. 12, 1993, 43 23 293.0

Int. Cl.<sup>6</sup> G06K 7/10

U.S. Cl. 235-463

41 Claims



1. A method for identifying a code comprising a base running length and a plurality of marks with sequential light and dark fields which form modules, each module having a module width upwardly restricted by an integral multiple number of base running lengths, each mark having a predetermined number of sequential modules and base running lengths, the method comprising: guiding a light bead with a light transmitter of an optical scanning device in sequence over the modules of the plurality of marks, the light bead having an extent less than 1.5 times greater than the base running length of the code; receiving scattered light from the code with a light receiver; generating electrical signals corresponding to the scattered light; differentiating and rectifying the electrical signals to generate a sequence of individual pulses of differing widths, each pulse being associated with a boundary between adjacent modules in the mark, wherein the time at which the pulses reach a predetermined level defines measured boundaries of the modules to form measured module widths; combining the boundaries into groups corresponding to each mark; normalizing each group with respect to a temporal length and a time spacing of adjacent boundaries to determine actual module widths in units of the base running length of the code; computing a combination module width based on the measured module width of two sequential modules; determining an appropriate correction value for said two sequential modules from a quantity of predetermined correction values, the predetermined correction values being based on reference module widths for a plurality of combinations of sequential modules for dioptic scanning devices; and correcting the combination module width of the two sequential modules based on the appropriate correction value.

5,569,901

## SYMBOL SCANNING SYSTEM AND METHOD HAVING ADAPTIVE PATTERN GENERATION

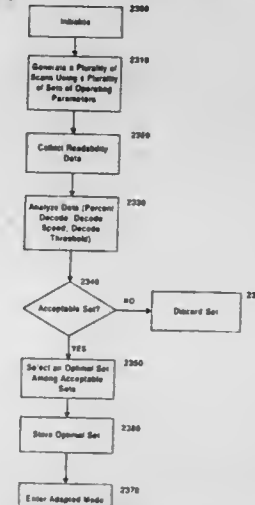
Raj Bridgelall, East Setauket; David Goren, Ronkonkoma; Joseph Katz, and Simon Bard, both of Stony Brook, all of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y. Division of Ser. No. 271,729, Jul. 7, 1994, abandoned, which is a continuation of Ser. No. 981,448, Nov. 25, 1992, Pat. No. 5,478,997, which is a continuation-in-part of Ser. No. 897,835, Jun. 12, 1992, abandoned, which is a continuation-in-part of Ser. No. 506,674, Apr. 9, 1990, abandoned, which is a continuation of Ser. No. 260,692, Oct. 21, 1988, Pat. No. 4,933,538.

This application Jun. 5, 1995, Ser. No. 461,447

Int. Cl.<sup>6</sup> G06K 7/10

U.S. Cl. 235-470

48 Claims



1. A method for scanning a bar code symbol including steps for: scanning a bar code symbol a plurality of times using different light beam patterns; collecting readability data indicating whether the scanning of a bar code symbol decodes successfully or unsuccessfully for the different light beam patterns; and determining, based on the collected readability data, which of the light beam patterns are acceptable light beam patterns for use with the bar code symbol.

5,569,902

## CONTACT TWO-DIMENSIONAL BAR CODE READER HAVING PRESSURE ACTUATED SWITCH

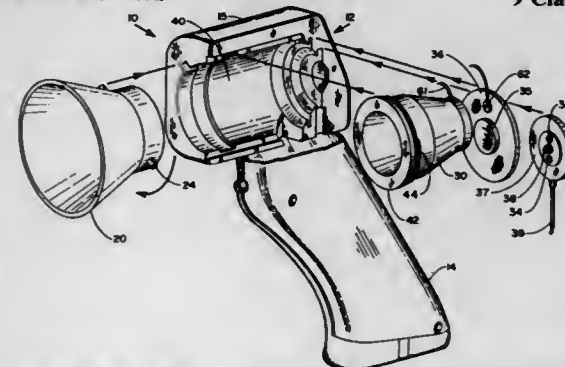
Robert J. Wood, Syracuse, and Michael J. Pilecki, Skaneateles, both of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Jan. 17, 1995, Ser. No. 373,656

Int. Cl.<sup>6</sup> G06K 7/10

U.S. Cl. 235-472

9 Claims



1. An optical reader of the type having a source of illumination, a photodetector, transmission optics for directing light emanating from the source onto a data carrier having indicia distributed in a

substantial length dimension and width dimension thereof, and receive optics for directing light returning from the indicia onto the photodetector, comprising:

a housing having therein a source of illumination for producing a beam for illuminating a data carrier having indicia thereon; an optical means for directing said beam outward of said housing at an angle of divergence; a transparent guide disposed on a front portion of said housing, said guide having a front end and walls that diverge from said housing parallel with marginal rays of said beam and proximate thereto, said walls fully encompassing the marginal rays, said guide being dimensioned to enclose the indicia when said front end is placed in contact with the data carrier, wherein a perimeter of said front end is substantially fully visible to an operator having an eye disposed behind the housing; and switch means for actuating said reader to initiate a reading operation when said guide presses on said data carrier; whereby the operator can confirm that the guide is in proper operating position relative to the indicia.

5,569,903

## NON-CONTACT IC CARD

Toshiyuki Matsubara, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

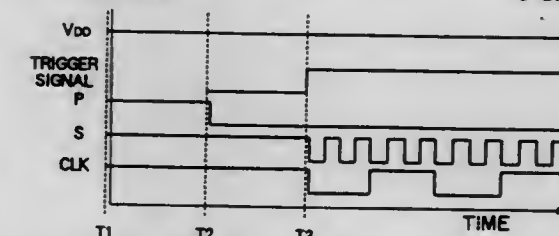
Filed Jun. 29, 1994, Ser. No. 267,374

Claims priority, application Japan, Jul. 5, 1993, 5-165689

Int. Cl.<sup>6</sup> G06K 19/067

U.S. Cl. 235-492

5 Claims



1. A non-contact IC card comprising: a transmitting/receiving circuit for transmitting data to and receiving data from an external device without direct contact; a data processing circuit connected to said transmitting/receiving circuit for processing data; a memory circuit connected to said data processing circuit for storing data; a battery for supplying source power to said transmitting/receiving and data processing circuits, and oscillation means for latching a predetermined potential when the source power is supplied from said battery, for stopping oscillation of said oscillation means by using the latched potential, and for starting oscillation of said oscillation means to supply a clock signal to said data processing circuit when a trigger signal is received from the external device through said transmitting/receiving circuit.

5,569,904

## MULTISPOT AUTOFOCUS SYSTEM HAVING A RADIATION EMITTER WHICH EMITS RADIATION THAT IS DIVIDED INTO A PLURALITY OF DISCRETE BEAMS

Mark M. Meyers, Hamlin, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 19, 1994, Ser. No. 277,151

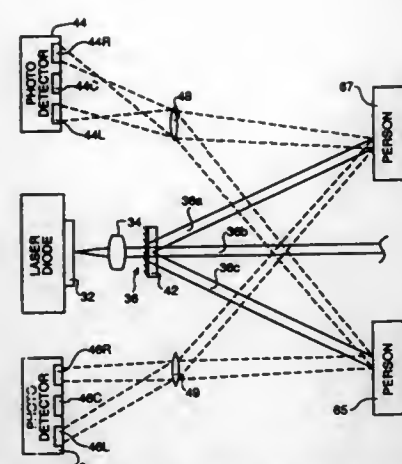
Int. Cl.<sup>6</sup> G01J 1/20

U.S. Cl. 250-201.8

9 Claims

1. A multispot autofocus system, comprising: a laser radiation emitter for emitting laser radiation; means for dividing laser radiation into a plurality of discrete beams which are directed to different areas of a scene to be recorded; and





means for measuring laser radiation reflected from said scene, said measuring means including a first photodetector and a first lens for focusing laser radiation reflected from said scene at a point in front of said first photodetector such that the radiation passing through the first lens is not focused at the first photodetector, said measuring means also including a second photodetector and a second lens for focusing laser radiation reflected from said scene at a point behind the second photodetector such that the radiation passing through the second lens is not focused at the second photodetector.

5,569,905

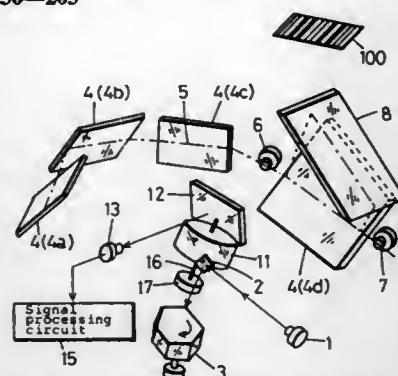
# **LASER BEAM SCANNING APPARATUS HAVING ARRANGEMENT FOR MAINTAINING INTENSITY LEVEL OF DETECTED SIGNAL IRRESPECTIVE OF DIRECTION OF LABEL TO BE READ**

Masanori Ohkawa, and Kozo Yamazaki, both of Kanagawa, Japan, assignors to Fujitsu Limited, Kawasaki, Japan  
Filed Oct. 20, 1994, Ser. No. 326,235

Claims priority, application Japan, Feb. 21, 1994, 6-021680  
Int. Cl.<sup>6</sup> G01J 1/32

U.S. Cl. 250—205

14 Claims



1. A laser beam scanning apparatus including a laser beam comprising:

- means for scanning the laser beam;
- means for changing a scanning direction of said laser beam into a plurality of different scanning directions in one of which the returning portion of the laser beam is attenuated in comparison to another returning portion of the laser beam traveling in another scanning direction;
- scanning optical path detecting means for detecting whether said laser beam is being scanned in the scanning direction in which it is attenuated;
- laser beam detecting means for detecting the portion of the laser beam reflected from a bar code scanned by a portion of the laser beam emanating from said scanning direction changing means; and

intensity controlling means for controlling an intensity of the laser beam incident on said laser beam detecting means in response to a result of detection made by said scanning optical path detecting means:

wherein the intensity of the signal beam incident on the laser beam detecting means is controlled by the intensity controlling means so that there will be no difference in the intensity level of the signal beam incident on the laser beam detecting means whether or not the laser beam travels in the scanning direction in which it is attenuated.

5,569,906

# **PHOTOELECTRIC CONTROL STRUCTURE FOR LINEAR TRANSMISSION DEVICES**

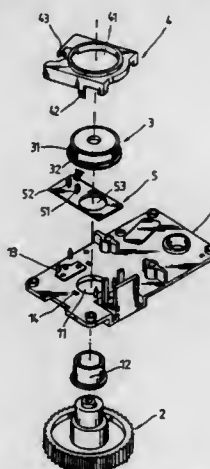
Ron Wong, Taipei Hsien, Taiwan, assignor to Jaeger Industrial Co., Ltd., Taipei Hsien, Taiwan

Filed May 31, 1995, Ser. No. 455,601

Int. Cl.<sup>6</sup> G01J 1/32; G01D 5/34

U.S. Cl. 250—205

2 Claims



1. A photoelectric control structure for a linear transmission device, comprising:

- a mount having an axle hole, a friction-resisting plastic axle bearing mounted within the axle hole on said mount, a plurality of mounting posts, and a plurality of retaining holes;
  - a transmission gear having a gear shaft at the center, said gear shaft having a front end coupled to a motor through a reducing gear and a rear end inserted through said axle bearing;
  - a photoelectric circuit board fastened to the mounting posts on said mount, comprising an infrared light emitting diode, a phototransistor, and an axle hole through which the rear end of said gear shaft of said transmission gear passes;
  - a light chopper coupled to the rear end of said gear shaft of said transmission gear and turned by said transmission gear to intermittently block light from said light emitting diode toward said phototransistor, having a plurality of light holes and a plurality of light blocking portions alternatively separated by said light holes; and
  - a chopper cover fastened to said mount and covering said light chopper and said photoelectric circuit board, said chopper cover having a plurality of hooks respectively fastened to the retaining holes on said mount, an opening which receives said light chopper, and an inside recess which receives said phototransistor of said photoelectric circuit board;
- wherein when said motor is started, said transmission gear is driven to turn said light chopper, causing light to intermittently pass through to the phototransistor, and therefore said infrared light emitting diode intermittently drives said phototransistor to send a pulse wave signal to the signal input terminal of a satellite antenna allocator.

5,569,907

# **APPARATUS FOR CONVERTING AN OPTICAL IMAGE OF AN OBJECT INTO A DIGITAL REPRESENTATION**

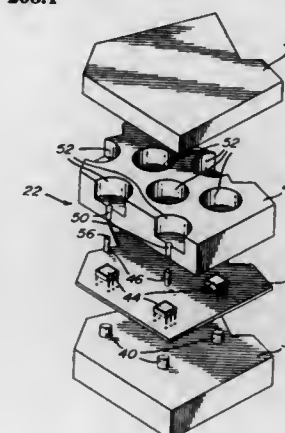
Jean-Francois Meunier, 4364 de la Cime, Cap-Rouge (Québec), Canada

Filed Jun. 17, 1994, Ser. No. 262,132

Int. Cl.<sup>6</sup> H01L 27/00

U.S. Cl. 250—208.1

36 Claims



1. An electronic apparatus for converting an optical image of an object into a digital representation of said optical image, said apparatus comprising:

- a cartridge having a first portion through which light emitted from said optical image lying in a first plane enters said cartridge during an exposure time, a second portion and a casing for attaching said first portion to said second portion;
- a two-dimensional array of focusing elements provided in said second portion, said array lying in a second plane spaced from said first plane in a parallel relationship, wherein each of said focusing elements has a field of vision intersecting an area of said optical image, and wherein adjacent ones of said focusing elements have fields of vision intersecting common portions of said optical image, whereby substantially the entirety of said optical image is covered by combined fields of vision of said focusing elements;
- a two-dimensional array of optical sensors arrays mounted on a board provided in said second portion and secured to the casing, said array of optical sensors arrays lying in a third plane spaced from said array of focusing elements in a parallel relationship, each of said optical sensors arrays being optically associated with a respective one of said focusing elements, whereby at least a portion of light emitted from an area of said optical image corresponding with one of said focusing elements and traversing therethrough is focused onto the associated optical sensors array so as to ensure that light emitted from substantially each point of said optical image is focused on at least one of said optical sensors, each of said optical sensors arrays integrating said focused light during said exposure time to produce a group of analog pixel signals representing a partial image associated with the corresponding area of said optical image;
- an analog to digital converter for receiving each group of analog pixel signals corresponding with each of said optical sensors arrays to produce corresponding groups of digital pixel signals;

computer means connected to said optical sensors arrays and said analog to digital converter for controlling said apparatus, said computer means receiving said groups of digital pixel signals, said computer means having a first memory for storing a converting table establishing for substantially each point of said optical image a spatial relationship between said at least one of said optical sensors upon which light emitted from said point is focused and a corresponding point of a composite representation of said optical image, said computer forming said composite digital representation of said optical image by using said table to convert said groups of digital pixel signals into composite digital pixel signals associated with respective points of said composite digital representation of said optical image.

5,569,908

# **A CHARGE STORAGE DEVICE HAVING SHARED CONDUCTORS**

Neil C. Bird, Horley, and Gerard F. Harkin, London, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

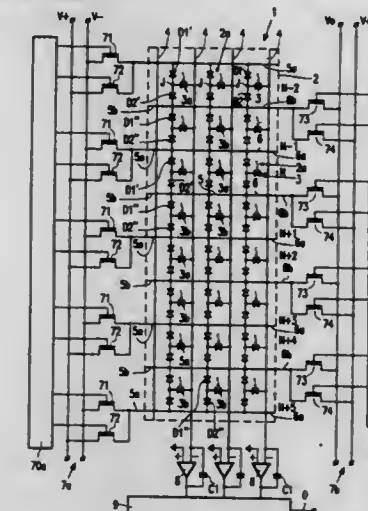
Filed Mar. 3, 1995, Ser. No. 398,318

Claims priority, application United Kingdom, Mar. 3, 1994, 9404113

Int. Cl.<sup>6</sup> H01L 27/00

U.S. Cl. 250—208.1

15 Claims



1. A charge storage device comprising an array of storage elements for storing charge, the storage elements being arranged in rows and columns with the storage elements in a column being coupled to a first conductor and the storage elements in a row being coupled to a second and to a third conductor, each storage element in a row being coupled to the associated second conductor by a first rectifying element and to the associated third conductor by a second rectifying element with the first and second rectifying elements allowing the passage of current when forward biased by applied voltages, wherein the third conductor of each row of storage elements also forms the second conductor of any adjacent rows of storage elements, the first and second rectifying elements associated with storage elements in alternate rows are oppositely oriented to the first and second rectifying elements associated with storage elements in the remaining rows so that when forward biased the first and second rectifying elements associated with storage elements in said alternate rows allow current to flow in one direction between the second and third conductors while when

forward biased the first and second rectifying elements associated with storage elements in the remaining rows allow current to flow in the opposite direction between the second and third conductors, and means are provided for applying voltages to the second and third conductors for enabling only the rectifying elements associated with a selected row of charge storage elements to be forward biased to allow charge stored at the storage elements of the selected row to be read by stored charge reading means.

5,569,909

# FORMAT RECOGNITION DEVICE FOR A FILM CASSETTE

Carlo Bogani, Bovisio, and Maria-Teresa Rubbi, Piacenza, both of Italy, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 303,737, Sep. 9, 1994, abandoned.

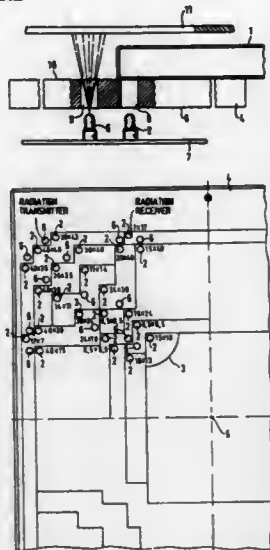
This application Jan. 3, 1996, Ser. No. 590,047

Claims priority, application Germany, Sep. 23, 1993, 43 32 428.2

Int. Cl.<sup>6</sup> G01J 1/42

U.S. Cl. 250—208.2

11 Claims



1. A device for recognizing a format, among a plurality of different formats, of a film cassette, comprising:

a plurality of groups of multiple radiation receivers, each group disposed at a location at which said radiation incident thereon is altered exclusively by a corner of said film cassette and each group generating a group output signal dependent exclusively on the radiation altered by said corner of said film cassette, each group output signal being uniquely indicative of one of said formats; and

means supplied with said group output signal for identifying a format, among said plurality of formats, of the film cassette whose corner altered said radiation incident on said radiation receiver.

5,569,910

# PHOTODETECTOR SYSTEM FOR DETECTING OBSTACLES IN AISLES BETWEEN MOBILE SHELVING CARRIAGES

Patrick J. Griesemer, Franklin, Wis., assignor to Spacesaver Corporation, Fort Atkinson, Wis.

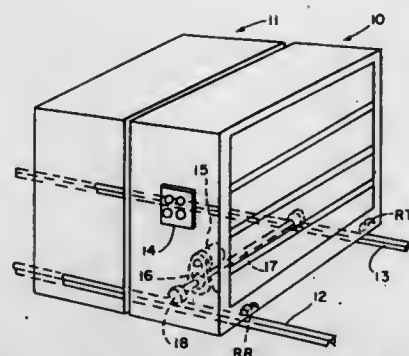
Filed Nov. 10, 1994, Ser. No. 338,006

Int. Cl.<sup>6</sup> G01V 9/04

U.S. Cl. 250—221

18 Claims

1. A self-calibrating photodetector protection system comprising:



a radiation beam transmitter having an input for electric driving pulses and operative to project a beam of radiation pulses corresponding substantially in width to the width of the driving pulses;

a radiation receiver spaced from the transmitter and arranged for receiving the pulsed radiation beam, the receiver having an output and is adapted to respond to receiving radiation pulses of a minimum width and greater than a minimum width by issuing from its output electric pulses corresponding substantially to the width of the received radiation pulses;

a digital processor having an electric pulse output coupled to the input of the transmitter and having an input coupled to the output of the receiver;

the processor responding to an initializing signal by functioning in a calibration mode wherein the processor is operative to output a series of electric pulses to the input of the transmitter, the first corresponding radiation pulse output in the series by a properly operative transmitter having a preset minimum width and following pulses having successively greater widths up to a predetermined limit to determine the least pulse width in the series that has sufficient width to exceed the pulse width sensitivity threshold of the receiver, which if exceeded, will cause a properly operating receiver to output an electric pulse signal to said input of the processor, said processor having an output and responding to said input of electric pulses by changing the logic level voltage state of said last named output.

5,569,911

# FIBER OPTIC SYSTEM FOR REMOTE FLUORESCENT SENSING USING EXCITATION AND RETURN FIBERS

Harold W. Tomlinson, Jr., Scotia; Sandra F. Feldman, Schenectady, and Emily Y. Shu, Niskayuna, all of N.Y., assignors to General Electric Company, Schenectady, N.Y. Continuation of Ser. No. 350,237, Dec. 6, 1994, abandoned, which is a continuation of Ser. No. 95,576, Jul. 19, 1993, abandoned. This application Feb. 6, 1996, Ser. No. 597,318

Int. Cl.<sup>6</sup> H01J 5/16

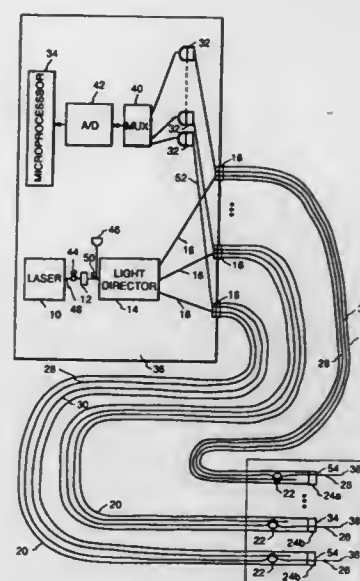
U.S. Cl. 250—227.24

18 Claims

1. A fiber optic probe system for remote fluorescence sensing, the system comprising:

a fiber optic probe; an excitation fiber for receiving excitation light and acting as a single source of said excitation light for said fiber optic probe; a detection subassembly; a return fiber for receiving detected light from said probe and acting as a single source of the detected light for said detection subassembly; and a directional coupler coupling said excitation fiber with said return fiber, said directional coupler being situated near the ends of said excitation and return fibers which are sufficiently close to said fiber optic probe to prevent native fluorescence from said excitation of fiber from being coupled into said return fiber and reaching said detection subassembly;

said directional coupler comprising, a coupler selected from the group consisting of dichroic and wavelength division multiplexing couplers for passing a greater proportion of the excitation light with predetermined excitation wavelengths towards



said fiber optic probe and passing a greater proportion of the detected light with predetermined detection wavelengths towards said detection subassembly.

5,569,912

# OPTICAL VELOCITY MEASURING WITH EFFICIENT USE OF RADIATION PASSING THROUGH PATTERNS ON DISCS

Everardus T. G. Turk; Gerard Van Engelen, and Jannis P. Van Der Linde, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

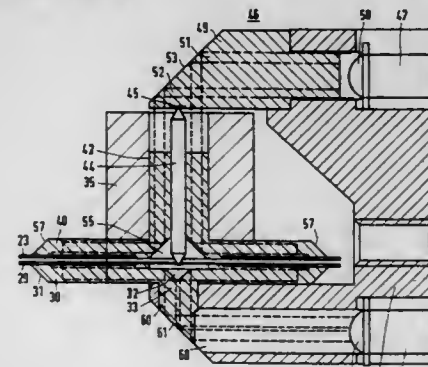
Continuation-in-part of Ser. No. 230,942, Apr. 21, 1994, abandoned. This application Sep. 29, 1994, Ser. No. 315,152

Claims priority, application Belgium, Sep. 30, 1993, 9301026; European Pat. Off., Jun. 7, 1994, 94201618

Int. Cl.<sup>6</sup> G01D 5/34

U.S. Cl. 250—231.14

26 Claims



1. A device for optically measuring the velocity of an object, comprising:

a first disc arranged to be driven rotatably by the object such that the angular velocity of the first disc is a measure of the velocity of said object, wherein said disc has a pattern of elongated interruptions in a first disc face, and said pattern is periodical and rotationally symmetrical;

a second disc having elongated interruptions in a second disc face, arranged in said pattern;

an illumination system for simultaneously illuminating the complete pattern of each of said faces, and

a detection system,

characterized in that the illumination system comprises a radiation source in the form of a diode, and a radiation guide which concentrates the radiation from the source to a first beam whose cross-section corresponds to said pattern, and

said detection system is constituted by a radiation guide for receiving radiation which is part of said first beam and has passed through the interruptions of each complete pattern, and for concentrating the received radiation to a second beam having a circular cross section, and a single detector for converting the intensity variation of said second beam into an electric signal which is a measure of the velocity of said object.

5,569,913

# OPTICAL DISPLACEMENT SENSOR

Koh Ishizuka, Omiya, and Yasushi Kaneda, Utsunomiya, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

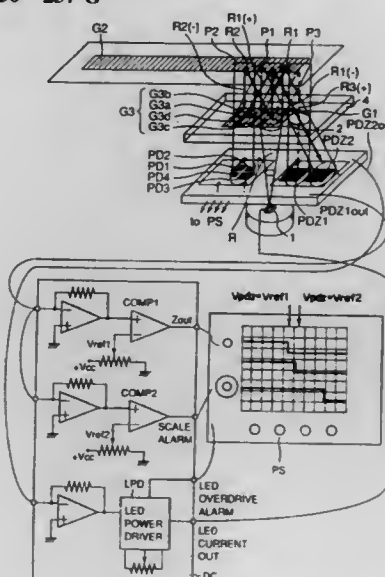
Filed Apr. 25, 1995, Ser. No. 429,236

Claims priority, application Japan, Apr. 27, 1994, 6-089990

Int. Cl.<sup>6</sup> H01J 3/14

U.S. Cl. 250—237 G

8 Claims



1. An apparatus for detecting a displacement of a diffraction grating provided on an object to be measured, comprising:

a light-emitting device;

a separation optical element for separating a beam from said light-emitting device into a plurality of beams;

a multiplexing optical element for multiplexing light beams respectively diffracted by said diffraction grating from two beams out of said plurality of beams;

a first detecting unit for detecting interference light generated when the beams of diffracted light are multiplexed by said multiplexing optical element and outputting a signal related to relative displacement information to said diffraction grating; and

a second detecting unit for outputting a signal related to information different from said relative displacement information to said diffraction grating, based on a change in a diffracted light quantity of diffracted light by said diffraction grating from another beam from said plurality of beams and/or another diffracted light by said diffraction grating from said two beams.



5,569,914

**METHOD FOR MEASURING HEIGHT OF FILL IN A PRODUCTION TUBING/CASING ANNULUS**

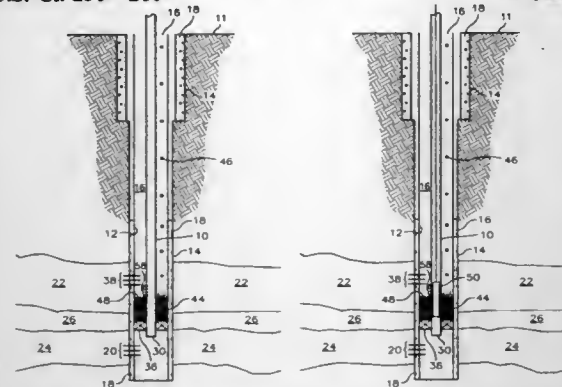
Thomas E. Ferg, Houston, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 18, 1995, Ser. No. 529,811

Int. Cl.<sup>6</sup> G01V 5/00

U.S. Cl. 250—260

12 Claims



1. A method for determining the location of the upper extremity of a quantity of fill material which is sufficient to restrict flow within a tubing/casing annulus at a subsurface location in a well, said method comprising:

- depositing a radioactive source on the top of said fill material in said tubing/casing annulus;
- detecting the depth of said deposited radioactive source by radiation measurements; and
- inferring the location of the upper extremity of said fill material based on the depth of said radioactive source detected in step (b).

5,569,915

**SENSITIVE MASS SPECTROSCOPY USING MOLECULAR FRAGMENTATION**

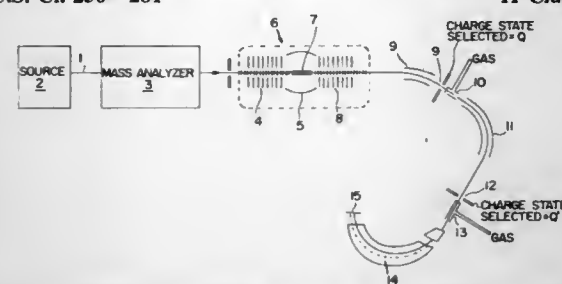
Kenneth H. Purser, 360 N. Emerson Rd., Lexington, Mass. 02173; Linas R. Kilus, 30 Rosemount Avenue, Thornhill, Ontario, Canada; Albert E. Litherland, 3 Hawthorne Gardens, Toronto, Canada; John C. Rucklidge, 351 Wellesley Street East, Toronto, Ontario, Canada, and Xiaolei Zhao, 10B Henry St., Toronto, Ontario, Canada

Filed Apr. 14, 1995, Ser. No. 422,520

Int. Cl.<sup>6</sup> H01J 49/26

U.S. Cl. 250—281

11 Claims



1. A method for measuring the mass and elemental composition of a sample comprising the following steps:

- ionizing the sample and extracting therefrom an ion beam of known energy;
- selecting ions from said ion beam having a specific mass; accelerating said selected ions to energies of the order of a few MeV;
- directing said selected MeV ions through a first thin target whereby electrons are removed from said selected ions causing them to dissociate into positive selected ions;
- analyzing said positive selected ions by directing said positive selected ions through a transverse electric field onto a first apertured member;

directing said positive selected ions that passed through the aperture in said first apertured member through a second thin target causing the charge state of said positive selected ions to be modified by electron addition or subtraction;

analyzing the resulting electron-enhanced or electron-subtracted ions by directing said electron-enhanced or electron-subtracted ions having a charge state that is a non-integral multiple of the wanted ions through a second electric field onto a second apertured member; and measuring the kinematic characteristic of the ions transmitted through an aperture in said second apertured member.

5,569,916

**ELECTRON SPECTROSCOPY APPARATUS**

Toshihisa Tomie, Tsukuba, Japan, assignor to Agency of Industrial Science &amp; Technology, Ministry of International Trade &amp; Industry, Tokyo, Japan

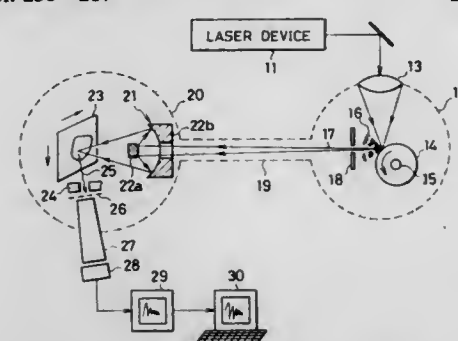
Continuation-in-part of Ser. No. 87,901, Jul. 9, 1993, abandoned. This application Jan. 30, 1995, Ser. No. 380,694

Claims priority, application Japan, Jul. 9, 1992, 4-205954

Int. Cl.<sup>6</sup> H01J 37/00

U.S. Cl. 250—287

14 Claims



- An electron spectroscopy apparatus, comprising: means for generating EUV pulses using a laser plasma composed mainly of a single ion species produced by the irradiation of a pulsed laser beam on a solid target containing a specific element, said single ion species emitting EUV pulses of a plurality of spectrally well-separated lines; means for filtering said EUV pulses to obtain EUV pulses of a single spectral line; means for irradiating a specimen to be analyzed with said filtered EUV pulses; a flight channel for passage of photoelectrons emitted from said specimen irradiated by said EUV pulses; and electron current measurement means for measuring a distribution of flight time of said photoelectrons.

5,569,917

**APPARATUS FOR AND METHOD OF FORMING A PARALLEL ION BEAM**

Sidney E. Buttrill, Jr., Palo Alto, and Alex V. Mordehai, Mountain View, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

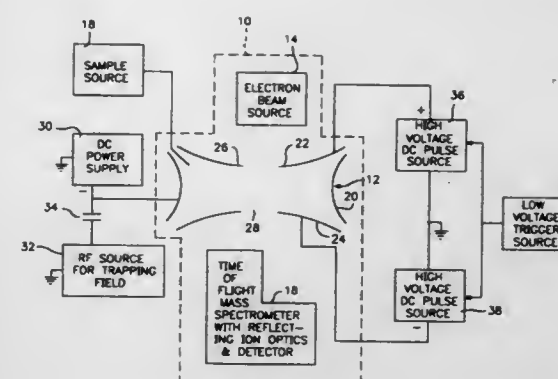
Filed May 19, 1995, Ser. No. 446,101

Int. Cl.<sup>6</sup> B01D 59/44; H01J 49/00

U.S. Cl. 250—292

33 Claims

1. A method of forming a parallel ion beam comprising compressing ions that are to form the beam in a region of an r.f. ion trap having first and second end cap electrodes, the first electrode having an opening through which ions flow from the region to form the beam, and simultaneously sucking and pushing the ions out of the region through the opening by applying different polarity voltages to the first and second electrodes at the same time.



5,569,918

**PROBE HOLDER AND PROBE MOUNTING METHOD FOR A SCANNING PROBE MICROSCOPE**

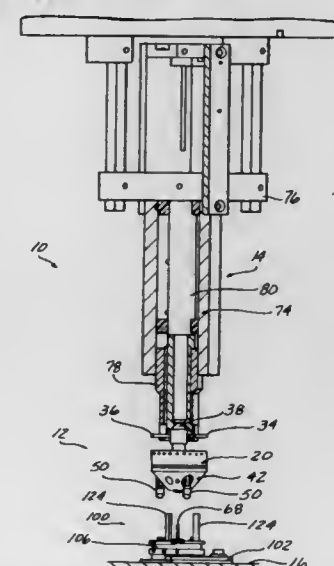
Zhouhang Wang, Pontiac, Mich., assignor to RHK Technology, Inc., Rochester Hills, Mich.

Filed Mar. 17, 1995, Ser. No. 406,296

Int. Cl.<sup>6</sup> H01J 37/28; 37/20

U.S. Cl. 250—306

51 Claims



- A scanning probe microscope comprising: probe holder means for releasibly holding a probe; a scan head; and the scan head and the probe holder means mounted for movement relative to each other to exchange a probe between the scan head and the probe holder means.

5,569,919

**X-RAY ANALYTICAL APPARATUS**

Kazushi Yokoyama; Norio Suzuki; Kenichi Inoue, and Yukito Furukawa, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 19, 1995, Ser. No. 530,408

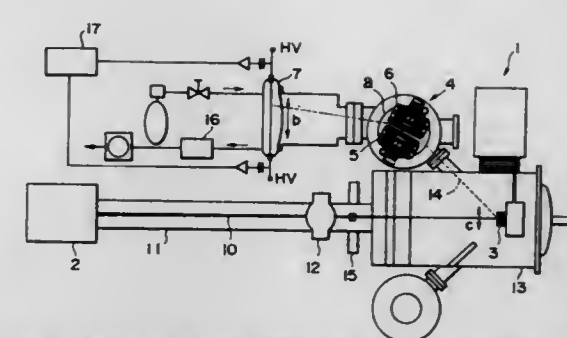
Claims priority, application Japan, Oct. 4, 1994, 6-239842

Int. Cl.<sup>6</sup> H01K 49/08

U.S. Cl. 250—309

4 Claims

1. An X-ray analytical apparatus in which an irradiation point of a sample irradiated by an ion beam, a spectral center at which a characteristic X-ray generated from said irradiation point is subjected to spectro-process by an analyzing element having an adjustable radius of curvature, and a measuring point for measuring a specific wavelength X-ray subjected to said spectro-process are arranged in the arrangement of a Rowland circle, said sample



being irradiated by the ion beam, said specific wavelength X-ray being detected to make the analysis of the sample, said apparatus comprising:

- ion beam scanning means for deflecting said ion beam to scan in a fine region of said sample;
- spectro-means comprising a curvature changing mechanism for changing a radius of curvature of said analyzing element and a rotational stage for rotating said analyzing element to adjust an incident angle of said characteristic X-ray; and
- X-ray detection means of a lengthy position sensitive type having an X-ray sensing region in a direction of changing an incident angle of said specific wavelength X-ray and measuring an incident position and strength of the X-ray.

5,569,920

**RETRACTABLE CATHODOLUMINESCENCE DETECTOR WITH HIGH ELLIPTICITY AND HIGH BACKSCATTERED ELECTRON REJECTION PERFORMANCE FOR LARGE AREA SPECIMENS**

J. C. H. Phang; W. K. Chm; D. S. H. Chan, and Y. Y. Liu, all of Kent Ridge Crescent, Singapore, assignors to National University of Singapore, Kent Ridge, Singapore

Filed Jun. 14, 1995, Ser. No. 490,352

Int. Cl.<sup>6</sup> H01J 37/24

U.S. Cl. 250—310

17 Claims

- A cathodoluminescence detector for collecting light emitted from a specimen irradiated by an electron beam, comprising: (a) a concave ellipsoidal mirror with an ellipticity greater than 0.8, the mirror having first and second focal points; and (b) collection means located at the second focal point of the mirror, whereby emissions from the first focal point are focused to the second focal point and collected by said collection means.

5,569,921

**INFRARED OPTICAL PART AND MEASURING INSTRUMENT**

Shuichi Sato; Hitoshi Sumiya; Katsuyuki Kawate, and Jiro Katoh, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

PCT No. PCT/JP93/01287, § 371 Date Jun. 6, 1994, § 102(e)

Date Jun. 6, 1994, PCT Pub. No. WO94/08224, PCT Pub. Date Apr. 14, 1994

PCT Filed Sep. 19, 1993, Ser. No. 244,635

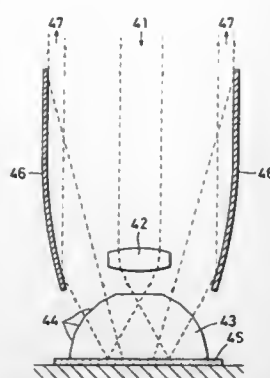
Claims priority, application Japan, Oct. 7, 1992, 4-296326

Int. Cl.<sup>6</sup> G01N 21/27; G02B 1/02

U.S. Cl. 250—339.01

3 Claims

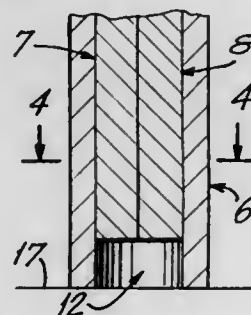
- A measuring instrument, comprising: an infrared optical part comprising an attenuated total reflection prism comprising a synthetic diamond having a nitrogen



content of not more than 3 ppm and a boron content of not more than 3 ppm contained in crystal; said prism comprising an incident surface and a transmitting surface, at least one of said incident surface and said transmitting surface comprising a plurality of surfaces having no attenuated total reflection property; and at least one selected from the group consisting of an optical-use mirror, a lens and an optical fiber for providing incident light to and receiving transmitted light from said prism, whereby attenuated total reflection spectral analysis can be performed by moving said prism into contact with a sample.

**5,569,923**  
**FIBER OPTIC REFLECTANCE PROBE**  
Yitzhak Weissman, Tel-Aviv; Rami Herman; Abaron Bornstein, both of Rishon-LeZion, and Israel Tugendhaft, Jerusalem, all of Israel, assignors to The State of Israel Atomic Energy Commission Soreq Nuclear Research Center, Yavne, Israel

Filed Mar. 15, 1995, Ser. No. 404,504  
Claims priority, application Israel, Mar. 31, 1994, 109181  
Int. Cl.<sup>6</sup> G01N 21/01  
U.S. Cl. 250—341.2 4 Claims

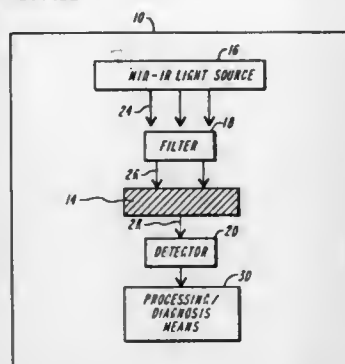


1. A fiber optic reflectance probe for infrared spectroscopy of a sample, comprising a tubular sheath that is opaque to infrared radiation and having a longitudinal axis and a tubular sampling tip with a terminal edge transverse to said axis, said tubular sheath holding at least one light input optical fiber and at least one light output optical fiber, which input and output optical fibers terminate within said tubular sampling tip short of the terminal edge to form with the terminal edge a sampling cavity, an inner wall of said sampling cavity having an infrared radiation reflecting coating.

**5,569,922**  
**PORTABLE FUEL ANALYZER FOR THE DIAGNOSIS OF FUEL-RELATED PROBLEMS ON-SITE AT THE VEHICLE SERVICE BAY**

Richard H. Clarke, Big Sky, Mont., assignor to Boston Advanced Technologies, Inc., Newton, Mass.

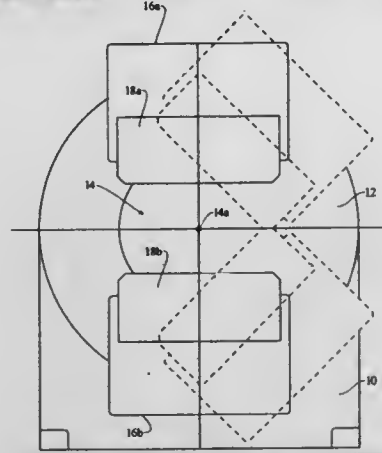
Filed Jul. 26, 1995, Ser. No. 507,724  
Int. Cl.<sup>6</sup> G01N 21/35; 33/22  
U.S. Cl. 250—339.12 16 Claims



1. A method for diagnosing potential fuel-related problems associated with a hydrocarbon fuel sample comprising the steps of: measuring a value for at least one fuel property associated with the sample through a mid-infrared analysis; comparing the value measured for the fuel property with a pre-determined preferred value range for the fuel property for a particular vehicle; diagnosing the fuel-related problem based upon the result of the comparison step; and displaying a result of the diagnosis step.

**5,569,924**  
**TRANSFORMABLE DUAL HEAD SPECT CAMERA SYSTEM**  
Steven J. Plummer, Hudson, Ohio, assignor to Picker International, Inc., Highland Heights, Ohio

Filed Aug. 18, 1994, Ser. No. 292,785  
Int. Cl.<sup>6</sup> G01T 1/164; 1/166  
U.S. Cl. 250—363.05 12 Claims



1. A SPECT camera system comprising:  
a stationary gantry;  
a rotating gantry which selectively rotates about an axis of rotation;  
a pair of nuclear camera heads supported by the rotating gantry, each camera head having a radiation receiving face;  
a repositioning means for moving the two detector heads between (1) a 180° opposite position in which the two nuclear camera heads are disposed on diametrically opposite sides of the axis of rotation and (2) an orthogonal position in which the two detector heads are disposed closely adjacent at adjacent edges with their radiation receiving faces orthogonal to

each other and tangentially offset such that rays normal to geometric centers of the radiation receiving faces intersect at an intersection point displaced from the axis of rotation and further from the adjacent edges than the axis of rotation;  
a radial movement means for moving the two detector heads along the normal rays in both the 180° opposite position and the orthogonal position to position the detector heads a minimal proximity from the subject as the gantry rotates around the axis of rotation without moving the subject radially relative to the axis of rotation.

the stimulating rays being electromagnetic waves having a wavelength within the range of 700–900 nm  
iii. detecting the emitted light,  
characterised in that said photostimulable phosphor corresponds to the general formula:

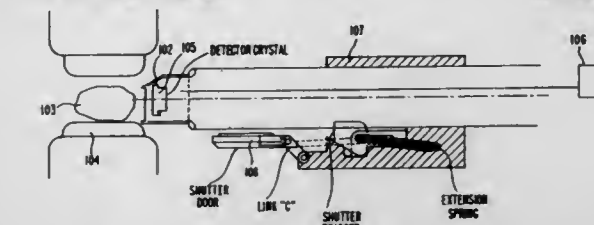


wherein  
 $0 \leq x \leq 0.30$ ,  $10^{-4} < y < 10^{-3}$ ,  $10^{-7} < z < 0.15$ ,  $0 \leq r < 0.05$ ,  
 $0.75 \leq a+b \leq 1.00$ ,  $0.05 < b < 0.20$ .

**5,569,925**  
**MECHANICAL SHUTTER FOR PROTECTING AN X-RAY DETECTOR AGAINST HIGH-ENERGY ELECTRON OR X-RAY DAMAGE**

Duncan R. Quinn, Ridgewood; Brian W. Gallagher, Highland Lakes; Costas Blonas, Hackensack, all of N.J., and Joseph A. Nicolosi, Bardonia, N.Y., assignors to Philips Electronics North America Corporation, New York, N.Y.

Filed Jun. 23, 1994, Ser. No. 264,395  
Int. Cl.<sup>6</sup> H01J 37/244  
U.S. Cl. 250—370.06 10 Claims



1. A detector head mechanism for use in an energy dispersive x-ray detector unit comprising:

- a detector crystal;
- shutter means for protecting the detector crystal;
- slidable means for
  - pushing the detector crystal through the shutter, into a first position that is adjacent to a specimen, for analysis of the specimen and
  - retracting the detector crystal behind the shutter, into a second position that is more distant from the sample than the first position, in response to a signal from the detector crystal indicating possible harm to the detector crystal,
 so that the first position is closer to the sample than the shutter and the shutter does not interfere with x-ray detection when the detector crystal is in the first position; and
- means, cooperating with the slidable means, for
  - closing the shutter means when the detector crystal is retracted; and
  - opening the shutter means when the detector crystal is pushed through the shutter means for analysis.

**5,569,926**  
**RADIATION IMAGE RECORDING AND REPRODUCING METHOD**

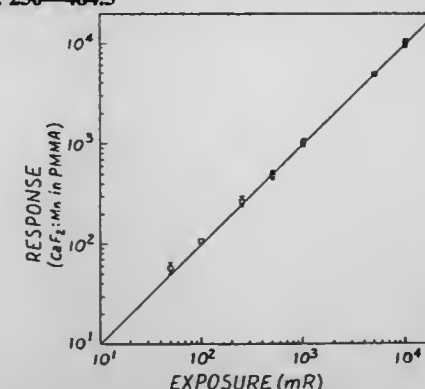
Paul Leblans; Lodewijk Neyens, both of Kontich; Luc Struye, Mortsels, and Peter Willems, Stekene, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsels, Belgium

Filed Sep. 22, 1995, Ser. No. 532,497  
Claims priority, application European Pat. Off., Sep. 27, 1994, 94202795  
Int. Cl.<sup>6</sup> C09K 11/61 20 Claims

1. A radiation image recording and reproducing method comprising the steps of:  
i. causing a radiation image storage panel containing a photostimulable phosphor to absorb radiation having passed through an object or having been radiated from an object,  
ii. exposing said image storage panel to stimulating rays to release the radiation energy stored therein as light emission,

**5,569,927**  
**COMPOSITE MATERIAL DOSIMETERS**  
Steven D. Miller, Richland, Wash., assignor to Battelle Memorial Institute, Richland, Wash.  
Division of Ser. No. 253,888, Jun. 3, 1994, abandoned. This application Sep. 27, 1995, Ser. No. 534,769  
Int. Cl.<sup>6</sup> G01T 1/10 5 Claims

U.S. Cl. 250—484.5



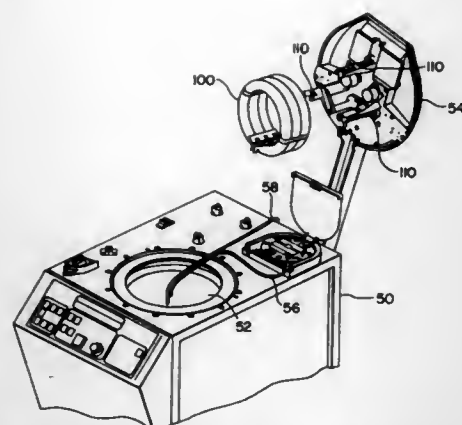
1. A dosimeter for measuring radiation exposure, comprising:  
(a) a volume of an optically non-opaque polymer containing;  
(b) particles of bi-element dosimeter material exhibiting a luminescent response upon stimulation of visible light substantially free of ultraviolet light, the particles dispersed throughout the volume of the polymer, the amount of particles being such that when said dosimeter has been exposed to ionizing radiation and stimulated with a visible light beam substantially free of ultraviolet light, the particles emit photons in sufficient quantity so as to provide a measure of exposure to ionizing radiation.

**5,569,928**  
**PHOTOACTIVATION LIGHT ARRAY**  
Kyu H. Lee, Bryn Mawr; Livingston B. Morris, Devon, and David W. Palmer, deceased, late of Conshohocken, all of Pa., assignors to Therakos, Inc., West Chester, Pa.

Filed Dec. 14, 1993, Ser. No. 166,494  
Int. Cl.<sup>6</sup> A61N 5/06 17 Claims

1. A system for separating and irradiating blood comprising: an instrument including a rotatable separation and irradiation chamber; and light array providing a source of radiant energy connected to the instrument and disposed within the separation and irradiation chamber, the light array comprising:  
one or more bulbs each having a first end and a second end, and each comprising electrical connecting leads;  
a first support member connected to the bulbs;  
a second support member disposed between the first end and the second end, and connected to the bulbs, the support member further comprising a connector for receiving the electrical leads;





the support means define an end surface and an interior surface, wherein the support members are disposed adjacent the bulbs so the end surfaces are opposed to define a channel therebetween.

5,569,929

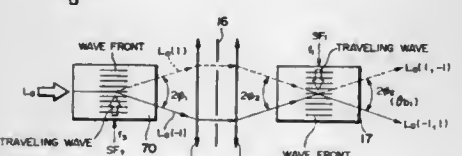
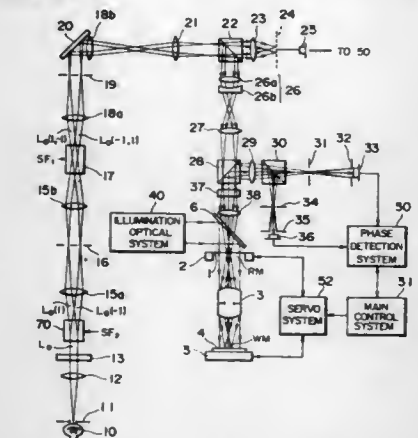
# DOUBLE-BEAM LIGHT SOURCE APPARATUS, POSITION DETECTING APPARATUS AND ALIGNING APPARATUS

Hideo Mizutani, Yokohama, and Kazuya Ota, Setagaya-ku, both of Japan, assignors to Nikon Corporation, Japan  
Division of Ser. No. 91,501, Jul. 14, 1993, Pat. No. 5,488,230.  
This application Jun. 6, 1995, Ser. No. 470,889  
Claims priority, application Japan, Jul. 15, 1992, 4-187198; Feb. 12, 1993, 5-024441; Feb. 19, 1993, 5-029530; Feb. 19, 1993, 5-029531

Int. Cl.<sup>6</sup> G01N 21/86; G06K 7/015; G01B 11/00

U.S. Cl. 250-548

18 Claims



1. A double-beam light source apparatus comprising: a light source system for supplying a beam; and a frequency difference producing system disposed in an optical path of the beam outgoing from said light source system to split it into two beams, that produces a predetermined frequency difference between said two beams to output said two beams radially spreading, the frequency difference producing system comprising an acousto-optic modulator, which effects Raman-Nath diffraction on an incident beam by a diffraction grating pattern formed by a compressional wave applied to said acousto-optic modulator, whereby the incident beam is split into two beams radially spreading from a predetermined

position and a frequency of each of said two split beams is changed in accordance with an outgoing direction thereof, wherein transmission optical path lengths of the two beams are identical to each other and the two beams having said predetermined frequency difference are made separately outgoing.

5,569,930

# SUBSTRATE HEIGHT POSITION DETECTING APPARATUS WHEREIN A STOP PLATE TRANSMITS A PATTERN OF OBLIQUE LIGHT BEAMS WHICH ARE REFLECTED BY THE SUBSTRATE

Yuji Imai, Ohmiya, Japan, assignor to Nikon Corporation, Tokyo, Japan

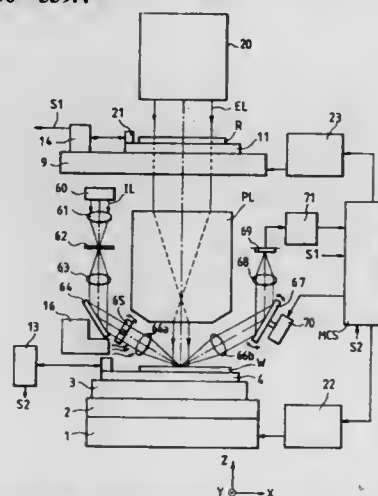
Filed Nov. 1, 1994, Ser. No. 333,291

Claims priority, application Japan, Nov. 8, 1993, 5-278395

Int. Cl.<sup>6</sup> G01N 21/86

U.S. Cl. 250-559.4

12 Claims



1. A position detecting apparatus for detecting the height position of a substrate including: a light source for applying a plurality of beams of light from an oblique direction to said substrate; a sensor for individually receiving the reflected light of said plurality of beams of light from said substrate, and outputting a signal corresponding to the position of said substrate; a substrate stage holding said substrate thereon and movable in the direction of height and in XY directions in a plane substantially perpendicular to said direction of height; and a control system for controlling said substrate stage based on a signal from said sensor; said light source having a member that provides said plurality of beams of light applied to said substrate with elongated cross-sections extending in a direction intersecting said XY directions, the directions of incidence of said plurality of beams of light being in planes that are substantially perpendicular to said substrate and that are parallel to one of said X direction and said Y direction.

5,569,931

# METHOD AND APPARATUS FOR DETECTING FILING STATE AT AN OPEN END OF A CIGARETTE

Marco Ghini, Lazzaro di Savena; Giuseppe Di Stefano, Ferrara, and Armando Neri, Bologna, all of Italy, assignors to G.D. Societa' Per Azioni, Bologna, Italy

Filed Jul. 11, 1994, Ser. No. 273,227

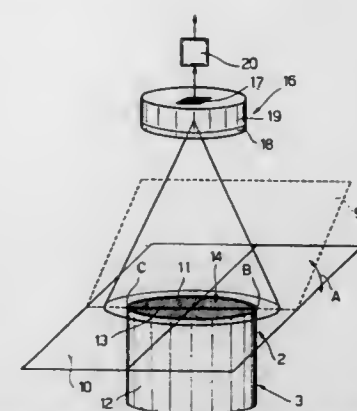
Claims priority, application Italy, Jul. 13, 1993, BO93A0320

Int. Cl.<sup>6</sup> G01N 21/86

U.S. Cl. 250-559.45

16 Claims

1. An optical control method for determining a filling state of a cigarette with tobacco, said method comprising:



producing from at least one laser source, at least one coherent light blade lying in a plane, directing said at least one coherent light blade onto a surface of a cigarette at an open end of the cigarette to produce a respective real light trace indicative of level of tobacco filling the cigarette, forming a theoretical, straight, continuous trace by joining two end points of said real light trace, comparing said real light trace and said theoretical trace to determine any deviation therebetween, and determining acceptability or not of the filling of the cigarette with tobacco based on said deviation between the real light trace and said theoretical trace.

5,569,932

# POROUS SILICON CARBIDE (SiC) SEMICONDUCTOR DEVICE

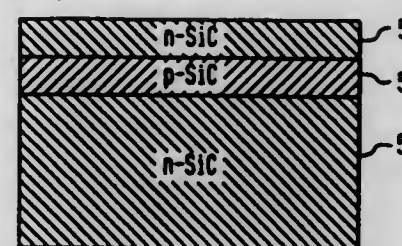
Joseph S. Shor, Flushing, N.Y., and Anthony D. Kurtz, Teaneck, N.J., assignors to Kulite Semiconductor Products, Inc., Leonia, N.J.

Division of Ser. No. 115,983, Sep. 1, 1993, Pat. No. 5,454,915, which is a continuation-in-part of Ser. No. 957,519, Nov. 12, 1992, abandoned. This application Jan. 23, 1995, Ser. No. 376,854

Int. Cl.<sup>6</sup> H01L 47/00; 31/0312; 27/15; 33/00

U.S. Cl. 257-3

22 Claims



1. A semiconductor device employing at least one layer of a semiconducting porous silicon carbide (SiC), said layer being of a first conductivity type.

5,569,933

# OPTICAL CONTROLLED RESONANT TUNNELING OSCILLATOR

Hye-Yong Chu, and Pyong-Woon Park, both of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon-shi, Rep. of Korea

Filed Nov. 22, 1994, Ser. No. 345,779

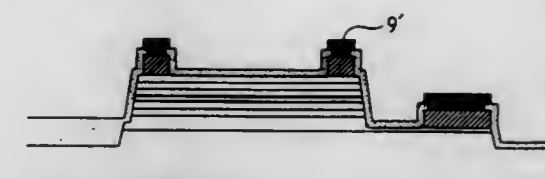
Claims priority, application Rep. of Korea, Oct. 24, 1994, 94-27166

Int. Cl.<sup>6</sup> H01L 29/06; 31/0328; 31/0336

U.S. Cl. 257-17

5 Claims

1. An optical controlled resonant tunneling oscillator comprising:



a semi-insulating substrate;  
a buffer layer of an n<sup>+</sup>-type GaAs doped with a high concentration and first and second semiconductor layers serving as first and second spacer layers successively formed over the semi-insulating substrate;  
a first barrier layer, a well layer and a second barrier layer successively formed over the second semiconductor layer for forming a double barrier quantum well structure;  
third and fourth semiconductor layers serving as third and fourth spacer layers successively formed over the second barrier layer; and  
a window layer formed over the fourth semiconductor layer; and wherein said window layer has a bandgap so as to permit absorption of incident light in the first to the fourth semiconductor layers.

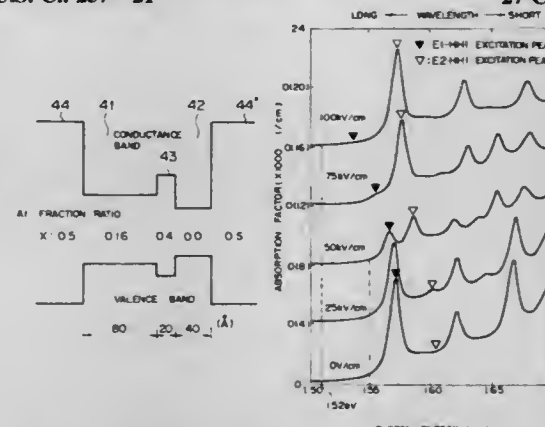
5,569,934

# OPTICAL DEVICE WITH AN ASYMMETRIC DUAL QUANTUM WELL STRUCTURE

Kazuhiro Fujii, Atsugi, and Takeo Ono, Sagami-hara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 139,866, Oct. 22, 1993, abandoned, which is a continuation of Ser. No. 781,580, Oct. 23, 1991, abandoned. This application Sep. 28, 1995, Ser. No. 535,349  
Claims priority, application Japan, Oct. 27, 1990, 2-289644  
Int. Cl.<sup>6</sup> H01L 29/205; 31/0304

U.S. Cl. 257-21

27 Claims



1. An optical device comprising: a first quantum well layer; a second quantum well layer having a smaller band gap and a smaller width than the band gap and width of said first quantum well layer; a first barrier layer disposed between said first and second quantum well layers and having a greater band gap than the band gap of said first and second quantum well layers, electron waves in said first and second quantum well layers interfering with each other across said first barrier layer; second and third barrier layers including therebetween said first barrier layer and said first and second quantum well layers, said second and third barrier layers having band gaps greater than the band gap of said first barrier layer; and application means for applying an electric field to said first and second quantum well layers to change refractive indices of said first and second quantum well layers for light of predetermined wavelengths while suppressing change of absorption factors of said first and second quantum well layers for the light of predetermined wavelengths.





said insulating layer is formed on an inside wall of said trench, and  
said control electrode layer substantially covers said insulating layer in said trench.

5,569,942

# AVALANCHE PHOTO-DIODE FOR PRODUCING SHARP PULSE SIGNAL

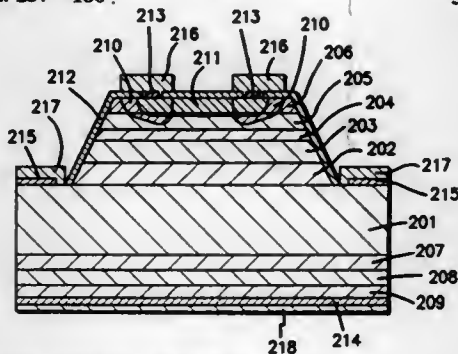
Atsuhiko Kusakabe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 22, 1995, Ser. No. 494,556

Claims priority, application Japan, Jun. 23, 1994, 6-163336  
Int. Cl.<sup>6</sup> H01L 31/0328

U.S. Cl. 257-186

5 Claims



1. A semiconductor photodetector comprising:
  - a semiconductor substrate of a first conductivity type, said semiconductor substrate being transparent to incident light;
  - a first photo-absorbing layer of said first conductivity type formed on a first major surface of said semiconductor substrate;
  - a multiplication layer of said first conductivity type formed on said first photo-absorbing layer and being transparent to said incident light;
  - a window layer comprising a second conductivity type photo incident region formed on said multiplication layer, said window layer being transparent to said incident light;
  - a photodiode formed on a second major surface of said semiconductor substrate opposite to said first major surface and including a second photo-absorbing layer; and
  - electrodes electrically connected to said semiconductor substrate, to said window layer, and to a semiconductor layer formed at a surface of said photodiode opposite to said semiconductor substrate, respectively.

5,569,943

# FIELD EFFECT REAL SPACE TRANSISTOR

Thomas E. Kosciak, Clark, and Jian H. Zhao, North Brunswick, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

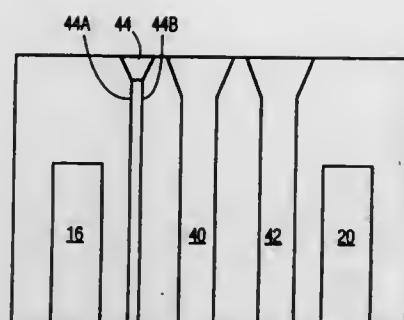
Filed Sep. 1, 1995, Ser. No. 522,894

Int. Cl.<sup>6</sup> H01L 31/0328; 31/0336; 29/80

U.S. Cl. 257-192

15 Claims

1. A semiconductor device including:
  - a first barrier layer;
  - a second barrier layer;
  - a channel layer between said first and second barrier layers;
  - a source electrode on said second barrier layer resistively coupled to one side of said channel layer;
  - a drain electrode on said second barrier layer resistively coupled to the other side of said channel layer;
  - a delta doping layer in one of said channel layer and said second barrier layer;



- a gate electrode attached to said second barrier layer in such manner as to form a Schottky diode with said barrier layer;
- a collector electrode attached to said second barrier layer and located between said gate electrode and said drain electrode;
- at least one additional collector electrode on said second barrier layer that is located between said gate electrode and said drain electrode; and
- electrical coupling between said collector electrode and said second barrier layer.

5,569,944

# COMPOUND SEMICONDUCTOR HETEROJUNCTION BIPOLAR TRANSISTOR

Joseph B. Delaney, Plano; Timothy S. Henderson, Richardson; Clyde R. Fuller, Plano, and Betty S. Mercer, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

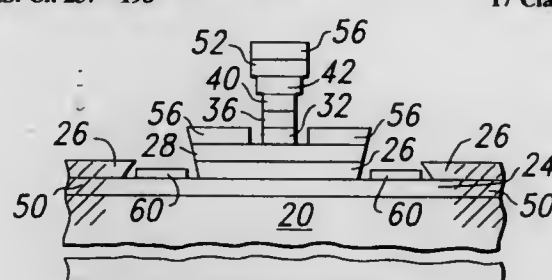
Continuation of Ser. No. 890,887, May 29, 1992, abandoned.

This application Jun. 7, 1994, Ser. No. 255,282

Int. Cl.<sup>6</sup> H01L 29/737

U.S. Cl. 257-198

17 Claims



1. A heterojunction bipolar transistor comprising:
  - a compound semiconductor material structure comprising a plurality of layers, wherein at least one of said plurality of layers is composed of a first material and at least one of the remaining of said plurality of layers is composed of a second material;
  - a mesa on a layer of a third material, said third material doped a conductivity type opposite that of said first and second materials, said mesa comprising a first layer of said first material atop a layer of said second material, said layer of first material serving as a buffer layer between a contact layer atop said first layer of material and said second layer of material, and wherein said first layer has a thickness greater than 4000 Å and said second layer has a thickness less than that of said first layer; and
  - a contact on said layer of third material and adjacent said mesa.

5,569,945

# STEPPED FLOATING GATE EPROM DEVICE

Gary Hong, Hsin-Chu, Taiwan, assignor to United Microelectronics Corporation, Hsin-Chu, Taiwan

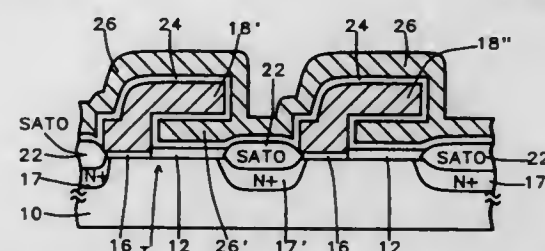
Division of Ser. No. 224,695, Apr. 8, 1994, Pat. No. 5,395,779.

This application Feb. 13, 1995, Ser. No. 387,440

Int. Cl.<sup>6</sup> H01L 29/788

U.S. Cl. 257-316

20 Claims



1. A MOSFET device formed on a semiconductor substrate comprising:
  - a dielectric layer on said substrate;
  - a first polysilicon layer formed over said dielectric layer in a stepped pattern partially on said dielectric layer and partially a step above said dielectric layer, said first polysilicon layer patterned to form a stepped electrode structure having an overhanging surface;
  - ion implanted regions comprising source/drain for said MOSFET device formed in said substrate outside of the area covered by said stepped electrode structure;
  - a second layer of dielectric material on exposed surfaces of said stepped electrode structure and said substrate; and
  - a second polysilicon layer over and under overhanging portions of said second layer of dielectric material and said stepped electrode structure and said substrate, said stepped electrode structure and said second polysilicon layer separated by said second layer of dielectric material.

5,569,946

# FLASH MEMORY CELL WITH SELF-ALIGNED TUNNEL DIELECTRIC AREA ABOVE LDD STRUCTURE

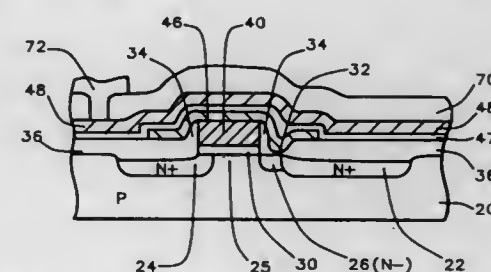
Gary Hong, Hsin-Chu, Taiwan, assignor to United Microelectronics Corporation, Hsin-Chu, Taiwan

Continuation of Ser. No. 304,119, Sep. 12, 1994, Pat. No. 5,413,946. This application May 5, 1995, Ser. No. 435,191

Int. Cl.<sup>6</sup> H01L 29/76; 29/788; G11C 11/34

U.S. Cl. 257-316

18 Claims



1. An improved memory cell, comprising:
  - a semiconductor substrate;
  - source and drain regions formed in said semiconductor substrate;
  - a gate dielectric formed on said semiconductor substrate;
  - a first gate electrode with sidewalls formed on said gate dielectric;
  - a sidewall oxide layer formed on said sidewalls of said first gate electrode;
  - a lightly doped region formed in said semiconductor substrate between said source region and said first gate electrode;

- a tunnel oxide layer having a width formed over said lightly doped region, wherein said width is the distance between said source region and the nearest said sidewall oxide layer;
- a first oxide layer formed over said source and drain regions;
- a second gate electrode formed on said semiconductor substrate over said first gate electrode, said sidewall oxide layer, said tunnel oxide layer, and said first oxide layer so as to make electrical contact between said first gate electrode and said second gate electrode;
- a layer of oxide/nitride/oxide formed on said semiconductor substrate over said second gate electrode; a control gate electrode formed on said layer of oxide/nitride/oxide;
- a floating gate formed from said first gate electrode and said second gate electrode;
- an insulating dielectric layer formed on said semiconductor substrate over said control gate electrode;
- contact openings formed in said insulating dielectric layer;
- metal contacts formed in said contact openings formed in said insulating dielectric layer;
- a patterned metal conductor layer formed over said insulating dielectric layer; and
- a passivation dielectric layer formed over said insulating dielectric layer covering said patterned metal conductor layer and said metal contacts.

5,569,947

# INSULATED-GATE FIELD-EFFECT TRANSISTOR IN A SEMICONDUCTOR DEVICE IN WHICH SOURCE/DRAIN ELECTRODES ARE DEFINED BY FORMATION OF SILICIDE ON A GATE ELECTRODE AND A FIELD-EFFECT TRANSISTOR

Shoichi Iwasa, and Takeshi Naganuma, both of Tokyo, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

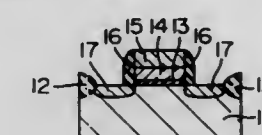
Filed Jun. 28, 1995, Ser. No. 496,064

Claims priority, application Japan, Jun. 28, 1994, 6-168998

Int. Cl.<sup>6</sup> H01L 27/088

U.S. Cl. 257-336

16 Claims



1. An insulated-gate field-effect transistor in a semiconductor device, comprising:
  - source/drain doped regions formed in a surface portion of a semiconductor substrate;
  - a gate electrode formed over said semiconductor substrate between said source/drain doped regions with an insulating film interposed between said gate electrode and said substrate, said gate electrode including a refractory metal film and a silicide film between said refractory metal film and said insulating film; and
  - source/drain electrodes formed on said source/drain doped regions.

5,569,948

## SEMICONDUCTOR DEVICE HAVING A CONTACT PLUG AND CONTACT PAD

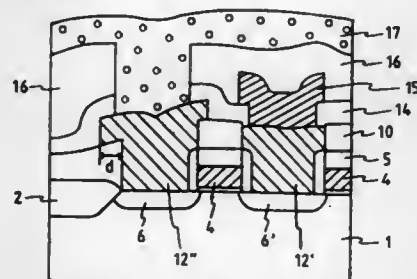
Jae K. Kim, Kyongki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Rep. of Korea  
Filed Dec. 20, 1994, Ser. No. 359,588

Claims priority, application Rep. of Korea, Dec. 21, 1993, 93-28885

Int. Cl.<sup>6</sup> H01L 29/76; 27/108

U.S. Cl. 257-382

3 Claims



1. A semiconductor device including a metal oxide semiconductor field effect transistor having a source and a drain formed in a semiconductor substrate, comprising:

- a first insulation layer disposed on the semiconductor substrate and having first and second contact holes therein respectively corresponding to the source and the drain;
- a contact plug formed in the second contact hole in electrical contact with the drain, the contact plug having a top surface substantially planar with an upper portion of the first insulation layer;
- a contact pad formed in the first contact hole in electrical contact with the source, an upper edge of the contact pad overlapping adjacent portions of the first insulation layer surrounding the first contact hole;
- a second insulation layer disposed on a surface of the first insulation layer and having third and fourth contact holes therein respectively corresponding to the contact plug and the contact pad;
- a first conductive wiring being in electrical contact with the contact plug through the third contact hole; and
- a second conductive wiring being in electrical contact with the contact pad through the fourth contact hole and being electrically insulated from the first conductive wiring.

5,569,949

## AREA EFFICIENT HIGH VOLTAGE MOSFETS WITH VERTICAL RESURF DRIFT REGIONS

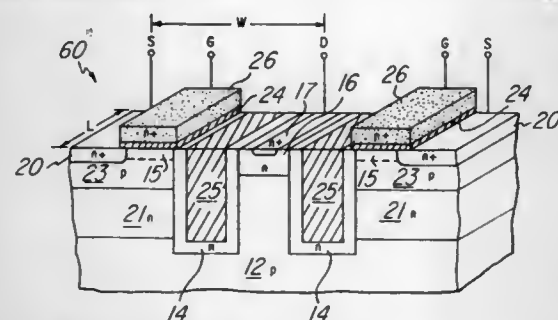
Satwinder Malhi, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 939,349, Sep. 2, 1992. This application May 31, 1995, Ser. No. 455,785

Int. Cl.<sup>6</sup> H01L 29/76; 29/94; 31/062; 31/113

U.S. Cl. 257-397

7 Claims



1. A lateral power transistor, comprising:
- a source region formed in a semiconductor substrate;
  - a drain region formed in the semiconductor substrate, the drain region being laterally spaced from the source region;

a trench disposed between the source region and the drain region, the trench abutting the drain region and being laterally spaced from the source region;

a gate formed on the semiconductor substrate above the lateral spacing between the source region and the trench, the lateral spacing forming a channel region; and

a drift region formed around the trench, making contact with the drain region and the channel region, wherein the drift region surrounding the trench provides an extended length drift region, thereby providing RESURF transistor performance while simultaneously reducing transistor pitch.

5,569,950

## DEVICE TO MONITOR AND CONTROL THE TEMPERATURE OF ELECTRONIC CHIPS TO ENHANCE RELIABILITY

David A. Lewis, Carmel, and Chandrasekhar Narayan, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

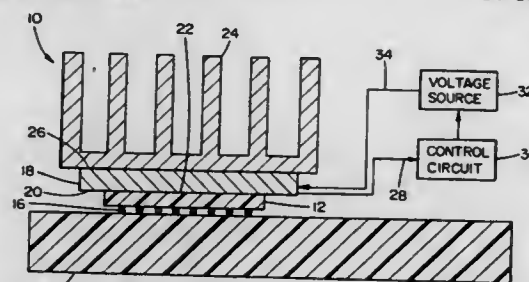
Continuation of Ser. No. 291,222, Aug. 16, 1994, abandoned.

This application Nov. 28, 1995, Ser. No. 563,510

Int. Cl.<sup>6</sup> H01L 31/058

U.S. Cl. 257-467

14 Claims



1. A device for maintaining the temperature of an electronic chip at a substantially constant temperature, comprising:

- a thermal electric cooling (TEC) device having a hot side and a cold side, said cold side being secured to said electronic chip;
- a temperature sensing means having top and bottom sides, said top side being attached to said cold side of said TEC device and said bottom side of said temperature sensing means being attached to said electronic chip for monitoring the temperature of said chip;
- heat sink means secured to the hot side of said TEC device; and
- feedback control circuit means coupled between said temperature sensing means and a voltage source, said feedback control circuit means controlling the level of voltage supplied to said TEC device in response to the temperature of said chip to reduce the temperature of said chip so as to maintain said chip at a substantially constant temperature.

5,569,951

## PRECISION INTEGRATED RESISTORS

James W. Grace, 13355 La Cresta Dr., Los Altos Hills, Calif. 94022, and David M. DiPietro, 1423 Woodgrove Sq., San Jose, Calif. 95117

Division of Ser. No. 77,189, Jun. 15, 1993, Pat. No. 5,428,297.

This application Mar. 24, 1995, Ser. No. 409,776

Int. Cl.<sup>6</sup> H01L 29/00

U.S. Cl. 257-536

11 Claims

6. A precision integrated resistor formed within a semiconductor substrate, the resistor comprising:

- an island tub region being of a first semiconductor material type, extending from a substrate surface;
- biasing and measuring resistor regions being of a second semiconductor material type and doped to provide a resistance, extending within the island tub region from the substrate surface;

5,569,953

## SEMICONDUCTOR DEVICE HAVING AN ISOLATION REGION ENRICHED IN OXYGEN

Toshihide Kikkawa, and Tatsuya Ohori, both of Kawasaki, Japan, assignors to Fujitsu Limited, Japan

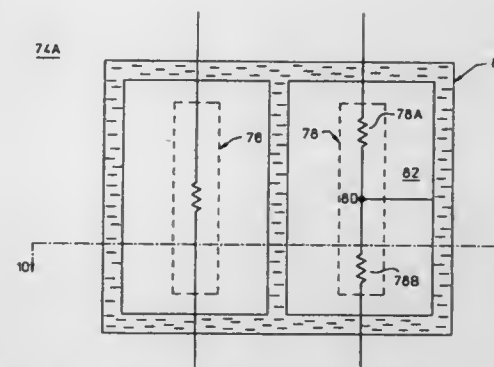
Continuation of Ser. No. 328,396, Oct. 24, 1994, Pat. No. 5,480,833, which is a continuation of Ser. No. 945,632, Oct. 19, 1992, abandoned. This application May 24, 1995, Ser. No. 449,113

Claims priority, application Japan, Feb. 19, 1991, 3-24319

Int. Cl.<sup>6</sup> H01L 29/27; 29/227; 31/0304

U.S. Cl. 257-607

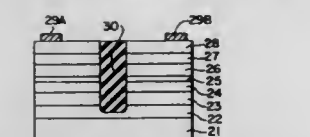
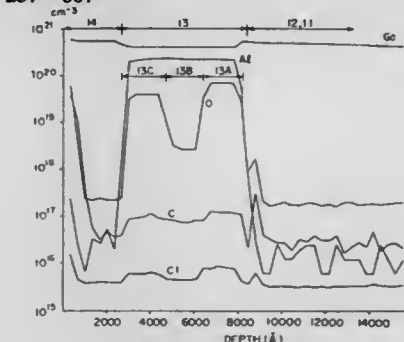
3 Claims



first and second measuring contacts, electrically connected to the measuring resistor region;

first and second biasing contacts electrically connected to the biasing resistor region;

a connecting path electrically connecting the biasing resistor region and the tub region such that a bias voltage is applied to the tub region if the first measuring and biasing contacts are at a first voltage,  $V_1$ , and the second measuring and biasing contacts are at a second voltage,  $V_2$ , which is lower than  $V_1$ , wherein the bias voltage provides a constant voltage for biasing the measuring resistor region.



1. A semiconductor integrated circuit, comprising:
- a substrate having upper and lower major surfaces;
  - a buffer layer of AlGaAs provided on said upper major surface of the substrate, said buffer layer having upper and lower major surfaces and containing oxygen with a concentration level substantially exceeding  $10^{19}$  ions  $\text{cm}^{-3}$ , said buffer layer interrupting a flow of carriers therethrough and interrupting a passage of an electric flux line;
  - a device layer provided on the upper major surface of the buffer layer, said device layer having upper and lower major surfaces and formed therein with a plurality of active devices; and
  - a device isolation region provided between adjacent active devices for isolating the active devices from each other, said device isolation region extending from the upper major surface of the active layer toward the substrate.

5,569,954

EPITAXIAL  $\text{In}_x\text{Ga}_{(1-x)}\text{As}$  HAVING A SLANTED CRYSTALLOGRAPHIC PLANE AZIMUTH

Masahiko Hata, Noboru Fukuhara, Hiroaki Takata, and Katsumi Inui, all of Ibaraki, Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

PCT No. PCT/JP94/00032, § 371 Date Sep. 13, 1994, § 102(e) Date Sep. 13, 1994, PCT Pub. No. WO94/16459, PCT Pub. Date Jul. 21, 1994

PCT Filed Jan. 12, 1994, Ser. No. 302,766

Claims priority, application Japan, Jan. 13, 1993, 5-003948

Int. Cl.<sup>6</sup> H01L 29/04

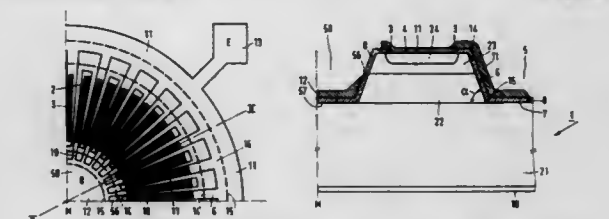
U.S. Cl. 257-627

7 Claims

1. A semiconductor epitaxial substrate having an  $\text{In}_x\text{Ga}_{(1-x)}\text{As}$  layer (wherein  $0 < x < 1$ ), wherein said  $\text{In}_x\text{Ga}_{(1-x)}\text{As}$  layer (wherein  $0 < x < 1$ ) is formed by chemical vapor deposition epitaxial growth on a gallium arsenide single crystal substrate having a crystallographic plane azimuth slanted from that of one of {100} planes at an angle of about  $0.05^\circ$  to  $0.6^\circ$ .

U.S. Cl. 257-579

7 Claims



1. A semiconductor device with a semiconductor body comprising a semiconductor element with connection points, which semiconductor element adjoins a surface of the semiconductor body and is laterally insulated and surrounded by a first depression in the surface, which depression is provided with a first wall and a first bottom, the surface of the semiconductor body and the first wall and the first bottom of the depression being covered with an insulating layer, and the connection points being provided in the insulating layer on the surface of the semiconductor body and being connected to conductor tracks which connect the connection points across one of said first and a second wall to connection surfaces belonging to the connection points and situated on one of said first and a second bottom, wherein a further depression having said second wall and said second bottom is present in the surface of the semiconductor body and surrounded by the first depression, a connection surface being present on each of said first and said second bottom, each connection surface being connected to one of said connection points on the surface of the semiconductor body through one of said conductor tracks.



5,569,955

**HIGH DENSITY INTEGRATED CIRCUIT ASSEMBLY  
COMBINING LEADFRAME LEADS WITH CONDUCTIVE  
TRACES**

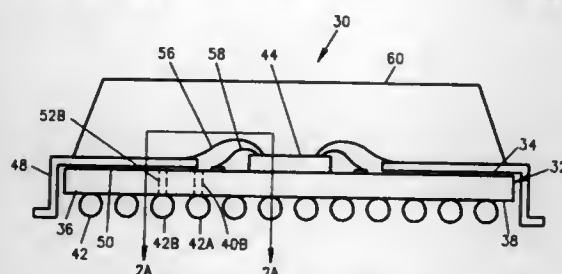
Satya Chillara, and Shahram Mostafazadeh, both of San Jose, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 307,270, Sep. 16, 1994, Pat. No. 5,442,230. This application Mar. 20, 1995, Ser. No. 406,726

Int. Cl.<sup>6</sup> H01L 23/495

U.S. Cl. 257—666

13 Claims



1. An integrated circuit assembly, comprising:
  - a dielectric substrate defining a predetermined array of electrically conductive traces on a first surface thereof;
  - a plurality of leadframe leads supported by said substrate and electrically isolated from said traces;
  - an IC chip supported by the substrate on the first surface, said IC chip including a series of input/output pads; and
  - a first series of bonding wires respectively electrically connecting certain ones of the input/output pads of the IC chip to respective ones of said traces and a second series of bonding wires respectively electrically connecting certain other ones of the input/output pads of the IC chip to respective ones of said leadframe leads, whereby the IC chip can be connected to external components in a predetermined way through both said electrically conductive traces and said leadframe leads;
  - said substrate further including at least said first surface and a second opposing surface, said first surface supporting said IC chip and said leadframe leads, said substrate further including a plurality of elongated, electrically conductive members attached to said second surface in predetermined positions, and

wherein said conductive traces extend from said first surface to said second surface, each of said traces being electrically connected to an associated one of said elongated members.

5,569,956

**INTERPOSER CONNECTING LEADFRAME AND  
INTEGRATED CIRCUIT**

Satya N. Chillara, San Jose, and Jaime A. Bayan, Palo Alto, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

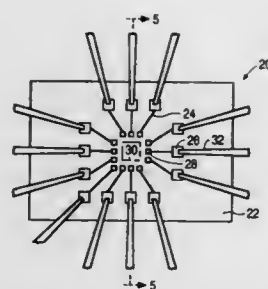
Filed Aug. 31, 1995, Ser. No. 521,618

Int. Cl.<sup>6</sup> H01L 23/28; 23/48

U.S. Cl. 257—668

13 Claims

1. An integrated circuit package comprising:
  - a conductive leadframe, said leadframe having leads terminating in lead tips generally converging toward a center of said leadframe and tapering as said lead tips extend toward said center of said leadframe, each of said lead tips being supported solely by its associated lead;
  - at least one integrated circuit die having terminal pads formed thereon;
  - an insulating substrate having a first set of bonding pads formed thereon, individual bonding pads in said first set of bonding pads being aligned with and directly connected to respective ones of said lead tips, said insulating substrate also having a second set of bonding pads formed thereon, said at least one die being affixed to said insulating substrate such that bonding pads in said second set of bonding pads are located proximate



to said at least one die, individual ones of said bonding pads in said second set of bonding pads being electrically connected to respective ones of said terminal pads on said at least one die;

- a plurality of conductors formed on said insulating substrate, individual ones of said conductors being connected between said bonding pads in said first set of bonding pads and said bonding pads in said second set of bonding pads so as to electrically connect said terminal pads of said at least one die to respective ones of said lead tips of said leadframe; and
- an insulating enclosure encapsulating said at least one integrated circuit die, said insulating substrate, and said lead tips.

5,569,957

**LOW INDUCTANCE CONDUCTOR TOPOGRAPHY FOR  
MOSFET CIRCUIT**

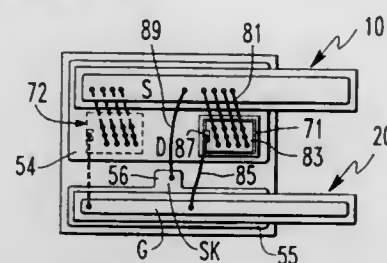
Thomas R. McLean, Mountain Top, Pa., assignor to Harris Corporation, Melbourne, Fla.

Filed Oct. 31, 1994, Ser. No. 332,300

Int. Cl.<sup>6</sup> H01L 23/52; 23/48; 23/053; 23/12

U.S. Cl. 257—691

15 Claims



1. An integrated circuit mounting and terminal connection structure comprising:
  - a support substrate having a first generally flat surface;
  - a first generally flat conductor layer disposed on a first portion of said first generally flat surface of said support substrate;
  - a first insulator layer having first and second generally parallel opposite surfaces upon which first and second generally flat conductive terminal leads are respectively formed in mutually overlying and parallel relationship, and being disposed on said first generally flat conductor layer so that said first and second generally parallel surfaces of said first insulator layer are parallel to said first generally flat conductor layer, with said first generally flat conductive terminal lead being mounted on said first generally flat conductor layer;
  - a circuit device mounted upon said first generally flat surface of said support substrate;
  - a first ohmic connection between said first generally flat conductive terminal lead and a first location of said circuit device; and
  - a second ohmic connection between said second generally flat conductive terminal lead and a second location of said circuit device; and

wherein entireties of said first insulator layer and said first and second generally flat conductive terminal leads are in said mutually overlying and parallel relationship, and wherein said first insulator layer and said first and second generally flat conductive terminal leads extend beyond an edge of said support substrate, maintaining current flow paths therethrough that are parallel to one another and parallel to said first generally flat surface of said substrate, so as to cancel magnetic flux linkage therebetween.

5,569,958

**ELECTRICALLY CONDUCTIVE, HERMETIC VIAS AND  
THEIR USE IN HIGH TEMPERATURE CHIP PACKAGES**

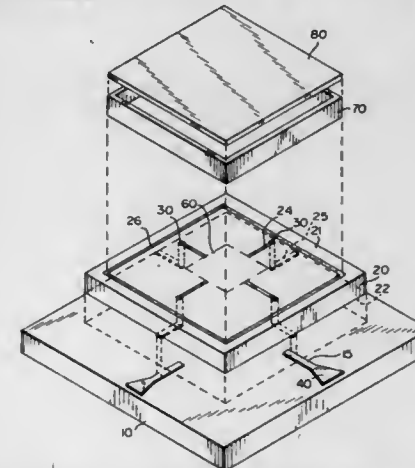
Terry R. Bloom, Middlebury, Ind., assignor to CTS Corporation, Elkhart, Ind.

Filed May 26, 1994, Ser. No. 249,813

Int. Cl.<sup>6</sup> H01B 17/26; H01H 1/02

U.S. Cl. 257—698

16 Claims



1. An electronic component base comprising:
  - a ceramic substrate having a first surface and a second surface and defining at least one via hole extending through the thickness of said substrate between said first surface and said second surface;
  - an electrically conductive fill composition disposed exclusively within said via hole and providing a hermetic seal with said substrate between said first surface and said second surface upon subsequent firing of said electronic component base, said fill composition consisting of from about 90% to about 99.99% of at least one metal selected from the group consisting of gold, silver, and combinations thereof, from about 0.01% to about 10% of at least one active agent based upon the total weight of said metal and said active agent, and an inert firing vehicle which when fired does not produce adverse amounts of carbon residue, wherein said fill composition is deposited in said via hole as a flowable paste to be subsequently fired to provide said hermetic seal.

wherein said conductive fill composition is deposited in said via hole as a flowable paste to be subsequently fired to provide said hermetic seal.

5,569,959

**CLOSURE FOR AN AIR BAG ASSEMBLY**

Robert Cooper, Oshawa, Canada; Peter Janazzi, Hampstead; Lawrence R. Nichols, Dover, both of N.H., and Thomas Parker, Imperial, Mo., assignors to David Textron, Inc., Dover, N.H.

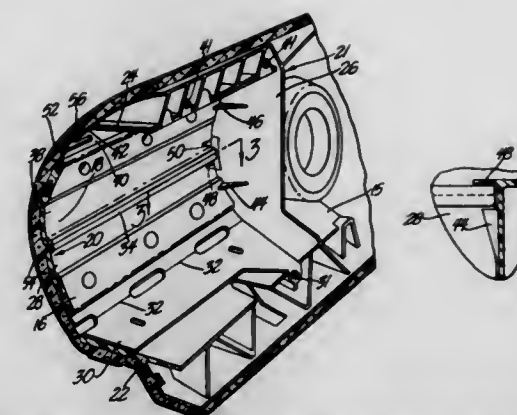
Continuation-in-part of Ser. No. 267,257, Jun. 29, 1994, Pat. No. 5,451,075. This application May 3, 1995, Ser. No. 434,022

Int. Cl.<sup>6</sup> B60R 21/16

U.S. Cl. 280—728.3

22 Claims

1. A closure for an air bag having an outer layer of polymeric material, a foam layer located within said outer layer and an inner retainer member having an air bag deployment opening preformed therein and the inner retainer member carrying said foam layer and



said outer layer in overlying relationship to the air bag deployment opening in the inner retainer member and a moveable door that is covered by the outer layer of polymeric material and the foam layer characterized by:

- said moveable door having sides thereof cooperating with said inner retainer member for supporting said moveable door against movement inwardly of said inner retainer member and for supporting said moveable door for free movement thereof from its supported position on said inner retainer member, the inner retainer member having shaped stops that taper inwardly and are relatively rigid and shear resistant, and the sides of the moveable door cooperating with the stops for retaining the moveable door in its supported position on the inner retainer member.

5,569,960

**ELECTRONIC COMPONENT, ELECTRONIC  
COMPONENT ASSEMBLY AND ELECTRONIC  
COMPONENT UNIT**

Tetsuo Kumazawa, Ibaraki-ken; Makoto Kitano, Tsuchiura; Akihiro Yaguchi, Ibaraki-ken; Ryuji Kohno, Ibaraki-ken; Naotaka Tanaka, Ibaraki-ken; Nae Yoneda, Ibaraki-ken, and Ichiro Anjoh, Koganei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

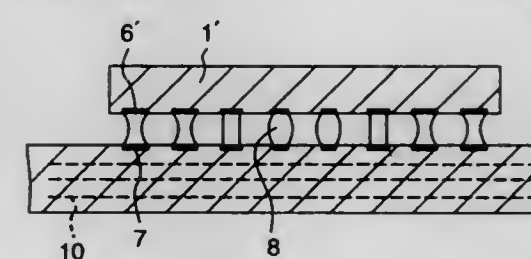
Filed May 10, 1995, Ser. No. 438,466

Claims priority, application Japan, May 16, 1994, 6-100443

Int. Cl.<sup>6</sup> H01L 23/48

U.S. Cl. 257—738

38 Claims



1. An electronic component unit comprising:
  - a first electronic component having an internal electric circuit therein;
  - a second electronic component having an internal electric circuit therein and disposed in substantially parallel relationship to said first electronic component;
  - at least five electrode pads provided on a surface of said first electronic component facing said second electronic component and electrically connected to the internal electric circuit of said first component, one of said at least five pads on said first electronic component being disposed adjacent a central portion of said first electronic component, two of said at least five pads on said first electronic component being disposed adjacent opposite outer peripheral edges of said first electronic component, and the remainder of said at least five pads on said first electronic component being successively dis-

posed between said two of said at least five pads on said first electronic component;

at least five electrode pads provided on a surface of said second electronic component facing said first electronic component, said at least five pads being respectively disposed substantially in alignment with the at least five pads of said first electronic component; and

at least five discrete metallic bonding elements disposed between said first and second electronic components for electrically and mechanically connecting together the respective at least five pads of said first electronic component and the at least five pads of said second electronic component; wherein: the ratios of the surface areas of the at least five pads of at least one of said first and second electronic components to the volumes of the respective metallic bonding elements vary stepwise in at least one direction from said central portion toward at least one of said outer peripheral edges; and each of the pads of said first and second electronic components is bonded to an associated metallic bonding element over the substantially whole area of the pad, whereby the shapes of the metallic bonding elements connected to the successive pads are different.

5,569,961

# SEMICONDUCTOR DEVICE HAVING A MULTI-LAYER METALLIZATION STRUCTURE

Sang-in Lee, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

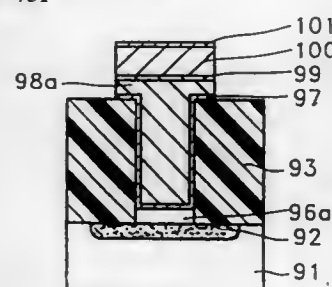
Division of Ser. No. 341,982, Nov. 16, 1994, which is a division of Ser. No. 172,216, Dec. 23, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 473,050

Claims priority, application Rep. of Korea, Dec. 30, 1992, 92-26603

Int. Cl.<sup>6</sup> H01L 29/41; 29/43

U.S. Cl. 257-751

13 Claims



1. A semiconductor device, comprising:
  - a substrate;
  - an insulating layer formed on said substrate;
  - an opening formed in said insulating layer, said opening including a bottom surface comprised of a portion of said substrate;
  - a composite diffusion barrier layer formed on said bottom surface of said opening, said composite diffusion barrier layer being comprised of at least first and second sub-layers;
  - a nucleation layer formed on said composite diffusion barrier layer and sidewalls of said insulating layer defining said opening, said nucleation layer including wing portions extending laterally outwardly beyond an upper edge of said opening and on adjacent surface portions of said insulating layer;
  - a first metal layer formed on said nucleation layer, said first metal layer including a plug portion filling said opening and wing portions which extend laterally outwardly beyond an upper edge of said opening and on said wing portions of said nucleation layer, said plug portion and said wing portions of said first metal layer being continuous and comprised of the same material;
  - an intermediate layer formed on said first metal layer; and
  - a second metal layer formed on said intermediate layer.

5,569,962

# SPLIT POLYSILICON SRAM CELL

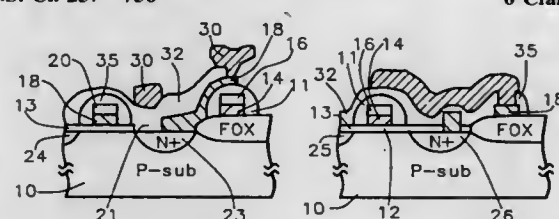
Ming-Tzong Yang, Hsin Chu, Taiwan, assignor to United Microelectronics Corporation, Hsin-Chu, Taiwan

Filed Nov. 16, 1994, Ser. No. 341,940

Int. Cl.<sup>6</sup> H01L 23/48; 29/78

U.S. Cl. 257-756

6 Claims



1. A semiconductor device formed on a silicon substrate having a surface, comprising
  - a) a first gate oxide layer formed on said silicon substrate,
  - b) a first polysilicon layer on said first gate oxide layer,
  - c) a first silicon dioxide layer on said first polysilicon layer,
  - d) said first polysilicon layer and said first silicon dioxide layer patterned with openings therethrough,
  - e) spacers lying over said patterned, first polysilicon layer and a second gate oxide layer formed on exposed portions of said surface of said substrate,
  - f) buried contact openings formed through said second gate oxide layer to said substrate for a buried contact,
  - g) a second polysilicon layer on said device extending down into said buried contact openings into contact with said substrate with source/drain regions in said substrate adjacent to said second polysilicon layer,
  - h) a second silicon dioxide layer over said second polysilicon layer,
  - i) said second polysilicon layer and said second silicon dioxide layer patterned,
  - j) a third silicon dioxide layer over the remaining portions of said second polysilicon layer,
  - k) ion implanted regions in said substrate,
  - l) a third gate oxide layer,
  - m) via opening in said third gate oxide layer down to said second polysilicon layer, and
  - n) a third polysilicon layer formed on said third gate oxide layer on said device, said third polysilicon layer extending down into said via opening and into contact with said second polysilicon layer.

5,569,963

# PREFORMED PLANAR STRUCTURES FOR SEMICONDUCTOR DEVICE ASSEMBLIES

Michael D. Rostoker, San Jose, and Nicholas F. Pasch, Pacifica, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Division of Ser. No. 105,547, Aug. 12, 1993, Pat. No. 5,504,035, which is a continuation-in-part of Ser. No. 981,096, Nov. 24, 1992, Pat. No. 5,229,730, which is a continuation of Ser. No. 775,009, Oct. 11, 1991, Pat. No. 5,168,346, which is a continuation of Ser. No. 576,182, Aug. 30, 1990, Pat. No. 5,111,279, which is a continuation of Ser. No. 400,572, Aug. 28, 1989, abandoned, which is a continuation of Ser. No. 975,185, Nov. 12, 1992, Pat. No. 5,399,898. This application Apr. 25, 1995, Ser. No. 428,323

Int. Cl.<sup>6</sup> H01L 23/48; 29/44

U.S. Cl. 257-773

22 Claims

1. A semiconductor assembly comprising:
  - at least one first semiconductor die having conductive bumps on a face thereof;
  - a separate and distinct preformed planar structure having one face receiving the face of the at least one first semiconductor die, and an other, opposite face;
  - through holes extending through the preformed planar structure from the one face to the other face;

5,569,965

# CONTROL METHOD FOR REDUCING QUIESCENT CURRENT

Naoshi Tsunehiro, Tokyo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

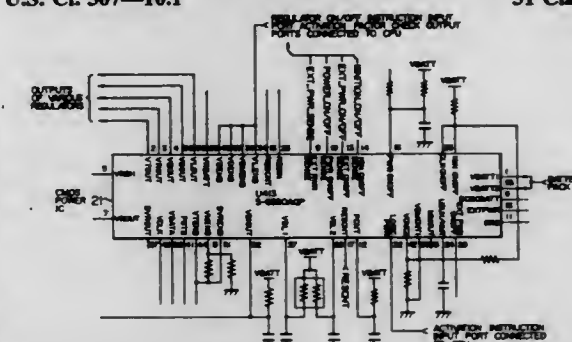
Filed Apr. 22, 1994, Ser. No. 231,481

Claims priority, application Japan, Nov. 29, 1993, 5-297749

Int. Cl.<sup>6</sup> H04M 11/00

U.S. Cl. 307-10.1

31 Claims



1. A quiescent-current reducing type electric-power supply control method for a device adapted to be fed power from at least one electric power source, said method comprising:
  - (a) detecting a predetermined necessary condition with respect to power input from at least one power source;
  - (b) generating a trigger pulse in response to detection of said predetermined necessary condition;
  - (c) detecting presence or absence of a predetermined sufficient condition with respect to power input from said at least one power source in response to said trigger pulse; and
  - (d) starting continuous power supply from said at least one power source to said device in response to detection of said predetermined sufficient condition.

5,569,964

# SEMICONDUCTOR DEVICE

Kimihiro Ikebe, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

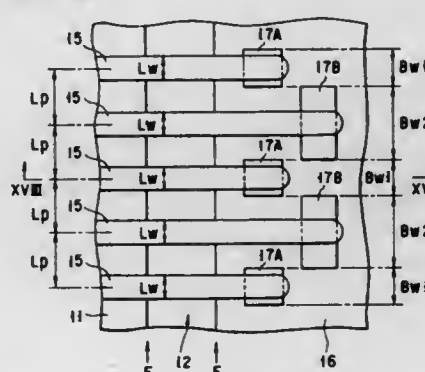
Filed Dec. 23, 1994, Ser. No. 363,321

Claims priority, application Japan, Dec. 27, 1993, 5-332755; Nov. 29, 1994, 6-295226

Int. Cl.<sup>6</sup> H01L 23/48; 23/52; 29/40

U.S. Cl. 257-780

14 Claims





midpoint detector capable of detecting and isolating a failure when said switching elements are in the "on" or "off" states.

# 5,569,967 MAGNETIC GEAR AND GEAR TRAIN CONFIGURATION

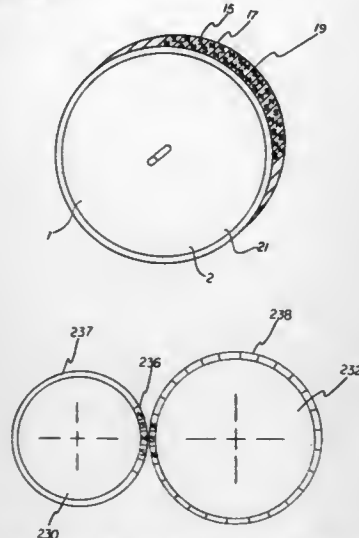
John E. Rode, Fonda, N.Y., assignor to Temper Corporation, Fonda, N.Y.

Continuation-in-part of Ser. No. 58,881, May 6, 1993, which is a continuation-in-part of Ser. No. 758,907, Sep. 11, 1991, Pat. No. 5,224,259. This application Dec. 5, 1994, Ser. No. 349,415

Int. Cl.<sup>6</sup> H02K 49/00; 15/00

U.S. Cl. 310-103

18 Claims



1. A magnetic gear having a substantially circular outer circumference comprising:

a rotatable member having a substantially continuous non-metallic magnetic material affixed along a circumference thereof, said rotatable member having a first axial end and a second axial end, said non-metallic magnetic material including a plurality of magnetic units spaced along a circumference thereof, each of said magnetic units being oriented in a direction substantially parallel to a central axis of said rotatable member and comprising a north pole and a south pole, said magnetic units being oriented about the circumference of the magnetic material wherein adjacent magnetic units are disposed in inverse polar alignment relative to one another thereby allowing alternate poles to be spaced along both the first axial end and second axial end about said circumference of said non-metallic magnetic material.

# 5,569,968 MICROFABRICATED ACOUSTIC SOURCE AND RECEIVER

Amit Lal, and Richard M. White, both of Berkeley, Calif., assignors to The Regents Of The University Of California, Oakland, Calif.

Continuation of Ser. No. 72,294, Jun. 4, 1993, abandoned. This application Sep. 14, 1994, Ser. No. 306,843

Int. Cl.<sup>6</sup> H01L 41/08

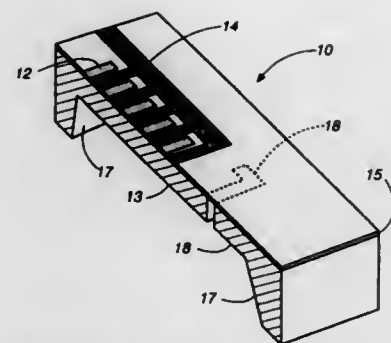
U.S. Cl. 310-322

39 Claims

1. A microfabricated acoustic source or receiver structure, comprising:

a substrate of a first material, said substrate having first and second sections wherein said first section is thicker than said second section;

a membrane of a second material disposed on said substrate over said first and second sections;



means, mechanically coupled to said membrane, for inputting or sensing mechanical energy in said membrane and said substrate; and

wherein said second section of said substrate includes a plate shaped to produce a predetermined acoustic response, said plate shaped by removing said first material from a preselected region of said second section of said substrate exposing said membrane, said preselected region having a lateral extent less than a lateral extent of said second section.

# 5,569,969 VIBRATOR AND VIBRATORY GYROSCOPE USING THE SAME

Tohru Kasanami, Takeshi Nakamura, Keiichi Okano, and Yoshiko Morishita, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto-fu, Japan

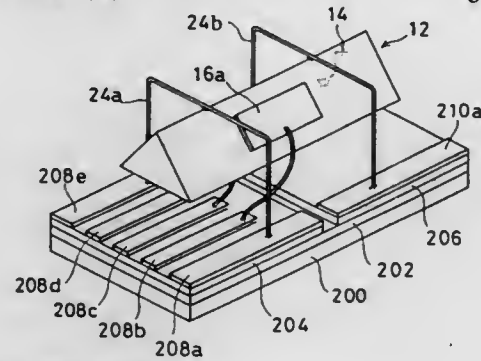
Division of Ser. No. 276,759, Jul. 18, 1994, Pat. No. 5,493,166, which is a continuation of Ser. No. 91,642, Jul. 15, 1993, abandoned, which is a division of Ser. No. 711,701, Jun. 7, 1991, abandoned, which is a continuation of Ser. No. 391,825, Aug. 10, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 474,118

Claims priority, application Japan, Aug. 12, 1988, 63-202385; Feb. 25, 1989, 1-44806; Feb. 25, 1989, 1-44807; Apr. 6, 1989, 1-89396; Apr. 6, 1989, 1-89397; Apr. 6, 1989, 1-89398; May 8, 1989, 1-115436; May 8, 1989, 1-115437; May 12, 1989, 1-120102; Jun. 9, 1989, 1-147779; Jun. 9, 1989, 1-147782

Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 310-345

8 Claims



1. A vibrator comprising:

a vibrating body having a polygonal section;

a support base;

a buffer of an elastic material formed on said supporting base;

substrates formed on said buffer and separated from one another; and

a plurality of supporting members, each secured to a respective substrate, for supporting said vibrating body.

# 5,569,970 TANTALA-SILICA INTERFERENCE FILTERS AND LAMPS USING SAME

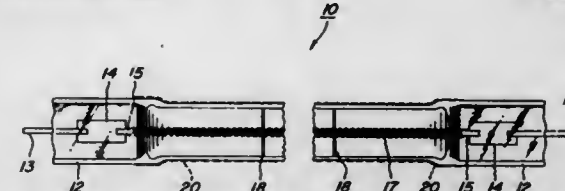
Frederick W. Dynys, Chagrin Falls, and Thomas G. Parham, Gates Mills, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 978,007, Nov. 18, 1992, Pat. No. 5,422,534. This application Mar. 23, 1995, Ser. No. 409,734

Int. Cl.<sup>6</sup> H01J 61/40

U.S. Cl. 313-112

5 Claims



1. An optical interference filter comprising a plurality of alternating layers of tantalum and silica in which each tantalum layer includes titania in an amount of from about 0.001 to less than 10 mole percent.

# 5,569,971 READILY ASSEMBLED SPARK ELECTRODE

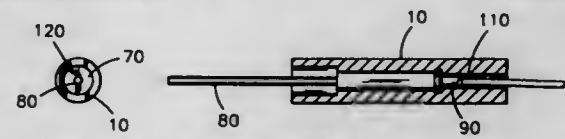
Gerald R. Clifford, 15 Strawberry Ln., Rolling Hills Estates, Calif. 90274, and James Wang, 5762 Bellfield La., Huntington Beach, Calif. 92648

Filed Mar. 31, 1994, Ser. No. 221,840

Int. Cl.<sup>6</sup> H01T 13/56

U.S. Cl. 313-141

4 Claims



1. A spark electrode device comprising:

a housing made of an electrically insulating material, providing a cylindrical passage therein, comprising, in sequence and mutually concentrically oriented along a longitudinal axis, a clearance portion, a slip fit portion, an annular groove portion, and a connection portion, the clearance portion, and the annular groove portion being of larger diameter than the slip fit portion, the connection portion being of lesser diameter than the slip fit portion, the annular groove portion defined by a first and a second annular side walls, the first of the walls abutting the slip fit portion, the second of the walls abutting the connection portion;

an integral, one-piece, electrically conducting, rod shaped electrode fitted into the cylindrical passage, and comprising, in sequence and mutually concentrically oriented along the longitudinal axis, an emitter portion, a body portion, an umbrella portion, and a wire connection portion, the emitter, body, umbrella and wire connection portions each primarily positioned in the clearance, slip fit, annular groove and connection portions respectively, of the housing, the body and umbrella portions of the electrode initially having a tightly-fitted sliding clearance relationship with the slip fit portion of the cylindrical passageway enabling insertion of the electrode into the housing, the emitter portion, and the wire connection portions, extending outwardly from opposite ends of the housing respectively, the body and umbrella portions, together, being of a length such that with the umbrella portion abutting the second of the annular side walls of the annular groove portion, the body portion extends slightly into the clearance portion of the housing in such a manner as to enable a force, delivered parallel to the longitudinal axis to be delivered thereto, the umbrella portion and the body portion being of such shape and size and space restriction relationship within the housing as to deform in a preferred manner from said force, to wit, the umbrella portion deforming expansively radially into the annular groove portion thereby capturing the

electrode in the housing, and further the body portion deforming expansively radially, wedging the body portion in the slip-fit portion so that the electrode cannot rotate or move longitudinally in the housing.

# 5,569,972 GAS-FILLED LIGHTNING ARRESTER HAVING COPPER ELECTRODES

Gerhard Lange, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

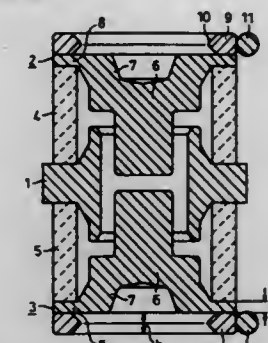
Filed Aug. 15, 1994, Ser. No. 290,274

Claims priority, application Germany, Aug. 31, 1993, 43 30 178.9

Int. Cl.<sup>6</sup> H01J 17/02

U.S. Cl. 313-231.11

10 Claims



1. A gas-filled lightning arrester comprising:

at least one tubular ceramic insulator;

two bowl-shaped copper electrodes, each soldered by their edges endwise on an end of the at least one tubular ceramic insulator, where each edge of said electrodes has a wall thickness (D) of less than 0.6 mm;

a contact ring coupled endwise to each of said copper electrodes and made of a material capable of being welded and having a coefficient of thermal expansion of approximately  $120 \times 10^{-7}/^{\circ}\text{C}.$ , each contact ring having a height (h) greater than the wall thickness (D) of each of said edges of said copper electrodes, where each contact ring is soldered to one of said edges of said copper electrodes; and

a connecting wire welded to an outside surface of each of said contact rings.

# 5,569,973 INTEGRATED MICROELECTRONIC DEVICE

Steven M. Zimmerman, Pleasant Valley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

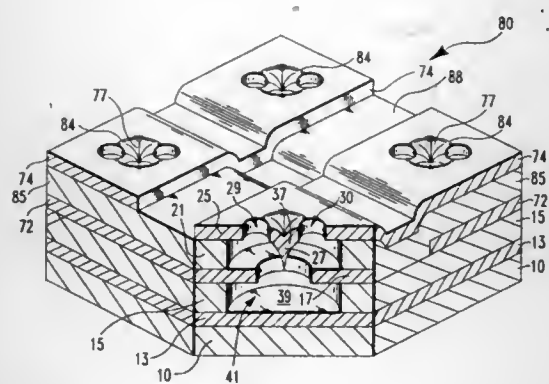
Continuation of Ser. No. 847,444, Mar. 6, 1992, Pat. No. 5,463,269, which is a continuation of Ser. No. 555,214, Jul. 18, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 470,605

Int. Cl.<sup>6</sup> H01J 1/00

U.S. Cl. 313-309

61 Claims

1. An integrated microelectronic device comprising an electron-emitting material having at least one field emission tip and at least one access hole that leads into a chamber, wherein said field emitter tip faces an anode which is in said chamber and is separated by at least one insulating material, wherein at least a portion said at least one access hole in said electron-emitting material faces said anode, and wherein said anode contains a layer of phosphor.



5,569,974

# **ELECTRON-EMITTING DEVICE AND ELECTRON BEAM LITHOGRAPH MACHINE AND IMAGE DISPLAY APPARATUS MAKING USE OF IT**

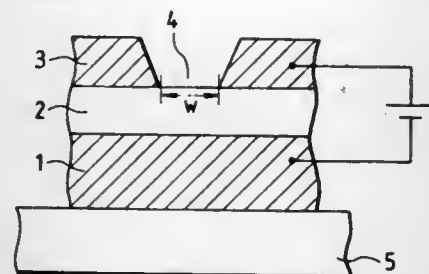
Yuko Morikawa, Kawasaki; Yoshihiro Yanagisawa, Atsugi, and Kiyoshi Takimoto, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 137,813, Oct. 19, 1993, abandoned, which is a continuation of Ser. No. 501,882, Mar. 30, 1990, abandoned. This application Jul. 12, 1994, Ser. No. 273,630 Claims priority, application Japan, Mar. 30, 1989, 1-76605; Mar. 27, 1990, 2-75764

Int. Cl.<sup>6</sup> H01J 1/30;29/48;37/317

U.S. Cl. 313—310

4 Claims



1. An image display apparatus comprising:  
an electron source including a plurality of lines of electron emitting devices;  
modulating electrodes capable of modulating an electron beam emitted from said lines of electron-emitting devices, in accordance with an information signal; and  
an image forming member capable of forming an image as a result of irradiation with said electron beam,  
wherein each of the plurality of lines of electron emitting devices comprises plural electron emitting devices electrically connected in parallel with each other,  
each of said plural electron-emitting devices comprises a substrate, a first electrode provided on said substrate, an insulating layer having a thickness of from 100 Å to 5 Å laminated on said electrode, and a second electrode having plural openings and laminated on said insulating layer in such a manner that the insulating layer is uncovered at the plural openings and electrons are emitted from the plural openings of the second electrode as a result of application of a voltage between the electrodes and wherein said insulating layer comprises a monomolecular film of an organic compound or a built-up film of said monomolecular films and a ratio of area of the plural openings to that of the second electrode is 50% or less, and  
wherein, the first electrodes of the electron emitting devices of a line are electrically connected with each other and the second electrodes of the electron emitting devices of the line are electrically connected with each other.

## **5,569,975 CLUSTER ARRANGEMENT OF FIELD EMISSION MICROTIPS**

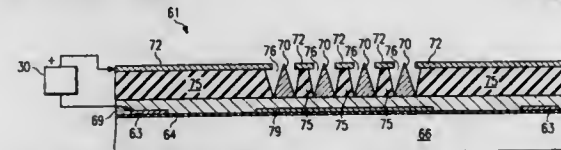
Robert H. Taylor, Richardson, and Jules D. Levine, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 341,829, Nov. 18, 1994. This application Jan. 26, 1995, Ser. No. 378,328

Int. Cl.<sup>6</sup> H01J 1/30

U.S. Cl. 313—310

34 Claims



12. Electron emission apparatus comprising:  
an insulating substrate;  
a conductor formed as a mesh structure on said substrate, said mesh structure defining mesh spaces;  
conductive plates on said insulating substrate occupying areas within said mesh spaces;  
a layer of an electrically resistive material on said substrate overlying said mesh structure and said conductive plates;  
an electrically insulating layer on said resistive layer;  
a conductive layer on said insulating layer, said conductive layer having a plurality of apertures formed therein and extending through said insulating layer;  
microtip emitters on said resistive layer, each emitter formed within a corresponding one of said apertures in said conductive layer.

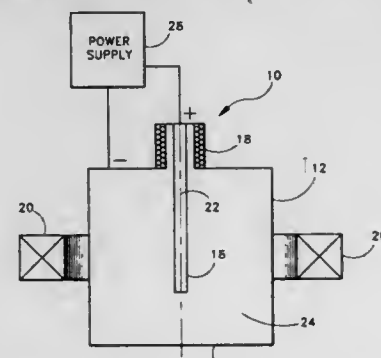
## **5,569,976 ION EMMITER BASED ON COLD CATHODE DISCHARGE**

Nikolai V. Gavrilov, Cherepanova St. 24, Apt. 229, 620034 Ekaterinberg, and Sergey P. Nikulin, Vikoolova 43, Bldg. 3, Apt. 80, 620131 Ekaterinburg, both of Russian Federation  
Filed Jun. 14, 1995, Ser. No. 490,208

Int. Cl.<sup>6</sup> H01J 61/09

U.S. Cl. 313—359.1

6 Claims



1. A cold cathode plasma emitter for producing ions comprising:  
a cylindrical cathode having an internal cavity with a first and second end with an ion emission window at said first end, said cavity containing a plasma producing gas, said cathode dimensions selected from the following ratios:  $L/D=0.8$  to  $1.2$ ;  $L$  is the length of said internal cavity and  $D$  is the diameter of said internal cavity;  
a rod-shaped anode, mounted coaxially with the center line of said cavity positioned within the cavity, said anode length  $l$  selected from the following ratio  $l/L=0.5$  to  $0.8$ ;  
a pulse power supply connected to said cathode and an anode;  
a feedthrough insulator positioned between said cathode and said anode for electrical insulation therebetween; and  
a magnetic coil, mounted externally of the cathode and coaxially with said longitudinal center line of said cavity for producing a magnetic field.

## **5,569,977 CATHODE RAY TUBE WITH UV-REFLECTIVE FILTER AND UV-EXCITABLE PHOSPHOR**

Robert L. Donofrio, Ann Arbor, Mich., assignor to Philips Electronics North America Corporation, New York, N.Y.

Filed Mar. 8, 1994, Ser. No. 207,501

Int. Cl.<sup>6</sup> H01J 29/10

U.S. Cl. 313—466

17 Claims



1. A cathode ray tube comprising:  
an envelope comprising a front display panel portion, an intermediate funnel portion and a rear neck portion;  
a phosphor screen on the interior surface of the display panel; and  
an electron gun in the neck for directing at least one electron beam to the screen;  
characterized in that a UV-reflective filter is present on the display panel, and in that the phosphor screen is located between the filter and the electron gun, and comprises at least one phosphor which emits visible light upon excitation by UV radiation, and in that the filter substantially passes visible light and substantially reflects UV light, whereby upon electron excitation, the UV light emitted by the phosphor is reflected back onto the phosphor screen.

## **5,569,979 UV ABSORBING FUSED QUARTZ AND ITS USE FOR LAMP ENVELOPES**

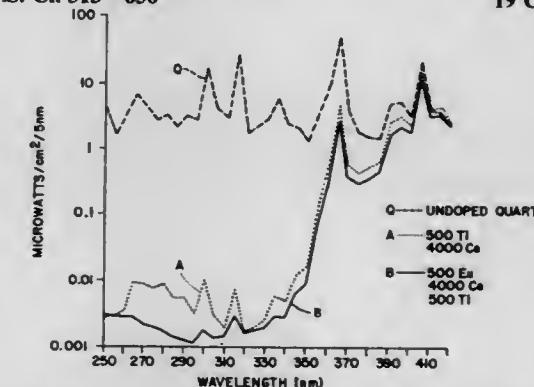
Curtis E. Scott; Cynthia A. Secen, both of Mentor; Thomas G. Parham, Gates Mills; Gary R. Allen, Chesterland, all of Ohio; Robert L. Bateman, Jr., Southern Shores, N.C., and Paul G. Mathews, Chesterland, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 891,136, Jun. 1, 1992, abandoned, and Ser. No. 843,660, Feb. 28, 1992, Pat. No. 5,196,759. This application Sep. 26, 1994, Ser. No. 312,164

Int. Cl.<sup>6</sup> H01J 17/16

U.S. Cl. 313—636

19 Claims



1. A lamp comprising a light source which emits both UV and visible light radiation surrounded by a UV-absorbing and visible light-transmissive fused quartz envelope containing at least 400 wppm europium oxide, at least 50 wppm titanium dioxide and at least 1000 wppm cerium oxide to absorb at least a portion of said UV radiation.

## **5,569,978 FLASH LAMP WITH O-RING ELECTRODE SEALS**

George Olye, Los Altos, and Joseph R. Caruso, San Martin, both of Calif., assignors to ILC Technology, Inc., Sunnyvale, Calif.

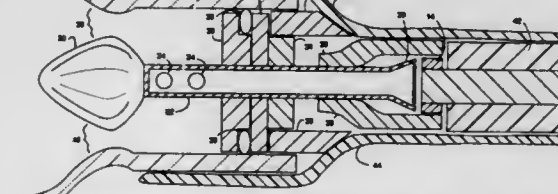
Continuation of Ser. No. 229,688, Apr. 19, 1994, abandoned.

This application Apr. 24, 1995, Ser. No. 427,688

Int. Cl.<sup>6</sup> H01J 61/06

U.S. Cl. 313—631

12 Claims



1. An electrode assembly for insertion in the open end of a glass tube envelope of a gas-filled gaseous discharge lamp, comprising:  
an arc electrode having a first end for facing an electric arc and a supersonic shock wave generated by said electric arc in an inert gas and a second end opposite to said first end;  
aerodynamic supersonic nozzle means annularly disposed, at least in part, in the arc electrode and encircling the arc electrode, and including funneling and nozzling means for redirecting outward expulsive forces of said shock wave acting on said first end of the electrode into a counteracting mechanical force applied to said second end of the electrode for pushing the electrode toward said electric arc; and  
an elastic compression seal assembly for supporting the arc electrode and for sealing said inert gas within said glass tube envelope.

## **5,569,980 NON-CONCENTRIC SUPPORT FOR CROSSED-FIELD AMPLIFIER**

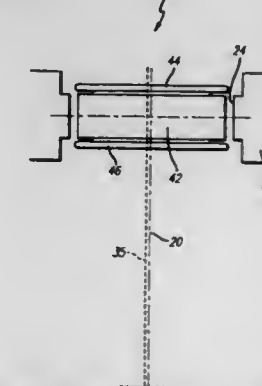
Michael S. Worthington, Hughesville; Kenneth F. Ramacher, and Edward M. Doyle, both of Montoursville, all of Pa., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Filed Jul. 29, 1994, Ser. No. 283,027

Int. Cl.<sup>6</sup> H01J 25/36;25/50

U.S. Cl. 315—39.3

8 Claims



1. In a crossed-field device having a cathode, a plurality of anode vanes radially disposed around said cathode, and an interaction region defined between said cathode and respective innermost tips of said anode vanes, an improvement comprising:  
a cathode support concentrically coupled to said cathode, said support having an axis of symmetry parallel to an associated axis of symmetry of said anode vanes and offset from said associated axis of symmetry by a predetermined amount, wherein said cathode support further comprises a first end-hat disposed at a first axial end thereof and a second end-hat disposed at a second axial end thereof.



disposed at a second axial end thereof, each respective end-hat being coaxial with said axis of symmetry of said anode vanes.

wherein the socket receiving part of the socket substrate extends through a central receiving cavity formed in the printed circuit board.

# **5,569,981** **BALLAST DEVICE FOR COMPACT FLUORESCENT LAMP**

Sung H. Cho, 100-4 Onsu-Dong, Kuro-Gu, Seoul, Rep. of Korea

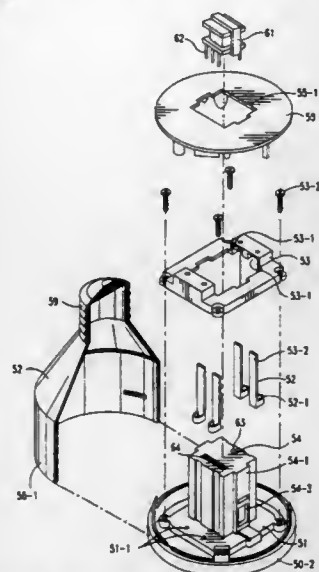
Continuation-in-part of Ser. No. 251,580, May 31, 1994. This application May 17, 1995, Ser. No. 446,895

Claims priority, application Rep. of Korea, Oct. 11, 1994, 1994-26438

Int. Cl.<sup>6</sup> H01J 7/44; H01R 33/08; H05B 41/00

U.S. Cl. 315-56

13 Claims



1. An adapter for receiving a compact fluorescent lamp and fitting into an incandescent socket, the adapter comprising:

- a socket substrate having a top side and a bottom side, the bottom side having a socket receiving part which defines a cavity having an open end on the top side of the socket substrate for receiving a socket plug of the compact fluorescent lamp, wherein a plurality of holes are defined from the top side to the bottom side of the socket substrate for permitting pins of the compact fluorescent lamp to pass through the socket substrate;
- a ballast case having an upper portion coupled with a peripheral region of the socket substrate, a bulb base, adapted to fit into the incandescent socket, at its lower portion, and a section arranged between the upper portion of the ballast case and the bulb base of the ballast case;
- a socket upper plate having a top side coupled with the bottom side of the socket substrate and having a plurality of receiving cavities defined therein, and a bottom side, wherein the socket receiving part of the socket substrate extends through a central receiving cavity formed in the socket upper plate, and wherein a plurality of holes, aligned with the plurality of holes defined in the socket substrate, are defined in the socket upper plate;
- a plurality of terminals, each of the plurality of terminals having a top portion and a tail, the top portion of each of the plurality of terminals held in a respective one of the receiving cavities of the socket upper plate;
- an electronic component arranged on a lower surface of the socket receiving portion of the socket substrate, the electronic component including at least one lead electrically coupled with the tail of at least one of the plurality of terminals; and
- a printed circuit board having an upper side adjacent to the lower side of the socket upper plate and having a lower side,

# **5,569,982** **CLAMPING CIRCUIT FOR IGBT IN SPARK PLUG IGNITION SYSTEM**

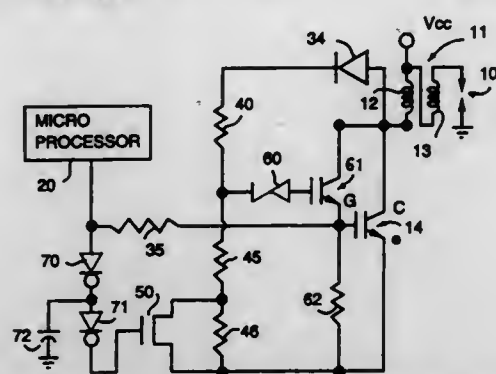
Bruno C. Nadd, Puyvert, France, assignor to International Rectifier Corporation, El Segundo, Calif.

Filed May 17, 1995, Ser. No. 442,813

Int. Cl.<sup>6</sup> F02P 3/02

U.S. Cl. 315-209 T

33 Claims



1. An ignition circuit for a spark plug comprising, in combination: an ignition transformer having a first winding means and a second winding means coupled to said first winding means and connectable to spark plug electrodes; a MOSgated power semiconductor device having first and second power electrodes and a gate electrode; means connecting said first winding means and said first and second power electrodes in series with one another and between a Vcc voltage terminal and a ground terminal; firing circuit means coupled to said gate electrode for producing turn-on and turn-off signals to said gate electrode; and foldback clamp circuit means connected to said MOSgated semiconductor device for clamping the voltage between said gate electrode and one of said power electrodes to a first clamping voltage for a first length of time, said first voltage and said first length of time being sufficient to produce a high enough voltage on said second winding means to fire said spark plug electrodes, said foldback clamp circuit means thereafter reducing said voltage between said gate electrode and said one of said power electrodes to a second clamping voltage which is substantially lower than said first clamping voltage.

# **5,569,983** **ELECTRONIC APPARATUS FOR PRODUCING VARIABLE SPECTRAL OUTPUT**

Kevin P. McGuire, Rochester, and Richard E. Hagerman, Penfield, both of N.Y., assignors to Tailored Lighting Inc., Pittsford, N.Y.

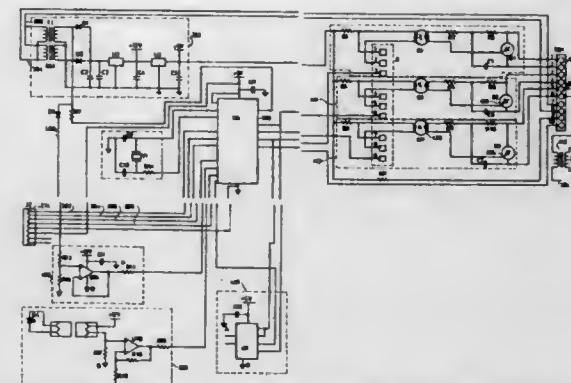
Continuation-in-part of Ser. No. 216,495, Mar. 22, 1994. This application Aug. 16, 1994, Ser. No. 291,168

Int. Cl.<sup>6</sup> G05F 1/00

U.S. Cl. 315-297

19 Claims

1. Apparatus for continuously producing a predetermined light characteristic from at least two spectrally different light sources, wherein a first of said light sources emits light at one range of color temperatures and a second of said light sources emits light at a different range of color temperatures, the apparatus comprising first means for changing the illumination output of said first light source, second means for changing the illumination output of said second light source, and electronic controller means comprised of means programmed to establish a desired light characteristic using said first light source, microprocessor means to establish the levels of illumination and color temperature of said first light source as the first illumination changing means changes the illumination



level of said first light source, wherein said microprocessor means calculates the amount of illumination needed from said second light source to restore the overall light to the desired characteristic, and wherein said apparatus further comprises light control means to set the level of illumination of said second light source to such calculated amount.

# **5,569,984** **METHOD AND CONTROLLER FOR DETECTING ARC INSTABILITIES IN GAS DISCHARGE LAMPS**

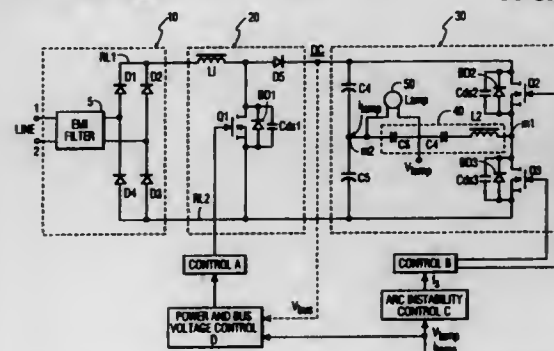
Antonius H. Holtslag, Eindhoven, Netherlands, assignor to Philips Electronics North America Corporation, New York, N.Y.

Filed Dec. 28, 1994, Ser. No. 366,333

Int. Cl.<sup>6</sup> H05B 37/02

U.S. Cl. 315-307

36 Claims



1. A method of operating a gas discharge lamp, comprising the steps of:

- operating the gas discharge lamp at a plurality of operating frequencies;
- sensing and taking a plurality of samples of an electrical lamp parameter at each of said plurality of operating frequencies;
- calculating a deviation, at each of said plurality of frequencies, of the samples taken at said each frequency; and
- evaluating the calculated deviations and selecting a lamp operating frequency based on the evaluation.

# **5,569,985** **AMPLIFIER FOR SCANNING BEAM VELOCITY MODULATION**

Dal F. Griepentrog, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

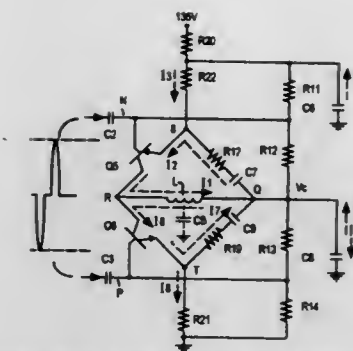
Filed Aug. 3, 1994, Ser. No. 285,566

Int. Cl.<sup>6</sup> G09G 1/04; H04N 5/21

U.S. Cl. 315-397

17 Claims

1. An apparatus for electron beam deflection, comprising: a cathode ray tube having a scanning electron beam; a coil for supplementary electron beam deflection mounted on said cathode ray tube;



a signal representing a video signal edge transition; an amplifier coupled between a supply of power and a return circuit and having an input coupled to said signal and an output coupled to said coil for generating a pulse current therein for electron beam deflection responsive to said signal; and,

said amplifier and said coil being configured for circulation of said pulse current within said coil and said amplifier, and a component of said pulse current circulating within said coil, said amplifier, said power supply and said return circuit, said component having a smaller magnitude than said pulse current which renders unwanted coupling effects in said power supply and said return circuit insignificant.

# **5,569,986** **SOFT START CONTROL APPARATUS FOR DRIVE MOTORS OF A ROTOR SPINNING MACHINE**

Herzner Erwin, Möckenlohe, and Götz Josef, Denkendorf, both of Germany, assignors to Rieter Ingolstadt Spinnereimaschinenbau AG, Ingolstadt, Germany

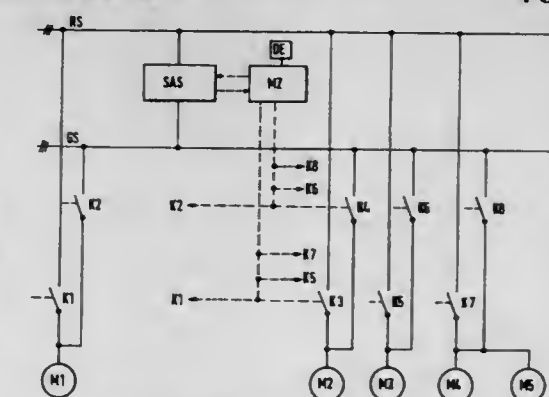
Filed Mar. 21, 1995, Ser. No. 407,720

Claims priority, application Germany, Apr. 29, 1994, 44 14 984.0

Int. Cl.<sup>6</sup> H02P 1/54; D01H 4/44

U.S. Cl. 318-66

4 Claims



1. A rotor spinning machine, comprising:

- a plurality of asynchronous motors configured to drive operating elements of the spinning machine so that said motors, when running from a standstill condition to an operating speed, are loaded by the inertia masses of the operating elements;
- a single soft-start control apparatus sized for at least the starting current of the most powerful of said motors; and
- a control circuit operably configured with said motors and said soft-start control apparatus to individually and successively connect said motors to said soft-start control apparatus in a predetermined hierarchy to bring said motors from a standstill condition to an operating speed in a predetermined sequence, thereby optimizing the load on said single soft-start control apparatus.

5,569,987

**POWER SUPPLY SYSTEM FOR A LONG-STATOR DRIVE FOR A MAGNETIC LEVITATION TRAIN**

Rolf Fischperer, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

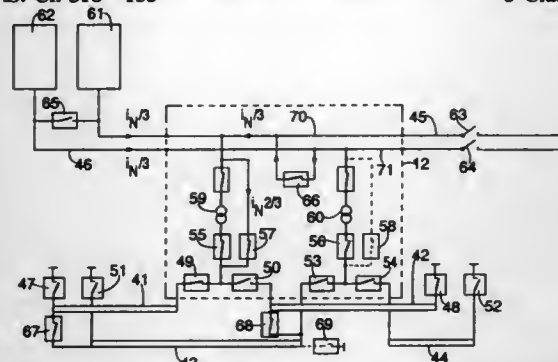
Filed Feb. 17, 1995, Ser. No. 390,005

Claims priority, application Germany, Mar. 4, 1994, 44 07 240.6

Int. Cl.<sup>6</sup> H02K 41/00; B61B 13/12

U.S. Cl. 318—135

5 Claims



1. A power supply system for a long-stator drive for a magnetic levitation train, comprising:

- a long-stator drive subdivided into a plurality of controllable stator segments along the path of the magnetic levitation train, each stator segment electrically connected to at least one section cable system running along the stator segments;
- at least one segment switch along said section cable system wherein each stator segment can be connected to at least one other stator segment through a segment switch;
- at least one frequency transformer provided for each section cable system and arranged in at least one substation along said stator segments, wherein said frequency transformer generates a supply voltage for said stator segments, and wherein the nominal voltage of said section cable system is greater than the nominal voltage of said stator segments; and
- at least one matching transformer connected between said section cable systems and said stator segments through which the nominal voltage of said section cable systems is transformed to the nominal voltage of said stator segments.

5,569,988

**BRUSHLESS MOTOR DRIVE CIRCUIT INCLUDING A LINEAR AMPLIFIER FOR SENDING AND OUTPUT SIGNAL BASED UPON THE DETECTED BACK ELECTROMOTIVE FORCE VOLTAGE**

Yasuhiko Kokami, and Satoshi Kondo, both of Takasaki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 7, 1994, Ser. No. 271,642

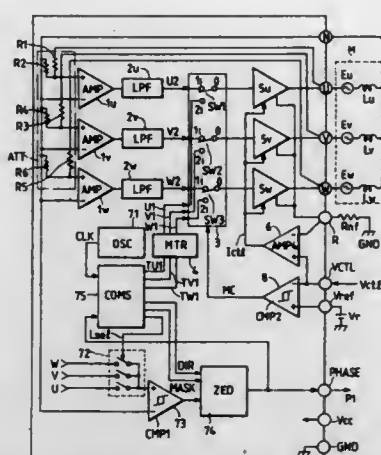
Claims priority, application Japan, Jul. 15, 1993, 5-175625; Jul. 15, 1993, 5-175626

Int. Cl.<sup>6</sup> A02P 7/00

U.S. Cl. 318—254

32 Claims

1. A motor drive circuit for driving a motor, comprising: an output amplifier for feeding a drive current for a winding of said motor;
- an amplifier for detecting a sinusoidal back electromotive force voltage induced on the winding of said motor;
- a phase compensation circuit for implementing a phase compensation for the detected back electromotive force voltage;
- a matrix circuit for producing a digital pulse signal; and



a switching circuit having a first input terminal for receiving the phase compensated back electromotive force voltage as an output signal of said phase compensation circuit, a second input terminal for receiving the digital pulse signal as an output signal of said matrix circuit and an output terminal connected to an input terminal of said output amplifier, and operating to deliver one of the output signal of said phase compensation circuit and the output signal of said matrix circuit selectively to the input terminal of said output amplifier in response to a switching signal.

5,569,989

**BRUSHLESS ELECTRIC MOTOR CONTROL PROVIDING REDUCED MOTOR TORQUE OSCILLATION**

Sebastiano Acquaviva, Pino Torinese, Italy, assignor to United Technologies Motor Systems, Inc., Columbus, Miss.

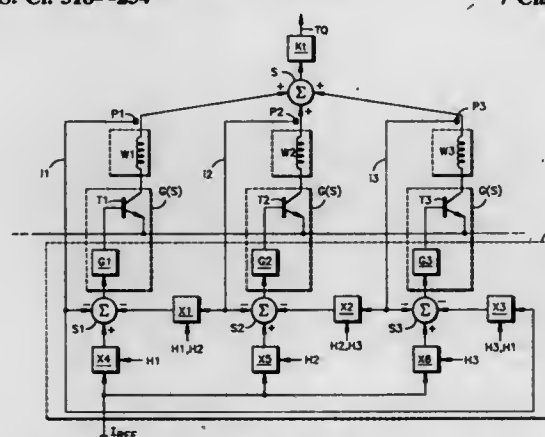
Filed Nov. 7, 1994, Ser. No. 335,525

Claims priority, application Italy, Nov. 16, 1993, TO93A0864

Int. Cl.<sup>6</sup> H02P 6/02

U.S. Cl. 318—254

7 Claims



1. A brushless electric motor having a plurality of winding phases and a control system for sequentially energizing said plurality of phases to provide continuous current to the motor, said control system comprising:

- means for switching current from a winding phase being deactivated to a winding phase being activated such that the winding phases are simultaneously energized for a time interval with current decreasing in magnitude in the winding phase being deactivated and current increasing in magnitude in the winding phase being activated; and

means for controlling the rate of decrease of the decreasing current in the winding phase being deactivated so that the magnitude of the decreasing current is approximately equal to the difference in magnitude between a predetermined reference current and the increasing current in the winding phase being activated, thereby reducing oscillations in line current and motor torque.

5,569,990

**DETECTION OF STARTING MOTOR POSITION IN A BRUSHLESS DC MOTOR**

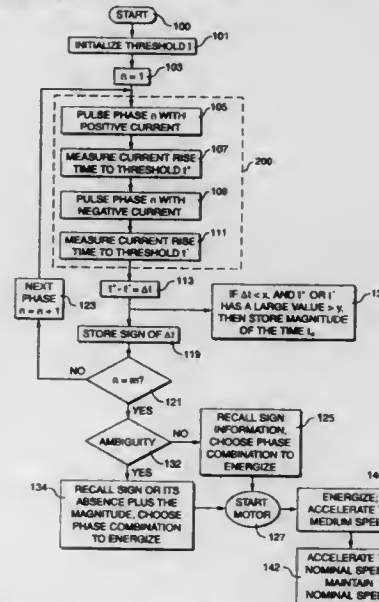
John C. Dunfield, Santa Cruz, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Mar. 31, 1995, Ser. No. 414,289

Int. Cl.<sup>6</sup> H02P 7/00

U.S. Cl. 318—254

46 Claims



1. In a brushless DC motor having multiple phase windings arranged as a stator and a rotor having a permanent magnet and a stator current excitation winding, a method for controlling ordered application of electrical current to the phase windings and measuring responses thereto to determine an initial position of said rotor, said method comprising the steps of:

- coupling circuit means to the phase windings for providing control signals for selectively establishing current paths through at least one selected winding;
- applying short duration current pulses of first and second opposite polarities to each said selected winding for providing at least one energized winding, leaving a predetermined phase winding open during pulsing;
- detecting a voltage corresponding to each of said applied current pulses of opposite polarities as converted by a current to voltage converter connected to the energized winding;
- determining a magnitude for each rise time of each of said responses to said current pulses from zero amplitude to a fixed reference level;
- subtracting at least one of said rise times from one associated one of said rise times to provide at least one rise time difference;
- determining a magnitude of at least one of each of said rise time for each said rise time difference;
- determining ambiguity in sign for each said rise time difference; retesting with said predetermined phase winding tied so as to change effective rotor position; and
- identifying the initial position of said rotor relative to said phase windings based on the sign of the rise time difference between the rise time of the responses to said pulses applied to the selected winding and based on the changed effective rotor position.

5,569,991

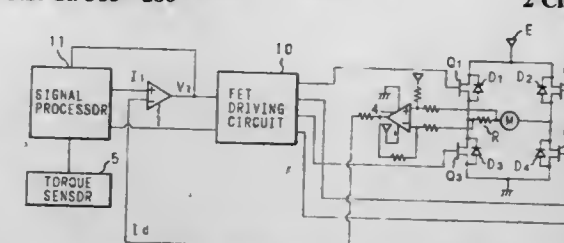
**ELECTRIC POWER STEERING APPARATUS**  
Hirofumi Matsuoka, Kyoto, and Mitsuhiro Nishimoto, Kashihara, both of Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Dec. 23, 1994, Ser. No. 362,837

Claims priority, application Japan, Dec. 24, 1993, 5-327934 Int. Cl.<sup>6</sup> B62D 5/04

U.S. Cl. 318—286

2 Claims



1. An electric power steering apparatus for assisting a steering force by driving a motor in response to torque supplied to a steering wheel that can be turned in either direction relative to a neutral position, comprising:

- a bridge circuit including said motor, a second and a third switching element for driving said motor in a clockwise direction, and a first and a fourth switching element for driving said motor in a counter-clockwise direction;
- decision means for deciding whether said steering wheel is being returned to its neutral position; and
- means for performing PWM control on said third switching element in accordance with the torque supplied to the steering wheel and turning off said second switching element when said decision means decides that the steering wheel is being returned to its neutral position as said motor is driven in the clockwise direction and for performing PWM control on said fourth switching element in accordance with the torque supplied to the steering wheel and turning off said first switching element when said decision means decides that the steering wheel is being returned to its neutral position as said motor is driven in the counter-clockwise direction.

5,569,992

**DC SHUNT (OR COMPOUND) MOTOR AND ITS RELATED CIRCUIT WITH CONTROLLABLE DYNAMIC CHARACTERISTICS**

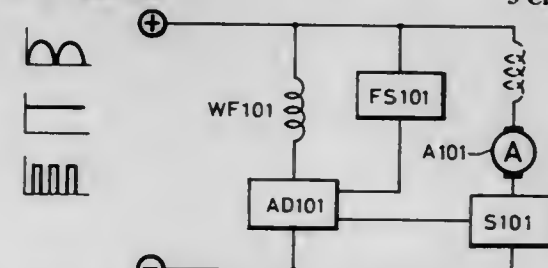
Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan Continuation of Ser. No. 860,999, Mar. 31, 1992, abandoned.

This application Mar. 14, 1994, Ser. No. 212,714

Int. Cl.<sup>6</sup> H02D 5/00

U.S. Cl. 318—526

3 Claims



1. In a DC motor, including a main shunt field winding connected in series with main shunt field winding power supply means for supplying current to said main shunt field winding, said main shunt field winding power supply means and said main shunt field winding being connected in parallel with a power supply, means for controlling the main shunt field winding power supply means to select a motor speed, and an armature connected in parallel with said series-connected main shunt field winding power supply means and main shunt field winding, the improvement comprising: armature current detection means for providing a reference signal to said main shunt field winding power supply means





5,569,999

# SYSTEM FOR MONITORING THE CURRENT DRAWN FROM TRACTION BATTERIES IN ELECTRIC VEHICLES AND HYBRID VEHICLES

Wolf Boll, Weinstadt; Günther Knörzer, Sachsenheim, and Hans-Dieter Heidenfelder, Waiblingen, all of Germany, assignors to Mercedes-Benz AG, Germany

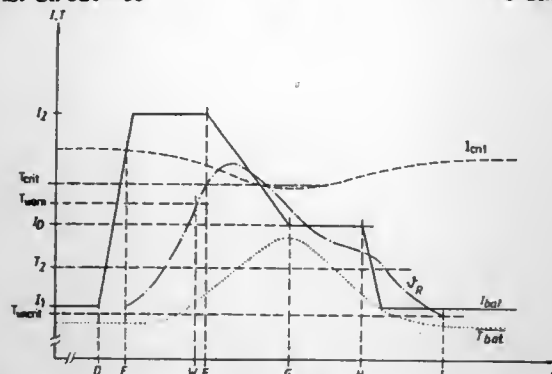
Filed Feb. 6, 1995, Ser. No. 384,265

Claims priority, application Germany, Feb. 4, 1994, 44 03 468.7

Int. Cl.<sup>6</sup> H02J 7/04; 7/00

U.S. Cl. 320—35

6 Claims



1. Method for monitoring a battery current drawn from a traction battery in an electric or hybrid vehicle, comprising the steps of: comparing said battery current with a battery current limit value which is a function of battery temperature of said battery; initiating said monitoring when said battery current exceeds said limit value; comparing the battery temperature with a predetermined temperature limit value; and whenever the battery temperature exceeds the predetermined temperature limit value, reducing the battery current to a predetermined normal value.

5,570,000

# SOLAR POWERED LIGHT FIXTURE

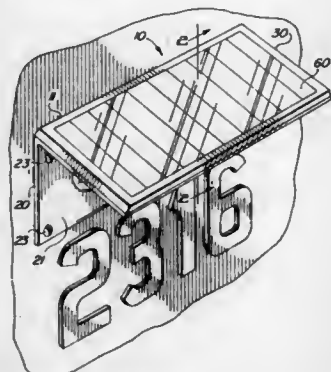
Stanley Kowalski, 2367 NE. 29th St., Lighthouse Point, Fla. 33064

Filed Aug. 18, 1994, Ser. No. 292,529

Int. Cl.<sup>6</sup> F21L 7/00; H02K 5/00

U.S. Cl. 322—1

19 Claims



1. A lighting assembly comprising: a shield including a first plate member having a front face and a rear face adapted for mounting engagement against a mounting surface and a second plate member having a top face and a bottom face, said second plate member being disposed in angled relation to said front face of said first plate member so that said front face and said bottom face of said respective first and second plate members channel light downward onto a surface below the mounting surface.

at least one electric lamp supported in concealed relation between said front face of said first plate member and said bottom face of said second plate member, said lamp positioned and disposed for directing light downward onto a surface below the mounting surface,

a power storage source interconnected to said electric lamp for supplying electric power to said lamp for operation thereof, a solar panel structured and disposed to absorb light energy and convert said light energy into electric power for recharging said power storage source,

attachment means for attaching said panel to said top face of said second plate member, said attachment means including at least two grommets protruding from said solar panel and a corresponding number of mounting holes in said second plate member, said grommets being structured and disposed to lock in said lock mounting holes thereby securing said solar panel to said top face of said second plate member,

a relay interconnected to said solar panel, said power storage source and said lamp, said relay being structured to direct electric current flow between said power storage source and said lamp and between said solar panel and said power storage source, and

a photocell mounted to said shield and being light sensitive, said photocell being interconnected to said relay for actuating said relay in response to a change between light and dark conditions in order to control direction of flow from said power storage source to said lamp during dark conditions and from said solar panel to said power storage source during light conditions.

5,570,001

# HAND PORTABLE BATTERY CHARGER

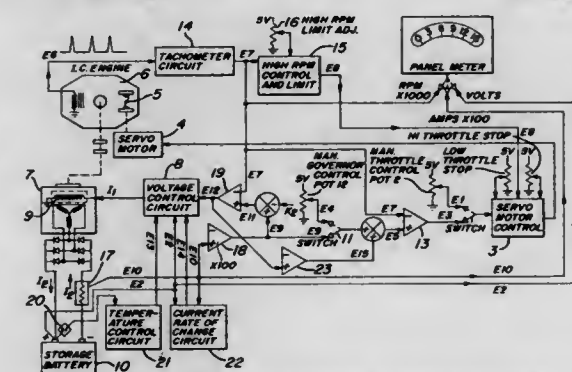
Thomas D. Fenley, Perkaskie, Pa., assignor to J.L. Behmer Corporation, Perkaskie, Pa.

Filed Sep. 26, 1994, Ser. No. 311,444

Int. Cl.<sup>6</sup> H02P 9/00

U.S. Cl. 322—36

15 Claims



1. An apparatus for charging a battery, an alternator connected to said battery, an engine to drive said alternator for producing a charging current to charge said battery, said engine having a throttle, a motor connected to a motor control circuit provided to position said throttle, said apparatus having a voltage regulator for controlling the output of said alternator, said apparatus comprising:

automatic governor control means operatively associated with said motor control circuit for producing a set point signal that varies in relation to the charging current and is inputted into said motor control circuit that causes said motor to automatically control said throttle to set the governed speed according to said charging current; and load control means for controlling the output of said alternator to prevent said engine from stalling, said load control means being operatively associated with said voltage regulator and responsive to both a speed signal representative of the rotational speed of said engine, and a load signal proportional to said charging current, said load control means causing said voltage regulator to reduce the output of said alternator when the difference between said speed signal and said load signal is indicative of a sudden

increase in load or a sudden decrease in the rotational speed of the engine or a combination thereof.

5,570,002

# UNIVERSAL POWER-SUPPLY CONNECTION SYSTEM FOR MULTIPLE ELECTRONIC DEVICES

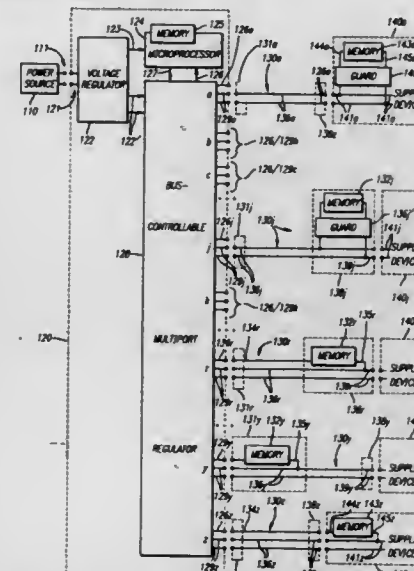
Neal J. Castleman, Malibu, Calif., assignor to Ergo Mechanical Systems, Incorporated, Santa Monica, Calif.

Filed Feb. 18, 1994, Ser. No. 198,994

Int. Cl.<sup>6</sup> G05F 1/56

U.S. Cl. 323—283

24 Claims



1. A power-supply connection system for providing electrical power, from a source of electrical power, to operate any of a multiplicity of electronic devices, said system comprising: means for receiving electrical power from such a source; means for passing electrical power to any of such electronic devices;

automatic means, associated with said power-passing means, for automatically accepting, from any particular one of such electronic devices respectively, electronic-device identification information for that particular one device;

programmed digital electronic microprocessor means for using said identification information to select power parameters, for passage of power from the power-receiving means and through the power-passing means to said particular one device; and

means for activating the power-passing means to apply power therethrough to said particular one device according to the power parameters.

5,570,003

# SWITCHING DEVICE WITH A FEEDING CIRCUIT FOR DC POWER SUPPLY TO A SUBSCRIBER'S TERMINAL UNIT

Andreas Zimmermann, Nürnberg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1995, Ser. No. 423,245

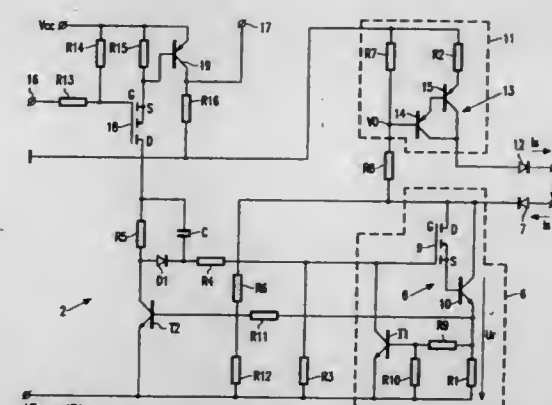
Claims priority, application Germany, Apr. 14, 1994, 44 12 811.8

Int. Cl.<sup>6</sup> G05F 1/40

U.S. Cl. 323—284

11 Claims

1. A switching device having at least one feeding circuit for supplying a DC power to at least one subscriber's terminal unit, said feeding circuit comprising:



a first limiting circuit, said first limiting circuit comprises a first series combination of a first supply transistor arrangement and a first supply resistor arrangement for limiting a supply current ( $I_s$ ) flowing through the first series combination, and a second limiting circuit, said second limiting circuit comprises a second series combination of a second supply transistor arrangement and a second supply resistor arrangement for limiting a supply current ( $I_s$ ) flowing through the second series combination, wherein a voltage potential ( $V_0$ ) present on a control input of the second supply transistor arrangement depends on a voltage ( $U_r$ ) present on the first series combination of said first limiting circuit.

5,570,004

# SUPPLY VOLTAGE REGULATOR AND AN ELECTRONIC APPARATUS

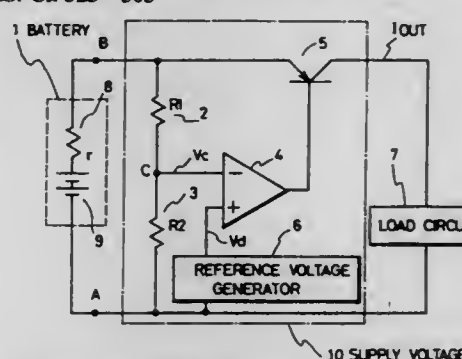
Kimio Shibata, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

Filed Jan. 3, 1994, Ser. No. 176,717

Int. Cl.<sup>6</sup> G05F 5/00

U.S. Cl. 323—303

11 Claims



1. A voltage regulator comprising: voltage supply means for supplying an input voltage for powering a load; current control signal generating means for detecting the input voltage and for generating a corresponding current control signal to control a current flowing through the load; and load current limiting means for controlling the current flowing from the voltage supply means through the load in accordance with the current control signal such that the input voltage does not fall below a predetermined value.



# 5,570,005 WIDE RANGE POWER SUPPLY FOR INTEGRATED CIRCUITS

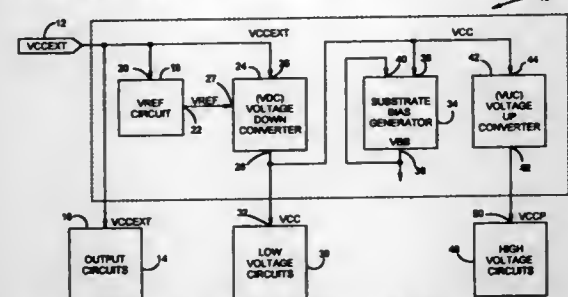
Kim C. Hardee, and Michael V. Cordoba, both of Colorado Springs, Colo., assignors to United Memories, Inc., Colorado Springs, Colo., and Nippon Steel Semiconductor Corp., Japan

Division of Ser. No. 3,450, Jan. 12, 1993, Pat. No. 5,483,152. This application Jun. 6, 1995, Ser. No. 471,486

Int. Cl.<sup>6</sup> G05F 3/16

U.S. Cl. 323—314

10 Claims



1. In an integrated circuit, a method for generating first and second internal supply voltages for powering circuits of the integrated circuit, and a substrate bias voltage for the integrated circuit, the method comprising the steps of:

- receiving, within the integrated circuit, an input supply voltage having a magnitude that is within a wide power supply range;
- generating and outputting a first internal supply voltage for use by on-chip low voltage circuits; and
- generating and outputting, for use by on-chip high voltage circuits, a second internal supply voltage that is based upon and higher than said first internal supply voltage and that is substantially constant and substantially independent of variations in the input supply voltage; and
- generating a substrate bias voltage based on the first internal supply voltage.

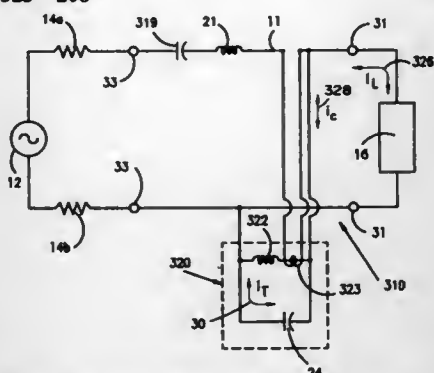
# 5,570,006 A.C. STORAGE MODULE FOR REDUCING HARMONIC DISTORTION IN AN A.C. WAVEFORM

George K. Woodworth, Gainesville, Va., assignor to Power Distribution, Inc., Sandston, Va.  
Continuation-in-part of Ser. No. 89,226, Jul. 8, 1993, Pat. No. 5,323,304, which is a continuation of Ser. No. 826,958, Jan. 27, 1992, abandoned. This application Jun. 16, 1994, Ser. No. 261,329

Int. Cl.<sup>6</sup> G05F 1/70

U.S. Cl. 323—208

2 Claims



1. A circuit for correcting perturbations in a power system signal operating at a system line frequency, said circuit comprising: capacitive means for drawing a capacitive current; first inductive means for drawing an inductive current substantially equal in amplitude and substantially one hundred eighty degrees out of phase with said capacitive means to form a storage module for storing energy therein and wherein said

storage module is tuned to resonate at said system line frequency, wherein said storage module is connected in parallel across a load and wherein said storage module has circulating currents similar in amplitude to said load;

a second inductive means connected in series between a power source and said load for isolating said power source from said load;

a second capacitive means connected in series with said second inductive means, wherein said second inductive means and said second capacitive means are series tuned to resonate at said system line frequency; and

a winding means having two output terminals, said winding means connected so as to be responsive to said inductive current flowing through said first inductive means for boosting an output voltage of said storage module, said output terminals being connected in series with said second inductive means.

# 5,570,007 METHOD AND APPARATUS FOR STATIC VAR COMPENSATOR VOLTAGE REGULATION

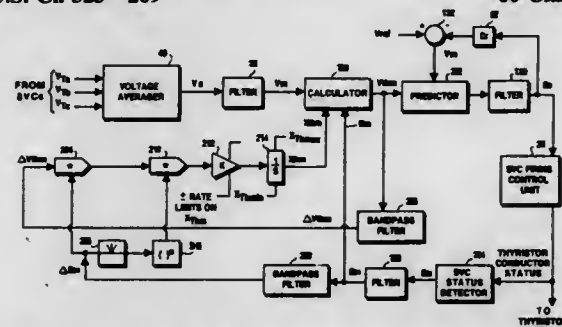
Einar V. Larsen, Charlton, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 88,555, Jul. 9, 1993, abandoned. This application Nov. 19, 1993, Ser. No. 154,480

Int. Cl.<sup>6</sup> G05F 1/70

U.S. Cl. 323—209

60 Claims



57. A power generation system for controlling reactive power comprising:

- an AC power generator for delivering AC power over a transmission line to a load;
- a static VAR compensator (SVC) connected at a bus to the transmission line for selectively providing reactive current to the transmission line;
- a voltage regulator for regulating voltage at the bus in accordance with a reference voltage;
- a calculator for calculating a voltage equivalent to the power generation system based on measured SVC voltage, measured SVC susceptance, and an estimate of an equivalent reactance for the power generation system;
- a predictor for predicting a susceptance to be provided by the SVC based on the calculated equivalent voltage; and
- means for tracking changes in the calculated equivalent voltage and measured SVC susceptance and automatically modifying the estimate of the equivalent reactance in response to those changes.

# 5,570,008 BAND GAP REFERENCE VOLTAGE SOURCE

Laszlo Goetz, Freising, Germany, assignor to Texas Instruments Deutschland GmbH, Germany

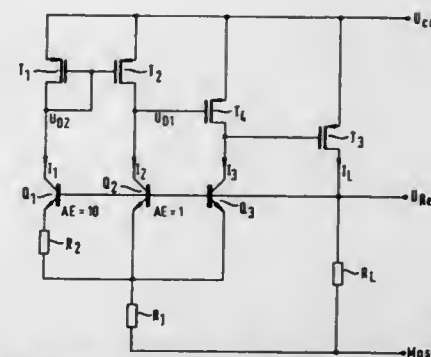
Filed Apr. 14, 1994, Ser. No. 227,427

Int. Cl.<sup>6</sup> G05F 3/20

U.S. Cl. 323—315

5 Claims

1. A circuit for providing a band gap reference voltage source, said circuit comprising:



first, second and third parallel circuit branches respectively providing first, second and third currents;

said first circuit branch including a first bipolar transistor having base, collector and emitter electrodes, and said second circuit branch including a second bipolar transistor having base, collector and emitter electrodes;

said first and second bipolar transistors being operable at respective current densities differing from each other;

a further bipolar transistor having base, collector and emitter electrodes, said further bipolar transistor being included in said third circuit branch;

said further bipolar transistor combining with said first bipolar transistor to define a first current mirror and combining with said second bipolar transistor to define a second current mirror for generating the currents required for achieving the differing current densities in the first and second bipolar transistors of the first and second circuit branches respectively; and

a voltage follower stage connected to said first and second circuit branches for generating a reference voltage at the output thereof as a function of the collector voltage of one of said first and second bipolar transistors, the reference voltage also being applied to the base electrodes of said first and second bipolar transistors of the first and second circuit branches respectively.

# 5,570,009 CONSTANT-CURRENT CIRCUITRY, IC DEVICE DRIVER USING SAME, AND UNIT USING THE DEVICE

Hiroaki Nakamura, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

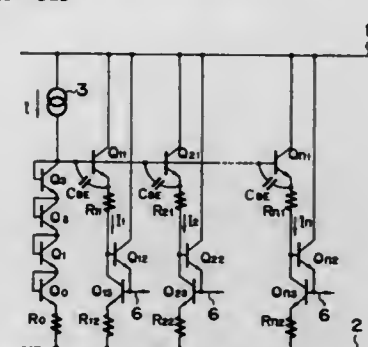
Continuation of Ser. No. 371,611, Jan. 12, 1995, which is a continuation of Ser. No. 79,834, Jun. 22, 1993, abandoned, which is a continuation of Ser. No. 614,497, Nov. 16, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 483,883

Claims priority, application Japan, Nov. 22, 1989, 1-302223; Nov. 8, 1990, 2-301092

Int. Cl.<sup>6</sup> G05F 3/22; 3/26

U.S. Cl. 323—315

13 Claims



1. Constant-current circuitry for supplying constant current to a plurality of drive circuits that drive a plurality of circuit blocks, each of the drive circuits being connected with a respective one of the circuit blocks, said constant-current circuitry comprising:

a plurality of transistors for supplying the constant current to the plurality of drive circuits, said transistors having bases which are commonly connected with a bias current that supplies a bias voltage to said bases of said transistors,

wherein each of said transistors has an emitter connected to a respective one of the drive circuits, and a collector connected to a voltage source, and

wherein said bias circuit includes a first transistor which has a base and a collector short-circuited together, and having an emitter, a second transistor having a collector connected to said emitter of said first transistor, and a third transistor having a base connected to said emitter of said first transistor, said drive circuits being respectively connected to said circuit blocks, and said transistors for supplying the constant current being connected to said voltage source.

# 5,570,010 METHOD AND APPARATUS FOR IDENTIFYING OBJECTS USING COMPOUND SIGNAL AND A DETECTOR EMPLOYING AN ELECTRICAL STATIC COUPLING TECHNIQUE

Dongzhi Jin, Chiba; Masael Numanami, Tokyo; Fumihiko Abe, Chiba, and Kazuhiro Miyazawa, Ichihara, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/00667, § 371 Date Jan. 18, 1994, § 102(e) Date Jan. 18, 1994, PCT Pub. No. WO93/23759, PCT Pub. Date Nov. 25, 1993

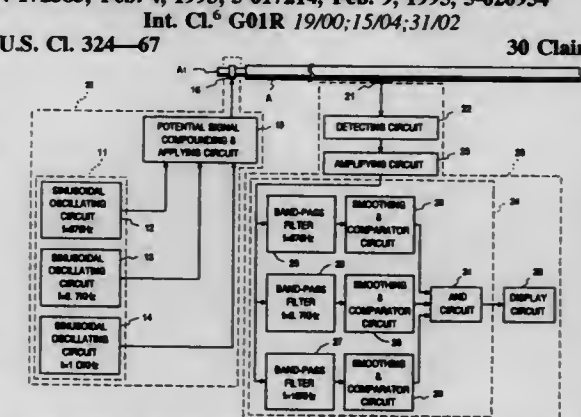
PCT Filed May 20, 1993, Ser. No. 185,953

Claims priority, application Japan, May 20, 1992, 4-127209; May 27, 1992, 4-134751; Jun. 19, 1992, 4-160774; Jun. 30, 1992, 4-172385; Feb. 4, 1993, 5-017214; Feb. 9, 1993, 5-020954

Int. Cl.<sup>6</sup> G01R 19/00; 15/04; 31/02

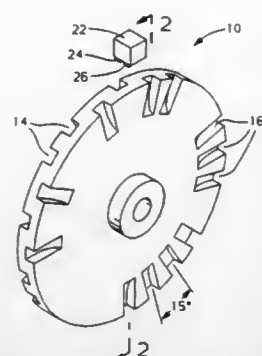
U.S. Cl. 324—67

30 Claims









a second sensor positioned adjacent to the target wheel periphery and responsive to passage of each of the second set of elements adjacent the second sensor as the target wheel is rotated; and

means for generating a repeatable set of  $n$  binary values for each complete rotation of the target wheel, a first binary value corresponding to passage of each of the first set of elements adjacent the first sensor and a second binary value corresponding to passage of each of the second set of elements adjacent the second sensor, each binary value and the preceding  $m$  binary values comprising a unique sequence of  $m+1$  binary values where  $m+1$  is less than  $n$ , each unique sequence of  $m+1$  binary values corresponding to a unique, predetermined angular position of the target wheel.

5,570,017

#### APPARATUS AND METHOD OF DAMAGE DETECTION FOR MAGNETICALLY PERMEABLE MEMBERS USING AN ALTERNATING MAGNETIC FIELD AND HALL EFFECT SENSORS

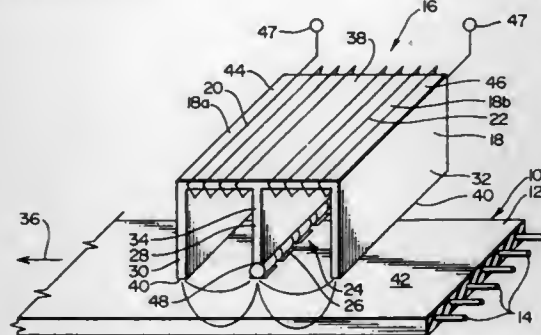
Dieter W. Blum, Delta, Canada, assignor to Canada Conveyor Belt Co., Inc., Surrey, Canada

Filed Sep. 30, 1992, Ser. No. 954,485

Int. Cl.<sup>6</sup> G01N 27/72; G01R 33/12

U.S. Cl. 324—232

14 Claims



1. An apparatus arranged to detect anomalies in a magnetically permeable member having a longitudinal axis, by providing a magnetic field at an operating area at which said magnetically permeable member is located, where said apparatus is arranged relative to said member so that there can be movement of said member relative to said apparatus along said longitudinal axis, said apparatus comprising:

- a coil means to generate said magnetic field as an alternating magnetic and at longitudinally spaced first and second field components at longitudinally spaced first and second field locations at said operating area;
- sensing means arranged to respond to modifications of said first and second field components, said sensing means being arranged to respond to differences in field intensity of said first and second field components at a sensing location, whereby when a portion of said member having an anomaly passes through said first and second field locations to create modifications in said first and second field components, said

sensing means responds to modifications created by said anomaly in said first and second field components to detect said anomaly;

- said sensing means comprising a plurality of sensors, said apparatus further comprising circuit means having receiving means to create a processing signal in response to an input from each of said sensors, said circuit means further comprising multiplexing means to respond to each of said processing signals to create a plurality of multiplexer signal outputs corresponding to processing signals from the sensors, and processing means to receive said multiplexer signal outputs to identify anomalies associated with certain of said sensors;
- field coil frequency control means responsive to linear speed of said member, relative to spacing of said first and second field components, in a manner to relate frequency of the alternating field of said coil means to a time interval of one portion of said member moving, relative to said apparatus, from the first field location to the second field location.

5,570,018

#### METHOD OF AND APPARATUS FOR OBTAINING SPATIAL NMR INFORMATION

Roger M. Halse, Beltinge, England, assignor to British Technology Group Limited, London, England

PCT No. PCT/GB93/00052, § 371 Date Jun. 2, 1994, § 102(e)

Date Jun. 2, 1994, PCT Pub. No. WO93/14416, PCT Pub.

Date Jul. 22, 1993

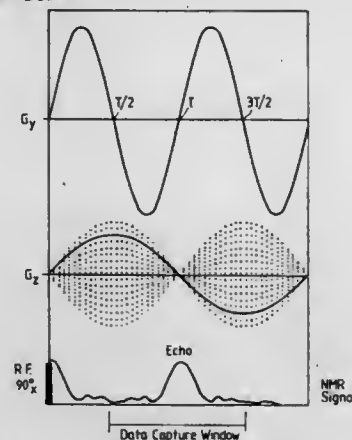
PCT Filed Jan. 12, 1993, Ser. No. 244,490

Claims priority, application United Kingdom, Jan. 13, 1992, 9200606

Int. Cl.<sup>6</sup> G01V 3/14

U.S. Cl. 324—309

11 Claims



1. A method of obtaining spatial NMR information from a solid sample, comprising the steps of:

- applying at least one excitation pulse to the sample;
- producing a magnetic field in the sample having a static component, and having first and second gradient field components in first and second directions respectively;
- controlling application of the or each excitation pulse and the production of said magnetic field so as to produce a plurality of NMR sampling responses from the sample, each sampling response providing a desired sampling path in  $k$ -space;
- varying the relative amplitudes of said first and second gradient field components over said plurality of sampling responses so as to provide a desired distribution of sampling paths in  $k$ -space over said plurality of sampling responses;
- reversing both said first and second gradient field components in direction during the occurrence of each sampling response; and
- detecting each sampling response, said first and second gradient field components each having a periodic waveform, the period of one waveform being an integral multiple  $n$  of the other, where  $n$  is greater than 1.

5,570,019

#### METHOD FOR MAGNETIC RESONANCE SPECTROSCOPIC IMAGING WITH MULTIPLE SPIN-ECHOES

Chrit T. W. Moonen, Silver Spring, and Jeff Duyn, Kensington, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

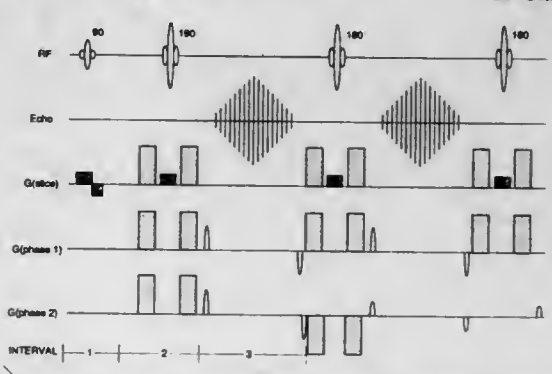
Continuation of Ser. No. 106,377, Aug. 13, 1993, abandoned.

This application Oct. 3, 1995, Ser. No. 538,786

Int. Cl.<sup>6</sup> G01V 3/00

U.S. Cl. 324—309

10 Claims



1. A method for acquiring nuclear magnetic resonance information, comprising the steps of:

- exciting at least some of the atoms of an object;
- providing a plurality of refocusing pulses, each for generating a respective spin echo signal from a common region of the object, successive refocusing pulses separated by a respective refocusing repetition time period, and each of said refocusing pulses associated with a respective phase encoding gradient for individually phase encoding each of the respective spin echo signals to provide spatial information; and
- receiving, in the absence of an externally applied magnetic field gradient, the respective spin echo signals from the object after at least one of the refocusing pulses.

5,570,020

#### MR METHOD AND DEVICE FOR CARRYING OUT SUCH A METHOD

Peter Börnert, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

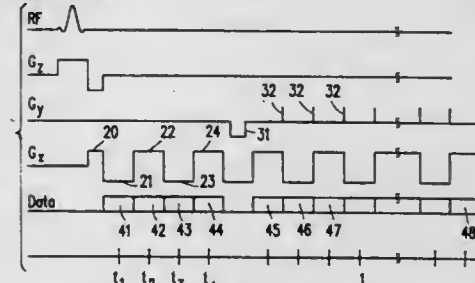
Filed Oct. 18, 1995, Ser. No. 544,503

Claims priority, application Germany, Oct. 28, 1994, 44 38 488.2

Int. Cl.<sup>6</sup> G01V 3/00

U.S. Cl. 324—309

7 Claims



1. An MR method, comprising the following steps: executing a sequence for producing MR signals in at least a region of an object under examination located in an examination zone which is subject to a uniform, steady magnetic field, said sequence comprising generating an RF excitation pulse for exciting nuclear magnetization in the region of the object, subsequently generating a read gradient having successive polarity reversals and a phase encoding gradient for affecting

the evolution of the excited nuclear magnetization into MR signals, the phase encoding gradient being generated such that MR signals occurring after at least three of the polarity reversals are not influenced by the phase encoding gradient, the MR signals not influenced by the phase encoding gradient including at least one MR signal occurring during a positive polarity of the read gradient and at least one MR signal occurring during a negative polarity of the read gradient, whereas the MR signals occurring after the balance of the polarity reversals are influenced by the phase encoding gradient and thereby constitute a set of MR raw data, said set of MR raw data being subject to a phase error; acquiring the set of MR raw data and the MR signals not influenced by the phase encoding gradient; deriving MR correction data from the acquired MR signals not influenced by the phase encoding gradient; applying the MR correction data to the acquired set of MR raw data to produce a set of MR raw data which is corrected for said phase errors; and reconstructing a nuclear magnetization distribution of a region of the object from the corrected set of MR raw data.

5,570,021

#### MR GRADIENT SET COIL SUPPORT ASSEMBLY

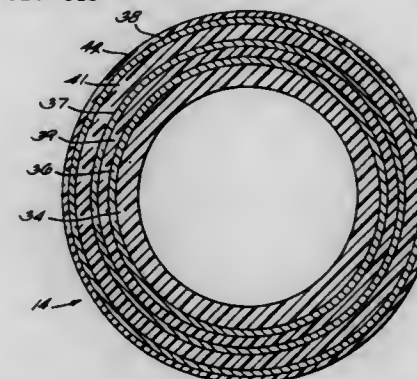
Roman I. Dachniwskyj, Pewaukee, Wis.; David E. Dean, Florence, S.C.; Thomas G. Ebben, Sullivan, Wis.; Perry S. Frederick, Waukesha, Wis.; Donald J. Jenders, Brookfield, Wis.; Michael J. Radziun, Waterford, Wis., and Peter L. Sue, Florence, S.C., assignors to General Electric Company, Milwaukee, Wis.

Filed Oct. 10, 1995, Ser. No. 541,673

Int. Cl.<sup>6</sup> G01V 3/00

U.S. Cl. 324—318

12 Claims



1. A gradient coil support assembly for an MR imaging system comprising:

- a first cylindrical coil form disposed to supportably carry a first gradient coil of a gradient coil set;
- a second cylindrical coil form disposed to supportably carry a second gradient coil of said set, said second coil form positioned in coaxial spaced-apart relationship with said first coil form;
- a stiffening cylinder positioned between said first and second coil forms in spaced apart relationship with each of said forms to divide the space between said coil forms into first and second volumes; and
- an adhesive material inserted into said first and second volumes to bond both said first and second coil forms to said stiffening cylinder, in order to hold said first and second gradient coils respectively carried by said first and second coil forms in rigid fixed relationship with respect to one another.

5,570,022

## POWER SUPPLY FOR MRI MAGNETS

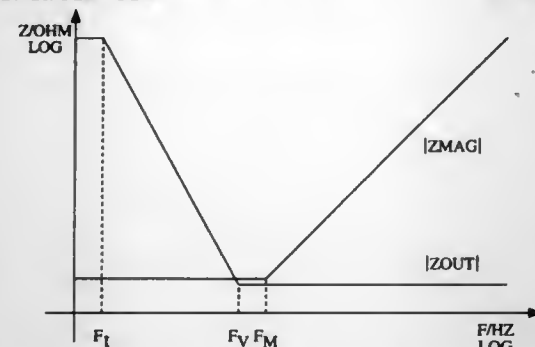
Gösta J. Ehnholm; Seppo T. Pekonen, and Juha P. Virtanen, all of Helsinki, Finland, assignors to Picker Nordstar Inc., Helsinki, Finland

Filed Aug. 19, 1994, Ser. No. 293,379

Claims priority, application Finland, Aug. 20, 1993, 933675

Int. Cl.<sup>6</sup> G01R 33/20

U.S. Cl. 324—319 21 Claims



5. A magnet system for a magnetic resonance imaging apparatus, the magnet system comprising:

- a main magnet for generating a magnetic field;
- a power supply for supplying voltage and current to the main magnet, the power supply comprising means for causing the power supply to have an output impedance approximately equal to the resistance of the main magnet in at least a range of frequencies above a frequency determined in relation to a characteristic of the main magnet and an output impedance greater than the main magnet impedance in at least a range of frequencies below said frequency determined in relation.

5,570,023

## PORTABLE STATION FOR MEASURING AND ADJUSTING THE MAGNETIC SIGNATURE OF A NAVAL SHIP

Joël Certenais, Lesneven, France, assignor to Thomson-CSE, Paris, France

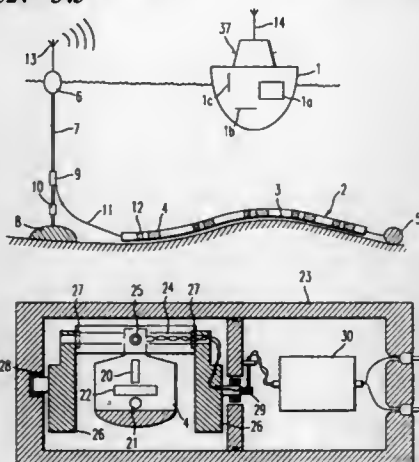
PCT No. PCT/FR92/00714, § 371 Date Jan. 14, 1994, § 102(e) Date Jan. 14, 1994, PCT Pub. No. WO93/01971, PCT Pub. Date Feb. 4, 1993

PCT Filed Jul. 21, 1992, Ser. No. 178,332

Claims priority, application France, Jul. 23, 1991, 91 09277

Int. Cl.<sup>6</sup> B63G 9/06; H01F 13/00; G01V 3/08; G01R 33/02

U.S. Cl. 324—345 17 Claims



1. A portable station for measuring the magnetic signature of a naval ship by determining the characteristics of currents made to flow in magnetic immunization loops of said ship, said station comprising:

- a set of magnetic sensors laid on the bottom of a sea and a set of water-height sensors each respectively associated with a

respective one of said set of magnetic sensors, said set of magnetic sensors each including a triaxial magnetometer hung on gimbals and each one of said set of magnetic sensors being connected, along with each one of said set of water-height sensors, to a means for relaying data provided by said magnetic and water-height sensors, said naval ship being equipped with a means for receiving said data and said set of magnetic sensors and said set of water-height sensors being arranged inside a deformable flexible sheath to form a deformable string laid on the bottom of the sea.

5,570,024

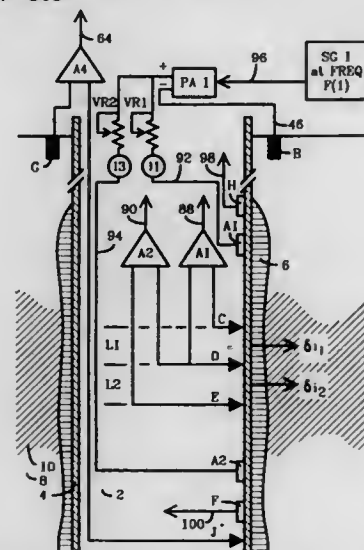
## DETERMINING RESISTIVITY OF A FORMATION ADJACENT TO A BOREHOLE HAVING CASING USING MULTIPLE ELECTRODES AND WITH RESISTANCES BEING DEFINED BETWEEN THE ELECTRODES

William B. Vail, III, Bothell, Wash., assignor to Paramagnetic Logging, Inc., Woodinville, Wash.

Continuation-in-part of Ser. No. 754,965, Sep. 4, 1991, Pat. No. 5,223,794, which is a division of Ser. No. 434,886, Nov. 13, 1989, Pat. No. 5,075,626, which is a continuation-in-part of Ser. No. 89,697, Aug. 26, 1987, Pat. No. 4,882,542, which is a continuation-in-part of Ser. No. 927,115, Nov. 4, 1986, Pat. No. 4,820,989. This application Jun. 28, 1993, Ser. No. 83,615

Int. Cl.<sup>6</sup> G01V 3/04

U.S. Cl. 324—368 2 Claims



2. A method for determining the resistivity of a geological formation from within a cased well comprising:

- providing an apparatus having a first electrode that electrically engages a particular section of casing for receiving first voltage related signals at a specific depth within the well;
- said apparatus having a second electrode that electrically engages the particular section of casing for receiving second voltage related signals located a first distance above said first electrode wherein the magnitude of the resistance of the portion of casing between said first and second electrodes is the first resistance; and
- said apparatus having a third electrode that electrically engages the particular section of casing for receiving third voltage related signals located a second distance below said first electrode wherein the magnitude of the resistance of the portion of casing between said first and third electrodes is the second resistance;
- causing a first current to flow into the geological formation from the particular section of casing;
- causing a second current to flow along the particular section of casing;
- obtaining said first, second, and third voltage related signals while conducting said first current into formation during the measurement step;

determining the magnitude of said first resistance using at least a selected one of said first current and said second current; determining the magnitude of said second resistance using at least a selected one of said first current and said second current; and processing the voltage related signals from each of said first, second and third electrodes obtained during the measurement step for use in determining the resistivity of the geological formation of interest, said processing taking into account the determined magnitudes of said first resistance and said second resistance to reduce the inaccuracy associated with the determination of the resistivity of the geological formation of interest.

5,570,025

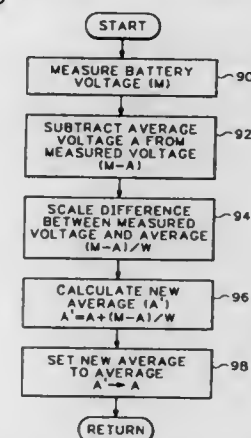
## ANNUNCIATOR AND BATTERY SUPPLY MEASUREMENT SYSTEM FOR CELLULAR TELEPHONES

Dan D. Lauritsen, 3905 NE. 42nd St., Vancouver, Wash. 98661, and Galen Seitz, 5120 SW. Scholls Ferry Rd., Portland, Oreg. 97225

Filed Nov. 16, 1994, Ser. No. 340,832

Int. Cl.<sup>6</sup> G01N 27/416; H04B 1/16

U.S. Cl. 324—433 13 Claims



1. A method for measuring battery voltage in a cellular phone having an analog mode, a distal mode, and a standby mode, comprising:

- periodically measuring the battery voltage at a first rate when the phone is operating in the analog mode;
- periodically measuring the battery voltage at a second rate slower than the first rate when the phone is operating in the standby mode;
- transmitting and receiving digitally encoded messages during selected time slots when the phone is operating in the digital mode;
- periodically measuring the battery voltage only during the selected time slots when the phone is operating in the digital mode;
- calculating an average voltage for each measured battery voltage;
- repeatedly measuring a new battery voltage according to the operating mode of the phone; and
- adjusting the average voltage according to the new phone battery voltage.

5,570,026

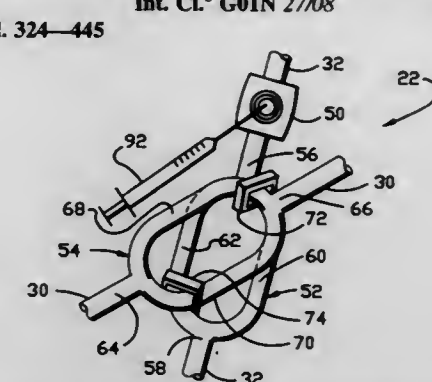
## ALTERED FLUID CONDUCTIVITY MONITOR

George W. Buffalo, IV, Arvada; Francis T. Ogawa, Lakewood, and James M. Brugger, Boulder, all of Colo., assignors to COBE Laboratories, Inc., Lakewood, Colo.

Division of Ser. No. 332,647, Nov. 1, 1994, Pat. No. 5,510,716, which is a continuation of Ser. No. 954,584, Sep. 30, 1992, abandoned. This application May 31, 1995, Ser. No. 455,349

Int. Cl.<sup>6</sup> G01N 27/08

U.S. Cl. 324—445 7 Claims



1. A tubing set adapted for use with an apparatus for determining a degree of recirculation flow in a zone of a vessel into which a first fluid having a first electrical conductivity is being inserted and from which a second fluid having a second electrical conductivity is simultaneously being withdrawn, comprising:

- a first conduit adapted to convey the first fluid with the first electrical conductivity before it is inserted into the zone of the vessel, said first conduit comprising a first conductivity cell upstream connection, a first conductivity cell downstream connection, and two branches connecting the upstream connection to the downstream connection with a continuous path configuration from the upstream connection to the downstream connection through one of the two branches and returning to the upstream connection through the other one of the two branches, the upstream connection being connectable to a source of the first fluid; and
- a second conduit adapted to convey the second fluid with the second electrical conductivity after it is withdrawn from the zone of the vessel, said second conduit comprising a second conductivity cell with a second conductivity cell upstream connection, a second conductivity cell downstream connection, and two branches connecting the upstream connection to the downstream connection with a continuous path configuration from the upstream connection to the downstream connection through one of the two branches and returning to the upstream connection through the other one of the two branches, the downstream connection being connectable to a destination of the second fluid.

5,570,027

## PRINTED CIRCUIT BOARD TEST APPARATUS AND METHOD

Louis J. Stans, Setauket, and Christopher F. Lynch, White Plains, both of N.Y., assignors to Photocircuits Corporation, Glen Cove, N.Y.

Filed Apr. 19, 1995, Ser. No. 425,080

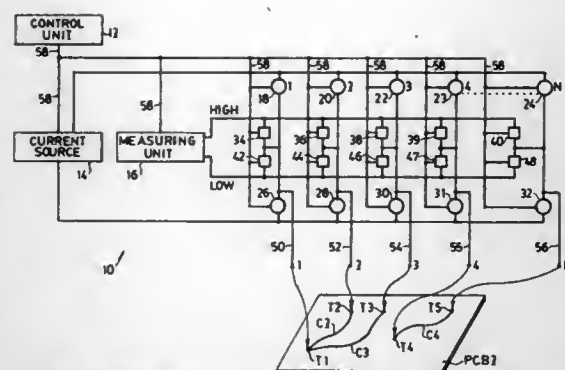
Int. Cl.<sup>6</sup> G01R 31/08

U.S. Cl. 324—523 26 Claims

1. A method for testing each conductor in one or more test printed circuit boards using a reference printed circuit board whose conductors have been determined to be acceptable, said method comprising the steps of:

- generating a set of reference voltage rises, each reference voltage rise in the set associated with one conductor on the reference printed circuit board and representing the difference between a first voltage drop reading and a subsequent voltage





drop reading taken across that one conductor while a constant current pulse is applied;

generating a set of test voltage rises, each test voltage rise in the set associated with one conductor on the test printed circuit board and representing the difference between the first and the subsequent voltage drop readings taken across that one conductor while the constant current pulse is applied; and comparing the test voltage rise for each conductor on the test printed circuit board against the reference voltage rise for the corresponding conductor on the reference printed circuit board to determine if the test voltage rise exceeds the reference voltage rise and if the test voltage rise exceeds the reference voltage rise, then identifying the conductor as defective.

5,570,028

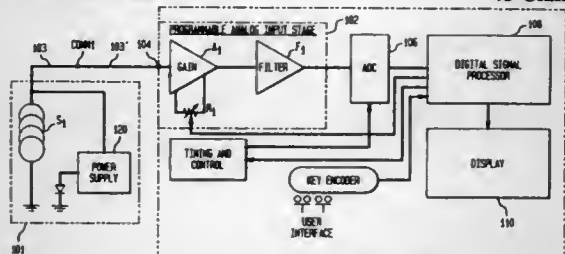
**METHOD FOR DETECTING FAULTS IN ELECTRICAL CABLES AND APPARATUS FOR IMPLEMENTING SAME**  
Thomas M. Sperlazzo, Edison; Garrett S. Sylvester, Mountain Lakes, and Jack F. Trezza, Hopatcong, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 30, 1994, Ser. No. 367,410

Int. Cl.<sup>6</sup> G01R 21/06

U.S. Cl. 324—528

48 Claims



1. Apparatus for localizing faults within a power line, comprising:

- an electromagnetic sensor interface for receiving a test signal propagating through said power line and detected by an electromagnetic sensor positioned proximate to said power line;
- signal conditioning means electrically coupled to said electromagnetic sensor interface for conditioning said received test signal;
- processing means for processing said received test signal using predetermined test signal signatures to generate usable power line fault detection data; and
- communicating means responsive to said processing means for communicating said usable power line fault detection data.

5,570,029

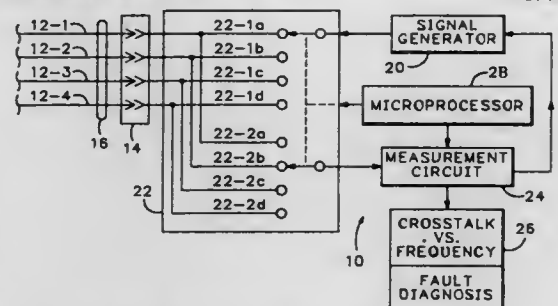
**CABLE CROSSTALK MEASUREMENT SYSTEM**  
Jeffrey S. Bottman; Eric R. Drucker, both of Seattle, and Lannes S. Purnell, Edmonds, all of Wash., assignors to Fluke Corporation, Everett, Wash.

Filed Mar. 30, 1994, Ser. No. 220,068

Int. Cl.<sup>6</sup> G01R 27/28

U.S. Cl. 324—628

12 Claims



1. A cable testing apparatus, comprising:  
a signal generator for generating stimulus signals for a first transmission line in a cable under test;  
a measurement system including a waveform digitizer connected to a second transmission line in said cable under test to receive and provide a digitized waveform record of crosstalk signals produced in response to said stimulus signals, said measurement system further including means for measuring crosstalk signal levels and elapsed time following generation of said stimulus signals to provide an indication of a location of crosstalk signals which exceeds a predetermined level.

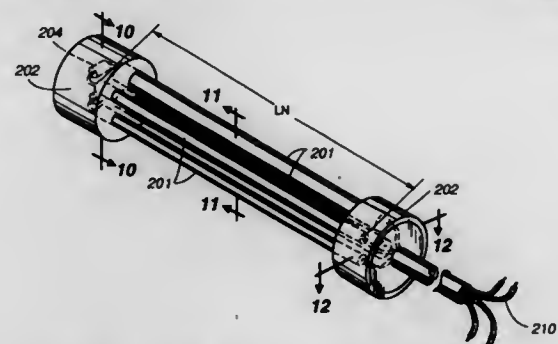
5,570,030

**MOISTURE SENSOR AND CONTROL SYSTEM**  
William E. Wightman, 11 Village Dr., Littleton, Colo. 80123  
Continuation-in-part of Ser. No. 57,871, May 7, 1993, abandoned. This application Apr. 17, 1995, Ser. No. 423,555

Int. Cl.<sup>6</sup> G01R 27/26

U.S. Cl. 324—694

43 Claims



1. A method of measuring soil moisture, comprising:  
providing a moisture content sensor having a first and a second rigid and electrically insulating body member, said first and second body members being physically spaced apart to define a sensor length parameter and to define an open space between said first and second body members, a plurality of electrically uninsulated and rigid electrical electrodes, each of said electrodes having a first end and a second end, said first end of each electrode being mechanically fastened to different physically spaced points on said first body member, said electrodes passing between said first and second body members in a manner such that said electrodes do not physically touch, and said second ends of each electrode being mechanically fastened to different physically spaced points on said second body member, said plurality of electrodes thereby forming a unitary physical assembly with said first and second body members having said open space between said first and second body members,

connecting current transmitter means to one of said ends of first ones of said electrodes,  
connecting voltage receiver means to one of said ends of different second ones of said electrodes, said voltage receiver means providing an output indicative of moisture content, and placing said sensor in soil whose moisture content is to be measured.

5,570,031

**SUBSTRATE SURFACE POTENTIAL MEASURING APPARATUS AND PLASMA EQUIPMENT**  
Makoto Sasaki, Sendai; Hirofumi Fukui, Taiwa-machi; Masami Aihara, Sendai; Kolchi Fukuda, Sendai; Yasuhiko Kasama, Sendai, and Tadahiro Ohmi, 1-7 Yukigaya, Otsuka-cho, Ota-ku, Tokyo, all of Japan, assignors to Frontec Incorporated, and Tadahiro Ohmi, both of Sendai, Japan

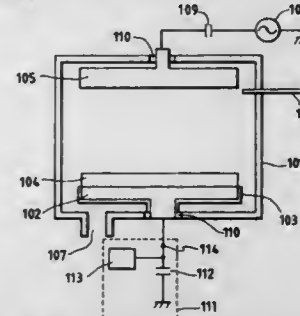
Filed Nov. 10, 1994, Ser. No. 336,903

Claims priority, application Japan, Nov. 11, 1993, 5-282724

Int. Cl.<sup>6</sup> G01R 31/302; 19/00

U.S. Cl. 324—750

12 Claims



1. A substrate surface potential measuring apparatus for measuring a surface potential of a substrate located in a plasma processing apparatus, the plasma processing apparatus including a susceptor electrode mounted in a plasma chamber, the substrate being mounted on the susceptor electrode, the substrate surface potential measuring apparatus comprising:  
a terminal electrically connected to the susceptor electrode;  
a first condenser electrically connected between said terminal and ground; and  
potential measuring means connected between said terminal and said condenser for measuring the potential of said susceptor electrode,  
wherein the surface potential of said substrate is determined from the potential of said susceptor electrode measured by said potential measuring means.

5,570,032

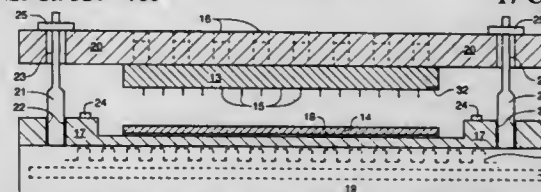
**WAFER SCALE BURN-IN APPARATUS AND PROCESS**  
Glen G. Atkins; Michael S. Cohen, both of Boise; Karl H. Mauritz, Eagle, and James M. Shaffer, Boise, all of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Aug. 17, 1993, Ser. No. 108,097

Int. Cl.<sup>6</sup> G01R 1/06

U.S. Cl. 324—760

17 Claims



1. A vessel for burning-in and testing of a semiconductor integrated circuit wafer having a plurality of dice, each die having a plurality of contact pads, which comprises:  
an upper plate;  
a lower plate;

a printed circuit board (PCB) releasably attached to an undersurface of said upper plate;  
a plurality of electrically conductive pillars extending downwardly from an undersurface of said PCB;  
said pillars positioned to precisely contact said pads when said wafer and PCB are brought together in alignment;  
means for attaching said wafer to said lower plate;  
said upper plate sized and positioned to impart a substantially uniform vertical force across said PCB and thereby said pillars;  
said lower plate sized and positioned to impart a substantially uniform vertical force across said wafer;  
said upper plate being releasably held in a fixed position with respect to said lower plate;  
wherein both the upper plate and lower plate are comprised of a thermally conductive material for dissipating heat;  
a heating element integral with said lower plate; and  
wherein said vessel further comprises:  
a channel, bored through said lower plate, sized and dimensioned to accommodate gaseous or liquid coolant being circulated through said channel.

5,570,033

**SPRING PROBE BGA (BALL GRID ARRAY) CONTACTOR WITH DEVICE STOP AND METHOD THEREFOR**

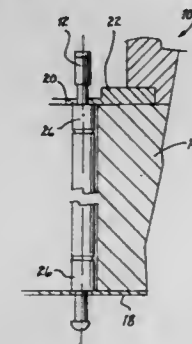
Craig C. Staab, Mesa, Ariz., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Jul. 20, 1995, Ser. No. 504,944

Int. Cl.<sup>6</sup> H01R 13/62; G01R 1/04

U.S. Cl. 324—761

11 Claims



1. A spring probe contactor for testing BGA (Ball Grid Array) devices that limits compression of spring probes within said spring probe contactor when each one of said BGA devices is placed in said spring probe contactor comprising, in combination:

a plurality of spring probe means for providing a connection with each BGA device to be tested when said BGA device is placed in said spring probe contactor;  
contactor block means having a plurality of apertures there-through for holding said plurality of spring probe means within said contactor block means;  
retaining plate means coupled to said contactor block for holding said plurality of spring probe means within said contactor block means, and having means for limiting compression of said plurality of spring probe means when said BGA device is placed in said spring probe contactor; and  
isolation ring means coupled to a top portion and a bottom portion of each of said plurality of spring probe means for ensuring said plurality of spring probe means do not come in contact with said contactor block means when said plurality of spring probe means are positioned within said contactor block means.

5,570,034

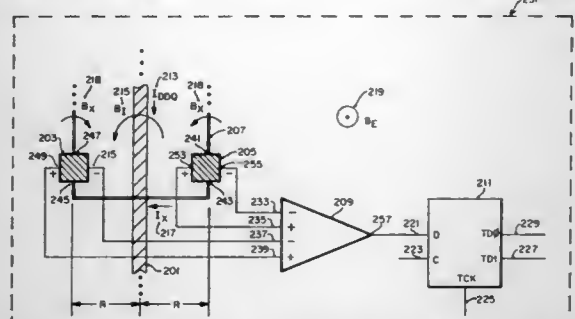
# USING HALL EFFECT TO MONITOR CURRENT DURING IDDQ TESTING OF CMOS INTEGRATED CIRCUITS

Wayne Needham, Gilbert, Ariz.; Qi-De Qian, Santa Clara, and Tim Maloney, Palo Alto, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 29, 1994, Ser. No. 365,800  
Int. Cl.<sup>6</sup> G01R 31/28; 33/07

U.S. Cl. 324—763

28 Claims



1. A method for measuring a quiescent current flowing through a supply line in the CMOS integrated circuit on a substrate, the CMOS integrated circuit switching clock states periodically, the quiescent current flowing through the supply line between clock switching states, the quiescent current producing a first magnetic field flowing in a circular path relative to the axis of the supply line, the method comprising the steps of:

locating a first magnetic field sensor on the substrate near the supply line such that the first magnetic field flows through the first magnetic field sensor, the first magnetic field sensor generating a first output in response to the first magnetic field; coupling the first output to an output circuit on the substrate so as to measure the strength of the first magnetic field, the output circuit generating a measurement result; and calibrating the output circuit such that the measurement result indicates when the first magnetic field produced by the quiescent current has a predetermined value.

5,570,035

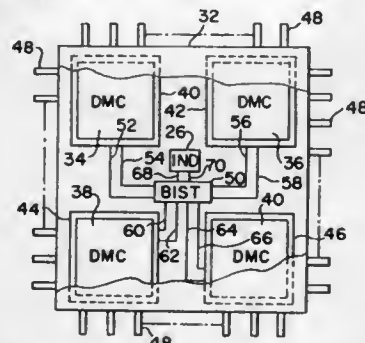
# BUILT-IN SELF TEST INDICATOR FOR AN INTEGRATED CIRCUIT PACKAGE

Michael A. Dukes, New Egypt, and Gerald T. Michael, Ocean, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 31, 1995, Ser. No. 426,261  
Int. Cl.<sup>6</sup> G01R 31/28

U.S. Cl. 324—763

12 Claims



7. A built-in self test apparatus for providing a visible indication of a failure of an electronic circuit, comprising:  
a multi-integrated circuit chip module having a plurality of integrated circuit chips;  
a built-in self test circuit integrally formed within said multi-chip module, said built-in self test circuit performing an operational test on said integrated circuit chips; and

visible indicator means coupled to said built-in self test circuit which becomes activated when said built-in self test circuit senses a failure of said integrated circuit chips when power is supplied thereto, said visible indicator means being formed as an integral part of a packaging for said multi-chip module.

5,570,036

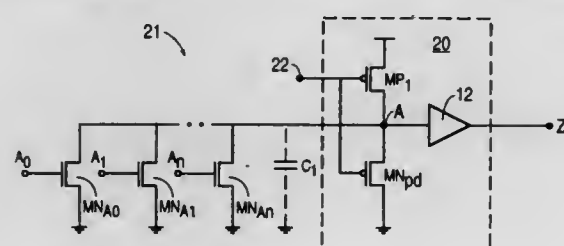
# CMOS BUFFER CIRCUIT HAVING POWER-DOWN FEATURE

Robert K. Montoya, Los Gatos, and John J. Zaslo, Sunnyvale, both of Calif., assignors to HAL Computer Systems, Inc., Campbell, Calif.

Filed Aug. 25, 1995, Ser. No. 519,444  
Int. Cl.<sup>6</sup> H03K 19/20

U.S. Cl. 326—16

5 Claims



1. A buffer circuit comprising:

an input node;  
at least one transistor having a control terminal coupled to receive an associated input signal, a first current-handling terminal coupled to a first reference voltage, and a second current-handling terminal coupled to said input node;  
a test terminal for receiving a test signal;  
a pull-up transistor having a first current-handling terminal coupled to a second reference voltage, a second-current handling terminal coupled to said input node, and a control terminal coupled to said test terminal; and  
a pull-down transistor having a first current-handling terminal coupled to said first reference voltage, a second-current handling terminal coupled to said input node, and a control terminal coupled to said test terminal, wherein no DC current flows through said circuit when said test signal is in a first logic state.

5,570,037

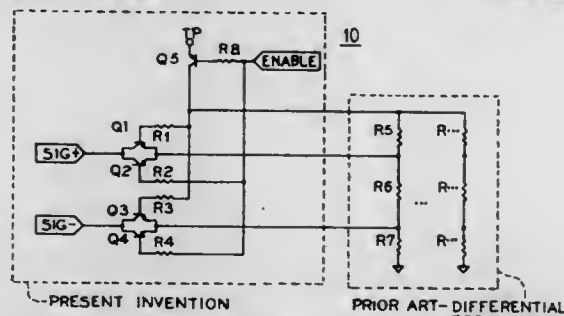
# SWITCHABLE DIFFERENTIAL TERMINATOR

Joseph R. Llorens, Winfield, Ill., assignor to Methode Electronics, Chicago, Ill.

Filed Jul. 20, 1994, Ser. No. 278,025  
Int. Cl.<sup>6</sup> H03K 17/16

U.S. Cl. 326—30

18 Claims



1. A switchable impedance matching termination apparatus including a terminating resistor network for terminating at least one pair of a plurality of differential signal line pairs, the termination apparatus comprising:  
an enabling means for providing a signal to terminate;

5,570,039

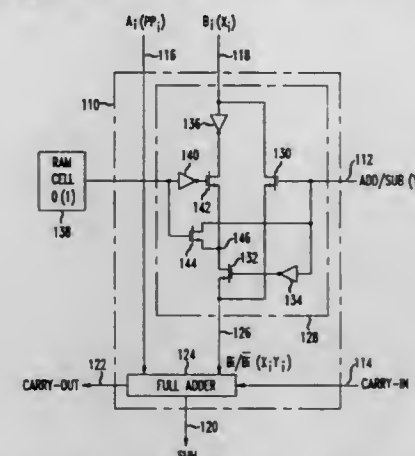
# PROGRAMMABLE FUNCTION UNIT AS PARALLEL MULTIPLIER CELL

William A. Oswald, Allentown, and Satwant Singh, Macungie, both of Pa., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jul. 27, 1995, Ser. No. 507,893  
Int. Cl.<sup>6</sup> H03K 19/173; 19/094

U.S. Cl. 326—39

26 Claims



23. An integrated circuit including a field programmable gate array (FPGA) which includes a programmable function unit (PFU), the programmable function unit comprising:  
an input line;  
an output line; and  
a programmable element for generating at least first and second functions in response to a configuration bit stream, in which the input line provides a control line to the programmable element when the first function is generated, and the input line provides a data line to the programmable element when the second function is generated; and wherein the first and second functions are different logic functions.

5,570,040

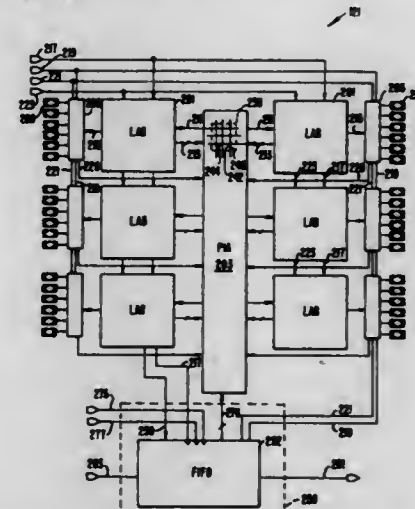
# PROGRAMMABLE LOGIC ARRAY INTEGRATED CIRCUIT INCORPORATING A FIRST-IN FIRST-OUT MEMORY

Craig S. Lytle, Mountain View, and Donald F. Faria, San Jose, both of Calif., assignors to Altera Corporation, San Jose, Calif.

Filed Mar. 22, 1995, Ser. No. 408,504  
Int. Cl.<sup>6</sup> H03K 19/177

U.S. Cl. 326—41

14 Claims



13. A programmable logic device integrated circuit comprising:

a first signal network interconnected between the enabling means and the terminating resistor network; and  
a second signal network interconnected between the enabling means and the terminating resistor network wherein the first and second signal networks are responsive to the signal to terminate the at least one pair of the plurality of differential signal line pairs.

5,570,038

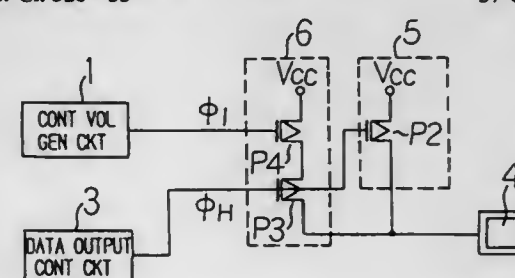
# SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WITH DATA OUTPUT CIRCUIT

Eiichi Makino, and Masaru Koyanagi, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan  
Continuation of Ser. No. 242,714, May 13, 1994, Pat. No. 5,491,430. This application Nov. 22, 1995, Ser. No. 561,064  
Claims priority, application Japan, May 15, 1993, 5-136867; Apr. 22, 1994, 6-85074

Int. Cl.<sup>6</sup> H03K 19/003

U.S. Cl. 326—33

37 Claims



1. A semiconductor integrated circuit device, comprising:  
a reference voltage generating circuit supplied with a power supply voltage, for generating a reference voltage having a constant level within a first predetermined power supply voltage range;  
a control voltage generating circuit supplied with the power supply voltage and the reference voltage for outputting a control voltage which corresponds to the voltage difference between the power supply voltage and the reference voltage, and increases more than the power supply voltage within a second predetermined power supply voltage range;  
a data output control circuit for outputting a data signal used for outputting data; and  
an output circuit for receiving the control voltage outputted by the control voltage generating circuit and the data signal outputted by the data output control circuit, and for outputting data according to the data signal in such a way that driving capability of the output circuit is controlled by the control voltage,

wherein the output circuit comprises a low-voltage operating output section and a full-voltage operating output section connected in parallel to each other between a power supply voltage terminal and an output terminal; the low-voltage operating output section receives the control voltage and the data signal, and outputs data according to the received data signal in such a way that the driving capability is high when the power supply voltage is lower than a predetermined value but reduces gradually when the external supply voltage is higher than the predetermined value; and the full-voltage operating output section receives the data signal, and outputs data according to the received data signal.



a first plurality of conductors, extending along a first dimension of a two-dimensional array;

a second plurality of conductors, extending along a second dimension of said two-dimensional array, wherein said second plurality of conductors is programmably coupled to said first plurality of conductors;

a plurality of logic array blocks, programmably coupled to said first plurality of conductors and second plurality of conductors; and

a first-in, first-out memory block, programmably coupled to said first plurality of conductors, wherein said first-in, first-out memory block further comprises a plurality of control inputs programmably coupled to said first plurality of conductors, wherein said plurality of control inputs control operations of said first-in, first-out memory block, wherein said first-in, first-out memory block generates a plurality of flag outputs programmably coupled to said first plurality of conductors, wherein said plurality of flag outputs indicate a status of said first-in, first-out memory block.

**5,570,041**  
**PROGRAMMABLE LOGIC MODULE AND ARCHITECTURE FOR FIELD PROGRAMMABLE GATE ARRAY DEVICE**

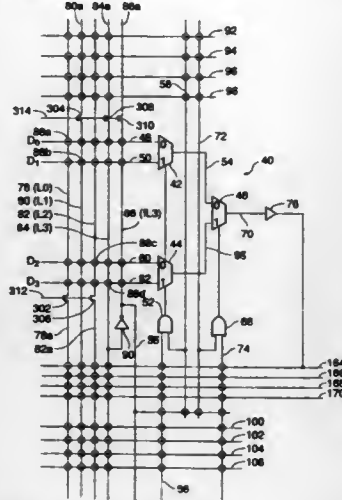
Khaled A. El-Avat, Cupertino; Sinan Kaptanoglu, San Carlos; King W. Chan, Los Altos; William C. Plants, Santa Clara, and Jung-Cheun Lien, Santa Clara, all of Calif., assignors to Actel Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 246,218, May 19, 1994, Pat. No. 5,451,887, which is a continuation-in-part of Ser. No. 2,873, Jan. 13, 1993, Pat. No. 5,367,208, which is a continuation of Ser. No. 869,488, Apr. 15, 1992, Pat. No. 5,187,993, which is a continuation of Ser. No. 621,452, Jan. 15, 1991, Pat. No. 5,172,014, which is a division of Ser. No. 309,306, Feb. 10, 1989, Pat. No. 5,015,885, which is a continuation-in-part of Ser. No. 195,728, May 18, 1988, Pat. No. 4,873,459, which is a continuation-in-part of Ser. No. 909,261, Sep. 19, 1986, Pat. No. 4,758,745. This application Jun. 28, 1995, Ser. No. 504,051

Int. Cl.<sup>6</sup> H03K 19/177

U.S. Cl. 326—41

24 Claims



1. A sequential logic unit comprising:  
a data flip-flop having a data input, a clock input, and an output;  
a first data multiplexer having a first data input connected to a first data input conductor, a second data input connected to a second data input conductor, a control input connected to a first control input conductor, and an output;

a second data multiplexer having a first data input connected to the output of said data flip-flop, a second data input connected to said output of said first multiplexer, a control input, and an output connected to the data input of said data flip-flop;  
an output buffer having an input connected to said output of said data flip-flop output, and an output connected to an output conductor; and  
a plurality of general interconnect conductors, at least some of said general interconnect conductors intersecting said data, clock, and control input conductors of said first and second multiplexers and said data flip-flop, said plurality of general interconnect conductors selectively connectable to individual ones of said data, clock, and control input conductors by user-programmable interconnect elements.

**5,570,042**  
**PECL INPUT BUFFER**

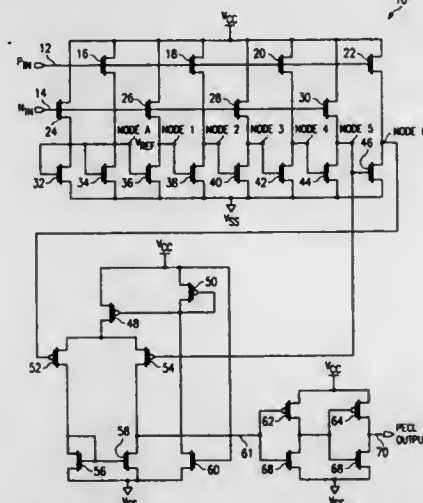
Herman H. Ma, Dallas, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jan. 3, 1995, Ser. No. 368,106

Int. Cl.<sup>6</sup> H03K 19/0175

U.S. Cl. 326—63

23 Claims



balanced clock-tree distribution systems provided between the delay buffers and circuitry in the sub-blocks respectively; the delay buffers providing equal clock skews from the clock driver to the distribution systems respectively, in which: the delay buffers have the same physical size, and comprise identical delay lines that are loaded to equalize said clock skews respectively.

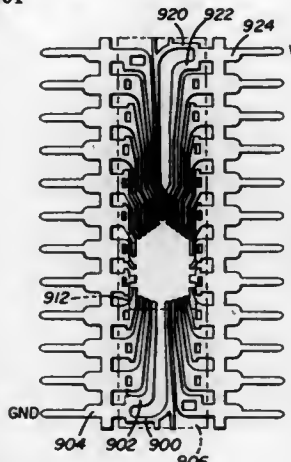
5,570,046

# LEAD FRAME WITH NOISY AND QUIET $V_{SS}$ AND $V_{DD}$ LEADS

Bradley A. Sharpe-Geisler, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.  
Division of Ser. No. 34,549, Mar. 19, 1993, Pat. No. 5,438,277.  
This application May 30, 1995, Ser. No. 453,184  
Int. Cl.<sup>6</sup> H03K 3/26

U.S. Cl. 326—101

6 Claims



1. A lead frame comprising:

a lead comprising:

- a quiet lead portion;
- a noisy lead portion, wherein the noisy lead portion has a line width greater than the quiet lead portion; and
- a terminal lead portion connected to both the quiet lead portion and the noisy lead portion.

5,570,047

# SEMICONDUCTOR INTEGRATED CIRCUIT WITH SENSE AMPLIFIER CONTROL CIRCUIT

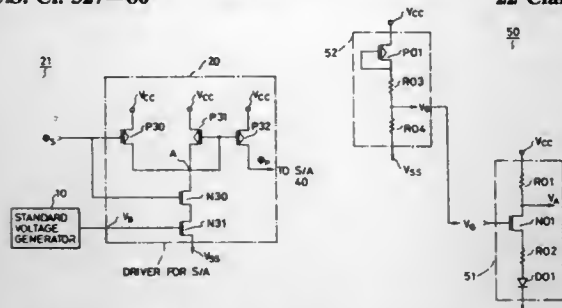
Eiichi Makino, Masaru Koyanagi, and Kazuyoshi Muraoka, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Aug. 31, 1994, Ser. No. 298,837

Claims priority, application Japan, Sep. 7, 1993, 5-221959  
Int. Cl.<sup>6</sup> H03K 5/153; G11C 7/00

U.S. Cl. 327—80

22 Claims



1. A semiconductor integrated circuit comprising:

- a plurality of memory cell blocks, each memory cell block comprising a plurality of memory cells arranged in rows and columns;

a plurality of sense amplifiers, each sense amplifier located adjacent to the plurality of memory cells; and

a plurality of sense amplifier control circuits, each sense amplifier control circuit being located outside of the plurality of memory cell blocks, each sense amplifier control circuit comprising:

- a standard voltage generating circuit that provides a standard voltage, the standard voltage generating circuit comprising: a first circuit comprising a first resistance, a N-channel MOS transistor, a second resistance, and a diode being connected in series, the first resistance being connected to a power source and the diode being connected to ground; and

- a second circuit comprising a P-channel MOS transistor, a third resistance, and a fourth resistance being connected in series, the P-channel MOS transistor being connected to the power source, the fourth resistance being connected to ground, and a connection point between the P-channel MOS transistor and the third resistance being connected to a gate of the P-channel MOS transistor, wherein a connection point between the third resistance and the fourth resistance is connected to a gate of the N-channel MOS transistor, and an output of the standard voltage generating circuit is generated from a connection point between the first resistance and the N-channel MOS transistor, and

- a control circuit for receiving the standard voltage provided from the standard voltage generating circuit and for generating a driver signal to a sense amplifier to control the charging ability of the sense amplifier,

wherein the power source has first, intermediate, and second voltage regions,

in the first voltage region, the potential of the standard voltage increases with an increase of the power source,

in the intermediate voltage region, the potential of the standard voltage changes opposite to a change of the power source, and

in the second voltage region, the potential of the standard voltage increases with an increase of the power source.

5,570,048

# SAMPLE-AND-HOLD CIRCUIT WITH REDUCED CLOCK FEEDTHROUGH

Johannes J. F. Rijns, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 138,944, Oct. 18, 1993, abandoned.

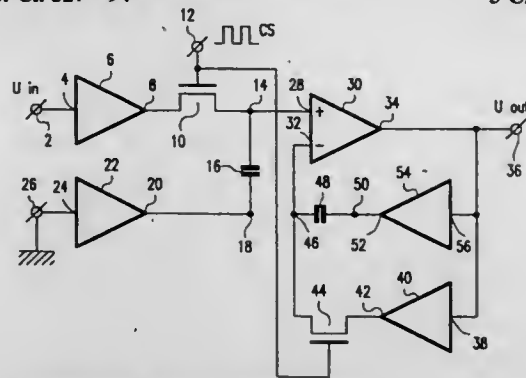
This application Nov. 6, 1995, Ser. No. 554,399

Claims priority, application European Pat. Off., Oct. 19, 1992, 92203190

Int. Cl.<sup>6</sup> G11C 27/02

U.S. Cl. 327—94

3 Claims



1. A sample-and-hold circuit comprising:

- an input terminal for receiving of an input to be sampled,
- a first buffer having an input coupled to the input terminal, and having an output,
- a first switching element having a control electrode coupled to a clock signal terminal for receiving a clock signal, having a

5,570,050

# ZERO STANDBY CURRENT POWER-UP RESET CIRCUIT

James Conary, Aloha, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

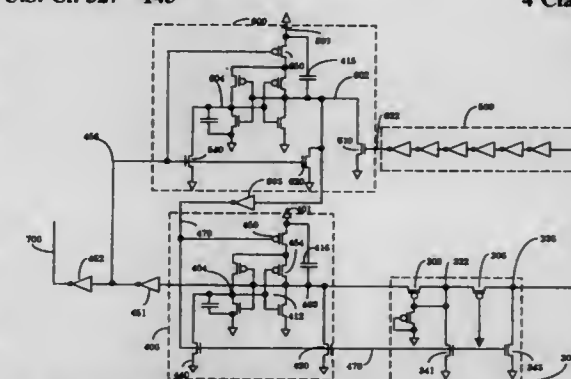
Continuation of Ser. No. 209,106, Mar. 8, 1994, abandoned.

This application Jan. 24, 1996, Ser. No. 590,726

Int. Cl.<sup>6</sup> H03K 17/22

U.S. Cl. 327—143

4 Claims



1. A power-up reset circuit comprising:

- a toggle circuit formed by CMOS transistors, coupled to a power supply, assuming a first state in response to an activation of the power supply and outputting a first voltage on a first line;
- a voltage shifter circuit, coupled to the first line, formed by a first P-channel transistor that operates as a first voltage dropping diode, a second P-channel transistor connected in series with the first P-channel transistor, and a third P-channel transistor connected between the first P-channel transistor and the second P-channel transistor that operates as a current removing diode, the voltage shifter circuit assuming the first state in response to receiving the first voltage and dropping the first voltage to a second voltage on a second line; and
- a reset circuit comprising a flip-flop circuit formed by CMOS transistors, coupled to the voltage shifter circuit via a delay circuit to the second line, assuming the first state and outputting a signal to reset the toggle circuit and the voltage shifter circuit to a second state in response to the second voltage such that each of the first and second lines are driven to a reference voltage, wherein the reference voltage at the first line also resets the reset circuit to said second state.

5,570,049

# TRANSCONDUCTOR ELEMENT FOR HIGH SPEED GM-C INTEGRATED FILTERS

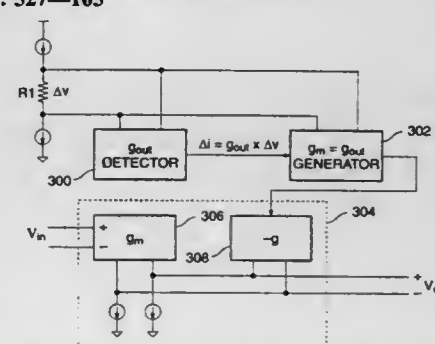
Xiaole Chen, Milpitas, Calif., assignor to Exar Corporation, San Jose, Calif.

Filed May 30, 1995, Ser. No. 453,413

Int. Cl.<sup>6</sup> H03F 3/45

U.S. Cl. 327—103

7 Claims



1. A transconductor circuit for use in transconductor-capacitor filters, comprising:

- an output conductance detector having a transistor coupled to a reference voltage, said output conductance detector generating a signal at an output representing an output conductance of the transistor;
  - a transconductance generator having an input coupled to the output of the output conductance detector, and an output;
  - a negative conductance block having an input coupled to the output of the transconductance generator; and
  - a transconductor element having an input coupled to an input of the transconductor circuit, and an output coupled to an output of the negative conductance block,
- wherein, the negative conductance block operates to minimize an output conductance of the transconductor element.

5,570,051

# MULTIPLEXED BY-PASSABLE MEMORY DEVICES WITH INCREASED SPEED AND IMPROVED FLIP-FLOP UTILIZATION

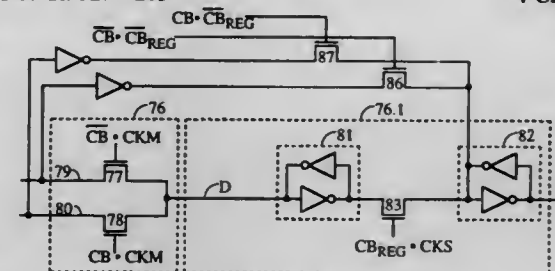
David Chiang, Saratoga; Napoleon W. Lee, Fremont; Thomas Y. Ho, Milpitas, and Nicholas Kucharewski, Jr., Pleasanton, all of Calif., assignors to Xilinx, Inc., San Jose, Calif.

Division of Ser. No. 301,504, Sep. 6, 1994, abandoned, which is a division of Ser. No. 10,378, Jan. 28, 1993, Pat. No. 5,357,153. This application May 31, 1995, Ser. No. 454,908

Int. Cl.<sup>6</sup> H03K 3/289

U.S. Cl. 327—203

4 Claims



1. A multiplexed bypassable flip flop comprising:

- a first input terminal;
- a second input terminal;



- a master latch having an input terminal and an output terminal;  
 a slave latch having an input terminal;  
 a first circuit connecting the first input terminal and the master latch input terminal when an associated first clock signal is active;  
 a second circuit connecting the second input terminal and the master latch input terminal when an associated second clock signal is active;  
 a third circuit connecting the first input terminal and the slave latch input terminal when an associated third clock signal is active;  
 a fourth circuit connecting the second input terminal and the slave latch input terminal when an associated fourth clock signal is active; and  
 a fifth circuit connecting the master latch output terminal and the slave latch input terminal when an associated fifth clock signal is active.

5,570,052

# DETECTION CIRCUIT WITH DIFFERENTIAL INPUT AND HYSTERESIS PROPORTIONAL TO THE PEAK INPUT VOLTAGE

Maarten J. Fonderie, Sunnyvale, Calif.; Johan H. Huijsing, Schipluiden, Netherlands, and Edmond Toy, Sunnyvale, Calif., assignors to Philips Electronics North America Corporation, New York, N.Y.

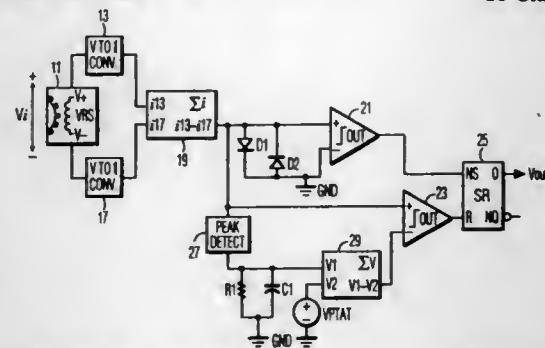
Continuation of Ser. No. 488,540, Jun. 7, 1995, abandoned.

This application Feb. 28, 1996, Ser. No. 607,921

Int. Cl.<sup>6</sup> H03K 3/037

U.S. Cl. 327—205

16 Claims



1. A detection circuit with input and hysteresis proportional to the peak value of input voltage having a voltage to current converter connected to each of the positive and negative terminals thereof for producing positive and negative input current signals, the detection circuit comprising:

a differential current amplifier having an input connected to each of the positive and negative terminals for producing an output current equal to the difference between the positive and negative input currents;

diode means having a first terminal connected to said output current signal of said differential amplifier and a second terminal connected to ground, whereby the output current from the differential current amplifier generates a log voltage signal across said diode means;

first comparator means having a first input connected to said first terminal of said diode means and its second input connected to ground, said first comparator means producing a signal at its output in response to the zero crossings in the log voltage signal across said diode means;

a peak value comparator means connected to the output of said differential current amplifier, said peak value comparator means sensing the log voltage signal across said diode means and comparing it with a hysteresis voltage proportional to the peak value of the input signal from the input signal source; and

a set reset (SR) flip-flop having a first input connected to said output of said first comparator means, and a second input connected to the output of said peak value comparator means,

said flip-flop producing at its output a noise free digital waveform signal representative of the input signal without a phase delay.

5,570,053

# METHOD AND APPARATUS FOR AVERAGING CLOCK SKEWING IN CLOCK DISTRIBUTION NETWORK

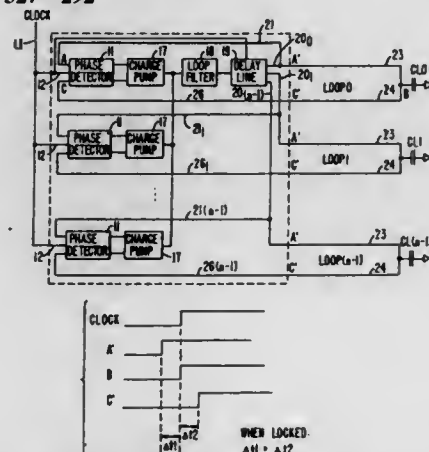
Ashraf K. Takla, San Jose, Calif., assignor to Hitachi Micro Systems, Inc., San Jose, Calif.

Filed Sep. 26, 1994, Ser. No. 312,026

Int. Cl.<sup>6</sup> H03L 7/00; 7/18

U.S. Cl. 327—292

11 Claims



1. A clock deskewing circuit for synchronizing a clock signal at destination loads with a system clock by averaging delay variations along a plurality of clock distribution paths, said circuit comprising:

a first input terminal for receiving a system clock signal;

a plurality of clock signal conductor members each having a proximal end and a distal end for providing a phase adjusted clock signal to an associated load device;

a plurality of phase error correction signal generating circuits each coupled to said first input terminal and to the proximal ends of said plurality of clock signal conductor members for generating a plurality of phase error correction signals each corresponding to the associated load device and each providing a phase correction for any delay associated thereto; and

averaging means coupled to said plurality of phase error correction signal generator circuits, said first input terminal and said plurality of clock signal conductor members for generating a plurality of substantially identical phase adjusted clock signals each coupled to a different one of said plurality of clock signal conductor members and each incorporating an average of the plurality of phase error correction signals.

5,570,054

# METHOD AND APPARATUS FOR ADAPTIVE CLOCK DESKEWING

Ashraf K. Takla, San Jose, Calif., assignor to Hitachi Micro Systems, Inc., San Jose, Calif.

Filed Sep. 26, 1994, Ser. No. 312,355

Int. Cl.<sup>6</sup> H03K 5/13; 3/01

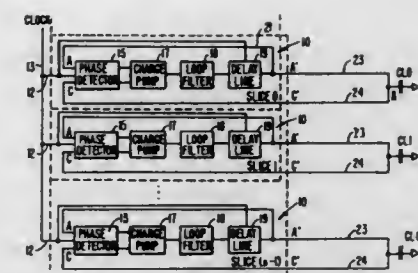
U.S. Cl. 327—292

14 Claims

1. A clock deskewing circuit for synchronizing a clock signal at destination loads with a system clock, said circuit comprising:

a first input terminal for receiving a system clock signal;

a plurality of pairs of clock signal conductors, each conductor having a path length and having a proximal end and a distal end, the path length of each conductor of a given pair having substantially the same path length, one conductor of each said plurality of pairs providing said system clock signal to a



corresponding destination load, the other conductor of each of said plurality of pairs providing a distal clock feedback signal; and

a plurality of phase-correction circuits each having a first input coupled to said first input terminal, and second and third inputs coupled to a corresponding pair of said plurality of pairs of clock signal conductors for centering said system clock signal to the corresponding destination load.

5,570,055

# DEMODULATING LOGARITHMIC AMPLIFIER

Barrie Gilbert, Beaverton, Oreg., assignor to Analog Devices, Inc., Norwood, Mass.

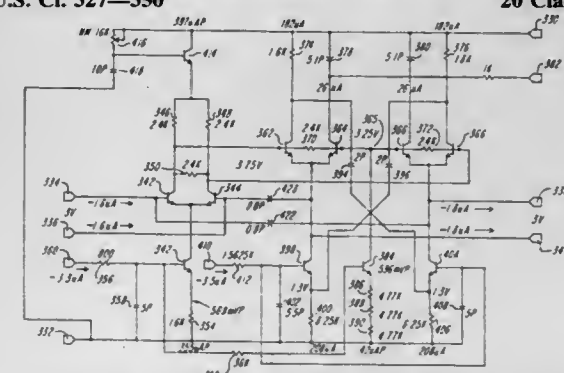
PCT No. PCT/US93/03536, § 371 Date Feb. 2, 1995, § 102(e) Date Feb. 2, 1995, PCT Pub. No. WO93/21689, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 14, 1993, Ser. No. 318,779

Int. Cl.<sup>6</sup> H03G 1/108; G06F 7/556

U.S. Cl. 327—350

20 Claims



1. A logarithmic amplifier gain stage for supplying, in response to an instantaneous input signal, an output signal corresponding to a logarithmic value of the instantaneous input signal, comprising:

a transistor amplifier having an input that receives the instantaneous input signal and an intermediate output that supplies an intermediate output signal;

a full-wave detector having an input coupled to the intermediate output of the transistor amplifier that receives the intermediate output signal and an output that supplies the output signal, the detector including a rectifier comprising rectifying transistors having different effective emitter areas for demodulating a signal applied to the input of the full-wave detector, wherein each rectifying transistor has a base and all bases of the rectifying transistors are coupled together by a single bias line; and

a noise-filtering circuit including a beta-multiplied pinch resistor and a capacitor coupled to the transistor amplifier.

5,570,056

# BIPOLAR ANALOG MULTIPLIERS FOR LOW VOLTAGE APPLICATIONS

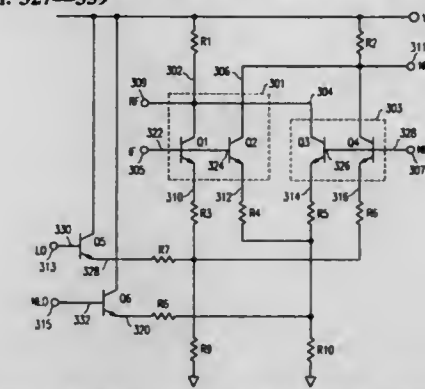
John B. Groe, Poway, Calif., assignor to Pacific Communication Sciences, Inc., San Diego, Calif.

Filed Jun. 7, 1995, Ser. No. 485,088

Int. Cl.<sup>6</sup> H03B 17/00; H04B 1/28

U.S. Cl. 327—359

23 Claims



1. A mixer circuit powered by a power supply having a positive and a negative power supply terminal, for performing analog multiplication of a first and second differential input signal, each signal having a positive and a negative component, including:

a. a first and a second active three port device, each having a control port, an input port, and an output port;

i. the control ports of the first and second active devices being coupled together;

b. a first load device having at least two terminals, a first terminal being coupled to the positive power supply terminal;

c. a second load device having at least two terminals, a first terminal being coupled to the positive power supply terminal;

d. a third and fourth active three port device, each having a control port, an input port, and an output port;

i. the control ports of the third and fourth active devices being coupled together;

ii. the input port of the third active device being coupled to the input port of the first active device and to a second terminal of the first load device;

iii. the input port of the fourth active device being coupled to the input port of the second active device and to a second terminal of the second load device;

e. a fifth active three port device, having a control port, an input port, and an output port, the input port being coupled to the positive power supply terminal and

f. a sixth active three port device, having a control port, an input port, and an output port, the input port being coupled to the positive power supply terminal;

g. a first, second, third, fourth, fifth, and sixth two input resistive device, (i) the first resistive device being coupled between the output of the first active device and the negative power supply terminal, (ii) the second resistive device being coupled between the output of the second active device and the negative power supply terminal, (iii) the third resistive device being coupled between the output of the third active device and the negative power supply terminal, (iv) the fourth resistive device being coupled between the output of the fourth active device and the negative power supply terminal, (v) the fifth resistive device being coupled between the output of the fifth active device and the negative power supply terminal, and (vi) the sixth resistive device being coupled between the output of the sixth active device and the negative power supply terminal;

wherein the positive component of the first input signal is coupled to the control port of the first active device, the negative component of the first input signal is coupled to the control port of the third active device, the positive component of the second input signal is coupled to the control port of the fifth active device, the negative component of the second input signal is coupled to the control

input to the sixth active device, and the output signal is taken across the output ports of the first and second active devices.

5,570,057

# **THREE-TERMINAL INSULATED-GATE POWER ELECTRONIC DEVICE WITH A VARIABLE-SLOPE SATURATED OUTPUT CHARACTERISTIC DEPENDING IN A DISCONTINUOUS WAY ON THE OUTPUT CURRENT**

Sergio Palara, Acicastello, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

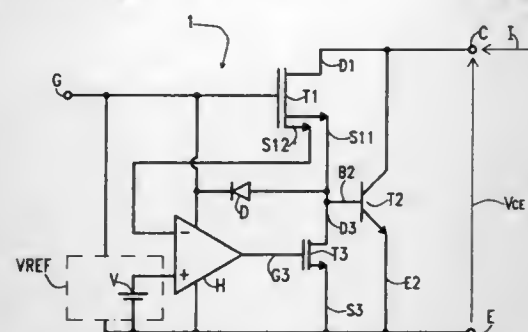
Filed Apr. 12, 1995, Ser. No. 420,756

Claims priority, application European Pat. Off., Apr. 12, 1994, 94830168

Int. Cl.<sup>6</sup> H03K 17/00

U.S. Cl. 327—365

56 Claims



1. An insulated-gate power electronic device, comprising:
  - an insulated-gate transistor having a first electrode, a second electrode having first and second terminals, and a control electrode;
  - a bipolar power transistor, forming a darlington pair with the insulated-gate transistor, and having:
    - a first electrode coupled to the first electrode of the insulated-gate transistor and to the first external terminal of the insulated-gate power electronic device;
    - a second electrode coupled to the second external terminal of the insulated-gate power electronic device; and
    - a control electrode coupled to the first terminal of the second electrode of the insulated-gate transistor;
  - switching means, coupled between the control and second electrodes of the bipolar power transistor and operative in response to a control signal, for assuming a highly conductive state when the control signal is asserted and for assuming a non-conductive state when the control signal is de-asserted; and
  - control means, coupled to the second terminal of the second electrode to receive a sense signal indicative of a current flowing between the first and second external terminals, for asserting the control signal in response to a low current value flowing between the first and second external terminals and for deasserting the control signal in response to a high current value flowing between the first and second external terminals.

5,570,058

# **SIGNAL LINE TESTING CIRCUIT CAUSING NO DELAY IN TRANSMISSION OF A NORMAL DATA SIGNAL**

Shigeru Maruyama, Kanagawa, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 17, 1995, Ser. No. 443,013

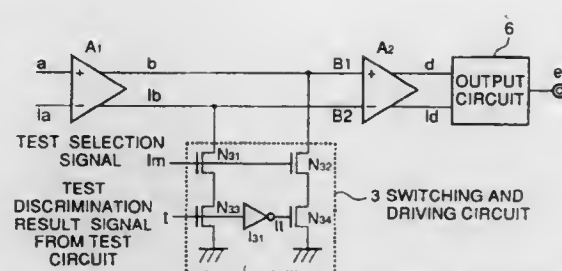
Claims priority, application Japan, May 17, 1994, 6-102512

Int. Cl.<sup>6</sup> H03K 17/693

U.S. Cl. 327—404

7 Claims

1. A signal line switching circuit comprising:



- a first amplifying circuit receiving a data signal for outputting first and second signals complementary to each other and having a first amplitude, onto first and second signal lines, respectively;
  - a second amplifying circuit receiving said first and second signals on said first and second signal lines, for outputting a pair of complementary output signals having a second amplitude; and
  - a switching and driving circuit connected in parallel to said first and second signal lines, and receiving a test discrimination result signal and responding to a test selection signal indicative of selection of a test operation, so as to supply on said first and second signal lines, third and fourth signals complementary to each other and corresponding to said test discrimination result signal;
- said switching and driving circuit having a current supply capacity larger than that of said first amplifying circuit as to be able to supply said third and fourth signals onto said first and second signal lines, respectively, independently of the level of said first and second signals.

5,570,059

# **BICMOS MULTIPLEXERS AND CROSSBAR SWITCHES**

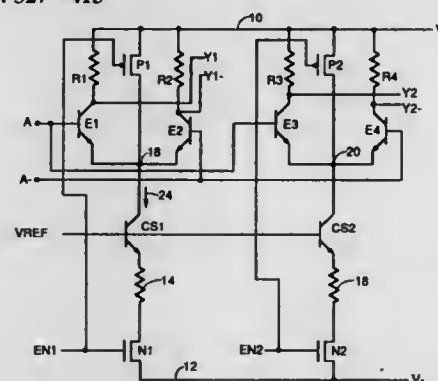
Madhukar B. Vora, Los Gatos, and Burnell G. West, Fremont, both of Calif., assignors to Dyna Logic Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 274,817, Jul. 14, 1994, Pat. No. 5,406,133, which is a division of Ser. No. 2,172, Jan. 8, 1993, Pat. No. 5,355,035. This application Jan. 20, 1995, Ser. No. 375,303

Int. Cl.<sup>6</sup> H03K 17/60; 17/62

U.S. Cl. 327—415

3 Claims



3. A method of switching high speed data signals, comprising:
  - receiving said high speed data signals at a high speed data input;
  - selectively coupling said high speed data signals to any one of a plurality of high speed data outputs each of which is an output of one of a plurality of high speed switching devices, each of said high speed switching devices having a data input coupled to receive the same high speed data signals received at said high speed data input, and each of said high speed switching devices having a node therein which if coupled to a first voltage source will disable said high speed switching device thereby preventing coupling of said high speed data signals received at said high speed data input to the high speed data output of that particular high speed switching device, and, if coupled to a second voltage source, will enable said high

speed switching device thereby enabling coupling of said high speed data signals received at said high speed data input to the high speed data output of that particular high speed switching device, and wherein said node in each said high speed switching device does not appreciably change in voltage with fluctuations of voltage in said high speed data signals received at said high speed data input or with fluctuations of voltage in said high speed data signals output at said high speed data output; and

CMOS enabling circuitry for each said high speed switching device and having an enable signal input for each said high speed switching device for receiving an enable signal associated with the corresponding high speed switching device, each said CMOS enabling circuit for selectively coupling said node of the corresponding high speed switching device to said first voltage source to disable said high speed switching device when said enable signal is in a first logic state, and for selectively coupling said node to said second voltage source to enable said high speed switching device when said enable signal is in a second logic state.

5,570,061

# **SWITCHING CIRCUIT**

Sadashi Shimoda, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

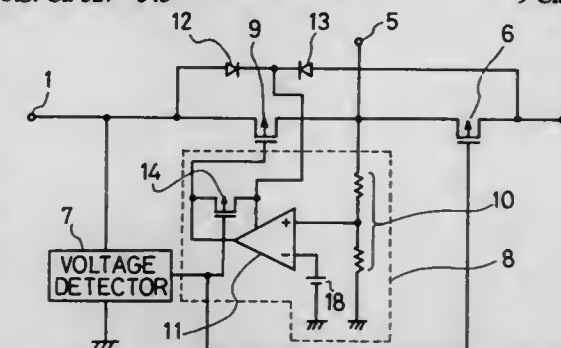
Filed Oct. 20, 1993, Ser. No. 140,228

Claims priority, application Japan, Oct. 27, 1992, 4-288675; Dec. 21, 1992, 4-340262; Jan. 18, 1993, 5-006164

Int. Cl.<sup>6</sup> G05F 1/10

U.S. Cl. 327—545

9 Claims



8. A switching circuit for supplying an output voltage at an output terminal from a plurality of input voltages at input terminals, comprising:

first voltage detecting means for detecting a level of an input voltage inputted to a first input terminal;

first switching means for outputting to the output terminal a first input voltage inputted from the first input terminal according to an output signal of the first voltage detecting means;

a second switching means for outputting to the output terminal a voltage inputted from a second input terminal, wherein an output signal of the first voltage detecting means alternatively activates the first switching means and the second switching means;

voltage controlling means for controlling a conducting state of the first switching means according to the voltage outputted at the output terminal, the voltage controlling means comprising a resistor divider network connected to the output terminal, and a difference amplifier connected at a node of the resistor divider network for outputting a signal proportional to a difference between the voltage at the output terminal and a reference voltage for controlling the conductivity of the first switching means according to the difference; and

second voltage detecting means for detecting a level of voltage of input voltage inputted from the second input terminal, wherein the output signal of the first voltage detecting means controls an operation of the second voltage detecting means.

5,570,060

# **CIRCUIT FOR LIMITING THE CURRENT IN A POWER TRANSISTOR**

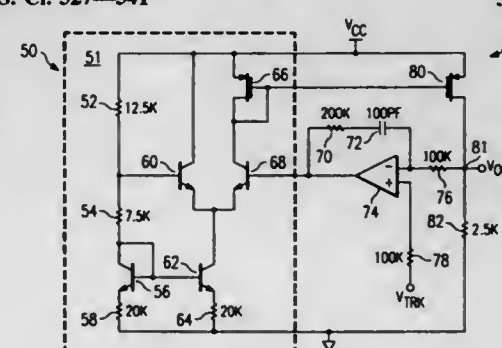
William E. Edwards, Milford, Mich., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Mar. 28, 1995, Ser. No. 411,498

Int. Cl.<sup>6</sup> G05F 3/02

U.S. Cl. 327—541

5 Claims



1. A voltage regulator for providing a regulated voltage on an output responsive to a voltage ( $V_{ref}$ ), said voltage regulator comprising:

an error amplifier having a first input for receiving the voltage ( $V_{ref}$ ), having a second input coupled to the output of the voltage regulator, and having an output;

a pass transistor having a current path between a voltage source and the output of the voltage regulator, and having a control element;

a first transistor having a control element coupled to the output of the error amplifier, and having a current path with a first end and a second end;

a second transistor having a control element for receiving a bias voltage and having a current path with a first end coupled to the source voltage and a second end, wherein the current path of the first transistor is in parallel with the current path of the second transistor;

a fixed current source coupled in series with the current path of the first transistor and the current path of the second transistor; and

an output transistor having a current path coupled in series the current path of the first transistor and having a control element coupled to its current path and to the control element of the pass element.

5,570,062

# **AM-FM TRANSISTOR POWER AMPLIFIER USING CLASS-BC**

Paul W. Dent, Stehag, Sweden, assignor to Ericsson GE Mobile Communications Inc., Research Triangle Park, N.C.

Filed Oct. 12, 1994, Ser. No. 321,446

Int. Cl.<sup>6</sup> H03F 3/19; 3/26

U.S. Cl. 330—051

9 Claims

9. A method for operating a power amplifier circuit to generate an output signal into a load at more than one alternative power level, the power amplifier circuit comprising at least two amplifying means, each coupled to the load and each having optimum efficiency at different power output levels, the method comprising the steps of:

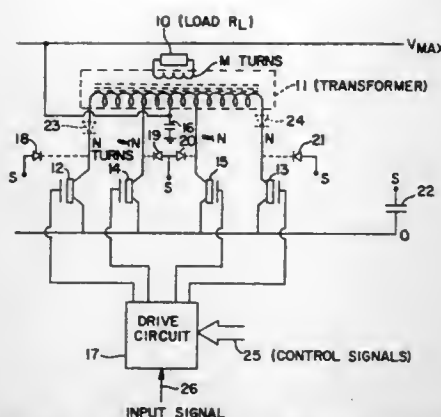
generating a control signal that is independent of the output signal;

using the control signal to select any one of the at least two amplifying means;

activating the selected amplifying means to produce an amplified signal;

concurrent with the activating step, deactivating all amplifying means that have not been selected for activation;

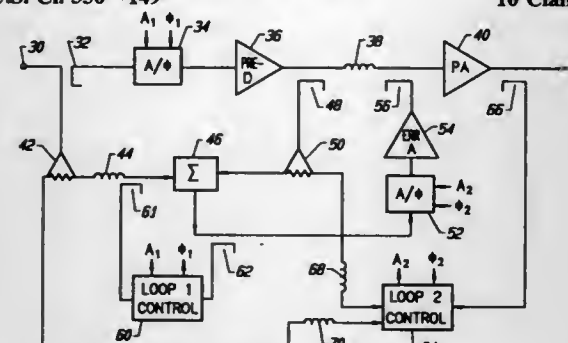




supplying the amplified signal from the activated amplifying means to the load; and preventing the deactivated amplifying means from consuming signal power from the amplified signal, wherein the step of generating a control signal comprises generating a control signal based on a modulating signal having a frequency that is slower than that of a carrier signal being supplied to the power amplifier circuit.

**5,570,063**  
**RF POWER AMPLIFIER WITH SIGNAL PREDISTORTION FOR IMPROVED LINEARITY**  
John A. Eisenberg, Los Altos, Calif., assignor to Spectrian, Inc., Mountain View, Calif.

Filed May 18, 1995, Ser. No. 444,183  
Int. Cl.<sup>6</sup> H03F 1/32  
U.S. Cl. 330-149 10 Claims

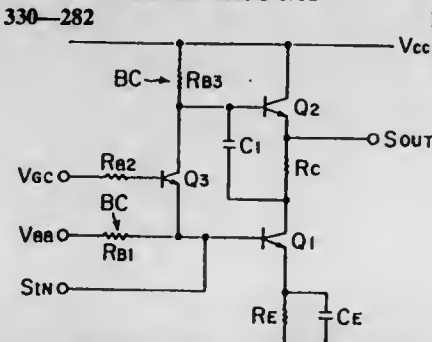


1. A linear RF power amplifier comprising an input terminal for receiving RF carrier signals for amplification;
- a power amplifier having an input coupled to said input terminal and an output for amplified RF carrier signals, said power amplifier introducing intermodulation distortion into the amplified RF signals;
- a predistortion amplifier connected between said input terminal and said input of said power amplifier and having signal distortion characteristics of said power amplifier;
- a first control loop including a subtractor for receiving RF carrier signals from said input terminal and signals from said predistortion amplifier and producing a distortion signal with suppressed carrier signals for injection into said power amplifier, an amplitude and phase adjuster serially connected between said input terminal and said predistortion amplifier, a control unit for receiving RF signals from said input terminal and said distortion signal and controlling the phase and amplitude of at least one signal applied to said subtractor for minimizing RF carrier signals in said distortion signal, said control unit of said first control loop controlling said amplitude and phase adjuster;
- a second control loop including an amplitude and phase adjuster for coupling said distortion signal to the power amplifier input, and a control unit coupled to the power amplifier output

and the predistortion amplifier and controlling the amplitude and phase adjuster whereby the distortion signal offsets intermodulation distortion of the power amplifier.

**5,570,064**  
**AUTOMATIC GAIN CONTROL AMPLIFIER FOR USE IN RADIO TRANSMITTER-RECEIVER**  
Hideo Sugawara, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

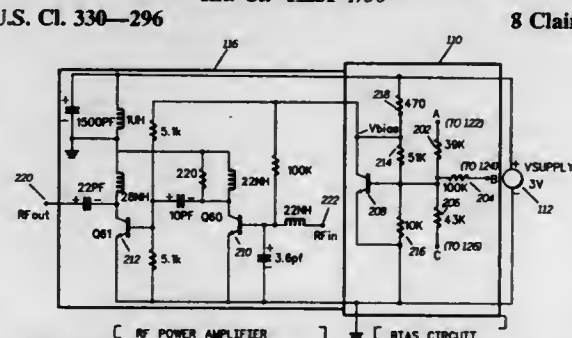
Filed Mar. 20, 1995, Ser. No. 407,201  
Claims priority, application Japan, Jul. 14, 1994, 6-162162  
Int. Cl.<sup>6</sup> H03G 3/12  
U.S. Cl. 330-282 15 Claims



1. In an AGC amplifier comprising a transistor for amplification and a transistor for buffer, the improvement comprising: an emitter of said transistor for amplification, which receives an input signal from a base thereof being grounded, and a collector of said transistor for amplification being connected via an impedance unit to an emitter of said transistor for buffer whose collector is connected to a power source to connected said transistor for amplification to said transistor for buffer in series as in direct current; said collector of said transistor for amplification being connected to a base of said transistor for buffer; and a third transistor; an emitter of said third transistor being connected to a base of said transistor for amplification, and a collector of said third transistor being connected to one of the base of said transistor for buffer and the collector of said transistor for amplification, and a bias control signal being applied to a base of said third transistor, an output signal being outputted from the emitter of said transistor for buffer.

**5,570,065**  
**ACTIVE BIAS FOR RADIO FREQUENCY POWER AMPLIFIER**  
John E. Eberhardt, Alpharetta, and Enrico Bellotti, Norcross, both of Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 26, 1994, Ser. No. 296,826  
Int. Cl.<sup>6</sup> H23F 1/30  
U.S. Cl. 330-296 8 Claims

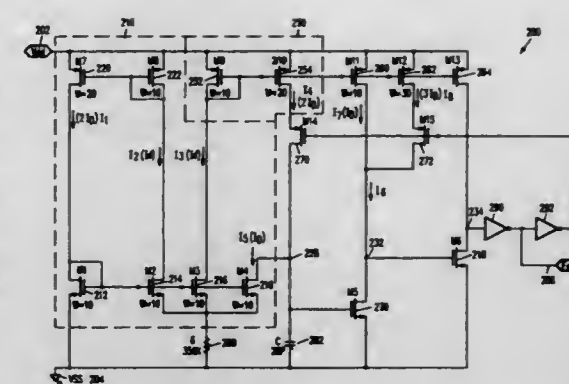


6. An amplifier receiving a supply voltage, comprising: an adjustable gain amplifier having an output port for providing an output signal having a power output level, and an input port for receiving a bias signal;

a bias circuit having a transistor having first, second and control terminals, the bias circuit providing a bias signal to the radio frequency power amplifier;

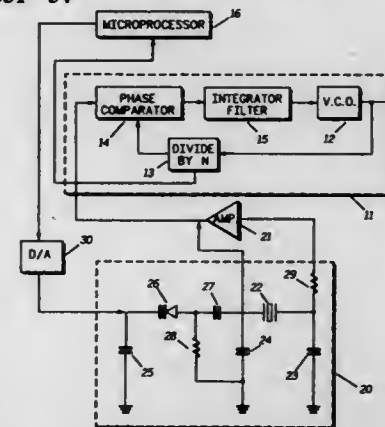
a controller having a port, a plurality of resistors disposed between the control terminal of the transistor and the port, the controller adjusting the power output level of the amplifier to a selected level by providing a digital word to the port, the digital word being converted to an analog level by the plurality of resistors; and

wherein the transistor maintains the selected power output level constant by adjusting the bias signal in response to changes in the level of the supply voltage by adjusting the resistance between the transistor's first and second terminals.



**5,570,066**  
**METHOD OF PROGRAMMING A FREQUENCY SYNTHESIZER**  
John E. Eberhardt, Alpharetta, and Ronald L. Bane, Stone Mountain, both of Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 30, 1994, Ser. No. 298,492  
Int. Cl.<sup>6</sup> H03L 7/00; H04B 1/06  
U.S. Cl. 331-34 4 Claims



1. A method of tuning a voltage control oscillator of a frequency synthesizer to a desired frequency, comprising the steps of: coarse tuning the frequency synthesizer by adjusting a divisor of a loop divider until its output frequency is close to the desired frequency; then adjusting a crystal reference oscillator to produce the desired frequency; providing a memory with an associated microprocessor; and storing the coarse and desired frequencies in said memory.

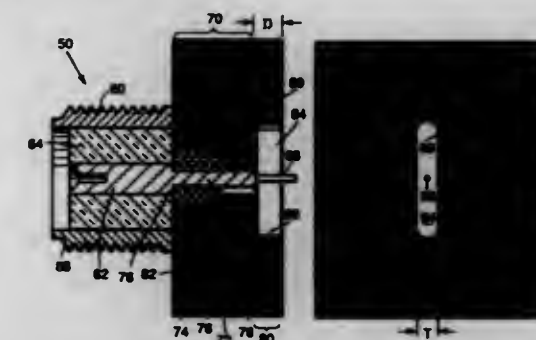
**5,570,067**  
**MICROPOWER RC OSCILLATOR HAVING HYSTERESIS PRODUCED BY SWITCHING CURRENT SOURCES TO A TRANSISTOR**  
Stuart B. Shacter, Tucson, Ariz., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 6, 1995, Ser. No. 469,129  
Int. Cl.<sup>6</sup> H03K 3/354  
U.S. Cl. 331-111 15 Claims

12. A method of operating an RC oscillator including a resistor and a capacitor comprising the steps of: alternately charging and discharging the capacitor; sensing the capacitor voltage using a transistor coupled to the capacitor; controlling a threshold voltage of the transistor as a function of the sensed capacitor voltage; and controlling the charging and discharging of the capacitor as a function of the sensed capacitor voltage.

**5,570,068**  
**COAXIAL-TO-COPLANAR-WAVEGUIDE TRANSMISSION LINE CONNECTOR USING INTEGRATED SLABLINE TRANSITION**  
Clifton Quan, Arcadia, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 26, 1995, Ser. No. 452,210  
Int. Cl.<sup>6</sup> H01P 5/08  
U.S. Cl. 333-33 15 Claims



1. Apparatus for transitioning between a circular coaxial transmission line and a coplanar waveguide (CPW) transmission line, the coaxial transmission line including a center conductor, an outer conductive shield member and a dielectric spacing the center conductor from the outer shield member, the CPW line including a center conductor strip and first and second ground plane conductors spaced from and sandwiching the center strip on a dielectric substrate, the apparatus comprising: coaxial connector interface apparatus for connection to said coaxial transmission line, said coaxial interface apparatus including a coaxial interface center conductor and an outer conductive shield spaced from said coaxial interface center conductor by a dielectric;
- a slabline transmission line section comprising a slabline conductor suspended within an elongated dielectric-filled slabline cavity defined by a conductive slabline outer shield, said shield electrically connected to said outer conductive shield of said coaxial interface apparatus, said slabline conductor in alignment with and electrically connected to said coaxial interface center conductor, said cavity having a cross-sectional elongated dimension in a direction transverse to said CPW substrate and a cross-sectional narrow dimension in a direction aligned with a plane of said CPW substrate; and connection apparatus for electrically connecting said slabline conductor to said center CPW strip and for electrically connecting said slabline outer shield to said first and second ground plane conductor strips, whereby said slabline transmission line section serves as an intermediate transmission line segment between said coaxial interface apparatus and said CPW line to shape the electric field distribution so as to provide a field transition between a coaxial line electric field distribution and a CPW line electric field distribution.

5,570,069

**BROADBAND DIRECTIONAL COUPLER**

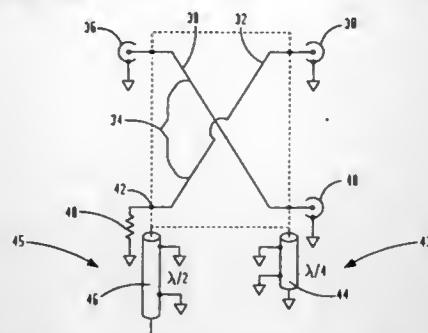
Earnest A. Franke, Largo, Fla., assignor to E-Systems, Inc.,  
Dallas, Tex.

Continuation of Ser. No. 235,922, May 2, 1994, abandoned.  
This application Jun. 7, 1995, Ser. No. 486,381

Int. Cl.<sup>6</sup> H01P 5/18

U.S. Cl. 333—115

12 Claims



1. A compensated backward-wave broadband directional coupler comprising:

- a first transmission line defining an input port and having a thru port on one side of the coupler;
- a second transmission line defining a coupled port and an isolation port and positioned adjacent to the first transmission line, the isolation port on a side of the coupler opposite from the thru port, whereby a signal propagating along the first transmission line induces a coupled signal for propagation along the second transmission line;
- a quarter-wave, short circuited transmission line coupled to the thru port of the first transmission line; and
- a half-wave, open circuited transmission line coupled to the isolation port of the second transmission line said quarter-wave transmission line and said half-wave transmission line coupled to opposite sides of the coupler thereby increasing the operating bandwidth of the directional coupler.

5,570,070

**METHOD OF ADJUSTING A FREQUENCY RESPONSE IN A LADDER-TYPE ELECTRIC FILTER**

Tatsuo Ogawa, and Junji Kawai, both of Nagoya, Japan,  
assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Division of Ser. No. 161,423, Dec. 6, 1993, Pat. No. 5,426,401.

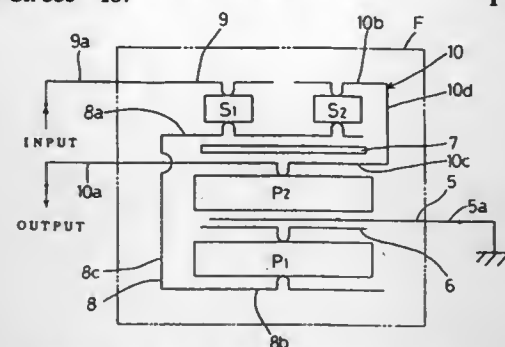
This application Mar. 6, 1995, Ser. No. 399,212

Claims priority, application Japan, Dec. 4, 1992, 4-350862

Int. Cl.<sup>6</sup> H03H 9/205; 9/58

U.S. Cl. 333—187

1 Claim



1. A ladder type electric filter comprising a pair of parallel resonators superimposed with each other, a pair of rectangular series resonators juxtaposed on the upper one of said paired parallel resonators, terminal means for connecting said parallel and series resonators to form a predetermined filter circuit unit, and a casing for containing said parallel and series resonators and terminal means.

5,570,071

**SUPPORTING OF A HELIX RESONATOR**

Kimmo A. Ervasti, Oulunsalo, Finland, assignor to  
LK-Products Oy, Kempele, Finland

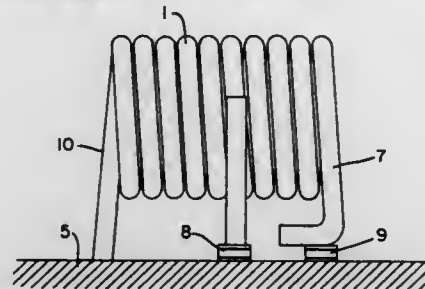
Filed Oct. 23, 1992, Ser. No. 146,037

Claims priority, application Finland, May 4, 1990, 902264

Int. Cl.<sup>6</sup> H01P 7/00

U.S. Cl. 333—219

16 Claims



1. A supporting arrangement for a helix resonator of a type having a resonator coil defining an axis therethrough, where the resonator coil is spaced from an installation plate and the axis of the coil is mainly parallel with the surface of the plate and at least one loop of the coil is provided with a protruding part wherein the resonator coil is fastened from the protruding part to a surface of a small insulation piece and an opposite surface of the insulation piece is fastened to the installation plate.

5,570,072

**METHOD OF ESTABLISHING A RELAY CONTACT ARRANGEMENT**

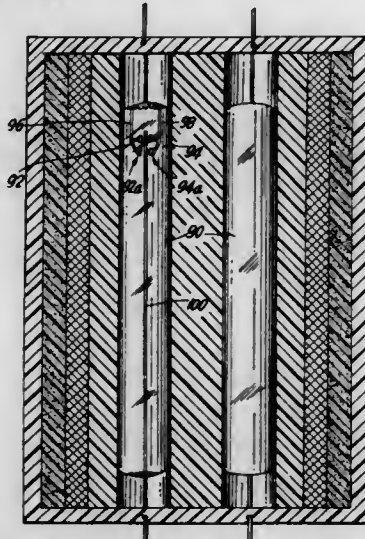
George King, Pompano Beach, Fla., assignor to Siemens  
Stromberg-Carlson, Boca Raton, Fla.

Filed Jan. 3, 1995, Ser. No. 367,657

Int. Cl.<sup>6</sup> H01H 1/66

U.S. Cl. 335—154

10 Claims



1. A method of establishing a contact arrangement for a reed switch that reduces the separation of the contact ends of the fixed contact and the armature contact during switch operation, comprising the steps of:

- a. providing a respective contact with a contact end that has multiple prongs;
- b. positioning the contacts so that the prongs of the respective contact surround the contact end of the other contact, said prongs being formed to surround the contact end in a predetermined geometric arrangement;
- c. adjusting the armature contact to be in a rest position; and
- d. adjusting the contacts so that certain of the prongs make contact with the contact end of the other contact when the armature contact moves from the rest position during switch operation.

operation and certain of the prongs provide multi-planar contact surfaces for the contact end of the other contact in the event that the armature contact and the fixed contact prematurely separate during switch operation.

5,570,073

**NMR SLICE COIL**

Wolfgang Müller, Karlsruhe, Germany, assignor to Bruker  
Analytische Messtechnik GmbH, Rheinstetten, Germany

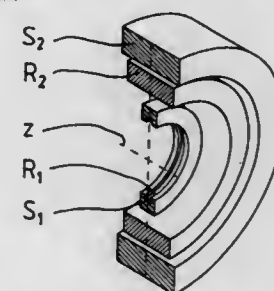
Filed Apr. 13, 1995, Ser. No. 421,071

Claims priority, application Germany, Jul. 13, 1994, 44 24 580.7

Int. Cl.<sup>6</sup> H01F 7/22; 7/06

U.S. Cl. 335—299

5 Claims



3. A magnet system for producing, in an investigational volume, a homogeneous magnetic field directed along a z-axis, the system comprising:

- a first field producing magnet coil located in a middle plane perpendicular to the z-axis, the middle plane passing through the investigational volume;
- a second field producing magnet coil, generally concentric and coplanar with the first magnet coil and electrically connected therewith to have a first current flow in the first magnet coil directed in a same direction as a second current flow through the second magnet coil; and
- a first ferromagnetic ring generally concentric and coplanar with the first and second magnet coils, wherein the first magnet coil is a resistive magnet coil.

5,570,074

**VERY LOW LEAKAGE INDUCTANCE, SINGLE-LAMINATE TRANSFORMER**

Robert L. Steigerwald, Burnt Hills; Alexander J. Yerman,  
Scotia, and Waseem A. Roshen, Clifton Park, all of N.Y.,  
assignors to General Electric Company, Schenectady, N.Y.

Filed May 30, 1995, Ser. No. 453,229

Int. Cl.<sup>6</sup> H01F 27/30

U.S. Cl. 336—83

8 Claims

- 1. A transformer, comprising an elongate dielectric laminate having two surfaces, a primary winding disposed on and extending substantially the length of said laminate, said primary winding having a pattern conformal to said laminate, said laminate having a secondary winding disposed on the other surface thereof, said laminate comprising corresponding sections on said two surfaces, each section having a length corresponding to the length of a winding turn, said secondary winding comprising at least two patterned conductive films spatially separated on said laminate, each of the conductive films of said secondary winding occupying substantially the length of a section;
- a dielectric layer situated adjacent to said laminate;
- said laminate, said windings and said dielectric layer comprising a barrel-wound configuration of interleaved winding layers with a dielectric layer between each of said winding layers, said transformer having a predetermined ratio of primary winding turns to secondary winding turns and a predetermined leakage inductance;



said laminate, said windings and said dielectric layer being situated in a magnetic core.

5,570,075

**COIL FORMER WITH INJECTION-MOLDED ENCAPSULATION**

Erwin Krimmer, Pluederhausen; Richard Lorenz, Marbach;  
Tilman Miehle, Kernen, and Steffen Schumacher, Rennin-  
gen, all of Germany, assignors to Robert Bosch GmbH,  
Stuttgart, Germany

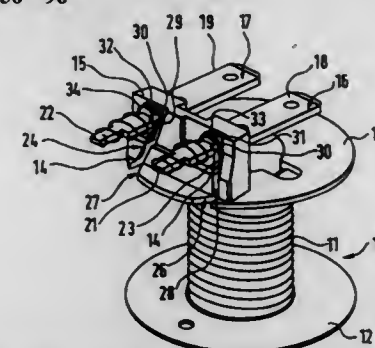
Filed Jun. 7, 1995, Ser. No. 483,397

Claims priority, application Germany, May 8, 1994, 44 27 767.9

Int. Cl.<sup>6</sup> H01F 15/10; 27/30

U.S. Cl. 336—96

4 Claims



1. A coil former with injection-molded encapsulation, comprising a coil core having a substantially vertical axis; at least one layer of a coil wire wound around said coil core; a flange connected with said coil core; a top fitting arranged above said coil core on said flange and having connection plugs which are connected to said coil wire in an electrically conductive way; groove-shaped coil wire guides formed between said connection plugs and said coil core, said coil wire guides being formed linearly in said top fitting and extending substantially perpendicular to said flange and in an axial direction of said coil core; a housing surrounding said coil core with said flange and said fitting and being composed of plastic material; and semicylindrical winding guides assigned to said connection plugs and arranged as extensions of said coil wire guides above said connection plugs.



5,570,076

## VARIABLE RESISTANCE DEVICE

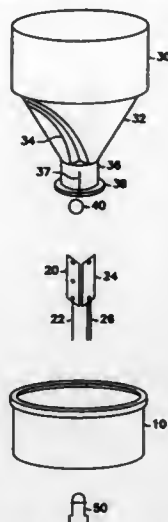
Bruce L. Erickson, 11732 Winnetka Ave. N., Champlin, Minn. 55316, and Alan H. Stull, 14963 Nowthen Blvd., Ramsey, Minn. 55303

Filed Jul. 18, 1994, Ser. No. 276,536

Int. Cl.<sup>6</sup> H01C 10/32

U.S. Cl. 338—163

14 Claims



7. A device for providing variable electrical resistance comprising:

- a base having a non-planar top surface including a curved surface portion;
- a retainer located directly above the top surface of the base, the retainer having a non-planar bottom surface including a curved surface portion that conforms to the shape of the non-planar top surface of the base, the retainer rotating about the center of the base;
- a first channel located in the curved surface portion of the top surface of the base and a second channel located in the curved surface portion of the bottom surface of the retainer, the first and second channels extending from proximate a center of the device towards a periphery of the device, said first channel being formed along a substantially straight line extending substantially radially from the center of the base, and the second channel being formed along a curved line extending from the center of the retainer towards the periphery of the retainer;
- a resistive element located along the first channel;
- a conductive element located along one of the first and second channels; the conductive element being insulated from the resistive element; and
- a conductive ball located within the first and second channels, the ball being in contact with each of the resistive and conductive elements, whereby the conductive ball moves along the first and second channels as the base and retainer are rotated relative to each other to provide a predetermined variable resistance based on the position of the conductive ball along the resistive element.

5,570,077

## AMBIENT CONDITION DETECTOR WITH HIGH INTENSITY STROBE LIGHT

Michael A. Swiebeda, Naperville, Ill., assignor to BRK Brands, Inc., Aurora, Ill.

Continuation of Ser. No. 65,222, May 20, 1993, abandoned.

This application Apr. 21, 1995, Ser. No. 426,216

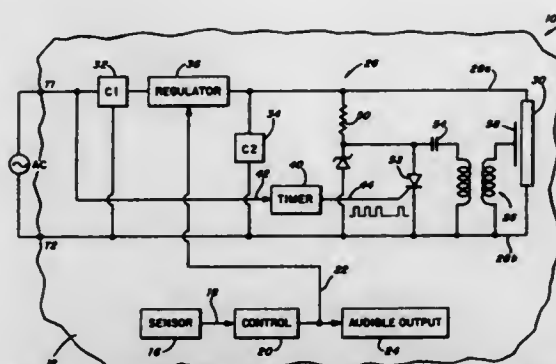
Int. Cl.<sup>6</sup> G08B 5/00

U.S. Cl. 340—331

10 Claims

1. An ambient condition detector with a visual output comprising:

- a housing;
- a condition sensor carried on said housing;



a control circuit coupled to said sensor wherein said circuit provides a control electrical signal on a selected output line indicative of a predetermined sensed, ambient condition;

a high intensity visual output device carried by said housing;

a drive circuit coupled to said control circuit and to said visual output device wherein said drive circuit includes a first energy storage device operatively connected to an AC power supply and a second energy storage device with a regulator circuit coupled therebetween, wherein said regulator circuit is coupled to said output line and wherein said regulator circuit is enabled by said control signal thereby fully charging said second storage device with sufficient energy to energize said high intensity output device at spaced apart time intervals thereby providing a high intensity indicium of said predetermined condition, said drive circuit including a digital timer for establishing said time intervals, wherein said visual output device is coupled across said second storage device and said second storage device is not fully charged absent said control signal that enables said regulator circuit.

5,570,078

## BRAKE SYSTEM FOR PREVENTING UNAUTHORIZED USE OF VEHICLE

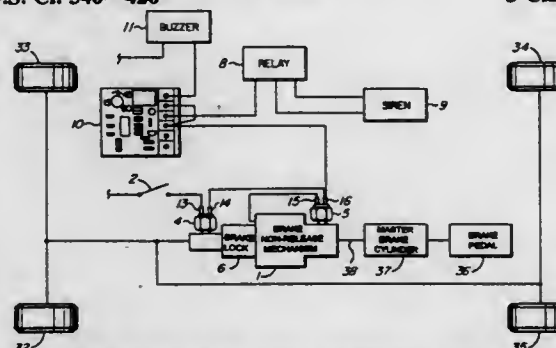
Albert Wayenberg, 960 - 355 Burrard St., Vancouver, B.C., Canada

Filed Jan. 3, 1995, Ser. No. 368,298

Int. Cl.<sup>6</sup> B60R 25/10

U.S. Cl. 340—426

3 Claims



1. A brake system for preventing unauthorized use of a vehicle comprising a brake non-release mechanism activated by a combination of an alarm arming switch and increased fluid pressure from a master brake cylinder within a braking system of the vehicle, comprising:

- a low pressure switch in the braking system located between the non-release mechanism and the brakes of the vehicle, the low pressure switch having a first electrical contact that receives electrical power when the brake system is armed and that trips upon a threshold of brake fluid pressure and provides power to a second electrical contact that is electrically connected to a hydraulic brake lock in the brake non-release mechanism;
- a second pressure switch in the hydraulic brake lock, having a third electrical contact connected by electrical wire to the second electrical contact, and providing power to activate a

solenoid in the hydraulic brake lock when the second pressure switch senses brake fluid pressure from the application of a brake pedal in the vehicle and cutting power, thereby deactivating the solenoid, when there is no such brake fluid pressure sensed.

5,570,079

## HOME SECURITY SYSTEM FOR DETECTING AN INTRUSION INTO A MONITORED AREA BY AN INFRARED DETECTOR

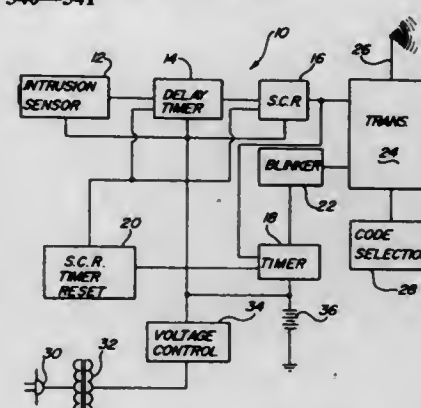
Devan Dockery, Rte. 8, Box 14, Defuniak Springs, Fla. 32433

Filed Apr. 24, 1995, Ser. No. 427,433

Int. Cl.<sup>6</sup> G08B 13/19

U.S. Cl. 340—541

19 Claims



1. A security system for a home comprising:

- a free standing intrusion detector to be set in an area of said home to be protected, said free standing intrusion detector comprising:
- an intrusion detector to generate an intrusion signal in response to an intrusion into said area;
- a radio signalling transmitter responsive to said intrusion signal to transmit a radio signal;
- means for modulating said radio signal for a predetermined time in response to said intrusion signal; and
- time delay means for delaying the actuation of said intrusion detector to allow a person sufficient time to exit said area to be protected after setting said intrusion detector; and
- a portable receiver adapted to be hand carried comprising:
- means for generating an output signal in response to said radio signal; and
- display means for generating a visual display indicating an intrusion has occurred in response to said output signal.

5,570,080

## THEFT PREVENTION TAB DEVICE HAVING ALARM MECHANISM HOUSED THEREIN

Toshio Inoue, 9-8, Maikozaka 4-chome, Tarumi-ku, Kobe-shi, Hyogo, and Tadashi Asada, Hyogo, both of Japan, assignors to Toshio Inoue, Hyogo, Japan

Continuation-in-part of Ser. No. 51,295, Apr. 23, 1993, abandoned. This application Oct. 28, 1994, Ser. No. 330,553

Claims priority, application Japan, Apr. 24, 1992, 4-106693; Mar. 11, 1993, 5-050786; May 24, 1994, 6-109668

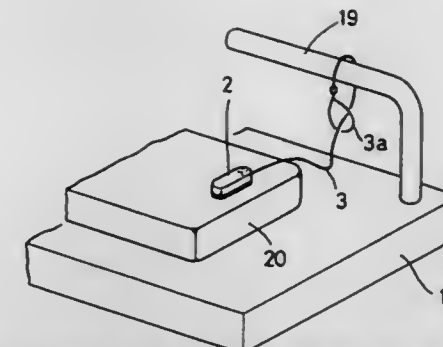
Int. Cl.<sup>6</sup> G08B 13/14

U.S. Cl. 340—571

10 Claims

1. A tag device comprising:

- a case;
- a fastener for fastening said case to a piece of merchandise;
- a limit switch having a plunger movable into and out of said case, said limit switch being in a first switch state when said plunger protrudes from said case and being in a second switch state when said plunger is pushed into said case when fastened to said piece of merchandise by coming into contact with the piece of merchandise;



a wire extending from said case for fastening said case to a fixed member;

a detecting means for detecting that said wire has been cut;

an alarm means for activating an alarm when said plunger of said limit switch protrudes from said case after having been pushed into said case by coming into contact with the piece of merchandise, and for also activating the alarm when said detecting means detects that said wire has been cut;

a small battery for powering said alarm means; and

an on/off switch for turning on and off said alarm means; wherein said limit switch, said detecting means, said alarm means, said small battery, and said on/off switch are all housed in said case.

5,570,081

## LOST ARTICLE TRACKING SYSTEM

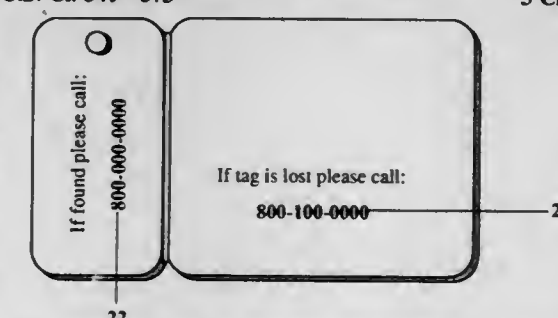
Stephen L. Holstrom, 93490 Paruso Point, San Diego, Calif. 92129

Filed Nov. 2, 1994, Ser. No. 333,228

Int. Cl.<sup>6</sup> G08B 23/00

U.S. Cl. 340—573

3 Claims



1. A method for an owner to track lost articles, comprising the steps of:

- snapping apart a two-piece card to provide a tag piece and a base piece, with each piece having affixed thereto a common, predetermined identification number and a common, predetermined telephone number;
- attaching the tag piece to an article via a through-hole in the tag piece, the base piece being carried by the owner;
- affixing a message to the tag piece so as to prompt a finder of the article carrying the tag piece to telephonically call said predetermined telephone number;
- connecting said call to a computer-generated voice mail box system whereupon said finder is telephonically prompted to enter said predetermined identification number affixed to said tag piece;
- in response to said predetermined identification number being entered by said finder, telephonically prompting said finder to leave a voice message specifying a phone number or location where said finder can be reached so as to recover said article;
- connecting a telephonic call to said predetermined telephone number made by said owner to said computer-generated voice mail box system, and telephonically prompting said owner to enter said predetermined identification number affixed to said base piece, and

g. in response to said predetermined identification number being entered by said owner, playing back said finder voice message if any such message is present.

5,570,082

## REMOTE WETNESS SENSOR FOR DIAPERS

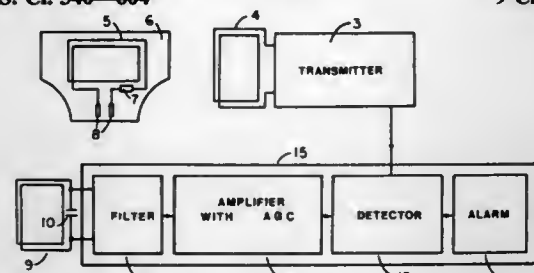
Nasser Mahgerefteh, 21101 Shaw La., Huntington Beach, Calif. 92646, and Israel D. Schleicher, 10901 Bahia Ct., Bakersfield, Calif. 93311

Filed Oct. 13, 1995, Ser. No. 542,723

Int. Cl.<sup>6</sup> G08B 21/00

U.S. Cl. 340-604

9 Claims



1. A device which is included in the lining of a diaper, that upon a set condition in the diaper generates harmonic frequencies of a background electromagnetic field produced by a remotely located transmitter, the harmonic frequency detectable by a remotely located receiver which also activates an alarm to call the attention of a caretaker, the device comprises:

an antenna coupled to a nonlinear electrical device via a set of two parallel electrodes, said electrodes embedded in the lining of the diaper in an area likely to experience wetness and adapted to provide substantially stronger coupling between said antenna and said nonlinear device when subjected to wetness.

5,570,083

## DOOR BELL/ANSWERING SYSTEM

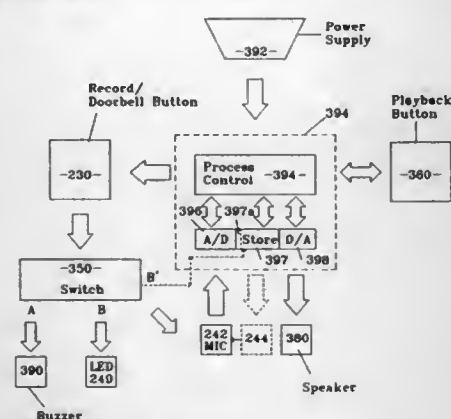
Lee A. Johnson, 2515 Crestline Ct., Lawrence, Kans. 66047

Filed May 2, 1995, Ser. No. 434,351

Int. Cl.<sup>6</sup> G08B 25/08

U.S. Cl. 340-692

7 Claims



1. A door bell system comprising:

a first housing;  
means for mounting said first housing to an exterior surface of a building adjacent a building entrance;  
a second housing;  
means for mounting said second housing to an interior surface of a building at an entrance position;  
an electronic circuit within said first and second housings and including:  
a biased button extending from said first housing;

an LED extending through said first housing;  
a microphone in said first housing;  
a speech module assembly in said second housing for recording and playback of a selected message;  
a biased button extending from said second housing;  
a buzzer in said second housing;  
a speaker in said second housing;  
a power source in said second housing for energizing said circuitry;  
switch means in said second housing for selectively connecting said circuitry with either said buzzer or said speech module whereupon depression of said button in said first housing will either energize said buzzer or said LED; and  
indicia associated with said first housing whereby said energized LED urges a user to speak into said microphone and record a message in said speech module assembly.

5,570,084

## METHOD OF LOOSE SOURCE ROUTING OVER DISPARATE NETWORK TYPES IN A PACKET COMMUNICATION NETWORK

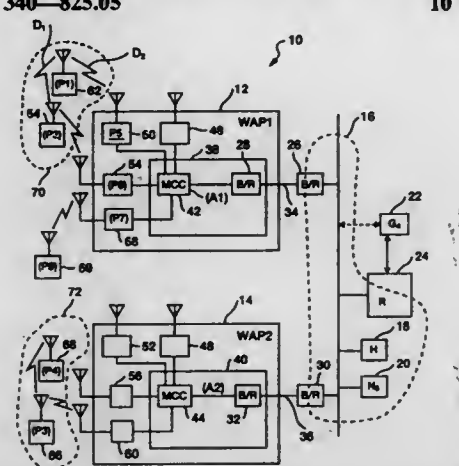
Michael W. Ritter, Los Altos; John Bettendorf, San Jose; George H. Flammer, III, Cupertino, and Brett D. Galloway, Campbell, all of Calif., assignors to Metricom, Inc., Los Gatos, Calif.

Filed Jun. 28, 1994, Ser. No. 268,765

Int. Cl.<sup>6</sup> H04Q 3/00; H04J 3/24

U.S. Cl. 340-825.05

10 Claims



1. A method for digital packet communication between nodes in disparate networks including path unaware network layer types and path aware network layer types, said method comprising:

- receiving a typed encapsulating packet which encapsulates a path-addressed packet at a first network layer, said first network layer being path aware;
- directing the encapsulating packet to a path router;
- determining by testing for type at said path router whether said typed encapsulating packet should be passed to a second network layer or to an application and whether said second network layer is path aware or path unaware; and
- passing said encapsulating packet to the application if said encapsulating packet is addressed to said application, or passing said encapsulating packet to said second network layer if not so addressed by routing said encapsulating packet according to a path unaware protocol if said second network layer is path unaware; otherwise routing said encapsulating packet according to a path aware protocol if said second network layer is path aware.

5,570,085

## PROGRAMMABLE DISTRIBUTED APPLIANCE CONTROL SYSTEM

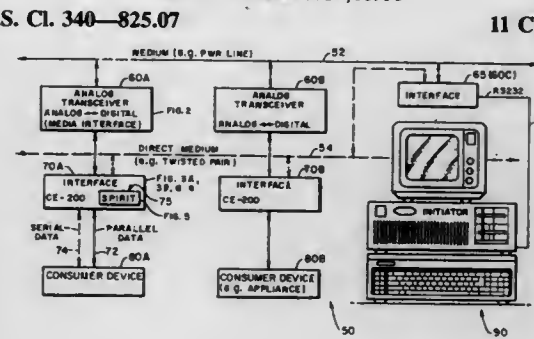
Ludo A. Bertsch, Victoria, Canada, assignor to Ludo Arden Bertsch, British Columbia, Canada

Continuation of Ser. No. 826,654, Jan. 21, 1992, abandoned, which is a continuation of Ser. No. 660,924, Feb. 27, 1991, abandoned, which is a continuation of Ser. No. 361,853, Jun. 2, 1989, abandoned. This application Nov. 22, 1994, Ser. No. 343,612

Int. Cl.<sup>6</sup> G06F 9/24; 13/10

U.S. Cl. 340-825.07

11 Claims



1. For use with plural consumer devices, a remotely configurable consumer device distributed interface system, comprising:

- a communications medium;
- plural medium interfaces each comprising a memory, each of said consumer devices connected to said communications medium via a respective one of said plural medium interfaces to provide control of said consumer devices in response to selected signals provided on said communications medium according to a program stored in said memory of said respective medium interface; and
- a medium interface control unit in removable communication with said plural medium interfaces, said medium interface control unit providing customization signals to said plural medium interfaces to thereby select predetermined functions of said plural medium interfaces according to said program stored in said memory of each of said plural medium interfaces,

said distributed interface system functioning without a central control unit and wherein

once said customization signals are provided to said plural medium interfaces by said medium interface control unit, said medium interface control unit is thereafter removable from said distributed interface system, said plural medium interfaces retain said predetermined functions selected by said customization signals once said medium interface control unit is removed from said distributed interface system, and each of said plural medium interfaces transmits and receives command and status signals with at least one other of said plural medium interfaces once said medium interface control unit is removed from said distributed interface system

wherein said medium interface control unit includes:

an address and command unit providing at least one of customized interface address command and command response signals, wherein each of said plural medium interfaces assumes an address corresponding to said address provided by said address and command unit, and each of said plural medium interfaces assumes functions corresponding to said command and command response signals provided by said address and command unit.

5,570,086

## DATA CARRIER SYSTEM

Tadashi Hanaoka, Koganei, and Haruhiko Higuchi, Tokorozawa, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/00200, § 371 Date Oct. 15, 1993, § 102(e) Date Oct. 15, 1993, PCT Pub. No. WO93/16444, PCT Pub. Date Aug. 19, 1993

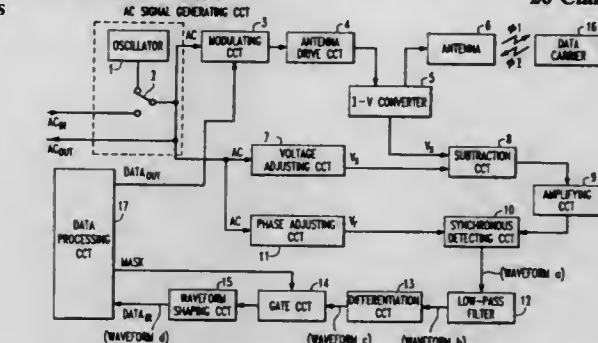
PCT Filed Feb. 18, 1993, Ser. No. 137,017

Claims priority, application Japan, Feb. 18, 1992, 4-060917; Jul. 24, 1992, 4-057444 U

Int. Cl.<sup>6</sup> H04L 7/033; H04Q 9/04; G08B 7/06

U.S. Cl. 340-825.54

26 Claims



1. A data carrier system in an automatic management system comprising:

- a plurality of adjacent fixed facilities each having a constant two-way communication area;
  - a data carrier for carrying out a two-way communication with a selected one of the plurality of adjacent fixed facilities; and
  - selective detecting means installed in each of the plurality of adjacent fixed facilities for detecting the data signal from the data carrier;
- the selected one of the plurality of fixed facilities recognizing stored data of a data carrier present in the constant communication area after receiving a data signal induced by an AC magnetic field generated by the data carrier present in the constant communication area of the fixed facilities, and the selected one of the plurality of fixed facilities rewriting the stored data of the data carrier by transmitting to the data carrier a rewriting signal induced by the AC magnetic field; the selective detecting means detecting the data signal by discriminating the data signal induced by the AC magnetic field generated by the data carrier, from the data signals induced by the AC magnetic fields from the fixed facilities other than the selected one of the plurality of fixed facilities.

5,570,087

## MOTOR VEHICLE PERFORMANCE MONITOR AND METHOD

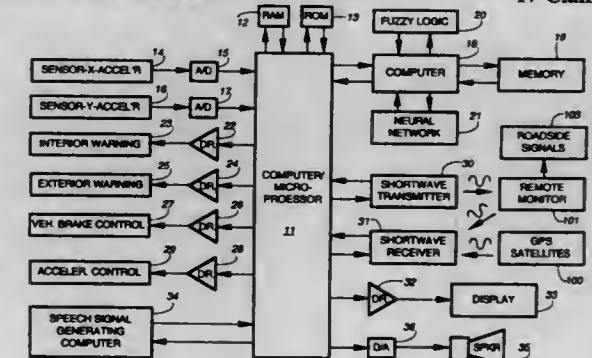
Jerome H. Lemelson, Suite 286, Unit 802, 930 Tahoe Blvd., Incline Village, Nev. 89451-9436

Filed Feb. 18, 1994, Ser. No. 198,621

Int. Cl.<sup>6</sup> B60Q 1/08

U.S. Cl. 340-870.05

17 Claims





1. A system for monitoring the performance and movements of a motor vehicle comprising:

a sensing module for sensing the vehicle's instantaneous acceleration in at least two directions and generating coded signals in accordance therewith;

a computer for computing performance variables of the vehicle from the coded signals generated by the sensing module and storing coded representations of said performance variables in select locations of a memory along with associated time and date codes;

a short wave transmitter/receiver interfaced to said computer for transmitting and receiving radio signals to and from a remote monitor station;

wherein said computer is programmed to control the transmission to a remote monitor station of radio signals modulated with digital information corresponding to the stored performance variables;

a receiver interfaced to said computer for receiving signals from a satellite global positioning system, wherein said computer is programmed to calculate the global position of the vehicle from the satellite signals and store a coded representation of same in a select memory location;

wherein said computer is programmed to analyze the stored performance variables over a period of time, compute an evaluation code corresponding to an assessment as to how the vehicle is being driven, store said evaluation code in a select location in memory, and to warn a driver of the vehicle when an evaluation code is computed which corresponds to an hazardous driving pattern; and

controllers for controlling the speed of the vehicle, said controllers being activated in response to the detection of a hazardous driving pattern.

5,570,088

# FORMAT SIGNAL CONVERTER USING DUMMY SAMPLES

Charles W. Rhodes, Edgewater, Md., assignor to Advanced Television Test Center, Inc., Alexandria, Va.

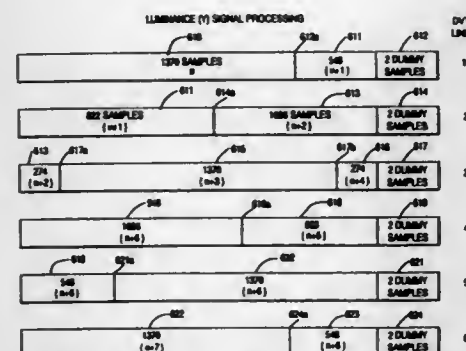
Division of Ser. No. 404,190, Sep. 7, 1989, Pat. No. 5,280,397.

This application Nov. 24, 1993, Ser. No. 156,832

Int. Cl.<sup>6</sup> H04N 5/782

U.S. Cl. 341—50

16 Claims



1. An apparatus for converting an input signal having a specified format into a digital signal having a pre-existing digital format, both the specified and pre-existing digital formats being orthogonal in structure and having lines and fields, comprising:

means for extracting from the input signal an active data portion according to the specified format to generate a digital data stream of active samples; and

means for inserting into the digital data stream dummy samples to generate the digital signal, the number of dummy samples being a function of the relationship of the specified format and the pre-existing digital format.

## METHOD AND APPARATUS FOR PROVIDING DATA STREAM FOR COST EFFECTIVE TRANSMISSION LINKS

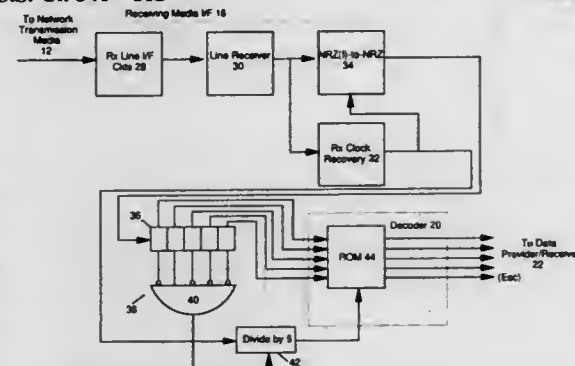
Lee C. Haas, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 16, 1994, Ser. No. 197,090

Int. Cl.<sup>6</sup> H04L 25/49; G11B 11/00

U.S. Cl. 341—102

2 Claims



1. A method of converting from a first code set to a second code set comprising the steps of:

grouping said first code set into groups of a non-data bit and n bits;

converting each group of n bits into a corresponding group of n+a bits, where each group of n+a bits is selected from 2<sup>n+a</sup> options, where each selected group of n+a bits has the characteristic of having a disparity of less than or equal to 1, and where at least one selected Group of n+a bits has comma property; and

converting said non-data bit into a corresponding group of n+a bits.

5,570,090

# DAC WITH DIGITALLY-PROGRAMMABLE GAIN AND SYNC LEVEL GENERATION

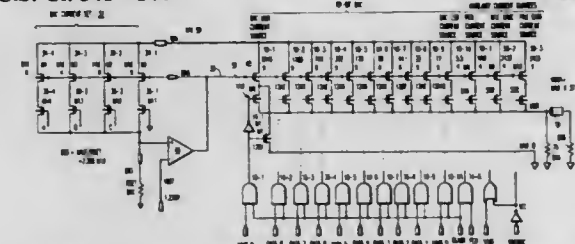
Timothy J. Cummins, Cratloe, Ireland, assignor to Analog Devices, Incorporated, Norwood, Mass.

Filed May 23, 1994, Ser. No. 247,263

Int. Cl.<sup>6</sup> H03M 1/66

U.S. Cl. 341—144

23 Claims



1. A D/A converter for use in controlling a CRT display, said converter comprising:

a plurality of MOS current sources for producing currents of magnitude responsive to the voltage on the MOS gate; means connecting the gates of said current sources to a common bias line;

means for selectively activating said current sources in accordance with a digital input signal to produce a composite output signal representing the activated current sources; and control means for setting the voltage of said common bias line so as to set correspondingly the full-scale output of said D/A converter;

said control means comprising means responsive to a digital control signal;

said converter further including at least one auxiliary MOS current source having its gate connected to said common gate bias line;

the current flow through said auxiliary current source setting the level of the output of said converter for controlling an operating function of said CRT.

5,570,091

# ANALOG-TO-DIGITAL CONVERTER

Masao Noro, and Takayuki Kohdaka, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

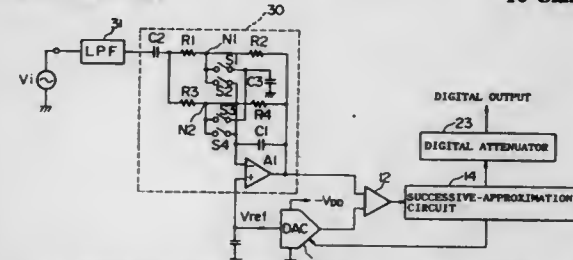
Filed Sep. 21, 1994, Ser. No. 310,283

Claims priority, application Japan, Sep. 21, 1993, 5-257736; Oct. 25, 1993, 5-288624

Int. Cl.<sup>6</sup> H03M 1/38; 1/12

U.S. Cl. 341—161

16 Claims



1. An analog-to-digital converter for receiving an analog input and producing an N-bit digital output, the analog-to-digital converter comprising:

reference-voltage generating means for generating a reference voltage whose level is successively altered;

first and second switches which are alternately turned on, the reference voltage being transmitted through the first switch and an analog-input voltage, corresponding to the analog input to be converted, being transmitted through the second switch; and

comparing means for comparing the reference voltage and the analog-input voltage, which are alternately supplied thereto through the first and second switches, so as to determine a bit in the digital output produced by converting the analog input; the comparing means at least comprising a capacitor and a parallel circuit consisting of an inverter and a third switch, wherein one terminal of the capacitor is commonly connected to the first and second switches, while another terminal of the capacitor is connected to the parallel circuit, and a capacitance of the capacitor is changed in response to an input voltage to the capacitor.

5,570,092

# REDUCTION OF SCATTER FROM MATERIAL DISCONTINUITIES

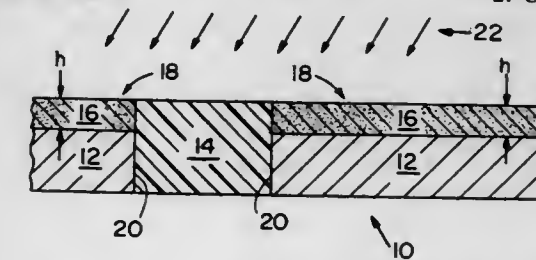
Margaret Kohin-Nitschelm, North Billerica, Mass., assignor to Hughes Danbury Optical Systems, Inc., Danbury, Conn.

Filed Apr. 11, 1994, Ser. No. 225,745

Int. Cl.<sup>6</sup> H01Q 17/00

U.S. Cl. 342—1

27 Claims



1. A method of reducing scatter of electromagnetic radiation within a range of frequencies from objects, which scatter occurs at the interface between object media having different surface impedances, comprising the steps of: forming a step discontinuity at an

interface, said step discontinuity having a height and containing a material, and selecting the height of the step and the composition of the material, such that the difference between imaginary parts of the surface impedance of the two media is minimized over the range of frequencies.

5,570,093

# POLICE TRAFFIC RADAR USING ABSOLUTE SIGNAL STRENGTH INFORMATION TO IMPROVE TARGET SIGNAL PROCESSING ACCURACY

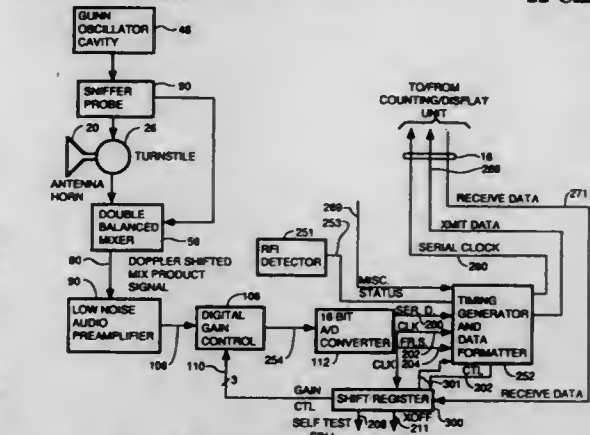
John L. Aker, Kansas City, Mo.; Robert S. Gammenthaler, Princeton, and Alan B. Mead, Plano, both of Tex., assignors to Applied Concepts, Inc., Plano, Tex.

Filed Feb. 10, 1995, Ser. No. 386,552

Int. Cl.<sup>6</sup> G01S 13/58

U.S. Cl. 342—104

22 Claims



$$T=A \times 10^{(G/10)}$$

where

T=true power of the spectral line having the highest apparent power

A=apparent power or a function of the apparent power of the spectral component

G=the gain adjustment established by said gain control signal, said computer also programmed to eliminate said patrol speed candidate's spectral component from further processing to calculate patrol speed if said true power thereof is unacceptably low, but if the signal power of said patrol speed candidate spectral component is acceptable, said computer programmed to calculate the patrol speed from said selected patrol speed spectral component.

### 5,570,094 THREE DIMENSIONAL TRACKING BY ARRAY DOPPLER RADAR

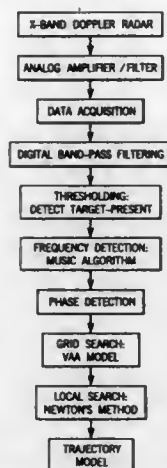
Brian S. R. Armstrong, 4107 N. Prospect Ave., Shorewood, Wis. 53211

Filed Oct. 10, 1995, Ser. No. 541,413

Int. Cl.<sup>6</sup> G01S 13/72

U.S. Cl. 342-107

3 Claims



1. A method of determining position, velocity, and acceleration of a moving target consisting of analyzing the phase angle of Doppler signals detected at three or more distinct points in space comprising:

- Representing the target motion in the velocity plus parallel acceleration plus perpendicular acceleration (VAA) model;
- Performing a search in the three dimensional space of possible velocities and parallel and perpendicular accelerations for the parameters which best fit the detected phase angles;
- Transforming the VAA model representation into a position, velocity, and acceleration model representation; and
- Determining the position, velocity, and acceleration of the moving target by optimizing the position velocity and acceleration model parameters to best fit the motion model to the detected phase angles.

### 5,570,095 AUTOMATIC DEPENDENT SURVEILLANCE AIR NAVIGATION SYSTEM

Paul R. Drouilhet, Jr., Arlington, Va.; George H. Knittel, Shirley, and Vincent A. Orlando, Bedford, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

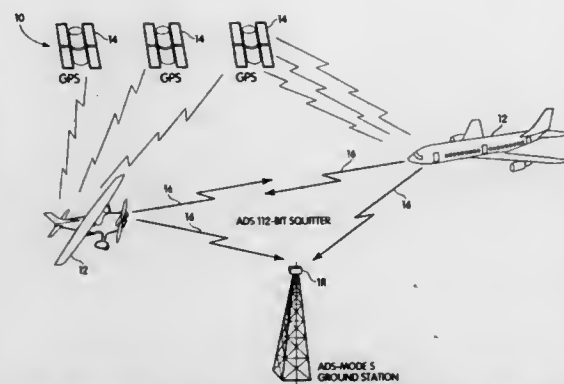
Filed Apr. 1, 1994, Ser. No. 222,633

Int. Cl.<sup>6</sup> G01S 5/02

U.S. Cl. 342-357

13 Claims

1. An automatic dependent surveillance system for tracking aircraft, comprising:



a navigation device for determining the position of an aircraft; a Mode S transponder for transmitting the position of the aircraft, derived from the navigation device, as a squitter on a random time basis having a preset average transmission rate; and

a Mode S receiving station for receiving the Mode S transmission of the aircraft position and for determining the position of the aircraft relative to other aircraft and the ground.

### 5,570,096 METHOD AND SYSTEM FOR TRACKING SATELLITES TO LOCATE UNKNOWN TRANSMITTING ACCURATELY

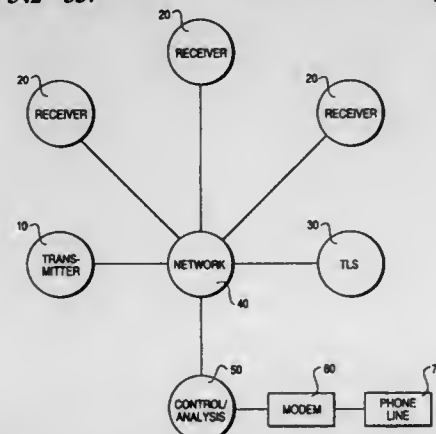
Curtis A. Knight, Washington, D.C., and John C. Webber, Herndon, Va., assignors to Interferometrics, Inc.

Filed Mar. 24, 1995, Ser. No. 410,279

Int. Cl.<sup>6</sup> G01S 5/02

U.S. Cl. 342-357

22 Claims



10. A satellite tracking system for tracking a satellite comprising:

- means for transmitting a tracking signal to the satellite, the transmitting means having a known location;
- means for receiving the tracking signal retransmitted from the satellite, the first receiving means having a known location;
- means for controlling the transmitting means and receiving means; and
- means for determining at least one of a position and velocity of the satellite based upon the received retransmitted tracking signal.

### 5,570,097 RETRANSMITTED GPS INTERFEROMETRIC SYSTEM

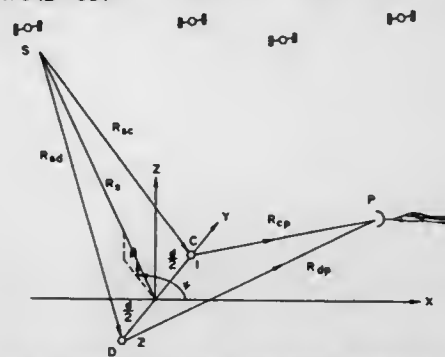
Morton M. Aguado, New York, N.Y., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Aug. 11, 1995, Ser. No. 513,712

Int. Cl.<sup>6</sup> H04B 7/185; G01S 5/02

U.S. Cl. 342-357

13 Claims



1. A retransmitted Ground Positioning System (GPS) using retransmission of a GPS signal, in combination with an interferometer for determining the angular deviations of an aircraft relative to a landing site in both vertical and horizontal planes, using the accumulated phase of the GPS carrier signal, comprising:

- an aircraft and a landing site, wherein a first unit comprising one of the aircraft and the landing site includes a GPS retransmitter for retransmitting GPS signals to a second unit comprising the other of the aircraft and the landing site, which includes a GPS receiver/computer;
- the landing site includes an interferometer comprising two spaced apart GPS antennas mounted on a rotating frame, the plane of rotation of which, is normal to the landing strip.

### 5,570,098 BASE STATION ANTENNA ARRANGEMENT

Jeffrey G. Searle, Galimpton, and Christopher R. Cox, East Portsmouth, both of United Kingdom, assignors to Northern Telecom Limited, Montreal, Canada

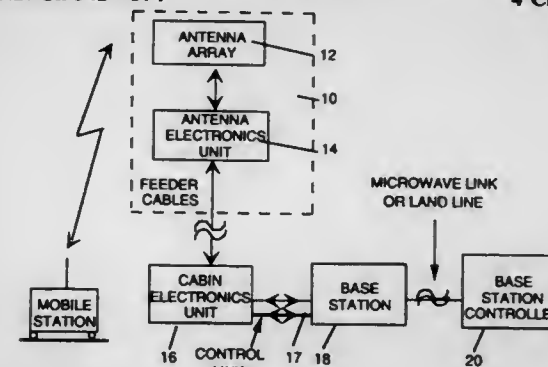
Division of Ser. No. 289,920, Aug. 12, 1994. This application May 16, 1995, Ser. No. 441,780

Claims priority, application United Kingdom, Aug. 12, 1993, 9316827

Int. Cl.<sup>6</sup> H01Q 3/02

U.S. Cl. 342-374

4 Claims



1. A cellular radio communication base station antenna comprising:

- a plurality of layered antenna arrays each capable of forming a multiplicity of separate overlapping narrow beams in azimuth, the arrays being positioned such that the beams of the plurality of arrays provide a coverage in azimuth wider than each array and in which communication link means are provided for communication between the antenna arrays and a base station network whereby, in addition to telecommunications message traffic passing through the antenna, control and

supervisory information can be exchanged between the antenna and the base station network.

### 5,570,099 TDOA/FDOA TECHNIQUE FOR LOCATING A TRANSMITTER

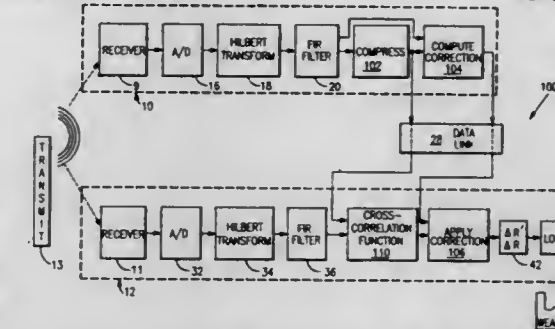
Gerard A. DesJardins, 6 Dorchester Dr., Endicott, N.Y. 13760

Filed Oct. 15, 1993, Ser. No. 138,154

Int. Cl.<sup>6</sup> G01S 3/16; 5/04; 15/00; 3/80

U.S. Cl. 342-378

35 Claims



1. A process for locating a transmitter, said process comprising the steps of:

- receiving at a first receiver a signal transmitted by said transmitter;
- analog to digital converting the signal received by said first receiver to yield a first digital signal;
- compressing the first digital signal or another digital signal derived from said first digital signal;
- receiving at a second receiver the signal transmitted by said transmitter, wherein there is relative motion between said first or second receiver and said transmitter;
- analog to digital converting the signal received by said second receiver to yield a second digital signal;
- transmitting the compressed signal to a cross-correlation unit local to said second receiver and coupled also to receive said second digital signal or another digital signal derived from said second digital signal;
- using said cross-correlation unit to generate and solve a cross-correlation function based on said compressed signal and said second digital signal or other digital signal derived from said second digital signal; and
- determining, locally to said first receiver, correction factors for the solution to the cross-correlation function, and transmitting said correction factors to a correction unit which applies said correction factors to the solution of said cross-correlation function.

### 5,570,100 METHOD FOR PROVIDING A COMMUNICATION UNIT'S ESTIMATED TIME OF ARRIVAL

Gary W. Grube, Palatine; Marc C. Naddell, Schaumburg, and Mark L. Shaughnessy, Algonquin, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 10, 1994, Ser. No. 209,025

Int. Cl.<sup>6</sup> G01S 3/02

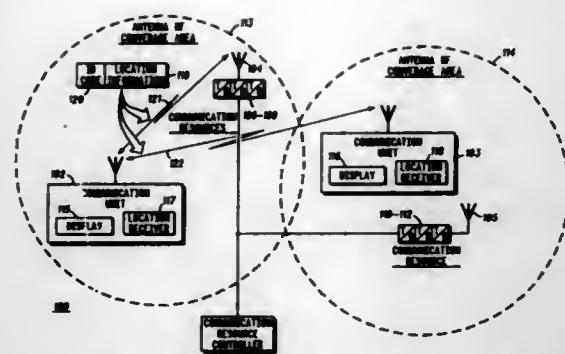
U.S. Cl. 342-457

6 Claims

1. A method for providing estimated time of arrivals of communication units, the method comprising the steps of:

- determining, by a communication resource controller, target coordinates;
- transmitting, by the communication resource controller, the target coordinates to at least two communication units;
- responsive to the target coordinates, transmitting, by each of the at least two communication units, location information;
- upon receiving the location information from each of the at least two communication units, determining, by the commu-





nication resource controller, location and velocity for each of the at least two communication units;

- determining, by the communication resource controller, estimated time of arrivals at the target coordinates for each of the at least two communication units based on the target coordinates and the location and velocity for each of the at least two communication units;
- providing, by the communication resource controller, the estimated time of arrivals and the location and velocity for each of the at least two communication units to the at least two communication units; and
- displaying, by the at least two communication units, the estimated time of arrivals and the location and velocity for each of the at least two communication units.

5,570,101

#### BROADCASTING SET COMPRISING A WIRE-DIPOLE ROTARY ANTENNA AND ROTATING JOINT DESIGNED FOR THIS SET

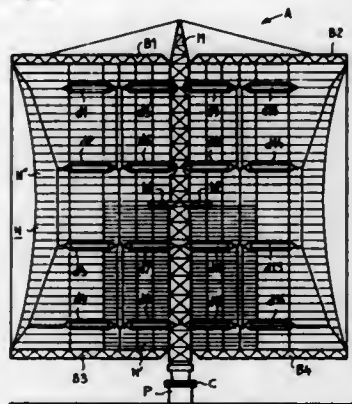
Jean-Marc Martin, St Leu La Foret, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 14, 1994, Ser. No. 322,997

Claims priority, application France, Oct. 15, 1993, 93 12287  
Int. Cl.<sup>6</sup> H01Q 21/12

U.S. Cl. 343—814

4 Claims



1. A broadcasting set formed by transmission means and a rotary antenna, the transmission means comprising two transmitters and supply means for the antenna, the antenna comprising a support with a fixed base, a vertical mast, a bi-coaxial rotating joint positioned between the base and the mast, pairs of horizontal girders positioned in one and the same vertical plane and fixed to the mast at different levels, the lowest pair constituting a platform on either side of the mast,  $m$ , with  $m$  as a positive integer smaller than 83, vertical reflector curtains and  $n$ , with  $n$  as an integer and  $m \leq n < 3$ , parallel vertical curtains of wire dipoles each associated with one of the reflector or curtains, the supply means having two distinct channels whose paths respectively leave the two transmitters, go into the joint, rise within the mast up to the platform where they separate to respectively follow the two beams of the platform to which the channels are respectively fixed, then rise up vertically to the dipoles to respectively supply the dipoles of two distinct

vertical portions of the  $n$  curtains of dipoles, the distinct channels each comprising a symmetrizer in the part of the path where they follow the platform, whereby two simultaneous transmissions are enabled from said rotary antenna.

5,570,102

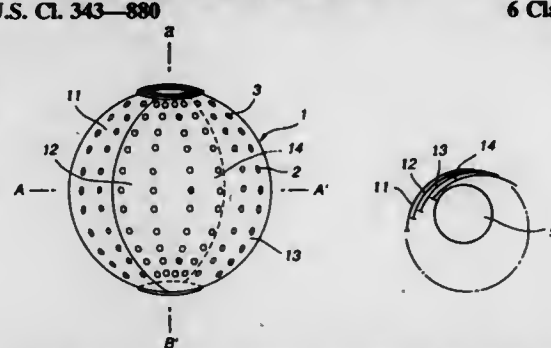
#### ENERGY RECEIVING SATELLITE

Jiro Kochiyama, Koshigaya; Nobuyuki Kaya, c/o Kobe University of No. 1-1, Rokkodai-cho, Nada-ku, Kobe City, Hyogo Prefecture; Teruo Fujiwara, Hoya; Hidenori Yasui, Musashino, and Hiroyuki Yashiro, Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, and Nobuyuki Kaya, Hyogo Prefecture, both of Japan  
Continuation of Ser. No. 201,501, Feb. 24, 1994, abandoned.  
This application Dec. 29, 1995, Ser. No. 580,776

Claims priority, application Japan, Feb. 25, 1993, 5-036629  
Int. Cl.<sup>6</sup> H01Q 1/08

U.S. Cl. 343—880

6 Claims



1. An energy receiving apparatus receivable of an energy signal from an energy transmission apparatus at a remote location, comprising:

- a central compartment;
  - a plurality of movably mounted panels contoured as uniformly sized, longitudinally extending, partial sphere segments;
  - energy signal receiving means including an arrangement of reception antenna elements respectively disposed on an outer surface of each of said panels; and
  - support means attached to an outer side of said central compartment and including extending portions respectively attached to an inner side of each of said panels, said support means enabling movement of said panels commonly around a central longitudinal axis at least between:
- a first position, wherein each longitudinal edge of each panel fully contacts a longitudinal edge of an adjacent panel so as to collectively define a substantially spherical satellite body enclosing said compartment; and
  - a second position wherein inner and outer surfaces of said plurality of panels are overlapped at one side of said compartment.

5,570,103

#### DRIVING APPARATUS FOR MOTOR-DRIVEN TELESCOPIC ANTENNA

Kiyoshi Tetsuka, Tokyo, Japan, assignor to Harada Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 152,465, Nov. 12, 1993, abandoned.

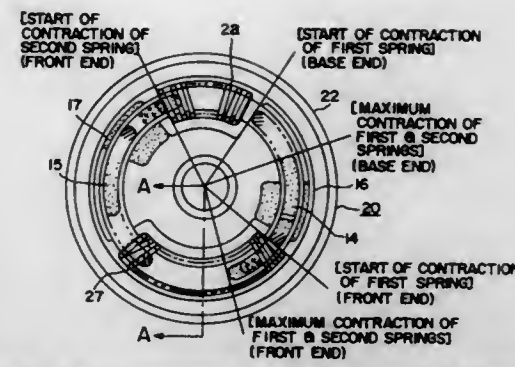
This application Jun. 22, 1995, Ser. No. 493,517

Claims priority, application Japan, Nov. 13, 1992, 4-78235  
Int. Cl.<sup>6</sup> H01Q 1/10

U.S. Cl. 343—903

5 Claims

1. A driving apparatus for a motor-driven telescopic antenna, said driving apparatus comprising: a drive side base component comprising a disk which is rotated by a motive force of a motor, a driven side base component comprising a disk which is installed concentrically with and adjacent to said drive side base component for extending and retracting an antenna element when rotated, and



a rotary force transmission mechanism which is interposed between said drive side base component and said driven side base component so as to transmit a rotary force of said drive side base component to said driven side base component, wherein said rotary force transmission mechanism comprises: first and second elastic elements provided on one of facing surfaces of said drive side and driven side base components with a longitudinal axis of said first and second elastic elements extending in a circumferential direction of said drive and driven side base components, said first and second elastic elements being spaced apart from each other in said circumferential direction and provided in first and second spaces in said drive and driven side base components; and first and second projections extending in an axial direction of said drive and driven side base components and from an other of said facing surfaces of said drive side and driven side base components into said first and second spaces respectively such that said first and second projections initiate a compressive deformation of said first and second elastic elements in the order of said first elastic element and then said second elastic element when a relative rotation occurs between said drive side base component and said driven side base component.

5,570,104

#### DISCHARGE CHAMBER AND METHOD OF MANUFACTURING THE SAME

Masatake Hayashi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

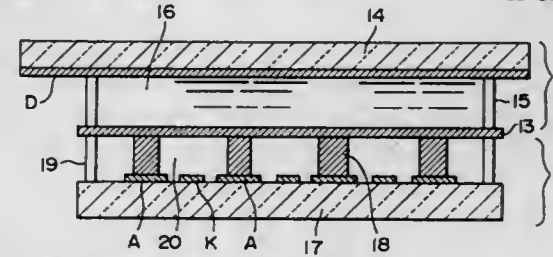
Continuation of Ser. No. 197,309, Feb. 16, 1994, abandoned.

This application Feb. 6, 1995, Ser. No. 384,232

Claims priority, application Japan, Feb. 24, 1993, 5-059664  
Int. Cl.<sup>6</sup> G07G 3/28

U.S. Cl. 345—60

11 Claims



1. A discharge chamber, comprising:  
first and second substrates having first and second facing surfaces respectively arranged substantially in parallel to each other to define a space which is filled with an ionizable gas;  
a plurality of barrier ribs arranged in the space to define a plurality of plasma discharge channels;  
a plurality of anodes arranged on said first substrate each of which is located underneath one of the barrier ribs, said barrier ribs extending from said anodes to said second substrate, each of said anodes having a width larger than the respective one barrier rib to provide an electrode exposed area parallel to said first facing surface of said first substrate and adjacent the respective one barrier rib; and  
a plurality of cathodes each of which is arranged between adjacent barrier ribs, said cathodes being entirely exposed across a width thereof to said plasma discharge channels.

whereby a lateral shifting of one barrier rib from a respective supporting anode a distance toward a respective adjacent cathode during manufacture does not effect the total anode and cathode exposed width within a respective plasma discharge channel defined by said one barrier rib and an adjacent barrier rib.

5,570,105

#### DRIVING CIRCUIT FOR DRIVING LIQUID CRYSTAL DISPLAY DEVICE

Jun Koyama, Kanagawa, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

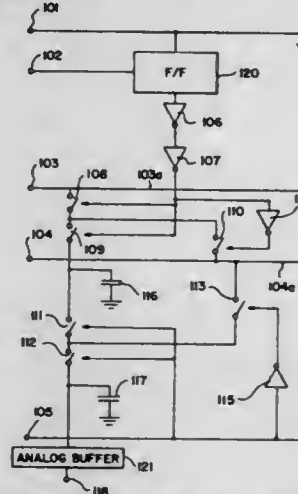
Filed Dec. 21, 1994, Ser. No. 361,034

Claims priority, application Japan, Dec. 25, 1993, 5-347674;  
Dec. 25, 1993, 5-347675

Int. Cl.<sup>6</sup> G09G 3/36

U.S. Cl. 345—98

24 Claims



1. A driving circuit for driving an active matrix circuit which is constructed by thin film transistors and has signal lines in a liquid crystal display device, the driving circuit comprising:  
sampling means for sampling a gradation signal to be supplied to the signal line,  
wherein the sampling means comprises,  
a constant voltage terminal which a constant voltage is supplied to,  
a first switch which the gradation signal is supplied to,  
a second switch having two ends, wherein one end is connected with the first switch in series and the other end is connected with the signal line, and  
a third switch having two ends, wherein one end is connected with a connection point between the first and second switches and the other end is connected with the constant voltage terminal.

5,570,106

#### METHOD AND APPARATUS FOR CREATING HORIZONS FROM 3-D SEISMIC DATA

Venkatraman Viswanathan, Katy, Tex., assignor to Landmark Graphics Corporation, Houston, Tex.

Filed Jul. 28, 1993, Ser. No. 98,506

Int. Cl.<sup>6</sup> G01V 1/00

U.S. Cl. 345—133

5 Claims

1. A method of deleting and rescanning areas of a horizon display on a computer monitor, where a horizon is a topographic representation of a subterranean strata derived from picked points of a 3-D seismic data base, the method comprising the steps of:  
directing a cursor of a pointing device to a first area of said horizon display adjacent a second area of said horizon display, which is to be deleted, said first area covering at least a portion of an area of said horizon display with picked points;





conforming to the shape of said wrist and palm with a recess centrally located in and extending substantially the full length of said upper surface in contact with said wrist and palm, in which recess is permanently mounted a soft, foam rubber material over which is a thin covering layer of fabric material conforming with said arch shaped upper surface and not protruding therefrom; and

c) two buttons in said housing to control a cursor on the monitor and a data cord extending from said housing to the computer to send a signal from said buttons to the computer to control the cursor on the monitor.

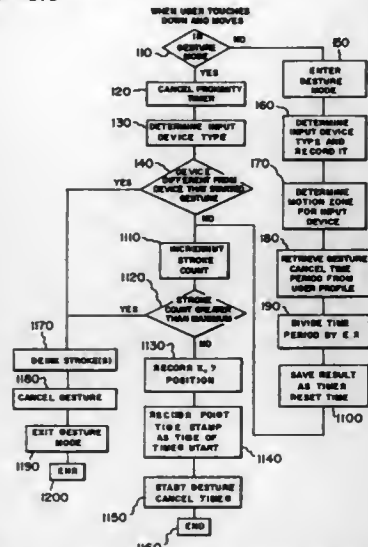
5,570,113

# COMPUTER BASED PEN SYSTEM AND METHOD FOR AUTOMATICALLY CANCELLING UNWANTED GESTURES AND PREVENTING ANOMALOUS SIGNALS AS INPUTS TO SUCH SYSTEM

John M. Zetts, Falls Church, Va., assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed Jun. 29, 1994, Ser. No. 267,731  
Int. Cl.<sup>6</sup> G06F 3/033

U.S. Cl. 345—173

8 Claims



1. A method for registering and operating an input device in a pen-based computer system for entering a gesture into the system, the system having a memory, a processor including proximity and gesture cancel timer devices and a display coupled to a system bus; the method comprising the steps of:

- placing the system in a gesture mode;
- determining the input device type and storing an identification of the device type in the memory for the gesture stroke, if the system is not in a gesture mode, and performing the following steps:
  - establishing an alterable motion zone definitive of movement for each input device type;
  - establishing a gesture cancel time period for a user;
  - dividing the gesture time period by a utility factor;
  - saving the result of step b3 as a gesture cancel reset time for the gesture cancel timer device;
- cancelling the proximity timer for a second or greater number of gesture stroke, if the system is in a gesture mode, and performing the following steps:
  - determining the input device type;
  - comparing the device types for present and past gesture strokes;
  - cancelling the gesture if the device types are different for present and past gesture strokes;
- incrementing a stroke count if the device types are the same for the present and past gesture strokes and performing the following steps:

- comparing the gesture stroke count to a preselected maximum count;
- cancelling the gesture if the stroke count exceeds the maximum count;
- recording coordinates in the display as the final gesture position, if the stroke does not exceed the maximum count, and performing the following steps:
  - time stamping the final gesture position;
  - initiating a gesture cancel timer, and
  - cancelling the gesture when the gesture cancel timer exceeds a preselected time period.

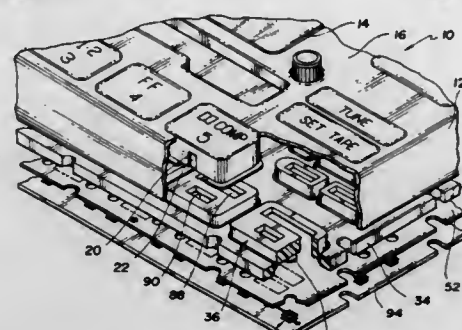
5,570,114

# CONTROL PANEL ILLUMINATION

James H. Fowler, Novi, Mich., assignor to Ford Motor Company, Dearborn, Mich.  
Continuation of Ser. No. 122,969, Sep. 17, 1993, abandoned.  
This application Mar. 2, 1995, Ser. No. 397,314  
Int. Cl.<sup>6</sup> G09G 3/02

U.S. Cl. 345—173

20 Claims



1. An illuminated control panel comprising: a bezel panel having a plurality of openings; at least one button received in one of said openings; at least one of said bezel panel and said at least one button having at least one optical indicia; an elastomeric layer beneath said button and said panel, wherein said layer has an opening communicating with said optical indicia and a wall portion resiliently maintaining said at least one button in said one opening, and at least one contact element registering with said button and carried on the surface opposite the button; an electroluminescent lamp panel beneath said elastomeric layer including at least one chargeable area in communication with said elastomeric layer opening, and an opening in said electroluminescent lamp panel in registration with said contact element; and a printed wiring board having electrical terminals registering with said electroluminescent lamp panel opening and said contact element for closing an electrical circuit by depressing of said button against the force of said elastomeric layer wall.

5,570,115

# IMAGE PROCESSOR

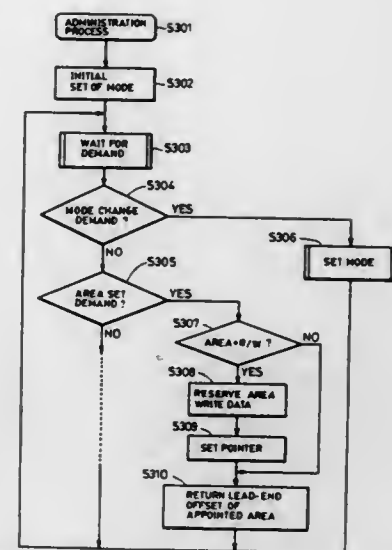
Tomoaki Kawai, and Hiroaki Sato, both of Kanagawa-ken, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 267,312, Jun. 29, 1994, abandoned, which is a continuation of Ser. No. 77,496, Jun. 17, 1993, abandoned, which is a continuation of Ser. No. 589,260, Sep. 28, 1990, abandoned. This application May 25, 1995, Ser. No. 450,099

Claims priority, application Japan, Oct. 2, 1989, 1-258346  
Int. Cl.<sup>6</sup> G09G 5/06

U.S. Cl. 345—199

7 Claims

1. A method of displaying a plurality of color images simultaneously, including a color map administration process and a plu-



rality of display processes each for displaying respective color images, simultaneously, said color map administration process comprising the steps of:

- receiving a write request with color map data and an area identifier issued from one of said plurality of display processes for writing color map data in one of a plurality of memory areas;
- securing a memory area from the plurality of memory areas and writing the color map data in the secured memory area;
- setting a pointer to the secured memory area associated with the area identifier in an administration table; and
- obtaining an offset corresponding to the color map data in the secured memory area from the administration table and transmitting the offset to the one of said display processes issuing the write request, and each one of said display processes comprising the steps of:
  - issuing a write request with color map data and an area identifier to said color map administration process for writing the color map data in one of a plurality of memory areas;
  - receiving an offset corresponding to the color map data written in the secured memory area from said color map administration process; and
  - displaying a color image by using the color map data in the secured memory area on the basis of the received offset.

5,570,116

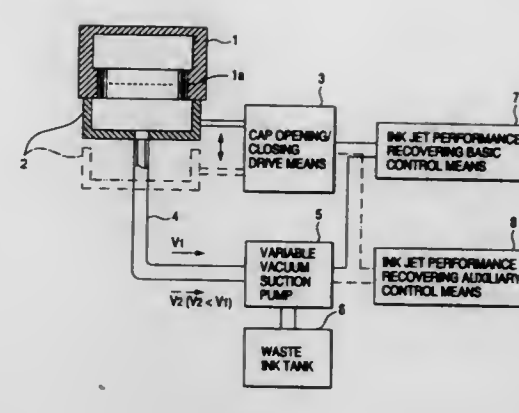
# METHOD AND DEVICE FOR RESTORING INK JET PERFORMANCE OF INK JET RECORDING APPARATUS

Mitsuhide Soga, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan  
Filed Mar. 18, 1994, Ser. No. 214,759  
Claims priority, application Japan, Mar. 19, 1993, 5-085752  
Int. Cl.<sup>6</sup> B41J 2/165

U.S. Cl. 347—30

7 Claims

1. A method of recovering ink jet performance of an ink jet recording apparatus, comprising the steps of: covering a nozzle surface of an ink jet head with a cap; then sucking the covered nozzle surface of said ink jet head to a vacuum by driving a variable vacuum suction pump for suction at a first suction speed, the variable vacuum suction pump being connected to said cap through a communication member so as to communicate therewith; and then driving the variable vacuum suction pump for idle suction at a second suction speed lower than said first suction speed with said cap moved away from the nozzle surface of said ink jet head.



5,570,117

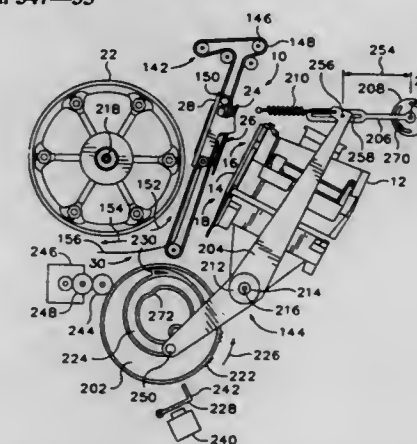
# PRINT HEAD MAINTENANCE METHOD AND APPARATUS WITH RETRACTABLE WIPER

Randy C. Karambelas, Milwaukee; Ernest I. Esplin, Sheridan; Terry A. Smith; Mike C. Gordon, both of Wilsonville, and Stephen H. Skidmore, Portland, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Jan. 6, 1995, Ser. No. 369,613  
Int. Cl.<sup>6</sup> B41J 2/165

U.S. Cl. 347—33

13 Claims

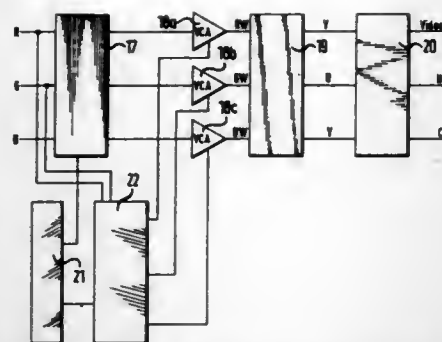


1. An ink jet print head maintenance apparatus for cleaning an ink jet print head that includes an orifice plate having a region with a row of orifices through which ink is ejected, the orifices being aligned in a row direction, comprising:
  - a purge cap having a recessed region with an open end, the recessed region defined by a rear wall bordered by side walls having top side margins that define a periphery of the open end, the purge cap having a length that spans the region with the orifices;
  - a seal positioned around the periphery of the purge cap;
  - a resilient wiper assembly positioned in the recessed region of the purge cap, the resilient wiper assembly including a wiper blade that extends substantially along the length of the purge cap and nominally outwardly of the recessed region; and
  - a positioning system that applies a force to urge the purge cap and orifice plate against each other and moves the purge cap and the orifice plate relative to each other so that the wiper blade engages and wipes the orifice plate in the region with the orifices, the wiper blade maintaining continuous engagement against the orifice plate while wiping it in a direction transverse to the row direction.





a) detecting the color quality of a video color picture signal, including at least a red component (R) and a brightness portion.;



- b) determining correction values (k) for correcting the color picture signal present after a white balance, for each individual color component (R, G, B) of the picture signal in dependency upon pre-set operating conditions, and
- c) correcting the color picture signal corresponding to the white balance using the correction values (k) determined in step (b), in dependency upon a relationship of the red component (R) detected in step (a) to the brightness portion of the detected color quality of the color picture signal.

5,570,130

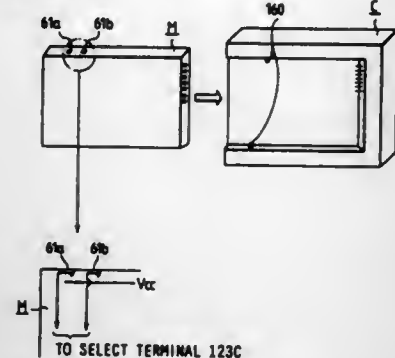
**DETACHABLE MEMORY WITH STARTING BLOCK ADDRESS SELECTED IN ACCORDANCE WITH DETECTED TELEVISION PROGRAMMING STANDARD**  
Hiroyuki Horii, Yokohama; Nobuaki Date, Kawasaki; Toshihiko Mimura; Akihiko Tojo, both of Yokohama; Hideaki Kawamura, Kawasaki; Yoshitaka Murata, Yokohama; Kan Takaiwa, Hachioji; Takashi Suzuki; Seichi Ozaki, both of Yokohama; Junzo Taira, Tokyo, and Kenichi Nagasawa, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 987,240, Dec. 7, 1992, Pat. No. 5,418,926, which is a continuation of Ser. No. 446,442, Dec. 5, 1989, abandoned. This application Feb. 6, 1995, Ser. No. 383,850  
Claims priority, application Japan, Dec. 6, 1988, 63-308169; Dec. 9, 1988, 63-309933

Int. Cl.<sup>6</sup> H04N 5/907

U.S. Cl. 348—233

18 Claims

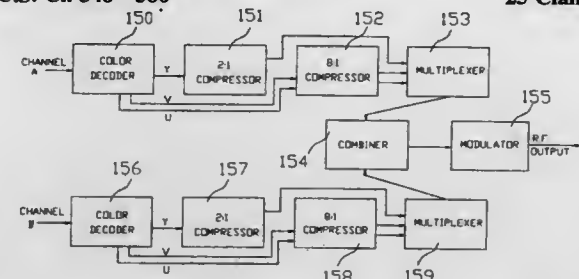


1. A handling apparatus for a memory capable of random data storage and readout, comprising:
- an address generator unit for generating start address information for each of plural blocks in the memory;
  - detection means for detecting an image processing method used in the storage into or readout from the memory; and
  - control means for controlling said address generator unit so as to change the start address information, based on a detection output of said detection means.

5,570,131  
**PSEUDO-DIGITAL COMPRESSION OF VIDEO SIGNALS**  
H. George Pires, 47H Valley Rd., Hampton, N.J. 08827  
Filed Oct. 25, 1994, Ser. No. 328,672  
Int. Cl.<sup>6</sup> H04N 7/26

U.S. Cl. 348—386

25 Claims



1. A method of combining first and second video signals for transmission via a single video channel, each of said first and second video signals being of the type having a luminance component within each of a plurality of sequentially recurring horizontal line periods, the method comprising the steps of:

- first separating a luminance component of the first video signal during a respective first horizontal line period;
  - second separating a luminance component of the second video signal during a respective first horizontal line period;
  - first time compressing the luminance component of the first video signal by a predetermined compression factor;
  - second time compressing the luminance component of the second video signal by a predetermined compression factor;
  - forming an output video signal having a plurality of sequential output horizontal line periods;
  - first inserting the time-compressed luminance component of the first video signal in a selected one of the output horizontal line periods;
  - second inserting the time-compressed luminance component of the second video signal in a selected one of the output horizontal line periods;
  - digitizing said luminance component of the first video signal to produce first digital data corresponding to said first video signal;
  - writing said first digital data in a first memory location;
  - digitizing said luminance component of the second video signal to produce second digital data corresponding to said second video signal;
  - writing said second digital data in a second memory location;
  - third separating a first chroma component of the first video signal during a respective first horizontal line period;
  - fourth separating a first chroma component of the second video signal during a respective first horizontal line period;
  - third time compressing the first chroma component of the first video signal by a predetermined compression factor;
  - fourth time compressing the first chroma component of the second video signal by a predetermined compression factor;
  - third inserting the time-compressed first chroma component of the first video signal in said selected one of the output horizontal line periods; and
  - fourth inserting the time-compressed first chroma component of the second video signal in said selected one of the output horizontal line periods; wherein:
- said step of third inserting is performed into a synchronization data portion of said selected one of the output horizontal line periods; and
- said step of fourth inserting is performed into a synchronization data portion of said selected one of the output horizontal line periods.

5,570,132  
**DEVICE FOR TRANSMITTING OR STORING DIGITAL TELEVISION PICTURES, AND DEVICE FOR RECEIVING SAID PICTURES**

Peter H. N. De With, and Wilhelmus J. Van Gestel, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

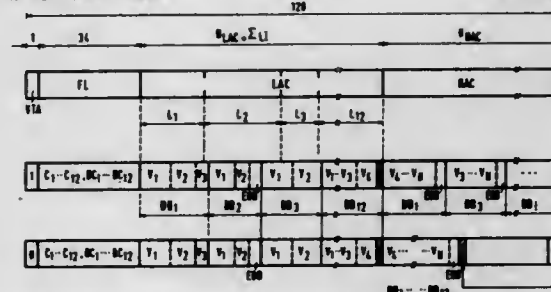
Filed Jun. 6, 1994, Ser. No. 254,092

Claims priority, application European Pat. Off., Jun. 7, 1993, 93201613

Int. Cl.<sup>6</sup> H04N 7/52

U.S. Cl. 348—408

17 Claims



1. A device for transmitting or storing digital television pictures, comprising:

- means for dividing each television picture into blocks of pixels;
- coding means for coding each block of pixels in a corresponding data block of code words of variable length;
- formatting means for accommodating the code words of a data block in a corresponding channel block of fixed length, in which a surplus of data of the data block is accommodated in other channel blocks and a shortage of data in a channel block is filled up with the surplus of data of other data blocks;
- wherein said formatting means are adapted to accommodate the start address of surplus data in a channel block at a predetermined position of said channel block.

5,570,133

**MOTION PICTURE ENCODING SYSTEM WHEREIN IMAGE QUALITY IS MAXIMIZED USING INTER-FRAME AND INTRA-FRAME ENCODING**

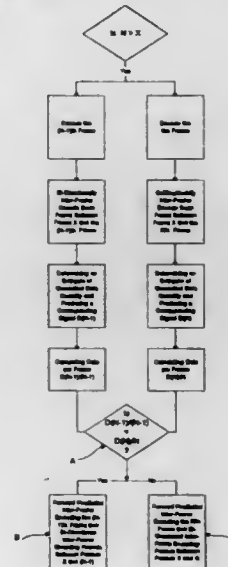
Yoichi Yagasaki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 949,397, Sep. 22, 1992, abandoned. This application May 2, 1995, Ser. No. 431,661

Claims priority, application Japan, Sep. 30, 1991, 3-278808  
Int. Cl.<sup>6</sup> H04N 7/32

U.S. Cl. 348—416

1 Claim



1. A motion picture encoding system for either intra-frame encoding or forward, rearward and bi-directional predictive inter-frame encoding a motion picture which includes a sequence of frames, comprising:

- a means for encoding a given frame X by one of either intra-frame encoding or forward predictive inter-frame encoding;
- means for forward predictive encoding for a first case an (N-1)th frame and then for a second case an Nth frame, where N is a positive integer greater than X;
- means for bi-directional inter-frame encoding for the first case each frame of a sequence of frames between said given frame X and the (N-1)th frame and then for the second case each frame of a sequence of frames between said given frame X and the Nth frame;
- means for determining an estimate of the generated data quantity for frames encoded according to the first case and producing a corresponding signal D(N-1) corresponding thereto and for determining an estimate of the generated data quantity for frames encoded according to the second case and producing a corresponding signal D(N) corresponding thereto; and
- means for comparing the quantities D(N-1)/(N-1) and D(N)/N and forward predictive inter-frame encoding the (N-1)th frame and bidirectional inter-frame encoding frames in the motion picture between said given frame X and the (N-1)th frame if:

$$\{D(N-1)/(N-1)\} < \{D(N)/N\}$$

- and otherwise forward predictive inter-frame encoding the (N)th frame and bidirectional inter-frame encoding the frames in the motion picture between said given frame X and the Nth frame.

5,570,134

**MULTILINGUAL DISPLAY DEVICE AND METHOD THEREOF**

Young-pyo Hong, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

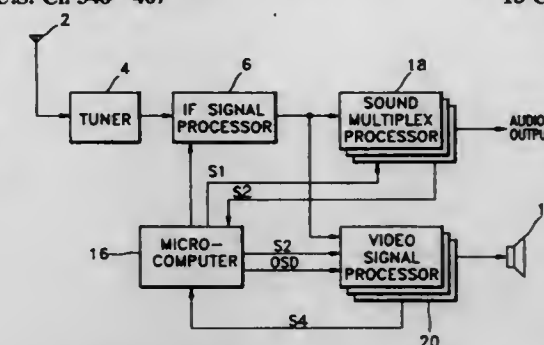
Filed Jun. 6, 1995, Ser. No. 471,686

Claims priority, application Rep. of Korea, Jul. 26, 1994, 94-18035

Int. Cl.<sup>6</sup> H04N 5/76

U.S. Cl. 348—467

18 Claims



1. A multilingual display device comprising:
- tuning means for converting a broadcast signal into an IF signal and outputting said IF signal;
  - a plurality of sound multiplex processors for detecting an audio signal from said IF signal, processing said audio signal according to a sound multiplex mode, and outputting information regarding the sound multiplex mode;
  - a plurality of video signal processors for detecting a video signal from said IF signal, processing said video signal according to a broadcasting system, outputting information regarding the broadcasting system, mixing input OSD signals with said processed video signal, and outputting said mixed signal for display; and
  - control means for outputting control signals for selecting respective corresponding processors among said plurality of sound multiplex processors and said plurality of video signal processors.





a coolant sealed between said image forming apparatus and said projection, lens, wherein

a refractive index of said coolant differs between at least two of said projection units depending on a wavelength of a ray of light projected therethrough.

8. A projection type display apparatus, comprising:

a plurality of projection units, each of said projection units having,

an image forming apparatus, and

at least one projection lens, said projection lens including a plurality of lens elements, wherein

a central thickness of one of said plurality of lens elements located most closely to said image forming apparatus differs between at least two of said projection units depending on a wavelength of a ray of light projected therethrough.

10. A projection type display apparatus, comprising:

a plurality of projection units, each of said projection units having,

an image forming apparatus, and

at least one projection lens; and

a screen, wherein

a projection distance from said projection lens to a center portion of said screen differs between at least two projection units depending on a wavelength of a ray of light projected therethrough.

5,570,141

# **MOLDED FRAME FOR FIXING OPTICAL ELEMENTS IN A LIQUID CRYSTAL SHUTTER**

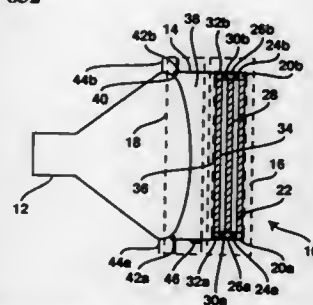
Eric R. Sirkin, Palo Alto, and Joseph J. Curry, Los Altos, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Apr. 30, 1992, Ser. No. 876,675

Int. Cl.<sup>6</sup> H04N 5/72

U.S. Cl. 348—832

21 Claims



1. A frame device for an optical system, comprising:

an integrated body having a registration portion and a mounting portion;

the registration portion of the integrated body having a plurality of holders, each holder for receiving and holding a respective one of a plurality of optical elements such that the plurality of optical elements are registered in predetermined positions relative to one another in the registration portion and such that the plurality of optical elements are separated from one another;

the mounting portion of the integrated body configured to couple the integrated body to a display device such that the plurality of optical elements are aligned relative to the display device so as to form an optical path from the display device through the plurality of optical elements, the mounting portion further comprising a gasket for providing a sealed interface between the integrated body and the display device.

5,570,142

# **ASYMMETRIC ASPHERIC CONTACT LENS**

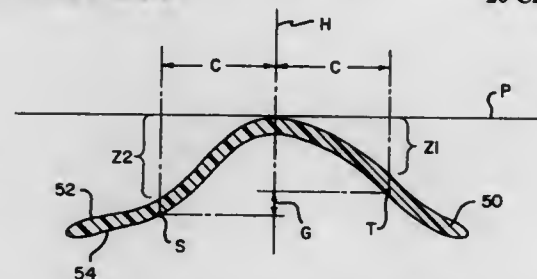
David M. Lieberman, New York, N.Y., assignor to Scientific Optics, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 119,351, Sep. 9, 1993, Pat. No. 5,502,518. This application Sep. 9, 1994, Ser. No. 303,350

Int. Cl.<sup>6</sup> G02C 7/04

U.S. Cl. 351—160 R

20 Claims



1. A contact lens for use on a patient's eye with an asymmetric aspheric cornea, said lens having: an anterior surface, a posterior surface and a base, said posterior surface comprising a peripheral portion, which is asymmetric and aspherical and at least coextensive with the base of said lens, said base comprising an edge of variable thickness;

said peripheral portion asymmetrically and aspherically matching a corresponding peripheral portion of the cornea which lies under said peripheral portion of the lens when the lens is worn in the patient's eye; and

said contact lens having a diameter that is less than or substantially equal to a diameter of said cornea.

5,570,143

# **TORIC LENS WITH AXIS MISLOCATION LATITUDE**

Steve Newman, Sunnybank, Australia, assignor to Capricornia Contact Lens Pty. Ltd., Springwood, Australia

PCT No. PCT/AU92/00418, § 371 Date Mar. 18, 1994, § 102(e) Date Mar. 18, 1994, PCT Pub. No. WO93/03409, PCT Pub. Date Feb. 18, 1993

PCT Filed Aug. 7, 1992, Ser. No. 190,125

Claims priority, application Australia, Aug. 9, 1991, PK7675

Int. Cl.<sup>6</sup> G02C 7/02; 7/04

U.S. Cl. 351—176

20 Claims

1. A toric lens for axis mislocation correction comprising a toric lens having optical topography on at least one surface of the lens which induces a depth of field effect on the eye and enables the principle meridians of power on the lens to align with those on the eye of a wearer such that the depth of field effect compensates for mislocation error if the lens mislocates 1 degree or more, said lens being thin enough to allow sufficient oxygen transmission therethrough to provide satisfactory morphology of the eye of a wearer.

5,570,144

# **FIELD RESTRICTIVE CONTACT LENS**

Gunilla Lofgren-Nisser, 25 East 67 St., #4E, New York, N.Y. 10021

Division of Ser. No. 790,577, Nov. 8, 1991, abandoned. This application Dec. 28, 1992, Ser. No. 997,349

Int. Cl.<sup>6</sup> A61B 3/00; G02C 7/16

U.S. Cl. 351—247

17 Claims

1. A method for determining functioning of visual brain pathways of the right and left brain hemispheres of a human subject by diagnosing electrical response of the brain hemispheres to visual input stimuli comprising the steps of:

a) placing in one eye of the subject a field restrictive contact lens having a portion that occludes visual input stimuli to a selected part of the one eye and that maintains its position relative to the one eye as it moves so as to transmit visual information to substantially only a selected one of the two

5,570,146

# **DIGITAL IMAGE RECORDING DEVICE**

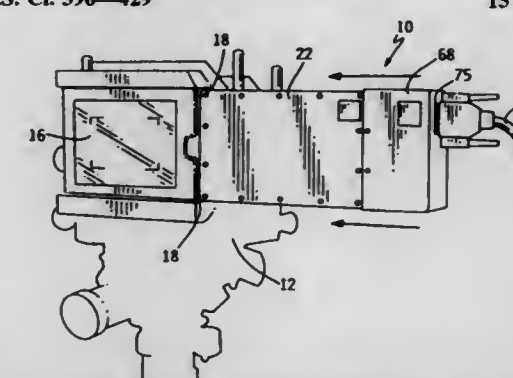
Michael L. Collette, 1720 Milton St., Redwood City, Calif. 94061

Filed May 31, 1994, Ser. No. 251,793

Int. Cl.<sup>6</sup> G03B 29/00

U.S. Cl. 396—429

15 Claims



brain hemispheres of the subject and that substantially reduces the input of visual information to the other of the two brain hemispheres;

b) subjecting the one eye of the subject having the contact lens to visual input stimuli; and

c) performance testing the electrical response of at least the subject's other brain hemisphere in response to the visual input stimuli to the one eye.

5,570,145

# **METHOD OF FORMING PHOSPHOR SCREEN OF COLOR CATHODE-RAY TUBE AND EXPOSURE APPARATUS**

Kouichi Soneda, Kumagaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

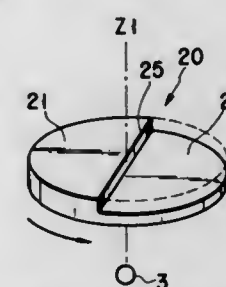
Filed Sep. 28, 1994, Ser. No. 313,796

Claims priority, application Japan, Sep. 30, 1993, 5-244093

Int. Cl.<sup>6</sup> G03B 41/00

U.S. Cl. 396—547

10 Claims



2. An exposure apparatus for exposing, through a shadow mask with a number of apertures, those portions of a resist film coated on the inner surface of a face panel in a color cathode-ray tube, in which phosphor dots are to be formed, said apparatus comprising:

an exposure light source having an optical axis coaxial with an axis of the face panel, for radiating a light beam onto the inner surface of the face panel through the shadow mask;

a discontinuous lens medium arranged between the exposure light source and the shadow mask and rotatable about the optical axis, the discontinuous lens medium having a plurality of regions arranged adjacent to one another in the direction of rotation of the discontinuous lens medium, for guiding the light beam from the exposure light source to the shadow mask along different paths; and

drive means for continuously rotating the discontinuous lens medium at a predetermined speed so that the light beam repeatedly passes the regions of the discontinuous lens medium in order and passes through each of the apertures along at least two different paths.

5,570,147

# **PHOTOGRAPHIC CAMERA SYSTEM**

Takahiko Saito, Kanagawa; Akira Nakanishi, Tokyo; Shunzi Obayashi, Tokyo; Kyoji Genda, Tokyo, and Hideki Toshikage, Saitama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 333,593, Nov. 2, 1994, which is a continuation of Ser. No. 26,415, Mar. 4, 1993, abandoned. This application Apr. 20, 1995, Ser. No. 426,113

Claims priority, application Japan, Mar. 17, 1992, 4-060684; Mar. 23, 1992, 4-065304

Int. Cl.<sup>6</sup> G03B 29/00

U.S. Cl. 396—429

2 Claims

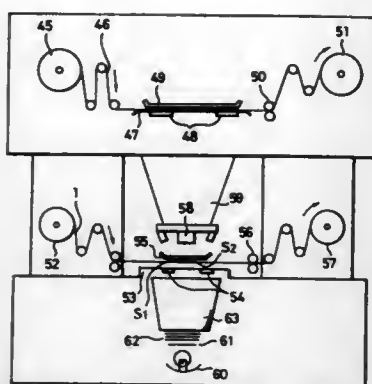
1. A photographic film printer comprising:

a printer body;

detecting means disposed on said printer body for non-mechanically detecting an exposure position control signal recorded on a photographic film when an exposure is made to indicate a size of an exposure area recorded on said photographic film, wherein said exposure position control signal is recorded within a marginal area of said photographic film between an edge of said photographic film and said exposure area of said photographic film;

film feed control means disposed on said printer body for controlling feeding of said photographic film based on said exposure position control signal detected by said detecting means;





printing means disposed on said printer body for varying an opening width of a mask which is used to print an image of a subject in an exposure area of said photographic film on photographic print paper depending on said exposure position control signal;

a negative feed sensor for detecting a distance said photographic film is fed independently of said exposure position control signal; and

a logic circuit receiving an output of said negative feed sensor for determining that said detecting means correctly detected said exposure position control signal.

5,570,148

## FLASH CONTROL APPARATUS

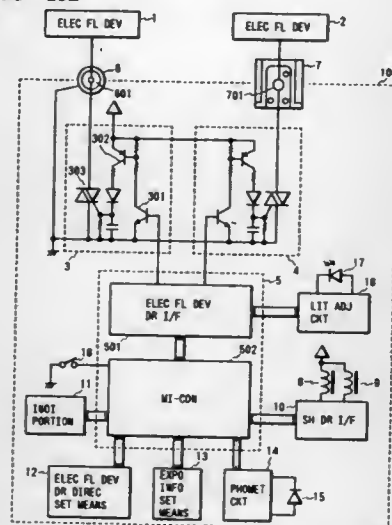
Hideo Hibino; Hiroshi Sakamoto, and Seichi Yasukawa, all of Kawasaki, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 168,359, Dec. 17, 1993, abandoned, which is a continuation of Ser. No. 917,369, Jul. 23, 1992, abandoned. This application Dec. 23, 1994, Ser. No. 364,393

Claims priority, application Japan, Jul. 30, 1991, 3-066837 U Int. Cl.<sup>6</sup> G03B 15/02; 15/03

U.S. Cl. 396—182

10 Claims



1. A flash control apparatus of a camera system that includes a camera having a leading shutter curtain and a trailing shutter curtain and a mechanism for releasing said shutter curtains, said flash control apparatus comprising:

a plurality of synchro terminals for connection, respectively, to a plurality of electronic flash devices;

an electronic flash device setting circuit which variably sets timing of triggering the electronic flash devices, said setting circuit being operative to changeably set an interval between respective triggering timings for successive light emissions by two of the plurality of electronic flash devices;

a control circuit which generates a corresponding plurality of start signals individually, in accordance with the timing set by said setting circuit, and having a plurality of output lines corresponding to said plurality of start signals; and

a plurality of trigger circuits each electrically connecting one of said output lines to the corresponding synchro terminal and applying to the synchro terminal, in response to a start signal received on said one output line, a light emission signal to cause an electronic flash device connected to the synchro terminal to emit light, whereby the plurality of electronic flash devices emit light in accordance with the timing set by said setting circuit,

wherein said control circuit is connected to said mechanism for releasing said shutter curtains and has a mode to output a start signal to one of said trigger circuits in association with release of said leading shutter curtain and to output another start signal to another of said trigger circuits in association with release of said trailing shutter curtain.

5,570,149

## CAMERA HAVING A COLLAPSIBLE MOUNT TYPE PHOTOGRAPHIC OPTICAL SYSTEM

Hiroshi Wakabayashi, Yokohama; Hidenori Miyamoto, Urayasu; Minoru Kato, Kawasaki; Isao Soshi, Tokyo, and Junichi Omi, Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

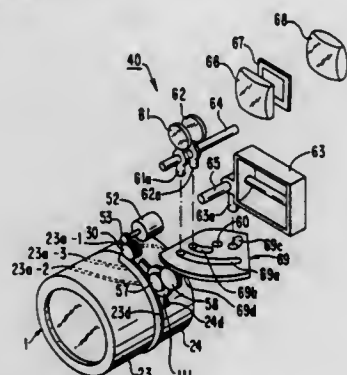
Continuation-in-part of Ser. No. 274,713, Jul. 18, 1994, abandoned. This application Dec. 2, 1994, Ser. No. 352,823

Claims priority, application Japan, Jul. 16, 1993, 5-199026; Dec. 2, 1993, 5-302531; Dec. 2, 1993, 5-302532; Dec. 2, 1993, 5-302533; Dec. 2, 1993, 5-302534

Int. Cl.<sup>6</sup> G03B 17/04

U.S. Cl. 396—85

18 Claims



1. A camera having a photographic optical system movable in a first region and a second region, said camera comprising:

a drive unit to provide a drive force;

a photographic auxiliary unit which is movable based upon an amount of movement of the photographic optical system;

a first movement unit to move the photographic optical system;

a second movement unit to move the photographic auxiliary unit; and

a drive force transmission unit to transmit the drive force to the first and second movement units while the photographic optical system is in the first region, and to transmit the drive force to the first movement unit, without transmitting the drive force to the second movement unit, while the photographic optical system is in the second region.

5,570,150

## STEREO PHOTOGRAPHING SYSTEM

Shuji Yoneyama, and Shinya Suzuka, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

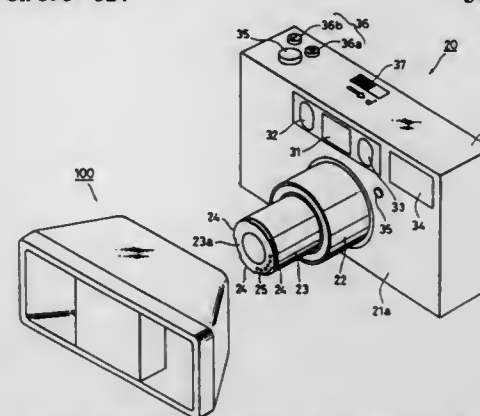
Filed Aug. 30, 1994, Ser. No. 298,391

Claims priority, application Japan, Aug. 30, 1993, 5-213976

Int. Cl.<sup>6</sup> G03B 35/00; 1/00

U.S. Cl. 396—324

34 Claims



1. A stereo photographing system having a stereo adapter for photographing two separate images of a same subject viewed from different points and formed onto one picture frame next to each other, and a camera including a finder and a photographing lens to which said stereo adapter can be detachably attached at the front end of said photographing lens, comprising:

a finder viewing field determining means provided in an optical path of said finder for selectively determining either a regular viewing field or a stereo viewing field; said determining means comprising:

a stereo finder viewing field determining means which can be inserted into and retracted from the finder optical path; and, a means for inserting and retracting said stereo finder viewing field determining means into and from said finder optical path;

a detecting means which detects said stereo adapter when said stereo adapter is mounted to said camera;

a switching means which switches between said regular viewing field and said stereo viewing field determined by said viewing field determining means and responsive to said detecting means, wherein said switching means operates as a driving means for said inserting and retracting means to insert and retract said stereo finder viewing field determining means when said detection means detects that the stereo adapter is mounted to the camera;

a variable power lens which is provided in a manner such that said variable power lens can be inserted into and retracted from said finder optical path at a position closer to an eyepiece than said stereo finder viewing field determining means, wherein a magnification of said finder is increased when said[.] variable power lens is inserted into said finder optical path;

a means for inserting and retracting said variable power lens into and from said finder optical [Path] path; and,

a means for actuating said inserting and retracting means to insert and retract said variable power lens into and from said finder optical path when said detection means detects that said stereo adapter is mounted to said camera.

5,570,151

## CAMERA WHICH OPERATES A SHUTTER ACCORDING TO A PHOTOGRAPHER'S WINK AND THE VIBRATION LEVEL

Hiroshi Terunuma, Yachiyoshi; Hiroshi Wakabayashi, Yokohama, and Dalki Tsukahara, Hiratsuka, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

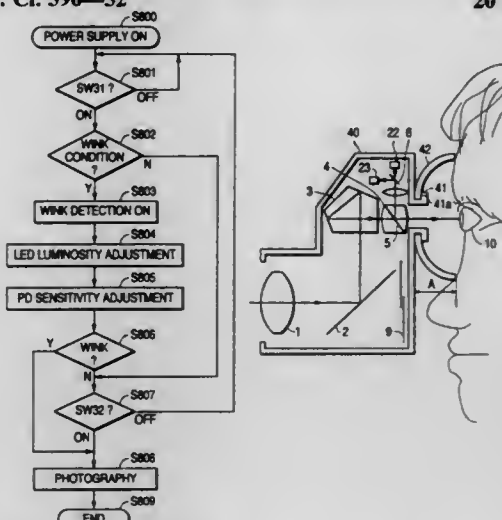
Filed Dec. 27, 1994, Ser. No. 363,859

Claims priority, application Japan, Dec. 27, 1993, 5-330796; Dec. 30, 1993, 5-354436

Int. Cl.<sup>6</sup> G03B 7/00; 17/38

U.S. Cl. 396—52

20 Claims



1. A camera comprising:

a wink detection device which detects a wink of a photographer and produces a corresponding wink detection output signal;

a vibration detection device which detects vibrations affecting the camera and produces a corresponding vibration detection signal;

a shutter which is released to take a photograph; and

a control mechanism which is responsive to the wink detection output signal and the vibration detection signal to control the release of the shutter.

5,570,152

## PHOTO FILM CASSETTE

Akimasa Kaya, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 22, 1995, Ser. No. 561,940

Claims priority, application Japan, Dec. 22, 1994, 6-321026

Int. Cl.<sup>6</sup> G03B 17/26

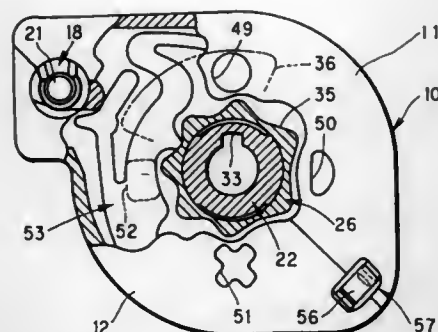
U.S. Cl. 396—515

20 Claims

1. A photo film cassette of which a spool with photo film wound thereon is contained in a cassette shell in rotatable fashion, and in which rotation of said spool causes said photo film to advance to an outside of said cassette shell, said photo film cassette comprising:

a tongue portion, formed by cutting a slit having a shape of a cornered line and in a wall of said cassette shell, said tongue portion, when folded, signaling a developed status of said photo film;

a first groove, formed in said tongue portion, and across a proximal end of said tongue portion, for rendering said tongue portion bendable; and



a support portion, disposed on an inside of a wall of said cassette shell, contacted on an inside of said tongue portion, for preventing said tongue portion from being bent toward an inside of said cassette shell while said tongue portion is pressed with force below a predetermined range.

5,570,153

## LENS MOUNTING STRUCTURE

Tetsuji Shono, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

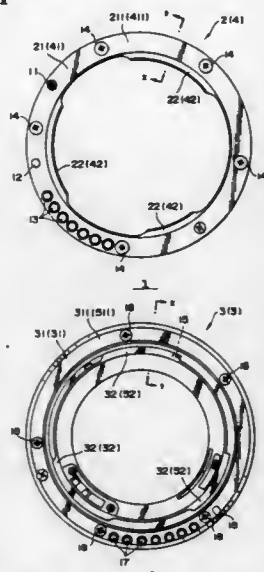
Filed Jul. 25, 1995, Ser. No. 506,624

Claims priority, application Japan, Jul. 28, 1994, 6-196011

Int. Cl.<sup>6</sup> G03B 17/00

U.S. Cl. 396—531

14 Claims



1. A combination of camera bodies and detachable lenses, comprising:

- a first lens-side mount, having a first mating gap formed therein;
- a first body-side mount, having a first mating member formed thereon, said first mating member being sized to fit into and engage said first mating gap, so that said first lens-side mount is mountable to said first body-side mount;
- a second lens-side mount, having a second mating gap formed therein, said second mating gap being smaller than said first mating gap;
- a second body-side mount, having a second mating member formed thereon, said second mating member being sized to fit into and engage said second mating gap, so that said second lens-side mount is mountable to said second body-side mount, said second mating member being smaller than said first mating member,

wherein said second mating member is sized to fit into and engage either of said second mating gap and said first mating gap, and said second mating gap is sized to preclude fitting into and engagement with said first mating member, so that said first lens-side mount is mountable to either of said first

and second body-side mounts, while said second lens-side mount is mountable only to said second body-side mount.

5,570,154

## AUTOMATIC DEVELOPING APPARATUS; USING SOLID PROCESSING AGENT DISSOLVED IN WATER; FOR DEVELOPING A PHOTSENSITIVE MATERIAL

Tetsuya Kurimoto, and Ryuji Uesugi, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

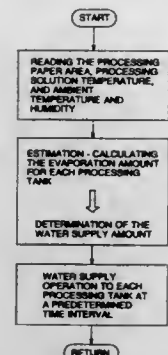
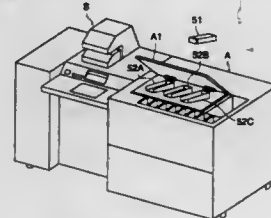
Filed Feb. 10, 1995, Ser. No. 387,112

Claims priority, application Japan, Feb. 15, 1994, 6-018601; May 11, 1994, 6-097722

Int. Cl.<sup>6</sup> G03D 3/02; 13/00

U.S. Cl. 396—568

19 Claims



1. An automatic developing apparatus for developing a photo-sensitive material, comprising:

- a processing section for accommodating a processing solution for processing the photosensitive material, said processing solution comprising a solid processing agent dissolved in water;
- a throughput detector for detecting a throughput of said photo-sensitive material through said processing section, and for generating detection signals when said throughput becomes a predetermined value;
- a processing agent supplier for supplying said solid processing agent to said processing section;
- a water supplier for supplying water to said processing section;
- a calculator for calculating an amount of evaporation water evaporated from said processing solution;
- a timer for generating timer signals when a predetermined time period elapses; and
- a controller for controlling said processing agent supplier and said water supplier to respectively supply to said processing section said solid processing agent and an amount of water not greater than a first predetermined supply amount according to said detection signals, said first predetermined supply amount being calculated in accordance with an allowable range of variations of concentration of said processing solution in said processing section, and for controlling said water supplier to supply to said processing section an amount of water corresponding to said amount of evaporation water in accordance with said timer signals.

5,570,155

## FOCUSING LENS POSITION CONTROLLING APPARATUS FOR A VARIABLE FOCAL LENGTH LENS

Atsushi Shibayama, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

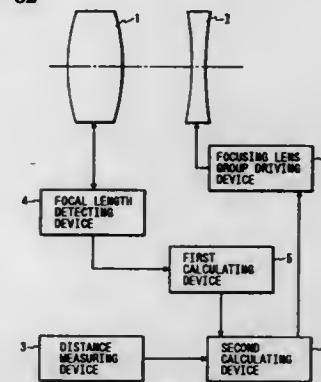
Filed Jun. 28, 1994, Ser. No. 266,546

Claims priority, application Japan, Jul. 7, 1993, 5-168096; Jul. 7, 1993, 5-168097

Int. Cl.<sup>6</sup> G03B 13/36

U.S. Cl. 396—82

15 Claims



1. A focusing lens position controlling apparatus adapted for use with a variable focal length lens, comprising:
  - a variable focal length lens having a focusing lens group;
  - a non-TTL type distance measuring unit measuring an object distance to an object;
  - a focal length detecting unit detecting a focal length of said variable focal length lens;
  - a first calculating unit calculating an operation coefficient from an output value from said focal length detecting unit by using a polynomial expression wherein an output value from said focal length detecting unit is a variable, said operation coefficient relating to said focal length; and
  - a second calculating unit calculating an amount of movement of said focusing lens group based on an output value from said distance measuring unit and said operation coefficient.

5,570,156

## CAMERA UTILIZING DETECTION OF VISUAL LINE

Takashi Arai, Tokyo, and Hirofumi Nakano, Kanagawa-ken, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 934,121, Aug. 21, 1992, abandoned.

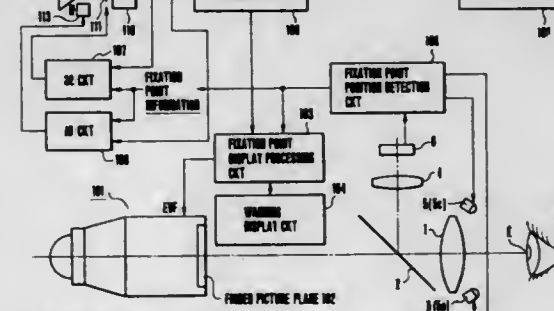
This application Jul. 8, 1994, Ser. No. 272,903

Claims priority, application Japan, Aug. 26, 1991, 3-213439; Sep. 6, 1991, 3-227084

Int. Cl.<sup>6</sup> G03B 17/20; H04N 5/225

U.S. Cl. 396—51

69 Claims



1. A camera comprising:
  - (A) an electronic viewfinder adapted to electrically display a photographing image;
  - (B) visual line detection means for detecting the position of a camera operator's visual line on a picture plane of said electronic viewfinder; and

(C) display processing means including settable timer means for temporarily displaying on said electronic viewfinder photographing-related information involved in a camera photographing, wherein said display processing means controls a display position of the photographing-related information in accordance with an output of said visual line detection means.

5,570,157

## VISUAL AXIS DETECTION APPARATUS

Kazuki Konishi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

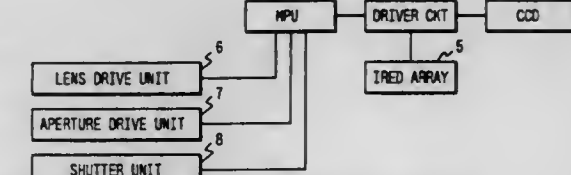
Continuation of Ser. No. 142,060, Oct. 28, 1993, abandoned. This application May 26, 1994, Ser. No. 249,683

Claims priority, application Japan, Oct. 30, 1992, 4-314408; Oct. 30, 1992, 4-314409

Int. Cl.<sup>6</sup> G03B 13/02

U.S. Cl. 396—232

15 Claims



1. A visual axis detection apparatus comprising:
  - illumination means for illuminating an eyeball;
  - light receiving means having a plurality of photoelectric transfer elements for intercepting reflected light from the eyeball;
  - storage means for storing a plurality of Purkinje image candidates from among signals obtained by receiving the light with said light receiving means;
  - selection means for selecting Purkinje image candidates satisfying predetermined conditions as the Purkinje image from the plurality of Purkinje image candidates; and
  - detection means for detecting a state of the visual axis on the basis of the Purkinje image selected by said selection means.

5,570,158

## CAMERA HAVING VISUAL LINE DETECTING DEVICE AND METHOD OF PHOTOGRAPHY PERFORMED THEREBY

Hiroshi Wakabayashi, Yokohama; Yuji Katano, and Minoru Kato, both of Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 220,452, Mar. 30, 1994, abandoned, which is a continuation of Ser. No. 5,829, Jan. 19, 1993. This application Jan. 11, 1995, Ser. No. 371,485

Claims priority, application Japan, Jan. 20, 1992, 4-027510

Int. Cl.<sup>6</sup> G03B 7/00

U.S. Cl. 396—51

17 Claims

1. A camera, comprising:
  - a viewfinder;
  - a means for detecting a visual line of a photographer looking through said viewfinder;
  - an operation member that when operated causes the camera to perform photography;
  - a mark displaying means for automatically displaying a target mark within said viewfinder when said operation member is operated not requiring operation of any devices other than said operation member;
  - a means for automatically inputting and storing calibration data based upon the visual line detected by said visual line detection means when said photographer fixates on said target mark visible within said viewfinder; and





means and a plate spring member having a free end and a mounted end for elastically supporting said rubber member, wherein one edge of the pair of edges nearer to the mounted end side of said plate spring member contacts said toner peeling means, and the other edge of the pair of edges nearer to the free end side of said plate spring member is separated from said toner peeling means; and

said toner peeling means is a roller rotating in a direction opposite to a rotating direction of said toner carrying means.

# 5,570,165 METHOD OF CONTROLLING TONER DENSITY DETECTION

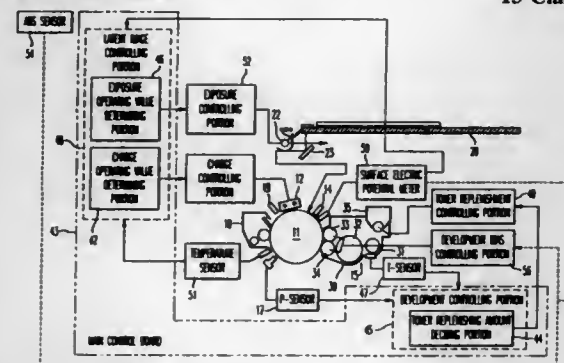
Tadao Koike, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 27, 1995, Ser. No. 394,818

Claims priority, application Japan, Feb. 25, 1994, 6-027633

Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 355—246 13 Claims



1. A method of controlling toner density detection of an electrophotographic-type image forming apparatus comprising a rotatable photosensitive body, forming means for forming an electrostatic latent image and standard density pattern on said photosensitive body, developing means for forming a toner image by developing said electrostatic latent image and standard density pattern on said photosensitive body, a transferring belt apparatus for transferring said toner image on said photosensitive body onto copying paper sheets through a transfer belt, density detection means for detecting a density of said toner image of said standard density pattern on said photosensitive body at a downstream side of said transferring belt apparatus in relation to a rotational direction of said photosensitive body, comprising the steps of:

- establishing a time interval for a transferring process for transferring said toner image on said photosensitive body onto said copying paper by use of said transferring belt apparatus, respectively, to long and short intervals;
- detaching said transferring belt from said photosensitive body only in a case that the time interval is the long interval and at a same time of forming the latent image forming the standard density pattern on the photosensitive body, and forming the toner image of said standard density pattern by developing said latent image and standard density pattern by use of said developing means;
- detecting a density of said toner image of said standard density pattern; and
- in a case that the time interval of the transferring process is the short interval, the formation of said electrostatic latent image of said standard density pattern is not performed.

# 5,570,166 DEVELOPING APPARATUS THAT APPLIES VOLTAGE TO DEVELOPER LAYER THICKNESS REGULATING MEMBER

Yukihiro Ohzeki, Yokohama; Masaki Ojima, Inagi; Katsuhiko Sakaizawa, Kawasaki, and Kenya Ogawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

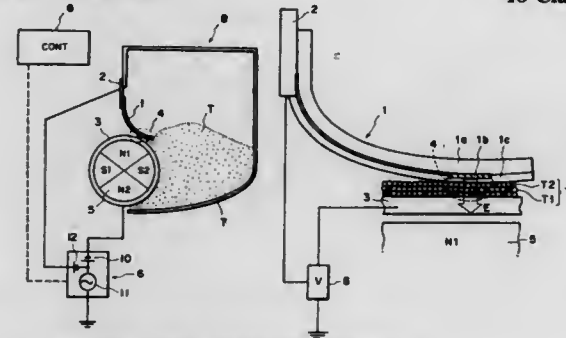
Filed Nov. 18, 1994, Ser. No. 345,394

Claims priority, application Japan, Nov. 19, 1993, 5-314584; Dec. 17, 1993, 5-344212; Dec. 27, 1993, 5-348358

Int. Cl.<sup>6</sup> G03G 15/09

U.S. Cl. 355—251

18 Claims



1. An image forming apparatus comprising: an image bearing member for bearing an electrostatic image having a predetermined polarity;
- a developer carrying member, opposed to said image bearing member, for carrying a one component developer which is charged to the same polarity as the electrostatic image by friction between the developer and said developer carrying member;
- electric field generating means for forming a developing electric field between said image bearing member and said developer carrying member;
- a regulating member for regulating an amount of the developer on said developer carrying member, said regulating member having an electroconductive layer and a dielectric layer located between said electroconductive layer and the developer on said developer carrying member; and
- voltage applying means for applying a voltage to the conductive layer to form an electric field which applies to developer having a polarity opposite the predetermined polarity a force urging the opposite polarity developer in a direction from said regulating member toward said developer carrying member.

# 5,570,167 MOLDED DEVELOPING MAGNET ROLLER

Masaaki Kuroda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 962,744, Oct. 19, 1992, Pat. No. 5,453,224.

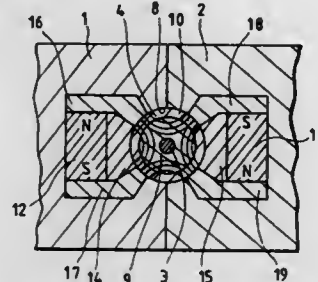
This application Jan. 27, 1995, Ser. No. 379,291

Claims priority, application Japan, Oct. 21, 1991, 3-272637; Jul. 27, 1992, 4-199973

Int. Cl.<sup>6</sup> G03G 15/06

U.S. Cl. 355—251

10 Claims



1. A magnet roller comprising a resin magnetic material in which magnetic material is mixed with a binder material in a molten state and injection molded to form an integral molded

product having a symmetric cross-section, and including plural pairs of magnetic poles, each comprising a magnetic exciting pole and a magnetic ending pole for generating magnetic lines of force therebetween, the plural pairs of magnetic poles being arranged at circumferential positions of said integral molded product, a surface magnetic flux density of at least one pair of magnetic poles being different from that of the other pairs of magnetic poles.

# 5,570,168 DEVELOPMENT PROCESS

Yoshiro Koga, and Masanao Kunugi, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo-to, Japan

Division of Ser. No. 756,997, Sep. 9, 1991, Pat. No. 5,438,395.

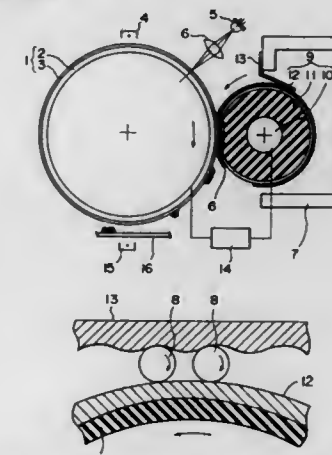
This application Apr. 10, 1995, Ser. No. 418,655

Claims priority, application Japan, Sep. 10, 1990, 2-239262; Sep. 10, 1990, 2-239263; Sep. 10, 1990, 2-239264; Sep. 10, 1990, 2-239265; Sep. 10, 1990, 2-239266

Int. Cl.<sup>6</sup> G03G 15/09

U.S. Cl. 355—253

22 Claims



1. An apparatus for developing an image by using spherical toner particles, comprising: a latent image carrier on which a latent image is formed by a potential contrast;
- a toner transporter having a surface for transporting spherical toner particles to the latent image carrier; and
- an elastic blade having a surface for passing the spherical toner particles transported by the toner transporter through a gap between the surfaces of the toner transporter and elastic blade thereby forming a thin toner layer which is charged, wherein the toner transporter is elastically deformed for the surface thereof to be brought into pressure contact with the latent image carrier and develop an electrostatic latent image on the latent image carrier with the thin toner layer which is charged, wherein surface roughnesses of the elastic blade and of the toner transporter are different from each other, and wherein the toner particles are rotated between the elastic blade and the toner transporter and charged electrostatically.

# 5,570,169 DONOR ROLLS WITH MODULAR COMMUTATION

Steven C. Hart, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

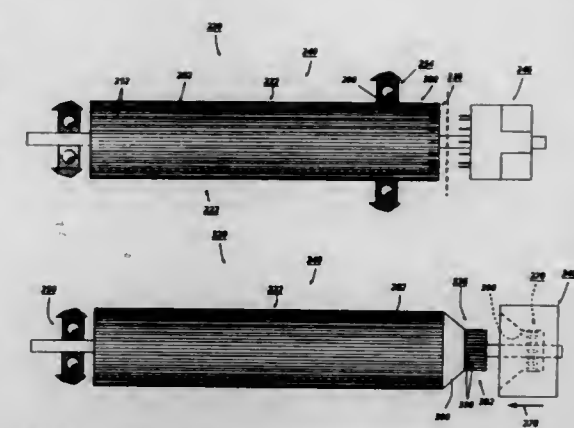
Filed Sep. 25, 1995, Ser. No. 533,229

Int. Cl.<sup>6</sup> G03G 15/06

U.S. Cl. 355—259

13 Claims

1. A donor roll for transporting marking particles to an electrostatic latent image recorded on a surface, said donor roll adaptable for use with a commutator for applying an electrical field to the roll to assist in transporting the marking particles, said donor roll comprising:



- a rotatably mounted body;
- an electrode member mounted on said body; and
- a pin extending from said body, electrically connected to said electrode member, and rotatable with said body, said connector adapted to be removably connectable to the commutator.

# 5,570,170 ELECTROSTATIC PRINTING APPARATUS WITH A HOPPER AND APPLICATOR ROLLER WITH METHOD OF APPLYING TONER TO AND DECLUMPING THE APPLICATOR ROLLER

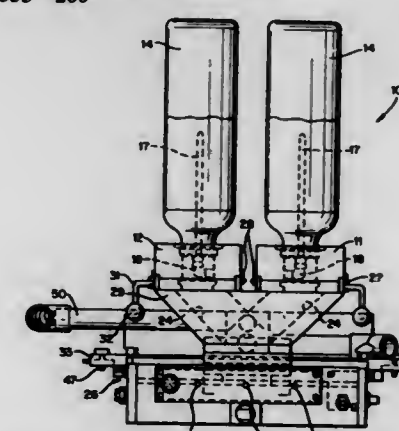
Mark J. Muranyi, Grand Island; Dennis C. Polluto, Cherry Creek; T. F. Cyman; Kevin J. Hook, both of Grand Island; Orrin D. Christy, and Mark A. Mathels, both of North Tonawanda, all of N.Y., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Dec. 27, 1993, Ser. No. 173,073

Int. Cl.<sup>6</sup> G03G 15/06

U.S. Cl. 355—260

34 Claims



18. An electrostatic printing apparatus comprising: a supply of conductive magnetic toner;
- a container for a fluidized bed of conductive magnetic toner; means for automatically replenishing toner withdrawn from the fluidized bed from said supply;
- means for fluidizing the toner in said container;
- a single applicator roller adjacent said container, and having an external surface thereof which extends into said container, said applicator roller including magnetic elements;
- means for rotating said applicator roller about a horizontal axis; and
- a metering blade cooperating with said applicator roller external surface for metering the conductive magnetic toner on said external surface.



5,570,171

# IN IMAGING FIXING DEVICE INCLUDING A HEAT ROLLER WITH A RELEASE LAYER

Yasuhiro Kusumoto, Nakai-Machi; Makoto Omata, Ebina; Yoshio Kanesawa; Yasuhiro Uehara, both of Nakai-machi, and Toru Inoue, Ebina, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

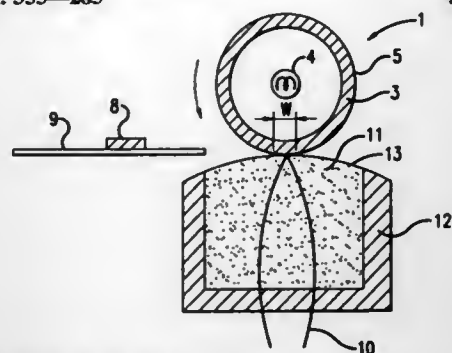
Filed Oct. 6, 1995, Ser. No. 529,545

Claims priority, application Japan, Oct. 12, 1994, 6-246475

Int. Cl.<sup>6</sup> G03G 15/20

U.S. Cl. 355—285

8 Claims



1. An image fixing device comprising: a heat roller disposed rotatably; pressure applying means fixed for contacting and applying pressure to said heat roller to form a nip portion where a recording sheet on which an unfixed toner image is formed is passed for fixing said toner image; said heat roller having a releasing layer on its surface for stripping said recording sheet which has passed through said nip portion; and  $\mu_1$  and  $\mu_2$  having the following relation

$$\mu_1/\mu_2 \geq 5,$$

wherein  $\mu_1$  is a frictional coefficient between said releasing layer of said heat roller and said recording sheet and  $\mu_2$  is a frictional coefficient between the surface of said pressure applying means and said recording sheet wherein said releasing layer of said heat roller is made of silicone rubber having at least  $2 \times 10^{-4}$  (mol/cm<sup>3</sup>) crosslink density.

5,570,172

# TWO UP HIGH SPEED PRINTING SYSTEM

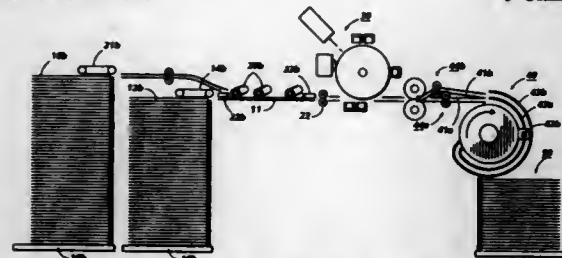
Thomas Acquaviva, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 18, 1995, Ser. No. 374,365

Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 355—323

6 Claims



1. In a high speed two up electronic printing system, with a printing path direction, in which dual page images are concurrently printed onto dual image substrates paired side by side laterally transverse said printing path direction to increase printing throughput speed, the improvement in said two up printing system comprising:

a dual high capacity cut sheet feeding system for loading and feeding pairs of separate precut copy sheets into said printing

path substantially in parallel to provide said paired side by side dual image substrates for said concurrent printing;

a registration system for registering said paired side by side dual image substrate sheets with a space between said paired sheets;

an electronic imaging system for line by line simultaneous printing of both of said opposite edge registered paired sheets with a non-imaging line space in said space between said paired sheets;

said electronic imaging system printing two different page images on said paired sheets;

and a sheet output lateral sheet merging and stacking system for consecutively laterally shifting and overlapping said printed paired sheets on top of one another and for stacking consecutive said overlapped sheet pairs on top of one another, to provide a collated output of said two up printed precut copy sheets.

5,570,173

# COLOR PRINTER USING LIQUID DEVELOPER

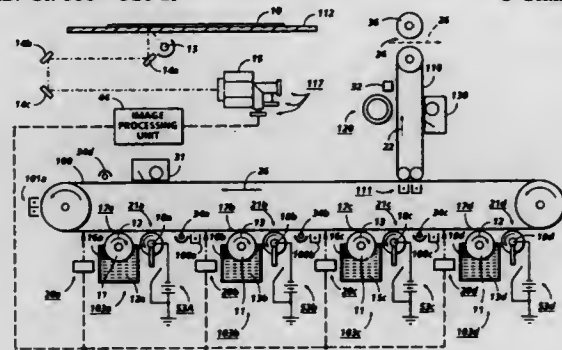
LeRoy M. Nye, Penfield; Henry R. Till, East Rochester, and James R. Larson, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 31, 1994, Ser. No. 331,855

Int. Cl.<sup>6</sup> G03G 15/01; 15/10

U.S. Cl. 355—326 R

8 Claims



1. An electrophotographic printing machine for producing a color image on a recording sheet, comprising:

a photoconductive member;

first means for charging the photoconductive member;

first means for exposing the charged photoconductive member for recording an electrostatic latent image thereon;

first means for developing the electrostatic latent image with liquid developer material containing toner particles of a first color to form a developed image on said photoconductive member;

first means for conditioning the developed image by reducing fluid content while inhibiting the departure of toner particles therefrom thereby increasing solids content of the developed image on said photoconductive member, said first condition means increase the solids content of the developed image so that the developed image has a solids content of about 15 to 40 percent, but preferably about 20 percent;

second means for charging the developed image on said photoconductive member;

second means for exposing the charged developed image on said photoconductive member;

second means for developing the developed image with liquid developer material containing toner particles of a second color to form a composite image on said photoconductive member.

5,570,174

# TWO-PASS HIGHLIGHT COLOR COPIER EMPLOYING CAD SCAVENGELESS DEVELOPMENT & STRONG DEVELOPMENT POTENTIALS

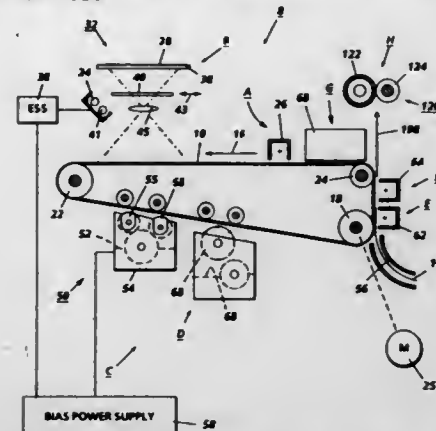
Robert P. Loe, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 1, 1994, Ser. No. 301,922

Int. Cl.<sup>6</sup> G03G 15/01

U.S. Cl. 355—328

8 Claims



1. A method of creating highlight color images on a charge retentive surface using light/lens optics to scan an original document, said method including the steps of:

moving said charge retentive surface past a plurality of process stations including a charging station where said charge retentive surface is uniformly charged;

using light/lens scanning optics, forming relatively high contrast charged area images in said charge retentive surface, said images corresponding to black images of an original;

using black toner particles, developing said images corresponding to black images;

uniformly recharging said charge retentive surface with said images corresponding to black images thereon;

using light/lens scanning optics and a color filter which causes color images on an original document to appear black on said charge retentive surface, forming relatively high contrast charged area images corresponding to color images of said original;

using colored toner particles, developing said high contrast charged area images corresponding to color images of said original.

5,570,175

# METHOD FOR DETERMINATION OF DEGREE OF MOLECULAR DISSOCIATION IN PLASMA USING COMBINED ELECTROSTATIC MEASUREMENT AND EMISSION SPECTROSCOPY

Frieder Dobe, Essen, Germany; William G. Graham, Coleraine, Northern Ireland; Denis P. Dowling, Blackrock; Terence P. O'Brien, Dublin, both of Ireland; Volkhard Kornas, Essen, Germany, and Thomas Morrow, Templepatrick, Northern Ireland, assignors to Ceram Optec Industries Inc., East Longmeadow, Mass.

Continuation of Ser. No. 209,073, Mar. 7, 1994, abandoned.

This application Aug. 3, 1995, Ser. No. 511,014

Int. Cl.<sup>6</sup> G01N 21/00; G01J 3/30; G01R 27/22

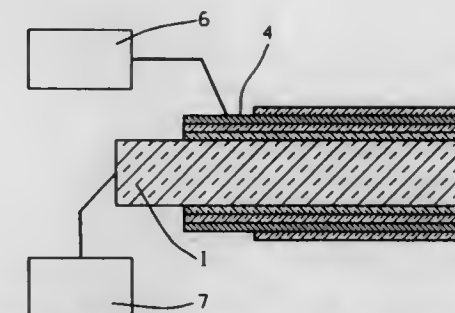
U.S. Cl. 356—72

6 Claims

1. A method for analyzing a plasma with a combination probe comprising:

a. measuring electrostatic parameters of said plasma, region by region, using an electroconductive means within said combination probe;

b. measuring emission spectroscopic parameters of said plasma, region by region, substantially simultaneously with said electrostatic measurements wherein said emission spectroscopic measurements use at least one optical fiber within said com-



- bination probe to transfer emitted light signals to a means for detection and, if desired, storage of said light signal; and
- c. producing from said measurements for each region of said plasma a degree of dissociation of  $A_xB_y$ , as determined by a ratio of dissociated molecular fragments to undissociated molecules of species  $A_xB_y$ , present in said plasma, wherein said plasma has an electron energy distribution, A and B are any chemical elements, x and y are any positive integers including wherein one of x and y may be zero.

5,570,176

# APPARATUS FOR CONVERTING A MULTIMETER TO AN OPTICAL POWER METER

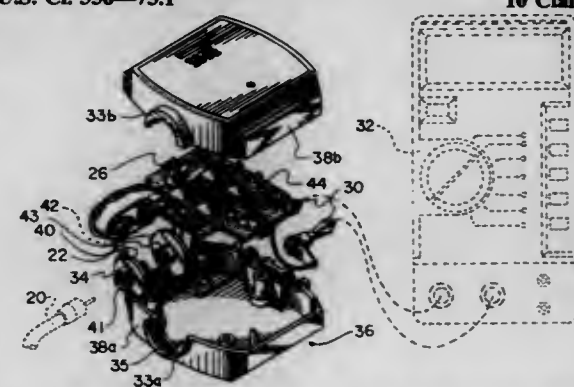
Claude A. Noel, Quebec, Canada, assignor to Nortech Fibronic Inc., Quebec, Canada

Filed Feb. 13, 1995, Ser. No. 387,164

Int. Cl.<sup>6</sup> G01N 21/84

U.S. Cl. 356—73.1

10 Claims



1. An apparatus for use in conversion of an optical power having a certain wavelength, said apparatus comprising:

- (a) a housing comprising a connecting area,
- (b) a pair of male connectors mounted in spaced apart relationship and protruding from said housing to be received by spaced apart female connectors of a meter,
- (c) means provided in said housing for connection to an optical cable, comprising a sheath and an optical fiber,
- (d) a photo-detector mounted in said housing to receive light from said optical cable and further comprising means for converting an output signal of said photo-detector to a signal value compatible for display by said meter,
- (e) calibration means connected between said photo-detector and said male connectors for providing a calibrated power response signal proportional to an intensity of said light received.

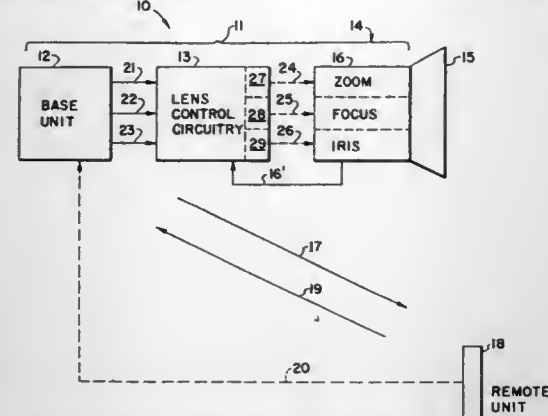
5,570,177

## CAMERA LENS CONTROL SYSTEM AND METHOD

Jeffrey L. Parker; David F. Sorrells, and John D. Mix, all of Jacksonville, Fla., assignors to ParkerVision, Inc., Jacksonville, Fla.

Continuation of Ser. No. 78,434, Jun. 16, 1993, Pat. No. 5,471,296, which is a continuation-in-part of Ser. No. 530,999, May 31, 1990, Pat. No. 5,268,734, and Ser. No. 736,729, Jul. 26, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 463,846

Int. Cl.<sup>6</sup> G01B 11/26; G01C 21/02; 3/08; G05B 1/06  
U.S. Cl. 356—139.06 61 Claims



1. A method of automatically controlling the field of view of an image-receiving device with an automatic control system to track a subject with the field of view comprising the steps of:

- A. controlling the field of view to automatically track a subject with the field of view by determining by the automatic control system the location of the subject with respect to a reference established by the automatic control system;
- B. defining the characteristics that control the field of view by selecting one or more values of one or more variables from one or more of the following list which defines field of view control of an image receiving device:
  - a. field of view position variables,
  - b. field of view perspective variables,
  - c. image-receiving imaging device variables,
  - d. automatic control system variables;
- C. remembering one or more of the values of step B;
- D. recalling one or more remembered values; and
- E. automatically tracking the subject with the field of view using the one or more values recalled in step D.

5,570,178

## SCANNING IMAGING SYSTEM HAVING REDUCED DETECTED SIGNAL ALIASING IN CROSS SCAN DIRECTION

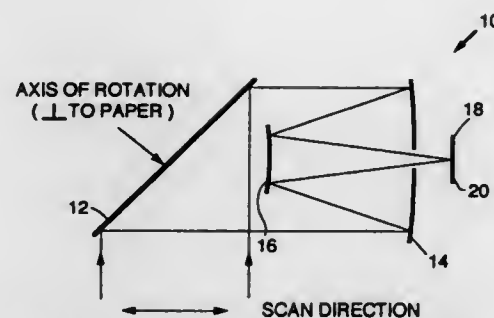
Frank R. Malinowski, Santa Barbara, and James B. Young, Goleta, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Dec. 9, 1994, Ser. No. 353,469

Int. Cl.<sup>6</sup> G01J 1/42

U.S. Cl. 356—218 17 Claims

1. A system for receiving electromagnetic energy, said system being mounted for movement over a surface and comprising: first means for receiving electromagnetic radiation and



second means for directing electromagnetic radiation to said first means, said second means having an astigmatic blur in a first direction effective to reduce aliasing of a signal received by said first means in said first direction.

5,570,179

## MEASURING SENSOR AND MEASURING ARRANGEMENT FOR USE IN THE ANALYSIS OF GAS MIXTURES

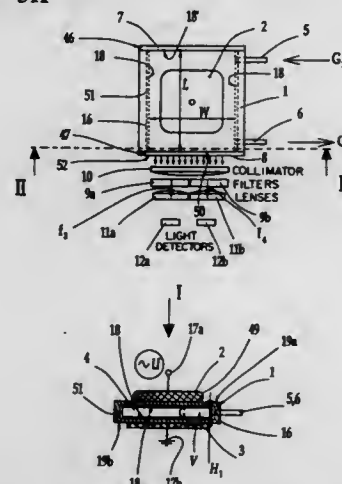
Kurt Weckström, Espoo, Finland, assignor to Instrumentarium Oy, Finland

Filed Dec. 15, 1994, Ser. No. 358,071

Claims priority, application Finland, Dec. 16, 1993, 935682

Int. Cl.<sup>6</sup> G01N 21/69

U.S. Cl. 356—311 29 Claims



1. A measuring sensor for the spectroscopic analysis of gas mixtures by means of a silent electrical discharge, the measuring sensor (1) comprising:

- a chamber (4) which includes a wall (16) made primarily of a dielectric material and surrounding the chamber; through-going flow connections (5,6) in the wall for passing a gas mixture to be analyzed into (G<sub>1</sub>) and out of (G<sub>2</sub>) the chamber; first and second electrodes (2,3) on the opposite sides of the chamber with a high alternating voltage (U) applied therebetween; and at least one window (8) included in the wall and transmissive to wavelengths to be measured; and
- at least one radiation detector element (12) positioned for measuring the intensity of radiation emitted through said window,

said high alternating voltage (U) having a frequency which is at least on the order of 10 kHz for producing a radiation emission based on the soft, substantially non-ionizing excitation of molecules and/or atoms in a gas mixture (G) to be analyzed and contained in the chamber (4).

5,570,180

## SPECTROMETER PROVIDED WITH AN OPTICAL SHUTTER

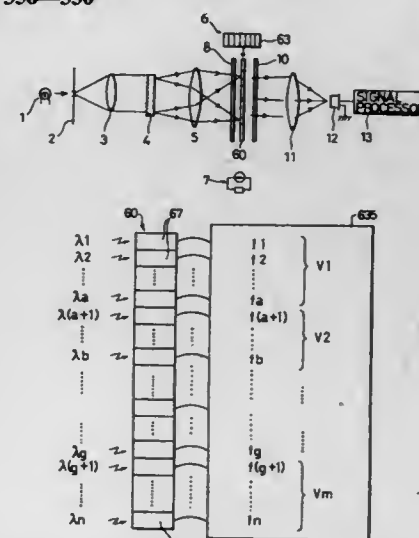
Yoshiro Nagai, Osaka, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 290,231, Aug. 19, 1994, Pat. No. 5,457,530. This application Aug. 23, 1995, Ser. No. 518,194

Claims priority, application Japan, Aug. 27, 1993, 5-213122

Int. Cl.<sup>6</sup> G01J 3/04; 3/28

U.S. Cl. 356—330 16 Claims



1. A spectrometer comprising:

- a light diffractor which diffracts an incident light according to wavelengths;
- an optical shutter array member including a plurality of optical shutter elements, the optical shutter elements being:
  - arranged in correspondence with wavelength bands diffracted by the light diffractor;
  - operable to transmit an incident ray according to an applied voltage; and
  - made of PLZT;
- a voltage applicator which applies a zone of a given number of adjacent optical shutter elements with a voltage corresponding to the wavelength bands of the rays incident upon the zone of adjacent optical shutter elements at a specified timing so that the rays respectively pass through the optical shutter elements, the application voltages for the zones differing from one another in accordance with wavelengths of rays which are incident upon the zones of optical shutter elements;
- a signal processor which receives the ray which has passed through each optical shutter element and outputs an electrical signal according to the intensity of the received ray; and
- a calculator which calculates the intensity of the incident ray for each wavelength band in accordance with the electrical signal output from the signal processor and the specified applying timing.

5,570,181

## METHOD OF DETECTING IMPURITIES IN MOLTEN RESIN UTILIZING SCATTERING LIGHT AND THE SHADOWS OF THE IMPURITIES

Hiroyuki Yasuo, and Hiroshige Deguchi, both of Osaka, Japan, assignors to Sumitomo Electric Industries Ltd., Osaka, Japan

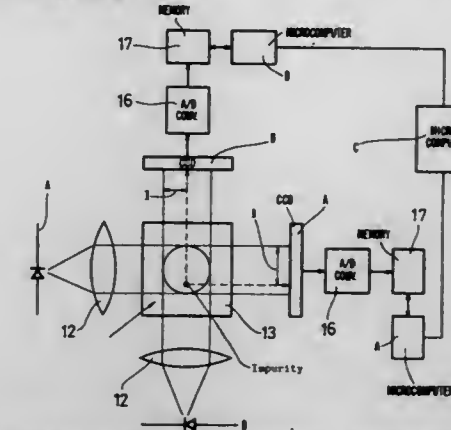
Continuation of Ser. No. 157,327, Nov. 26, 1993, abandoned.

This application Jun. 6, 1995, Ser. No. 471,443

Claims priority, application Japan, Nov. 25, 1992, 4-339776; Sep. 13, 1993, 5-252250

Int. Cl.<sup>6</sup> G01N 15/02; 21/00; G01B 11/14; G02B 7/04

U.S. Cl. 356—336 7 Claims



4. A method of detecting impurities in a molten resin comprising: providing at least two devices used in carrying out the method of detecting impurities in a molten resin by passing the molten resin through a passage having a window through which light can pass and emitting light from a light source through said window and the molten resin flowing through said passage and sensing, by means of a sensor, shadows produced when the light from said light source is interrupted by an impurity contained in the molten resin and measuring a size of the impurity from a width of the shadow and an intensity of light in the shadow, detecting the shadows of impurities contained in the molten resin by means of at least two sensors of said at least two devices to determine three-dimensional positions of the impurities, and correcting a size of the impurities according to the three-dimensional position thus obtained.

5,570,182

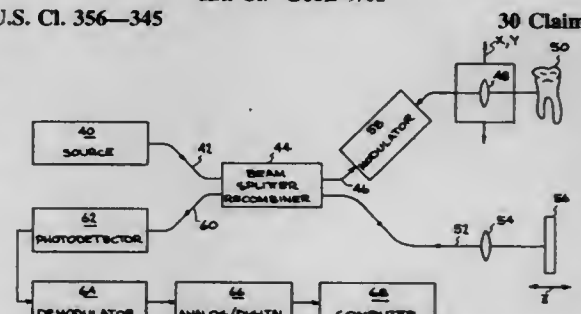
## METHOD FOR DETECTION OF DENTAL CARIES AND PERIODONTAL DISEASE USING OPTICAL IMAGING

Howard Nathel, Albany; John H. Kinney, Danville, and Linda L. Otis, San Francisco, all of Calif., assignors to Regents of the University of California, Oakland, Calif.

Filed May 27, 1994, Ser. No. 250,492

Int. Cl.<sup>6</sup> G01D 9/02

U.S. Cl. 356—345 30 Claims



1. A method for characterizing dental caries and periodontal disease in dental or periodontal tissue using optical imaging, comprising:

- directing non-ionizing radiation of a selected wavelength onto a surface of the dental or periodontal tissue, wherein the wave-



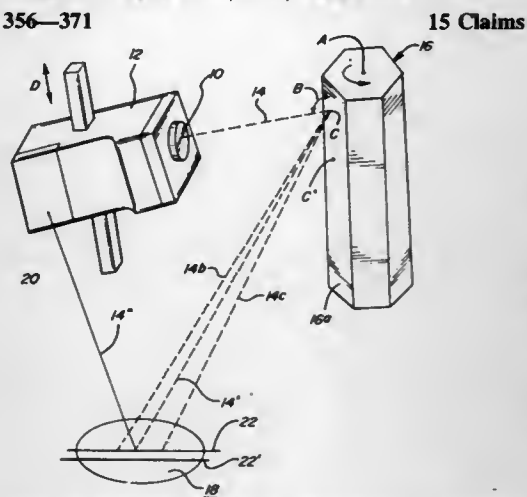
length simultaneously maximizes the differential absorption/reflection between carious and healthy dental tissue and the number of photons reflected by the dental tissue, collecting photons reflected by internal structures or interfaces of the tissue, discriminating between photons that are unscattered by the dental or periodontal tissue, and photons that are scattered by the tissue, based on the coherence of the reflected photons, selecting photons that are unscattered by the dental or periodontal tissue, interpreting the distribution of the selected photons to determine the characteristics of the dental or periodontal tissue.

5,570,183

**APPARATUS FOR MEASURING OPTICAL CHARACTERISTICS OF A SURFACE IN TWO DIMENSIONS USING A MOVING LIGHT SOURCE**  
Gregory R. Wiles, Royal Oak, Mich., assignor to ATI Systems, Inc., Madison Heights, Mich.

Filed Apr. 24, 1995, Ser. No. 426,963  
Int. Cl.<sup>6</sup> G01B 11/30; 11/24; G02B 26/08

U.S. Cl. 356—371



1. A system for measuring an optical characteristic of a surface of a workpiece, said system including:

- a support block;
- a light source which is retained upon the support block and is operative to project a beam of light;
- a scanning assembly which includes a mirror which has a length and a width and is disposed so as to intercept said beam at a contact point thereupon and at an angle of incidence, and to reflect said beam on to a surface of a workpiece, said scanning assembly further including a motor for rotating said mirror about an axis of rotation so that the angle of incidence of said beam of light upon said mirror varies as said mirror is rotated and the beam which is reflected from the mirror is thereby swept across said surface so as to define a scan line thereupon;
- an optical sensor retained upon said support block so as to receive a portion of the beam of light which is reflected from said surface, said sensor being operative to provide a signal corresponding to illumination incident thereupon;
- a driver for moving said support block, light source and sensor as a single unit, along a path of travel which will displace the contact point of said beam of light along the length of said mirror, whereby the scan line is laterally displaced along said surface.

5,570,184  
**METHOD AND APPARATUS FOR LOCATING THE POSITION OF LASING GAPS FOR PRECISE ALIGNMENT AND PLACEMENT OF OPTOELECTRIC COMPONENTS**

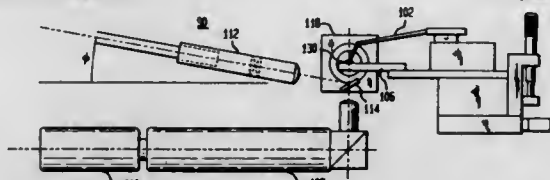
Richard S. Armington, Hopewell, and Leroy D. L'Esperance, Erial, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 7, 1994, Ser. No. 350,917

Int. Cl.<sup>6</sup> G01B 11/14; H01S 3/02

U.S. Cl. 356—375

12 Claims



1. An apparatus for locating a lasing gap position of an optoelectric component comprising:  
tool means for holding and energizing said optoelectric component, including a substantially light transparent portion and an electrically conductive portion, wherein said electrically conductive portion is configured to selectively energize said optoelectric component to emit light; and  
an image gathering optics system including at least one camera positioned relative to said tool means for receiving positional information regarding said optoelectric component through said light transparent portion.

5,570,185

**METHOD FOR POSITIONING A MEASURING DEVICE EMITTING AND RECEIVING OPTICAL RADIATION FOR MEASURING WEAR IN THE LINING OF A CONTAINER**

Hannu Jokinen, and Kari Mänttä, both of Oulu, Finland, assignors to Rautaruukki Oy, Oulu, Finland

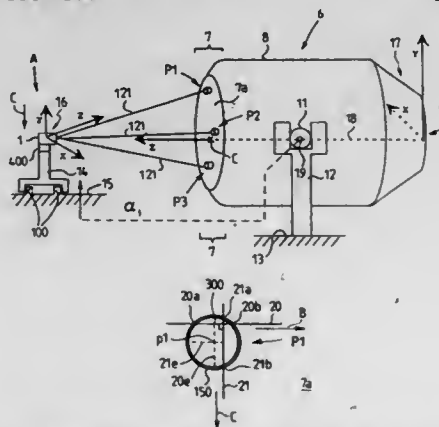
Filed Dec. 20, 1994, Ser. No. 359,635

Claims priority, application Finland, Dec. 29, 1993, 935918

Int. Cl.<sup>6</sup> G01B 11/00; 11/03

U.S. Cl. 356—376

15 Claims



1. In a method for positioning a measuring device which emits and receives optical radiation to measure wear in the lining of a container, said method involving fixing coordinate systems for the measuring device and the container by combining said coordinate systems, and individually determining the positions of a plurality of specific fixing points in the coordinate system of the measuring device, wherein each of said fixing points has a substantially regular geometric shape, a method for determining the position of each fixing point comprising the steps of:

- a) deflecting an optical radiation beam across the fixing point in first and second intersecting directions,
- b) measuring optical radiation reflected back from the fixing point,

- c) determining at least four intersections, two in each deflection direction, between the fixing point and the optical radiation beam from the optical radiation reflected back to the measuring device, and
- d) calculating a target point from said at least four intersections to which the optical radiation beam can be directed to determine the coordinates of the fixing point in the coordinate system of the measuring device.

- (f) processing said correlated values with the aid of a computer program for ascertaining said curvature.

5,570,187

**WELD-POSITION DETECTOR PROVIDED WITH AN OPTICAL AXIS ADJUSTMENT MEANS AND USED WITH A ROBOT WELDING MACHINE**

Ryo Nihei, Fujiyoshida; Yasuo Sasaki, and Takahiro Hase, both of Yamanashi, all of Japan, assignors to Fannc Ltd, Yamanashi, Japan

Continuation of Ser. No. 329,168, Oct. 26, 1994, abandoned.

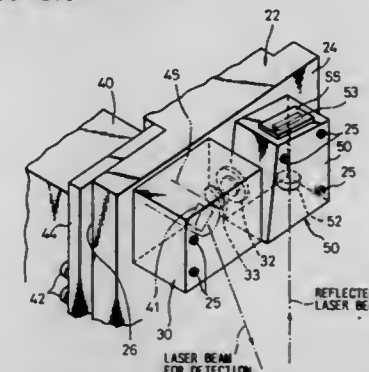
This application Feb. 20, 1996, Ser. No. 603,181

Claims priority, application Japan, Oct. 26, 1993, 5-267326

Int. Cl.<sup>6</sup> G01B 11/24

U.S. Cl. 356—376

4 Claims



1. A weld-position detector, for detecting weld portions of a workpiece to be welded by an automatic welding machine, comprising:

- a laser-beam projecting means including a laser source and a projecting lens, said projecting lens projecting a detection laser-beam from said laser source in a fixed direction;
  - a scanning means including a movable reflecting mirror and a galvanometer, said galvanometer moving said reflecting mirror so as to direct the detection laser-beam coming from said laser-beam projecting means along said fixed direction toward the weld portions of the workpiece and to scan the detection laser-beam across the weld portions of the workpiece upon being projected by the laser-beam projecting means; and
  - a light-receiving means including a light-receiving lens and a light sensor, said light-receiving means receiving the detection laser-beam reflected from the weld portions of the workpiece to therein permit the light sensor to detect the detection laser-beam,
- wherein said laser-beam projecting means, scanning means, and light-receiving means are beforehand produced as single independent units; and
- a fixture for accurately mounting, at predetermined positions thereof, said respective three independent units, said fixture having a first reference face to which said laser-beam projecting means and said light-receiving means are commonly and fixedly attached, and a second reference face thereof to which said scanning means provided with an optical axis adjusting means is adjustably attached, said first and second reference faces of said fixture being opposite faces formed in a plate member,
- wherein said optical axis adjusting means adjusts position and posture of said scanning means with respect to the predetermined position thereof to therein allow alignment of the optical axis of the detection laser-beam projected by said laser-beam projecting means with a predetermined axis lying in a predetermined plane of said light-receiving means.

5,570,186

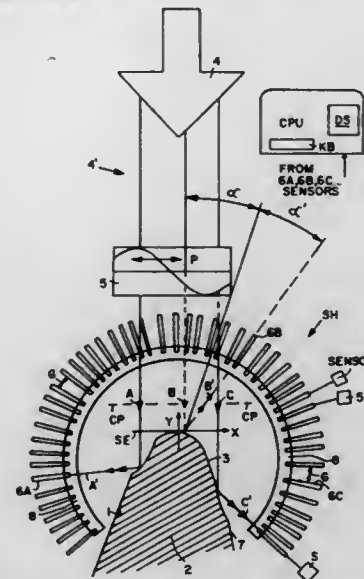
**METHOD FOR INSPECTING THE CURVATURE OF A PROFILE, SUCH AN EDGE OF A TURBINE BLADE**  
Wilhelm Satzger, Munich, and Edmund Mangold, Ohlstadt, both of Germany, assignors to MTU Motoren- und Turbinen-Union Munich GmbH, Muenchen, Germany  
Continuation-in-part of Ser. No. 53,156, Apr. 27, 1993, Pat. No. 5,444,536. This application Feb. 21, 1995, Ser. No. 391,553

Claims priority, application Germany, Apr. 28, 1992, 42 13 908.2

Int. Cl.<sup>6</sup> G01B 11/24

U.S. Cl. 356—376

14 Claims



1. A method for inspecting the curvature of a metal edge profile having a specular light reflecting surface, comprising the following steps:

- (a) generating a single light beam having a plurality of parallel beam segments for illuminating at least a portion of said specular light reflecting surface;
- (b) intensity modulating said parallel beam segments for marking different beam segments with a respective different beam segment intensity in the same cross-sectional plane of said light beam to provide marked illuminating beam segments (A, B, C, ...) each having a different intensity value;
- (c) directing said marked illuminating beam segments (A, B, C, ...) from said single light beam directly onto said specular light reflecting surface, whereby each marked illuminating beam segment (A, B, C, ...) has a respective incidence angle and represents its respective illuminating different beam intensity value to produce reflected beam segments (A', B', C', ...) each having a reflection angle (α') that is equal to said incidence angle of the corresponding illuminating beam segment (A, B, C, ...);
- (d) sensing or scanning said reflected beam segments (A', B', C', ...) to provide reflected different intensity values;
- (e) correlating said illuminating different beam intensity values of said illuminating beam segments (A, B, C, ...), with reflected beam intensity values of said reflected beam segments (A', B', C', ...) to provide correlated values (A, A'; B, B'; C, C'; ...); and

5,570,188

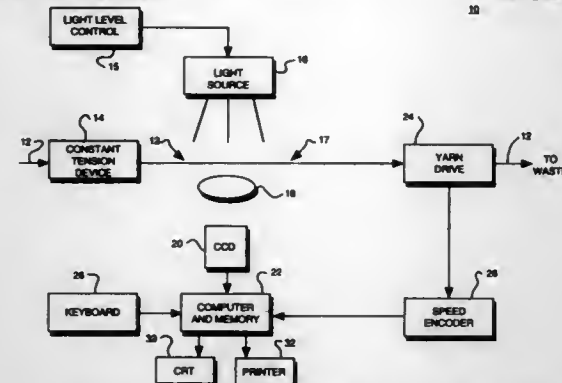
## SYSTEM AND METHOD FOR ELECTRONICALLY DISPLAYING YARN QUALITIES

Avishai Nevel; John B. Lawson, both of Providence; Kendall W. Gordon, Jr., North Kingstown, all of R.I., and David Bonneau, West Boylston, Mass., assignors to Lawson-Hemphill, Inc.

Continuation-in-part of Ser. No. 150,613, Nov. 10, 1993, abandoned. This application Jun. 1, 1994, Ser. No. 252,346 Int. Cl.<sup>6</sup> G01B 11/10

U.S. Cl. 356—385

16 Claims



1. A system for electronically displaying at least one yarn quality which has been measured by means for measuring at a plurality of locations along a length of yarn, comprising:

- means for assigning a display attribute to each measured quality;
- means for dividing the display attributes into a number of groups, each representing a portion of the length of yarn; and
- means for displaying the display attributes of the groups side-by-side to facilitate comparison of the quality in the groups.

5,570,189

## SPLIT-FIELD PUPIL PLANE DETERMINATION APPARATUS

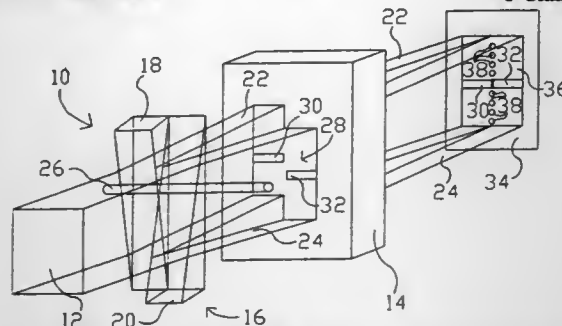
Joseph T. Salmon, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 967,462, Oct. 28, 1992, abandoned. This application May 30, 1995, Ser. No. 453,404

Int. Cl.<sup>6</sup> G01B 11/26

U.S. Cl. 356—399

6 Claims



1. Apparatus for locating a pupil plane following relay telescope optics along an optical path comprising:

- a pair of optical wedges disposed side-by-side on said optical path for splitting an incident beam of collimated light on said optical path to provide two parallel side-by-side beams of collimated light on said optical path, said parallel side-by-side beams of collimated light being provided such that they diverge while being parallel to the path of the incident beam of collimated light;

- a mask disposed to provide a reference shadow having an initial configuration, said mask being disposed so that the reference shadow is split between the diverging parallel side-by-side

collimated beams to provide a section of said reference shadow in each diverging parallel side-by-side collimated light beam;

said relay telescope optics receiving said diverging parallel side-by-side collimated light beams and coupling said received collimated light beams along the optical path, said relay telescope optics further outputting said diverging parallel side-by-side collimated light beams as converging parallel side-by-side collimated light beams toward said pupil plane; means for determining a location where said sections of the reference shadow are aligned in said converging parallel side-by-side collimated light beams along said optical path, said pupil plane being located where said sections of the reference shadow are aligned to provide a recombined reference shadow having a configuration similar to the initial configuration of the reference shadow.

5,570,190

## VISUAL SENSOR COORDINATE SYSTEM SETTING JIG AND SETTING METHOD

Fumikazu Terawaki, and Fumikazu Warashina, both of Oshino-mura, Japan, assignors to Fanuc Ltd., Japan

PCT No. PCT/JP93/01750, § 371 Date Aug. 3, 1994, § 102(e) Date Aug. 3, 1994, PCT Pub. No. WO94/12915, PCT Pub. Date Sep. 6, 1994

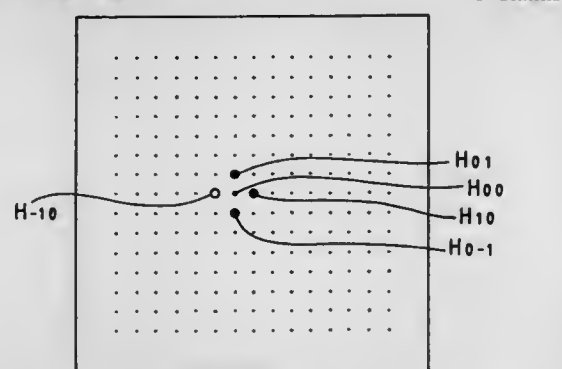
PCT Filed Dec. 1, 1993, Ser. No. 284,442

Claims priority, application Japan, Dec. 3, 1992, 4-350296

Int. Cl.<sup>6</sup> G01B 11/03

U.S. Cl. 356—400

3 Claims



1. A visual sensor coordinate system setting jig comprising:

- a plurality of feature points of a jig arranged at known intervals in an array state corresponding to a visual sensor coordinate system; and

- a visual sensor to receive an image of said plurality of feature points of said jig,

- at least three of said plurality of feature points each having a distinguishing appearance which said visual sensor recognizes to discriminate said at least three feature points from the other of said plurality of feature points, said at least three feature points each having said distinguishing appearance representing an origin and coordinate axes of said visual sensor coordinate system, and

- said visual sensor to identify said origin and said coordinate axes of said visual sensor coordinate system based on said array state of said plurality of feature points and said at least three feature points each having said distinguishing appearance.

5,570,191

## IDENTIFICATION OF CONNECTOR TERMINALS

Hitoshi Uesugi; Tsutomu Maki; Kazuyoshi Tomikawa; Tatsuya Maeda, and Yoshimi Masuda, all of Haibara-gun, Japan, assignors to Yazaki Corporation, Tokyo, Japan

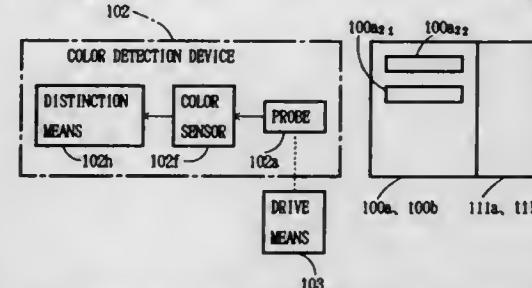
Filed Oct. 6, 1994, Ser. No. 321,035

Claims priority, application Japan, Oct. 8, 1993, 5-253408

Int. Cl.<sup>6</sup> G01J 3/46

U.S. Cl. 356—402

9 Claims



1. A method for identifying connector terminals comprising the steps of:

- positioning a connector housing including plural kinds of terminals mounted at predetermined locations;
- moving a sensor probe of a color detection device across locations of said terminals in said connector housing;
- sensing a level of a specific color component of light received by said sensor probe while performing the step of moving the sensor probe; and
- comparing the sensed level with a predetermined reference level, and determining a type of terminal according to whether the sensed level is higher than the reference level.

5,570,192

## SAMPLE OPTICAL PROPERTIES MEASURING DEVICE WITH PREDICTIVE ESTIMATION OF MEASUREMENT RANGE BY USING PRELIMINARY AND MAIN LIGHT EMISSION

Kolchi Terauchi, Toyohashi, and Tomomi Ono, Akashi, both of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

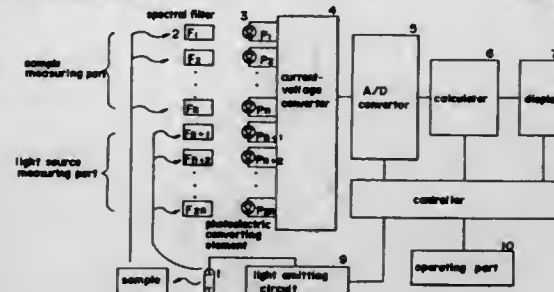
Filed Sep. 6, 1994, Ser. No. 300,971

Claims priority, application Japan, Sep. 6, 1993, 5-220952

Int. Cl.<sup>6</sup> G01N 21/25; G01J 3/46

U.S. Cl. 356—407

18 Claims



1. An optical properties measuring device comprising:

- a light source that irradiates a measurement sample;
- a photosensor that receives a light from the irradiated measurement sample and outputs an electrical signal in response to an intensity of the light;
- a preliminary light emission means that performs preliminary light emission from the light source prior to a main light emission for sample measurement;
- a preliminary calculating means that approximates optical properties of the sample based on an electrical signal output from the photosensor at a time of preliminary light emission;
- a determining means that determines a luminous energy level for the main light emission for sample measurement based on the optical properties obtained by means of said approximation of the preliminary calculating means;

a main light emission means that, when the sample is measured, performs main light emission from the light source in accordance with the determined level of luminous energy;

a main calculating means that calculates optical properties of the sample based on only an electrical signal output from the photosensor at a time of the main light emission; and

an output means that outputs as sample measurement results the optical properties of the sample calculated by the main calculating means.

5,570,193

## CONCENTRATION DETECTOR FOR COLORED TONER

Benzion Landa, Edmonton, Canada; Yehuda Niv, Rehovot, Israel; Michael Plotkin, Kibbutz Einat, Israel, and Peter Forgacs, Kiryat Gat, Israel, assignors to Indigo N.V., SM Veldhoven, Netherlands

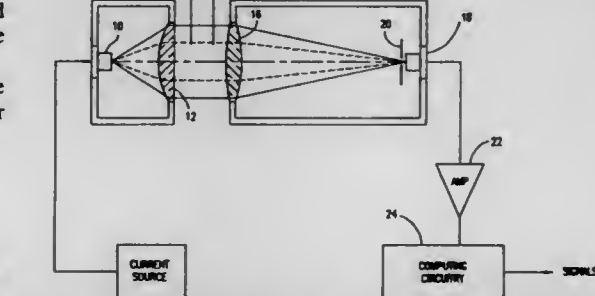
PCT No. PCT/NL92/00117, § 371 Date Feb. 27, 1995, § 102(e) Date Feb. 27, 1995, PCT Pub. No. WO94/01809, PCT Pub. Date Jan. 20, 1994

PCT Filed Jul. 2, 1992, Ser. No. 360,681

Int. Cl.<sup>6</sup> G01N 21/59

U.S. Cl. 356—442

37 Claims



1. A method for detecting the concentration of colored toner particles in a dispersion undesirably contaminated by black toner particles, the method comprising the steps of:

- providing a quantity of the dispersion of colored toner particles optionally contaminated with black toner particles;
- illuminating the dispersion;
- detecting an amount of light passed through the dispersion with a viewing angle of less than  $\pm 10$  degrees; and
- determining the concentration of the colored toner particles utilizing the detected amount of light.

5,570,194

## COLOR IMAGE FORMING APPARATUS IN WHICH PRE-TRANSFER IMAGE EXPOSURE IS PERFORMED ON FULL COLOR TONER IMAGE ON PHOTORECEPTOR AFTER FOURTH COLOR TONER IMAGE IS FORMED BUT BEFORE TRANSFERRING FULL COLOR TONER IMAGE

Masakazu Fukuchi; Satoshi Haneda, and Shizuo Morita, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Nov. 18, 1993, Ser. No. 154,748

Claims priority, application Japan, Nov. 26, 1992, 4-317353 Int. Cl.<sup>6</sup> H04N 1/29; G03G 15/01

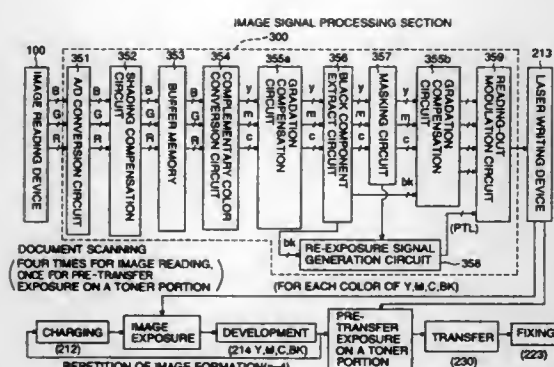
U.S. Cl. 358—300

6 Claims

1. An apparatus for forming a desired color toner image, comprising:

- an image reader for outputting three kinds of color image signals by scanning an image;
- a signal processor for converting the three kinds of image signals into four kinds of recording signals of Y, M, C, and BK, the image reader conducting the scanning for each of the





four kinds of recording signals so that the image reader conducts the scanning on the same image four times in first to fourth scanings;

- a photoreceptor on which the desired color toner image is formed;
- a first exposure device for conducting an image exposure on the photoreceptor on the basis of each of the four kinds of recording signals in synchronization with the scanning of the image reader so as to form a latent image for each of the four kinds of recording signals;
- a developing device for developing each of the latent images with a corresponding one of Y, M, C, and BK color developers so as to form the desired color toner image composed of Y, M, C, and BK color toner images on the photoreceptor;
- a transfer device for transferring the desired color toner image from the photoreceptor onto a recording sheet; and
- a controller for controlling a second exposure device to conduct a pre-transfer image exposure on the full color toner image on the photoreceptor on the basis of the recording signals after the fourth scanning which forms a fourth color toner image of the Y, M, C, and BK color toner images, but before transferring the desired color toner image.

5,570,195

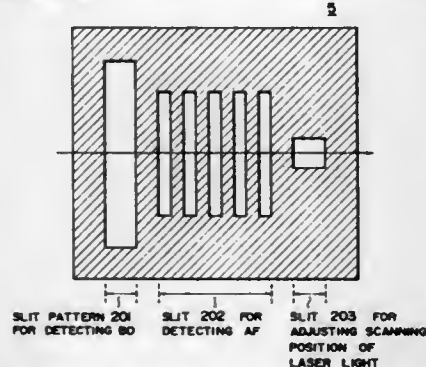
**IMAGE FORMING APPARATUS WHICH DETECTS SCANNING LIGHT THROUGH SLITTED SHIELD PLATE**  
Tsunao Honbo, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1993, Ser. No. 29,047

Claims priority, application Japan, Mar. 10, 1992, 4-86180  
Int. Cl.<sup>6</sup> H04N 1/21; G01D 9/42

U.S. Cl. 358—302

20 Claims



1. An image forming apparatus for forming images by allowing a light beam to be scanned and exposed on a photosensitive body, comprising:

- single detecting means for detecting the light beam scanned and exposed onto the photosensitive body;
- a plurality of signal generating means for generating a predetermined control signal based on an output from the detecting means; and

output control means for controlling an optical signal output which is output from said detecting means to be routed to any one of said plurality of signal generating means.

5,570,196

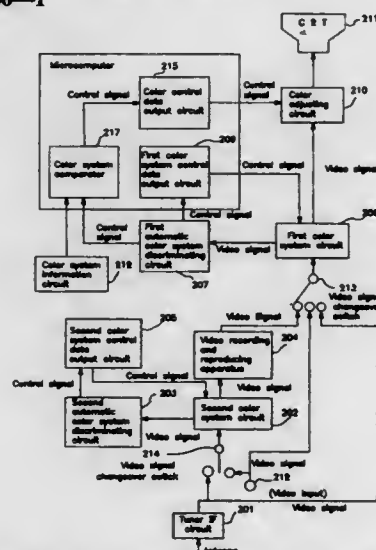
**TELEVISION RECEIVER INCORPORATING VIDEO RECORDING AND REPRODUCING APPARATUS**  
Hisashi Miyaguchi, Takatsuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 5, 1995, Ser. No. 462,612

Claims priority, application Japan, Jun. 7, 1994, 6-125069  
Int. Cl.<sup>6</sup> H04N 9/79

U.S. Cl. 386—1

5 Claims



1. A television receiver incorporating a video recording and reproducing apparatus comprising:

- a first automatic color system discriminating circuit for discriminating a color system of an input video signal,
- a first color system control data output circuit for applying color system control data to a first color system circuit based on the color system discrimination by the first automatic color system discriminating circuit, and setting the color system,
- a second automatic color system discriminating circuit for discriminating a color system of an input video signal,
- a second color system control data output circuit for applying color system control data to a second color system circuit based on the color system discrimination by the second automatic color system discriminating circuit, and setting the color system,
- a video recording and reproducing apparatus for recording an output video signal of the second color system circuit,
- color system information means for storing color system information for determining the accuracy of the color system discrimination by the second automatic color system discriminating circuit,
- a color system comparator for comparing the color system information discriminated by the first automatic color system discriminating circuit and the color system information stored in the color system information means, and issuing a control signal when the second automatic color system discriminating circuit cannot discriminate the color system,
- a color adjusting circuit for adjusting the color of an output of the first color system circuit,
- a color control data output circuit for receiving the control signal from the color system comparator, and controlling the color adjustment by the color adjusting circuit, and
- a display device for receiving the output of the color adjusting circuit, and reproducing the picture.

**5,570,197**  
**APPARATUS FOR FURTHER COMPRESSING AND RECORDING ENCODED DIGITAL VIDEO DATA STREAMS**

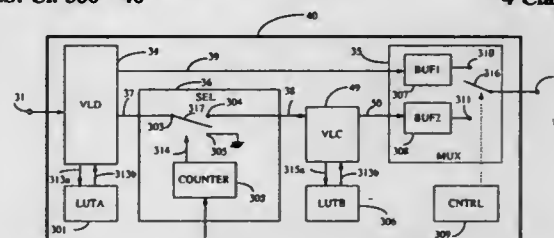
Choong S. Boon, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 1, 1994, Ser. No. 252,173

Claims priority, application Japan, Jun. 1, 1993, 5-130840  
Int. Cl.<sup>6</sup> H04N 5/76; 7/12

U.S. Cl. 386—46

4 Claims



1. An apparatus for further compressing an encoded video data stream which includes a plurality of blocks each containing K quantized orthogonal transformed coefficients, wherein K is a positive integer, comprising:

- a variable length decoder for parsing the video data stream, distinguishing and extracting the quantized orthogonal transformed coefficients from other side information;
- a selector coupled to said variable length decoder for extracting, for each said block, k quantized orthogonal transformed coefficients wherein K is a positive integer and (k < K);
- a variable length encoder coupled to said selector for converting said selected k quantized orthogonal transformed coefficients into a set of variable length codes; and
- a multiplexer coupled to said variable length decoder and said variable length encoder for merging the variable length codes of said selected k quantized orthogonal transformed coefficients into said side information, such that said selected k quantized coefficients replacing corresponding blocks in the video data stream.

5,570,198

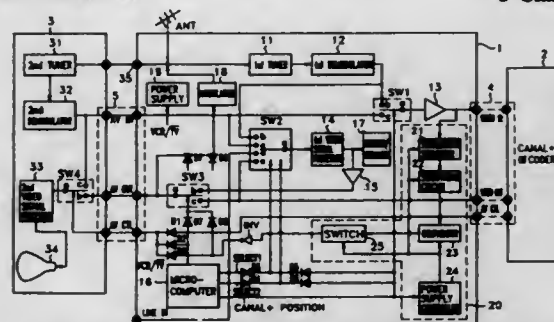
**PAID BROADCAST RECEIVING DEVICE WITH CONNECTION DETECTING CAPABILITY**  
Hyun-gi Cho, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Jul. 27, 1994, Ser. No. 281,090

Claims priority, application Rep. of Korea, Jul. 27, 1993, 1993-14068  
Int. Cl.<sup>6</sup> H04N 5/76

U.S. Cl. 386—46

5 Claims



1. A paid broadcast receiving device in a video cassette recorder (VCR) which includes a paid broadcast decoder for converting a scrambled paid broadcast signal into an unscrambled signal for normal reception, said paid broadcast receiving device comprising: first switching means for performing a switching operation such that an input terminal of said paid broadcast decoder is connected to one of an output terminal of a VCR demodulator and an output terminal of a television demodulator;

second switching means for performing a switching operation such that an input terminal of a VCR video signal processor is connected to one of said output terminal of said VCR demodulator, said output terminal of said television demodulator, and said output terminal of said paid broadcast decoder; third switching means for performing a switching operation according to a VCR/TV select mode control signal, whose output terminal is connected to an output terminal of said VCR video signal processor in a VCR mode and to an output terminal of said paid broadcast decoder in a television mode; fourth switching means for performing a switching operation such that an input terminal of a television video signal processor is connected to one of an output terminal of said television demodulator and the output terminal of said third switching means; decoder connection detecting means connected to an output terminal of said first switching means so as to detect whether or not said paid broadcast decoder is connected to the VCR, depending on an impedance matching, and outputting a detection signal; and

controlling means for discriminating between a VCR/TV mode and a paid broadcast/general broadcast mode and for controlling said second switching means according to said detection signal so that the second switching means selects said output of said VCR demodulator when a paid broadcast signal is received in the VCR mode and selects said output of said TV demodulator when a paid broadcast signal is received in the TV mode, in order to output the selected output to a television via said third switching means.

5,570,199

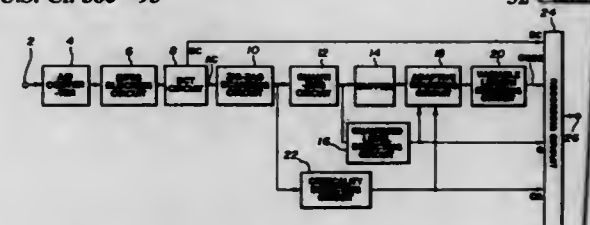
**IMAGE PROCESSING DEVICE AND METHOD**  
Yasuyuki Tanaka, Tokyo, and Hidenori Hoshi, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1993, Ser. No. 163,003

Claims priority, application Japan, Dec. 28, 1992, 4-360137  
Int. Cl.<sup>6</sup> H04N 7/30

U.S. Cl. 386—95

32 Claims



1. An image signal reproducing device, comprising:

- (a) receiving means for receiving a transmitted signal from a transmitting path, the transmitted signal including image data and subordinate data different from the image data, the subordinate data indicating levels of alternating components of the image data; and
- (b) error concealing means for concealing code errors in the transmitted signal, said error concealing means determining an error concealing characteristic to be carried out thereby in accordance with the subordinate data received by said receiving means.

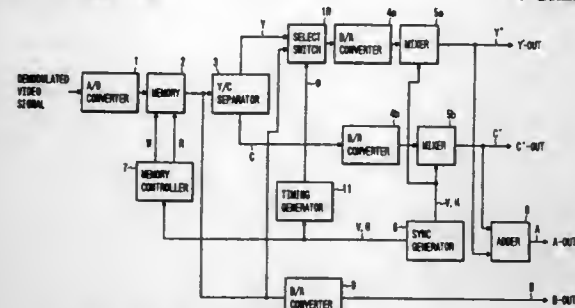
5,570,200

# VIDEO DISK PLAYER COMPRISING A SIGNAL CIRCUIT FOR SELECTING ONE OF A VIDEO DATA SIGNAL AND A LUMINANCE SIGNAL AS AN OUT SIGNAL

Tutomu Banno, and Junichi Nakata, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan  
Continuation of Ser. No. 911,036, Jul. 9, 1992, Pat. No. 5,369,498. This application Jul. 11, 1994, Ser. No. 272,454  
Claims priority, application Japan, Oct. 4, 1991, 3-257986  
Int. Cl.<sup>6</sup> H04N 5/781

U.S. Cl. 386-45

4 Claims



1. A video disk player comprising:  
memory means for storing a video data signal read from a video disk, the video data signal stored in the memory means being devoid of any sync signals;  
Y/C separating means for separating the video data signal stored in the memory means into a luminance signal and a chrominance signal;  
sync signal generating means for generating sync signals;  
timing generator means for setting a selection signal after counting a predetermined number of horizontal sync signals, and being reset for each occurrence of a vertical sync signal;  
signal selection means, responsive to the selection signal generated by the timing generator means, for selecting the video data signal stored in the memory means as a first output signal when the selection signal is set, and for selecting the luminance signal from the Y/C separator means as a second output signal when the signal is not set; and  
mixing means for mixing the sync signals generated by the sync signal generating means with the first output signal from the signal selection means.

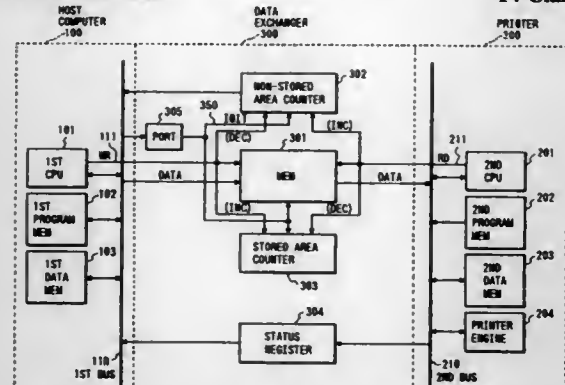
5,570,201

# DATA CONTROLLING APPARATUS

Masayuki Yokota, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Jul. 7, 1993, Ser. No. 87,045  
Claims priority, application Japan, Jul. 9, 1992, 4-182454  
Int. Cl.<sup>6</sup> H04N 1/00; 1/32

U.S. Cl. 358-404

14 Claims



7. A data controlling apparatus which uses a plurality of memory means for storing data, writing means for writing data into the

memory means and reading means for reading data from the memory means, comprising:  
counting means for counting an amount of data written into the plurality of memory means;  
selecting means for selecting at least one arbitrary memory means from the plurality of memory means;  
first switching means for switching the writing means to correspond to the at least one arbitrary memory means selected by said selecting means;  
second switching means for switching the reading means to correspond to the at least one arbitrary memory means selected by said selecting means; and  
control means for controlling the writing means and the reading means switched by said first switching means and said second switching means, respectively, based on a counted value counted by said counting means.

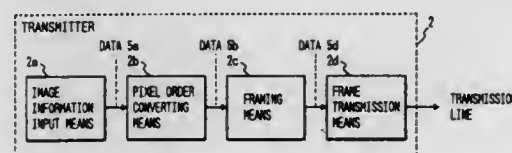
5,570,202

# IMAGE TRANSMISSION APPARATUS IN WHICH PIXEL DATA ARE REARRANGED USING SEQUENCE NUMBERS FOR RESPECTIVE FRAMES

Shinji Shishido, and Koh Kamizawa, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan  
Filed Dec. 23, 1994, Ser. No. 363,319  
Claims priority, application Japan, Dec. 27, 1993, 5-331121  
Int. Cl.<sup>6</sup> H04M 1/00

U.S. Cl. 358-405

5 Claims



1. An image transmission apparatus which receives a plurality of pixel data constituting an image in a unit of a prescribed number of pixels, attaches transmission control data to each frame data including a plurality of pixel data, to form transmission frames which are then transmitted, and reconstructs the image by arranging the pixel data at original two-dimensional positions based on the transmission control data, said image transmission apparatus comprising:  
means for attaching sequence numbers to the respective frame data, to form frames each having a fixed length;  
means for changing an order of the pixel data on a frame-by-frame basis so as to produce a prescribed combination of pixel data, to thereby form transmission frames;  
means for transmitting the transmission frames to a transmission line;  
means for receiving the transmission frames from the transmission line;  
means for detecting a missing frame by checking the sequence numbers of the received frames; and  
means for replacing pixel data of the missing frame with that of a prescribed received frame.

5,570,203

# IMAGE SIGNAL CODING DEVICE

Kazuhiro Suzuki, Taro Yokose, Toshiaki Yoshinari, Yutaka Koshi, and Koh Kamizawa, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan  
Filed Oct. 20, 1994, Ser. No. 325,143  
Claims priority, application Japan, Oct. 22, 1993, 5-265154  
Int. Cl.<sup>6</sup> H04N 1/413; 1/415

U.S. Cl. 358-432

9 Claims

1. In an image signal coding device including orthogonal transform means for performing a two-dimensional orthogonal transform to generate transform coefficients for each of a plurality of

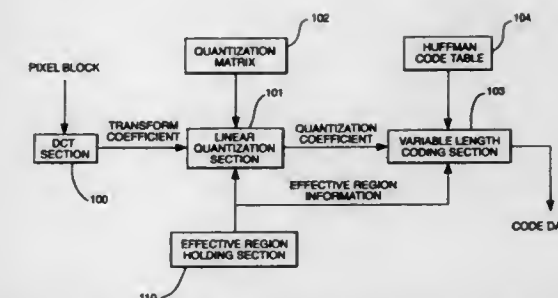
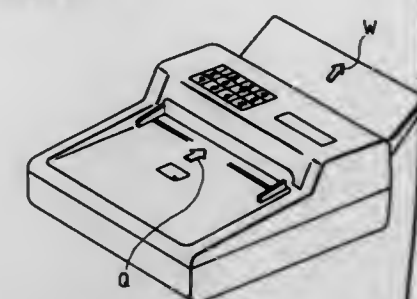
5,570,205

# FACSIMILE APPARATUS HAVING A COMMON CARRIER PATH FOR AN ORIGINAL SHEET AND A RECORDING SHEET

Yasutoshi Sugita, Tokyo; Kiyoharu Yoshioka, Yokohama, and Yoshiaki Nakashima, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 765,003, Sep. 24, 1991, abandoned.  
This application Jul. 1, 1994, Ser. No. 269,621  
Claims priority, application Japan, Sep. 28, 1990, 2-262444  
Int. Cl.<sup>6</sup> H04N 1/024

U.S. Cl. 358-472

4 Claims



rectangular pixel blocks each consisting of  $N \times M$  pixels ( $N, M$  being positive integers) obtained by dividing an image signal, quantization means for linearly quantizing said transform coefficients by using given quantization characteristics to generate quantized coefficients, and variable length coding means for performing variable length coding to said quantized coefficients to generate code data; the improvement comprising region holding means for holding region information including a first range of said transform coefficients to be linearly quantized by said quantization means and a second range of said quantized coefficients to be coded by said variable length coding means, wherein said quantizing means omits linearly quantizing the transform coefficients outside of the first range and said variable length coding means omits coding of the quantized coefficients outside of the second range, thereby increasing coding speed.

5,570,204

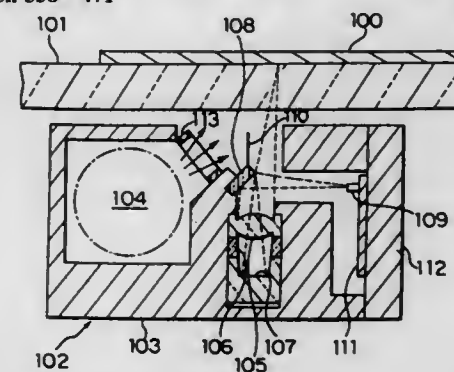
# IMAGE READER WITH FLARE PREVENTION USING LIGHT SHIELD PLATES

Toshiaki Kumashiro, Ebina, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan  
Filed Dec. 27, 1994, Ser. No. 364,757

Claims priority, application Japan, Dec. 28, 1993, 5-334666  
Int. Cl.<sup>6</sup> H04N 1/04; 5/225; H01L 27/00; G02B 27/10

U.S. Cl. 358-471

9 Claims

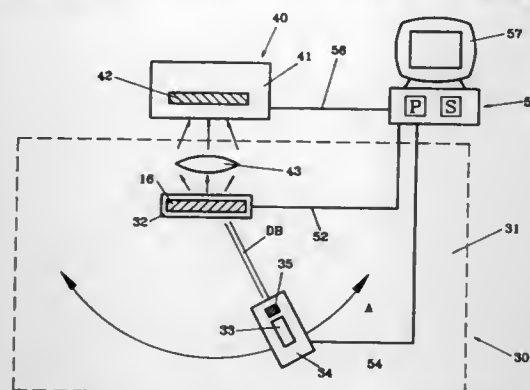




a plurality of line sensors for reading an image of a document, said line sensors being arranged such that lines read at a given instant by adjacent line sensors mutually differ;  
moving means for causing relative movement of said line sensors and the document; and  
control means for controlling said moving means to intermittently effect the relative movement so as to read the entire image of the document in a plurality of steps,  
wherein said control means controls the stop positions of the respective relative movements effected intermittently so that a line read by one of the line sensors before the suspension of the relative movement, is read by another line sensor after the resumption of the relative movement.

5,570,207

**HOLOGRAPHIC IMAGE IDENTIFICATION SYSTEM**  
Mao-chi Chang, No. 36, Kang-An Rd., North East Village, Tung-Shih Hsiang, Yun-Lin Hsien, Taiwan  
Filed Jun. 28, 1994, Ser. No. 268,145  
Int. Cl.<sup>6</sup> G03H 1/00; 1/02; G06K 7/10  
U.S. Cl. 359—2



1. A holographic image identification system comprising:  
image reconstruction means comprising a base on which a movable hologram holder is disposed to retain thereon a hologram on which an interference pattern representing a three-dimensional image of an object to be identified by said holographic image identification system is formed in advance and to move the hologram to an identification position;  
coherent light beam generation means for selectively projecting, at a pre-determined incidental angle, a coherent light beam onto the hologram located on the identification position to display the three-dimensional image;  
image reading means comprising a screen on which the three-dimensional image is shown by the image reconstruction means, and a charge coupling device, which is connected to the screen to receive the three-dimensional image displayed on the screen and convert the image into electrical signal representing the image;  
computer means having a storage memory in which data of a reference image and a reference angle associated with the reference image are stored in advance, and a processing unit, which receives the electrical signal of the image to be identified from the image reading means, retrieves the reference image data and compares the image to be identified with the reference image, and when the comparison is successful, the processing unit further accesses the storage memory to retrieve the reference angle to compare with the pre-determined incidental angle at which the coherent light beam is projected onto the hologram  
wherein the coherent light beam generation means comprises a support to hold thereon a coherent light source, the support being movable along an arc path on the base with a center of the arc substantially coincident with the hologram identification position to selectively project the coherent light beam at an angle corresponding to the pre-determined incidental

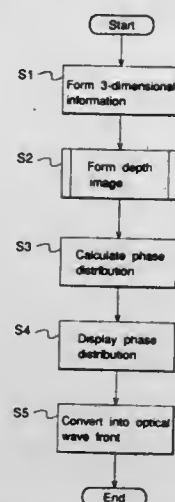
angle of the coherent light beam onto the hologram for displaying the image on the screen.

5,570,208

**STEREOSCOPIC DISPLAY METHOD OF HOLOGRAM AND ITS FORMING METHOD AND STEREOSCOPIC DISPLAY APPARATUS**

Masayuki Kato; Hirokazu Aritake; Manabu Ishimoto; Noriko Sato, and Masato Nakashima, all of Kawasaki, Japan, assignors to Fujitsu Limited, Japan  
Continuation of Ser. No. 104,622, Aug. 11, 1993, abandoned.  
This application Sep. 25, 1995, Ser. No. 533,191  
Claims priority, application Japan, Aug. 21, 1992, 4-222588  
Int. Cl.<sup>6</sup> G03H 1/26; 1/30; 1/28  
U.S. Cl. 359—23

24 Claims



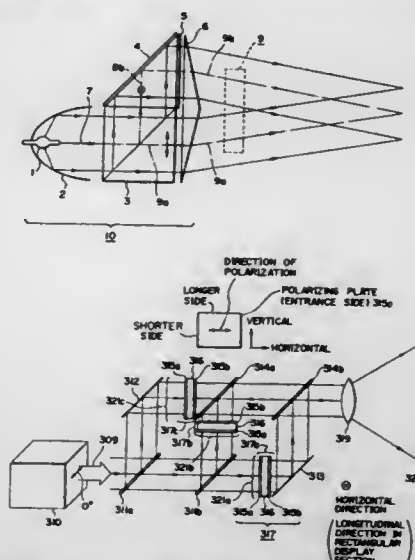
1. A stereoscopic display method of a hologram, comprising the steps of:  
(a) forming 3-dimensional information of an object or objects to be displayed;  
(b) dividing the 3-dimensional information of an object to be expressed in a depth direction into 3-dimensional regions, thereby setting a plurality of 3-dimensional regions;  
(c) forming 3-dimensional region data indicative of 3-dimensional information of an object to be displayed for every 3-dimensional region of the plurality of 3-dimensional regions set by dividing the 3-dimensional information in step (b);  
(d) setting a 2-dimensional plane to form depth data for said every 3-dimensional region set in step (b);  
(e) forming projection image data, when the objects are seen from segment hologram regions, as minimum units for a hologram expression finely divided on the hologram forming surface from the 3-dimensional information onto the 2-dimensional plane set for every segment hologram area in each of the plurality of regions in the depth direction thereby forming a 2-dimensional image;  
(f) calculating a phase distribution at a hologram forming surface from said information regarding said 2-dimensional image formed;  
(g) expressing the phase distribution, obtained in said calculating of the phase distribution in step (f), onto the hologram forming surface; and  
(h) displaying a solid image by irradiating a reference light to the phase distribution expressed in step (g) and by converting said reference light into an optical wave front.

5,570,209

**COLOR PROJECTION TYPE DISPLAY APPARATUS HAVING THREE LIQUID CRYSTAL DISPLAYS OF SAME STRUCTURE**

Masahiro Usui; Hiroshi Kida; Shinsuke Shikama, and Mitsushige Kondo, all of Nagakakyō, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 760,927, Sep. 17, 1991, abandoned.  
This application Feb. 28, 1994, Ser. No. 203,607  
Claims priority, application Japan, Sep. 18, 1990, 2-250494; Sep. 18, 1990, 2-250495; Sep. 20, 1990, 2-252564  
Int. Cl.<sup>6</sup> G02F 1/335; H04N 9/31; G02B 27/28; G03B 21/28  
U.S. Cl. 359—41

12 Claims



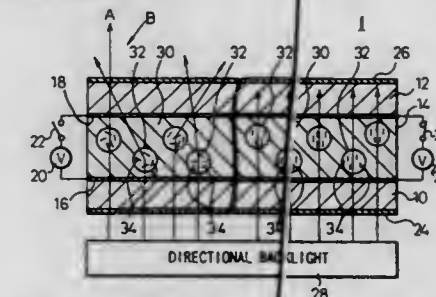
1. A projection type display apparatus having three rectangular liquid crystal display elements each of which has an entrance side polarizing plate with the same polarizing direction, which is parallel to one side of the respective rectangular liquid crystal display element comprising:  
a light source producing non-polarized illuminating light;  
converting means, receiving the non-polarized illuminating light and converting the non-polarized illuminating light to illuminating light having a direction of polarization parallel to one side of the three rectangular liquid crystal display elements including,  
polarized light separating means for separating the non-polarized illuminating light into two linearly polarized light beams,  
polarization direction rotating means for rotating the polarization direction of at least one of the two polarized light beams to make the polarization direction of the two light beams identical, and  
synthesizing means for synthesizing the two polarized light beams so that the optical axes of said two polarized light beams are non-parallel to each other,  
spectroscope means for separating said linearly polarized light beam into light rays of red, green and blue colors;  
wherein the three rectangular liquid crystal display elements each permit the respective light rays of red, green and blue colors to pass therethrough, the transmittance of each pixel being controlled by a desired image signal, each of the three rectangular liquid crystal display elements being composed of a pair of polarizing plates and a liquid crystal layer being held therebetween;  
a light synthesizer for synthesizing images from the three rectangular liquid crystal display elements; and  
a projection lens for enlarging and projecting said synthesized image.

5,570,210

**LIQUID CRYSTAL DISPLAY DEVICE WITH DIRECTIONAL BACKLIGHT AND IMAGE PRODUCTION CAPABILITY IN THE LIGHT SCATTERING MODE**

Hidefumi Yoshida; Kazutaka Hanaoka; Kimiaki Nakamura; Hideaki Tsuda, and Fumiaki Yamada, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan  
Filed Jan. 31, 1994, Ser. No. 188,901  
Claims priority, application Japan, May 6, 1993, 5-105553  
Int. Cl.<sup>6</sup> G02F 1/133; 1/1335  
U.S. Cl. 359—51

12 Claims



1. A direct viewing type liquid crystal display device, comprising:  
a first transparent plate having inside and outside parallel main surfaces and a first transparent electrode formed on the inside main surface thereof;  
a second transparent plate having inside and outside parallel main surfaces and a second transparent electrode formed on the inside main surface thereof, the second transparent plate being positioned in spaced, parallel relationship to the first transparent plate with a gap between the respective inside main surfaces thereof;  
a liquid crystal layer having, selectively, a light scattering mode and a light transmitting mode and being disposed in the gap between the first and second transparent plates;  
a polarizer arranged on the outside main surface of the first transparent plate;  
an analyzer arranged on the outside main surface of the second transparent plate; and  
a directional backlight unit supplying a backlight to the direct viewing type liquid crystal display device, the backlight having a directivity substantially in a normal direction relatively to the respective main surfaces of the first and second transparent plates and a large proportion of the backlight, supplied from the backlight unit to the polarizer, having a directivity within an angular range of up to an angle of 10 degrees relative to the normal direction, the backlight being transmitted through the liquid crystal device in the light scattering mode of the liquid crystal layer for image production and being blocked by the analyzer after transmission through the liquid crystal layer in the light transmitting mode of the liquid crystal layer.

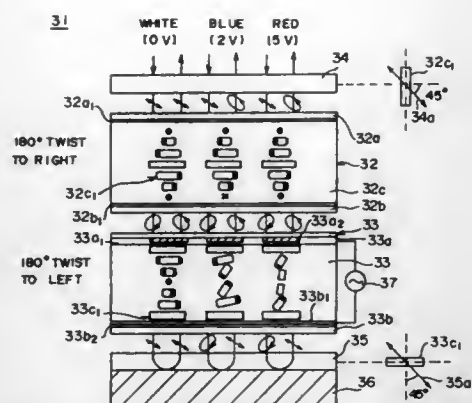
5,570,211

**COLOR LIQUID CRYSTAL DISPLAY DEVICE USING BIREFRINGENCE**

Kazutaka Hanaoka; Hidefumi Yoshida; Kimiaki Nakamura; Hideaki Tsuda, and Hideaki Chida, all of Kawasaki, Japan, assignors to Fujitsu Limited, Japan  
Filed May 31, 1994, Ser. No. 251,865  
Claims priority, application Japan, Mar. 2, 1994, 6-032703  
Int. Cl.<sup>6</sup> G02F 1/133; 1/1337  
U.S. Cl. 359—53

15 Claims

1. A color liquid crystal display device, comprising:  
a first liquid crystal panel having upper and lower major surfaces for accommodating liquid crystal molecules, said first liquid crystal panel having a first thickness and a first predetermined twist angle of liquid crystal molecules in a first direction;



a second liquid crystal panel having upper and lower major surfaces for accommodating liquid crystal molecules, said second liquid crystal panel having a second thickness identical to said first thickness and a second predetermined twist angle of liquid crystal molecules in a second, opposite direction such that said second predetermined twist angle is identical with said first predetermined twist angle in terms of magnitude;

one of said first and second liquid crystal panels carrying electrode means for applying an electric field to said liquid crystal molecules therein;

said first and second liquid crystal panels being stacked such that said first liquid crystal panel is provided on said second liquid crystal panel to form a liquid crystal panel assembly;

a first polarizer provided on said first liquid crystal panel with a first polarization plane; and

a second polarizer provided on said second liquid crystal panel with a second polarization plane;

said first and second polarizers being disposed to form one of a first state wherein said first and second polarization planes are parallel with each other and a second state wherein said first and second polarization planes intersect with each other perpendicularly;

said first and second thicknesses being set such that a retardation larger than 1600 nm is obtained in each of said first and second liquid crystal panels.

5,570,212

# ANTIREFLECTOR BLACK MATRIX FOR DISPLAY DEVICES COMPRISING THREE LAYERS OF ZINC OXIDE, MOLYBDENUM, AND ZINC OXIDE

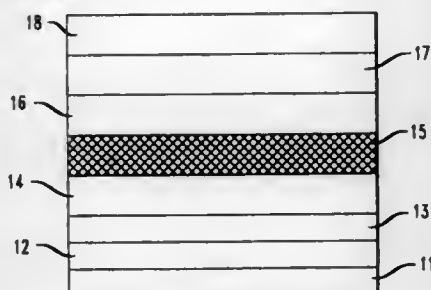
Michael L. Steigerwald, Martinsville, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Continuation-in-part of Ser. No. 351,969, Dec. 8, 1994. This application Mar. 24, 1995, Ser. No. 410,174

Int. Cl.<sup>6</sup> G02F 1/1333; 1/1335

U.S. Cl. 359—67

7 Claims



1. An active liquid crystal display including an antireflective black matrix deposited upon the back side of a glass substrate member comprising successively a first zinc oxide layer with a thickness in the range of 6–11 nanometers, a molybdenum layer with a thickness in the range of 35–60 nanometers, and a second

zinc oxide layer with a thickness in the range of 35–50 nanometers and a molybdenum mirror.

5,570,213

# LIQUID CRYSTAL LIGHT VALVE WITH MINIMIZED DOUBLE REFLECTION

Javier A. Ruiz, Oceanside, and Rodney D. Sterling, Carlsbad, both of Calif., assignors to Hughes-JVC Technology Corporation, Carlsbad, Calif.

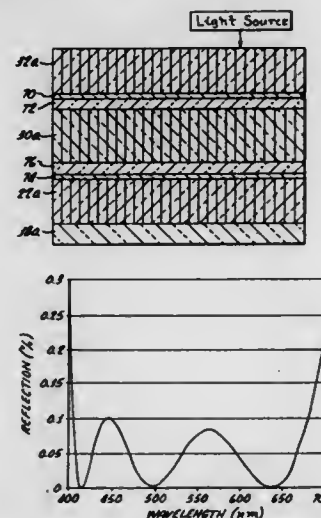
Continuation of Ser. No. 963,612, Oct. 20, 1992, abandoned.

This application May 10, 1994, Ser. No. 240,541

Int. Cl.<sup>6</sup> G02F 1/135; 1/1335

U.S. Cl. 359—72

22 Claims



1. In a reflective liquid crystal light valve apparatus including a window layer for receiving an incoming light beam, a transparent conductive layer, a reflective layer, a liquid crystal layer interposed between said reflective layer and said transparent conductive layer wherein said transparent conductive layer is interposed between said liquid crystal layer and said window layer, and a line spectrum light source for transmitting light through said window layer said transparent conductive layer and said liquid crystal layer to said reflective layer, to be reflected back through said liquid crystal layer, said transparent conductive layer, and said window layer wherein said reflective liquid crystal light valve apparatus has interference fringes at a first interface between said window layer and said transparent conductive layer and at a second interface between said transparent conductive layer and said liquid crystal layer, an improved reflective liquid crystal light valve apparatus comprising:

means, located between said window layer and said transparent conductive layer and between said transparent conductive layer and said liquid crystal layer, for decreasing reflection of light from said first and second interfaces to less than 0.3% for light having wavelengths from 400–700 nm.

5,570,214

# NORMALLY WHITE TWISTED NEMATIC LCD WITH RETARDATION FILMS ON OPPOSITE SIDES OF LIQUID CRYSTAL MATERIAL FOR IMPROVED VIEWING ZONE

Adiel Abileah, Farmington Hills, and Gang Xu, Royal Oaks, both of Mich., assignors to OIS Optical Imaging Systems, Inc., Troy, Mich.

Filed Dec. 15, 1993, Ser. No. 167,652

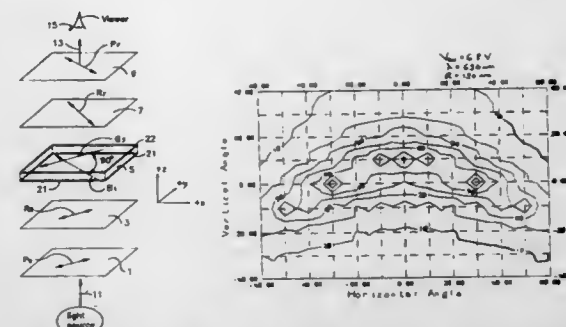
Int. Cl.<sup>6</sup> G02F 1/13

U.S. Cl. 359—73

48 Claims

1. A pixel for a liquid crystal display comprising:

a rear, light-entrance polarizer having a transmission axis oriented in a first direction;



a front, light-exit polarizer having a transmission axis oriented in a second direction with respect to said first direction thereby to define a normally white pixel;

a rear uniaxial retardation film disposed between said rear polarizer and a twisted nematic liquid crystal material, wherein said liquid crystal material twists at least one normally incident visible wavelength of light about 80°–100° as it passes therethrough;

a front uniaxial retardation film disposed between said front polarizer and said liquid crystal material; wherein said front and rear retardation films each have positive birefringent values and each have retardation values of from about 80–200 nm; and

wherein the transmission axes of said polarizers and optical axes of said retardation films are so arranged each with respect to the others so as to achieve a high contrast ratio over a predetermined range of viewing angles.

5,570,215

# LIQUID CRYSTAL DISPLAY APPARATUS AND PROJECTION DISPLAYING APPARATUS HAVING A ROTATABLE PHASE DIFFERENCE PLATE AND POLARIZER

Hideki Omae, Suita; Yoshito Miyatake, and Hiroshi Takahara, both of Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

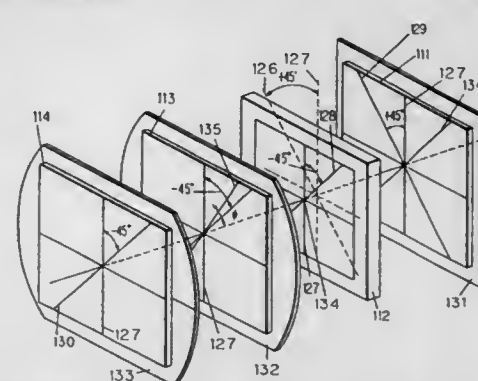
Continuation of Ser. No. 148,511, Nov. 8, 1993, abandoned.

This application Aug. 3, 1995, Ser. No. 510,872

Claims priority, application Japan, Nov. 9, 1992, 4-298321 Int. Cl.<sup>6</sup> G02F 1/1335

U.S. Cl. 359—73

44 Claims



1. A liquid crystal display apparatus comprising:

an input side transparent substrate having an input side pixel electrode formed thereon;

an output side transparent substrate having an output side pixel electrode formed thereon;

a liquid crystal cell disposed between the input side and output side transparent substrates and having twist nematic liquid crystal of a twist angle of 90° inserted therein;

an input side polarization plate attached to an input side of the liquid crystal cell;

an output side polarization plate attached to an output side of the liquid crystal cell; and

a phase difference element disposed between the input side polarization plate and the output side polarization plate; wherein the input side polarization plate and the output side polarization plate are arranged in such a way that said liquid crystal display apparatus is of a NW mode; wherein the polarizing axis of the input side polarization plate is parallel or perpendicular to the molecular long axis of a liquid crystal molecule in contact with the input side transparent substrate; wherein the phase difference element has a retardation smaller than 50 nm and larger than a phase difference of the liquid crystal cell when the liquid crystal cell has a voltage of a given size applied thereto to provide a black display; and wherein the direction of the phase advancing axis of the phase difference element relative to the polarization axis of the input side polarization plate is defined by an angle  $\alpha$  which satisfies the following equation

$$Q = \sin 2\alpha \sin \delta / (1 + \sin^2 \alpha \sin^2 \delta)^{1/2},$$

where

$Q$  = elliptical index of the liquid crystal cell; and  $\delta$  = a phase difference of the phase difference element.

5,570,216

# BISTABLE CHOLESTERIC LIQUID CRYSTAL DISPLAYS WITH VERY HIGH CONTRAST AND EXCELLENT MECHANICAL STABILITY

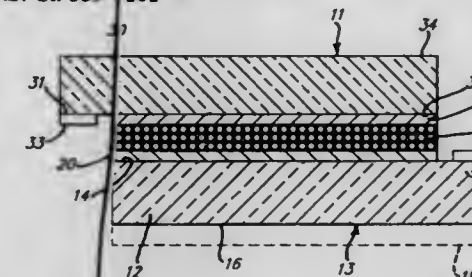
Minhua Lu, Kent, and Haiji Yuan, Stow, both of Ohio, assignors to Kent Display Systems, Inc., Kent, Ohio

Filed Apr. 14, 1995, Ser. No. 421,772

Int. Cl.<sup>6</sup> G02F 1/137; 1/139

U.S. Cl. 359—101

21 Claims



1. A structurally stabilized bistable cholesteric display comprising:

a first back plate substrate and a second front plate substrate, a cholesteric liquid crystal material disposed between said substrates, said liquid crystal material being homeotropically aligned at the substrate surfaces and secured in an alignment by a securement matrix forming agent.

5,570,217

# POSITIONALLY INDEPENDENT APPLICATION OF AN OTDR TECHNIQUE BASED ON CORRELATION IN A BRANCHED OPTICAL FIBRE NETWORK DURING OPERATION

Franciscus H. Fleuren, HP Gouda, Netherlands, assignor to Koninklijke PTT Nederland N.V., Netherlands

Filed Oct. 28, 1994, Ser. No. 331,221

Claims priority, application Netherlands, Nov. 4, 1993, 9301903

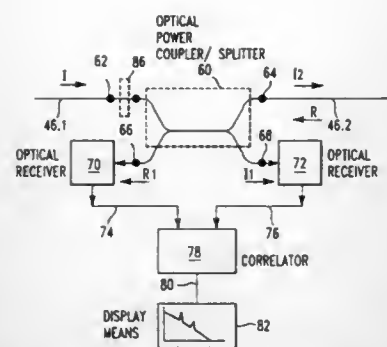
Int. Cl.<sup>6</sup> H04B 10/08

U.S. Cl. 359—110

10 Claims

5. A device for monitoring, by means of fault location with the aid of optical time-domain reflectometry based on correlation, at least a part of an optical transmission network comprising at least one optical fibre connection for distributing an optical signal.





modulated with a data signal, from a transmitter connected to the optical transmission network to at least one receiver, the device comprising:

- a first uncoupling means for uncoupling a first optical signal from the network at an uncoupling point in a fiber connection of the network ahead of said part of the network, said first optical signal being a fraction of the distributed optical signal;
- a second uncoupling means for uncoupling the second optical signal from the network at or near the uncoupling point, said second optical signal being at least a fraction of signals reflected in said part of the network being monitored;
- first and second photo/electrical conversion means for separately converting said first and second optical signals to first and second electrical signals, respectively; and
- correlation means for correlating the second electrical signal with the first electrical signal and for supplying a signal for optical time-domain reflectometry in that part of the optical transmission network which is to be monitored.

5,570,218

## OPTICAL SWITCHING MATRIX

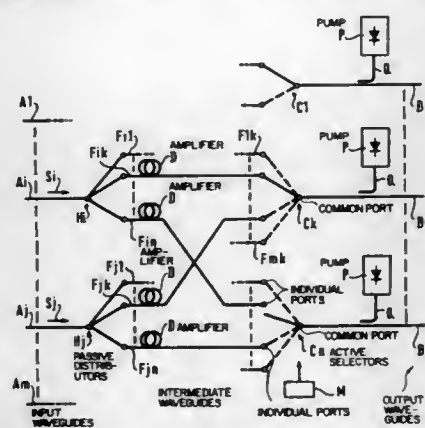
Michel Sotom, Paris, France, assignor to Alcatel N.V., Rijswijk, Netherlands

Filed Aug. 23, 1995, Ser. No. 518,300

Claims priority, application France, Aug. 29, 1994, 94 10367  
Int. Cl.<sup>6</sup> H04J 14/00; H04B 10/20

U.S. Cl. 359—117

5 Claims



1. An optical switching matrix comprising: an optical waveguide including:
  - a plurality of input waveguides,
  - a plurality of output waveguides, and
  - a plurality of intermediate waveguides;
- a plurality of selectors, each including at least three ports and having a plurality of possible states, each state being associated with at least one pair of said ports and being operative to be selected for optically mutually connecting two ports associated with said selected state, said selectors being operative to switch optical signals between a plurality of possible paths connecting one of said input waveguides to one of said output waveguides via at least one of said intermediate waveguides

and at least one of said pair of ports of a selector, at least one of said selectors constituting a Y-shaped selector having a common port and at least two individual ports constituting said at least three ports, each of said pair of ports of said Y-shaped selector including said common port and a respective one of said individual ports;

an optically pumped amplifier disposed on said intermediate waveguide in each of said plurality of possible paths; and a plurality of pumping trees, each having one trunk, at least two branches and a pump disposed on said trunk for injecting pump lights and for pumping at least two of said amplifiers, wherein said common port of said Y-shaped selector is on said trunk for receiving a pump light from said pump and said at least two individual ports thereof are respectively disposed on said at least two branches, one of the individual ports returning the pump light according to the selected state of said Y-shaped selector, and wherein said at least two amplifiers on said at least two branches receive pump light solely from said at least two individual ports, respectively.

5,570,219

## OPTICAL TRANSMITTER FOR SUBCARRIER FREQUENCY MULTIPLEXED OPTICAL TRANSMISSION SYSTEM

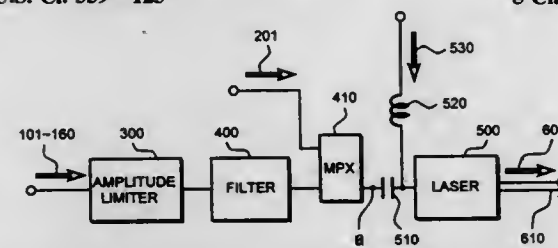
Makoto Shibutani, Toshiharu Yasugi, and Akihiro Kanazawa, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jun. 16, 1995, Ser. No. 491,084

Claims priority, application Japan, Jun. 21, 1994, 6-138825  
Int. Cl.<sup>6</sup> H04J 14/02

U.S. Cl. 359—125

8 Claims



6. A subcarrier frequency multiplexed optical transmission system in which a plurality of analog subcarrier signals and at least one digital subcarrier signal are optically transmitted by frequency multiplexing, said system comprising:

- an amplitude limiter for limiting the amplitude of the plurality of analog subcarrier signals;
  - a filter connected to the output of the amplitude limiter for eliminating distortions and noise components in the frequency band of the digital subcarrier signal;
  - a multiplexer for multiplexing the analog subcarrier signals outputted from the filter and the digital subcarrier signal; and
  - a light source for modulating output signal light intensity according to the analog and digital subcarrier frequency signals outputted from said multiplexer;
- said amplitude limiter includes:
- an input buffer amplifier having an input node for receiving said plurality of analog subcarrier signals and an output node;
  - a diode having an anode coupled to the output node of said input buffer amplifier and a cathode, said diode being forward-biased through high frequency blocking inductors; and
  - an output buffer amplifier having an output node coupled to the cathode of said diode and an output node connected to said filter.

5,570,220

## APPARATUS FOR TRANSMITTING LIGHTWAVE

Kenji Matsumoto, Yokohama; Shigeyuki Itoh, Kawasaki; Kenji Sano, Yokohama; Jun Kobayashi, Katsuta; Koji Mori, Katsuta, and Kenji Okada, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

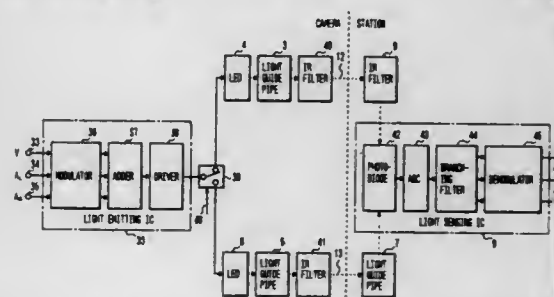
Filed Sep. 20, 1994, Ser. No. 309,412

Claims priority, application Japan, Sep. 20, 1993, 5-233045

Int. Cl.<sup>6</sup> H04B 10/00; H04N 5/225

U.S. Cl. 359—146

53 Claims



1. An interface apparatus for interfacing a signal producing apparatus to display apparatus having a display screen and an audio output device by use of optical signals, said signal producing apparatus produces video, audio, control and digital data signals, said interface apparatus comprising:

- a first converter for converting at least two of said signals produced by said signal producing apparatus into an optical signal;
- a first set of light guides for guiding said optical signal for transmission from a transmitting unit to a receiving unit, said first set of light guides includes a spatial transmission light guide and a near-by transmission light guide;
- a second set of light guides for receiving said optical signal from said transmitting unit and guiding said optical signal into said receiving unit, said second set of light guides includes a spatial receiving light guide and a near-by receiving light guide;
- a switch for applying said optical signal to said spatial transmission light guide for transmission of said optical signal from said spatial transmission light guide to said spatial receiving light guide when spatial transmission between said transmitting unit and said receiving unit is to be conducted and applying said optical signal to said near-by transmission light guide for transmission of said optical signal from said near-by transmission light guide to said near-by receiving light guide when near-by transmission between said transmitting unit and said receiving unit is to be conducted; and
- a second converter for converting said optical signal received by said receiving unit from the spatial or near-by receiving light guides into said at least two signals for use by said display apparatus.

5,570,221

## LIGHT AMPLIFICATION DEVICE

Masayuki Fujita, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Dec. 28, 1994, Ser. No. 365,503

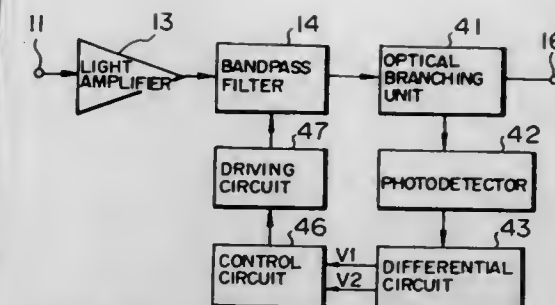
Claims priority, application Japan, Dec. 28, 1993, 5-336771

Int. Cl.<sup>6</sup> H04B 10/00; H01S 3/00

U.S. Cl. 359—161

12 Claims

1. A light amplification device, comprising:
  - a light amplifier for amplifying an inputted optical signal;
  - a bandpass filter for transmitting an optical signal having a wavelength within a predetermined transmission band of optical signals output from said light amplifier;
- controllable transmission center wavelength sweep means included at least partially within said bandpass filter for sweeping a transmission center wavelength of said bandpass filter in a predetermined band at a predetermined speed;



a photoelectric converter for converting an intensity of the optical signal transmitted through said bandpass filter into an electrical signal;

a differentiating circuit for performing second-order differentiation on the electrical signal converted by said photoelectric converter using time as a variable, and for generating a differentiated value representative of said second-order differentiation; and

sweep stop means for receiving said differentiated value from said differentiating circuit and for supplying control signals to said controllable transmission center wavelength sweep means to cause said transmission center wavelength sweep means to stop sweep of the transmission center wavelength of said bandpass filter when the differentiated value generated by said differentiating circuit has a negative peak.

5,570,222

## UNDERWATER VIEWING SYSTEM FOR REMOTE PILOTED VEHICLE

Joseph L. Chovan, North Syracuse, N.Y., assignor to Lockheed Martin Corporation, Syracuse, N.Y.

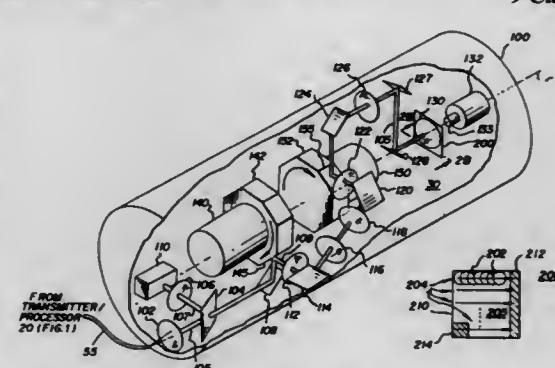
Division of Ser. No. 845,684, Mar. 4, 1992, Pat. No. 5,305,135.

This application Dec. 20, 1993, Ser. No. 170,158

Int. Cl.<sup>6</sup> G02B 26/08

U.S. Cl. 359—201

9 Claims



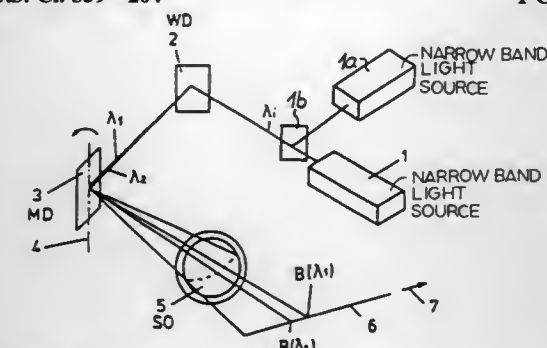
1. An illumination system comprising:

- a source of illumination energy;
- first energy scanning means for scanning the illumination energy in a first predetermined direction for generating first scanned illumination;
- second energy scanning means for receiving the first scanned illumination and for scanning the first scanned illumination in a second predetermined direction for generating second scanned illumination;
- first generator mean for generating a first termination signal in response to the second scanned illumination incident on the first generator means, the first termination signal indicative of the end of a scan in the first direction; and
- second generator means for generating a second termination signal in response to the second scanned illumination incident on the second generator means, the second termination signal indicative of the end of a scan in the second direction wherein the first and second direction are different from each other.

wherein the first generator means include means for reflecting a portion of the second scanned illumination and the first termination signal further in response to reflected second scanned illumination.

**5,570,223**  
**OPTICAL POSITIONING SYSTEM FOR AT LEAST ONE PICTURE ELEMENT**  
 Thomas Härig, Eppstein, Germany, assignor to Linotype-Hell AG, Kiel, Germany  
 Division of Ser. No. 859,364, May 26, 1992, Pat. No. 5,387,995. This application Jan. 6, 1994, Ser. No. 179,037  
 Claims priority, application Germany, Nov. 30, 1989, 39 551.0

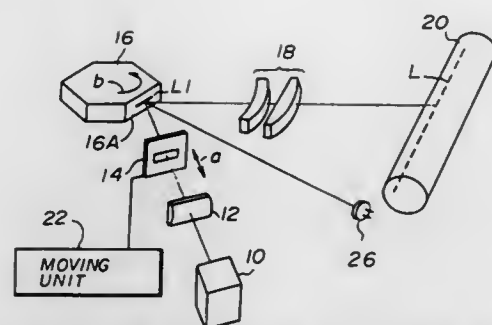
Int. Cl. G02B 26/08  
 U.S. Cl. 359—204



1. An optical positioning system, comprising:  
 first and second separate light sources for emitting respective first and second light beams for generating respective first and second picture elements in an image plane, said first and second light sources having respective variable and controllable different wavelengths;  
 an element for combining said two light beams onto a common path;  
 a wavelength-dispersive, first light-deflecting element means positioned to be impinged upon by said combined first and second light beams along said common path and for deflecting said light beams in a first deflection direction within a first deflection range in said image plane according to the respective wavelengths of the light beams and;  
 a moveable second light-deflecting element means arranged in the beam path between the first deflecting element means and said image plane for deflecting the light beams independently of their respective wavelengths, said second light-deflecting element means deflecting the light beams onto different positions within a second deflection range in the image plane by movement of said moveable second light deflecting element means.

**5,570,224**  
**OPTICAL SCANNING APPARATUS**  
 Osamu Endo, Yoshinori Hayashi, both of Kawasaki; Koji Ichimiya, Yokohama, and Takayuki Ohsawa, Funabashi, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan  
 Filed Apr. 6, 1994, Ser. No. 223,849  
 Claims priority, application Japan, Apr. 8, 1993, 5-082045; Jun. 28, 1993, 5-157648; Jan. 10, 1994, 6-000735  
 Int. Cl. G02B 26/08

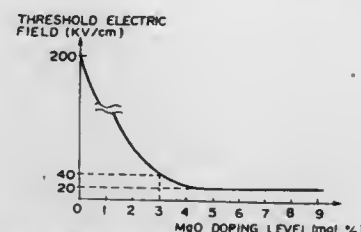
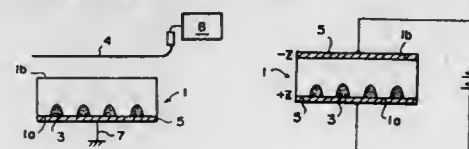
- U.S. Cl. 359—212  
 18 Claims  
 1. An optical scanning apparatus comprising:  
 at least one cylinder lens positioned between a laser light source and an optical deflector, wherein said cylinder lens converts laser light rays emitted from the light source into a first convergent light ray, such that light rays emitted from the light source are converged in a sub-scanning direction and remain unchanged in a main scanning direction, and wherein



- said optical deflector deflects the first convergent light ray from said at least one cylinder lens;  
 at least one focusing lens positioned between said optical deflector and a photosensitive drum such that said at least one focusing lens converts the deflected light ray deflected by said optical deflector into a second convergent light ray, said second convergent light ray converging in the main scanning direction, and wherein said at least one focusing lens focuses said second convergent light ray on a scanned surface of a photosensitive drum as a light spot; and  
 a movable light restricting member positioned between said at least one cylinder lens and said optical deflector, said movable light restricting member being movable along an axis substantially parallel to an optical axis of said first convergent light ray and having an aperture for changing a width of said first convergent light ray and a width of said light spot in said sub-scanning direction in response to movement of said light restricting member.

**5,570,225**  
**FABRICATION OF FERROELECTRIC DOMAIN REVERSALS**  
 Akinori Harada, Kanagawa-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
 Division of Ser. No. 197,708, Feb. 17, 1994. This application Jun. 7, 1995, Ser. No. 478,648  
 Claims priority, application Japan, Feb. 18, 1993, 5-29206  
 Int. Cl. G02F 1/37

U.S. Cl. 359—326  
 48 Claims

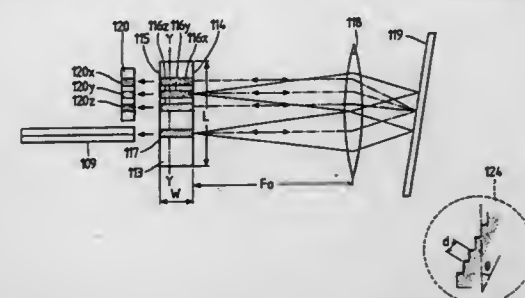


1. A method for fabricating localized ferroelectric domain reversals, comprising the steps of:  
 providing a  $\text{MgO-LiNbO}_3$  or a  $\text{MgO-LiTaO}_3$  substrate having a doping level of MgO within a range from 3 mol. % to 9 mol. % as a unipolarized ferroelectric substance possessing a nonlinear optical effect;  
 subjecting the substrate to a proton exchange treatment so as to produce periodic proton-exchanged regions on the substrate; and  
 applying a direct current voltage or a pulse voltage to the unipolarized ferroelectric substance, to form the domain reversals in the periodic proton-exchanged regions.

**5,570,226**  
**OPTICAL LINK AMPLIFIER AND A WAVELENGTH MULTIPLEX LASER OSCILLATOR**  
 Takeshi Ota, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan  
 Division of Ser. No. 184,137, Jan. 21, 1994, Pat. No. 5,523,879, which is a continuation-in-part of Ser. No. 873,448, Apr. 24, 1992, Pat. No. 5,510,920. This application Apr. 7, 1995, Ser. No. 418,414

Claims priority, application Japan, Apr. 26, 1991, 3-97406; Jun. 28, 1991, 3-158580; Sep. 30, 1991, 3-251677; Oct. 7, 1991, 3-259429

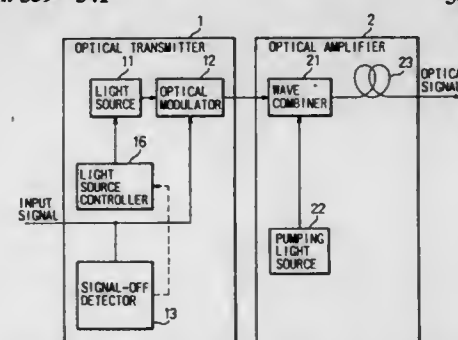
Int. Cl. H01S 03/00; 03/08; H04B 10/20  
 U.S. Cl. 359—333



1. A wavelength multiplex laser oscillator comprising:  
 an optical waveguide having first and second light end faces;  
 a plurality of laser amplifiers located within a laser amplifier array so that the optical axes of said laser amplifiers are parallel to one another, each of said plurality of laser amplifiers having first and second end faces and being driven independently of one another;  
 a spectral optical system in an optical conjugate relationship with the first light end face of said laser amplifiers so that each said laser amplifier and said optical waveguide have an optical image forming relationship therebetween, and wherein said spectral optical system is optically between said optical waveguide and said laser amplifier array; and  
 first and second reflecting means provided on the second light end faces of said optical waveguide and said laser amplifiers, respectively.

**5,570,227**  
**METHOD AND APPARATUS FOR PREVENTING OCCURRENCE OF SURGE LIGHT IN OPTICAL AMPLIFIER/TRANSMITTER APPARATUS**  
 Yoshio Nabeyama, Fukuoka, and Hirofumi Araki, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Aug. 31, 1994, Ser. No. 298,574  
 Claims priority, application Japan, Mar. 2, 1994, 6-031736  
 Int. Cl. H04B 10/00; H01S 3/00; G02F 1/39  
 U.S. Cl. 359—341

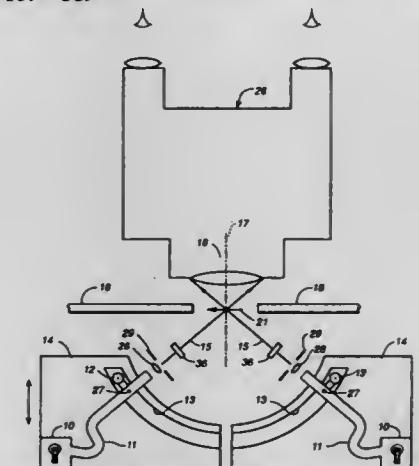


1. A method of preventing the occurrence of surge light in an optical amplifier that amplifies signal light input to said optical

amplifier by introducing the signal light into an optical fiber supplied with pumping light, comprising the steps of:  
 a) detecting an off-to-on transition of the signal light; and  
 b) when the off-to-on transition of the signal light is detected, increasing over a period of time the energy level of at least one of the signal light introduced into the optical fiber and the pumping light supplied to the optical fiber, from a first level to a second level, said first level being less than said second level.

**5,570,228**  
**FIBER OPTIC ILLUMINATION SYSTEM AND METHOD FOR A HIGH DEFINITION LIGHT MICROSCOPE**  
 Gary Greenberg, Los Angeles, Calif., assignor to Edge Scientific Instrument Company LLC, Santa Monica, Calif.  
 Continuation-in-part of Ser. No. 688,170, Apr. 19, 1991, Pat. No. 5,345,333. This application Nov. 13, 1992, Ser. No. 975,814

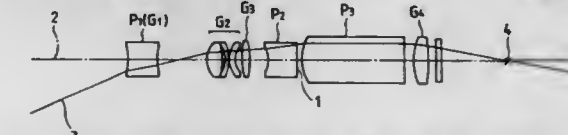
Int. Cl. G02B 21/06; 21/00  
 U.S. Cl. 359—389



1. In a specimen illumination system for a transmitted light microscope having an objective lens having an optical axis, the improvement comprising:  
 light beam source means for providing a plurality of independent light beams that pass through a specimen and travel to the objective lens along paths that are oblique to the optical axis of the objective lens and wherein the light beam paths between said light beam source means and the objective lens do not pass through a common condenser lens.

**5,570,229**  
**REAL IMAGE MODE VARIABLE MAGNIFICATION FINDER OPTICAL SYSTEM**  
 Tatsuru Kanamori, Hannou, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan  
 Filed Jun. 14, 1994, Ser. No. 260,407  
 Claims priority, application Japan, Jun. 16, 1993, 5-144924  
 Int. Cl. G02B 23/00; G03B 13/08

U.S. Cl. 359—431



1. A real image mode variable magnification finder optical system comprising, in order from an object side:  
 a finder objective having a positive refracting power as a whole and being provided separate from a photographic objective, said finder objective including:  
 a first lens unit having a negative refracting power,



a second lens unit movable along an optical axis for varying magnification, having a positive refracting power, and  
 a third lens unit movable along said optical axis for varying magnification, having a positive refracting power;  
 an eyepiece for observing an image formed by said finder objective, said eyepiece having a positive refracting power as a whole;  
 a first reflecting surface disposed on an incidence side of a region of space provided on an object side of said second lens unit for movement of lenses in varying a magnification of said real image mode variable magnification finder optical system;  
 a second reflecting surface disposed between said third lens unit and an intermediate imaging plane; and  
 a third reflecting surface and a fourth reflecting surface disposed between said second reflecting surface and said eyepiece;  
 said first reflecting surface, said second reflecting surface, said third reflecting surface, and said fourth reflecting surface for erecting said image.

5,570,230

# RETROREFLECTOR FOR LASER GEODESY WITH OMNIDIRECTIONAL CORRECTION OF SPEED ABERRATIONS

Glenn Lund, Peillon, France, assignor to Aerospatiale Societe Nationale Industrielle, France

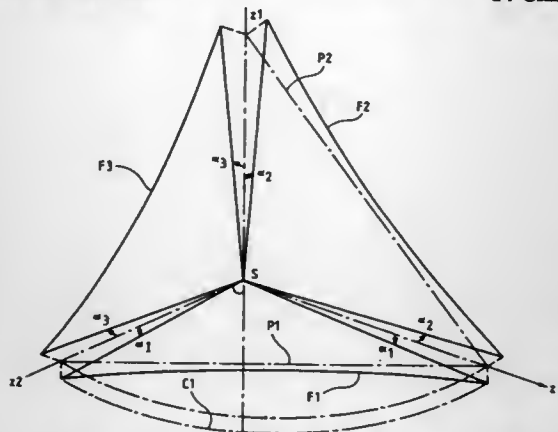
Filed Dec. 23, 1994, Ser. No. 364,481

Claims priority, application France, Dec. 31, 1993, 93 15973

Int. Cl.<sup>6</sup> G02B 5/12; 5/08; B64G 1/36

U.S. Cl. 359—529

14 Claims



1. A cube-corner retroreflector having an interior volume, for laser telemetry adapted to correct a speed aberration ( $\delta$ ) comprising:

three mirror surfaces extending from a common apex;  
 wherein each mirror surface of said three mirror surfaces has a portion of a cone having a cone apex coincident with said common apex, a cone axis including said common apex and generatrices, each generatrix extending from said common apex and having a generatrix slope relative to a respective imaginary plane perpendicular to said cone axis and including said common apex, said generatrix slope having a local slope value along each generatrix of said generatrices which is within 20% from an average generatrix slope value of said each generatrix, and said generatrices determining for each said mirror surface an average mirror surface slope value;  
 said average mirror surface slope value of a first mirror surface of said three mirror surfaces is non-null;  
 said cone axes of each mirror surface of said three mirror surfaces are orthogonal to each other;  
 said average mirror surface slope value of each mirror surface of said three mirror surfaces is within 30% from an average slope value ( $\alpha_0$ ); and  
 said average slope value  $\alpha_0$  satisfies the equation

$$\alpha_0 = 0.25/k$$

where  $k$  is a predetermined parameter dependent on the number, the geometry and the refractive index or indices of the media constituting said interior volume of said retroreflector.

5,570,231

# IMAGE SENSOR HOLDING APPARATUS

Makoto Mogamiya, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 165,849, Dec. 14, 1993, Pat. No. 5,510,937. This application Oct. 10, 1995, Ser. No. 541,409

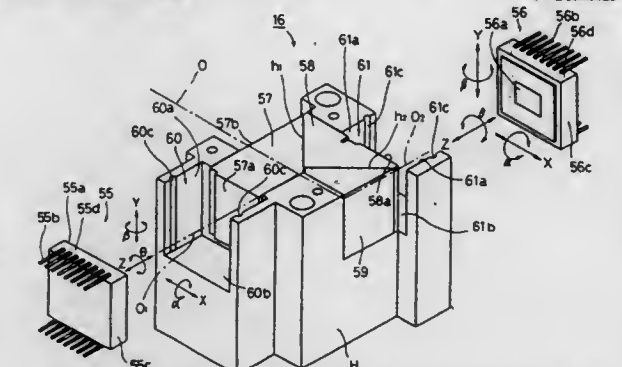
Claims priority, application Japan, Dec. 14, 1992, 4-333260;

Dec. 14, 1992, 4-333261; Dec. 14, 1992, 4-333262

Int. Cl.<sup>6</sup> G02B 27/12; 5/04

U.S. Cl. 359—640

6 Claims



1. An image sensor holding apparatus which holds at least one image pickup device at a predetermined position, comprising: holding surfaces which hold therebetween outer side surfaces of said image pickup device; and, guide grooves provided on said holding surfaces in which an adhesive is introduced along said outer side surfaces of said image pickup device.

5,570,232

# ANAMORPHIC SINGLE LENS FOR USE IN AN OPTICAL SCANNER

Motonobu Yoshikawa, Osaka, and Yoshiharu Yamamoto, Toyonaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

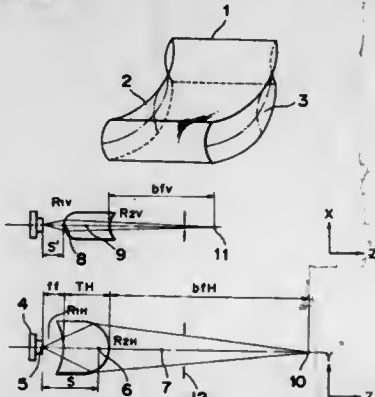
Filed Aug. 31, 1993, Ser. No. 113,663

Claims priority, application Japan, Sep. 1, 1992, 4-233390

Int. Cl.<sup>6</sup> G02B 13/08

U.S. Cl. 359—668

11 Claims



1. An anamorphic single lens having different refractive powers in a first direction of said anamorphic single lens and a second direction of said anamorphic single lens for refracting beams of light from a light source that diverge at a larger divergence angle in the first direction and at a smaller divergence angle in the second direction wherein said anamorphic single lens satisfies the formulae 1 and 2:

(Formula 1)  $0.6 < TH/fm < 2$ , and

(Formula 2)  $S' < S$ ,

where  $fm$  is the focal length of said anamorphic single lens in the first direction,  $TH$  is the thickness of the lens,  $S$  is the distance from the light source side principal point position to the light source in the first direction, and  $S'$  is the distance from the light source side principal point position to the light source in the second direction; and

wherein said anamorphic single lens has a light source side with a first surface thereon and an outgoing side with a second surface thereon, wherein said first surface is a toric surface having a curvature in the first direction concave in the direction of the light source and a curvature in the second direction convex in the direction of the light source, and wherein said second surface is a toric surface having a curvature in the first direction convex in the direction of the image surface.

5,570,233

# VARI-FOCAL LENS SYSTEM

Shinichi Mihara, and Hironori Shibata, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

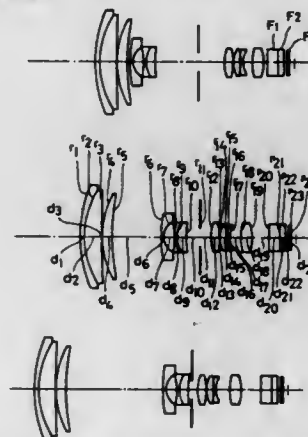
Filed Jul. 1, 1994, Ser. No. 269,790

Claims priority, application Japan, Jul. 5, 1993, 5-190957

Int. Cl.<sup>6</sup> G02B 15/14

U.S. Cl. 359—687

28 Claims



1. A vari-focal lens system comprising, in order from an object to an image side:

a first lens unit having a positive refractive power;  
 a second lens unit having a negative refractive power;  
 a third lens unit having a positive refractive power; and  
 a fourth lens unit having a positive refractive power;  
 wherein said lens system has a wide-angle position and a telephoto position,  
 there being a first airspace between said second and third lens units and a second airspace between said third and fourth lens units,  
 said vari-focal lens system being selectively variable from a first focal length at said wide-angle position to a second focal length at said telephoto position by moving said first lens unit toward said object side, displacing said second lens unit toward said image side, moving said third lens unit so as to make said first airspace narrower and displacing said fourth lens unit so as to make said second airspace wider.

5,570,234

# COMPACT WIDE-ANGLE VARIABLE FOCAL LENGTH LENS SYSTEM

Hironori Shibata, Tokyo-To, Japan, assignor to Olympus Optical Co., Ltd., Tokyo-To, Japan

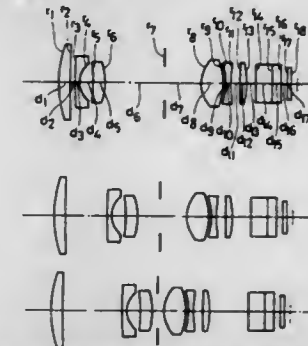
Filed Mar. 8, 1994, Ser. No. 207,145

Claims priority, application Japan, Mar. 8, 1993, 5-070800

Int. Cl.<sup>6</sup> G02B 15/14

U.S. Cl. 359—690

6 Claims



1. A variable focal length lens system comprising, in order from the object side: a first lens unit of a single positive lens component, a second lens unit which comprises a positive lens component and a negative lens component, and has a negative refractive power as a whole, an aperture stop and a third lens unit having a positive refractive power;  
 wherein said variable focal length lens system is configured so as to vary a focal length of the lens system as a whole by moving said second lens unit and said third lens unit along an optical axis in directions reverse to each other while keeping said first lens unit stationary on the optical axis.

5,570,235

# COMPACT ZOOM LENS

Shuji Yoneyama, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

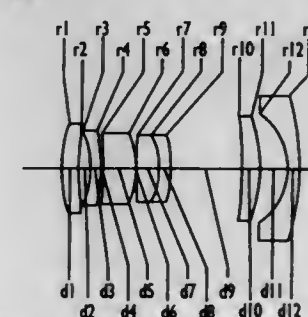
Filed Sep. 1, 1994, Ser. No. 299,424

Claims priority, application Japan, Sep. 2, 1993, 5-218399

Int. Cl.<sup>6</sup> G02B 15/14; 13/18

U.S. Cl. 359—692

6 Claims

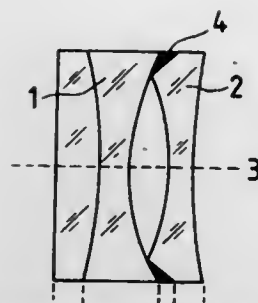


1. A zoom lens comprising:  
 a first lens group having a positive refractive power and a second lens group having a negative refractive power, arranged in this order from an object to an image side, said first and said second lens groups capable of moving to change their spatial distance in carrying out a zooming operation;  
 said second lens group comprises a first positive meniscus lens with a concave surface located adjacent to an object to be photographed, and a second negative lens with a concave surface located adjacent to an object to be photographed, arranged in this order from the object side;

and the following relationships are satisfied:

- (1)  $1.9 < f_1/f_2$
- (2)  $3.4 < f_1/f_2 < 4$
- (3)  $0.5 < f_1/f_2 < 1.2$

wherein  
 $f_w$  represents a focal length of the whole lens system at a wide-angle extremity;  
 $r_1$  represents a radius of curvature of the surface of a first lens of said first lens group, located adjacent to the object to be photographed;  
 $f_T$  represents a focal length of the whole lens system at a telephoto extremity;  
 $f_1$  represents a focal length of the first lens group;  
 $f_{2-1}$  represents a focal length of the first lens of the second lens group.



to each other at a portion outward from said contact portion with respect to the optical axis.

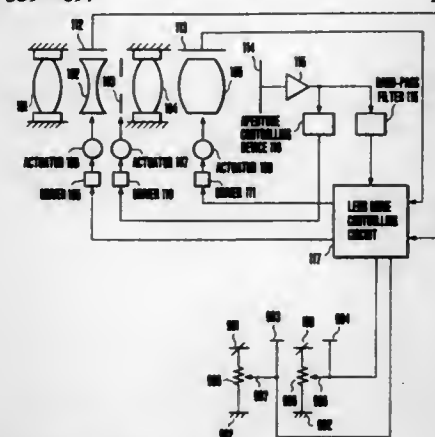
5,570,236

## LENS DRIVE CONTROLLING APPARATUS

Masahide Hirasawa, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan  
 Division of Ser. No. 694,883, May 2, 1991, Pat. No. 5,287,223.  
 This application Jun. 24, 1993, Ser. No. 82,561  
 Claims priority, application Japan, May 10, 1990, 2-122037; May 28, 1990, 2-139037; May 28, 1990, 2-139038  
 Int. Cl.<sup>6</sup> G02B 15/14

U.S. Cl. 359—697

25 Claims



19. A lens control device, comprising:

- (A) a zoom lens;
- (B) a focusing lens for compensating a variation of a focal position according to a movement of said zoom lens; and
- (C) control means for controlling a driving speed of said focusing lens on the basis of the driving speed of said zoom lens, said control means being arranged to change a moving direction of said zoom lens depending on an initial position of said zoom lens at the time of starting of operation of said zoom lens.

5,570,237

## LENS UNIT CEMENTED AT CIRCUMFERENCE OF EACH OF ELEMENTS AND OPTICAL SYSTEM INCLUDING THE SAME

Susumu Sato, Chiba, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jun. 7, 1994, Ser. No. 225,952

Claims priority, application Japan, Jun. 11, 1993, 5-165036  
 Int. Cl.<sup>6</sup> G02B 9/00

U.S. Cl. 359—797

27 Claims

1. A circumferentially cemented lens unit comprising first and second lenses opposed to each other with a space therebetween on an optical axis thereof, wherein a contact portion of an opposing surface of one of said first and second lenses is disposed inward from the periphery of said one lens with respect to the optical axis and is in contact with a curved opposing optical surface of the other of said first and second lenses near the periphery thereof, and at least one of the opposing surfaces of the first and second lenses is a concave surface, and said first and second lenses are cemented

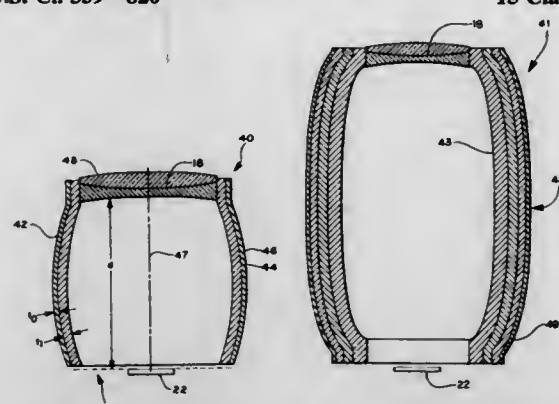
5,570,238

## THERMALLY COMPENSATING LENS MOUNT

David F. Leary, Woodside, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.  
 Filed Mar. 31, 1995, Ser. No. 414,629  
 Int. Cl.<sup>6</sup> G02B 7/02

U.S. Cl. 359—820

18 Claims



1. A thermally compensated lens mount comprising a multilayer housing formed by a layer of a first material having a first coefficient of thermal expansion (CTE) affixed to a layer of a second material having a second CTE, the multilayer housing having a symmetry axis and a selected curvature along the symmetry axis such that differential thermal expansion of the first and second materials changes the curvature, altering the length of the multilayer housing along its symmetry axis.

5,570,239

## DIRECTIONAL SCREEN FOR A LIGHTING FIXTURE AND METHOD OF MAKING SAME

Rinaldo Raimondi, Schlieren, Switzerland, assignor to Enrico Raimondi, Thalwil, Switzerland; Olgo Raimondi-Stauble, Schlieren, Switzerland, and Bruno Raimondi, Adliswil, Switzerland

Filed Nov. 2, 1994, Ser. No. 332,791

Claims priority, application Switzerland, Dec. 1, 1993, 3584/93  
 Int. Cl.<sup>6</sup> G02B 27/00; 7/182; F21V 11/06; 11/02

U.S. Cl. 359—873

33 Claims

1. A directional light screen comprising:  
 A plurality of transparent carrier members secured together in a side-by-side manner generally parallel to one another forming an integral screen body having a source-facing side and an opposite side, each carrier member extending a thickness of said integral screen body from said source-facing side to side opposite side, each carrier member having a refractive index such that incident light is refracted generally perpendicularly onto an incident plane; and

5,570,241

## SINGLE CHANNEL, MULTIPLE HEAD SERVO WRITING WITH EMBEDDED HEAD IDENTIFICATION

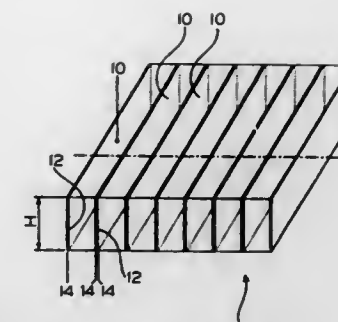
Charles R. Nielsen, San Jose; Charles A. Bates, Saratoga; Matthew W. Rooke, San Jose; Fred R. Hansen, Newark; Paul T. Petersen, Santa Clara; Me V. Le, Milpitas, and Eugene K. Lew, Cupertino, all of Calif., assignors to Conner Peripherals, Inc., San Jose, Calif.

Filed May 24, 1995, Ser. No. 449,123

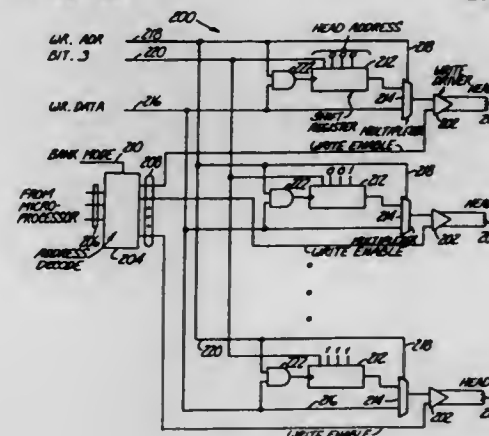
Int. Cl.<sup>6</sup> G11B 5/09; 5/02

U.S. Cl. 360—46

20 Claims



a plurality of film-like lamellae, each lamella being disposed between adjacent carrier members.



5,570,240

## TRANSFLECTIVE COLOUR FILTER, AND A METHOD OF MANUFACTURING SUCH A FILTER

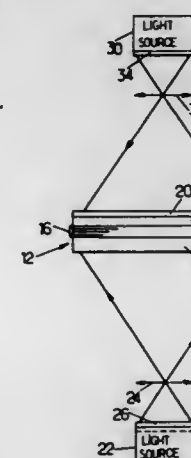
Christophe Deffontaines, Cergy; Ambroise Parker, Rueil-Malmaison, and Daniel Lecat, Argenteuil, all of France, assignors to Societe d'Applications Generales d'Electricite et Mecanique-Sagem, Paris, France

Filed Nov. 12, 1993, Ser. No. 151,171

Claims priority, application France, Nov. 24, 1992, 92 14117  
 Int. Cl.<sup>6</sup> G02B 5/20; 5/22; G09F 13/04; G03C 7/24

U.S. Cl. 359—887

6 Claims



1. A transfective optical filter comprising:  
 a single transparent or translucent substrate;  
 a coloured slice carried by said substrate and made of a plurality of superimposed layers, each of said layers corresponding to one colour out of at least two colours;  
 a light diffusing layer; and  
 an opaque mask having transparent zones defining observable marks;  
 said coloured slice and said opaque mask consisting of photographic emulsions, whereby said transparent zones appear in colour when said transfective optical filter is backlit by a source of light placed on a side opposite to an observer and appear white in reflective mode when lighted via a front face.

7. A write drive logic circuit, which comprises:

- a write driver, the write driver having an input and an output, the write driver being responsive to an input signal applied to the input to provide a write output signal at the output as a function of the input signal;
- a memory device, the memory device storing unique identification information and having an output to controllably output a signal representative of the unique identification information, a control input to cause output of the unique identification information to the output of the memory device;
- a multiplexer, the multiplexer having an output, a first input coupled to the output of the memory device to receive the signal representative of the unique identification information stored in the memory device, a second input and select input to control the application of one of the first and second inputs of the multiplexer to the output of the multiplexer;
- a control line coupled to the select input of the multiplexer,
- a write data line for transmitting a signal representative of preselected information and being coupled to the second input of the multiplexer for input of the signal representative of preselected information to the multiplexer;
- the output of the multiplexer being coupled to the input of the write driver such that one of the first and second inputs of the multiplexer is selective applied to the input of the write driver; and
- a logic device, the logic device having an output coupled to the clock input of the memory device, a first input coupled to the control line and a second input coupled to the write data line, the output of the logic device asserting an output pulse each time the state of the control line and the signal transmitted on the common data line are in a preselected logical relationship to one another.





5,570,248

**METHOD AND SYSTEM USING ENCODED PERIODIC DIGITAL SUM VARIATION (DSV) AS PILOT SIGNAL AND CONTROLLING TRACKING ERROR USING CROSSTALK FROM THE PILOT SIGNAL**

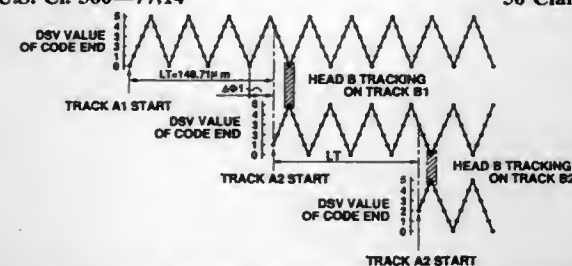
Kihei Ido, and Masayuki Ohta, both of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 120,857, Aug. 31, 1993, Pat. No. 5,365,232, which is a continuation of Ser. No. 743,888, Aug. 12, 1991, abandoned. This application Aug. 9, 1994, Ser. No. 287,918

Claims priority, application Japan, Aug. 18, 1990, 2-217624; Feb. 26, 1991, 3-30839; Jun. 14, 1991, 3-143457

Int. Cl.<sup>6</sup> G11B 5/584; 5/09; H03M 5/00; 7/00

U.S. Cl. 360—77.14 50 Claims



1. In a system where data is digitally stored on a magnetic storage medium in parallel tracks, a method of tracking comprising:

storing said data in said parallel tracks using code words having a periodically varying DSV (digital sum variation), the tracks having differing periodic DSVs to enable tracking of a selected parallel track, said step of storing including the steps of,

- providing data arranged in data words of  $m$  bits,
- providing an open loop DSV control signal representative of a desired change in DSV to be produced by each said code word,
- developing a code word of  $n$  bits from each said code word of  $m$  bits, each said code word of  $n$  bits having a CDS (code word digital sum) of known value selected in response to said DSV control signal to control the DSV of a string of the plural code words to a desired value under control of said DSV control signal,
- storing each of said code words produced in said step of developing on a said parallel track, thereby producing the desired variation in DSV on that said track, and
- repeating said substeps i)-v) for adjacent tracks with their associated different DSV signals;

reading the signals obtained from the desired track to produce a reproduction signal, said step of reading further reading low frequency crosstalk from adjacent tracks caused by said periodically varying DSV of the data contained in these adjacent tracks;

comparing the low frequency crosstalk from said adjacent tracks to produce a tracking error signal; and controlling the tracking of said desired track from said tracking error signal.

5,570,249

**TRANSDUCER SUSPENSION SYSTEM**

Akihiko Aoyagi, Kanagawa-ken, Japan, and Oscar J. Ruiz, San Jose, Calif., assignors to International Business Machines Corporation

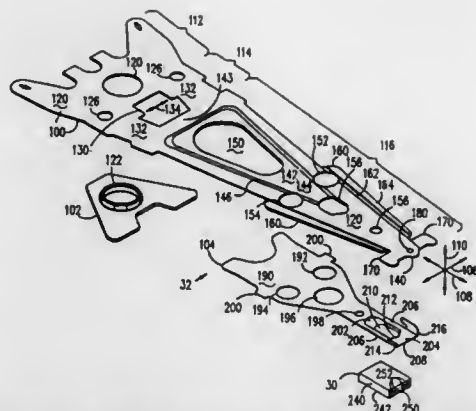
Continuation of Ser. No. 298,475, Aug. 29, 1994, Pat. No. 5,526,205. This application Aug. 18, 1995, Ser. No. 516,675

Int. Cl.<sup>6</sup> G11B 5/68; 2/116; 5/54; 5/55

U.S. Cl. 360—104 29 Claims

1. A transducer suspension system comprising:

a load beam having a longitudinal axis, a lateral axis, and a perpendicular axis, a first and a second ends of the load beam being located on the longitudinal axis, the first end for con-



nection to a support member, the load beam having a first and a second surfaces on opposite sides of the load beam, a raised section running along the longitudinal axis of the load beam and located between the first and second ends, the raised section forms an elevated portion on the first surface and a recessed portion on the second surface; and

a flexible member connected to the load beam, a first end of the flexible member located on the side of the load beam having the second surface, the flexible member covering the recessed portion such that the load beam and the flexible member form an enclosed interior chamber along a cross sectional plane parallel to a plane containing the lateral and perpendicular axes, a second end of the flexible member having a mounting section for mounting a transducer assembly.

5,570,250

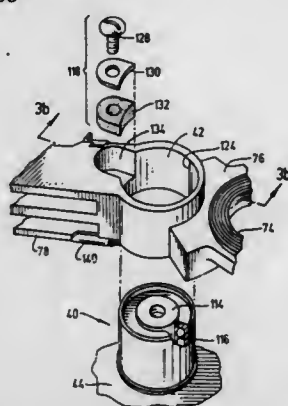
**DISK DRIVE HEAD DISK ASSEMBLY ACTUATOR MOUNT MECHANISM**

Shawn E. Casey, San Jose, Calif., assignor to Western Digital Corporation, Irvine, Calif.

Division of Ser. No. 89,705, Jul. 9, 1993, Pat. No. 5,455,728, which is a division of Ser. No. 802,347, Dec. 4, 1991, Pat. No. 5,270,887. This application Nov. 1, 1994, Ser. No. 332,957

Int. Cl.<sup>6</sup> G11B 5/54

U.S. Cl. 360—106 5 Claims



1. A head disk assembly of a rotating disk data storage device, comprising:

- a base;
- a cover adapted to fit on top of said base so as to form a housing;
- a spindle motor coupled to the base;
- one or more magnetic disks attached to the spindle motor and configured within the housing, each having one or more data surfaces;

an actuator assembly including an E-block, said E-block having a generally cylindrical opening, a flexure arm provided for each data surface and coupled to the E-block, each said flexure arm supporting a magnetic read/write transducer head adjacent a data surface, an electromagnetic voice coil coupled

5,570,252

**DISK DRIVE CARTRIDGE DOOR**

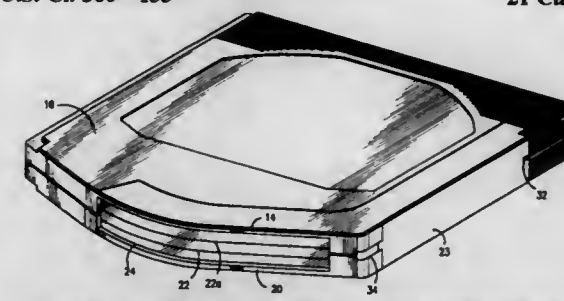
Wayne A. Sumner, Ogden; Allen T. Bracken, Layton; David W. Griffith, Layton; David E. Jones, Layton, and Edward L. Rich, Ogden, all of Utah, assignors to Iomega Corporation, Roy, Utah

Filed Jun. 7, 1995, Ser. No. 482,010

Int. Cl.<sup>6</sup> G11B 23/03

U.S. Cl. 360—133

21 Claims



1. A cartridge for a drive in which read/write heads read/record data on a recording medium comprising:

- a shell;
- a recording medium in said shell;
- an opening in said shell for access by said read/write heads from outside said shell to said recording medium;
- a flexible door covering said opening when said cartridge is removed from said drive;
- tracks along the front of said shell guiding said door outside of said shell, said flexible door sliding in said tracks from a closed position covering said opening, along the outside of said shell on said one side, to an open position when said cartridge is inserted into said drive.

5,570,251

**THIN FILM MAGNETIC DEVICE WITH PLURAL VALVES OF MAGNETOSTRICTION**

Osamu Shinoura, Chiba; Tsutomu Koyanagi, Nagano; Hiroshi Chihara, Chiba; Makoto Yoshida, Nagano, and Tsutomu Chou, Chiba, all of Japan, assignors to TDK Corporation, Tokyo, Japan

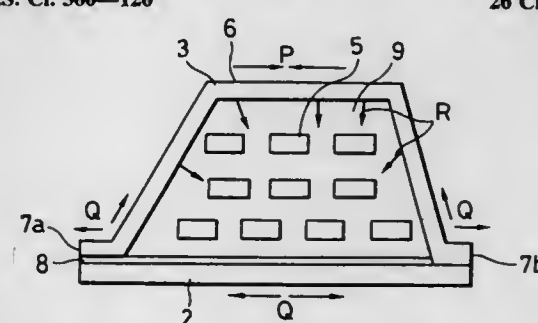
Filed Jul. 7, 1994, Ser. No. 271,731

Claims priority, application Japan, Jul. 7, 1993, 5-167776; Mar. 18, 1994, 6-048572

Int. Cl.<sup>6</sup> G11B 5/127; 5/147

U.S. Cl. 360—126

26 Claims



1. A thin film magnetic device, comprising:

- an underlying layer;
  - a layer having a raised shape including an organic insulating layer, said layer having said raised shape provided directly or indirectly on said underlying layer; and
  - a soft magnetic alloy thin film having a first end and a second end, said film covering said layer having said raised shape, said first end being fixedly joined to said underlying layer directly and said second end being fixedly joined to said underlying layer either directly or indirectly;
- said soft magnetic alloy thin film consisting of a top region, a bottom region, the top region having a height relative to the underlying layer, the bottom region having a height relative to the underlying layer, and the height of the top region being greater than the height of the bottom region for all points of the top region and the bottom region, and an intermediate region that is between said top region and said bottom region, wherein said film has a magnetostriction distribution varying from positive to negative magnetostriction values such that all of said top region has one of positive and negative magnetostriction, all of said bottom region has the other one of said positive and negative magnetostriction, and at least part of said intermediate region has zero magnetostriction.

5,570,253

**SELECTION LEVER SLIDING MEANS FOR DISENGAGING THE SELECTION GEAR FROM THE MAIN GEAR OF A CASSETTE TAPE RECORDER WHEN SELECTING A MODE**

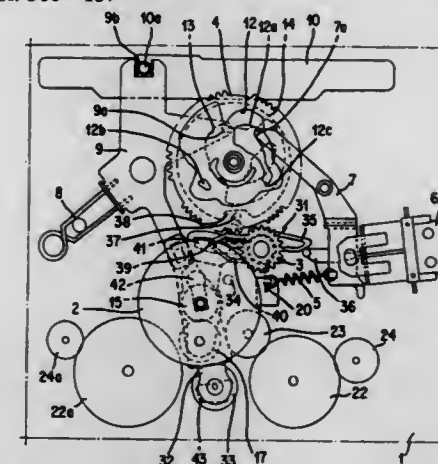
Taek S. Lee, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 17, 1994, Ser. No. 342,035

Int. Cl.<sup>6</sup> G11B 15/48; 5/008; 5/00; 17/00

U.S. Cl. 360—137

6 Claims



1. A device for changing modes of a cassette tape recorder, comprising:

- reel gears and a main gear, each rotatably disposed on a main plate;
- a selection lever rotatably disposed on said main plate;
- a selection gear mounted on one end of said selection lever, said selection gear being capable of selectively engaging said main gear upon rotation of said selection lever, and enabling rotational force to be transmitted to one of said reel gears;



a cam gear rotatably disposed on said main plate;  
a pinch gear rotatably disposed on a shaft attached to said main plate, and said pinch gear being capable of transmitting rotating force from said main gear to said cam gear;  
a transmission lever disposed on said pinch gear shaft;  
a solenoid lever rotatably disposed on said main plate and capable of imparting rotational force to said cam gear upon selection of one of play and record modes; and  
a disengagement means slidably disposed above said main plate, for disengaging said selection gear from said main gear by causing said selection lever to move downward in a direction away from the cam gear when said selection gear is not rotating.

5,570,254

# METHOD AND DEVICE FOR PREVENTING EXCESSIVE CURRENTS IN A WELDING CONVERTER

Gerhard Spilger, Beerfelden; Thomas Klinger, Luetzelbach, and Dieter Stellwag, Erbach, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE92/00862, § 371 Date Apr. 7, 1994, § 102(e) Date Apr. 7, 1994, PCT Pub. No. WO93/08628, PCT Pub. Date Apr. 29, 1993

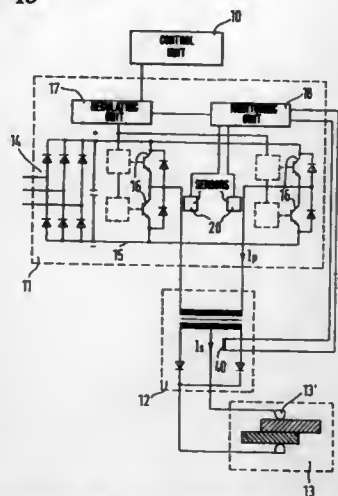
PCT Filed Oct. 15, 1992, Ser. No. 211,555

Claims priority, application Germany, Oct. 18, 1991, 41 34 461.8

Int. Cl. H02H 3/26

U.S. Cl. 361—18

10 Claims



1. A resistance welding tool comprising a frequency-converter device, including a rectifying unit, an intermediate DC voltage circuit and a converter comprising power semiconductor, which converter supplies two-phase, positive and negative pulse-width-modulated current pulses to the primary side of a welding transformer; a detector for detecting at least one of the welding current and the welding voltage and for producing a signal corresponding to the welding current; a control apparatus that controls the converter depending on the detected welding current; a respective sensor associated with each phase of the primary current for the separate detection of the current ( $I_p$ ) respectively flowing in each of the phases; and a monitoring unit to which output signals from said sensors are supplied;

and wherein the monitoring unit includes means for comparing the output signals of the sensors with one another, a detector circuit which emits a signal which results in the deactivation of the power semiconductor when the difference between the compared measured signals of the two phases is greater than a predetermined peak value, means for forming the time derivation for at least one of the output signals of the sensors, and a comparator by comparing this time derivation with a predetermined peak value and for providing an output signal to the detector circuit to emit a signal that leads to the deactivation of the power semiconductor when the value of the time

derivation of the compared measuring signal of the sensor is greater than the predetermined peak value.

5,570,255

# OVERCURRENT PREVENTING CIRCUIT

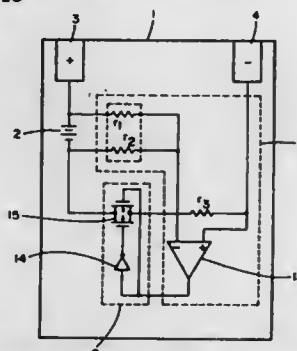
Masaru Hirata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 2, 1995, Ser. No. 382,607

Claims priority, application Japan, Feb. 2, 1994, 6-011190 Int. Cl. H02H 7/00

U.S. Cl. 361—18

12 Claims



1. An overcurrent preventing circuit, comprising:  
an overcurrent detecting circuit for detecting any overcurrent flowing in a current path in which a battery and connection terminals are electrically connected; and  
a switching circuit, responsive to a detection output signal of said overcurrent detecting circuit, for controlling the opening and closing of said current path;  
an analog switch inserted into said current path, in which a P-channel transistor and an N-channel transistor are connected in parallel, and said detection output signal of said detecting circuit is supplied to the gate of said P-channel transistor; and  
an inverter for supplying said detection output signal, which has been inverted, to the gate of said N-channel register.

5,570,256

# INDUCTION MACHINE PROTECTION DEVICE

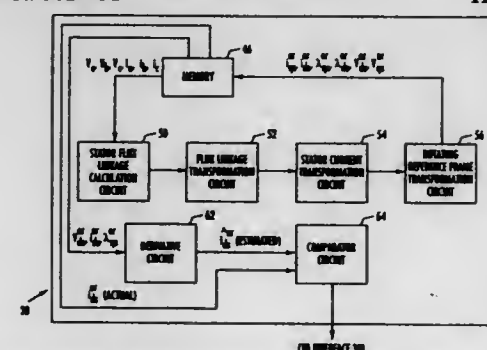
Randy Schoen, Decatur, and Thomas G. Habetler, Snellville, both of Ga., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Mar. 15, 1994, Ser. No. 213,285

Int. Cl. H02H 5/04

U.S. Cl. 361—31

11 Claims



5. A monitoring device coupled to three phase conductors which supply power to an induction motor including a stator winding and a rotor winding, for determining the presence of unacceptable magnetic fields in the machine, the device comprising:  
first, second and third transducers disposed to produce first, second and third signals representative of the voltages in the three phase conductors, respectively;

fourth, fifth and sixth transducers disposed to produce fourth, fifth and sixth signals representative of the currents in the three phase conductors, respectively;  
a programmed digital processor coupled to the transducers to read the first, second, third, fourth, fifth and sixth signals, the digital processor being programmed to produce digital data representative of the stator flux linkages based upon the signals representative of the phase currents;  
a processing circuit included in the programmed digital processor, the processing circuit being configured to distinguish a component of the phase currents related to unacceptable magnetic fields in the machine and substantially unrelated to the torque of the motor, wherein the processing circuit is programmed to produce digital data representative of the stator direct axis flux linkage and the stator quadrature axis flux linkage based upon the data representative of the stator flux linkages, and to produce digital data representative of the stator direct axis current and the quadrature axis current based upon the signals representative of the phase currents, and to produce digital data representative of the actual direct axis current aligned with the rotor flux based upon the data representative of the stator direct and quadrature axis voltages, and to produce digital data representative of an estimated direct axis current aligned with the rotor flux based upon the data representative of the actual direct axis current aligned with the rotor flux;  
a comparator circuit coupled to the processing circuit to determine if the value of the component is unacceptable; and  
a switching device coupled to the comparator circuit and configured to interrupt the application of power to the machine from the three phase conductors when the value of the component is unacceptable.

5,570,257

# PHASE SEQUENCE WIRING PROTECTION APPARATUS

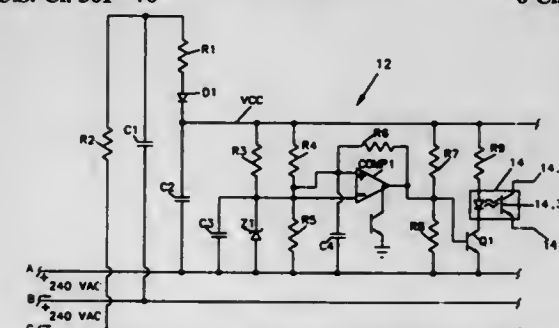
William R. Manning, Wrentham, Mass.; Mark C. Carlos, North Providence, R.I., and Stanley J. Naciewicz, Plainville, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 3, 1994, Ser. No. 176,754

Int. Cl. H02H 3/26

U.S. Cl. 361—76

6 Claims



1. Phase sequence protection circuit apparatus for interfacing a three phase AC power source on respective three AC power source leads with a load comprising first and second resistors each having a first value of impedance and a first capacitor having an impedance equivalent to the first value, the first and second resistors and the first capacitor being coupled together in a Y configuration, the resistors and capacitor being coupled to respective power source leads,

a comparator network coupled to only one of the AC power source leads comprising a diode to rectify AC current conducted through the first resistor to provide a voltage source rail for the protection circuit, the DC magnitude of the voltage source rail being dependent upon the sequence of connection

of the power source leads with a load, a comparator having an inverting and a non-inverting input and a transistor output, zener diode means coupled to the rail to provide a fixed reference voltage, the reference voltage coupled to the inverting input, a voltage divider comprising third and fourth resistors connected between the rail and the respective line, a junction formed between the third and fourth resistors, the junction coupled to the non-inverting input, a solid state switch, the output of the comparator coupled to the solid state switch, the voltage at the inverting input being greater than the voltage at the non-inverting input when the first and second resistors and the first capacitor are coupled to the three AC power source leads with the phases in sequence thereby biasing the transistor output into conduction and the voltage at the inverting input being less than the voltage at the non-inverting input when the first and second resistors and the first capacitor are coupled to the three AC power source leads with the phases out of sequence thereby turning the transistor output off, the solid state switch turning on in one of the two states of the transistor output and turning off in the other of the two states of the transistor output to thereby provide a signal in dependence upon whether the phases are in sequence.

5,570,258

# PHASE MONITOR AND PROTECTION APPARATUS

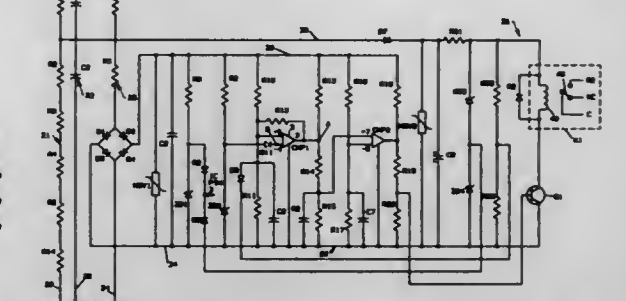
William R. Manning, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 11, 1995, Ser. No. 439,258

Int. Cl. H02H 3/26

U.S. Cl. 361—85

12 Claims



1. Phase monitor and protection circuit apparatus for use with a three phase AC power supply as a pilot duty control having a relay with contacts to be wired in series with a contactor coil comprising first, second and third unbalanced networks connected in a wye configuration, each impedance network being coupled to a phase connection terminal for connection to respective power source lines, the first and third impedance networks comprising resistive networks and the second impedance network comprising a capacitive network to establish a selected voltage profile across the impedance networks,

a relay network coupled to the first impedance network comprising a diode to rectify AC current conducted through the first impedance network to provide a relay voltage source rail for the relay network, first zener diode means coupled to the rail to provide a selected voltage level for driving a relay, a relay coil and a solid state switch means serially connected with the relay coil coupled to the rail,

a control logic network serially connected to the third impedance network comprising a full wave bridge rectifier to provide a control voltage source rail and common, the voltage level of the control voltage source rail being dependent upon the voltage level of the respective power source line to which the third impedance network is connected, a comparator having an inverting and a non-inverting input and an output transistor, second zener diode means coupled to the control voltage source rail to provide a fixed reference voltage, the reference voltage coupled to the inverting input, a voltage

divider comprising first and second voltage divider resistors connected between the control voltage source rail and common, a junction formed between the first and second voltage divider resistors, the junction coupled to the non-inverting input, the output transistor of the comparator and the control voltage source rail being coupled to the solid state switch means of the relay network, the reference voltage at the inverting input being less than the voltage at the non-inverting input when the impedance networks are coupled to the respective power source lines with the phases in sequence and with all the phases energized and with the phases above a preselected minimum voltage level thereby keeping the comparator output transistor off and allowing current to flow from the control voltage source rail to the solid state switch means to excite the solid state switch means and energize the relay coil, the voltage at the inverting input being greater than the voltage at the non-inverting input when the impedance networks are coupled to the respective power source lines with the phases out of sequence thereby turning the transistor output on and shunting current away from the solid state switch means to thereby deenergize the solid state switch means and the relay coil.

5,570,259

# CIRCUIT ARRANGEMENT FOR CONTROLLING A LOAD AND FOR RECOGNIZING A LINE INTERRUPTION

Franz Allmeier, Mintraching; Theodor Maier, Aiglsbach; Gerhard Goesser, Pentling, all of Germany; Donald Preslar, Ringoes, N.J., and Philip Murphy, München, Germany, assignors to Siemens Aktiengesellschaft, and Harris Semiconductor GmbH, both of Munich, Germany

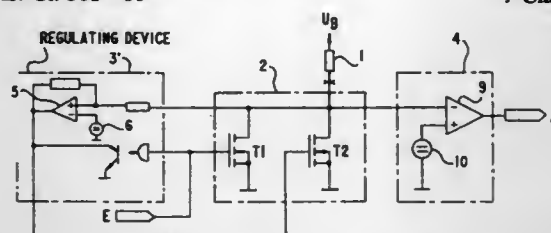
Filed Aug. 9, 1993, Ser. No. 104,327

Claims priority, application European Pat. Off., Aug. 7, 1992, 92113493

Int. Cl.<sup>6</sup> H02H 3/00

U.S. Cl. 361—86

7 Claims



1. A circuit arrangement for controlling a load and for recognizing an interruption in a line to the load, comprising a measuring resistance connected in series with the load, means for varying a resistance value of said measuring resistance as a function of a current passing through the load, and a diagnostic device for generating a diagnosis signal if a voltage drop, producible across said measuring resistance by a load current, drops below a threshold value, said measuring resistance having at least two field-effect transistors connected in parallel, and a resistance value determinable by a drain-to-source path of said transistors, said transistors having different drain-to-source resistance values, in a conducting state thereof, and wherein said change-over device is constructed as a comparator subjectible to hysteresis, said comparator having a first input at which a drain-to-source voltage is applied, and a second input at which a first reference voltage is applied.

5,570,260

# OVERVOLTAGE PROTECTION CIRCUIT

Takeo Kanai, Saitama-Ken, and Kiyoshi Kusunoki, Kanagawa-Ken, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

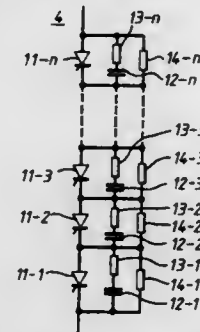
Filed Dec. 3, 1993, Ser. No. 160,847

Claims priority, application Japan, Apr. 20, 1993, 5-092681

Int. Cl.<sup>6</sup> H02H 9/00

U.S. Cl. 361—91

13 Claims



1. An overvoltage protection circuit, comprising: a plurality of series connected thyristor means having an overvoltage protection function; a plurality of impedance means, each being connected in parallel with one of said thyristor means, respectively; and said plurality of impedance means including at least a first impedance means and at least a second impedance means, wherein said first impedance means comprising a first impedance circuit having a first impedance value and said second impedance means comprising a second impedance circuit.

5,570,261

# TRANSDUCER SUSPENSION SYSTEM

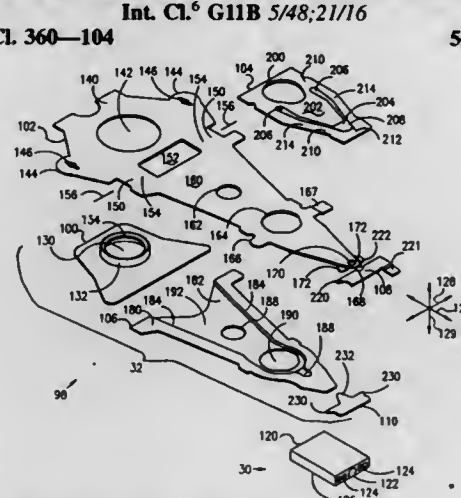
Norman K. Frater, San Jose; Alan P. Giorgi, Cupertino, and Oscar J. Ruiz, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 296,613, Aug. 25, 1994, abandoned, which is a continuation of Ser. No. 122,879, Sep. 16, 1993, abandoned. This application Oct. 20, 1995, Ser. No. 546,518

Int. Cl.<sup>6</sup> G11B 5/48; 21/16

U.S. Cl. 360—104

56 Claims



1. A suspension system comprising: a load beam having a longitudinal axis, a lateral axis and a perpendicular axis, a first and a second end of the load beam being located along the longitudinal axis, the first end for connection to a support member, the load beam having a first and a second surface each aligned substantially parallel to a plane containing the longitudinal and lateral axes; a stiffener member connected to the load beam between the first and second ends of the load beam and located on the side of the load beam which contains the first surface of the load

5,570,262

# COMMUNICATIONS BUS SURGE PROTECTOR

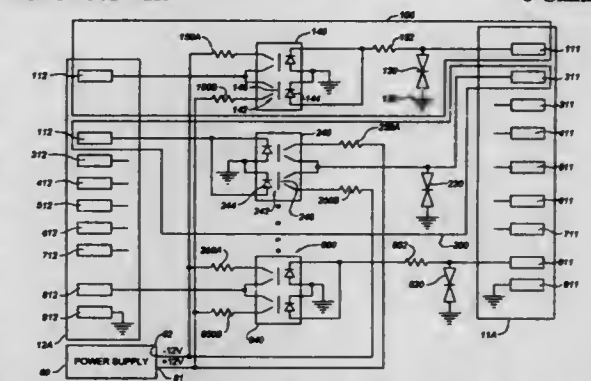
Philip G. Dion, Columbia Heights, and Brian K. Sorenson, Minnetonka, both of Minn., assignors to Dataserv Computer Maintenance, Inc., Chanhassen, Minn.

Filed Dec. 27, 1994, Ser. No. 364,207

Int. Cl.<sup>6</sup> H02H 3/22

U.S. Cl. 361—119

6 Claims



1. A surge protector for coupling an exposed bi-directional and ground-referenced signal data communication bus and a protected bi-directional and ground-referenced data signal communication bus, comprising:

- an exposed port adapted to be interconnected to the exposed communication bus, including:
  - a ground terminal, for connection to a ground terminal of the exposed communication bus,
  - a first direction signal terminal, for connection to a first direction signal terminal of the exposed communication bus; and
  - a second direction signal terminal, for connection to a second direction signal terminal of the exposed communication bus;
- protected port adapted to be interconnected to the protected communication bus, including:
  - a ground terminal, for connection to a ground terminal of the protected communication bus;
  - a first direction signal terminal, for connection to a first direction signal terminal of the protected communication bus; and
  - a second direction signal terminal, for connection to a second direction signal terminal of the protected communication bus;

- a first direction transient surge protection element connected to the exposed port first direction signal terminal and to a ground, for conducting current to ground when voltage in the exposed port first direction signal terminal reaches a threshold limit;
- a second direction transient surge protection element connected to the exposed port second direction signal terminal and to a ground, for conducting current to ground when voltage in the exposed port second direction signal terminal reaches a threshold limit;
- a first direction opto-isolation element connected between the first direction transient surge protection element and the protected port first direction signal terminal, for optically coupling and galvanically isolating the exposed port first direction signal terminal and the protected first direction signal port terminal; and
- a second direction opto-isolation element connected between the second direction transient surge protection element and the protected port second direction signal terminal, for optically coupling and galvanically isolating the exposed port second direction signal terminal and the protected port second direction signal terminal.

5,570,262

# HYBRID OVERLOAD RELAY

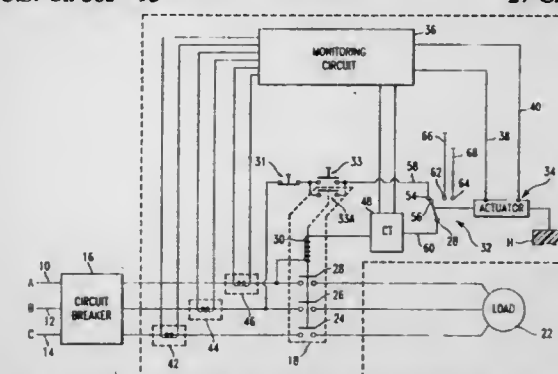
Bruno C. Doerwald, Duluth, Ga., assignor to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Feb. 25, 1994, Ser. No. 201,844

Int. Cl.<sup>6</sup> H02H 3/00

U.S. Cl. 361—93

27 Claims



1. A system for monitoring an electrical current in a conductor and interrupting the current flow in the conductor when the electrical current exceeds a predetermined limit, the system comprising:

- a transducer configured to produce a first signal representative of the electrical current;
- a first switch connectable to the conductor and configured to interrupt current flow in the conductor in response to a second electrical signal;
- a second switch including at least one pair of contacts which are moved between their opened and closed positions to produce the second electrical signal;
- a thermal actuator coupled to at least one of the contacts and configured to move the contacts relative to each other in response to a predetermined control current applied to the thermal actuator for a predetermined period of time, the control current changing the temperature of the actuator; and
- a control circuit electrically coupled to the transducer and the thermal actuator, and configured to produce the predetermined control current for the predetermined period of time in response to the first signal exceeding a predetermined limit.



5,570,264

## SURGE ARRESTER

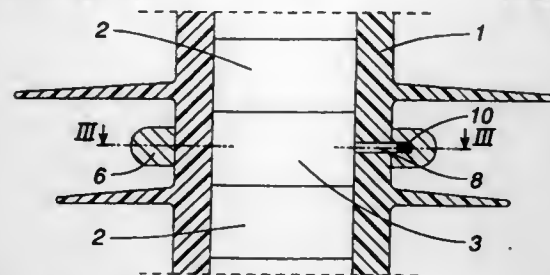
Jan Lundquist, and Lennart Stenström, both of Ludvika, Sweden, assignors to Asea Brown Boveri AB, Vasteras, Sweden  
PCT No. PCT/SE94/00097, § 371 Date Sep. 11, 1995, § 102(e)  
Date Sep. 11, 1995, PCT Pub. No. WO94/22150, PCT Pub. Date Sep. 29, 1994

PCT Filed Feb. 8, 1994, Ser. No. 513,963

Claims priority, application Sweden, Mar. 16, 1993, 9300857  
Int. Cl.<sup>6</sup> H02H 1/00

U.S. Cl. 361—127

6 Claims



1. A surge arrester comprising:  
an elongated outer housing consisting of an insulator of polymeric material;  
two metal electrodes affixed to the ends of said insulator;  
at least one stack of a plurality of cylindrical arrester elements of metal oxide varistor material disposed within said insulator, said arrester elements being arranged one after the other in their axial direction between the ends of said insulator for providing permanent electrical connection between said end electrodes;  
at least one field-limiting control electrode fixed around the insulator at a location intermediate said end electrodes; and  
connecting means extending transversely to the stack of arrester elements for electrically connecting said control electrode with said stack to limit radial voltage stress in the polymeric material.

5,570,265

## STATIC DISCHARGERS FOR AIRCRAFT

Henry R. Smith, Knightwick, Great Britain, assignor to HR Smith (Technical Developments) Limited, Herefordshire, England

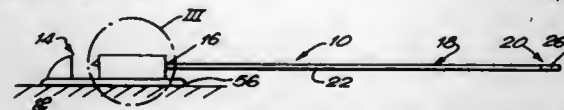
Continuation of Ser. No. 938,379, Aug. 31, 1992, abandoned, which is a continuation-in-part of Ser. No. 472,094, Jan. 30, 1990, abandoned. This application Jan. 20, 1995, Ser. No. 376,086

Claims priority, application United Kingdom, Jan. 31, 1989, 8902084

Int. Cl.<sup>6</sup> H05F 3/04

U.S. Cl. 361—218

12 Claims



1. Apparatus for discharging static electricity from an aircraft, comprising an elongate member formed of molded high temperature thermoplastics material free of any metallic material, said elongate member having a first end shaped and adapted for coupling to the surface of the aircraft and a second end provided with a tip member from which the electrostatic charge built up on the aircraft is discharged, said elongate member being covered with an electrically resistive coating, said tip member being formed of the same high temperature thermoplastics material as said elongate member and incorporating an aligned array of fibers, each fiber terminating in a fine point, and the material of the elongate member, the tip member, and the couple being selected so that their combined electrical resistivity is equal to or greater than  $10^2$  ohmmeter, the high temperature thermoplastics material of the tip

member, elongate member and attachment socket being selected from the group comprising polyetherimide, polyethersulphone and polyetheretherketone.

5,570,266

## STATIC BAR WITH INDICATOR LIGHT

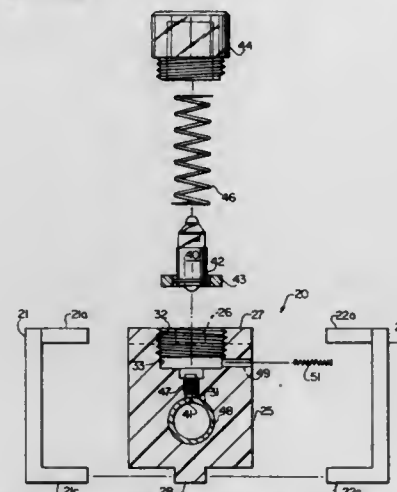
Anthony Q. Testone, Schwenksville, Pa., assignor to Electrostatics, Inc., Harleysville, Pa.

Filed May 25, 1995, Ser. No. 450,132

Int. Cl.<sup>6</sup> H01T 19/04

U.S. Cl. 361—229

3 Claims



1. An air ionizing apparatus comprising:  
a housing comprising an elongated structure and a support of insulating material, said elongated structure comprising a pair of conductive channels capable of connection to ground, said support having a passage therethrough generally parallel to said elongated structure,  
a conductor in said housing for connection to a source of alternating electric current, said conductor having an insulated sheath thereon,  
at least one air ionizing point coupled to said conductor for causing ionization of air upon the supplying of alternating electric current to said conductor,  
a neon indicator light supported by said housing,  
structure for capacitively coupling said neon indicator light to said conductor comprising a conductive sleeve in said support in surrounding relationship to said insulated conductor, and  
a conductive contact ring in said support engaging said neon indicator light, and a grounding connector between said conductive contact ring and a said channel,  
whereby said neon indicator light will be energized only when said apparatus is causing ionization of air by said at least one air ionizing point.

5,570,267

## FLAT DISPLAY MODULE

Hsi-Kuang Ma, 4F, No. 48, Sec. 2, Chung Cherng Rd., Taipei, Taiwan

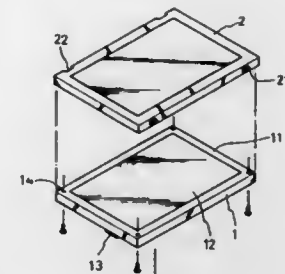
Filed Jul. 12, 1995, Ser. No. 501,615

Int. Cl.<sup>6</sup> H05K 7/14; G02F 1/1333

U.S. Cl. 361—681

8 Claims

1. A flat display module comprising:  
a flat display unit including a frame, a flat display mounted within the frame, and an electrical connector mounted on the frame at a bottom side;  
a protective cover covered on said display unit;  
a display holder frame for holding said display unit and said protective cover on the inside, said display holder frame comprising a rectangular center opening, which receives said



1. A magnetic disk module adapted to be inserted in a data storing device body which is in use, said module comprising:  
a housing having a front end and a rear end;  
at least one disk-drive unit accommodated in the housing and having a first connector;  
at least one printed wiring board accommodated in the housing for controlling the at least one disk-drive unit and having a second connector;  
a power supply unit accommodated in the housing;  
a third connector arranged at the rear end of the housing for plug-in connection to a connector of a data storing device body when the magnetic disk module is inserted into the data storing device body;  
a fourth connector arranged in the housing for plug-in connection to the first connector when the disk-drive unit is inserted in the housing;  
a fifth connector arranged in the housing for plug-in connection to the second connector when the printed wiring board is inserted in the housing; and  
a supporting plate disposed in the housing so as to extend transversely to a longitudinal direction of the housing, the disk drive unit and the printed wiring board being arranged on the side of the front end of the housing from the supporting plate, the power supply unit arranged on the side of the rear end of the housing from the supporting plate, the fourth and fifth connectors being mounted to the supporting plate.

## STOWABLE WRIST REST FOR PORTABLE COMPUTERS

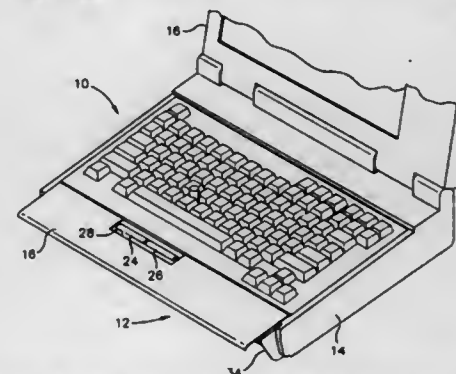
Edwin J. Selker, Palo Alto, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1994, Ser. No. 363,510

Int. Cl.<sup>6</sup> G06F 1/16; B43L 15/00

U.S. Cl. 361—683

20 Claims



1. A stowable wrist support assembly for a portable computer of the type having an upper housing and a lower housing, said lower housing having a front edge and a back edge, said upper housing being pivotally connected to the back edge of the lower housing, the lower housing having top and bottom surfaces connected by a vertical peripheral side surface and having a keyboard disposed on the top surface, said support assembly comprising:

a generally thin flat panel having a generally planar top support surface and a rear edge formed with a lip for detachably engaging and latching at a location proximate to the front edge of the lower housing; and  
a panel support member extending downwardly from the underside of said thin flat panel for engaging the front edge of said lower housing for supporting said thin flat panel in an outwardly extending position substantially in the plane of the keyboard.

5,570,269

## MAGNETIC DISK MODULE

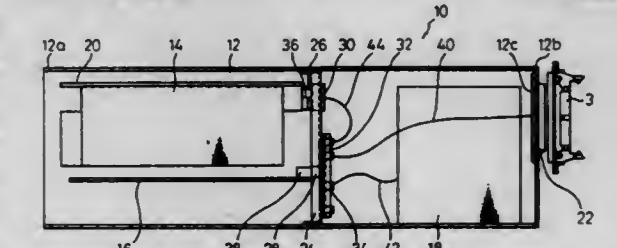
Masayuki Korikawa; Toru Shinohara; Masahito Iwatsubo; Saori Yokoyama; Hideki Ohmori; Takasi Watanabe, and Tsuneo Ohsugi, all of Kawasaki, Japan, assignors to Fujitsu Limited, Japan

Filed Jun. 30, 1994, Ser. No. 268,503

Claims priority, application Japan, Oct. 5, 1993, 5-249436  
Int. Cl.<sup>6</sup> G06F 1/16; H05K 5/00; H01R 9/00

U.S. Cl. 361—685

25 Claims



1. A magnetic disk module adapted to be inserted in a data storing device body which is in use, said module comprising:  
a housing having a front end and a rear end;  
at least one disk-drive unit accommodated in the housing and having a first connector;  
at least one printed wiring board accommodated in the housing for controlling the at least one disk-drive unit and having a second connector;  
a power supply unit accommodated in the housing;  
a third connector arranged at the rear end of the housing for plug-in connection to a connector of a data storing device body when the magnetic disk module is inserted into the data storing device body;  
a fourth connector arranged in the housing for plug-in connection to the first connector when the disk-drive unit is inserted in the housing;  
a fifth connector arranged in the housing for plug-in connection to the second connector when the printed wiring board is inserted in the housing; and  
a supporting plate disposed in the housing so as to extend transversely to a longitudinal direction of the housing, the disk drive unit and the printed wiring board being arranged on the side of the front end of the housing from the supporting plate, the power supply unit arranged on the side of the rear end of the housing from the supporting plate, the fourth and fifth connectors being mounted to the supporting plate.

5,570,270

## CHASSIS AND PERSONAL COMPUTER FOR SEVERE ENVIRONMENT EMBEDDED APPLICATIONS

Richard G. Naedel, Rockville; David B. Harris, Columbia, and Mark Uehling, Bowie, all of Md., assignors to Pulse Electronics, Inc., Rockville, Md.

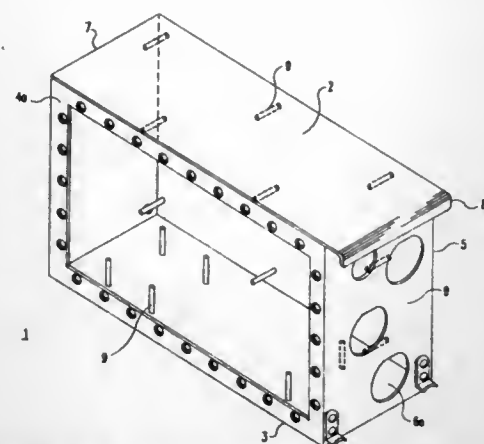
Filed Jun. 3, 1994, Ser. No. 253,910

Int. Cl.<sup>6</sup> H05K 7/20; F28D 21/00

U.S. Cl. 361—687

20 Claims

1. A computer including a plurality of printed circuit boards having integrated circuits mounted thereon and a power supply coupled to said printed circuit boards, comprising:



a sealed, airtight, watertight enclosure for accommodating said plurality of printed circuit boards and said power supply, said enclosure having a plurality of integrally joined walls, a first of said plurality of walls having a removable plate for access to said plurality of printed circuit boards and said power supply accommodated in said enclosure, wherein said enclosure comprises metal and wherein heat is dissipated by conduction along a thermal path from said integrated circuits directly to at least one of said plurality of walls of said enclosure, and means for coupling first and second boards of said plurality of printed circuit boards to form a board pair module subassembly, said board pair module subassembly being mounted to an inner surface of a wall of said plurality of walls.

5,570,271

## HEAT SINK ASSEMBLIES

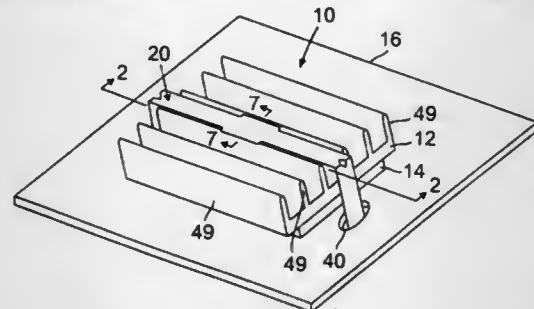
Ronald B. Lavochkin, Bow, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.

Filed Mar. 3, 1995, Ser. No. 397,830

Int. Cl.<sup>6</sup> H05K 7/20

U.S. Cl. 361—704

21 Claims



1. A heat sink assembly, for use with an electrical component adapted for mounting to a region of a printed circuit board, comprising:

- a heat sink; and,
- a clip, such clip comprising:
  - a planar horizontal section;
  - a pair of substantially vertical extending legs disposed along folds formed at opposing ends of the horizontal section;
  - an engaging section disposed along a portion of an edge of the horizontal section and positioned between the opposing ends of the horizontal section, such engaging section being adapted engage the heat sink and force the heat sink against the printed circuit board mounted electrical component as the legs of the clip engage the printed circuit board through holes formed in the printed circuit board on opposing sides of the component mounting region of the printed circuit board;
- a pair of gussets, each one of the gussets being disposed at one of the folds formed at the opposing ends of the horizontal

section, such gussets extending between the horizontal section and the pair of substantially vertical extending legs; and wherein the planar horizontal section, the pair of substantially vertical extending legs, the engaging section, and the pair of gussets of the clip are a single, integral unit having a common material.

5,570,272

## APPARATUS FOR ENCAPSULATING AN INTEGRATED CIRCUIT PACKAGE

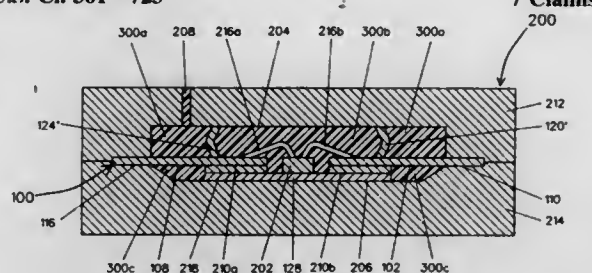
Patrick Variot, San Jose, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Continuation of Ser. No. 110,281, Aug. 18, 1993, Pat. No. 5,420,752. This application May 26, 1995, Ser. No. 451,577

Int. Cl.<sup>6</sup> H05K 7/20

U.S. Cl. 361—723

7 Claims



1. A apparatus for fabricating an integrated circuit package by encapsulating a semiconductor die connected to a leadframe and attached to a heatsink, comprising:

- an encapsulation mold having first and second portions, wherein an integrated circuit assembly comprising,
  - a semiconductor die,
  - a leadframe, and
  - a heatsink having first and second surfaces, the first surface being on one side of the heatsink and the second surface being on the opposite side of the heatsink;
- the leadframe and the semiconductor die being attached to the first surface of the heatsink, and the semiconductor die being connected to the leadframe;
- wherein portions of the leadframe are bent away from the first surface of the heatsink a desired distance;
- said integrated circuit assembly being placed in the first portion of said mold so that the second surface of the heatsink is in contact with a first inside surface of the first portion of said mold;
- the second portion of said mold being placed over said integrated circuit assembly so that a second inside surface of the second portion of said mold is in contact with the bent portions of the leadframe, wherein the bent portions of the leadframe springingly bias the second surface of the heatsink toward the first inside surface of the first portion of said mold; and
- encapsulant being injected into the first and second portions of said mold so as to encapsulate said integrated circuit assembly, wherein the bent portions of the leadframe keep the second surface of the heatsink in contact with the first inside surface of the first portion of said mold during injection of the encapsulant.

5,570,273  
SURFACE MOUNTABLE INTEGRATED CIRCUIT PACKAGE WITH LOW-PROFILE DETACHABLE MODULE

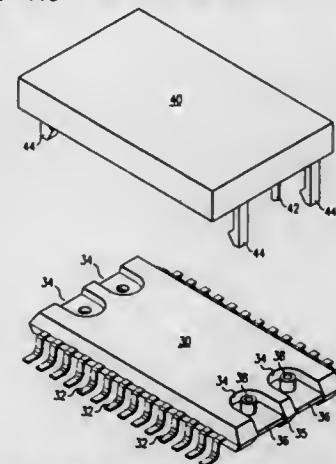
Harry M. Siegel; Hurst; Tom Q. Lao, Irving; Krishnan Kelappan, Carrollton, and Michael J. Hundt, Double Oak, all of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Continuation-in-part of Ser. No. 114,750, Aug. 31, 1993, abandoned. This application Apr. 8, 1994, Ser. No. 225,227

Int. Cl.<sup>6</sup> H01R 9/00

U.S. Cl. 361—773

16 Claims



1. A system for packaging integrated circuit components, comprising:

- a chip package, comprising:
    - a body containing a semiconductor device;
    - a plurality of leads extending from said body, said leads in electrical connection with the semiconductor device, and of the type suitable for surface mounting to a circuit board; and
    - first and second terminals in electrical connection with the semiconductor device, and extending from said body; and
  - a component module disposed over said chip package, comprising:
    - an auxiliary body, having a first portion containing a first auxiliary component; and
    - first and second connectors in electrical connection with the first auxiliary component, and extending from said auxiliary body to electrically connect with said first and second terminals, respectively, of said chip package;
- wherein the first portion of the auxiliary body does not overlie the chip package.

5,570,274

## HIGH DENSITY MULTICHIP MODULE PACKAGING STRUCTURE

Masaru Saito, and Manabu Bonkohara, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 29, 1994, Ser. No. 350,122

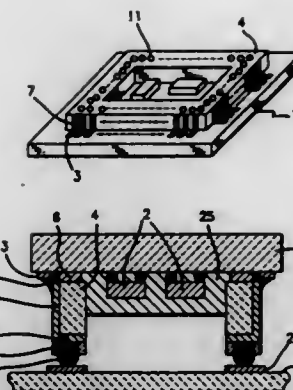
Claims priority, application Japan, Nov. 29, 1993, 5-297137

Int. Cl.<sup>6</sup> H05K 1/11

U.S. Cl. 361—784

14 Claims

1. A multichip module packaging structure comprising:
- a mother board having a plurality of first pads provided on a peripheral region of a top surface thereof;
  - a substrate having a plurality of second pads provided on a peripheral region of a bottom surface thereof, said substrate being mounted over said mother board through a frame member, said frame member being provided to extend successively on a peripheral region of said bottom surface of said substrate and further extend downward from said bottom surface of said substrate so as to surround a sealing resin material, said frame member having a top portion mechanically bonded with said bottom surface of said substrate;



a plurality of terminals, each of said terminals comprising: a side portion extending on an outside face of said frame member between top and bottom portions of said frame member; and a bottom portion extending on a bottom portion of said frame member, said bottom portion being united with said side portion, said frame member being mechanically connected through said bottom portions of said terminals to said mother board so as to form a three dimensional space surrounded by said frame member, said terminals electrically connecting said first pads and said second pads; and

a plurality of semiconductor integrated circuit chips being provided on said bottom surface of said substrate so that said chips are completely embedded within said sealing resin material surrounded by said frame, within said three dimensional space, wherein each of said semiconductor integrated circuit chips is electrically connected to a part of said second pads, said part is positioned relatively closer to said chip than the remaining part of said second pads, whereby each said chip is electrically connected to said second pads via said first pads and said terminals which are closer to each said chip.

5,570,275

## SPORTS CARD VIEWING APPARATUS

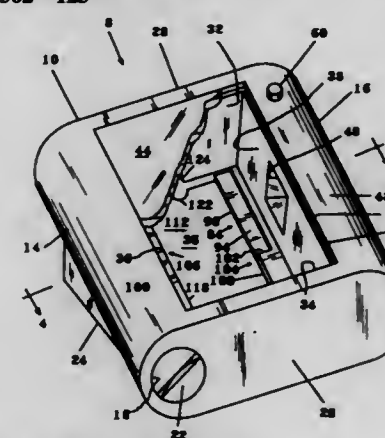
Leo H. Luquire, 1742 Radcliffe Rd., Montgomery, Ala. 36106

Filed Mar. 7, 1995, Ser. No. 399,435

Int. Cl.<sup>6</sup> F21V 33/00

U.S. Cl. 362—125

28 Claims



1. A viewing apparatus comprising:

- a body having a hollow central region with a floor therein, and first and second hollow sides,
- a discrete enclosure in one of said first and second hollow sides, said enclosure having an opening communicating with said hollow central region,
- an illumination bulb mounted in said enclosure,
- an electrical power source in another one of said first and second hollow sides, and coupled to said bulb for selective energization thereof,



a first pair of opposed slots defining a first plane adjacent said floor, said opposed slots spaced to receive at east one printed card therebetween,  
a magnifying lens mounted in said body over said floor, for magnifying said card,  
whereby said card is indirectly illuminated by light from said bulb and an illuminated image thereof magnified by said lens.

5,570,276

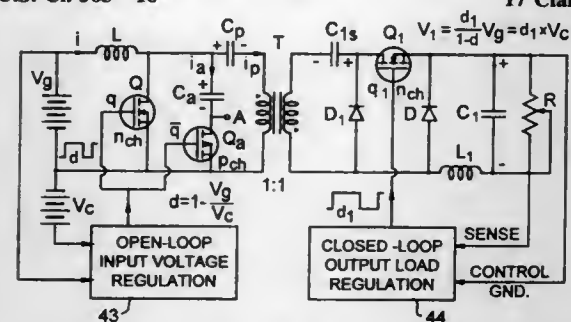
# SWITCHING CONVERTER WITH OPEN-LOOP INPUT VOLTAGE REGULATION ON PRIMARY SIDE AND CLOSED-LOOP LOAD REGULATION ON SECONDARY SIDE

Slobodan Cuk, Laguna Hills, and Zhe Zhang, Margarita, both of Calif., assignors to Optimun Power Conversion, Inc., Irvine, Calif.

Filed Nov. 15, 1993, Ser. No. 153,132  
Int. Cl. H02M 3/335

U.S. Cl. 363-16

17 Claims



1. A switching converter with an open-loop nonisolated input voltage regulator and a closed-loop nonisolated output voltage regulator comprising an isolated power processing stage and said nonisolated input and output voltage regulators, one on each side of an isolation transformer in said power processing stage, with said nonisolated input voltage regulator on the primary side of said transformer regulating against input voltage changes in an open-loop control mode and said nonisolated output voltage regulator on the secondary side of said transformer regulating against load current changes as well as any voltage variations in a closed-loop control mode, said isolated power processing stage comprising

a dc voltage source in series with an input inductor, an input energy transfer capacitor and the primary winding of said isolation transformer in that sequence and a main current bidirectional switch connecting a junction between said input inductor and input energy transfer capacitor to the return current path of said primary winding to said dc voltage source, and an auxiliary circuit comprising an auxiliary current bidirectional switch and capacitor in series, said auxiliary circuit being connected in parallel with said main current bidirectional switch, and switching means for driving said main current bidirectional switch and said auxiliary current bidirectional switch out-of-phase such that when either one is turned ON the other is OFF turned off,

a secondary circuit comprising an output energy transfer capacitor, a series current bidirectional switch, a load and filter capacitor in parallel, and an output inductor in series in that order with the secondary winding of said isolation transformer, and a rectifier diode connecting a junction between said series current bidirectional switch and said load to a junction between said output inductor and said secondary winding of said isolation transformer, and

means for synchronizing cyclical operation of said nonisolated output voltage regulator controlling said current bidirectional switch of said secondary circuit with a fixed cyclical rate of said open-loop nonisolated input voltage regulator thereby to provide drive signals to turn ON said main and said auxiliary current bidirectional switches and turn ON said current bidirectional switch of said secondary circuit, and to turn OFF both said main and said auxiliary current bidirectional

switches as dictated by said open-loop nonisolated input voltage regulator and to turn OFF said current bidirectional switch of said secondary circuit as dictated by said closed-loop nonisolated output voltage regulator.

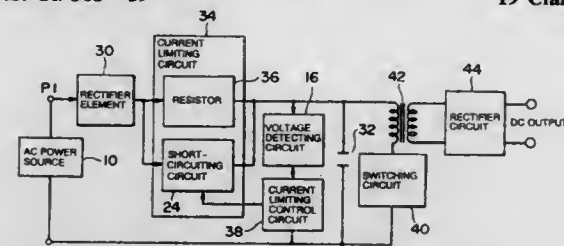
5,570,277

# SWITCHING POWER SUPPLY APPARATUS

Akihiko Ito, and Yukio Gotoh, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan  
Filed Jun. 2, 1994, Ser. No. 253,137  
Claims priority, application Japan, Aug. 30, 1993, 5-214594  
Int. Cl. H02M 3/335

U.S. Cl. 363-19

19 Claims



1. A switching power supply apparatus comprising:  
an AC power source for supplying an AC power input;  
a rectifier circuit for rectifying the AC power input from said AC power source;  
a switching regulator for switching and smoothing an output of said rectifier circuit and outputting a preset DC voltage;  
a current limiting circuit for limiting a current supplied from said AC power source to said rectifier circuit;  
a voltage detecting circuit for detecting a voltage rectified by said rectifier circuit; and  
a current limiting control circuit for comparing a detected voltage detected by said voltage detecting circuit with a preset level and setting said current limiting circuit into an operative state in a first period of time in which the detected voltage is lower than the preset level and in a second period of time after the detected voltage is returned to a level which is not lower than the preset level in a case where the detected voltage is first changed from a level which is not lower than the preset level to a level which is lower than the preset level and then returned to a level which is not lower than the preset level.

5,570,278

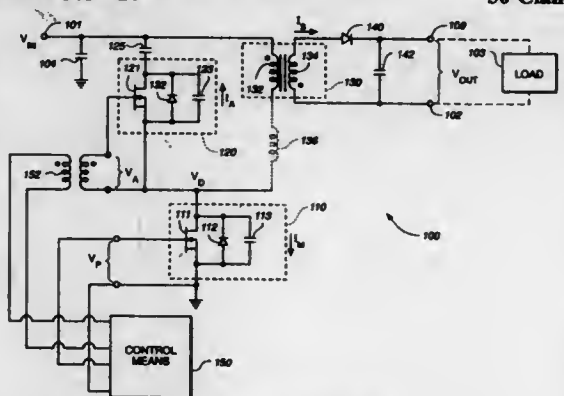
# CLAMPED CONTINUOUS FLYBACK POWER CONVERTER

David A. Cross, Sai Kung, Hong Kong, assignor to Astec International, Ltd.

Filed Feb. 25, 1994, Ser. No. 201,653  
Int. Cl. H02M 3/335

U.S. Cl. 363-20

30 Claims



21. A flyback power converter comprising:

5,570,280

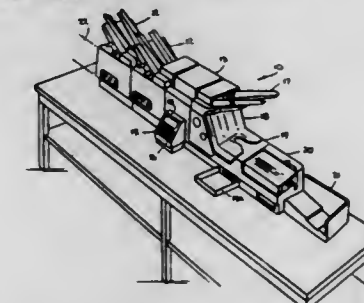
# METHOD FOR CONTROLLING ELECTRO-MECHANICAL DEVICES

Stephen C. Nunnally, Bridgewater; Perry A. Pierce, Darien, and Peter K. Zanger, Naugatuck, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 14, 1994, Ser. No. 338,726  
Int. Cl. G06F 19/00

U.S. Cl. 364-140

9 Claims



an input port for receiving a source of input power and an output port for providing power to a load;  
a transformer having a primary winding, a secondary winding, a magnetizing inductance through which a corresponding magnetizing current flows, and a primary leakage inductance;  
a power switch coupled in series with said primary winding at a circuit node, the series combination of the primary winding and power switch being coupled to said input port, said power switch being switched in alternating ON and OFF states wherein power is coupled from said input port to the primary winding during ON states and wherein substantially no power is coupled during OFF states, said transformer storing energy in its magnetizing inductance during said ON states and releasing energy during OFF states;  
a rectifier coupled in series with the secondary winding such that current is substantially blocked from flowing to said output port during ON states of the power switch and is enabled to flow during OFF states;  
a series combination of a capacitor and an auxiliary switch, said series combination having one terminal coupled to said circuit node and a second terminal coupled to a terminal of said input port, said auxiliary switch having an auxiliary ON state in which electrical current is enabled to be conducted between said capacitor and said circuit node and an auxiliary OFF state in which electrical current is not enabled to be conducted, said auxiliary switch being switched to said auxiliary ON state while said power switch is in said OFF state and switched to said auxiliary OFF state a selected period of time before said power switch is switched to its ON state; and  
wherein said power switch is operated such that the magnetizing current of said magnetizing inductance flows continuously in one direction during a plurality consecutive ON states of said power switch; and  
wherein said capacitor, said auxiliary switch, and said primary leakage inductance generate a reverse current in said leakage inductance during the OFF state of said power switch which lowers the voltage across the power switch in said selected time period prior to said power switch being switched to its ON state.

5,570,279

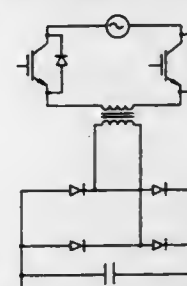
# PWM CONVERTERS FOR THREE PHASE AC POWER CONTROL AND AC TO DC CONVERSION

Giri Venkataramanan, Bozeman, Mont., assignor to The Research and Development Institute, Inc. At Montana State University, Bozeman, Mont.

Filed Sep. 21, 1994, Ser. No. 309,356  
Int. Cl. H02M 7/217; 5/45

U.S. Cl. 363-127

15 Claims



1. Apparatus for converting AC power to DC power, comprising: pulse-width-modulated switching means connected across an input voltage source providing an input AC voltage, said switching means operating at a frequency higher than a frequency of the input AC voltage, high frequency isolating means receiving an output from said pulse-width-modulated switching means, and rectifying means receiving a high frequency output signal from said high frequency isolating means for converting the output signal to a DC voltage.

5,570,281

# METHOD AND SYSTEM FOR FACILITATING VISUAL CONNECTIONS BETWEEN OBJECTS USING HANDLES

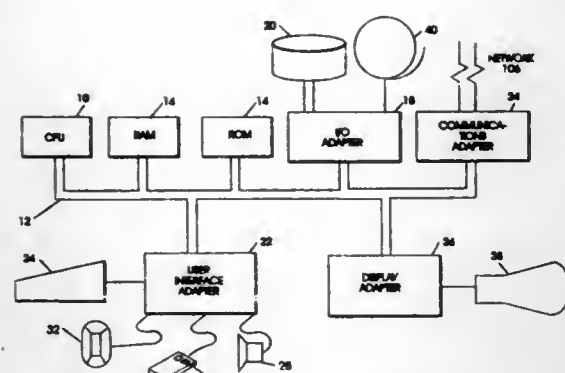
Richard E. Berry, Georgetown, Tex., assignor to International Business Machine Corporation, Armonk, N.Y.

Filed Jan. 31, 1995, Ser. No. 380,983  
Int. Cl. G05B 11/01; G06F 3/00

U.S. Cl. 364-146

18 Claims

9. A data processing system for connecting objects having handles, comprising:  
display means for displaying objects, each of said objects having an associated handle;  
selecting means for selecting a first handle associated with a first of said objects;  
memory means for storing a coordinate location of said selected first handle;  
dragging means for dragging said selected first handle to a second handle associated with a second object; and



processor means for forming a connection between said first object and said second object.

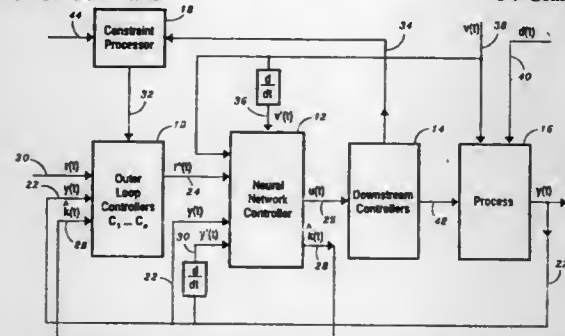
### 5,570,282 MULTIVARIABLE NONLINEAR PROCESS CONTROLLER

Peter D. Hansen, Wellesley Hills, and Paul C. Badavas, Southboro, both of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Nov. 1, 1994, Ser. No. 333,161  
Int. Cl.<sup>6</sup> G05B 13/02; G06F 15/18

U.S. Cl. 364-148

54 Claims



1. An apparatus for controlling a process having process inputs and process outputs comprising a controlled variable, the process responsive to a manipulated variable to vary the process in relation to the controlled variable, said apparatus comprising:

- measuring means for measuring values of one of said process outputs generating a process output signal representative thereof;
- setpoint means for receiving a setpoint which represents a target value of the controlled variable;
- control means, coupled to said measuring means and the process, for generating a selected value of the manipulated variable as a function of the setpoint and the process output signal, said control means utilizing a nonlinear function generator previously trained to compute the selected value of the manipulated variable in accordance with an optimum prediction time, the optimum prediction time representing the effective response time of the process to a change in the setpoint, and the selected value of the manipulated variable representing a change in the process needed to move the controlled variable towards the setpoint as advanced by the optimum prediction time; and
- actuator means, coupled to said control means and said process, for applying the selected value of the manipulated variable to the process.

### 5,570,283 CORPORATE TRAVEL CONTROLLER

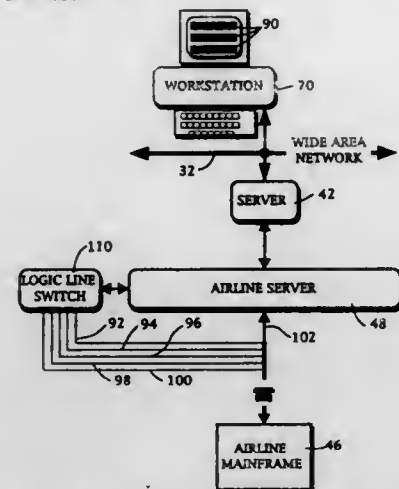
John R. Shoolery, Palo Alto; Guy E. Pasela, Davis; Diane L. De La Torre, San Bruno; Kenneth M. Leung, San Jose, and Kathleen A. Morris, Saratoga, all of Calif., assignors to TravelNet, Inc., Santa Clara, Calif.

Filed Nov. 18, 1994, Ser. No. 342,348

Int. Cl.<sup>6</sup> G06F 15/02

U.S. Cl. 364-407

27 Claims



1. A system to allow rapid access to at least one airline computerized reservation system (CRS) by unskilled persons, the CRS having a generally fixed maximum response size per data request, said system including:

- a plurality of workstations for inputs by unskilled persons and outputs thereto;
- server means connected to said workstations;
- means to translate inputs from said workstations into CRS communication code;
- means to translate communication code from the CRS into outputs to said workstations;
- communication means for connecting said server means to the CRS including:
- a plurality of logical connections;
- sensing means to sense a data request from a said workstation for CRS information that is likely to be larger than the maximum response size and produce a first signal indicative that such a data request has been received;
- means responsive to said first signal to increase the number of said logical connections providing outputs to said workstation;
- means to request the CRS information across said increased number of said logical connections so that the CRS responds to each logical connection with a different portion of the requested CRS information; and
- means to reassemble the different portions of the CRS information into the requested output for said workstation, thereby increasing the response time of said system to the data request.

### 5,570,284 METHOD AND APPARATUS FOR REMOTE CONTROL OF A LOCOMOTIVE THROTTLE CONTROLLER

Leonard Roselli, Murrysville; Daniel J. Wolf, Pittsburgh; Gregory S. Balukin, Pittsburgh, and John Pfaff, Pittsburgh, all of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

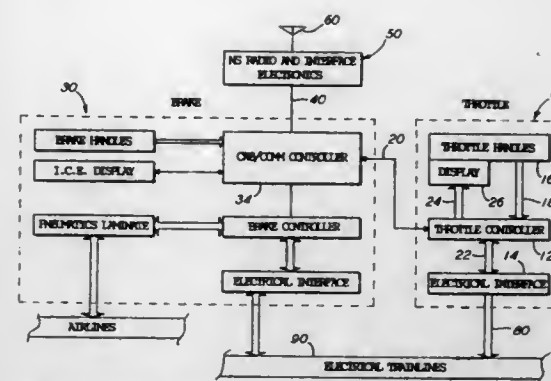
Filed Dec. 5, 1994, Ser. No. 349,320

Int. Cl.<sup>6</sup> B61K 13/00

U.S. Cl. 364-424.01

24 Claims

1. A method for controlling a locomotive from a remote host first computer, said locomotive having a throttle controller equipped with a second computer, said method comprising the steps of:



(a) establishing two-way transmission of signals representing digital data packets between said first computer and said second computer;

(b) transmitting signals representing digital data packets representing engine control commands from said first computer to said second computer at time intervals no greater than a predetermined maximum time interval, each of said data packets including the following bytes disposed sequentially in time,

- two bytes of data which serve as a start flag for said data packet,
- one byte of data, which is reserved as an address for said data packet,
- one byte of data, which is reserved to indicate different types of packet,
- two bytes of data, a first header byte representing the type of information represented by said data packet and a second header byte representing a version number, used to facilitate implementation with successive software versions,
- at least one byte of information,
- at least two bytes representing integers calculated for a cyclic redundancy check, and
- two bytes which serve as an end flag for said data packet,

wherein ambiguity between said at least one information byte in Step (V) and said end flag bytes of Step (VII) is eliminated by the following substeps,

- using known numeric values for said end flag bytes,
- selecting a first byte of said end flag bytes, and, whenever the numeric value of said first byte appears in the stream of bytes to be transmitted, transmitting its numeric value twice in sequence, and
- in said second computer, interpreting said twice transmitted numeric value as a single byte of information, and not as an end flag;
- driving signals on trainlines via said throttle controller means based on said engine control commands; and
- responding to one of corruption of transmission and loss of transmission from said first computer.

### 5,570,285 METHOD AND APPARATUS FOR AVOIDING OBSTACLES BY A ROBOT

Shunichi Asaka, 1-10-25, Kotobuki-sou 203, Sounan, Sagami-hara-shi, Kanagawa-ken, 288, and Shigeki Ishikawa, 6-17-7, Casa de R10 4F, Ebara, Shinagawa-ku, Tokyo, 142, both of Japan

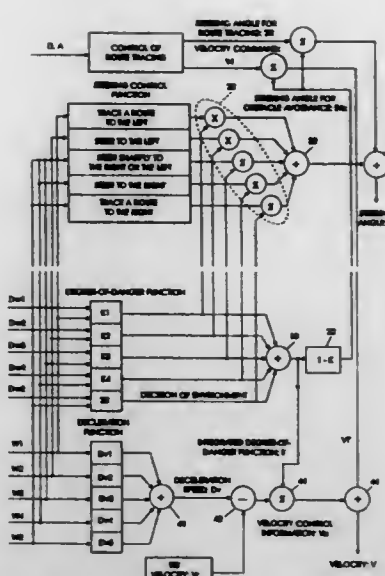
Filed Sep. 14, 1994, Ser. No. 305,543

Claims priority, application Japan, Sep. 12, 1993, 5-309255  
Int. Cl.<sup>6</sup> G06F 16/00

U.S. Cl. 364-424.02

8 Claims

1. A method of guiding an autonomous mobile machine for determining a guiding steering angle and a guiding velocity value to guide the machine, the steps of the method comprising: using distances from obstacles in a plurality of directions as input information;



obtaining an output for each of said directions, using said input information as a parameter and using a function relating to steering angle, a function relating to velocity, and a function relating to degree of danger;

calculating a steering angle for obstacle avoidance and a velocity for obstacle avoidance by using at least one of said outputs for each of said directions as a parameter and a steering angle for route tracing and a velocity for route tracing by a predetermined method; and

controlling the machine using said guiding steering angle by synthesizing said steering angle for route tracing and said steering angle for obstacle avoidance and said guiding velocity value by synthesizing said velocity for route tracing and said velocity for obstacle avoidance.

### 5,570,286 REGENERATIVE SYSTEM INCLUDING AN ENERGY TRANSFORMER WHICH REQUIRES NO EXTERNAL POWER SOURCE TO DRIVE SAME

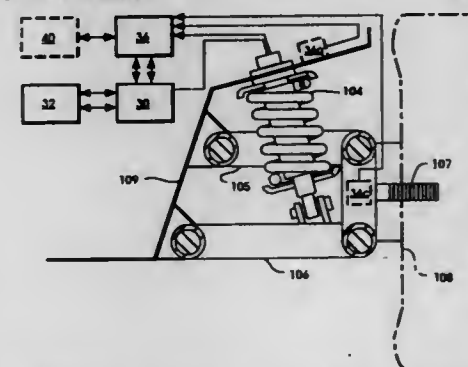
Donald L. Margolis, Elmacero, Calif.; Mark R. Jolly, Holly Springs, N.C.; Warren R. Schroeder, Davis, Calif.; Michael C. Heath, and Douglas E. Ivers, both of Cary, N.C., assignors to Lord Corporation, Cary, N.C.

Filed Dec. 23, 1993, Ser. No. 173,538

Int. Cl.<sup>6</sup> B60G 17/00

U.S. Cl. 364-424.05

20 Claims



1. A regenerative system for controlling the transmission of vibrational energy between a first member and a second member which undergo relative vibratory motion, said regenerative system operating without an auxiliary power source for actively providing assisting forces and comprising:

- an energy transformer for converting kinetic energy from said relative vibratory motion between said first and said second members to energy in storable form and for utilizing said



- energy in storable form for performing useful work between said first member and said second member by controlling transmission of vibrational energy between said members;
- b) an energy storage element for storing said energy in storable form from said energy transformer;
- c) a sensor associated with said system for providing a signal indicative of a force condition of said regenerative system;
- d) an energy management element interconnected between said energy transformer and said energy storage element for channeling said energy in storable form converted by said energy transformer to and from said storage element; and
- e) a controller responsive to said sensor for controlling said channeling of said energy in storable form to and from said energy storage element such that said energy in storable form is stored and released to provide assisting forces in response to said relative vibratory motion without the need for an auxiliary power source for actively driving said energy transformer for providing assisting forces.

5,570,287

## SPEED DEPENDENT SUSPENSION CONTROL

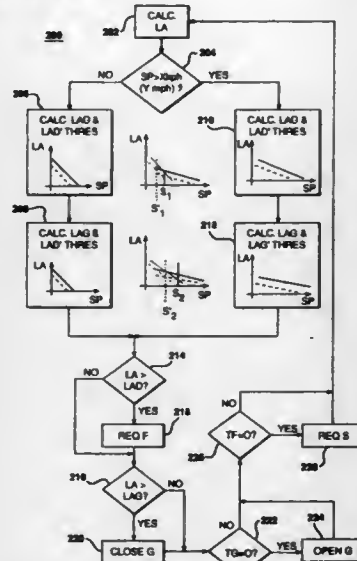
Douglas C. Campbell, Dearborn; Gary J. Gloceri, West Bloomfield, and Daniel M. McCoy, Shelby Township, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 16, 1994, Ser. No. 356,992

Int. Cl.<sup>6</sup> B60G 17/015

U.S. Cl. 364—424.05

18 Claims



1. A method for operating a controllable suspension connected between a body and wheels of a vehicle, said method comprising the steps of:

- sensing the speed of the vehicle;
- determining a lateral acceleration damping threshold for switching a damping factor of said controllable suspension in response to the sensed speed of the vehicle by performing the steps of:
- determining whether the sensed speed of said vehicle is less than or equal to a first speed, or greater than said first speed;
- solving a first damping equation, dependent upon the sensed speed of said vehicle, if the sensed speed of said vehicle is less than or equal to said first speed; and
- solving a second damping equation, dependent upon the sensed vehicle speed and different than said first damping equation, if the sensed speed of said vehicle is greater than said first speed;
- determining the lateral acceleration of the vehicle;
- comparing the determined lateral acceleration of the vehicle to said lateral acceleration damping threshold; and

setting the damping factor of said controllable suspension in response to the result of said step of comparing the determined lateral acceleration of the vehicle to said lateral acceleration damping threshold.

5,570,288

## VEHICLE SUSPENSION CONTROL USING A SCALED WHEEL DEMAND FORCE

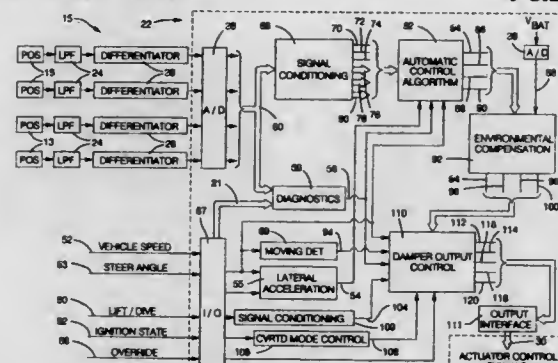
Scott W. Badenoch, Bloomfield Hills, Mich.; David A. Shal, Centerville, and Scott A. Stacey, Kettering, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 27, 1995, Ser. No. 410,788

Int. Cl.<sup>6</sup> B60G 17/00

U.S. Cl. 364—424.05

6 Claims



1. A method of controlling a vehicle suspension system comprising the steps of:
- determining a relative velocity between a wheel and a corresponding corner of a vehicle body;
- determining responsive to the relative velocity, according to a non-linear passive function, a raw wheel demand force;
- determining an average vertical velocity of the wheel;
- determining, responsive to the average vertical velocity of the wheel, a first scaling factor;
- multiplying the first scaling factor by the raw wheel demand force to determine a scaled wheel demand force; and
- controlling the vehicle suspension system responsive to the scaled wheel demand force.

5,570,289

## VEHICLE SUSPENSION CONTROL WITH WHEEL AND BODY DEMAND FORCE PHASE DETERMINATION

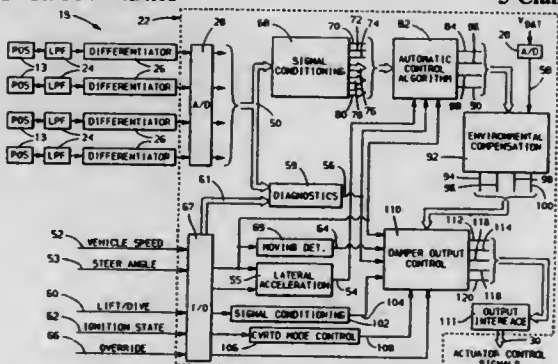
Scott A. Stacey, Kettering, and Joan B. Arwine, Miamisburg, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 27, 1995, Ser. No. 410,794

Int. Cl.<sup>6</sup> B60G 17/00

U.S. Cl. 364—424.05

5 Claims



1. A suspension system control method according to the steps of:
- measuring a set of parameters indicative of motion of a body of a vehicle and of motion of wheels of the vehicle;

determining a body demand force responsive to the measured parameters;

determining a set of wheel demand forces responsive to the measured parameters;

for each wheel of the vehicle:

- comparing the body demand force and the corresponding wheel demand force to determine whether the body demand force and the corresponding wheel demand force are in phase;
- if the body demand force and the corresponding wheel demand force are in phase, determining a damper command responsive to the greater of the body and corresponding wheel demand force;
- if the body demand force and the corresponding wheel demand force are out of phase, determining the damper command responsive to the sum of the body demand force and the corresponding wheel demand force; and
- applying the determined damper command to a controllable variable force damper.

5,570,290

## ELECTRONIC FRANKING SYSTEM FOR POSTAL ITEMS

Vanni Foschi, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

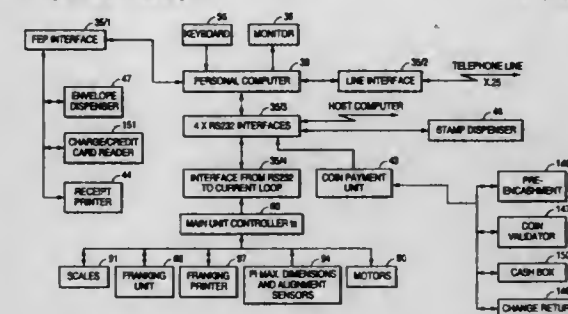
Filed Aug. 26, 1994, Ser. No. 297,555

Claims priority, application Italy, Sep. 9, 1993, TO93A0060

Int. Cl.<sup>6</sup> G07B 17/02

U.S. Cl. 364—464.02

10 Claims



1. Electronic franking system comprising:
- an area for depositing a postal item;
- devices for determining a franking amount;
- a franking unit;
- sensor devices which provide signals indicating correct positioning of the postal item in a limited zone of said deposit area;
- a print unit that can print the said franking amount;
- handling devices for handling said print unit; and
- electronic control devices conforming to the signals of the said sensor devices for activating said handling devices and said print unit for positioning said print unit on the postal item in said limited zone for franking said postal item.

5,570,291

## CUSTOM PRODUCT ESTIMATING AND ORDER PROCESSING SYSTEM

James Dudge, Homewood; Michael Leatherman, Tinley Park; Michael Morrison, Highland Park, and Waldo Schnell, Prospect Heights, all of Ill., assignors to Wallace Computer Services, Inc., Hillside, Ill.

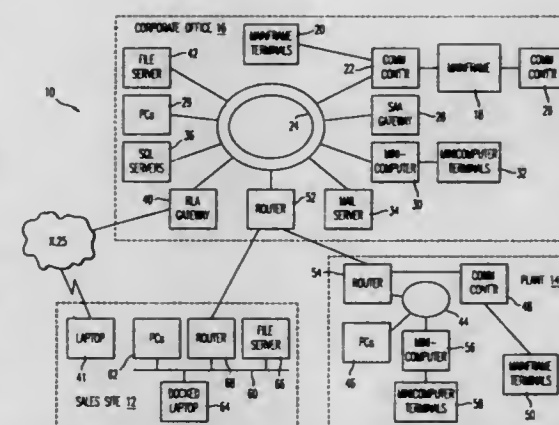
Continuation-in-part of Ser. No. 295,385, Aug. 24, 1994, abandoned. This application Aug. 31, 1994, Ser. No. 298,274

Int. Cl.<sup>6</sup> G06F 19/00

U.S. Cl. 364—468.01

5 Claims

1. A system for ordering the manufacture of an item comprising:



a first computer comprising a monitor, a first memory device and an input device for use by an operator initiating an order to enter customer order data selected from the group consisting of customer biographical data, credit approval data, item identification data, quantity data, shipping data, handling data, storage data, item usage data, ordering data, planning data, and contract data, and specification data relating to the item to be manufactured, and to store said customer order data and said specification data in said first memory device;

a second computer comprising a second memory device for storing a database comprising data relating to features of different types of items, to different manufacturing processes, and to material and labor costs for producing the different types of items, said database being operable to store data relating to a contract for the manufacture of items, said second computer being programmable to also use said contract data to generate said estimate data, said second computer being programmable to receive from said first computer said specification data, to generate estimate data for manufacturing said item using said specification data and said database, and to transmit said estimate data to said first computer, said first computer being further programmable to generate a production order by retrieving said customer order data and said specification data using said first memory and automatically combining said retrieved data with said estimate data;

a third computer located at a manufacturing plant; and

a communication network, said first computer, said second computer and said third computer each being connected to said communication network, said third computer being operable to receive said production order via said communication network, said third computer being programmable to provide to said second computer at least one of a group of data types consisting of materials, labor and equipment available in the plant and used to fulfill said production order.

5,570,292

## INTEGRATED METHOD AND APPARATUS FOR SELECTING, ORDERING AND MANUFACTURING ART GLASS PANELS

Loren Abraham; Michael F. Pilla, and Jason Bright, all of St. Paul, Minn., assignors to Andersen Corporation, Bayport, Minn.

Filed Feb. 14, 1994, Ser. No. 195,257

Int. Cl.<sup>6</sup> G06F 19/00

U.S. Cl. 364—473.01

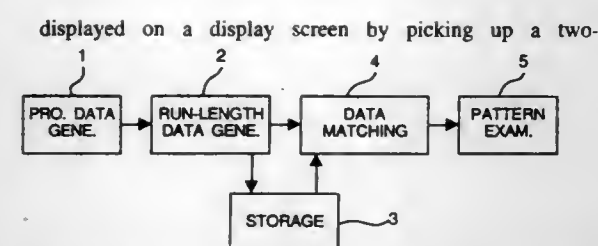
21 Claims

1. An integrated system for selecting, ordering and manufacturing art glass panels, comprising:

- (a) first computer means suitable for receiving user input selections in the form of a rough opening dimension selection and an art glass panel design selection, for reconfiguring a







dimensional image of the display screen and by performing image processing with respect to the dot pattern on the two-dimensional image, said dot pattern-examining apparatus comprising:

- an image projection data generating section for generating image projection data indicative of a set of density values by accumulating, on a predetermined axis, density values of individual dots of the two-dimensional image of the display screen for each line;
- a run-length data generating section for generating run-length data indicative of a set of combinations of an accumulated density value and a length thereof, based on the image projection data of the two-dimensional image; and
- a run-length data matching section for comparing the run-length data of the two-dimensional image with a reference run-length data indicating a reference dot pattern and generated in advance by said run-length data generating section, to thereby determine a position having run-length data which most match the reference run-length data as a position where the dot pattern to be examined exists.

5,570,299

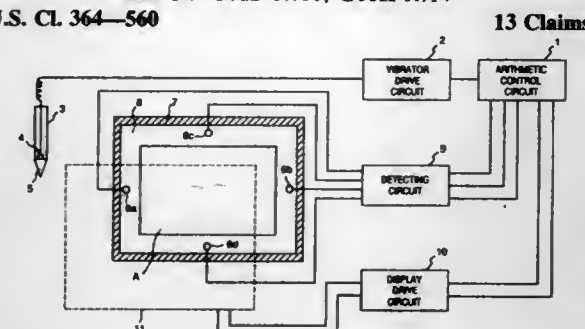
#### COORDINATE INPUT APPARATUS, VIBRATION SENSING DEVICE AND METHOD OF EVALUATING SAME

Masaki Tokioka, Yokohama; Atsushi Tanaka, Kawasaki; Yuichiro Yoshimura, Kamakura; Kiyoshi Kaneko, Yokohama; Ryoze Yanagisawa, Matsudo, and Katsuyuki Kobayashi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1993, Ser. No. 112,253

Claims priority, application Japan, Aug. 31, 1992, 4-232351  
Int. Cl.<sup>6</sup> G01B 17/00; G06K 11/14

U.S. Cl. 364—560



1. A coordinate input apparatus, comprising:
  - a tablet for transmitting vibration;
  - a vibration pen for applying vibration to said tablet;
  - a plurality of vibration sensing means for sensing vibration transmitted by said tablet;
  - generating means for generating an envelope signal based on the vibration sensed by said vibration sensing means;
  - detecting means having a differentiating circuit for detecting a specific point in the envelope signal, wherein said differentiating circuit adopts a frequency the same as or higher than that of the vibration applied by said vibration pen as peak gain frequency, differentiates the envelope signal at least one time and obtains a first zero-cross point which serves as the specific point;
  - measuring means for measuring time from the application of the vibration from said vibration pen to said tablet to the detection of the specific point by said detecting means; and

calculating means for calculating a distance between said vibration pen and said vibration sensing means based on the time measured by said measuring means, and for calculating a coordinate of a position of said vibration pen on said tablet based upon the calculated distance.

5,570,300

#### SELF-VALIDATING SENSORS

Manus P. Henry, Oxford, England; Wade M. Mattar, Wrentham; David W. Clarke, Oxford, and Janice Yang, Hertfordshire, both of England, assignors to The Foxboro Company, Foxboro, Mass.

Continuation of Ser. No. 51,192, Apr. 21, 1993, abandoned.

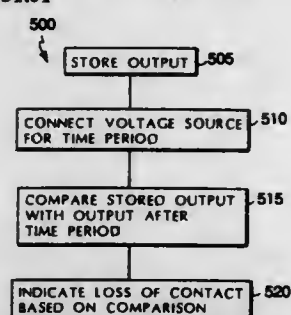
This application Mar. 20, 1995, Ser. No. 406,805

Claims priority, application United Kingdom, Apr. 22, 1992, 9208704

Int. Cl.<sup>6</sup> G01B 21/00

U.S. Cl. 364—551.01

21 Claims



1. A method of providing a measurement and an indication about the validity of the measurement when the occurrence of a fault has been detected in the source of the measurement, the method comprising:

combining multiple estimates of the measurement to produce a combined estimate for the measurement, combining uncertainty measures for each of the multiple estimates to produce an uncertainty measure for the combined estimate for the measurement, when the occurrence of a fault has been detected, providing the combined estimate for the measurement as a value for the measurement at a current time, and when the occurrence of a fault has been detected, providing the uncertainty measure for the combined estimate for the measurement as an indication of the validity of the value for the measurement at the current time.

5,570,301

#### SYSTEM FOR UNENCUMBERED MEASUREMENT AND REPORTING OF BODY POSTURE

John W. Barrus, Lexington, Mass., assignor to Mitsubishi Electric Information Technology Center America, Inc., Cambridge, Mass.

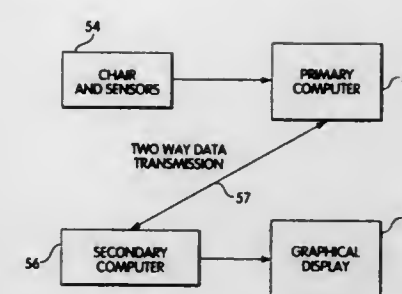
Filed Jul. 15, 1994, Ser. No. 275,496

Int. Cl.<sup>6</sup> A61B 5/103

U.S. Cl. 364—559

20 Claims

1. A computer system for non-encumbered measurement of positional attitude of an individual, comprising:
  - a non-encumbering device adapted to be used by said individual when operating said computer system;
  - a plurality of sensors associated with said device, each sensor having an output which provides a signal indicative of a response of the sensor to the individual using said device;
  - means for estimating a positional attitude of the individual relating to said device from the signals output by said plurality of sensors; and
  - means for displaying an animated image of the individual on said computer display in a positional attitude which mimics the estimated positional attitude of the individual.



5,570,302

#### DISTANCE MEASURING DEVICE, AND COORDINATE INPUT APPARATUS UTILIZING THE SAME

Katsuyuki Kobayashi, Yokohama; Atsushi Tanaka, Kawasaki; Yuichiro Yoshimura, Kamakura; Ryoze Yanagisawa, Chiba-ken; Masaki Tokioka, Fujisawa, and Hajime Sato, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

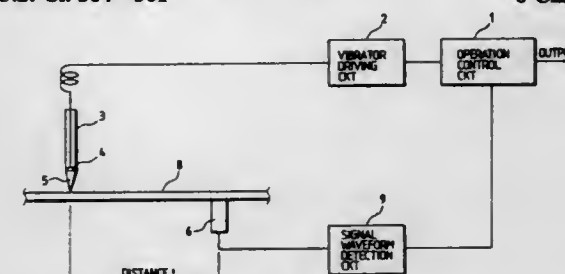
Filed Dec. 1, 1994, Ser. No. 352,114

Claims priority, application Japan, Dec. 2, 1993, 5-302889

Int. Cl.<sup>6</sup> G01B 7/14

U.S. Cl. 364—561

6 Claims



1. A distance measuring device comprising:

a vibration transmitting plate in which a vibration entered by a vibration source into said vibration transmitting plate propagates as a Lamb wave; and means for calculating the distance from said vibration source to vibration detection means based on the propagation time of said Lamb wave in said vibration transmitting plate from said vibration source to said vibration detection means, wherein the frequency  $f$  of said Lamb wave measured as a signal and the thickness  $d$  of said vibration transmitting plate in which said Lamb wave propagates are so set as to minimize a function  $G(f, d)$  defined below:

$$G(f, d) = V_g \cdot V_p / \{f(V_g - V_p)\}$$

in which

$f$ : frequency of the Lamb wave

$V_g$ : group velocity (depending on frequency  $f$  and thickness  $d$  of said vibration transmitting plate)

$V_p$ : phase velocity (depending on frequency  $f$  and thickness  $d$  of said vibration transmitting plate).

5,570,303

#### SYSTEM FOR COLLECTING OCEANOGRAPHIC DATA FROM A MOVING VESSEL

Jean-Guy Dessureault, Dartmouth, Canada, assignor to Her Majesty in right of Canada as represented by the Department of Fisheries and Oceans, Ottawa, Canada

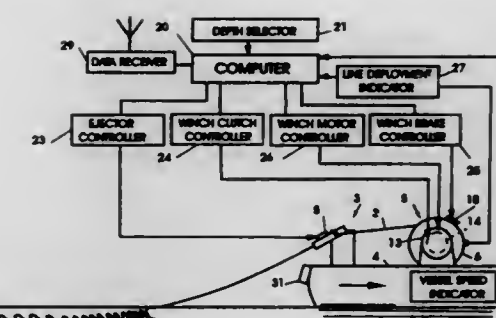
Filed Aug. 29, 1995, Ser. No. 520,415

Claims priority, application Canada, Dec. 12, 1994, 2,137,846  
Int. Cl.<sup>6</sup> G01B 3/00

U.S. Cl. 364—562

10 Claims

1. A system for the automated collection of oceanographic profile data from a vessel in motion, comprising:



- a) a hydrodynamically streamlined probe having sensing means for collecting oceanographic data;
- b) a winch including a drum for storing a line connecting the probe with the vessel;
- c) line ejecting means for deploying the line rapidly from the drum and for depositing substantially all the line, required for a selected probe depth, in the water in proximity with the region of descent of the probe;
- d) line deployment indicating means for providing an indication of the length of line deployed by the line ejecting means;
- e) line deployment control means for receiving a probe depth request instruction, activating the line ejecting means for initiating line deployment, and terminating line deployment when the line deployment indicating means indicates a deployed line length sufficient to provide the selected probe depth; and
- f) winch control means for controlling rotation of the drum for retrieval of the probe.

5,570,304

#### METHOD FOR THERMAL MODELING AND UPDATING OF BIAS ERRORS IN INERTIAL NAVIGATION INSTRUMENT OUTPUTS

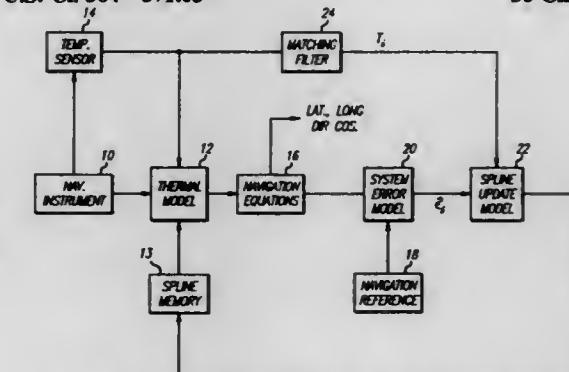
John G. Mark, Pasadena, and Daniel A. Tazartes, West Hills, both of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Filed Jul. 27, 1994, Ser. No. 281,348

Int. Cl.<sup>6</sup> G01C 19/34

U.S. Cl. 364—571.03

30 Claims



1. A method for correcting the output of an inertial navigation instrument for temperature dependent bias comprising the steps of:
  - a) making a plurality of measurements of instrument bias; and
  - b) making a corresponding plurality of measurements of instrument temperature; then
  - c) associating corresponding bias and temperature measurements to form a bias-temperature model; then
  - d) encoding said model into spline parameters by (i) subdividing said temperature range into a plurality of equal temperature intervals, each of said intervals being defined by opposed interval boundaries, then (ii) determining a series of cubic polynomial functions over said intervals representing a fit to





has a predetermined sign portion, a predetermined exponent portion, and the fraction portion  $f$ ; finding, via the central processing unit (CPU), a binary representation of a logarithm to the predetermined base  $p$  of the number  $y$  (represented as  $\log_p(y)$ ) by generating a plurality of CPU control signals to result in the following:

$$\log_p(y) = -\log_p(a) + \log_p(1 + (ay - 1))$$

wherein  $a$  is a predetermined parameter read from the memory by the central processing unit (CPU) wherein  $\log_p(a)$  is required to have a plurality of zero bit values in a plurality of low-order bit positions; and

using the binary representation of  $\log_p(y)$  to find the  $\log_p(x)$  using the central processing unit (CPU).

5,570,311

## SRAM SEMICONDUCTOR DEVICE

Taiji Ema, Kazuo Itabashi, and Kazuhiro Mizutani, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

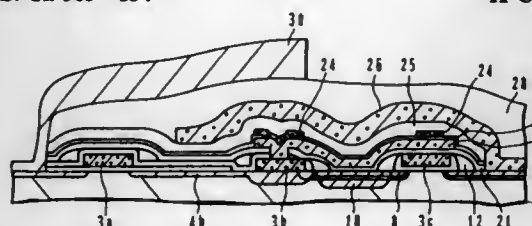
Filed Jan. 31, 1994, Ser. No. 189,142

Claims priority, application Japan, Apr. 30, 1993, 5-104649; Dec. 15, 1993, 5-315274

Int. Cl. G11C 11/00

U.S. Cl. 365-154

11 Claims



5. An SRAM semiconductor device, comprising:

- a pair of bit line wirings;
- a word line wiring;
- a parallel connection of two series circuits each having a driver transistor and a load connected in series;
- a wiring for connecting an interconnection point between said driver transistor and said load of one of said two series circuits to a control terminal of said driver transistor of the other of said two series circuits;
- a transfer transistor having current electrodes connected to each said interconnection point and an associated one of said bit line wirings, and a control electrode connected to said word line wiring,

wherein said driver transistor and said transfer transistor each are an insulated gate field effect transistor having a channel region formed in the surface of a semiconductor substrate at a predetermined area, source and drain regions on opposite sides of said channel region, and an insulated gate above said channel region, and

wherein said transfer transistor has a resistor region having an impurity concentration lower than that in said source region of said driver transistor, said resistor region being contiguous to said channel region of said transfer transistor;

an insulating film covering said resistor region; and

a polycrystalline semiconductor regions having the same conductivity type as said source/drain regions of said driver transistor and formed on the surface of said semiconductor substrate, and a contact region including a low resistance formed by impurity diffusion from said polycrystalline semiconductor region, said polycrystalline semiconductor region and said contact region being disposed between said driver transistor and said transfer transistor.

5,570,312

## SRAM CELL USING WORD LINE CONTROLLED PULL-UP NMOS TRANSISTORS

Chien-Chih Fu, Hsinchu, Taiwan, assignor to United Microelectronics Corporation, Hsin-Chu, Taiwan

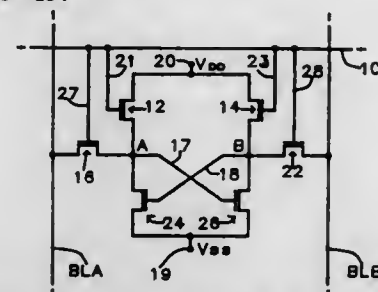
Continuation of Ser. No. 215,461, Mar. 21, 1994, abandoned.

This application Jun. 9, 1995, Ser. No. 488,705

Int. Cl. G11C 11/00

U.S. Cl. 365-154

9 Claims



1. A storage cell for a memory array having a word line (10) for each row of the array, a word driver for each word line, a pair of bit lines (BLA, BLB) for each column of the array, and a sense amplifier and a bit driver for each pair of bit lines, the storage cell comprising

first (24), second (26), third (12) and fourth (14) FETs, all of the same channel conductivity type, two input/output nodes (A, B), the first and second FETs being connected with an associated one of the input/output nodes and a first power supply point (19) as pull down FETs and the third and fourth FETs being connected with an associated one of the input/output nodes and a second power supply point (20) as pull up FETs, and means (17, 18) cross connecting the gates and drains of the pull down FETs to form a latch,

fifth (16) and sixth (22) FETs of said same channel conductivity type, each connected as a word pass FET between an associated bit line and input/output node for carrying data to the cell on a write operation and receiving data from the cell on a read operation,

the first, second, third, fourth, fifth and sixth FETs all being enhancement mode devices,

means (27, 28) connecting the gates of the word pass FETs to the associated word line for turning on the word pass FETs when the cell is selected for a read operation or a write operation and turning off the word pass FETs when the cell is not selected, and

means (23) connecting the gates of the two pull up FETs to the word line for turning on the pull up FETs when the cell is selected for a read operation or a write operation and to conduct at a low current level sufficient to maintain the latch operation, when the cell is not selected for a read operation or a write operation.

5,570,313

## MEMORY INSENSITIVE TO DISTURBANCES

Thierry Masson, St. Egreve, France, and Richard Ferrant, Carrollton, Tex., assignors to Thomson-CSF Semiconducteurs Specifiques, Paris, France

Filed Oct. 17, 1995, Ser. No. 544,009

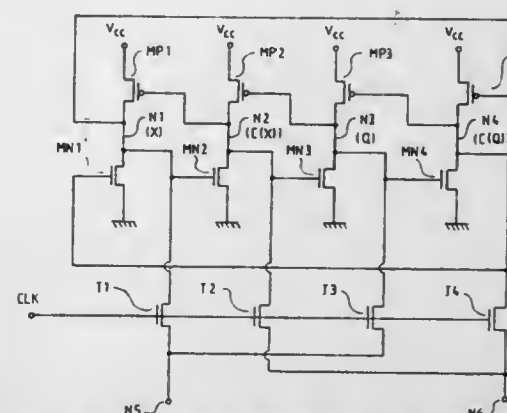
Claims priority, application France, Oct. 18, 1994, 94 12412

Int. Cl. G11C 11/34; 7/02

U.S. Cl. 365-174

5 Claims

1. A memory cell containing information in the form of two complementary logical levels stored in different nodes for storing each logical level in two different nodes, wherein it comprises four subassemblies, each subassembly consisting of a first and second transistor, said first transistor (MPI) being a P type MOS transistor and said second transistor being an N type MOS transistor, the source and drain of the first transistor being connected to a power supply source (+Vdc) and to the drain of the second transistor respectively, the source of the second transistor being connected to



the cell earth, the gate and the drain of the first transistor in subassembly index  $i$  ( $i=1, 2, 3$ ) being connected to the drain of the first transistor in subassembly index  $i+1$  and to the gate of the second transistor in subassembly index  $i+1$  respectively, the gate and the drain of the first transistor in subassembly index 4 being connected to the drain of the first transistor in subassembly index 1 and the gate of the second transistor index 1 respectively.

5,570,314

## EEPROM DEVICES WITH SMALLER CELL SIZE

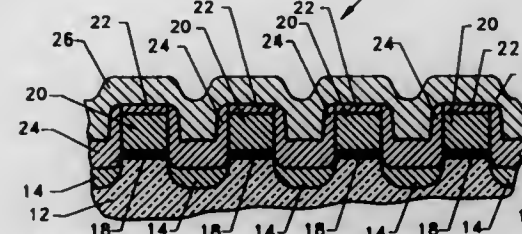
Manzur Gill, Saratoga, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 28, 1994, Ser. No. 365,208

Int. Cl. G11C 11/34

U.S. Cl. 365-185.1

7 Claims



1. An array of electrically erasable and programmable read-only memory cells formed on a semiconductor substrate, the array comprising:

- a plurality of parallel bit lines formed in the substrate;
- a plurality of spaced-apart field oxide regions formed on the substrate in rows and columns so that a column of field oxide regions is formed between each adjacent pair of bit lines, each field oxide region having sidewalls;
- a plurality of channel regions defined in the substrate between each adjacent pair of bit lines so that a channel region is defined between each adjacent pair of field oxide regions in each column of field oxide regions formed between each adjacent pair of bit lines;
- a plurality of first dielectric regions formed on the plurality of channel regions so that each first dielectric region is formed over a corresponding channel region;
- a plurality of floating gate regions formed over the plurality of first dielectric regions so that each floating gate region is formed over a corresponding first dielectric region and a part of each adjacent field oxide region, each floating gate region having a sidewall substantially vertically aligned with a sidewall of each of the adjacent field oxide regions that are partially covered by said each floating gate region;
- a plurality of second dielectric regions formed over the plurality of floating gate regions so that each second dielectric region is formed over a corresponding floating gate region; and
- a plurality of control gate regions formed over the plurality of second dielectric regions so that each control gate region is formed over a corresponding second dielectric region.

5,570,315

## MULTI-STATE EEPROM HAVING WRITE-VERIFY CONTROL CIRCUIT

Tomoharu Tanaka, Yokohama, and Gertjan Hemink, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

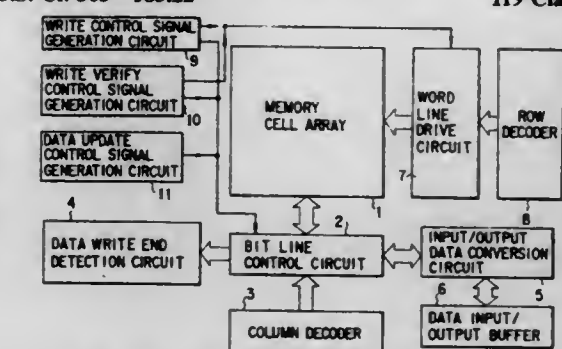
Filed Sep. 21, 1994, Ser. No. 308,534

Claims priority, application Japan, Sep. 21, 1993, 5-234767; Dec. 13, 1993, 5-311732

Int. Cl. G11C 16/04

U.S. Cl. 365-185.22

119 Claims



1. A multi-level non-volatile semiconductor memory device comprising:

- a semiconductor substrate;
- a plurality of bit lines;
- a plurality of word lines insulatively intersecting said bit lines;
- a memory cell array comprising a plurality of memory cells coupled to said word lines and bit lines, each memory cell including a transistor with a charge storage portion and having written states of first, second, . . . ,  $(n-1)$ th and  $n$ th ( $n \geq 3$ ) predetermined storage levels;
- a plurality of programming control circuits coupled to said memory cell array for storing data of first, second, . . . ,  $(n-1)$ th and  $n$ th predetermined logic levels in data storage portions which define write voltages to be applied to respective of said memory cells, for applying said write voltages to said respective of said memory cells according to the data stored in said data storage portions, for determining actual written states of said memory cells, for modifying stored data from said  $i$ th ( $i=2, 3, \dots, n-1, n$ ) predetermined logic level to said first predetermined logic level in the data storage portions storing the data of said  $i$ th (respectively,  $i=2, 3, \dots, n-1, n$ ) predetermined logic level and corresponding to the memory cells in which successful writing of said  $i$ th (respectively,  $i=2, 3, \dots, n-1, n$ ) predetermined storage level has been determined, for maintaining said stored data at said  $i$ th ( $i=2, 3, \dots, n-1, n$ ) predetermined logic level in the data storage portions storing the data of said  $i$ th (respectively,  $i=2, 3, \dots, n-1, n$ ) predetermined logic level and corresponding to the memory cells in which it has been determined that said  $i$ th (respectively,  $i=2, 3, \dots, n-1, n$ ) predetermined storage level has not been successfully written, and for maintaining said stored data at said first predetermined logic level in the data storage portions storing the data of said first predetermined logic level.

5,570,316

## APPARATUS AND METHOD FOR ENABLING A BUS DRIVER WHEN A DATA SIGNAL IS VALID

Mark A. Lysinger, Carrollton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

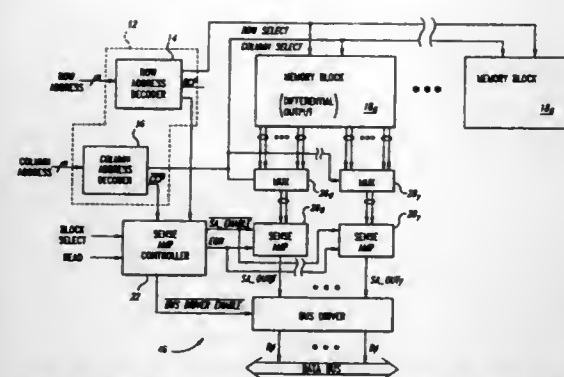
Division of Ser. No. 288,334, Aug. 10, 1994. This application May 10, 1995, Ser. No. 438,276

Int. Cl. G11C 7/02

U.S. Cl. 365-196

12 Claims

7. A static random access memory that is coupled to a data bus and that is operable to store data, comprising:



- a bus driver that is coupled to the data bus, said bus driver operable to receive a data signal and a bus-driver enable signal;
- at least one memory block operable to store the data in differential form;
- at least one sense amplifier that is coupled to said bus driver and to said memory block and that is operable to receive a sense-amplifier enable signal, receive the data from said memory block, and to generate and provide to said bus driver said data signal; and
- a controller that is coupled to said sense amplifier and said bus driver and that is operable to generate and provide to said sense amplifier said sense-amplifier enable signal, and that is operable to generate and provide to said bus driver said bus-driver enable signal when said data signal is valid.

5,570,317

# MEMORY CIRCUIT WITH STRESS CIRCUITRY FOR DETECTING DEFECTS

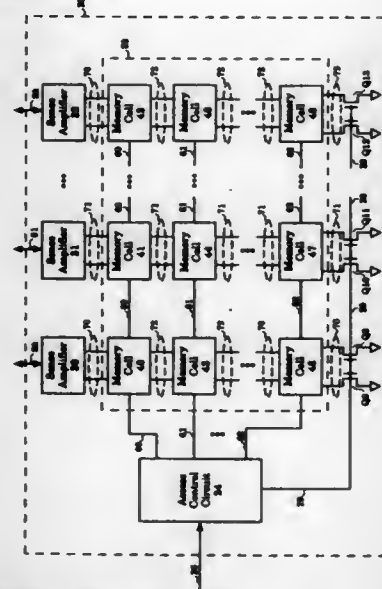
Eltan Rosen, and Yakov Milstain, both of Haifa, Israel, assignors to Intel Corporation, Santa Clara, Calif.

Filed Jul. 19, 1994, Ser. No. 277,148

Int. Cl. G11C 13/00

U.S. Cl. 365-200

10 Claims



1. A memory circuit comprising:
  - a memory cell array comprising at least one memory cell coupled to a first bit line and a second bit line;
  - an access circuit coupled to access the memory cell;
  - a discharge circuit coupled to stress the memory cell by discharging the first bit line and the second bit line during an access of the memory cell by the access circuit, wherein the discharge circuit comprises

- a first pull-down transistor coupled between the first bit line and a predetermined low voltage, and
- a second pull-down transistor coupled between the second bit line and the predetermined low voltage.

5,570,318

# SEMICONDUCTOR MEMORY DEVICE INCORPORATING REDUNDANCY MEMORY CELLS

Sumio Ogawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

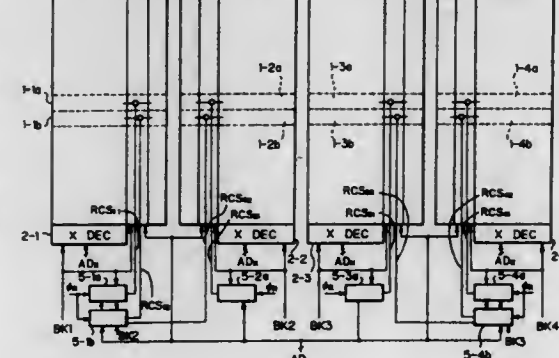
Filed Nov. 29, 1995, Ser. No. 563,940

Claims priority, application Japan, Nov. 29, 1994, 6-294412

Int. Cl. G11C 29/00

U.S. Cl. 365-200

12 Claims



1. A semiconductor memory device comprising:
  - a plurality of memory cell blocks each having a normal memory cell array and first and second redundancy memory cell columns;
  - a plurality of first redundancy column selecting means, each provided for one of said memory cell blocks and storing a first redundancy column address, each of said first redundancy column selecting means accessing said first redundancy memory cell column of a respective memory cell block in response to receiving a respective memory cell block selection signal and said first redundancy column address; and
  - a plurality of second redundancy column selecting means, each provided for at least two of said memory cell blocks and storing a second redundancy column address, each of said second redundancy column selecting means accessing said second redundancy memory cell column of a respective memory cell block in response to receiving a respective memory cell block selection signal and said second redundancy column address.

5,570,319

# EMBEDDED ACCESS TREES FOR MEMORY ARRAYS

Mark R. Santoro; Lee S. Tavrow, both of Sunnyvale, and Gary W. Bewick, Palo Alto, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

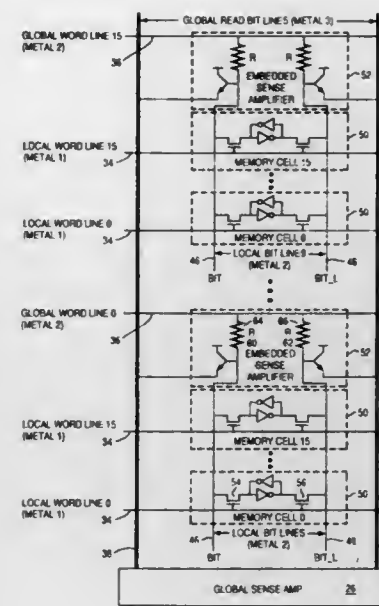
Continuation of Ser. No. 276,740, Jul. 18, 1994, abandoned, which is a continuation of Ser. No. 960,616, Oct. 14, 1992, abandoned. This application Aug. 31, 1995, Ser. No. 522,061

Int. Cl. G11C 8/00

U.S. Cl. 365-230.03

18 Claims

1. A circuit comprising:
  - a select line;
  - a bit line coupled to a memory cell;
  - a bipolar transistor having a base coupled to the bit line; and
  - a passive element coupled between the base of the bipolar transistor and the select line to activate the bipolar transistor when the select line is selected.



5,570,320

# DUAL BANK MEMORY SYSTEM WITH OUTPUT MULTIPLEXING AND METHODS USING THE SAME

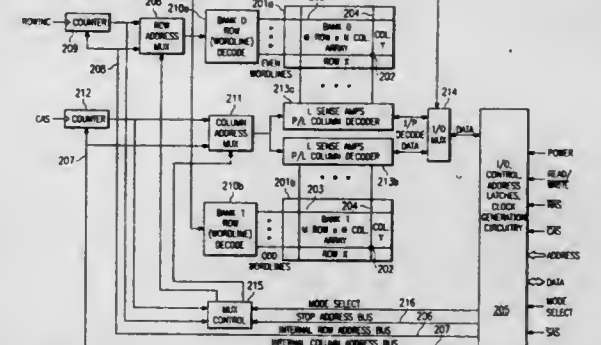
Michael E. Runas, McKinney, Tex., assignor to Cirrus Logic, Inc., Fremont, Calif.

Division of Ser. No. 291,093, Aug. 16, 1994, Pat. No. 5,506,810. This application Nov. 6, 1995, Ser. No. 554,297

Int. Cl. G11C 8/00

U.S. Cl. 365-230.03

16 Claims



6. Memory circuitry comprising:
  - first and second banks of memory cells arranged in rows and columns;
  - row decoder circuitry for selecting a said row in at least one of said banks in response to a row address;
  - row address circuitry for presenting a sequence of said row addresses to said row decoder circuitry in response to a single row address received at an address port to said memory circuitry;
  - column decoder circuitry for selecting a said column in each of said banks in response to a column address;
  - column address circuitry for presenting a sequence of said column addresses to said column decoder circuitry in response to a single column address received at said address port; and
  - wherein said row address circuitry comprises:
    - a row address counter for generating a sequence of said row addresses by incrementing from a first row address to a last row address following access to a said cell in a column corresponding to a said last column address; and
    - multiplexer circuitry for presenting to said row decoder circuitry an initial row address received from said address port and thereafter at least a first row address provided by said row address counter.

5,570,321

# SEISMIC VELOCITY MODEL OPTIMIZATION METHOD USING SIMULATED ANNEALING TO DETERMINE PRESTACK TRAVELTIMES

Nikolaos Bernitsas, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

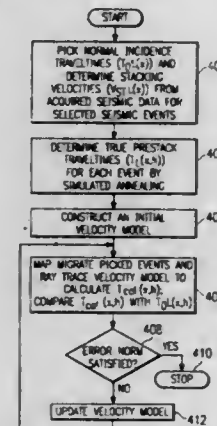
Continuation of Ser. No. 205,912, Mar. 3, 1994, abandoned.

This application Oct. 12, 1995, Ser. No. 542,069

Int. Cl. G01V 1/36

U.S. Cl. 367-38

13 Claims



1. A method of determining a reference seismic velocity model that includes lateral and vertical variations in a stratified subterranean medium, the method comprising:
  - displaying a stacked section of common midpoint gathers of seismic traces, said traces representing the amplitude of seismic reflections for seismic events as a function of time and common midpoint surface location along a path of exploration of said medium;
  - picking normal incidence traveltimes from said display and determining the associated stacking velocities as a function of said location for selected seismic events from said stacked section;
  - determining true prestack traveltimes for each said selected event, by summing a term representing the best fit hyperbola for said event with a perturbation term representing the non-hyperbolic component thereof, said hyperbolic term being determined from said picked normal incidence travel times and said associated stacking velocities, and said perturbation term being determined by simulated annealing;
  - constructing an initial reference seismic velocity model for said medium;
  - determining travel times from said velocity model to be compared to said true prestack traveltimes by map migrating said picked normal incidence travel times from time to depth and then ray tracing said seismic velocity model;
  - comparing said travel times determined from said velocity model with said true prestack travel times, such that when they are substantially the same within a predetermined error norm, said velocity model provides an accurate representation of said subterranean medium strata;
  - updating said velocity model when said predetermined error norm is not satisfied, said velocity model being updated by a constrained generalized least squares solution; and
  - returning to said step of determining travel times from said velocity model until said error norm is satisfied.

5,570,322

# BARRACUDA-REPELLING SOUND GENERATION DEVICE

Michael T. Miller, 1010 Dove Rd., Key Largo, Fla. 33037

Filed Feb. 23, 1995, Ser. No. 393,195

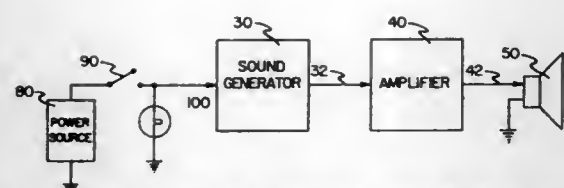
Int. Cl. G10K 1/00

U.S. Cl. 367-107

12 Claims

1. A barracuda-repelling sound generation device comprising:





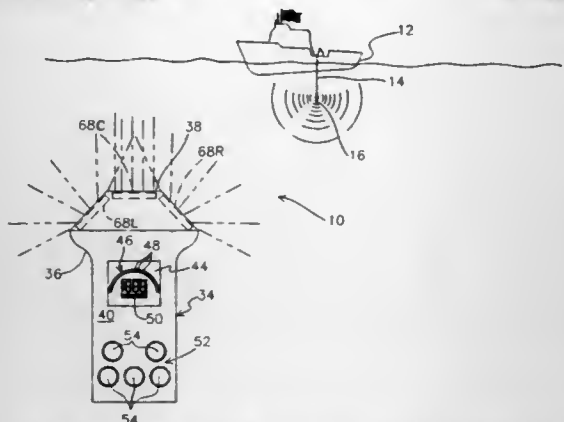
sound generator means for generating a speaker activation signal when electrically energized;  
remote speaker means positionable beneath the surface of a body of water for generating a noise capable of repelling barracudas upon receipt of the speaker activation signal;  
weight means removably securable to the remote speaker means for maintaining the remote speaker means in a set position beneath the surface of the body of water;  
speaker cable means for transferring speaker activation signals from the sound generator means to the speaker means;  
power supply means for supplying electrical energy for operation; and  
power switch means for selectively supplying electrical energy to the sound generator means;  
wherein the sound generator means and power switch means are encased in a waterproof container.

5,570,323

**NAVIGATIONAL DEVICE FOR A SCUBA DIVER**  
D. Wayne Prichard, and Joe C. Guthrie, both of Knoxville, Tenn., assignors to Ascend Corporation, Knoxville, Tenn.  
Filed Jan. 19, 1995, Ser. No. 375,354  
Int. Cl.<sup>6</sup> G01S 3/80

U.S. Cl. 367-118

14 Claims



1. A navigational device for assisting a scuba diver in determining a direction toward and a distance from a selected point, said navigational device comprising:

a transponder unit disposed at said selected point for broadcasting an identification signal and a distance response pulse and for receiving a distance request signal, said identification signal and said distance response pulse being coded to include a transponder message signal and a transponder unit identification signal to indicate a particular said transponder unit, said transponder unit including a transponder encoder for converting said identification signal and said distance response pulse from digital to analog domain and a transponder decoder for converting said distance request signal from analog to digital domain; and

an interrogator unit for receiving said identification signal and said distance response pulse, said distance request signal being coded to include an interrogator message signal and an interrogator unit identification signal to indicate a particular said interrogator unit, for transmitting said distance request signal, and for determining at least a direction to said transponder unit, said interrogator unit including an interrogator decoder for converting said identification signal and said distance response pulse from analog to digital domain and an

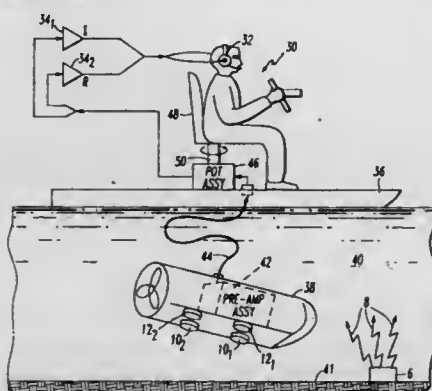
interrogator encoder for converting said distance request signal from digital to analog domain, said transponder unit producing said distance response pulse in response to receipt of said distance request signal, said interrogator unit determining a distance to said transponder unit as a function of time elapsed between transmitting said distance request signal and receipt of said distance response pulse.

5,570,324

**UNDERWATER SOUND LOCALIZATION SYSTEM**  
Frederick G. Geil, Annapolis, Md., assignor to Northrop Grumman Corporation, Los Angeles, Calif.  
Filed Sep. 6, 1995, Ser. No. 523,968  
Int. Cl.<sup>6</sup> G01S 3/80

U.S. Cl. 367-124

25 Claims



19. Apparatus for localizing a source of underwater acoustic signals from a remote location, comprising:

a passive array of hydrophones located on an underwater vehicle for converting acoustic signals to corresponding electrical signals, said array of hydrophones comprising two sets of hydrophones separated laterally by a first fixed distance, each said set of hydrophones further comprising at least a front hydrophone and a rear hydrophone separated by a second fixed distance, said front and rear hydrophones of both sets of hydrophones having respective outputs and generating electrical output signals corresponding to the acoustic signals sensed thereby and emanating from said source;

a first potentiometer coupled across the outputs of one set of said hydrophones and having a first movable output signal tap;

a second potentiometer coupled across the outputs of the other set of said hydrophones and having a second movable output signal tap;

means responsive to at least the turning motion of a listener's head remote from said underwater vehicle and being coupled to and moving said first and second movable output signal taps of said potentiometers in mutually opposite directions; and

a pair of headphones adapted to be worn by the listener and being coupled to the output signal taps of said first and second potentiometers for converting electrical signals to corresponding acoustic signals emanating from said source and coupling said acoustic signals to the ears of the listener;

whereby the direction from which acoustic signals impinge on the array of hydrophones is resolved by the turning motion of at least the listener's head varying the position of the output signal taps of said first and second potentiometers.

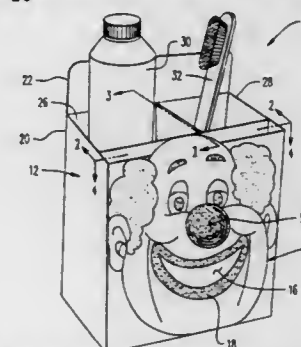
5,570,325

**TOOTH BRUSHING TIMER**

Harry S. Arpadi, 70 Frederick Pl., Mount Vernon, N.Y. 10552  
Filed Mar. 20, 1996, Ser. No. 618,924  
Int. Cl.<sup>6</sup> G04B 47/00; G04F 1/04; B67D 1/07

U.S. Cl. 368-10

18 Claims



1. A timer device for providing a dynamic, visual indication of time progression while a user brushes his or her teeth, the timer comprising:

a housing having a front surface;

a static facial representation of a particular character disposed on said front surface of said housing, said facial representation having an aperture for displaying a particular image therethrough; and

a timing-based indicator disposed on one side of said facial representation having a dynamic smile representation exposed through said aperture of said facial representation, said smile representation of said timing-based indicator having a first color for representing non-clean teeth and a second color for representing clean teeth,

wherein said timing-based indicator provides a gradual kinetic transition of said smile representation from said first color to said second color for a predetermined period of time.

5,570,326

**DEVICE FOR MEASURING THE DURATION OF A TIME INTERVAL**

Philippe Trystram, Saint Egreve, France, assignor to Commissariat a l'Energie Atomique, France

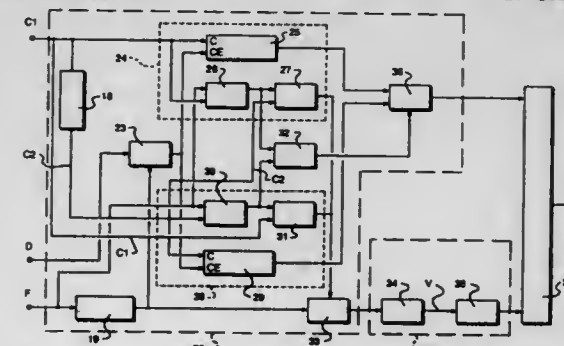
Filed Jun. 14, 1994, Ser. No. 259,714

Claims priority, application France, Jul. 2, 1993, 93 08145

Int. Cl.<sup>6</sup> G04F 8/00; G04P 10/00

U.S. Cl. 368-113

17 Claims



1. A device for measuring duration of a time interval between a start signal and an end of an interval end signal, and comprising:

a digital circuit having first and second clocks and for counting respective numbers of clock pulses generated by said clocks between the start signal and a clock pulse following the end of the interval end signal,

an analog circuit for measuring a time period separating the interval end signal and the clock pulse following the interval end signal, and

a processing circuit for calculating the duration of the time interval from first data supplied by the digital circuit and

second data supplied by the analog circuit previously converted into digital data;

wherein the pulses generated by the second clock are shifted by a half-period T with respect to those generated by the first clock and the digital circuit has means for determining which respective number of pulses of said first and second clocks is to be taken into account to determine the duration of said time interval so as to resolve any ambiguity situation which might lead to a clock period counting error.

5,570,327

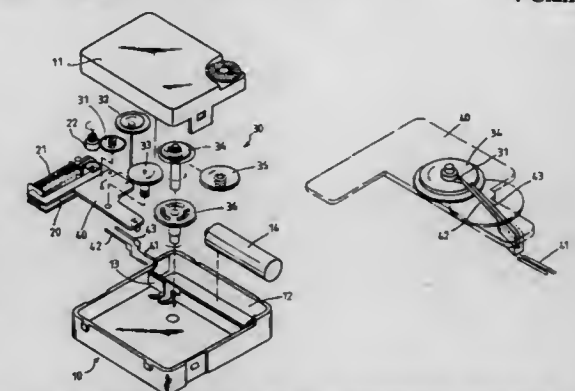
**TING ACTUATING DEVICE FOR CLOCK MECHANISM**  
Ching-Ti Chen, Suite 1, 11F. No. 95-8 Chang-Ping Road, Sec. 1, Taichung, Taiwan

Filed Jan. 24, 1995, Ser. No. 379,191

Int. Cl.<sup>6</sup> G04G 13/02

U.S. Cl. 368-272

4 Claims



1. A ting actuating device for clock mechanism comprising:

a housing for disposing said clock mechanism therein having a battery chamber, a circuit plate and a number of different wheels sequentially meshed one another and rotatably disposed on a positioning plate therein, said different wheels being intermittently driven by said circuit plate via an active wheel thereon;

a right triangular protrudent member formed on the top surface of a minute wheel along a radial orientation thereof in cooperation with a pair of a first and a second conductor rods disposed to a predetermined position of said positioning plate and parallel extended toward the center of said minute wheel, said conductor rods being connected at one end with a power source and a load via a pair of cords respectively, with said first conductor rods being longer than that of said second conductor rod and exceeding the circularly travelling track of said protrudent member on said minute wheel;

Whereby said first conductor rod is contacted by said protrudent member upon each turn of said minute wheel and is bowed away to contact said second conductor rod for switching on a load of musical sounding device attached thereon.

5,570,328

**OPTICAL SCANNING DEVICE WITH COARSE AND FINE SCANNING CONTROL**

Christian Buehler, Marbach, Germany, assignor to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Germany  
Continuation of Ser. No. 107,179, Jul. 29, 1993, abandoned.

This application Mar. 3, 1995, Ser. No. 400,432

Claims priority, application Germany, Feb. 8, 1991, 41 03 854.1

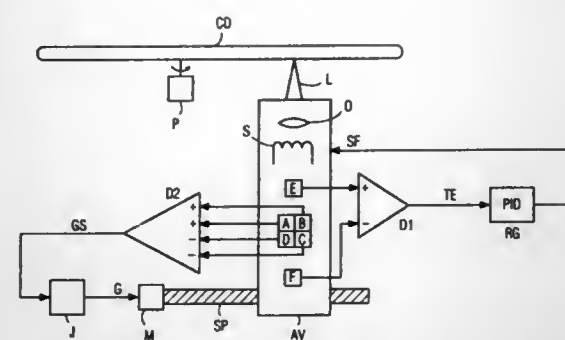
Int. Cl.<sup>6</sup> G11B 7/00; H1/00

U.S. Cl. 369-13

7 Claims

1. An optical scanning device comprising:

an objective lens movably mounted in said scanning device, for focusing a light beam onto a track of a recording medium,



said scanning device and said objective lens having respective optical axes which normally are aligned;

a first detector, responsive to reflected light from said recording medium, for generating coarse drive signals;

a photodetector, different from said first detector, and responsive to reflected light from said recording medium, for generating fine drive signals;

a tracking regulation circuit for guiding said objective lens along said data track, said tracking regulation circuit including a coarse drive circuit, for radially translating said optical scanning device, and a fine drive circuit, for adjusting said objective lens within said optical scanning device;

means for concurrently applying during normal tracking operation, said coarse and fine drive signals respectively to said coarse and fine drive circuits for maintaining the axes of the scanning device and the objective lens substantially in alignment.

5,570,329

# SYSTEM FOR SELECTIVELY INVERTING A MAGNETIC BIAS FIELD FOR MAGNETO-OPTIC RECORDING

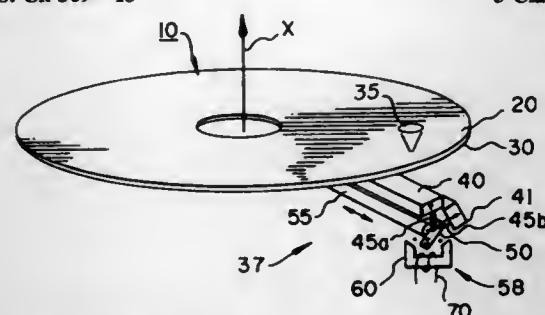
Edward P. Furlani, Lancaster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 31, 1995, Ser. No. 414,705

Int. Cl.<sup>6</sup> G11B 13/04

U.S. Cl. 369-13

5 Claims



1. An apparatus for selectively inverting an external magnetic field in a magneto-optic recording system so that information can be selectively recorded on or erased from a magneto-optic recording element of the system moving through the field, the apparatus comprising:

- (a) a first and second magnet operatively connected to each other both having a north and south pole oriented along their cross-sectional dimension, and each magnet having a pole, which is of opposite polarity from the other magnet, positioned adjacent the recording element;
- (b) means, in operative association with said magnets, for alternately rotating said magnets between a first and second position so that the first position is in close proximity with the recording element, which permits either said first or second magnet to induce the magnetic field through which the recording element moves, and the second position that is in a spaced apart relationship with the first position, which substantially prevents the magnetic of either said first or second magnet from engaging the recording element;

- (c) a third magnet which is attached to both said first and second magnets; and
- (d) a core in electromagnetic communication with said third magnet for inducing said third magnet to rotate, which permits said first and second magnets to be alternately positioned between the first and second positions.

5,570,330

# OPTICAL DISK APPARATUS UTILIZING EXCLUSIVELY ALLOCATED SERVO SIGNAL PROCESSING REGISTERS

Sumihiro Okawa, Kanagawa, Japan, assignor to Sony Corporation, Japan

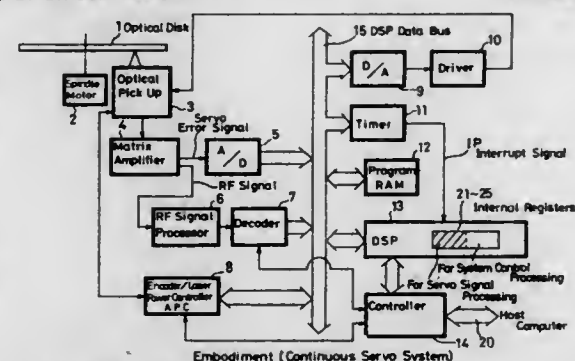
Filed May 27, 1994, Ser. No. 250,297

Claims priority, application Japan, May 27, 1993, 5-126223

Int. Cl.<sup>6</sup> G11B 7/095

U.S. Cl. 369-44.32

12 Claims



1. An optical disk apparatus comprising:

an optical pickup having a photo-detector;

means for generating a servo error signal in response to an output signal from the photo-detector;

a digital signal processor for executing processing of signals including the servo error signal;

first and second registers within the digital signal processor, the first registers exclusively allocated to storage of data utilized in execution of servo error signal processing, the second registers allocated to storage of data utilized in execution of processing of signals other than the servo error signal, at least a portion of the data utilized in the execution of the servo error signal processing being stored only in the first registers;

means for generating an interrupt signal and for supplying said interrupt signal to the digital signal processor, the digital signal processor executing servo error signal processing in response to the interrupt signal; and

servo means for controlling the optical pickup in response to the processed servo error signal.

5,570,331

# METHOD OF AND APPARATUS FOR DETECTING END OF REPRODUCTION OF MAIN DATA RECORDED ON INFORMATION RECORD MEDIUM, AND SYSTEM FOR REPRODUCING INFORMATION RECORD MEDIUM

Nobuhiko Akashi, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 2, 1995, Ser. No. 538,030

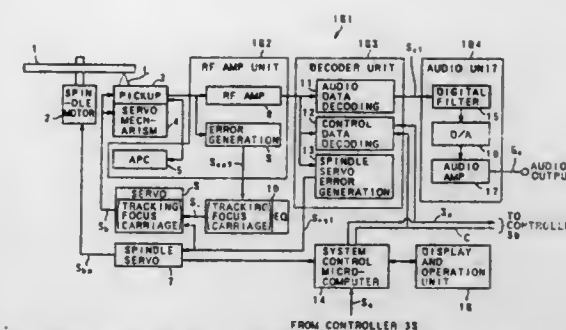
Claims priority, application Japan, Jun. 10, 1994, 6-243216

Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369-47

18 Claims

7. An apparatus for detecting an end of a reproduction of each piece of main data recorded on an information record medium, on which each piece of sub code data corresponding to said each piece of main data is also recorded to indicate information for controlling the reproduction of said each piece of main data, in a reproducing system which reads said main data and said sub code data on the basis of a predetermined clock, said sub code data including a first data portion, which value changes when the reproduction of said



each piece of main data is ended, and a second data portion, which value changes in correspondence with a content of said main data and has a predetermined relationship with a value of the first data portion, said apparatus comprising:

- a change detection means for detecting a change in the value of the first data portion during the reproduction of said each piece of main data;
- a current value detection means for detecting a current value of the second data portion when the change is detected by said change detection means;
- a judgement means for judging whether or not the detected current value of the second data portion is equal to a predetermined value of the second data portion, which is supposed to be obtained when the first data portion is normally changed at the end of the reproduction of said each piece of main data; and
- an end detection means for detecting the end of the reproduction of said each piece of main data on the basis of a result of judgement by the judgement means.

5,570,332

# METHOD FOR REDUCING ROTATIONAL LATENCY IN A DISC DRIVE

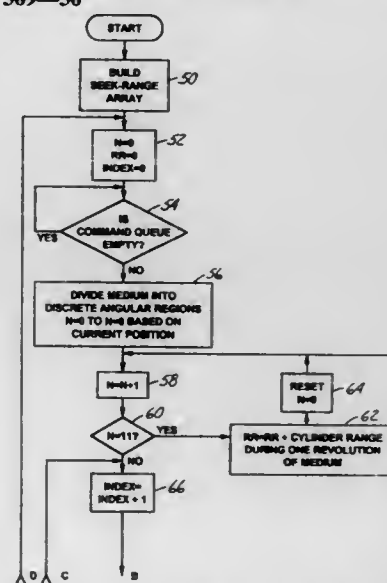
Mark A. Heath; D. Christopher Pruett, and Bang C. Nguyen, all of Oklahoma City, Okla., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed May 25, 1995, Ser. No. 449,758

Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369-50

36 Claims





5,570,334

# OPTICAL PICKUP WITH A DOUBLE REFRACTION POLARIZING PLATE TO SPLIT LIGHT BEAMS INTO TWO POLARIZED BEAMS

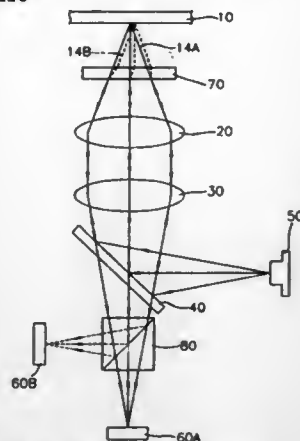
Seongmin Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 25, 1994, Ser. No. 348,941

Claims priority, application Rep. of Korea, Nov. 29, 1993, 93-25621

U.S. Cl. 369-110

Int. Cl. G11B 7/00



1. An optical pickup apparatus, comprising: a laser light source for generating a plurality of beams which are irradiated on a recording medium; a beam splitter for reflecting the beams vertically to be irradiated onto a surface of the recording medium and for passing a beam reflected from the recording medium; a polarizing means for splitting the beams reflected vertically by the beam splitter into first and second polarized beams which are irradiated onto the recording medium disc and for transmitting reflected first and second polarized beams so as to have a same beam path for being irradiated onto the beam splitter; a polarized beam separating means for reflecting the reflected first polarized beam passing through the polarizing means and for transmitting the reflected second polarized beam; and at least one photodetecting means for separately receiving the reflected first and second polarized beams.

5,570,335

# REPRODUCING WAVEFORM CORRECTION CIRCUIT FOR OPTICAL INFORMATION RECORDING/REPRODUCING SYSTEM

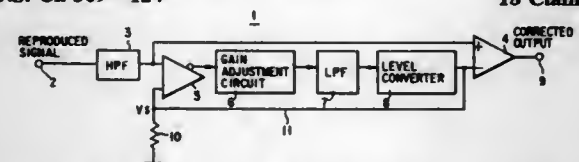
Takashi Ogata, Hachioji, and Junichi Nakano, Hino, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 18, 1995, Ser. No. 443,442

Claims priority, application Japan, May 23, 1994, 6-108550; Jun. 2, 1994, 6-121369

Int. Cl. G11B 7/00

U.S. Cl. 369-124



1. A magneto-optical recording apparatus having a reproducing waveform correction circuit, comprising: a high-pass filter for removing a low-frequency component of a signal reproduced from a recording signal; comparison means for comparing an output from said high-pass filter with a predetermined reference level, thereby generating a quantization output;

a low-pass filter for performing time integration of the quantization output generated by said comparison means; and arithmetic means for arithmetically operating a correction output according to outputs from said high-pass filter and said low-pass filter.

5,570,336

# INFORMATION RECORDING AND REPRODUCING APPARATUS HAVING A SLIDER FORMAL OF SINGLE CRYSTAL SILICON BODY AND CANTILEVER

Tetsuya Inui, Nara; Yorishige Ishii, Yamatotakada; Kenji Ohta, Kitakatsuragi-gun; Kazuhiro Kimura, Sakai, and Susumu Hirata, Ikoma-gun, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

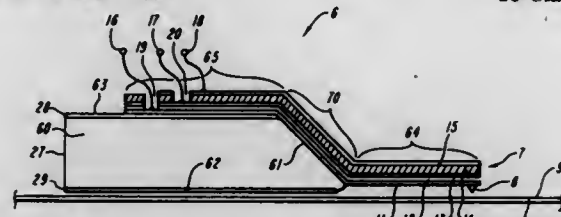
Filed Dec. 7, 1993, Ser. No. 163,175

Claims priority, application Japan, Dec. 8, 1992, 4-328256

Int. Cl. G11B 11/08

U.S. Cl. 364-126

16 Claims



1. An information recording and reproducing apparatus in which a tunnel current is utilized for recording information to a recording surface of a recording medium and/or for reproducing information from said recording surface, said apparatus comprising a slider which is arranged on said recording surface and floats above said recording surface by an air flow caused by movement of said recording medium, said slider including: a body having a first surface positioned opposite to said recording surface, a second surface parallel to said first surface, and a third surface oblique to said first and second surfaces, a cantilever having a projecting portion projecting from said body so as to be substantially parallel to said recording surface, and a tip for detecting said tunnel current, formed on a surface of said projecting portion on the side of said recording surface; wherein said cantilever of said slider includes a first electrode layer connected to said tip, an insulating layer formed on said first electrode layer, a second electrode layer formed on said insulating layer, a piezoelectric layer formed on said second electrode layer, and a third electrode layer formed on said piezoelectric layer.

5,570,337

# MODULAR INDEPENDENT LIBRARIES INTERCONNECTED BY A COMMON MEDIA EXCHANGE AND INPUT APPARATUS

Chi-Hung Dang, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

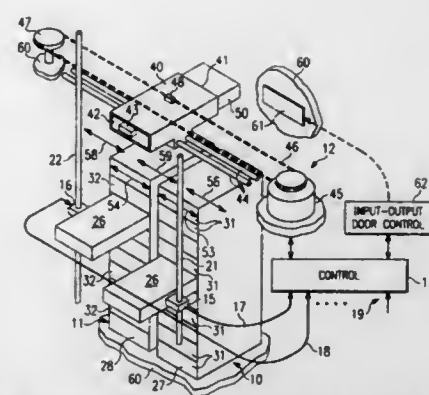
Filed Nov. 7, 1994, Ser. No. 334,898

Int. Cl. G11B 15/68

U.S. Cl. 369-192

2 Claims

1. A media library system, including in combination: a plurality of library arrays disposed in a side-by-side relationship along a first direction for storing a plurality of media containers; each of said library arrays having a media drive and a plurality of media storage receptacles arranged in a second direction that is transverse to said first direction; a separate media transport apparatus in each of said library arrays having a media holder for moving media along said second direction between said storage receptacles in said library arrays and said media drives, respectively;



a media exchanging and input-output apparatus having a media carrier disposed for movement adjacent a common end of all of said library arrays along said first direction and having a media-transfer stop location at each of said library arrays at media-transfer stop location at each of said library arrays at said common end of each of said library arrays;

each of said media transport apparatus moving said respective media holders to be aligned with said media carrier while said media carrier is disposed in a predetermined alignment with said library arrays for transferring said media between said carrier and said media holders, respectively;

said media carrier having an input-output location that is disposed in a predetermined misalignment with all of said separate media transport apparatus;

said media carrier comprising a rectangular tube having a first opening facing said library arrays and a second opening facing away from said library arrays;

an L-shaped media retainer having first and second substantially perpendicular arms, said first arm having a pivot mount on one distal end;

mounting means on a top wall of said media carrier connected to said pivot mount for pivotally mounting said media retainer on said media carrier such that said second arm is gravity urged to be in front of said first opening;

said first arm extending substantially parallel to said top wall while said second arm is disposed in front of said first opening whereby insertion of a media container through said second opening is stopped by said second arm without pivoting said media retainer upwardly; and

said input-output stop location overlapping along said first direction a predetermined one of said media-transfer stop locations;

said media exchanging and input-output apparatus comprising:

longitudinal-extending support means movably supporting said media carrier for movements along said first direction in juxtaposition to said common ends of said library arrays;

motive means stationarily disposed adjacent a first end of said longitudinal-extending support means;

idler means stationarily disposed adjacent a second end of said longitudinal-extending support means, said second end being an opposite end to said first end of said longitudinal-extending support means;

a belt extending between said motive means and said idler means and having a fixed attachment to said media carrier for moving said media carrier in reciprocating motions along said first direction;

said media exchanging and input-output apparatus having first and second media transfer stop locations for said media carrier respectively aligned with said library arrays for enabling said media transport apparatus in each of said library arrays to access said media carrier for exchanging said media container with said media carrier;

said common apparatus having an input-output stop location along said first direction disposed in a predetermined misalignment along said first direction with said;

external access apparatus disposed at said input-output stop location for enabling access to said media carrier externally of said system;

cabinet means enclosing said library arrays and said media exchanging input-output apparatus;

said external access apparatus comprising a door pivotally mounted on said cabinet means for vertical pivoting motions for closing an access opening in said cabinet means while pivoted to a vertical position at said media input-output stop location;

an access control rod on an upper portion of said door and extending inwardly into said media input-output stop location; said media carrier having an interlock plate longitudinally extending along said first direction and extending toward said cabinet means, said interlock plate having a slot for receiving said access control rod while said media carrier is at said media input-output stop location for permitting said door to pivot away from said vertical position for enabling access to said media carrier via said second opening and said access opening in said cabinet means and said interlock plate engaging said access control rod while said media carrier is away from said media input-output stop location.

5,570,338

# OPTICAL INFORMATION RECORDING MEDIUM WHICH USES DIFFRACTION GRATING

Toshiki Toda, Saitte; Susumu Takahashi, Matsudo, and Fujio Iwata, Chiba, all of Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/01199, § 371 Date Apr. 28, 1994, § 102(e) Date Apr. 28, 1994, PCT Pub. No. WO94/06113, PCT Pub. Date Mar. 17, 1994

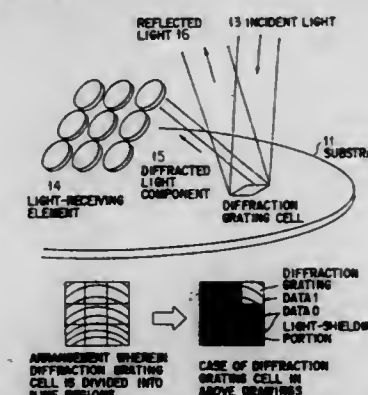
PCT Filed Aug. 26, 1993, Ser. No. 232,072

Claims priority, application Japan, Aug. 28, 1992, 4-230535

Int. Cl. G11B 7/24; 7/00

U.S. Cl. 369-275.1

18 Claims



1. An optical information recording medium characterized in that

at least one cell comprising diffraction gratings is disposed on a planar substrate, and said cell is divided along two dimensions into  $n$  ( $n$  is an integer of not less than 2) regions such that each divided region represents one binary data.

5,570,339

# OPTICAL DISC AND A RECORDING AND/OR REPRODUCING APPARATUS HAVING COPY-PROTECTION FUNCTION

Hirofumi Nagano, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jul. 21, 1994, Ser. No. 278,422

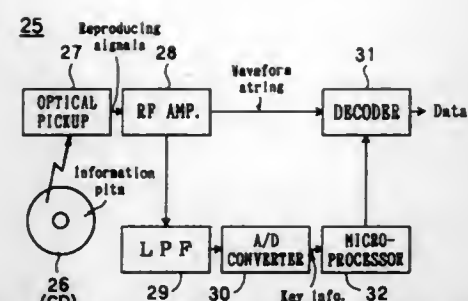
Claims priority, application Japan, Jul. 22, 1993, 5-201738

Int. Cl. G11B 7/00

U.S. Cl. 369-275.3

2 Claims

1. A copy protecting optical disc optically recorded with digital data and a key information as a series of pits forming track turns of



a predetermined pitch on the optical disc, the digital data being converted to a string of signal waveforms according to a predetermined encoding scheme defined by the key information, the key information being a form of carrier signal which has a single frequency signal that is much lower in frequency than a frequency of the string of signal waveforms, the single frequency signal modulating the string of signal waveform carrying the digital data in such a pit configuration that each of a plurality of widths of the series of pits in a radial direction of the optical disc is deviated symmetrically with respect to a center of each track turn, and an outer contour and an inner contour of each of the plurality of widths in the radial direction are changed in response to an amplitude of the single frequency signal of the key information, each of the plurality of widths of the series of pits having a maximum width smaller than the predetermined pitch.

5,570,340

# DISK RECORDING MEDIUM AND METHOD WHICH USES AN ORDER TABLE TO CORRELATE STORED PROGRAMS

Deok-hyun Lee, Seoul, and Rae-hwan Lee, Suwon, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

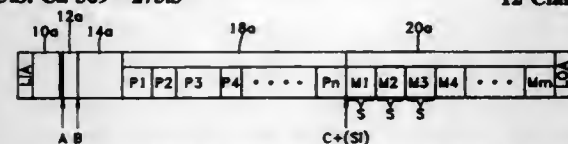
Filed May 31, 1995, Ser. No. 455,069

Claims priority, application Rep. of Korea, May 31, 1994, 94-12155; May 31, 1994, 94-12156; May 31, 1994, 94-12157; May 31, 1994, 94-12158

Int. Cl. G11B 7/24; 5/09

U.S. Cl. 369-275.3

12 Claims



1. A disk recording medium having a lead-in area, a program area and a lead-out area, wherein said program area comprises:  
a first table area whose start address is a first address value determined by a start address of said program area, and where a first index table consisting of a plurality of first indices and address data are recorded;  
a second table area whose start address is a second address value determined by the start address of said program area, and where a second index table consisting of a plurality of second indices and address data are recorded;  
a first data area where a plurality of first programs whose start address is determined by address data of the corresponding first index among said first indices of said first table area consisting of first data are recorded according to an order of the plurality of first indices of said first index table; and  
a second data area where a plurality of second programs whose start address is determined by address data of the corresponding second index among said second indices of said second table area consisting of second data and an order table of said first programs related to said second data are recorded according to an index of the plurality of second indices of said second index table.

## 5,570,341 METHOD OF ASSEMBLING DISK CARTRIDGE WITH ONE-PIECE PLASTIC MOLDED DOOR

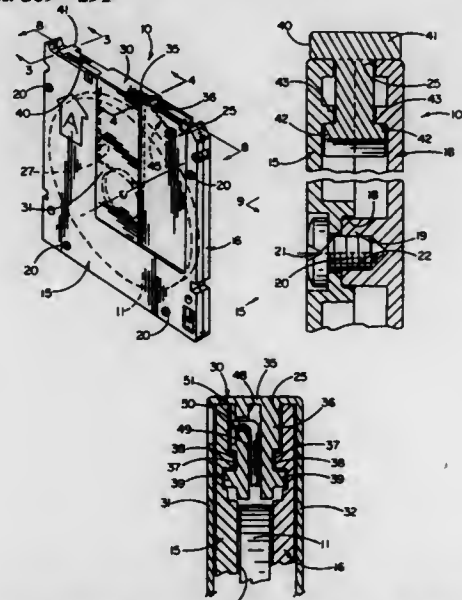
Patrick Sandell, Barrington, and Mohamed Agha, Hoffman Estates, both of Ill., assignors to Opticord, Inc., Palatine, Ill.

Filed Jun. 21, 1994, Ser. No. 263,055

Int. Cl. G11B 23/02

U.S. Cl. 369-291

1 Claim



1. A method of assembling a cartridge and a data information disk, said method comprising the steps of:

- providing (a) a data information disk, (b) a pair of shells made of resiliently yieldable plastic and each having inner and outer sides, having peripheral edges and having an access aperture, and (c) a one-piece integrally formed plastic door having first and second spaced and generally parallel shutters, a web molded integrally with and joining the ends of said shutters, and a tongue molded integrally with said web and located between said shutters;
- placing said disk on the inner side of one of said shells;
- placing the inner side of the other shell in face-to-face relation with said disk and said one shell;
- connecting said shells together in a manner captivating the disk in the shells while leaving a channel between the shells along one peripheral edge of the shells; and
- inserting said tongue into said channel such that said tongue flexes said shells outwardly to allow said tongue to engage said inner sides of said shells with snap action for assembling said door to said shells with said web spanning said shells and with said shutters located adjacent the outer sides of said shells and movable along said outer sides between closed and open positions relative to said access apertures.

5,570,342

## DISK CARTRIDGE WITH TWO SLIDABLE SHUTTER MEMBERS

Katsuki Kosaka, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 12, 1995, Ser. No. 527,360

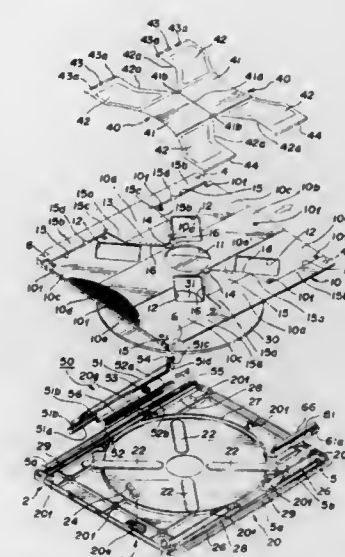
Claims priority, application Japan, Sep. 14, 1994, 6-219686

Int. Cl. G11B 23/03

U.S. Cl. 369-291

18 Claims

1. A disk cartridge comprising:  
a case enclosing a rotatable disk, the case comprising a first main side having a center hole that exposes a center of said rotatable disk, and a plurality of pickup holes that expose a plurality of regions of said rotatable disk;



first and second shutters for opening and closing said center hole and said pickup holes, said first and second shutters being slidably mounted on said case; and  
drive means for moving said first and second shutters away from each other and toward each other to open and close said center hole and said pickup holes, said drive means comprising:  
a first slide rack slidably mounted in said case and connected with said first shutter,  
a second slide rack slidably mounted in said case and connected with said second shutter, and  
a pinion interposed between said first and second slide racks.

5,570,343

## COMMUNICATIONS SYSTEM

Peter W. D. Bishop, Swindon, and Ian M. Bartlett, Marlborough, both of Great Britain, assignors to Motorola, Inc., Schaumburg, Ill.

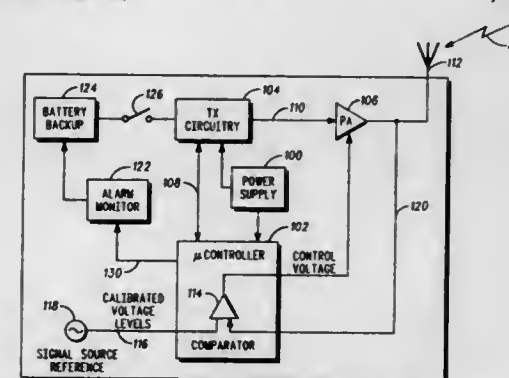
Filed Jul. 27, 1994, Ser. No. 281,376

Claims priority, application United Kingdom, Jul. 31, 1993, 9315899

Int. Cl. H04B 7/212; 17/00

U.S. Cl. 370-16

7 Claims



1. A communications system for communications coverage over a coverage area comprising a plurality of interconnected cells, the system comprising:

- a controller;
  - a first transmitter for transmitting information into a first cell in response to the controller; and
  - a fault detection circuit, responsive to the first transmitter and coupled to the controller, for detecting a fault in the first transmitter and for generating a fault signal, in response to the detection of a fault, that indicates that the cell has suffered failure in communications coverage;
- wherein the controller, in response to said fault signal generated by said fault detection circuit associated with the first cell,

instructs a variable power second transmitter located in an adjacent cell to increase its output power, thereby extending its coverage range and providing, at least in part, communications coverage to the cell suffering failure.

## 5,570,344 SYNCHRONOUS DIGITAL HIERARCHY TRANSMISSION DEVICE AND METHOD FOR EXCHANGING SYNCHRONOUS DIGITAL HIERARCHY TRANSMISSION DEVICE UNITS

Yasuo Fujii, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

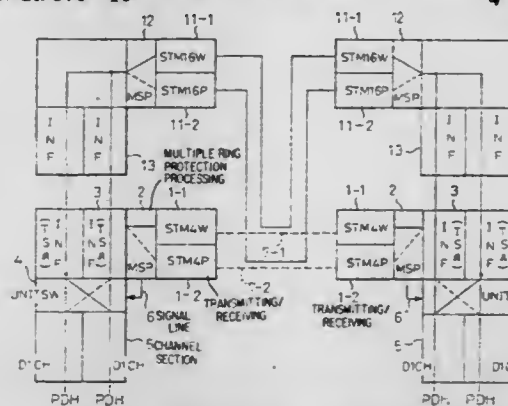
Filed Aug. 30, 1994, Ser. No. 298,048

Claims priority, application Japan, Mar. 1, 1994, 6-030746

Int. Cl. H04L 1/22

U.S. Cl. 370-16

4 Claims



1. A method of exchanging units for the purpose of upgrading an SDH transmission device, said SDH transmission device including:  
a redundantly configured transmitting/receiving section including an in-service transmitting/receiving unit and a spare transmitting/receiving unit for respective connection to at least one transmission line;  
a unit switching processing section for selectively connecting one of said in-service and said spare transmitting/receiving units for outputting signals to and for receiving signals from said at least one transmission line;  
a redundantly configured time-slot exchange section connected to said unit switching processing section;  
a multiplexing protection processing section for detecting switching information received from said at least one transmission line for controlling said unit switching processing section to selectively connect one of said transmitting/receiving units to said at least one transmission line;  
a channel section connecting to said redundantly configured time-slot exchange section for outputting of received signals and inputting of signals to be transmitted,  
said sections being configured as units;  
a first register in said multiplexing protection processing section for storing unit switching information; and  
a second register in said unit switching processing section for storing unit switching information;  
a signal line for transferring said switching information from said first register to said second register,  
said method comprising the steps of:

requesting unit switching of the near-end and far-end SDH transmission devices to the multiplexing protection processing section;  
setting said unit switching information by means of this unit switching request into said multiplexing protection processing section; and  
performing unit exchange by which either the near-end SDH transmission device or the far-end SDH transmission device sends a mandatory switching request to the other side, said mandatory switching request causing said unit switching information to be transferred from said multiplexing protection processing section to said unit switching processing section, and the units are then exchanged.



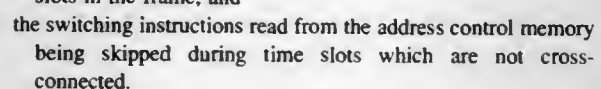






U.S. Cl. 370—58.2

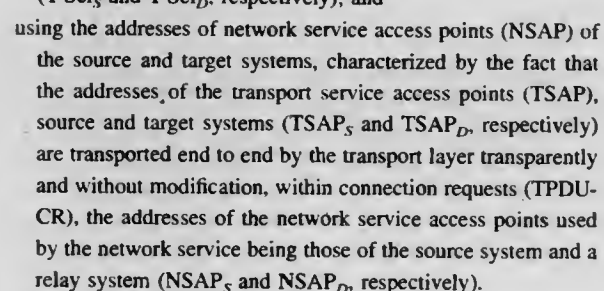
### 3 Claims



U.S. Cl. 370—60

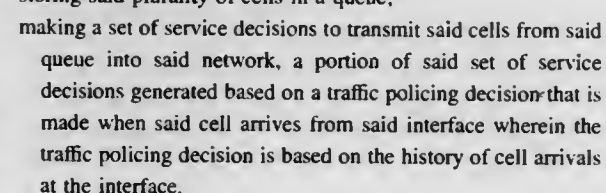
## 5 Claims

1. In a system of at least one OSI transport relay, a method for ensuring cooperation between at least a first system containing at least one source system (SS), using an OSI transport profile based on a network service in so-called CONS connected mode and at



U.S. Cl. 370—60

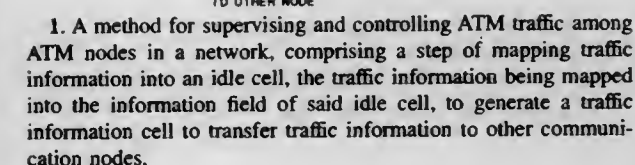
## 15 Claims



3703

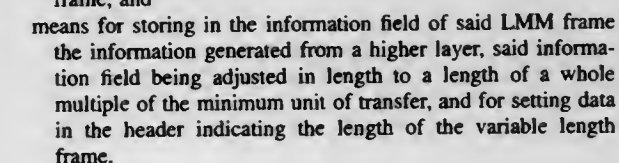
U.S. Cl. 370—60.1

## 6 Claims



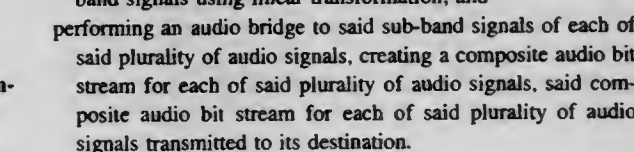
U.S. Cl. 370—60.1

### 36 Claims



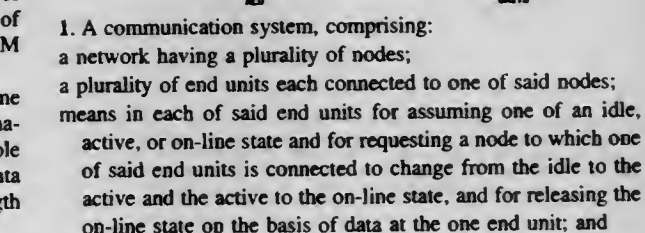
U.S. CL. 370-62

## 25 Claims



U.S. Cl. 370-79

### 18 Claims



means in each of said nodes for changing the state of an end unit from the idle to the active and from the active to the on-line state on the basis of available communication time;  
said node including means for transmitting and receiving data in time sectors, said time sectors each having an acquisition field for receiving acquisition requests and a traffic field for messages;  
said end units directing requests for access to the on line state during the time of the acquisition field in the time sectors.

5,570,365

# LAN BRIDGE USING GATE CIRCUITS FOR PROTECTING HIGH-PRIORITY PACKETS FROM LOW-PRIORITY PACKET TRANSMISSIONS

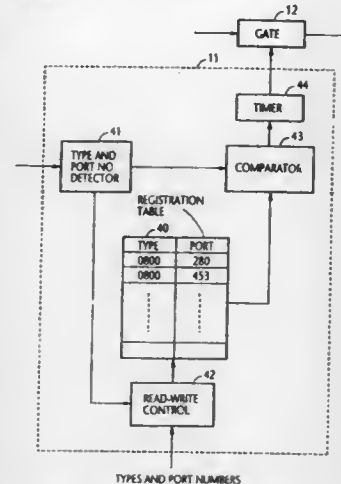
Atsushi Yoshida, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Mar. 8, 1995, Ser. No. 399,902

Claims priority, application Japan, Mar. 9, 1994, 6-066749  
Int. Cl.<sup>6</sup> H04L 12/46

U.S. Cl. 370—85.6

9 Claims



1. A bridge for interconnecting a plurality of local area networks, comprising:

header detector means for detecting a packet header contained in a packet transmitted from a first local area network to a second local area network;

registration means for storing information representing packets which are to be protected from interference by other packets; comparator means for comparing the packet header detected by said header detector means with the information stored in the registration means to detect a match or mismatch;

gate means responsive to a match detected by said comparator means for preventing said other packets from being forwarded to said second local area network and responsive to a mismatch detected by said comparator means for allowing said other packets to be forwarded to said second local area network; and

timer means responsive to a match detected by said comparator means for preventing said other packets from being forwarded to said second local area network for a specified period of time.

## 5,570,366 BROADCAST/MULTICAST FILTERING BY THE BRIDGE-BASED ACCESS POINT

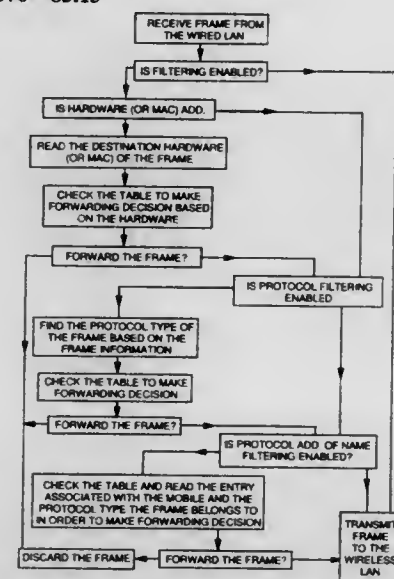
Murray C. Baker, Toronto; Roger Y. M. Cheung, Scarborough, both of Canada; Partha P. Bhattacharya, Briarcliff, N.Y.; Roberto M. Kobo; Eduardo M. Kolbe, both of Campinas, Brazil; and Mahmoud Naghshineh, Fishkill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 18, 1995, Ser. No. 443,793

Claims priority, application Canada, Dec. 8, 1994, 2137587  
Int. Cl.<sup>6</sup> H04J 3/02

U.S. Cl. 370—85.13

12 Claims



1. In a communications system comprising a plurality of wired networks, a plurality of wireless networks and an access point between each wireless network and a wired network, each said access point controlling the transmission of messages between one of said wireless networks and one of said wired networks, wherein said access points control said transmission by performing the following steps:

creating a table in each said access point, said table including the identity of each node in its associated wireless network and predetermined communication parameters associated with each node on said associated wireless network;  
comparing identity and communication parameter information associated with each message received by said access point with corresponding information in said table at said access point; and

transmitting, to said associated wireless network, only those messages which will be responded to by a node on said associated wireless network as determined by comparing said identity and communications parameters in said received message to entries in said table.

## 5,570,367 ASYMMETRIC PROTOCOL FOR WIRELESS COMMUNICATIONS

Ender Ayanoglu, Red Bank; Richard D. Gitlin, Little Silver, both of N.J.; Thomas F. La Porta, Thornwood, N.Y.; Sanjoy Paul, Atlantic Highlands, and Krishan K. Sabnani, Westfield, both of, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jul. 29, 1994, Ser. No. 282,254

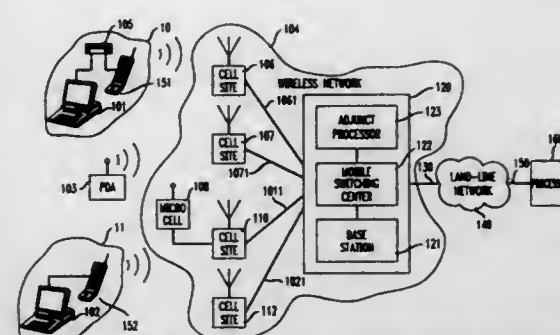
Int. Cl.<sup>6</sup> H04J 3/16

U.S. Cl. 370—94.1

8 Claims

1. A wireless communications system comprising:  
at least one base station which

a) transmits data packets to, and receives data packets from at least one wireless end-user device over a wireless link,



b) sends to the at least one wireless end-user device at predetermined periodic intervals i) unsolicited status messages of data packets received from the at least one wireless end-user device, and ii) polling messages to inquire about the status of data packets transmitted to, but unacknowledged by the at least one wireless end-user device after a predetermined time period, and

c) stores channel information for the wireless link, and status information of received and transmitted data packets; and within the at least one wireless end-user device processing means for

i) determining whether data packets received from the at least one base station are received in sequence, and  
ii) requesting retransmission of missing data packets, the processing means having means for time-stamping each data packet prior to the transmission of each data packet by the wireless end-user device, and

in response to a request for retransmission of one or more data packets by the at least one base station, means for computing the difference between the present time and the stamped time of each data packet for which retransmission is being requested, and

the processing means initiating retransmission of the one or more data packets if propagation delay between the at least one wireless end-user device and the at least one base station is less than the computed time difference.

5,570,368

## CELL MULTIPLEXER HAVING CELL DELINEATION FUNCTION

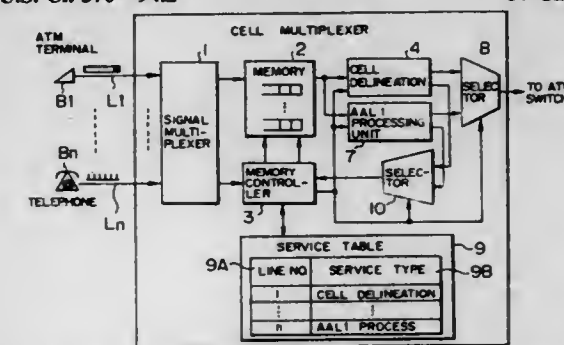
Masaru Murakami; Yozo Oguri; Yoshihiro Ashi, all of Yokohama; Katsuyoshi Tanaka, Tokyo; Takahiko Kozaki, Koganei; Akihiko Takase, Tokyo, and Morihito Miyagi, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 24, 1995, Ser. No. 409,691

Claims priority, application Japan, Mar. 31, 1994, 6-062387  
Int. Cl.<sup>6</sup> H04L 12/56

U.S. Cl. 370—94.2

37 Claims



1. A cell multiplexer in which fixed-length cell signals provided in parallel from a plurality of input lines are stored in a buffer memory temporarily and then sent out to an output line in data blocks each having a form synchronized with a predetermined cell structure, said cell multiplexer comprising:  
multiplexing means for multiplexing cell signals received from the plurality of input lines;

write control means for writing the cell signals outputted from said multiplexing means in said buffer memory successively correspondingly to the input lines;

read control means for reading the cell signals stored in said buffer memory from said buffer memory in data blocks each constituted by a predetermined number of bytes correspondingly to the input lines; and

cell delineation control means for detecting a delineation state of each of the data blocks read from said buffer memory, notifying said read control means of delineation control information in accordance with a result of the detection and transmitting data blocks each having a form synchronized with said predetermined cell structure to the output line selectively, wherein said read control means determines read beginning addresses of data blocks to be read next correspondingly to respective input lines on the basis of the delineation control information notified by said cell delineation control means.

5,570,369

## REDUCTION OF POWER CONSUMPTION IN A MOBILE STATION

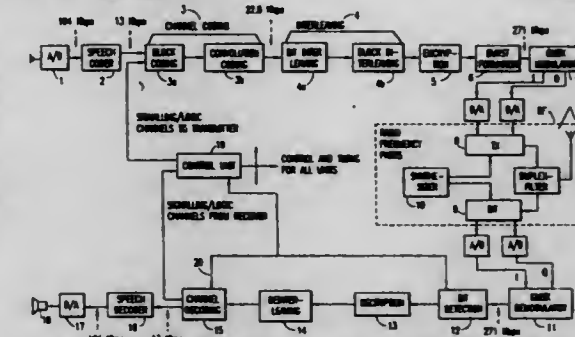
Harri Jokinen, Hlsli, Finland, assignor to Nokia Mobile Phones Limited, Salo, Finland

Filed Mar. 14, 1995, Ser. No. 404,040

Claims priority, application Finland, Mar. 15, 1994, 941221  
Int. Cl.<sup>6</sup> H04B 7/00; H04Q 7/00

U.S. Cl. 370—95.3

13 Claims



1. A method for controlling the power consumption of a mobile station in a cellular radio system when receiving a message, the method comprising the steps of:

a) providing power for receiving a first predetermined portion of a message;  
b) determining whether the message can be reconstructed from the received portion of the message; and  
c) if the message cannot be reconstructed from the previous predetermined portion of the message, providing power for receiving a next predetermined portion of the message, receiving a second predetermined portion of the message, and returning to step b) if the complete message has not been received.

## 5,570,370 FRAME TIMING ACQUISITION METHOD AND SYSTEM FOR CORDLESS TDMA SYSTEMS

Hung-Sheng Lin, Chiu-Ju, Taiwan, assignor to Industrial Technology Research Institute, Taiwan

Filed Apr. 28, 1995, Ser. No. 430,601

Int. Cl.<sup>6</sup> H04J 3/06

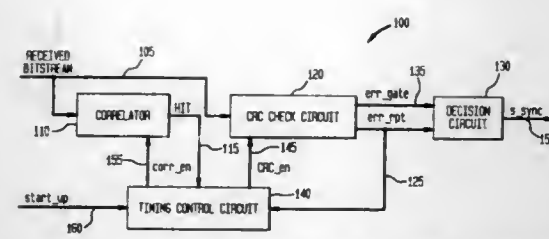
U.S. Cl. 370—95.3

10 Claims

9. A system for acquiring frame timing in a TDMA receiver comprising:

a correlator for comparing a first fixed length subsequence of bits of a received bitstream to a predetermined sync word, a CRC check circuit for, in response to said correlator determining that said first fixed length subsequence of bits matches said predetermined sync word, determining if a third fixed





length subsequence of bits of said bitstream is a cyclical redundancy code parity word formed from a second fixed length subsequence of bits of said bitstream, and a decision circuit for identifying boundaries of a frame of said received bitstream in response to said CRC check circuit determining that said third fixed length subsequence of bits is a cyclical redundancy check parity word of said second fixed length subsequence of bits.

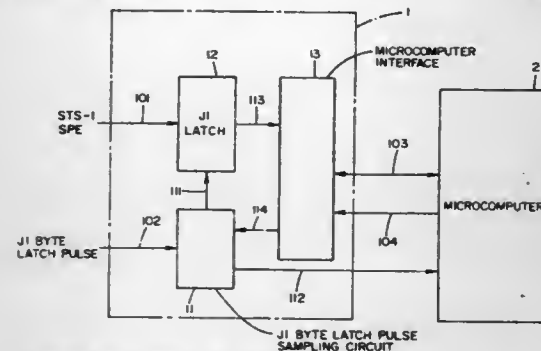
5,570,371

### PATH TRACE BYTE COLLECTING CIRCUIT FOR SYNCHRONOUS OPTICAL NETWORKS

Naoto Iga, Tokyo, Japan, assignor to NEC Corporation, Japan  
Filed May 31, 1995, Ser. No. 456,171  
Claims priority, application Japan, Jun. 1, 1994, 6-119929  
Int. Cl.<sup>6</sup> H04J 3/26; H04J 1/39

U.S. Cl. 370—99

5 Claims



1. A path trace byte collecting circuit comprising: sampling means for sampling a latch pulse at a predetermined sampling period, and for supplying the sampled latch pulse to a latching means for latching path trace bytes that are periodically embedded in an input signal, and instructing means for instructing a collecting means to collect the latched path trace bytes at said predetermined sampling period.

5,570,372

### MULTIMEDIA COMMUNICATIONS WITH SYSTEM-DEPENDENT ADAPTIVE DELAYS

Shmuel Shaffer, Palo Alto, Calif., assignor to Siemens Raim Communications Inc., Santa Clara, Calif.

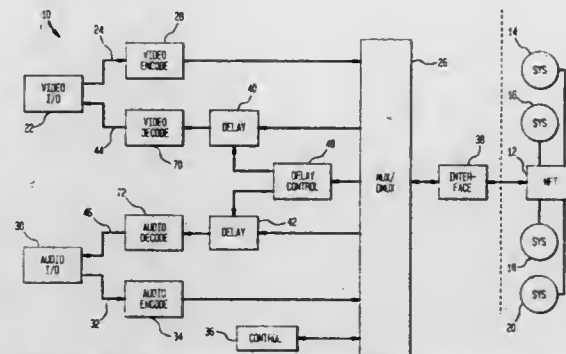
Filed Nov. 8, 1995, Ser. No. 555,567

Int. Cl.<sup>6</sup> H04N 7/13

U.S. Cl. 370—108

17 Claims

1. A method of synchronizing video data and audio data within intersystem communications comprising steps of: forming separate video and audio signals at an originating system; processing a video signal along a video path of said originating system and processing an audio signal along an audio path of said originating system for transmission of video and audio data to a remote site, wherein processing said video and audio signals introduces dissimilar delays to said video and audio data; forming delay data that are indicative of dissimilarity of said delays to said video and audio data;



transmitting said video, audio and delay data to a receiving system that is remote from said originating system; processing said video and audio data along video and audio paths of said receiving system, wherein said video and audio paths of said receiving system introduce dissimilar delays; and

adaptively introducing a compensation delay to one of said video and audio data at said receiving system in response to said delay data from said originating system and to dissimilarity of said delays at said receiving system, including selecting said compensation delay to at least partially offset a difference between audio data delay and video data delay introduced via a combination of said originating and receiving systems.

5,570,373

### METHOD AND APPARATUS FOR TESTING A RADIO IN A BASE STATION WITHOUT USING A RADIO TEST UNIT

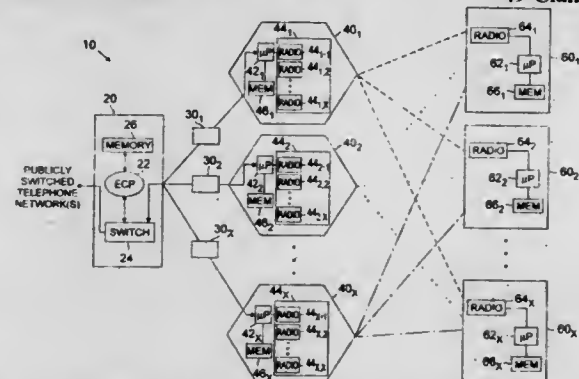
Thomas E. Wing, Mendham, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 20, 1995, Ser. No. 407,728

Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 371—5.1

49 Claims



5. An apparatus for testing a radio in a base station of a wireless communication network, wherein the network comprises a plurality of mobile stations, the apparatus comprising:

a detector for detecting a wireless communication in progress between the radio and the mobile station in the network;  
a memory for storing data concerning call processing activities associated with frames detected in error on a traffic channel of the radio which are collected during the course of a wireless communication between the radio and the mobile station, and for storing an expected frame error rate value;  
a processor for computing a frame error rate value from the collected data values and for comparing the computed frame error rate value to the expected frame error rate value in order to determine whether the radio is operating properly; and  
an indicator for indicating that the radio is failing.

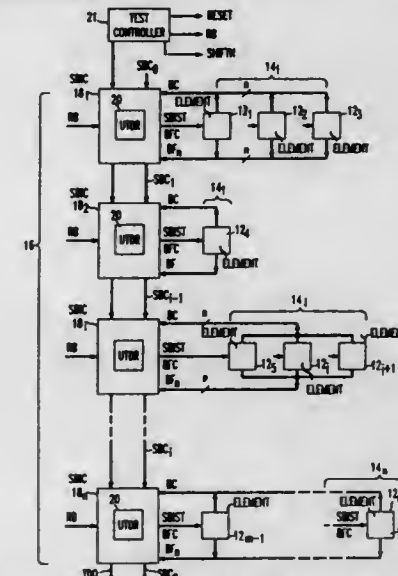
5,570,374

### BUILT-IN SELF-TEST CONTROL NETWORK

Chi W. Yau, Holland, Pa., and Yervant Zorian, Princeton, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.  
Continuation of Ser. No. 876,169, Apr. 30, 1992, abandoned.  
This application Jun. 23, 1993, Ser. No. 80,148  
Int. Cl.<sup>6</sup> G01R 31/28

U.S. Cl. 371—22.5

5 Claims



1. A network for controlling the self-testing of a plurality of electronic devices in parallel, each electronic device having Built-In, Self-Test (BIST) circuitry, said network comprising:

at least one Standard BIST Resource Controller (SBRC) coupled to said plurality of electronic devices, each SBRC generating a test command which is broadcast to the Built-In Self-Test circuitry of each of said electronic devices in parallel to cause each electronic device to initiate self-testing so each electronic device generates a test signature, each SBRC storing the test signatures generated by said electronic devices following self-testing, each SBRC including:

(a) a finite-state machine for broadcasting the test command to each of said electronic devices coupled to the SBRC to initiate self-testing of said electronic devices and for storing a composite test signature indicative of the test signatures of said electronic devices coupled to that SBRC; and  
(b) logic gate means coupled to said electronic devices and the finite-state machine for logically combining said test signatures of said electronic devices simultaneously to yield the composite test signature that allows identification of said each electronic device that fails supplied to said finite-state machine for storage; and wherein the network further includes a Boundary-Scan test controller for shifting a string of bits through each of said SBRCs to shift out the composite test signatures.

5,570,375

### IEEE STD. 1149.1 BOUNDARY SCAN CIRCUIT CAPABLE OF BUILT-IN SELF-TESTING

Ching-Hong Tsai, Fang-Diann Guo, Jin-Hua Hong, and Cheng-Wen Wu, all of Hsinchu, Taiwan, assignors to National Science Council of R.O.C., Taipei, Taiwan

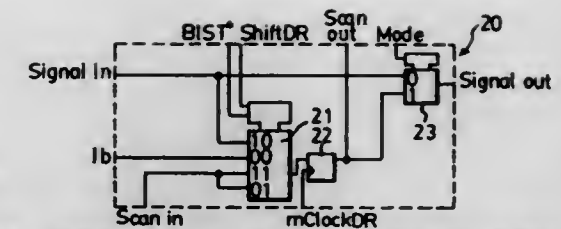
Filed May 10, 1995, Ser. No. 438,417

Int. Cl.<sup>6</sup> G01R 31/28

U.S. Cl. 371—22.3

13 Claims

1. The linear feedback shift register comprising cascaded input boundary-scan cells of an IEEE std. 1149.1 boundary scan circuit, said input boundary-scan cells forming an input boundary-scan register that is adapted to be connected to input nodes of a logic circuit of the boundary scan circuit, said input boundary-scan register being reconfigurable to operate as a test pattern generator



that is adapted to provide test patterns to the logic circuit for a predetermined number of clock cycles upon receipt of a built-in self-test control signal from a test access port system of the boundary scan circuit, wherein:

each of said input boundary-scan cells is one of a first cell, a second cell and a third cell;

said first cell includes: a four-channel first multiplexer having a first data input which serves as a signal input, a second data input which serves as a feedback input, third and fourth data inputs which are connected to one another and which serve as a scan input, a pair of channel select inputs which are adapted to receive a first control signal (BIST\*) and a second control signal (ShiftDR) respectively, and an output; a D-type flip-flop having a data input connected to said output of said first multiplexer, a clock input adapted to receive a clock signal (mClockDR), and an output which serves as a scan output; and a two-channel second multiplexer having a first data input which is connected to said first data input of said first multiplexer, a second data input which is connected to said output of said flip-flop, a channel select input which is adapted to receive a third control signal (Mode), and an output which serves as a signal output;

said second cell includes: a four-channel first multiplexer having a first data input which serves as a signal input, second, third and fourth data inputs which are connected to one another and which serve as a scan input, a pair of channel select inputs which are adapted to receive said first control signal (BIST\*) and said second control signal (ShiftDR) respectively, and an output; a D-type flip-flop having a data input connected to said output of said first multiplexer, a clock input which is adapted to receive said clock signal (mClockDR), and an output which serves as a scan output; and a two-channel second multiplexer having a first data input which is connected to said first data input of said first multiplexer, a second data input which is connected to said output of said flip-flop, a channel select input which is adapted to receive said third control signal (Mode), and an output which serves as a signal output; and

said third cell includes: a two-input XOR gate having a first input which serves as a feedback input, a second input which serves as a scan input, and an output; a four-channel first multiplexer having a first data input which serves a signal input, a second data input which is connected to said output of said XOR gate, third and fourth data inputs which are connected to one another and which are further connected to said second input of said XOR gate, a pair of channel select inputs which are adapted to receive said first control signal (BIST\*) and said second control signal (ShiftDR) respectively, and an output; a D-type flip-flop having a data input connected to said output of said first multiplexer, a clock input which is adapted to receive said clock signal (mClockDR), and an output which serves as a scan output; and a two-channel second multiplexer having a first data input which is connected to said first data input of said first multiplexer, a second data input which is connected to said output of said flip-flop, a channel select input which is adapted to receive said third control signal (Mode), and an output which serves as a signal output.

# 5,570,376 METHOD AND APPARATUS FOR IDENTIFYING FAULTS WITHIN A SYSTEM

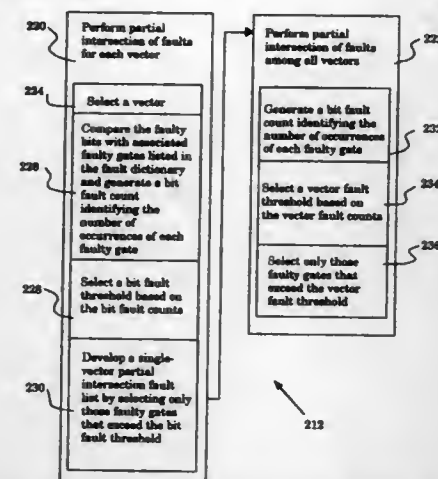
Ramachandra P. Kunda, Milpitas; Adam C. Malamy, Palo Alto, and Marc Levitt, Sunnyvale, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Oct. 5, 1994, Ser. No. 318,378

Int. Cl.<sup>6</sup> G06F 11/22

U.S. Cl. 371—25.1

30 Claims



21. A test apparatus for testing an electronic system provided on a chip and having a plurality of elements, said apparatus comprising:

- a device for receiving a set of test vectors output from the system;
- a device for comparing the output test vectors with an expected set of output test vectors to identify faulty test values, with any differences between the output test vectors and corresponding expected test vectors indicating a failure of the test and indicating that at least one element of the system is faulty;
- a device for identifying a set of candidate faulty elements for each of the faulty test values; and
- a device for identifying elements of the system that are likely to contain faults based on the sets of candidate faulty elements by performing a partial intersection on the sets of candidate faulty elements associate with faulty test values wherein only elements which are associated with at least a predetermined number of faulty values are selected; and
- a device for determining the physical location of the elements likely to contain faults within the chip by employing a software tool capable of identifying the location on a chip of one or more elements.

# 5,570,377 METHOD AND DEVICE FOR DETECTION AND CORRECTION OF ERRORS IN ATM CELL HEADERS

Jose L. Merino Gonzalez, Castillas-Arroyo de Valdemoro, and Carmen maria L. Cabello, deceased, late of Santander, both of Spain, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Nov. 29, 1993, Ser. No. 158,609

Claims priority, application Spain, Nov. 30, 1992, P9202433

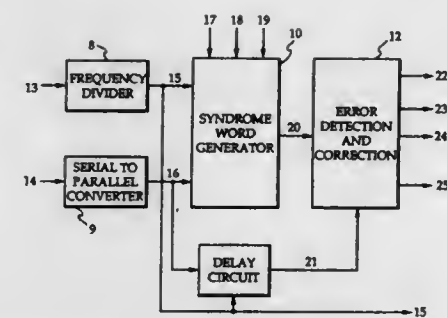
Int. Cl.<sup>6</sup> H03M 13/00

U.S. Cl. 371—37.1

9 Claims

1. A method for detection and correction of errors in asynchronous transfer mode (ATM) cell header signals in which a serial to parallel conversion (2) takes place for n bits in a serial data signal (1), obtaining an n-bit parallel data signal with a clock rate that is n times lower than an input clock rate of the serial data signal (1), said method further comprising the steps of:

generating a syndrome word signal (3) from the n-bit parallel input data signal in an ATM cell header signal in accordance with a functional relation: the output code vector signal



$$S_{p+1} = T^n \cdot S_p + U_p$$

where

$T^n$  is an n-th power of a serial transformation matrix signal;  
 $U_p$  is an n-bit input data vector signal at a time  $t_p$ ;  
 $S_p$  is the syndrome word signal (3) at the time  $t_p$ ; and  
 $S_{p+1}$  is the syndrome word signal (3) at a time  $t_{p+1}$ ; and  
 indicating with the syndrome word signal (3) for a header signal of each ATM header cell signal with the n-bit parallel data signal: that no error has been detected; or that more than one error has been detected; or an erroneous bit to be corrected when only one error has been detected.

5,570,378

# ERROR-CORRECTING APPARATUS

Sadayuki Inoue; Junko Ishimoto, both of Nagaokakyo; Takahiko Nakamura, Kamakura, and Makoto Kumano, Nagaokakyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 53,497, Apr. 28, 1993, Pat. No.

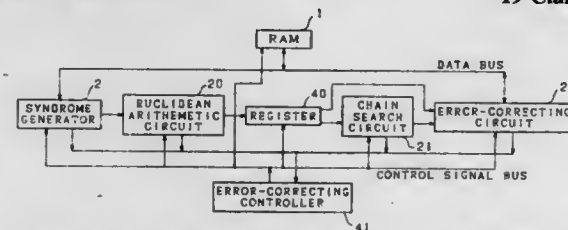
5,504,758. This application Jul. 24, 1995, Ser. No. 505,883

Claims priority, application Japan, Apr. 28, 1992, 4-109402; Jul. 10, 1992, 4-183742

Int. Cl.<sup>6</sup> G06F 11/10

U.S. Cl. 371—37.1

19 Claims



1. An error-correcting apparatus for performing an error correction process using a Reed-Solomon code and a Euclidean algorithm comprising:

- first and second storage means for storing coefficients of two polynomials;
- division means for dividing a highest-degree coefficient of the polynomial stored in said first storage means by a highest degree coefficient of the polynomial stored in said second storage means and
- arithmetic means for multiplying coefficients other than the highest degree coefficient of the polynomial output from said second storage means by an output of said division means and adding a result of the multiplication and an output of said first storage means;

wherein an output of said arithmetic means in input to said first and second storage means which stores coefficients of which degrees are higher by one than those of the coefficients of respective polynomials in which arithmetic operations have been performed and wherein division of polynomials are performed by rewriting contents of said first and second storage means in which the dividend polynomial is stored into an output of said arithmetic means.

# 5,570,379 CODED MODULATION APPARATUS

Eisaku Sasaki, and Yuka Kuroda, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

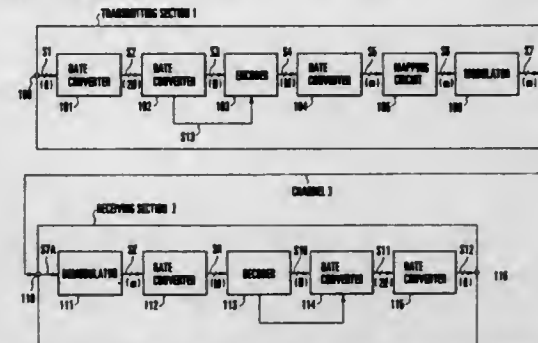
Filed Sep. 22, 1994, Ser. No. 310,074

Claims priority, application Japan, Sep. 28, 1993, 5-240969

Int. Cl.<sup>6</sup> H03M 13/00; H04L 27/20

U.S. Cl. 371—42

7 Claims



5. A receiving unit used for a coded modulation apparatus and adapted to perform error-correcting decoding of eight first signal streams encoded at a coding rate  $R=N/M$  (where N and M are natural numbers, and M is not less than N), and receive a 2<sup>m</sup>-value quadrature amplitude-modulated radio signal (m is a natural number not less than four, and M is a multiple of m) via a channel, said receiving unit comprising:

- demodulation means for generating m demodulated signal streams by demodulating the radio signal from said channel;
- first rate conversion means for converting the demodulated signal streams from said demodulation means at a one-to-M/m ratio to generate M second signal streams;
- decoding means for generating a first frame pulse on the basis of the second signal streams from said first rate conversion means, and generating N decoded signal streams by performing error correction of the second signal streams from said first rate conversion means according to different coding rules respectively set for first and second half portions of a frame on the basis of the first frame pulse and eliminating the redundancy code added by said coding means;
- second rate conversion means for parallel/serial converting the decoded signal streams from said decoding means at a two-to-one ratio on the basis of the first frame pulse from said decoding means to generate 2N third signals streams; and
- third rate conversion means for parallel/serial converting the third signal streams from said second rate conversion means at a N/4-to-one ratio to generate the fourth signal streams.

5,570,380

# SURVIVAL SEQUENCE REGISTER FOR VARIABLE THRESHOLD QUALIFICATION FOR RECORDING CHANNELS

Paolo Gadducci, Tirrenia; David Moloney, Cornaredo, and Giorgio Betti, Milan, all of Italy, assignors to SGS-Thomson Microelectronics, S.r.l., Agrate Brianza, Italy

Filed Nov. 29, 1994, Ser. No. 346,601

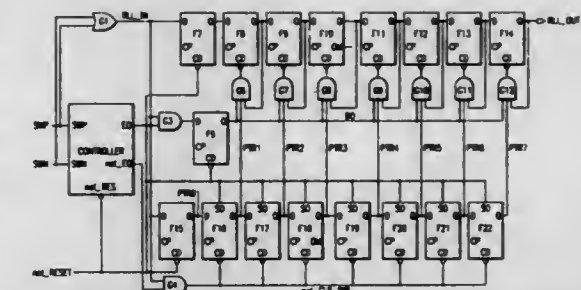
Claims priority, application European Pat. Off., Nov. 30, 1993, 93830485

Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 371—57.1

22 Claims

- 1. A circuit comprising:
  - a first shift register, connected to an external logic to receive, and to clock in, a sequence of pulses corresponding to read head signals from a magnetic medium;
  - a second shift register, connected to said first shift register to receive, and to clock through, pulses indicating a location within said first shift register of the last pulse clocked in;



error-detect logic, connected to said first shift register to provide an error-detect signal whenever two pulses in succession are received by said first shift register with the same polarity; and reset logic, connected to said error-detect logic and said first and second shift registers to clear said location in said first register which is indicated by said second register whenever said error-detect signal indicates that two pulses in succession have been received by said first shift register with the same polarity, and to clear said second shift register when two pulses in succession have been received by said first shift register with the opposite polarity.

5,570,381

# SYNCHRONOUS DRAM TESTER

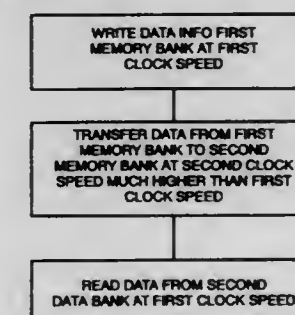
Paul Schofield, Kanata, Canada, assignor to Mosaid Technologies Incorporated, Kanata, Canada

Filed Apr. 28, 1995, Ser. No. 430,230

Int. Cl.<sup>6</sup> G11B 27/00; H03M 13/00; H04L 7/00

U.S. Cl. 371—61

7 Claims



1. A method of testing an synchronous dynamic random access memory (SDRAM) having a pair of memory banks, comprising writing data into a first of the pair of memory banks at a first clock speed that can be used by a tester, transferring said data at a second clock speed much higher than the first clock speed from the first of the pair of memory banks to a second of the pair of memory banks, and then reading data from the second of the pair of memory banks at the first clock speed to the tester.

5,570,382

# CLOCK SIGNAL FAULT DETECTOR

Katsuhiko Miyamoto, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 26, 1995, Ser. No. 494,932

Claims priority, application Japan, Jul. 6, 1994, 6-177442

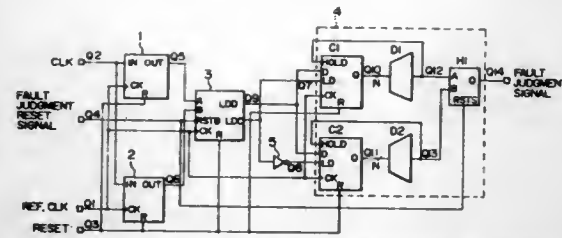
Int. Cl.<sup>6</sup> G11B 27/00; H03M 13/00; H04L 1/00

U.S. Cl. 371—61

10 Claims

- 1. A clock signal fault detector comprising:
  - a signal level monitor for monitoring a clock signal to be monitored, in synchronicity with a reference clock signal to detect extraordinary conditions, and for determining the existence of a clock fault of a first kind when the level of the clock signal to be monitored is in an unchanged condition for a first predetermined period or longer;





- a turning point number monitor for monitoring the number of turning points of the clock signal to be monitored when the level of the clock signal to be monitored changes during a second predetermined period and for determining the existence of a clock fault of a second kind when the number of the turning points in the second predetermined period is equal to or greater than a predetermined number;
- a fault judgment portion having an output, for detecting kinds of clock faults determined by the signal level monitor and by the turning point number monitor, and for feeding an output signal corresponding to the detected kind of clock faults at the output; and
- a counting portion for counting the duration of the output signal of the fault judgment portion and for delivering a fault judgment signal when the duration of the output signal is equal to or greater than a predetermined duration.

5,570,383

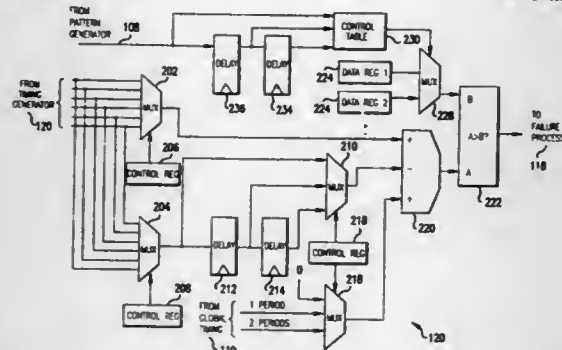
**TIMING HAZARD DETECTOR ACCELERATOR**  
Benjamin J. Brown, Westlake Village, and Peter A. Reichert, Thousand Oaks, both of Calif., assignors to Teradyne, Inc., Boston, Mass.

Filed Aug. 15, 1994, Ser. No. 290,477

Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 371-62

20 Claims



1. A circuit for detecting hardware timing hazards in a test pattern comprising a plurality of vectors, said pattern adapted to run on a tester which generates a plurality of timing signals at programmed times which differ by time differences and performs I/O functions at a pin in response to information in each vector of the pattern, said circuit comprising:

- a) means for computing the time difference between the programmed times of a first one of the plurality of timing signals and a second one of the plurality of timing signals;
- b) means, responsive to information in at least one vector specifying I/O functions at a pin, for providing a permissible time difference between first and second ones of the plurality of timing signals; and
- c) means, responsive to the means for computing the time difference and the means for providing a permissible time difference, for indicating if the first and second ones of the plurality of timing signals have been programmed at times which violate the permissible time difference.

# 5,570,384 LASER PROCESSING APPARATUS WITH BEAM MODE CONTROL

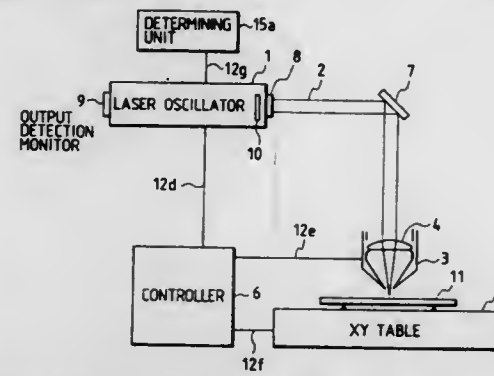
Satoshi Nishida; Masato Matsubara, and Akihiro Otani, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 14, 1994, Ser. No. 181,062

Claims priority, application Japan, Jan. 20, 1993, 5-007821  
Int. Cl.<sup>6</sup> H01S 3/098

U.S. Cl. 372-19

31 Claims



1. A laser processing apparatus comprising:  
a laser oscillator constructed to output a laser beam;  
an output detector for detecting a laser beam output level of said laser oscillator;  
a mode changeover unit disposed to change the laser beam from one beam mode to another beam mode in response to an input provided by an operator; and  
a determining unit, coupled to said output detector, for calculating preferred mode information based on a comparison of stored information with the output level detected by said detector and for supplying the preferred mode information to the operator.

5,570,385

# SEMICONDUCTOR LASER AND METHOD FOR MANUFACTURING THE SAME

Hyung S. Ahn, Kyungki-do, and Won T. Choi, Seoul, both of Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

Division of Ser. No. 972,015, Nov. 6, 1992, Pat. No. 5,346,854.

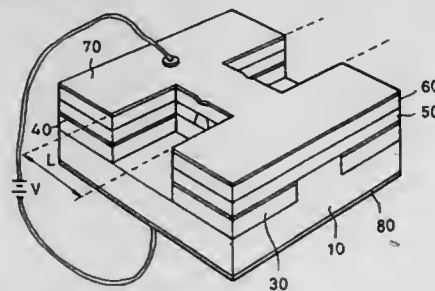
This application Jun. 10, 1994, Ser. No. 257,888

Claims priority, application Rep. of Korea, Nov. 7, 1991, 19770/1991

Int. Cl.<sup>6</sup> H01S 3/18; G02B 6/36

U.S. Cl. 372-43

2 Claims



1. A semiconductor laser comprising:  
a compound semiconductor substrate of a first conductivity type, the compound semiconductor substrate being made of an n-type GaAs and having an upper portion;  
a semiconductor laser chip region of hexahedron shape disposed at a center portion of the upper portion of the substrate, the chip region having front and rear surfaces provided with mirror surfaces for oscillating laser beams, the laser chip region including

- a p-type GaAs layer acting as a block layer disposed on an upper surface of the upper portion of the n-type GaAs substrate, the p-type GaAs layer having a first portion and a second portion, said first portion being separate from said second portion to define a first cavity having a predetermined width along the p-type GaAs layer and exposing a central portion of the substrate;
- an n-type GaAlAs layer acting as a clad layer disposed over the p-type GaAs layer and over the exposed portion of the n-type GaAs substrate;
- an undoped GaAlAs layer acting as an active layer disposed over the n-type GaAlAs layer; and
- a p-type GaAlAs layer acting as another clad layer disposed over the GaAlAs layer;
- a pair of guide regions disposed at opposite sides of the chip region and including the upper portion of the semiconductor substrate that is not part of the chip region being surrounded by a p-type AlGaAs layer formed on the lower portion of the n-type GaAs substrate and a p-type GaAs layer formed on the p-type AlGaAs layer, the guide regions defining a second cavity for coupling the chip region with external elements at the substrate together with the front and rear surfaces of the chip region;
- a first electrode disposed over the chip region and guide regions and adapted to receive electric power; and
- a second electrode disposed beneath the semiconductor substrate and adapted to receive the electric power for generating laser beams in conjunction with the first electrode.

5,570,386

# SEMICONDUCTOR LASER

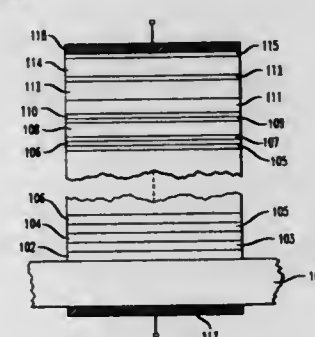
Federico Capasso, Westfield; Alfred Y. Cho, Summit; Jerome Faist, Scotch Plains; Albert L. Hutchinson, Piscataway; Carlo Sirtori, Summit, and Deborah L. Sivco, Warren, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation-in-part of Ser. No. 223,341, Apr. 4, 1994, Pat. No. 5,457,709. This application Jul. 31, 1995, Ser. No. 509,409

Int. Cl.<sup>6</sup> H01S 3/19

U.S. Cl. 372-46

10 Claims



1. An article comprising a unipolar semiconductor laser, said laser comprising
- a) a multilayer semiconductor structure that comprises doped semiconductor material of only a first conductivity type; and
- b) means for applying a voltage across said multilayer semiconductor structure;
- CHARACTERIZED IN THAT
- c) said multilayer structure comprises a multiplicity of essentially identical active regions, a given of said active regions being separated from an adjoining active region by a superlattice carrier injection/relaxation region;
- d) the given active region comprises a single quantum well, associated with said quantum well are a first and a second energy state for charge carriers of the first conductivity type, with said second energy state being higher in energy than said first energy state;

- e) said superlattice carrier injection/relaxation region is selected to be relatively transmissive for carriers in the first energy state, and to be substantially less transmissive for carriers in the second energy state; and
- f) at least some of the charge carriers of the first conductivity type undergo a radiative transition from the second to the first energy state.

5,570,387

# TWO-STAGE POWER LASER

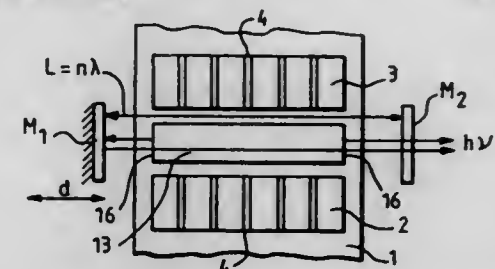
Claude Carriere, Marcoussis; Bernard Groussin, Les Ulis; Christian Larat, Paris, and Jean-Paul Pocholle, Arpajon/La Norville, all of France, assignors to Thomson-CSF Semiconducteurs Specifiques, Paris, France

Filed Jan. 26, 1995, Ser. No. 378,675

Claims priority, application France, Jan. 28, 1994, 94 00958  
Int. Cl.<sup>6</sup> H01S 3/19

U.S. Cl. 372-50

25 Claims



1. A high-power two-stage laser comprising a first laser stage and a second laser stage,  
said first laser stage having an emissive array integrated into a monolithic substrate, said substrate having a main face, said first stage including a plurality of primary semiconductor lasers integrated into said monolithic substrate, said primary semiconductor lasers having at least two mutually parallel rods separated by at least one groove formed in said monolithic substrate, said primary semiconductor lasers emitting light in a plane parallel to said main face and in a direction perpendicular to said parallel rods, said light providing optical pumping energy for said second laser stage,  
said second laser stage having at least one solid laser of an optically pumpable material, said solid material of said second stage laser comprising a material incrustated in said groove between said rods of said first laser stage, said solid material being illuminated by the first laser stage.

5,570,388

# METHOD AND APPARATUS USING SIMPLE CODES FOR THE WIRELESS TRANSMISSION OF NON-DATA SYMBOLS

Peter H. Halpern, Longwood, Fla., assignor to Digital Ocean, Inc., Lenexa, Kans.

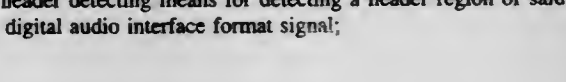
Filed Sep. 27, 1994, Ser. No. 312,840

Int. Cl.<sup>6</sup> H04K 1/00

U.S. Cl. 345-200

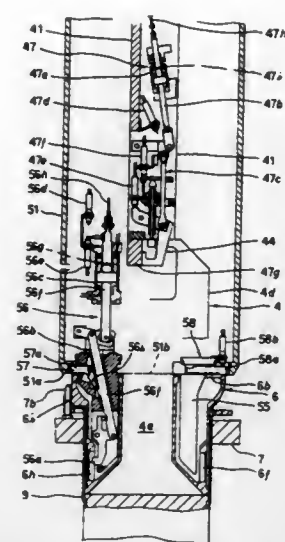
5 Claims

1. A wireless communication system for transmitting a serial pulse-code modulated digital data stream and a non-data delimiter symbol to a receiver, comprising:
- (a) encoder means including an encoder (2) for encoding the data stream in accordance with a code having an alphabet with at least one spare symbol;
- (b) delimiter control means (8) for applying a delimiter symbol in the code alphabet spare symbol, thereby to produce a coded data stream including said delimiter symbol;
- (c) means including a quaternary phase-shift keying modulator (14) for transmitting the coded data stream to the receiver;
- (d) receiver means including a quaternary phase-shift keying demodulator (20) for demodulating the coded data stream;









- b. a pump positioned to deliver liquid into said fluid line and through the nozzle in said fluid line; and
- c. an aspirator in operative connection with said fluid line, said aspirator having a venturi connected to an ambient air line whereby liquid flow through said aspirator causes ambient air to be drawn into said line and mixed with the liquid therein.

5,570,401

## BWR CONTAINMENT CONFIGURATION HAVING PARTITIONED WETWELL AIRSPACE

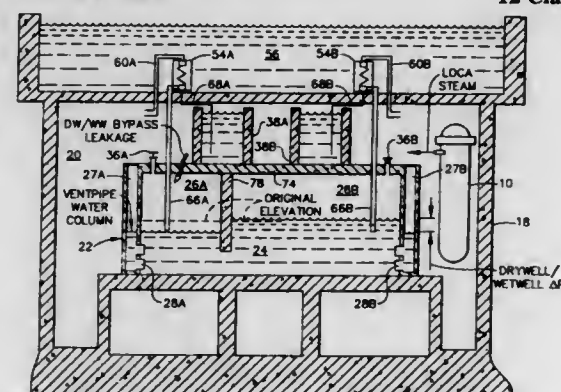
Douglas M. Glantz, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Sep. 22, 1995, Ser. No. 532,292

Int. Cl. G21C 9/004

U.S. Cl. 376—283

12 Claims



1. A boiling water reactor comprising:

- a containment vessel;
- a reactor pressure vessel arranged inside said containment vessel;
- a nuclear fuel core arranged inside said reactor pressure vessel;
- wetwell means arranged inside said containment vessel, said wetwell means comprising first and second wetwell airspace chambers and first and second pools of water arranged such that said first wetwell airspace chamber overlies said first pool and said second wetwell airspace chamber overlies said second pool, said first and second pools of water being connected to allow free flow of water therebetween, and said first and second wetwell airspace chambers being separated such that gas cannot flow freely therebetween;
- a drywell comprising a space inside said containment vessel and outside said reactor pressure vessel and said wetwell;
- a condenser pool of water arranged above said drywell;
- first and second condensers in heat transfer relationship with the water in said condenser pool;
- first and second condenser inlet flow paths for coupling steam from said drywell into said first and second condensers respectively;
- first and second condenser outlet flow paths for coupling gas from said first and second condensers respectively into said first and second pools of water respectively; and
- first and second venting means for respectively venting gas from said first and second wetwell airspace chambers to said drywell, each of said first and second venting means having a first state in which said respective venting means is closed and a second state in which said respective venting means is at least partially open.

5,570,400  
ON LINE SIPPING AIR DELIVERY SYSTEM

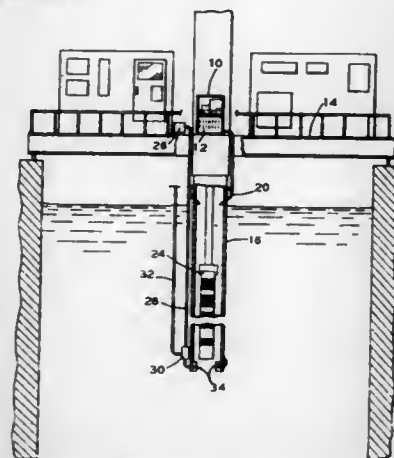
David M. Minor, Lynchburg, and Ronald N. Roseveare, Evington, both of Va., assignors to B&amp;W Fuel Company, Lynchburg, Va.

Filed Aug. 8, 1995, Ser. No. 512,589

Int. Cl. G21C 17/00

U.S. Cl. 376—253

1 Claim



1. An on-line sipping air delivery system for detecting defective fuel element sheaths in a nuclear fuel assembly, comprising:
- a. a fluid line having a nozzle positioned to direct liquid flow from the nozzle under the nuclear fuel assembly;

5,570,402  
CONTROL ROD HOUSING SUPPORT SYSTEM WITH RADIATION SHIELD RINGS

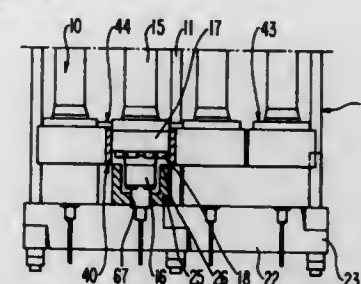
Bengt I. Baversten, Västerås, Sweden, assignor to Combustion Engineering, Inc., and John H. Mulholland, both of Windsor, Conn.

Filed Aug. 4, 1994, Ser. No. 285,739

Int. Cl. G21C 11/00

U.S. Cl. 376—287

23 Claims



1. A support for a control rod drive housing in a boiling water reactor, comprising:
- first means for supporting a control rod drive in the case of a housing failure;
- second means for supporting said control rod drive in the case of a housing failure and shielding persons working under the reactor vessel from radiation, said second means being supported by said first supporting means, and wherein said second means can be raised and lowered between a non-support position where said control rod drive is not supported and a support position where said control rod drive is supported; and
- a radiation shield means separate from said second support means for shielding persons working under the reactor vessel from radiation, said radiation shield means being provided about the control rod drive above said second supporting means, said radiation shield means being removable from the second support means and supported by the second support means when the second support means is in its support position.

5,570,403  
X-RAY CT IMAGING APPARATUS WITH VARIED ENERGY LEVEL DETECTION CAPABILITY

Masahiko Yamazaki, and Yoshiaki Yaol, both of Tochigiken, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

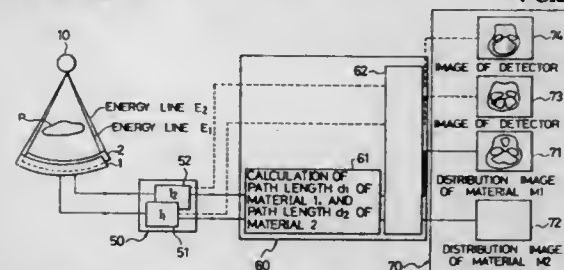
Filed Apr. 19, 1994, Ser. No. 229,635

Claims priority, application Japan, Apr. 19, 1993, 5-091319

Int. Cl. A61B 6/00

U.S. Cl. 378—5

4 Claims



1. An X-ray computerized tomographic (CT) imaging apparatus comprising:
- an X-ray tube for irradiating X-rays to a biological body under medical examination;
- a plurality of detection systems for detecting an X-ray energy transmitted through the biological body, the plural detection systems having different energy characteristics respectively;
- data acquisition means for acquiring respective transmission X-ray energy data of the biological body which are detected by the plural detection systems;

reconstruction means for reconstructing a tomographic image for the biological body in accordance with data from the data acquisition means; and

switch means for switching between a dual-energy scanning mode and a multi-slice scanning mode.

5,570,404  
METHOD AND APPARATUS FOR EDITING ABDOMINAL CT ANGIOGRAPHIC IMAGES FOR BLOOD VESSEL VISUALIZATION

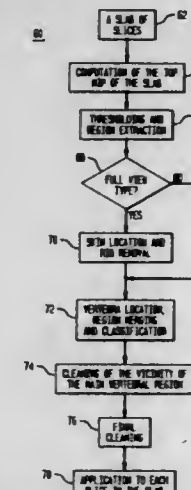
Cheng-Chung Liang, Lawrenceville; Ajit Singh, Plainsboro; Ming-Yee Chiu, Princeton Junction; Jay Ezrielev, Jersey City; Richard Fisler, Kendall Park, and Dietmar Hentschel, Little Silver, all of N.J., assignors to Siemens Corporate Research, Princeton, N.J.

Filed Sep. 30, 1994, Ser. No. 215,524

Int. Cl. A61B 6/03

U.S. Cl. 378—8

20 Claims



1. A method for automatically editing a plurality of computed tomograms to provide a three dimensional view of a selected object located within a patient's body, each of said computed tomograms comprising an array of pixels having various illuminating intensities which depict various objects scanned by a computed tomogram scanning system within a layer of a patient's body, said method comprising the steps of:

- providing at least one slab of computed tomographic image slices produced by said computed tomogram scanning system, said image slices including an undesirable object;
- computing a top maximum intensity projection of said slab; automatically removing said undesirable object from said top maximum intensity projection of said slab in order to define modifications to be applied to said image slices of said at least one slab; and
- applying said modifications to each computed tomographic image slice in said at least one slab in order to remove said undesirable object from said image slices.

5,570,405  
REGISTRATION AND ALIGNMENT TECHNIQUE FOR X-RAY MASK FABRICATION

Ken Tze-Kin Chan, Wappingers Falls; William A. Enichen, Poughkeepsie; John G. Hartley, Fishkill, all of N.Y., and Maris A. Sturans, Essex Junction, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 6, 1995, Ser. No. 466,564

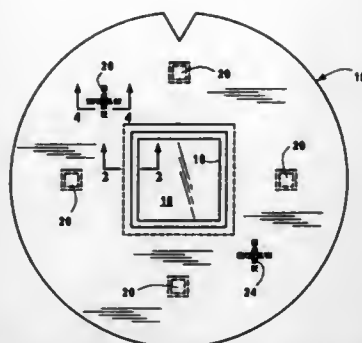
Int. Cl. G21K 5/00

U.S. Cl. 378—35

15 Claims

1. An X-ray mask comprising:
- a mask substrate having first and second surfaces;





an X-ray transparent pattern window etched into the mask substrate from the second surface; and  
at least one pattern-to-mask alignment mark detectable from the first surface of the mask substrate and etched into the mask substrate from the second surface defining a fixed location relative to the pattern window, the at least one pattern-to-mask alignment mark comprising at least two valleys oriented at right angles to each other, the valleys being formed by etching into the second surface of the mask substrate, the valleys having a depth just less than the thickness of the mask substrate such that electrons impinging upon the pattern-to-mask alignment mark from the first surface of the mask substrate penetrate the mask substrate into the valleys to reduce the level of backscattered electrons from the first surface of the mask substrate.

5,570,406

### X-RAY ANALYZER SYSTEM AND METHOD OF INCREASING RESPONSE TIME

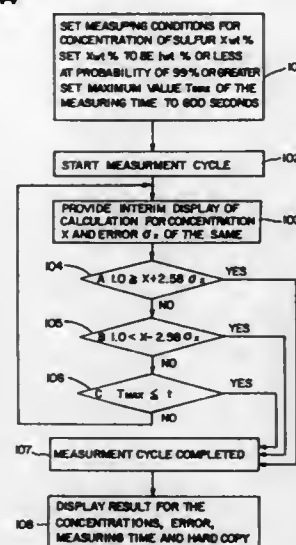
Shintaro Komatani, Miyahigashi-machi, Japan, assignor to Horiba, Ltd., Kyoto, Japan

Filed Jul. 18, 1995, Ser. No. 503,872

Claims priority, application Japan, Jul. 30, 1994, 6-197615  
Int. Cl.<sup>6</sup> G01N 23/23; G01T 1/36

U.S. Cl. 378-44

12 Claims



1. A fluorescent X-ray qualitative analytical method of determining the concentration of an element in a sample comprising:  
radiating a sample with X-rays to create fluorescent X-rays from elements in the sample;  
setting conditions for a measurement of a predetermined concentration amount of an element at a predetermined probability of accuracy;  
detecting the fluorescent X-rays resulting from impact of the X-rays with the sample;

calculating from the detected fluorescent X-rays the concentration of the element based on the predetermined probability of accuracy; and  
comparing the calculated concentration of the element with the predetermined amount and indicating to the operator when it is the predetermined amount or less.

5,570,407

### DISTORTIONLESS X-RAY INSPECTION

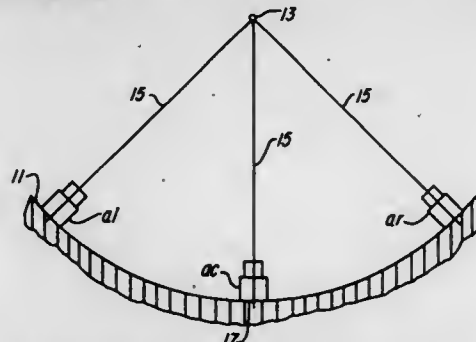
Eduardo Pesante, Melbourne; Terry Hammond, Palm Bay, and Gordon DeBoer, Satellite Beach, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jun. 30, 1994, Ser. No. 268,417

Int. Cl.<sup>6</sup> G01N 23/04

U.S. Cl. 378-58

3 Claims



1. An apparatus for accurately inspecting a sealed cavity of an IC for contaminants in the cavity comprising:  
an IC having a cavity defined by a lid, a bottom a first side wall and a second side wall;  
a point source of radiation;  
said lid said IC being sealed to said first wall and said second wall by sealing means;  
radiation sensitive means placed on the opposite side of said IC from said point source of radiation; whereby,  
said cavity to said radiation sensitive means; and  
means for aligning said IC relative to said point source at radiation to pass radiation from said point source of radiation perpendicularly through said cavity and said first side wall and second side wall, to said radiation sensitive means without passing through said lid or said bottom, to form an image of said cavity unobstructed by said lid or bottom;  
said point source of radiation is arranged to emit an arcuate wave front; and  
said means for aligning is arranged to be arcuate in the shape of said arcuate wave front.

5,570,408

### HIGH INTENSITY, SMALL DIAMETER X-RAY BEAM, CAPILLARY OPTIC SYSTEM

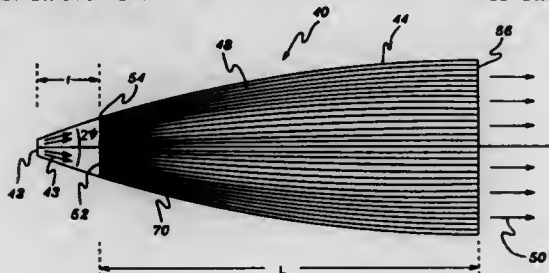
David M. Gibson, Voorheesville, N.Y., assignor to X-Ray Optical Systems, Inc., Albany, N.Y.

Filed Feb. 28, 1995, Ser. No. 395,714

Int. Cl.<sup>6</sup> G21K 1/02

U.S. Cl. 378-145

11 Claims



1. Apparatus for producing an x-ray beam with a width 'w', said apparatus comprising:

an x-ray source having a spot size width 'y'; and  
a multiple-total-external reflection monolithic capillary optic ("optic") having an input and an output and being positioned such that said input to said optic faces said x-ray source and is disposed at an optic-to-source distance of less than 60 millimeters, said optic having multiple channels each of which has an input aimed at said x-ray source, said output of said optic providing said x-ray beam of width 'w'.

5,570,409

### APPARATUS FOR X-RAY FLUOROSCOPY AND FLUOROGRAPHY

Shojiro Yamaguchi, and Hajime Takemoto, both of Kyoto, Japan, assignors to Shimadzu Corporation, Japan

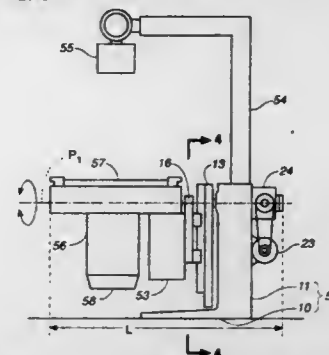
Filed Sep. 6, 1995, Ser. No. 524,247

Claims priority, application Japan, Oct. 31, 1994, 6-292131

Int. Cl.<sup>6</sup> H05G 1/02

U.S. Cl. 378-196

3 Claims



1. An apparatus for X-ray fluoroscopy and fluorography comprising:  
a supporting column for supporting means for radiating and detecting X-rays opposite each other;  
a top board supporting means for supporting a top board above said means for detecting X-rays;  
a base for supporting said top board supporting means movably vertically and rotatably around a horizontal axis;  
a rotary member which is disposed between said top board supporting means and said base and is rotatable around said horizontal axis;  
means for rotationally driving said rotary member;  
guide rails extending vertically and attached to a side surface of said rotary member facing away from said base;  
a parallel-moving base attached to said top board supporting means and movable along said guide rails; and  
parallel-moving means for causing said parallel-moving base to move vertically.

5,570,410

### DYNAMIC RESOURCE ALLOCATION PROCESS FOR A SERVICE CONTROL POINT IN AN ADVANCED INTELLIGENT NETWORK SYSTEM

Alireza Hooshari, Atlanta, Ga., assignor to BellSouth Corporation, Atlanta, Ga.

Filed Oct. 13, 1994, Ser. No. 322,583

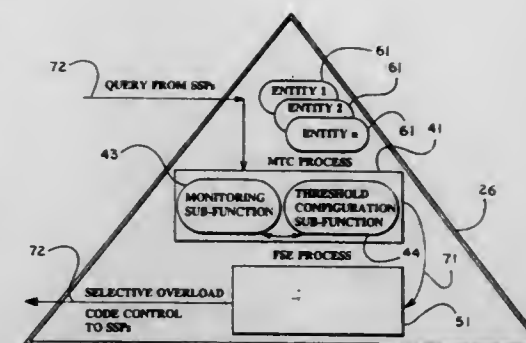
Int. Cl.<sup>6</sup> H04M 3/08; 3/22; 15/00; 3/42

U.S. Cl. 379-32

15 Claims

1. A process for use in allocating resource time in a service control point (SCP) located in an Advanced Intelligent Network used in operation of a telephone network amongst a plurality of monitored entities, comprising the steps of:

initially assigning a SCP resource time to each of said plurality of monitored entities;



monitoring the respective use of said SCP resource time by each of said plurality of monitored entities already chosen observation interval;  
measuring any unutilized SCP resource time by any of said plurality of monitored entities during a previous observation interval; and  
re-assigning said unutilized SCP resource time to those of said plurality of monitored entities using more than their respective assigned SCP resource time during said chosen observation interval.

5,570,411

### CALL PRIORITY IN A MOBILE RADIOTELEPHONE SYSTEM

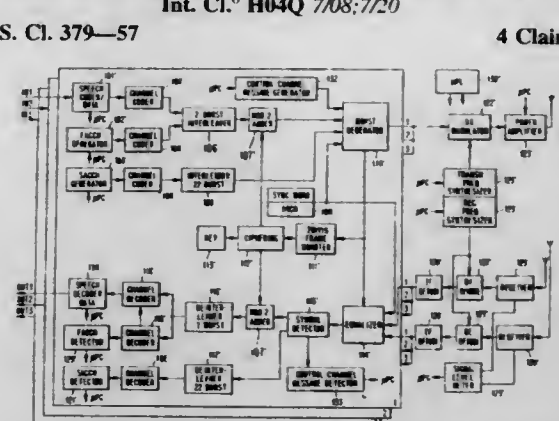
Alan Sicher, Garland, Tex., assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation of Ser. No. 226,366, Apr. 12, 1994, abandoned, which is a continuation of Ser. No. 842,557, Feb. 27, 1992, abandoned. This application Jul. 20, 1994, Ser. No. 278,252

Int. Cl.<sup>6</sup> H04Q 7/08; 7/20

U.S. Cl. 379-57

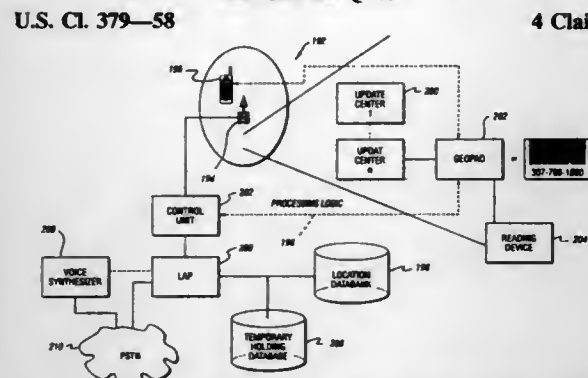
4 Claims



1. A call request handling method in a mobile radiotelephone system wherein a plurality of mobile stations communicate with a base station through an air interface across defined channels, comprising the steps of

ascertaining whether a call is to be given priority;  
assigning said channels preferentially to a call when it is ascertained that said call is to be given priority;  
providing for more extensive paging of a mobile station including paging over a wider geographic extent than would be allowed if said priority call were not given priority;  
through-connecting said priority call;  
maintaining a paging queue; and  
preempting a queued paging request in favor of a paging request of higher priority.

5,570,412  
**SYSTEM AND METHOD FOR UPDATING A LOCATION DATABANK**  
 Frederick W. LeBlanc, Arvada, Colo., assignor to U.S. West Technologies, Inc., Boulder, Colo.  
 Filed Sep. 28, 1994, Ser. No. 314,482  
 Int. Cl.<sup>6</sup> H04Q 7/36  
 U.S. Cl. 379—58  
 4 Claims



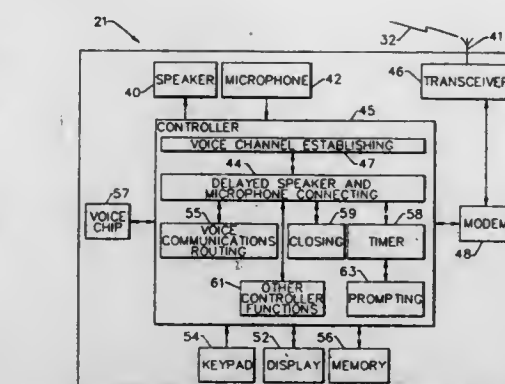
2. For use in cooperation with a wireless communication system, including a base station in electrical communication with at least one mobile unit within a corresponding coverage area, and a location databank operative to store real-time RF measurements for the base station, including its link budget, a method for periodically updating the location databank, comprising:

- providing a plurality of update centers at known fixed locations within the base station coverage area, each of the update centers including an electronically readable GeoPad encoded with the precalibrated location information for that center;
- providing an electronic reading device in electrical communication with the at least one mobile unit;
- decoding the encoded location information at one of the GeoPads through the use of the electronic reading device;
- providing processing logic in electrical communication with the at least one mobile unit;
- providing a control unit in electrical communication with the base station;
- providing a Location Adjunct Processor (LAP) in electrical communication with the control unit;
- providing a holding database in electrical communication with the LAP and the location databank; and
- making real-time RF measurements at one of the GeoPads and initiating a call to the LAP in cooperation with the processing logic to transmit the measurements along with the decoded location information to the holding database for temporary storage, whereby to provide said periodic updating of the location databank.

5,570,413  
**CELLULAR TELEPHONE AND ASSOCIATED METHOD FOR OPENING A VOICE CHANNEL WITH A SOURCE TELEPHONE WITHOUT ESTABLISHING VOICE COMMUNICATIONS THEREWITH**

Björn G. D. Ahlberg, Falsterbo; Johan Falk, Järfälla, both of Sweden, and Anders Mölne, Cary, N.C., assignors to Ericsson Inc., Research Triangle Park, N.C.  
 Filed Jul. 18, 1994, Ser. No. 276,265  
 Int. Cl.<sup>6</sup> H04M 1/64  
 U.S. Cl. 379—59  
 16 Claims

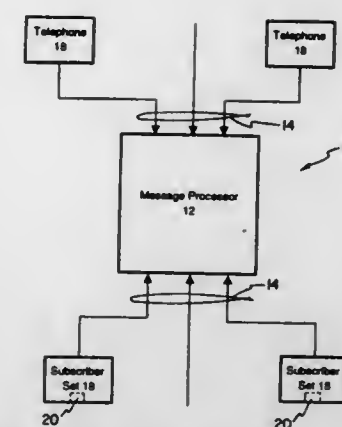
1. A cellular telephone comprising:  
 a speaker;  
 a microphone;



voice channel establishing means for opening a voice channel between the cellular telephone and a source telephone requesting communications with the cellular telephone without opening said speaker and said microphone of the cellular telephone such that voice communications are prevented between the source telephone and the cellular telephone;  
 data receiving means, responsive to said voice channel establishing means, for receiving modulated data via the open voice channel from the source telephone without opening said speaker and said microphone of the cellular telephone;  
 demodulating means, responsive to said data receiving means, for processing the received data without opening said speaker and said microphone of the cellular telephone;  
 user input means for accepting user input of an alternative terminal identifier after receipt of the identity of the source telephone, wherein said alternative terminal identifier identifies an alternative terminal other than the cellular telephone;  
 voice communications routing means, responsive to said demodulating means and said user input means, for transmitting signals via the open voice channel indicative of the alternative terminal other than the cellular telephone and for transferring the communications request to the alternative terminal other than the cellular telephone such that the user of the cellular telephone is permitted to select the alternative terminal other than the cellular telephone based upon the identity of the source telephone without opening said speaker and said microphone and without establishing voice communications with the source telephone;  
 data processing means, responsive to said demodulating means, for determining if the source telephone has requested voice communications with the cellular telephone;  
 alerting means, responsive to said data processing means, for notifying the user of the cellular telephone, without establishing voice communications with the source telephone, that the source telephone has requested voice communications with the cellular telephone; and  
 timer means, associated with said demodulating means, for determining if the cellular telephone has received data from the source telephone within a predetermined time period after opening of the voice channel and, if no data is received within the predetermined time period, for prompting said alerting means such that the user of the cellular telephone is notified that the source telephone has requested voice communications therewith.

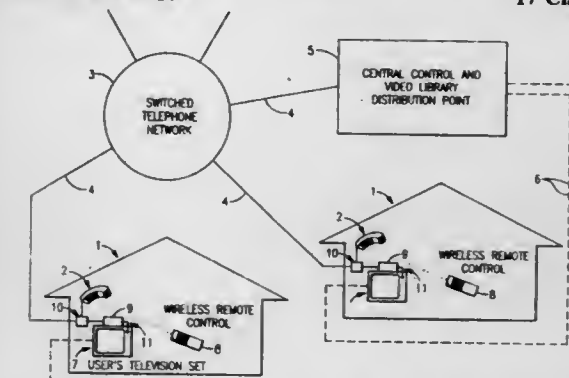
5,570,414  
**VOICE MESSAGE KEEPSAKE SYSTEM**  
 Geoffrey S. Stern, Westport, Conn., assignor to Starbro Communications, Inc., Westport, Conn.  
 Division of Ser. No. 371,755, Jan. 12, 1995, Pat. No. 5,490,206, which is a division of Ser. No. 94,292, Jul. 19, 1993, Pat. No. 5,425,078. This application Jan. 16, 1996, Ser. No. 586,599  
 Int. Cl.<sup>6</sup> H04M 1/64  
 U.S. Cl. 379—67  
 8 Claims

1. In a system for recording a purchasing customer's voice message in a voice message keepsake provided by a vendor, the combination of:



a voice message processor comprising:  
 a plurality of communication links capable of receiving calls transmitted over a public communication network; and  
 recording means responsive to receipt of a customer's call on one of said communication links for recording the customer's voice message in association with a code provided by the customer; and  
 a subscriber set co-located with said vendor and remote from said message processor, comprising:  
 means for communicating with said message processor via one of said communication links to receive voice messages previously recorded by said recording means;  
 and  
 keepsake recording means electrically communicating with said means for communicating and said voice message keepsake for recording thereon a voice message received by said means for communicating.

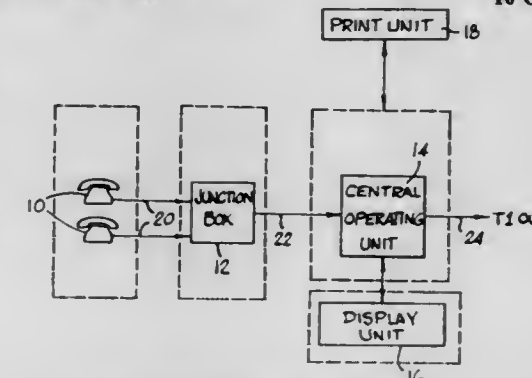
5,570,415  
**VIDEO PROGRAMMING AND STORAGE CONTROL USING THE TELEPHONE NETWORK**  
 Paul King, and Alton O. Stretton, both of Regina, Canada, assignors to Sasktel, Regina, Canada  
 Continuation of Ser. No. 241,458, May 11, 1994, abandoned, which is a continuation of Ser. No. 752,037, Aug. 29, 1991, abandoned. This application Jan. 9, 1995, Ser. No. 370,835  
 Int. Cl.<sup>6</sup> H04M 1/100  
 U.S. Cl. 379—110  
 17 Claims



1. A television and telephone control apparatus comprising:  
 a receiver for detecting encoded user command signals and encoded data signals transmitted by a wireless remote control transmitter and for transmitting the encoded user command signals and encoded data signals;  
 a processor for  
 i) receiving the encoded user command signals and encoded data signals from the receiver;

- ii) interpreting the encoded user command signals and encoded data signals to determine a specified destination of the encoded user command signals and of the encoded data signals;
  - iii) translating the encoded user command signals into command signals having a form understood by apparatus at the specified destination;
  - iv) translating the encoded data signals into data signals having a form for receiving and understanding by the specified destination apparatus;
  - v) transmitting the translated command signals and translated data signals to the specified destination; and,
- a telephone terminal apparatus for connection to a telephone network, the telephone terminal apparatus being connected to the processor for receiving command signals and data signals from the processor, and responsive to unique predetermined command signals for establishing, maintaining and terminating a telephone connection over the telephone network, the telephone terminal apparatus also for transmitting data signals received from the processor over the telephone network, wherein the telephone terminal apparatus includes a multi-frequency dialling tone converter for converting data signals received from the processor into multi-frequency dialling tone signals for transmission over the telephone network.

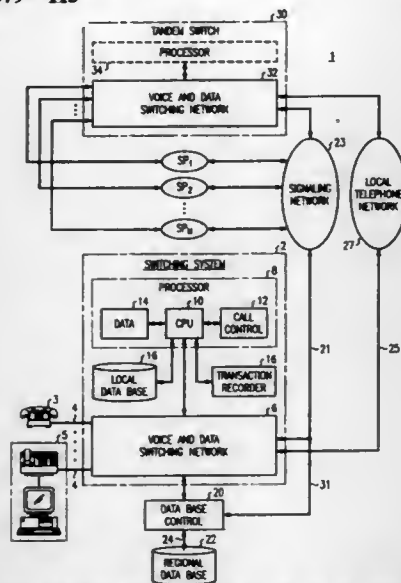
5,570,416  
**CALL CENTER MANAGEMENT SYSTEM**  
 Jeffrey R. Kroll, Fair Lawn, N.J., assignor to ComTel Debit Card Limited, L.L.C., Lyndhurst, N.J.  
 Filed Aug. 30, 1994, Ser. No. 298,377  
 Int. Cl.<sup>6</sup> H04M 1/500; 1/700; 1/100  
 U.S. Cl. 379—114  
 10 Claims



7. A call center management system comprising:  
 a plurality of telephones operatively connected to a central operating unit which includes an information storage device, credit receiving means within said central operating unit for receiving a deposit of a telephone usage credit for usage of a particular telephone from among the plurality of telephones, and  
 calculating means for continuously recalculating the particular telephone's usage and continuously subtracting the usage from the usage credit to determine an unused portion of the credit,  
 wherein said central operating unit selectively activates the particular telephone upon receiving the telephone usage credit, and said central operating unit selectively deactivates the particular telephone upon depletion of the credit or upon request.



**5,570,417**  
**SYSTEM FOR AUTOMATICALLY PROVIDING CUSTOMER ACCESS TO ALTERNATIVE TELEPHONY SERVICE PROVIDERS**  
 Charles C. Byers, Aurora, Ill., assignor to Lucent Technologies Inc., Murray Hill, N.J.  
 Filed Mar. 28, 1995, Ser. No. 412,248  
 Int. Cl.<sup>6</sup> H04M 15/00; 7/00  
 U.S. Cl. 379—115 20 Claims

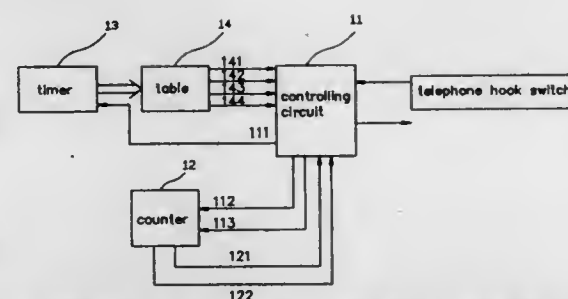


1. In a telecommunications network having at least one switching system connected to a plurality of calling stations, a method of automatically routing a call from one of the plurality of calling stations to a selected one of a plurality of service providers accessible from the switching system, said selected service provider offering the lowest cost service for carrying the call, comprising the steps of:

storing in a data base rate information regarding said plurality of service providers and said plurality of calling stations, said data base being associated with said switching system such that it is accessible by all calling stations;  
 receiving the call in said switching system;  
 before accessing the data base, determining if accessing the data base is economically justified for the call;  
 accessing said data base responsive to receiving the call;  
 retrieving from said data specific rate information associated with said call;  
 determining the selected one of said plurality of service providers based on said specific rate information; and  
 routing the call through said selected one of said service provider.

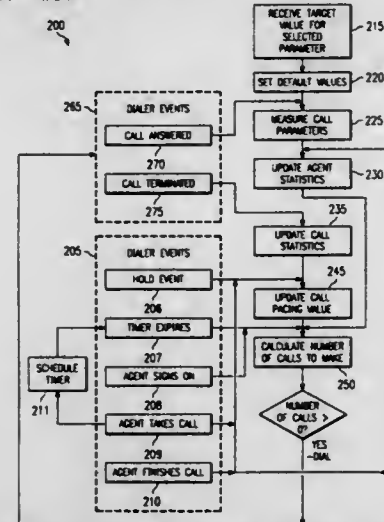
**5,570,418**  
**DEVICE FOR DETECTING OPERATION STATE OF TELEPHONE HOOK SWITCH**  
 Jui-Kuang Wu, Mao-Sung Chen, and Meng-Tsang Wu, all of Hsin-Chu, Taiwan, assignors to Winbond Electronics Corporation, Hsin-Chu, Taiwan  
 Continuation of Ser. No. 245,800, May 19, 1994, abandoned.  
 This application Jun. 1, 1995, Ser. No. 457,908  
 Int. Cl.<sup>6</sup> H04M 3/22; 1/00; 3/00; 1/66  
 U.S. Cl. 379—164 14 Claims

1. A device for detecting an operation state of a telephone hook switch for selectively preventing hook switch dialing in a telephone set, said device comprising:  
 a timer for producing intervals of different predetermined durations and outputting pulses, each of said pulses being indicative of a completion of producing a corresponding interval of said intervals;



a controlling circuit electrically connected to telephone hook switch and adapted to generate a starting signal for said timer in response to said telephone hook switch going from an on-hook operation state to an off-hook operation state, and an enabling signal and a clearing signal in response to said pulses; and  
 a counter electrically connected to said controlling circuit and adapted to start counting upon receiving said enabling signal and to be zeroed upon receiving said clearing signal, said counter outputting a signal to said controlling circuit for preventing a telephone having said telephone hook switch from being successfully dialed when said counter has counted up to a predetermined reference value defining a number of dial pulses forbidden to be dialed by virtue of said telephone hook switch.

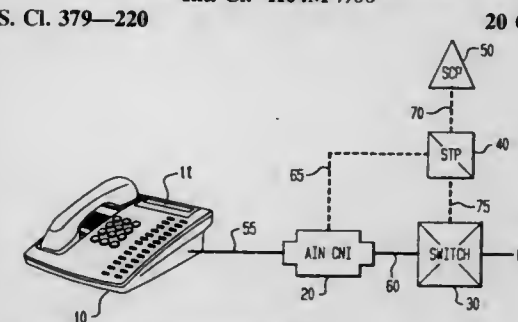
**5,570,419**  
**SYSTEM AND METHOD FOR AN IMPROVED PREDICTIVE DIALER**  
 Ellis K. Cave, Garland; Larry P. Ammann, Richardson, and Christopher P. Zimmer, Plano, all of Tex., assignors to InterVoice Limited Partnership, Reno, Nev.  
 Filed Oct. 13, 1995, Ser. No. 543,010  
 Int. Cl.<sup>6</sup> H04M 3/42; 15/00; 3/00  
 U.S. Cl. 379—216 14 Claims



1. A call pacing system for initiating outbound telephone calls on a plurality of telephone lines coupled to an automated telephone system, said telephone calls to be handled by one or more telephone agents connected to said telephone system, said call pacing system comprising:  
 predictive dialing circuitry for initiating outbound calls from said telephone system according to a call pacing delay;  
 computer input means for receiving a target value for a first parameter selected from a plurality of operating parameters of said telephone system;  
 monitoring circuitry for measuring said plurality of operating parameters;  
 a control processor coupled to said computer input means and said monitoring circuitry for calculating and updating a plurality of averages of said operating parameters, and compar-

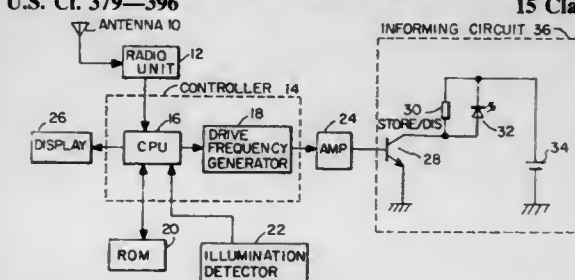
ing a selected one of said averages corresponding to said first parameter to said target value in order to detect a difference between said selected average and said target value, said comparing occurring substantially concurrent with said measuring said plurality of operating parameters; and  
 adjustment means coupled to said predictive dialing circuitry and said control processor for increasing or decreasing said call pacing delay, wherein said adjustment means increases or decreases said call pacing delay so as to decrease the detected difference between said selected average and said target value.

**5,570,420**  
**CUSTOMER PREMISE EQUIPMENT NETWORK INTEGRATOR**  
 James R. Bress, Neptune, and Barry K. Schwartz, Stockton, both of N.J., assignors to Bell Communications Research, Inc., Morristown, N.J.  
 Filed Mar. 1, 1994, Ser. No. 204,106  
 Int. Cl.<sup>6</sup> H04M 7/06  
 U.S. Cl. 379—220 20 Claims



1. A telephone network, comprising:  
 customer premises equipment ("CPE");  
 a switch;  
 a service transfer point ("STP") connected to the switch;  
 a service control point ("SCP") connected to the STP; and  
 a CPE network integrator (CNI) connected to the CPE, the switch, and the STP, the CNI including:  
 means for detecting network call progress tones;  
 means for detecting local CPE events;  
 means for inferring a network state from the network call progress tones and local CPE events; and  
 means for processing a telephone call based on an inferred network state.

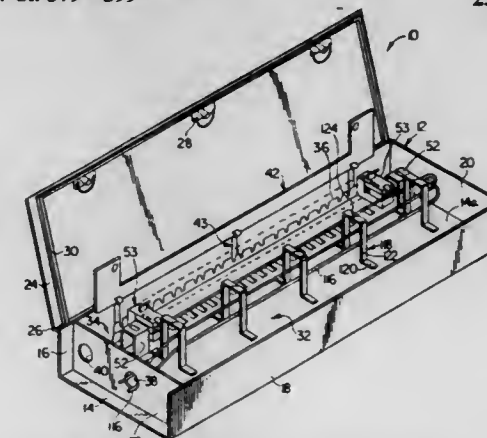
**5,570,421**  
**METHOD AND APPARATUS FOR CONTROLLING THE DRIVE FREQUENCY OF A LED**  
 Masaaki Morishima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan  
 Filed Jul. 25, 1994, Ser. No. 279,794  
 Claims priority, application Japan, Jul. 23, 1993, 5-183109  
 Int. Cl.<sup>6</sup> H04M 1/00  
 U.S. Cl. 379—396 15 Claims



1. A call informing device comprising:  
 informing means for informing a user of an incoming call; and  
 a drive frequency controller, coupled to said informing means, for controlling a drive signal supplied to said informing

means in response to ambient light of said call informing device, wherein said informing means comprises:  
 a light emitting element;  
 supplying means for supplying electric current to said light emitting element; and  
 on-off switching means for controlling said supplying means so as to vary said electric current to said light emitting element based on said ambient light.

**5,570,422**  
**TELEPHONE NETWORK INTERFACE DEVICE**  
 John J. Napiorkowski, Cape Elizabeth; Thomas W. Kroll, Portland; Boyd G. Brower, Gorham; Robert A. Crane, Windham; Walter K. Butler, III, Standish; Mark P. Cote, Springvale; James G. Beahm, Westbrook, and Nils P. Mickelson, Buxton, all of Me., assignors to Slecro Puerto Rico, Inc., Hickory, N.C.  
 Continuation-in-part of Ser. No. 956,144, Oct. 5, 1992, Pat. No. 5,333,193, Ser. No. 956,516, Oct. 5, 1992, Pat. No. 5,479,505, Ser. No. 956,531, Oct. 5, 1992, Pat. No. 5,416,837, and Ser. No. 956,746, Oct. 5, 1992, each which is a continuation-in-part of Ser. No. 523,457, May 15, 1990, Pat. No. 5,153,910. This application Mar. 11, 1993, Ser. No. 29,592  
 Int. Cl.<sup>6</sup> H04M 1/00  
 U.S. Cl. 379—399 25 Claims



1. A telephone network interface device comprising:  
 a housing having an opening to the interior thereof, said housing interior containing a telco wiring portion and a subscriber portion,  
 a plurality of network termination modules removably secured to said housing in stacked, side-by-side relation substantially within the subscriber portion thereof,  
 means in said housing for accessing the telco wiring portion thereof with telephone company wiring,  
 means in said housing for accessing the subscriber portion thereof with subscriber wiring connecting with said plurality of network termination modules,  
 means forming a ground bus electrically connecting all of said plurality of network termination modules, and  
 cover means effective to restrict access to said telco wiring portion of said housing including a pair of covers and means for mounting said covers for independent pivotal movement with respect to said housing, one of said covers being sized to operably close said housing opening, and the other of said covers being sized to operably close only said telco wiring portion of said housing interior.

5,570,423

## METHOD OF PROVIDING ADAPTIVE ECHO CANCELLATION

Michael Walker, Baltmannsweller, and Hans-Jürgen Matt, Remseck, both of Germany, assignors to Alcatel N.V., Rijswijk, Netherlands

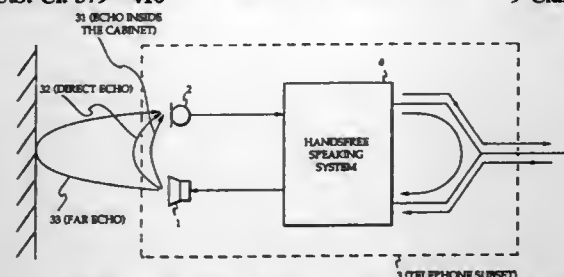
Filed Aug. 25, 1995, Ser. No. 519,303

Claims priority, application Germany, Aug. 25, 1994, 44 30 189.8

Int. Cl.<sup>6</sup> H04B 3/20; H04M 9/08

U.S. Cl. 379-410

9 Claims



1. A method of providing adaptive echo cancellation in a transmission system comprising an echo canceller with a finite impulse response (FIR) filter (5), with which expected echoes are simulated and having an output signal for subtraction from a useful signal affected by echo, the FIR filter coefficients ( $c_1 \dots c_N$ ) having values determined by a normalized least mean square (NLMS) algorithm characterized in

that a step width ( $\alpha$ ) introduced in the NLMS algorithm is controlled in dependence upon ambient conditions of a signal source (1) and a signal sink (2) at a near end of the transmission system, upon disturbance variables superimposed on the useful signal, and upon efficiency of the echo canceller,

that from the value of a greatest filter coefficient ( $c_{max}$ ) of the FIR filter (5), a normalization quantity is determined for the FIR filter and, thus, for all the filter coefficients ( $c_1 \dots c_N$ ) of the FIR filter (5) such that the values of the filter coefficients ( $c_1 \dots c_N$ ) are automatically dynamically scaled and that said values lie within a range of defined limits, and

that from a time interval between the greatest filter coefficient ( $c_{max}$ ) of the FIR filter (5) and a beginning of an excitation of a signal in a transmit direction, a shortest signal propagation time ( $t_{sk}$ ) from the signal source (1) to the signal sink (2) is determined, an effective time range of the echo canceller is determined therefrom, and this effective time range is used to estimate a value (dlm) for a residual coupling signal.

5,570,424

## SOUND EFFECTOR CAPABLE OF IMPARTING PLURAL SOUND EFFECTS LIKE DISTORTION AND OTHER EFFECTS

Toshinori Araya, and Akio Suyama, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Nov. 24, 1993, Ser. No. 157,625

Claims priority, application Japan, Nov. 28, 1992, 4-341382; Nov. 28, 1992, 4-341383

Int. Cl.<sup>6</sup> H03G 3/00

U.S. Cl. 381-61

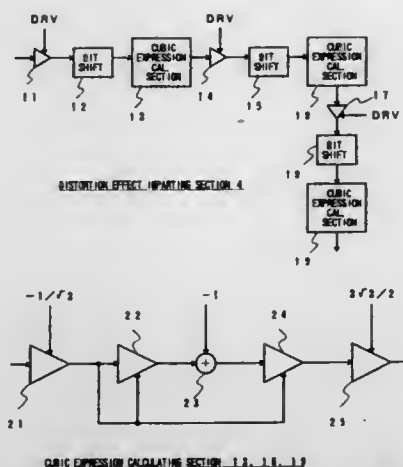
3 Claims

3. A method of digitally processing an analog input sound signal to provide an analog output signal having a distortion effect, the method comprising:

converting the analog input sound signal into a digital sound signal;

multiplying the digital sound signal by a distortion control coefficient to provide a multiplied digital signal having a predetermined number of digital bits that is limited to a numerical value range that corresponds to the predetermined number of digital bits;

performing a predetermined multi-degree expression calculation on the multiplied digital signal to provide a digital output



signal, wherein the numerical value range of said multiplied digital signal is limited to provide an input to a specific portion of the multi-degree expression that provides a smooth distortion characteristic, wherein the multi-degree expression is a cubic expression; and converting the digital output signal from into said analog signal having a distortion effect,

wherein the step of performing a predetermined multi-degree expression calculation on the multiplied digital signal includes the steps of:

multiplying said multiplied digital signal by a first constant to provide a first scaled digital signal;

squaring the first scaled digital signal to provide a squared digital signal;

adding a second constant to the squared digital signal to provide a summed digital signal;

multiplying the summed digital signal by the first scaled digital signal to provide a second scaled digital signal; and

multiplying said second scaled digital signal by a third constant to provide the digital output signal.

5,570,425

## TRANSDUCER DAISY CHAIN

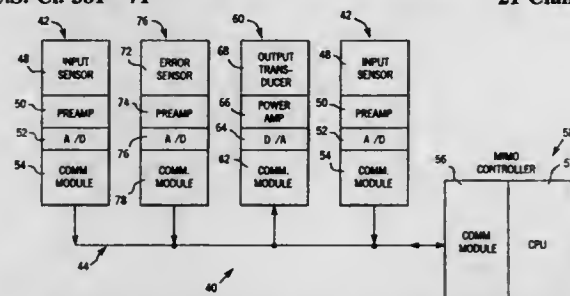
Seth D. Goodman; Larry J. Eriksson, both of Madison; Douglas E. Melton, Stoughton, and Edward R. Braun, Madison, all of Wis., assignors to Digisonix, Inc., Middleton, Wis.

Filed Nov. 7, 1994, Ser. No. 335,456

Int. Cl.<sup>6</sup> A61F 11/06; H03B 29/00

U.S. Cl. 381-71

21 Claims



1. An adaptive multi-channel active acoustic attenuation system for attenuating an input acoustic wave, comprising:

one or more output nodes, each output node including a network interface and an actuator for introducing a canceling acoustic wave in response to a correction signal received by the network interface, the canceling acoustic wave attenuating the input acoustic wave to yield an attenuated output acoustic wave;

one or more error sensor nodes, each error sensor node including an error sensor for sensing the output acoustic wave and providing a respective error signal, and a network interface for transmitting the error signal;

a controller having a network interface that receives the one or more error signals and transmits the one or more correction signals to a respective output node, the controller also having a central processing unit that generates the one or more correction signals; and

a control network for controlling the transmission and receipt of signals by each network interface.

5,570,426

## METHOD AND APPARATUS FOR INTRACRANIAL NOISE SUPPRESSION

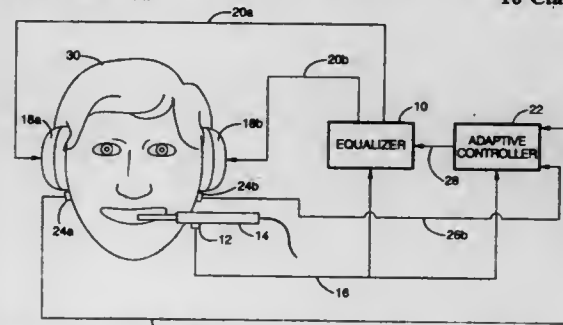
William A. Gardner, 6950 Yount St., Yountville, Calif. 94599

Filed Dec. 7, 1994, Ser. No. 351,004

Int. Cl.<sup>6</sup> A61F 11/06; H03B 29/00

U.S. Cl. 381-71

10 Claims



9. A method for suppressing intracranial noise generated by a medical instrument, comprising the steps of:

(a) sensing mechanical vibration signals generated by a medical instrument;

(b) sensing, with a transducer attached to the head of a patient, intracranial vibration signals induced by said medical instrument in the patient;

(c) processing said mechanical and intracranial vibration signals and generating equalizing signals which suppress said intracranial vibration signals;

(d) adapting said equalizing signals to changes in said mechanical and intracranial vibration signals; and

(e) transmitting said equalizing signals to said patient.

5,570,427

## MUTING CONTROL CIRCUIT

Kei Nishioka, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 898,459, Jun. 15, 1992, abandoned.

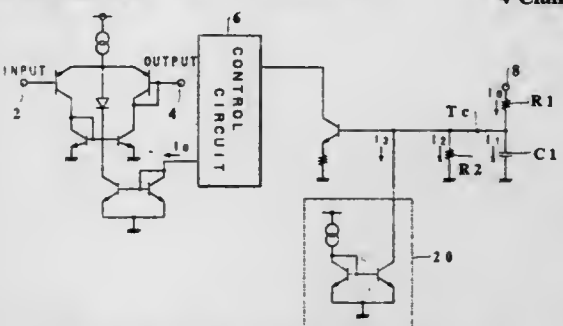
This application Jul. 11, 1994, Ser. No. 273,186

Claims priority, application Japan, Nov. 20, 1991, 3-304697

Int. Cl.<sup>6</sup> H04B 15/00

U.S. Cl. 381-94

4 Claims



3. A method for muting control comprising the steps of: charging and discharging a capacitor through a resistance by applying first and second differing potentials; applying a voltage across said capacitor to a controlling input terminal of a control circuit;

initiating a muting control output current from said control circuit when said voltage across said capacitor exceeds a first threshold;

increasing gradually said muting control output current as said voltage across said capacitor increases;

decreasing gradually said muting control output current as said voltage across said capacitor further increases;

terminating said muting control output current when said voltage across said capacitor exceeds a second threshold; and

applying a predetermined compensating current to said capacitor, to said compensating current effective to decrease a charge rate during said charging of said capacitor and increase a discharge rate during said discharging of said capacitor.

5,570,428

## TRANSDUCER ASSEMBLY

Peter L. Madaffari, Camden, and James S. Collins, Lincolnville, both of Me., assignors to Tibbetts Industries, Inc., Camden, Me.

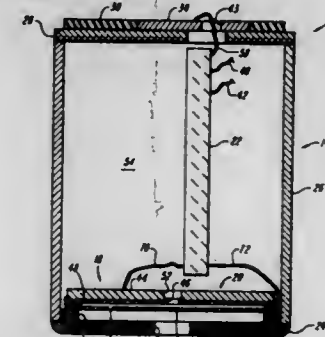
Continuation of Ser. No. 313,371, Sep. 27, 1994, abandoned.

This application May 23, 1995, Ser. No. 447,725

Int. Cl.<sup>6</sup> H04R 25/00

U.S. Cl. 381-191

3 Claims



1. A transducer assembly having, in combination,

a subassembly comprising a faceplate having a pair of opposed major surfaces bounded by a lateral edge and a ring shaped ridge spaced inwardly of said edge and surrounding a central portion of the face plate, said ridge extending from one of said surfaces in a direction normal thereto and terminating in an extremity of the face plate in said direction formed as a closed loop mounting surface lying in a plane spaced from and generally parallel to said central portion, said central portion having an aperture therethrough, said subassembly further comprising a flexible diaphragm having a metalized surface and extending over and secured at its periphery to said mounting surface,

transducer means secured to the periphery of the diaphragm and comprising a backplate, an electret film on the backplate facing the diaphragm and spacer means between the diaphragm and said film, and

a tubular sleeve having one end extending over and laterally externally to said ridge and being secured to the face plate.

5,570,429

## AUDIO TRANSDUCER WITH FLEXIBLE FOAM ENCLOSURE

Paul W. Paddock, McMinnville, Oreg., assignor to Lineaum Corporation, Portland, Oreg.

Continuation of Ser. No. 986,803, Dec. 8, 1992, abandoned.

This application Feb. 3, 1995, Ser. No. 384,380

Int. Cl.<sup>6</sup> H04R 25/00

U.S. Cl. 381-202

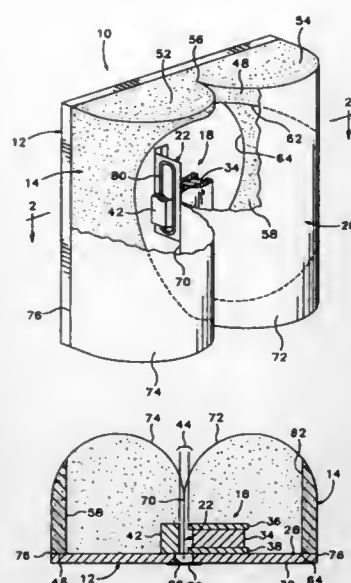
28 Claims

1. An audio transducer comprising:

a rigid frame;

a magnetic assembly attached to the frame and defining a magnet gap;





a flexible sheet diaphragm having a pair of curved expanses;  
a coil attached to the diaphragm, at least a portion of the coil being suspended within the magnet gap such that current flowing through the coil generates motion of the coil and at least a portion of the diaphragm relative to the frame; and  
a flexible diaphragm form attached to the frame and having a form function to support and shape the flexible diaphragm, the diaphragm form having a front curvilinear surface including a middle portion from which said curved expanses extend and to which the diaphragm is attached so that the diaphragm conforms to the curvilinear surface.

5,570,430

# METHOD FOR DETERMINING THE CONTOUR OF AN IN VIVO ORGAN USING MULTIPLE IMAGE FRAMES OF THE ORGAN

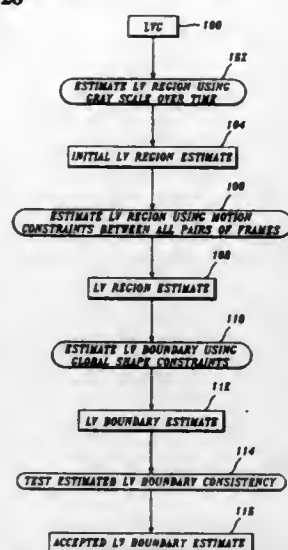
Florence H. Sheehan, Mercer Island; Robert M. Haralick, and Chang-Kyu Lee, both of Seattle, all of Wash., assignors to University of Washington, Seattle, Wash.

Filed May 31, 1994, Ser. No. 251,733

Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382—128

22 Claims



1. A method for automatically determining a contour of an internal organ based upon digital image data of a region in which the organ is disposed, said image data representing a sequence of image frames of the region made over an interval of time during which a wall of the organ has completed at least one cycle of

movement, the wall of the organ undergoing repetitive cycles of movement as part of the organ's physiological function, each image frame of said sequence of image frames comprising a plurality of pixels, said method comprising the steps of:

- developing an initial estimate of a region bounded by the contour of the organ in each image frame of the sequence, based upon a comparison of the image data with parameters derived from training data that were previously produced through manual evaluation of a plurality of image frames over a corresponding cycle for each of a plurality of corresponding organs in other individuals, said parameters derived from the training data being used to assign classes to the pixels comprising each of the image frames of the sequence, said classes indicating pixels that are most likely inside the contour of the organ in each image frame; and
- using boundary motion data that were previously developed through manual evaluation of the corresponding organs in other individuals, refining the initial estimate of the region in each image frame of the sequence to determine the contour, said boundary motion data establishing an allowed range of motion of the contour between subsequent image frames of the sequence.

5,570,431

# PROCESS AND APPARATUS FOR AUTOMATICALLY CHARACTERIZING, OPTIMIZING AND CHECKING A CRACK DETECTION ANALYSIS METHOD.

Hervé, P. R. Gillard, Viry Chatillon, and Véronique H. M. P. Prejean-Lefevre, Sceaux, both of France, assignors to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation "Snecma", Paris, France

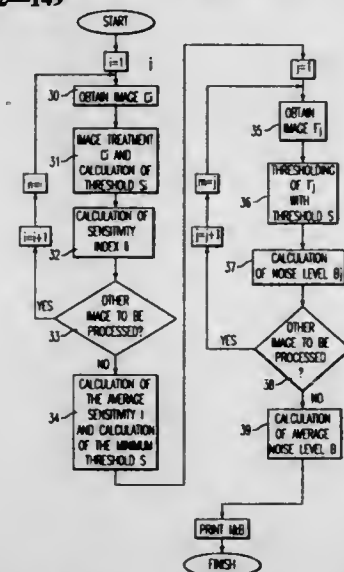
Filed Oct. 20, 1994, Ser. No. 326,386

Claims priority, application France, Oct. 20, 1993, 93 12486

Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382—149

7 Claims



1. A process for automatically characterizing, optimizing and checking a crack detection analysis method, comprising the steps of:

- selecting a control specimen;
- preparing said control specimen using an indicator product which reveals surface defects as in said analysis method;
- exposing said control specimen to illumination suited to said indicator product used in said preparation step;
- obtaining a grey level image of said control specimen; and
- processing said grey level image to eliminate artifacts and determine the detection sensitivity and background noise produced by said analysis method, including the substeps of:
  - correcting said grey level image in order to obtain a homogeneous background having a predetermined grey level;

filtering the corrected grey level image so as to combine discontinuous indications which correspond to a single crack;

calculating a threshold value and attributing a binary value to each pixel of the corrected and filtered grey level image compared to said threshold value in order to retain only those points of the image which are likely to correspond to a defect in the control specimen;

filtering the binary image in order to eliminate image points which are not associated with defects and have not been eliminated by said filtering of said corrected grey level image;

searching for multiple indications in order to detect close-together defects which have merged;

separating said indication of merged defects; and

determining a sensitivity index, based on dimensions and average luminance of defects.

5,570,432

# IMAGE CONTROLLER

Akio Kojima, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 99,307, Jul. 29, 1993, abandoned.

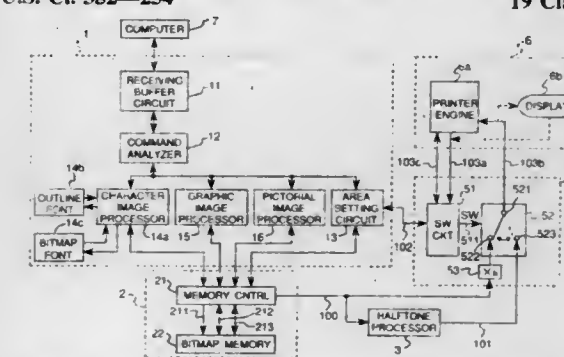
This application May 2, 1995, Ser. No. 434,325

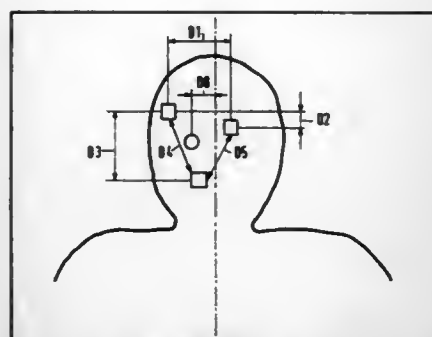
Claims priority, application Japan, Aug. 4, 1992, 4-20772

Int. Cl.<sup>6</sup> G06K 9/40

U.S. Cl. 382—254

19 Claims





form a difference picture comprising a plurality of difference blocks each comprising a plurality of picture elements each having a standard value, said standard values of said difference picture elements of each of said difference picture blocks are summed so as to form respective standard value sums, and said difference picture is mapped onto a status picture formed by status bits by comparing the standard value sum of each of said difference blocks to at least one threshold value and mapping those of said difference blocks having a standard value sum exceeding said at least one threshold value onto a status bit having a first binary value, and mapping those of said difference blocks having a standard value sum not exceeding said at least one threshold onto a status bit having a second binary value which is inverse to said first binary value, said circuit arrangement comprising:

- transforming means for transforming a first area of said status picture comprising first status bits having said first binary value into a unidimensional feature function in such a manner that the total number of these status bits within a line or a column of the status picture is determined;
- convolution means for standardizing said unidimensional feature function by convoluting said feature function with a second function so as to form a convolution integral and to supply a recognition signal when said current convolution integral corresponds to ideal values within predetermined tolerance limits; and
- marking means for determining, when said recognition signal is present, the center point of each line of said first area of said status picture so as to determine a vertical center axis, and to mark a plurality of points of said status picture located within a predetermined face area, which is cut in half by said center axis.

5,570,435

## SEGMENTATION OF TEXT STYLES

Dan S. Bloomberg, Palo Alto, and M. Margaret Withgott, Los Altos, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 750,156, Aug. 26, 1991, Pat. No. 5,402,504, which is a continuation-in-part of Ser. No. 449,263, Dec. 8, 1989, abandoned, and Ser. No. 627,284, Dec. 13, 1990, Pat. No. 5,181,255. This application Dec. 28, 1994, Ser. No. 365,251

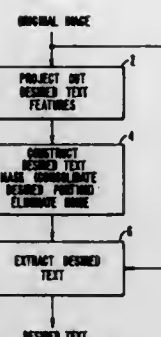
Int. Cl.<sup>6</sup> G06K 9/36

U.S. Cl. 382—283

23 Claims

1. A copy machine for copying characters of a first type style in a document, said document having at least characters of a first type style and characters of a second type style, said copy machine comprising:

- input means for inputting a binary text image of said document;
- means for identifying a region of said first type style programmed to:



- erode, during a first step, said input binary text image with a structuring element to provide a first destination image having a plurality of remaining pixels, said structuring element more likely to provide a hit in said region of said first type style than in other regions, and
- create a mask image from said plurality of remaining pixels of said first destination image in a step subsequent to said first step, said mask image substantially covering characters of said first type style; and
- means for printing characters substantially covered by said mask image.

5,570,436

## METHOD FOR INTERPOLATING MISSING PIXELS AND AN APPARATUS EMPLOYING THE METHOD

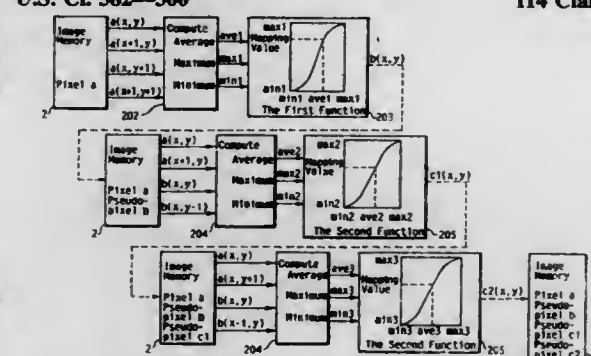
Tsumoru Fukushima, Katano; Hiroshi Onishi, Hirakata, and Haruo Yamashita, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 996,189, Dec. 23, 1992, Pat. No. 5,430,811. This application Dec. 8, 1994, Ser. No. 351,808

Claims priority, application Japan, Dec. 25, 1991, 3-343005 Int. Cl.<sup>6</sup> G06K 9/32

U.S. Cl. 382—300

114 Claims



1. An apparatus for interpolating image data, wherein a first image of four pixels is expanded into a second image and pseudo-pixels are computed to fill in pixel positions between the expanded four pixels, the apparatus comprising:

- means for storing into an image memory a first image in the form of a plurality of pixels, the plurality including the four pixels;
- means for generating a first function table with a first computer unit, the first function table representing a first monotonous increasing non-linear function;
- means for generating a second function table with a second computer unit, the second function table representing a second monotonous increasing non-linear function;

means for computing a first pseudo-pixel value, the first pseudo-pixel value being interpolated between the four pixels, which are diagonally adjacent to the first pseudo-pixel, the computation utilizing the first function table and determining an average, maximum, and minimum value of a plurality of the four pixels;

means for activating the first computing unit to write the first pseudo-pixel value into the image memory;

means for computing a second pseudo-pixel value, the second pseudo-pixel value being interpolated between two of the four pixels, which are not diagonally adjacent to the second pseudo-pixel, the computation utilizing the second function table and determining an average of a plurality of pixels including the two pixels and the first pseudo-pixel, and a maximum and a minimum value pixel of the plurality of pixels;

means for activating the second computing unit to write the first pseudo-pixel value into the image memory; and

means for forming a second image by adding the first and second pseudo-pixels to the first image, the first image being enlarged by a factor of two both lengthwise and breadthwise, the first pseudo-pixels being interpolated diagonally and the second pseudo-pixels being interpolated vertically and horizontally in a resulting enlarged first image to form the second image.

5,570,437

## APPARATUS FOR THE REMOTE MEASUREMENT OF PHYSICAL PARAMETERS

Erhard L. E. Kluth, and Malcolm P. Varnham, both of Alresford, United Kingdom, assignors to Sensor Dynamics, Ltd., Itchen Abbas, United Kingdom

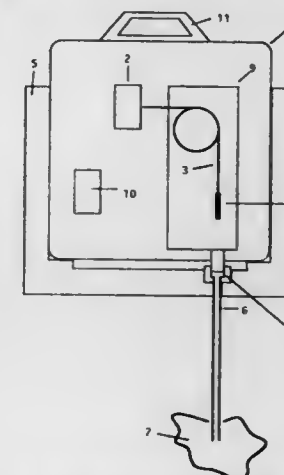
Filed Nov. 14, 1994, Ser. No. 340,023

Claims priority, application United Kingdom, Nov. 26, 1993, 9324334

Int. Cl.<sup>6</sup> G02B 6/00; G01L 1/24

U.S. Cl. 385—12

15 Claims



1. Apparatus for the remote measurement of physical parameters, which apparatus comprises sensing means for sensing one or more physical parameters, instrumentation means for interrogating the sensing means and making a measurement, cable means for communicating between the sensing means and the instrumentation means, container means for containing the sensing means and the cable means prior to installation of the sensing means, container holder means for providing a support for the container means at a convenient location, channel means for providing a channel between the container means and a measurement location where the channel is suitable for accepting the cable means and the sensing means, and cable installation means for installing the

sensing means and cable means from inside the container means into the channel means and placing the sensing means at the measurement location, the cable installation means comprising means for propelling fluid along the channel means.

5,570,438

## ACTIVE-MODE-LOCKING OPTICAL-FIBRE PULSED LASER GENERATOR HAVING A VARIABLE INSTANTANEOUS FREQUENCY

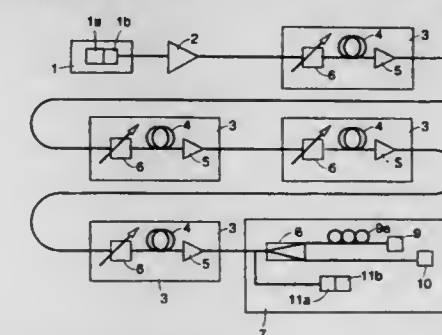
Flavio Fontana, Cormano, and Pierluigi Franco, Padova, both of Italy, assignors to Pirelli Cavi S.p.A., Milan, Italy

Filed May 31, 1995, Ser. No. 455,549

Claims priority, application Italy, Jun. 27, 1994, MI94A1327 Int. Cl.<sup>6</sup> G02B 6/28; H04B 10/04

U.S. Cl. 385—24

28 Claims



1. A high-transmission-speed optical connection comprising at least:

a laser source for generating pulsed optical signals of a predetermined wavelength having predetermined duration and spectral amplitude at the emission;

optical-fibre means having an end operatively connected to said laser source for receiving and transmitting said signals, said optical-fibre means having a chromatic dispersion at the wavelength of said source and an attenuation of predetermined unitary values,

a receiver operatively connected to the end of said optical-fibre means opposite to said laser source,

said optical-fibre means forming an optical fibre path included between the source and the receiver of such a length that a pulsed signal of the soliton type is subjected to a broadening or widening in time greater than 50%, by effect of said chromatic dispersion,

characterized in that said laser source comprises an active and harmonic mode-locking optical-fibre laser exhibiting a fibre length, filter pass-band and power in the cavity correlated with the length of said fibre path and establishing, at the emission, the duration and bandwidth of said pulses in such a manner that, on entering the receiver, the duration of said pulses is not more than 15% higher than the duration at the emission.

5,570,439

## OPTICAL WAVEGUIDE DEVICE AND OPTICAL TRANSMISSION SYSTEM

Tatemi Ido, and Hirohisa Sano, both of Kokubunji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 7, 1994, Ser. No. 178,678

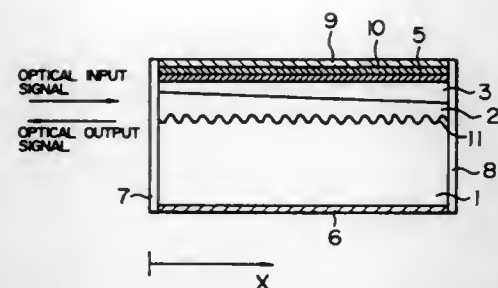
Claims priority, application Japan, Jan. 19, 1993, 5-006419 Int. Cl.<sup>6</sup> G02B 6/34

U.S. Cl. 385—37

4 Claims

1. An optical waveguide device comprising a semiconductor optical waveguide with a grating, wherein a Bragg diffraction wavelength  $\lambda_B$  of the grating is defined as





$\lambda_B = 2nw$ ;  
wherein  $n$  is an effective refractive index of said semiconductor optical waveguide and  $w$  is a pitch of said grating; and the optical waveguide device further comprising coatings applied on input and output end surfaces of said optical waveguide to control a transmissivity of light.

#### 5,570,440 OPTICAL WAVEGUIDING COMPONENT COMPRISING A BAND-PASS FILTER

Victor Mizrahi, Bedminster, N.J., assignor to AT&T Corp., Murray Hill, N.J.

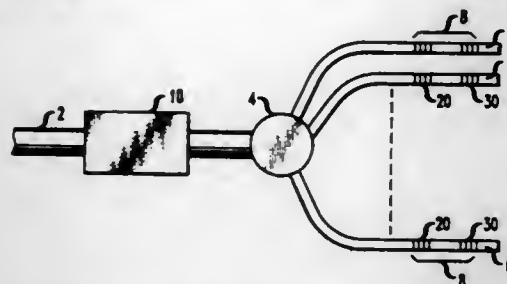
Division of Ser. No. 78,992, Jun. 17, 1993, Pat. No. 5,475,780.

This application Aug. 2, 1995, Ser. No. 510,161

Int. Cl. G02B 6/34; H04J 14/02

U.S. Cl. 385—37

14 Claims



1. Apparatus comprising an optical filter for selectively transmitting electromagnetic radiation within a passband of wavelengths that is bounded on respective sides by first and second stop bands of relatively low transmissivity, wherein:

- a) the filter comprises a glass waveguiding medium having a core characterized by a core refractive index;
- b) the filter further comprises a set of one or more Bragg gratings formed in the medium, each grating at least partly defined by a repetitive pattern of perturbations of the core refractive index;
- c) associated with the set of gratings are at least two wavelength bands of relatively low transmissivity;
- d) each of said low-transmissivity bands coincides with at least a portion of a respective one of the stop bands;
- e) at least one of the low-transmissivity bands is a reflection band of a Bragg grating;
- f) the passband is broad enough to substantially transmit a signal channel at least 5 Å wide;
- g) the transmission of at least some wavelengths in each of the low-transmissivity bands is at least 10 dB below the peak transmission in the passband; and
- h) the first and second stop bands are each broad enough to substantially exclude wavelengths over a range of at least 10 Å.

#### 5,570,441 CYLINDRICAL FIBER PROBES AND METHODS OF MAKING THEM

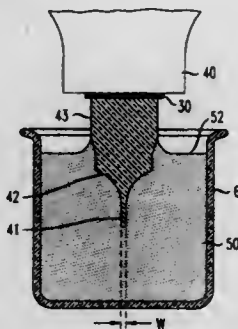
Robert W. Filas, Bridgewater, and Herschel M. Marchman, New Providence, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Continuation-in-part of Ser. No. 91,808, Jul. 15, 1993, abandoned. This application May 20, 1994, Ser. No. 247,165

Int. Cl. G02B 6/26

U.S. Cl. 385—43

13 Claims



1. A probe device comprising:  
a fiber having a relatively thick upper cylindrical portion terminating in a tapered portion that terminates in a relatively thin right cylindrical lower portion; the lower cylindrical portion having maximum width in the approximate range of 0.05 μm to 10 μm and terminating at its bottom extremity in an essentially planar end surface oriented perpendicular to the axis of the thin right cylindrical portion.

#### 5,570,442 DESIGN AND MANUFACTURE OF AN OPTIMIZED WAVEGUIDE-TYPE MULTIPLE BRANCHED STAR COUPLER

Mitsuo Arai, Kuniaki Jinnai, Hisashi Ohwada, and Yasunari Kawahata, all of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

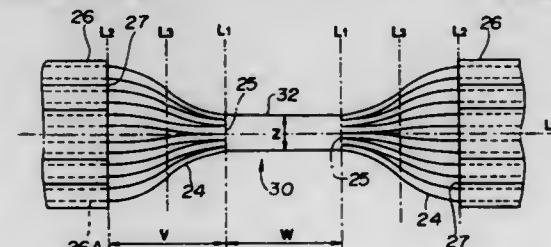
Filed Nov. 18, 1993, Ser. No. 154,038

Claims priority, application Japan, Nov. 19, 1992, 4-310335

Int. Cl. G02B 6/26

U.S. Cl. 385—46

20 Claims



1. An optical device having an optical transmission means which mixes a plurality of entering light signals, and then distributes and ejects the mixed light signals; said optical transmission means comprising:

an optical circuit in which a plurality of branched optical waveguides are connected to a light receiving side and a light ejecting side of a main optical waveguide, which mixes the entering light, wherein said optical circuit has the following characteristics:

$$X/Y \leq 0.8$$

$$40 \leq Z \leq W$$

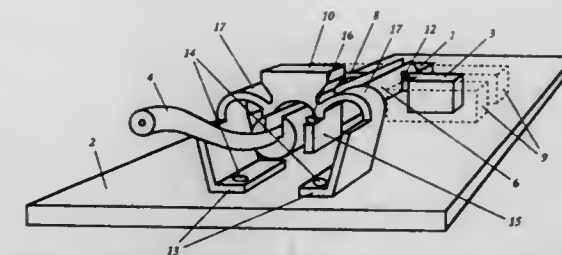
X: Width of said branched optical waveguide at its joint portion with said main optical waveguide,

Y: Width of said branched waveguide at its end on the terminal side,

W: Longitudinal length of the main optical waveguide (mm), and

Z: Cross-directional length of the main optical waveguide (mm),

wherein at least one of said branched optical waveguides has a slope of which a width is wider at its end on a terminal side than at its end on a side to be connected to the main optical waveguide and at least one of said branched optical waveguides comprises a bend with points of inflection.



#### 5,570,443 COMBINED BEAM WAVEGUIDE AND METAL CABLE PLUG CONNECTOR

Guntram May, Altdorf, and Jürgen Hitz, Oelsnitz, both of Germany, assignors to Framatome Connectors International, Paris, France

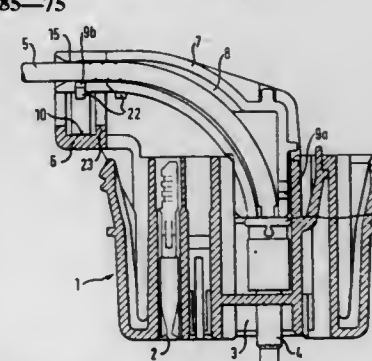
Filed Apr. 13, 1995, Ser. No. 421,268

Claims priority, application Germany, Apr. 13, 1994, 44 12 571.2

Int. Cl. G02B 6/36

U.S. Cl. 385—75

11 Claims



1. A combined beam waveguide and metal cable plug connector with an angled cable outlet, comprising:

- a housing;
- beam waveguide plugs and flat contact springs disposed on a plug side of said housing in contact chambers, and an outlet opening for cables at a rear of said housing;
- said opening for said cables comprising a channel having a base which is bent at an angle equal to or less than 90° to a plug axis and which is open toward a back of the plug connector;
- wherein said cables pass out of said housing through a U-shaped channel in said housing;
- a snap cap closing said channel at the rear and having lateral ducts in which beam waveguide cables are accommodated, said ducts ensuring that said cables are deflected with a radius which is non-damaging to said cables.

#### 5,570,444 METHOD OF OPTICALLY COUPLING OPTICAL FIBRES TO INJECTION LASERS

Adrian P. Janssen, and Alan Donaldson, both of Devon, United Kingdom, assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 12, 1995, Ser. No. 570,983

Claims priority, application United Kingdom, Dec. 12, 1994, 9425022

Int. Cl. G02B 6/36

U.S. Cl. 385—90

14 Claims

1. A method of securing the end of an optical fibre in position relative to an injection laser to provide substantially optimal optical coupling between the laser and the fibre, wherein the injection laser is secured to a substrate, wherein said one end of the optical fibre is secured to an elongate support member so that the tip of said one end of the fibre lies in the vicinity of one end of the support member, wherein said one end of the support member is

located between two slide members engaged with co-operating runners on the substrate, and wherein the position of the fibre relative to the substrate is adjusted to provide substantially optimal optical coupling between the laser and the fibre, which position is substantially maintained while both slide members are positioned minimally separated from contact with the support member and are then secured to the substrate, and also while the support member is then secured to the slide members.

#### 5,570,445 REUSABLE OPTICAL FIBER CONNECTOR ADAPTER WITH PLURALITY OF OPTICAL BARRIERS FOR ALL FIBER DELIVERY LASER SOURCES

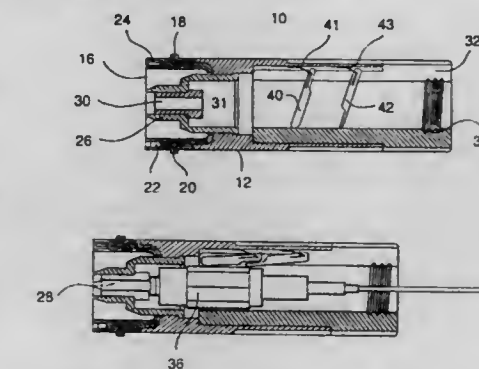
Marilyn M. Chou, King J. J. Yu, and Ken T. Yu, all of Oakland, Calif., assignors to Xintec Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 264,079, Jun. 22, 1994, Pat. No. 5,452,391. This application Jun. 29, 1995, Ser. No. 496,342

Int. Cl. G02B 6/36

U.S. Cl. 385—92

24 Claims



1. A reusable connector adapter for coupling any fiber optic transmittable laser source to a fiber optic laser delivery device, the laser source having an output port for transmitting laser energy, the fiber optic laser delivery device having a laser receiving end with a fiber connector at the laser receiving end, the fiber optic laser delivery device further having a fiber optic waveguide, the reusable connector adapter comprising:

a connector plug portion, the connector plug portion having a proximal end precisely shaped so as to couple efficiently with the laser source, the proximal end of the connector plug portion having a laser source attachment means such that the connector plug portion can be securely maintained adjacent to the output port of the laser source in an operative position, the connector plug portion further having a distal end, the connector plug portion further having a central hollow body portion intermediate the proximal end and the distal end for receiving and containing the fiber connector within the central hollow body portion in efficient optical communication with the laser source;

a fiber optic laser delivery device securing portion for removably maintaining and securing the fiber optic laser delivery device within the central hollow body portion of the connector plug portion;

a first optical barrier for preventing the laser energy from being transmitted; and

a second optical barrier for preventing the laser energy from being transmitted.

5,570,446

## ALIGNMENT AND CONTROL IN SPLICING OPTICAL FIBERS

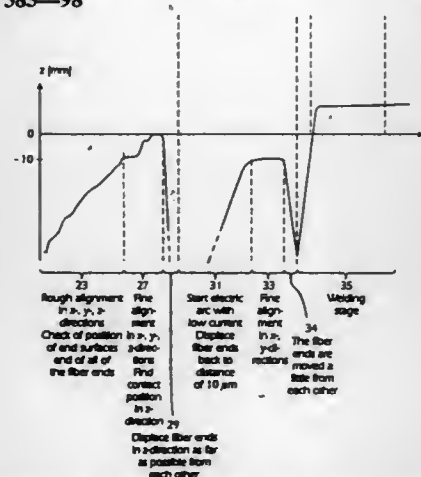
Wenxin Zheng, Solna, and Joakim Ström, Stockholm, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jun. 16, 1995, Ser. No. 491,571

Claims priority, application Sweden, Jun. 16, 1994, 9402127  
Int. Cl.<sup>6</sup> G02B 6/255

U.S. Cl. 385—98

16 Claims



1. A method for splicing ends of optical fibers, comprising the steps of:

moving the fiber ends to a first position with end surfaces extending in a cross plane substantially perpendicular to longitudinal directions of the fiber ends, placed opposite, adjacent, or engaging each other;

moving the fiber ends in the longitudinal directions to a second position where the end surfaces are located at distance from each other;

moving again the end surfaces in the longitudinal directions of the fiber ends towards each other to the first position and then supplying heat to a first region, including the region where the end surfaces were present when the fiber ends were located in the first position, so that outermost portions of the fiber ends gradually enter the heated first region;

increasing or intensifying, when the fiber ends again reach the first position, the heat supply to the first region to produce a melting of the outermost portions of the fiber ends and a fusioning of the fiber ends to each other making a fusion splice;

allowing the end portions to cool;

wherein, during the movement of the end surfaces towards each other, when the outermost portions of the fiber ends gradually enter the heated first region and before the fiber ends reach the first position, making an alignment of the fiber ends by means of movement of the fiber ends in relation to each other in at least one direction perpendicular to the longitudinal directions of the fiber ends, so that the longitudinal axes of the fiber ends will be positioned along substantially the same line.

5,570,447

## AQUEOUS FLUID CORE WAVEGUIDE

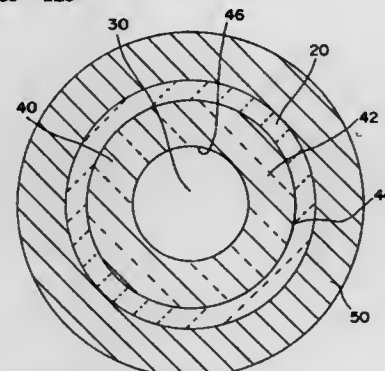
Su-Yi Liu, Sarasota, Fla., assignor to World Precision Instruments, Inc., Sarasota, Fla.

Filed Aug. 17, 1995, Ser. No. 516,158

Int. Cl.<sup>6</sup> G02B 6/20

U.S. Cl. 385—125

18 Claims



1. Light transmission means comprising: an aqueous fluid for transmitting light; capillary means defining a core region, said aqueous fluid occupying said core region, said capillary means comprising a wall defining interior and exterior surfaces, said capillary means being rigid and having a refractive index which is greater than or equal to the refractive index of said aqueous fluid, said aqueous fluid being in contact with said interior surface; and coating means for coating said exterior surface of said capillary means, said coating means having a refractive index which is less than the refractive index of said aqueous fluid.

5,570,448

## RARE EARTH ELEMENT-DOPED MULTIPLE-CORE OPTICAL FIBER, METHOD FOR FABRICATING THE SAME, AND OPTICAL AMPLIFIER USING THE SAME

Katsuyuki Imoto, Saitama-ken, and Kazuo Koya, Gunma-ken, both of Japan, assignors to Hitachi Cable, Ltd., and Shin-Etsu Chemical Co., Ltd., both of Tokyo, Japan

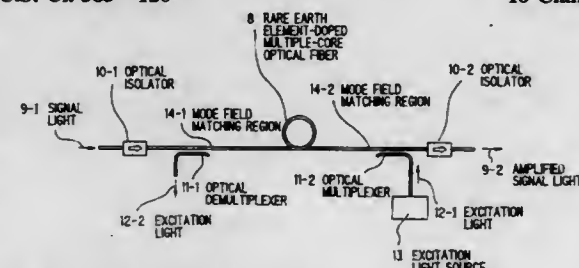
Filed Jun. 7, 1995, Ser. No. 476,445

Claims priority, application Japan, Jul. 27, 1994, 6-175366

Int. Cl.<sup>6</sup> G02B 6/02

U.S. Cl. 385—126

16 Claims



10. An optical amplifier, comprising: a rare earth element-doped multiple-core optical fiber of a predetermined length, said rare earth element-doped multiple-core optical fiber comprising at least three elementary optical fibers each comprising a core of a refractive index  $n_w$  having an outer diameter of  $D_w$ , and a cladding layer of a refractive index  $n_c$  ( $n_w > n_c$ ) having a thickness of  $t$  for covering said core, and a jacket layer of a refractive index  $n_j$  ( $n_w > n_j$ ) for covering said at least three elementary optical fibers, said core being doped with at least one rare earth element and Al of at least 1 weight %, and a value of  $(1+2t/D_w)$  defined by said outer diameter of  $D_w$  and said thickness of  $t$  being ranged to 1.1 to 2.5;

means for input of a signal light to an input end of said rare earth element-doped multiple-core optical fiber;

means for propagating an excitation light through said rare earth element-doped multiple-core optical fiber to amplify said signal light therein; and

means for output of said signal light thus amplified from an output end of said rare earth element-doped multiple-core optical fiber.

5,570,450

## JUNCTION AND MODULAR OPTICAL SHARING TERMINAL ASSEMBLY

Manuel F. Fernandez, and Jesus D. Cortijo, both of Madrid, Spain, assignors to Telefonica De España, S.A., Madrid, Spain

Continuation of Ser. No. 987,705, Dec. 9, 1992, abandoned.

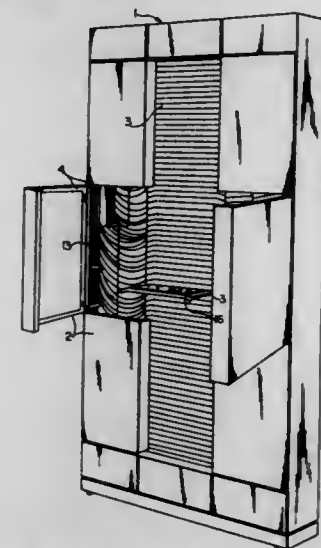
This application Aug. 15, 1994, Ser. No. 288,714

Claims priority, application Spain, Dec. 12, 1991, 9103757

Int. Cl.<sup>6</sup> G02B 6/36

U.S. Cl. 385—135

6 Claims



1. A junction and modular optical sharing terminal assembly comprising:

a vertically-extending frame;

a plurality of frame plates vertically mounted on said frame;

a plurality of horizontally-extending tray guides mounted on said frame plates, said tray guides being telescopic and being movable between a retracted position and a horizontally extended position;

a plurality of horizontal tray modules movable between a retracted position and a horizontally extended position, said tray modules comprising warehousing, junction, and connector trays, each of said tray modules having identical perimeters and having formed along opposite sides thereof identical anchoring bands, said anchoring bands removably resting on said tray guides;

a housing enclosing said frame, said frame plates, said tray guides, and said tray modules; and

a resilient trigger band mounted on each of said anchoring bands, said trigger bands releasably engaging said tray guides in said extended and retracted positions to lock said tray modules in said extended and retracted positions, respectively.

5,570,451

## IMAGE FORMING APPARATUS INCLUDING PLURAL IMAGE FORMING MEANS AND PLURAL RECORDING MEDIUM TRANSPORT PASSAGES

Katsuhiko Sakaizawa, Yasushi Satoh, both of Kawasaki; Yukihiro Ohzeki, and Yasunori Chigono, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1994, Ser. No. 324,504

Claims priority, application Japan, Oct. 21, 1993, 5-263527

Int. Cl.<sup>6</sup> G03G 15/00

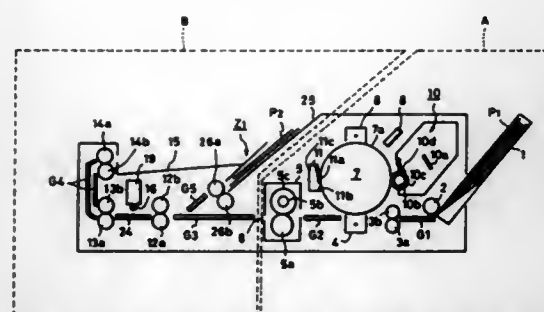
U.S. Cl. 355—202

63 Claims

1. An image forming apparatus for forming an image on a recording medium, comprising:

first image forming means for forming an image on the recording medium using an ink jet image forming method;





second image forming means for forming an image on the recording medium using an electrophotographic image forming method;

a first recording medium transport passage for discharging the recording medium out of the apparatus after the recording medium has passed through said first and second image forming means;

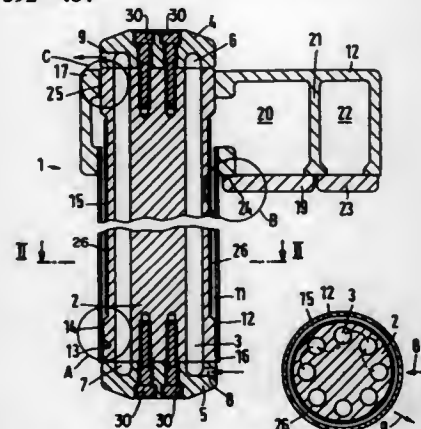
a second recording medium transport passage for discharging the recording medium out of the apparatus without passing the recording medium through said second image forming means after the recording medium has passed through said first image forming means; and

a third recording medium transport passage for discharging the recording medium out of the apparatus without passing the recording medium through said first image forming means after the recording medium has passed through said second image forming means.

**5,570,452**  
**FLUID HEATER WITH MAIN HOUSING AND SURROUNDING AUXILIARY HOUSING DEFINING A PRESSURE RESISTANT COMPARTMENT THEREBETWEEN**  
Wolfgang Kuhn, Ortstest Sende, Norbert Buchholz, and Reiner Schulte, both of Bielefeld, all of Germany, assignors to Böllhoff Verfahrenstechnik GmbH & Co., KG, Bielefeld, Germany

Filed Jan. 7, 1994, Ser. No. 178,429  
Claims priority, application Germany, Jan. 7, 1993, 43 00 163.7

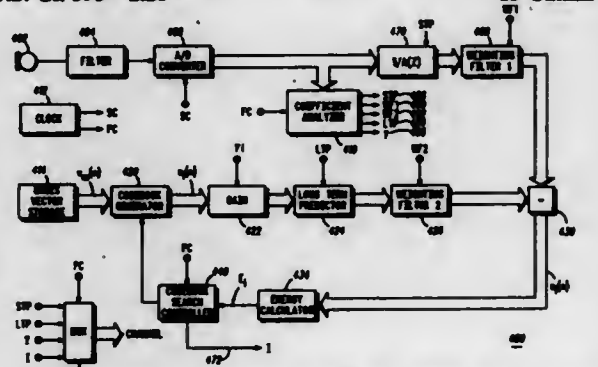
Int. Cl.<sup>6</sup> H05B 3/82; F24H 1/00  
U.S. Cl. 392—484 22 Claims



1. A continuous-flow heater, comprising a housing having a first part with at least one flow channel for a fluid to be heated, said first part having an outer surface, and a second part disposed adjacent to said first part, said second part having a wall including an inner surface which cooperates with said outer surface of said first part to define an encapsulated flame-proof, pressure-resistant compartment, said compartment communicating with the atmosphere, a non-combustible substance being disposed in said compartment; and a heating element, for the fluid, disposed substantially flush against one of said surfaces.

**5,570,453**  
**METHOD FOR GENERATING A SPECTRAL NOISE WEIGHTING FILTER FOR USE IN A SPEECH CODER**  
Ira A. Gerson, Schaumburg; Mark A. Jasluk, Chicago, and Matthew A. Hartman, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.  
Division of Ser. No. 21,364, Feb. 23, 1993, Pat. No. 5,434,947.  
This application May 4, 1995, Ser. No. 434,868  
Int. Cl.<sup>6</sup> G10L 9/14

U.S. Cl. 395—2.28 13 Claims



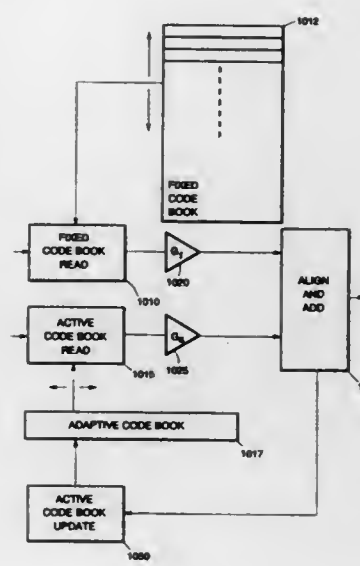
1. A method of speech coding for use in a digital speech coder, the method comprising the steps of:  
receiving speech data;  
producing excitation vectors in response to the received speech data;  
producing difference vectors in response to the speech data and the excitation vectors;  
generating coefficients for a Pth-order filter;  
generating coefficients for an interim filter including coefficients for a first F-order filter and a second Jth-order filter, each filter dependent upon said coefficients for said Pth-order filter;  
generating coefficients for a Rth-order model of said interim filter for use in a weighting filter, where  $R < F + J$ ;  
filtering the difference vectors of the digital speech coder using the coefficients for the Rth-order model of said interim filter, producing filtered difference vectors;  
choosing an excitation code in response to the filtered difference vectors; and  
transmitting the excitation code for subsequent decoding of the speech data.

**5,570,454**  
**METHOD FOR PROCESSING SPEECH SIGNALS AS BLOCK FLOATING POINT NUMBERS IN A CELP-BASED CODER USING A FIXED POINT PROCESSOR**  
Weimin Liu, Germantown, Md., assignor to Hughes Electronics, Los Angeles, Calif.

Filed Jun. 9, 1994, Ser. No. 257,831  
Int. Cl.<sup>6</sup> G10L 3/02; H04B 1/66

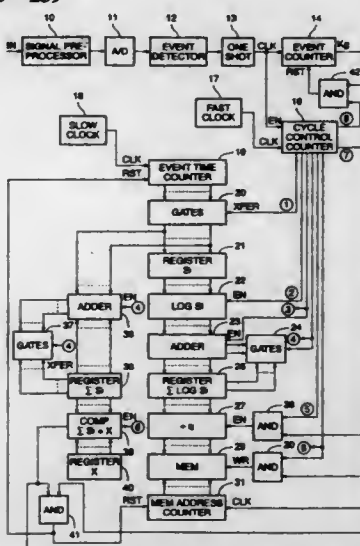
U.S. Cl. 395—2.32 12 Claims

1. In a CELP coder, a method of filtering a first plurality of blocks including a first plurality of amplitudes and a first scale, the method comprising the steps of:  
shifting each of said first plurality of blocks into a filter comprising a plurality of filter coefficients and a plurality of delays, each of said delays corresponding to at least one of an amplitude from a third block including a third plurality of amplitudes and a third scale; and  
calculating a second amplitude after each of the first plurality of amplitudes is shifted into the filter, the amplitude being a function of the third block, the filter coefficients and the shifted one of the first plurality of amplitudes, the second amplitude becoming part of a second plurality of amplitudes having a second scale.



**5,570,455**  
**METHOD AND APPARATUS FOR ENCODING SEQUENCES OF DATA**  
John F. Remillard, Chicago, Ill., assignor to Philosophers' Stone LLC, Cheyenne, Wyo.  
Filed Jan. 19, 1993, Ser. No. 5,734  
Int. Cl.<sup>6</sup> G10L 5/06

U.S. Cl. 395—259 10 Claims



1. In a speech compression system including an analog-to-digital converter, an electronic calculation unit, and an electronic memory device, a method for encoding an analog speech signal comprising the steps of:

- extracting, using the analog-to-digital converter and the electronic calculation unit, a first sequence of digital samples from said analog speech signal;
- summing, using the electronic calculation unit, each digital sample in the first sequence with the previous digital samples to obtain a cumulative sum sequence of sample point sums;
- determining, using the electronic calculation unit, the logarithm of each sample point sum in said sum sequence to obtain a sequence of logarithms;
- summing, using the electronic calculation unit, each logarithm with the previous logarithms in said sequence of logarithms to obtain a cumulative sequence of summed logarithms;
- obtaining, using the electronic calculation unit, a scaled average of the summed logarithms from step (d); and

(f) storing the scaled average obtained in said (e) step in the electronic memory device; and  
wherein said scaled average represents said analog speech signal in compressed form.

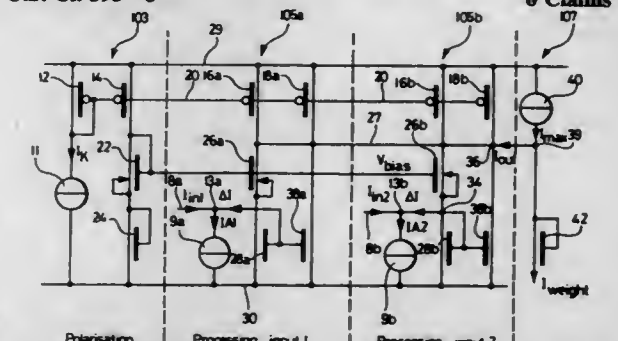
**5,570,456**  
**ANALOG CIRCUIT IMPLEMENTING A FUZZY LOGIC CONTROLLER**

Oliver Landolt, Neuchatel, Switzerland, assignor to CSEM Centre Suisse d'Electronique et de Microtechnique SA - Recherche et Developpement, Neuchatel, Switzerland  
Filed Mar. 18, 1994, Ser. No. 214,431

Claims priority, application Switzerland, Mar. 26, 1993, 00 924/93; Oct. 8, 1993, 03 041/93

Int. Cl.<sup>6</sup> G06G 7/00; G06F 17/00

U.S. Cl. 395—3 6 Claims



1. A fuzzy logic controller for implementation in an analog circuit and which permits the implementation of at least one rule defining the causal relationship between input variables ( $X_{lin}$ ) and output variables ( $Y$ ), each rule having at least one condition having a degree of truth, and being expressed by a relational operator between said input variables ( $X_{lin}$ ) and a reference value ( $A; I_A$ ), said controller functioning to supply from a set of said output variables ( $Y$ ) magnitudes ( $V_{out}$ ) which are determined on the basis of predetermined values ( $V_A$ ) by weighing each of them by an overall degree of truth of the rules, said overall degree of truth being determined by combining the degrees of truth of the different conditions of said rule, said degree of truth of a condition being equal to 1 when said condition is strictly verified and being equal to 0 when the condition is considered non-verified, said controller having at least one determination circuit of the overall degree of truth of the different conditions of each of said rules, and further having a circuit for determining said magnitudes ( $V_{out}$ ) of said output variables ( $Y$ ) by weighing said overall degree of truth of said rule, said determination circuit of the overall degree of truth comprising

- a plurality of Euclidian distance determination circuits which each provide at its output, an output current the intensity of which is 0 when said condition between said input variable ( $X_{lin}$ ) and said reference value ( $A; I_A$ ) is verified, and which is an increasing function of the Euclidian difference between each component of said input variable ( $X_{lin}$ ) and of said reference value ( $A; I_A$ ) when said condition is non-verified; and wherein said outputs of said distance determination circuits are each connected to a common node so as to obtain at said common node a summation signal which is equal to the sum ( $I_{out}$ ) of the amplitudes of said output currents; and
- at least one transformation circuit for receiving said summation signal and for delivering a signal ( $I_{weight}$ ) which equals 0 when said sum is greater than a given threshold value, which equals 1 when said sum is at a minimum value, and which assumes continuously increasing values between 0 and 1 when said sum varies between, respectively, said given threshold value and said minimum value.

5,570,457

## VISUAL INFORMATION PROCESSING DEVICE

Satoru Isoda; Yoshio Hanazato; Satoshi Ueyama; Hiroaki Kawakubo, and Satoshi Nishikawa, all of Hyogo-ken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 727,991, Jul. 10, 1991, Pat. No. 5,416,891.

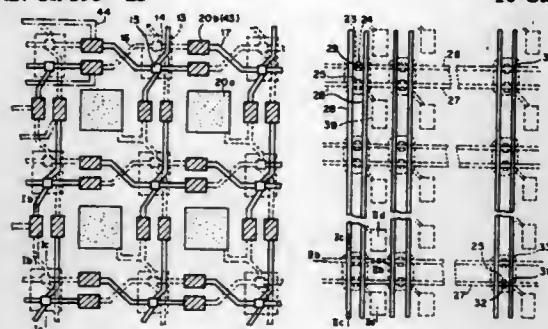
This application May 15, 1995, Ser. No. 441,627

Claims priority, application Japan, Jul. 10, 1990, 2-184525

Int. Cl.<sup>6</sup> G06G 7/16; H01L 31/08

U.S. Cl. 395—25

10 Claims



## 1. A visual information processing device comprising:

a semiconductor integrated circuit section including N×M neuron-like circuit regions that form a matrix, said neuron-like circuit regions each having an input electrode and an output electrode;

a first photoelectric molecular film is disposed on said semiconductor integrated circuit section, wherein said first photoelectric molecular film has image input elements;

2N first transparent wiring lines are extended in a first direction on said first photoelectric molecular film such that each line extends above an output or an input electrode of M neuron-like circuit regions;

a second photoelectric molecular film is disposed on said first photoelectric molecular film;

2M second transparent wiring lines are extended in a second direction on said second photoelectric molecular film so as to extend above each of N neuron-like circuit regions without extending above the output and input electrodes of N neuron-like circuit regions;

a transparent insulating layer is disposed on said second photoelectric molecular film and said second transparent wiring lines;

a transparent electrode is disposed on said transparent insulating layer;

a light-emitting molecular film is disposed on said first transparent electrode;

6×N×M electrodes are disposed on said light-emitting molecular film and at intersections of the output or input electrodes of said neuron-like circuit regions and said first transparent wiring lines and at intersections of said first transparent wiring lines and said second transparent wiring lines;

lead wires are connected to said 6×N×M electrodes; wherein light emitted from said light-emitting molecular film irradiates said intersections of the output or input electrodes of said neuron-like circuit regions and said first transparent wiring lines, and said intersections of said first transparent wiring lines and said second transparent wiring lines, whereby coupling strength between said N×M neuron-like circuit regions is controlled.

5,570,458

## MANIPULATOR TRACKING APPARATUS AND METHOD FOR ACCURATELY TRACKING A PATH FOR SENSORS IN LOW RELIABILITY CONDITIONS

Akira Umeno, Koganei; Kiyoshi Nonaka, Tokyo, and Takao Kakizaki, Kodaira, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

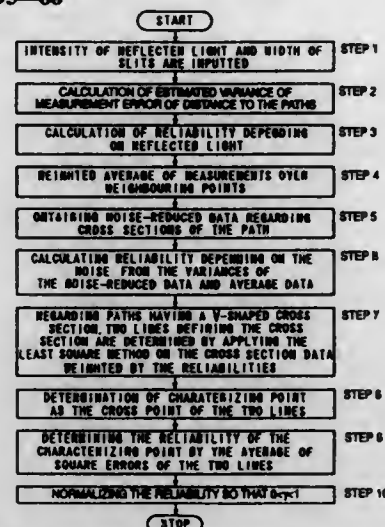
Filed Mar. 28, 1995, Ser. No. 411,996

Claims priority, application Japan, Mar. 29, 1994, 6-059122

Int. Cl.<sup>6</sup> G05B 19/04

U.S. Cl. 395—88

18 Claims



## 10. A tracking method for a manipulator which holds an effector for processing objects, comprising the steps of:

measuring measurement data using a sensor; calculating measurement reliability indicating an accuracy of the measurement data from the sensor;

sequentially correcting movement instructions of said manipulator by:

storing predetermined taught data; measuring actual work path information leading in a path direction of said effector;

calculating conversion information for converting a taught path to an actual work path by comparing the actual work path information for sensing points obtained from multiple sets of measurement information of said sensor weighted by said measurement reliability, and taught path information corresponding to sensing points calculated from taught information generated by said taught data;

calculating correction information for correcting taught information based on multiple sets of conversion information; and

correcting said taught information using said correction information.

5,570,459

## DELIVERING AND FETCHING FONT INFORMATION

Chi S. Kam, Kowloon, Hong Kong, assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Nov. 1, 1993, Ser. No. 146,387

Int. Cl.<sup>6</sup> G06K 1/500

U.S. Cl. 395—110

13 Claims

## 1. A method for outputting characters on an output device comprising the steps of:

storing character descriptions of each of the characters in a computer having storage which is linked to the output device by a communication channel;

receiving, at the output device, character codes which identify characters to be outputted;

setting up a raster image of the characters to be outputted,

5,570,461

## IMAGE PROCESSING USING INFORMATION OF ONE FRAME IN BINARIZING A SUCCEEDING FRAME

Yoshikazu Yokomizo, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 236,098, May 2, 1994, abandoned.

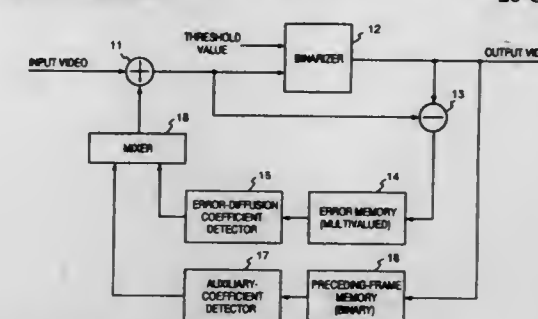
This application Feb. 22, 1996, Ser. No. 605,623

Claims priority, application Japan, May 14, 1993, 5-113003

Int. Cl.<sup>6</sup> G06T 5/00

U.S. Cl. 395—135

26 Claims



in the course of setting up the raster image, sending information corresponding to the character codes from the output device to the computer having storage via the communication channel, and

in response to the character codes sent from the output device to the computer having storage, sending corresponding character descriptions from the computer having storage to the output device via the communication channel.

5,570,460

## SYSTEM AND METHOD FOR VOLUME RENDERING OF FINITE ELEMENT MODELS

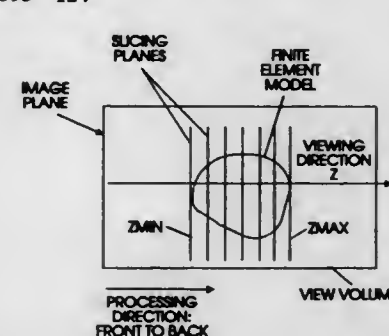
Gopalan Ramanujam, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 21, 1994, Ser. No. 327,337

Int. Cl.<sup>6</sup> G06T 17/20

U.S. Cl. 395—124

9 Claims



## 1. A method of converting an unstructured finite element grid to a grid of voxel data, said grid of voxel data to be displayed on a display device, said method comprising the steps of:

inputting data representing said unstructured finite element grid, wherein said unstructured finite element grid represents a three-dimensional object;

performing a plurality of slicing operations upon said unstructured finite element grid in a viewing direction;

generating, during each slicing operation, intersection polygons with scalar data at polygon vertices;

mapping, during each slicing operation, each of said scalar data to shades of a color;

generating, during each slicing operation, a two-dimensional array of pixel colors from said shades of a color; and

reading back said two-dimensional array of pixel colors from a frame buffer such that each pixel represents a three dimensional point voxel corner.

1. An image processing apparatus comprising: input means for entering image data frame by frame; correcting means for applying hysteresis of image data of a preceding frame to image data of an entered present frame, to correct the present frame; and

N-value converting means for subjecting the image data corrected by said correcting means to an N-value conversion in which the image data is converted to data having N bits per pixel,

wherein said correcting means includes: memory means for storing results of the N-value conversion of the preceding frame by said N-value converting means;

distributing means for distributing an error, which is produced at an N-value conversion of a pixel of interest contained in the present frame entered by said input means, to a group of pixels not yet subjected to the N-value conversion in the vicinity of said pixel of interest;

combining means for combining, at a prescribed ratio, an error, which has been distributed from a group of pixels already subjected to the N-value conversion, accumulated at the position of the pixel of interest contained in the entered present frame, and a weighted mean value based upon a prescribed number of items of N-value converted data in an area in said memory means corresponding to the position of said pixel of interest; and

adding means for adding a value obtained by said combining means to the value of the entered pixel of interest.

5,570,462

## SYSTEM AND METHOD FOR OBJECT PLACEMENT AND SIZING IN A DYNAMIC DISPLAY ENVIRONMENT

Max McFarland, Cupertino, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed May 5, 1995, Ser. No. 435,386

Int. Cl.<sup>6</sup> G06T 3/00

U.S. Cl. 395—136

14 Claims

## 12. A method for placing an object after a change in display space configuration comprising the steps of:

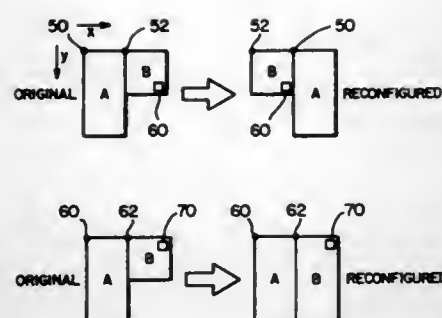
rendering said object on a display device at a first reference location;

changing said display space configuration by changing a size of said display device;

determining a scale vector associated with said change in size of said display device by multiplying original coordinates of said first reference location by a scaling factor; and

rendering said object on said display device at a second reference location using said scale vector, wherein said step of determining a scale vector further comprises the steps of:





normalizing said original coordinates of said first reference location relative to an absolute origin by subtracting coordinates of an origin of said display device from said coordinates of said first reference location;  
calculating new coordinates using said normalized coordinates; and  
adding said coordinates of said origin to said new coordinates to generate said scale vector.

5,570,463

**BRESENHAM/DDA LINE DRAW CIRCUITRY**

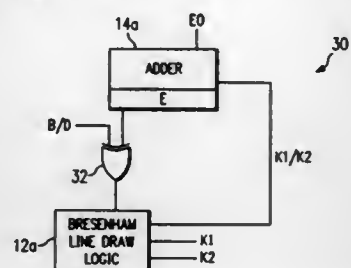
Giang H. Dao, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 1,085, Jan. 6, 1993, abandoned. This application Mar. 30, 1995, Ser. No. 414,047

Int. Cl.<sup>6</sup> G06F 15/00

U.S. Cl. 395-143

15 Claims



1. A line draw engine for generating Bresenham lines having points defined in accordance with integer error calculations and Digital Differential Analyzer (DDA) lines having points defined responsive to floating point error calculations, comprising:  
an adder for calculating an integer error term;  
circuitry for generating a control signal indicative of whether said Bresenham line or said DDA line is desired;  
circuitry for selectively performing a logical invert function on an output of said adder indicative of the sign of the error term responsive to said control signal; and  
Bresenham line draw logic coupled to said adder for drawing a point responsive to the output of said inverting circuitry, such that said Bresenham line draw logic may be used to generate both said Bresenham lines and said DDA lines.

5,570,464

**CONTROLLER FOR A RECORDING APPARATUS**

Takeshi Fuse, Ebina, Japan, assignor to Fuji Xerox Co. Ltd., Tokyo, Japan

Filed Oct. 20, 1993, Ser. No. 138,078

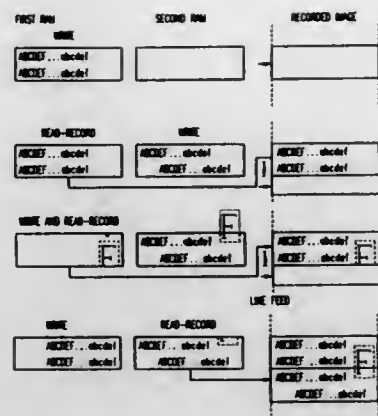
Claims priority, application Japan, Dec. 25, 1992, 4-359513

Int. Cl.<sup>6</sup> B41J 2/07

U.S. Cl. 395-105

23 Claims

1. A controller for a recording apparatus, the recording apparatus able to read data contained in regions, where each two adjacent regions define a printing zone divided by a boundary, comprising:



at least two storing means for storing image data for a printing zone, one of the at least two storing means storing image data from one of the two adjacent regions of the printing zone, an other of the at least two storing means storing image data from the other of the two adjacent regions, and the at least two storing means also outputting the data to enable a printing operation;  
means for determining if a portion of image data of one of the two adjacent regions stored within the at least two storing means extends across the boundary from the one of the two adjacent regions of the printing zone and into the other of the two adjacent regions;  
controlling means for storing the portion of the image data that extends across the boundary into the other of the two adjacent regions into the other of the at least two storing means storing the image data for the other of the two adjacent regions, wherein the controlling means inhibits the movement of the recording medium when the means for determining determines that a portion of the image data of the one of the at least two storing means extends across the boundary of the printing zone until the image data that extends across the boundary of the printing zone can be sent to be printed, said controlling means also controlling developing a portion of the image data on the other of the at least two storing means and controlling printing the portion of the image data in the other of the at least two storing means on the recording medium.

5,570,465

**APPARATUS, METHOD AND SYSTEM FOR PRINTING OF LEGAL CURRENCY AND NEGOTIABLE INSTRUMENTS**

Peter J. Tsakanikas, 3080 N. Course Dr. Bldg. 51, #108 Palm-Aire Country Club of Florida, Pompano Beach, Fla. 33069

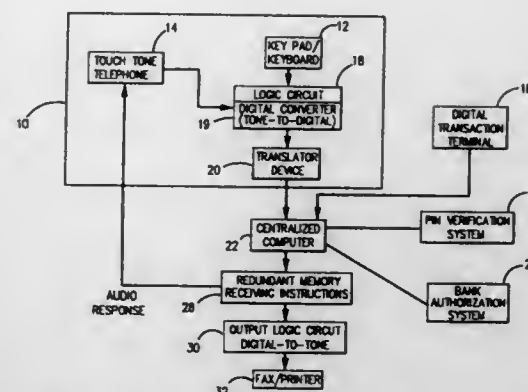
Continuation-in-part of Ser. No. 174,688, Dec. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 94,905, Jul. 22, 1993, abandoned. This application Apr. 20, 1994, Ser. No. 230,254

Int. Cl.<sup>6</sup> G06F 15/00; H04M 11/00

U.S. Cl. 395-114

23 Claims

1. An information processing system for transferring negotiable instruments, comprising:  
user input means having a plurality of actuatable members thereon for producing a plurality of signals having different characteristics corresponding to the actuation of said actuatable members;  
circuit means coupled with said user input means, responsive to the actuation of said actuatable members on said user input means for producing information signals;  
system processor means for receiving and processing said information signals, and producing document output signals corresponding and configured for unique identification of a preselected negotiable instrument document corresponding to said information signals and for retaining an indicia of said unique identification and



code processor means connected to said system processor means for receiving said information signals and processing said signals to produce an authorization signal, and means for providing said authorization signal to said system processor means;  
means for routing said output signals to second circuit means said second logic circuit means including converter means for converting said document output signals into document printing signals;  
printing means coupled to said second circuit means for receiving said document printing signals and printing said negotiable instrument document in response to said document printing signals and including said unique identification.

5,570,466

**MULTIPLE PATH TREES AND LAN SEGMENTS FOR ROUTING IN A NETWORK OF BRIDGE-CONNECTED LAN SEGMENTS**

Rainer Oechsle, Langnau am Albis, Switzerland, assignor to International Business Machines Corporation, Armonk, N.Y.

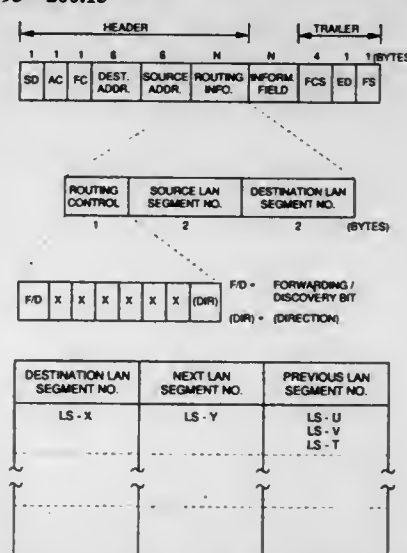
Continuation of Ser. No. 838,126, Feb. 19, 1992, abandoned. This application Jan. 13, 1995, Ser. No. 372,693

Claims priority, application European Pat. Off., Oct. 14, 1991, 91810791

Int. Cl.<sup>6</sup> H04J 3/24

U.S. Cl. 395-200.15

8 Claims



1. A method of routing frames through a network comprising of network segments interconnected by bridges, each network segment having a unique identifier, said frames being transmitted between terminals connected to said network segments, the method comprising the steps of:  
determining a single path between each network segment and each one of other network segments;

using each network segment as a destination network segment, determining a path tree from respective single paths leading to the destination network segment and being established between the destination network segment and the other network segments;

storing in at least one bridge a routing table having an entry for each path tree of which said at least one bridge is a part, each said entry listing for the respective path tree identifiers for the destination network segment, for the next network segment and for all previous network segments on said path tree to which said bridge is connected;

receiving in said at least one bridge a frame to be routed, said frame including an identifier for a destination network segment;

in said at least one bridge, determining

(a) if the identifier for the destination network segment in said frame corresponds to one of the identifiers for a destination network segment in said routing table, and  
(b) if an identifier for an input network segment from which the frame is received corresponds to one of the identifiers for all previous network segments in said routing table; and  
forwarding the frame to the next network segment identify in the table if (a) and (b) determinations are positive.

5,570,467

**METHOD AND APPARATUS FOR LOCATING A DIGITAL CONTROL CHANNEL IN A RADIOCOMMUNICATION SYSTEM**

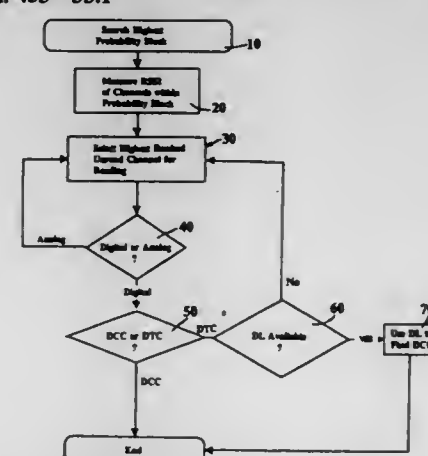
Francois Sawyer, St-Hubert, Canada, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Division of Ser. No. 331,711, Oct. 31, 1994, which is a continuation-in-part of Ser. No. 147,254, Nov. 1, 1993. This application Jun. 7, 1995, Ser. No. 473,583

Int. Cl.<sup>6</sup> H04Q 7/22

U.S. Cl. 455-33.1

12 Claims



1. A method for locating a control channel in a radiocommunication system comprising the steps of:  
providing a connection between a mobile station and a base station in said radiocommunication system using a traffic channel;  
sending a message when said connection is being terminated, from said base station to said mobile station which includes location information pointing to said control channel; and  
tuning to said control channel, at said mobile station, using said location information received from said base station.

5,570,468

**METHOD AND APPARATUS FOR DECONTAMINATING SUBSTANCES CONTAMINATED WITH RADIOACTIVITY**

Kenji Morikawa, Kohshoku; Hiroshi Obinata, Nagano; Kazuo Omata, Iruma; Toshihiko Sato, Hohya; Yoshihiko Nakajima, Toguramachi, and Seigo Ichikawa, Kohshoku, all of Japan, assignors to Morikawa Industries Corporation, Kohshoku, Japan

Filed Mar. 29, 1995, Ser. No. 412,310

Claims priority, application Japan, Sep. 13, 1994, 6-218756  
Int. Cl.<sup>6</sup> G21F 9/00

U.S. Cl. 588—1

3 Claims

1. A method of decontaminating substances contaminated with radioactivity, comprising the steps of: decontaminating a substance contaminated with radioactivity by using a chelate liquid, removing the chelate liquid from the contaminated substance, drying and heating the contaminated substance by hot air at a temperature not lower than the boiling point of a solvent, adding said solvent to the contaminated substance to rapidly vaporize the solvent so as to separate any remaining chelate liquid, which has been adhering to the contaminated substance, from the contaminated substance, and removing the thus separated chelate liquid from the contaminated substance along with said solvent.

5,570,469

**METHOD FOR REMOVING METAL CONTAMINANTS FROM FLUE DUST**

Dean J. Soderstrom, Henderson; Jesse Gerard, Las Vegas, both of Nev., and Stephen S. Spaulding, Venice, Calif., assignors to Lockheed Martin Corporation, Bethesda, Md.

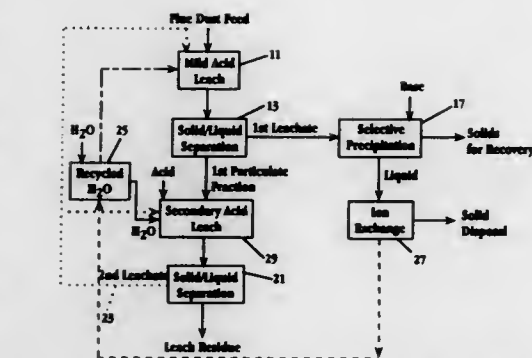
Filed Jan. 6, 1995, Ser. No. 369,347

Int. Cl.<sup>6</sup> G21F 9/00

U.S. Cl. 588—18

9 Claims

1. A method for removing radioactive cesium-137 from flue dust composed of a fine-particulate, acid-soluble matrix containing said cesium-137 in bound form, said method comprising the steps of:



- (i) forming a slurry of the dust in an acidic aqueous leaching medium that is effective to leach a portion of said cesium-137 from the matrix without solubilizing the matrix;
- (ii) treating said slurry under conditions effective to leach at least 50% of said bound cesium from said matrix;
- (iii) separating said slurry into a first particulate fraction and a first leachate fraction;
- (iv) forming a second slurry of said first particulate fraction in a solubilizing acidic aqueous medium capable of solubilizing said matrix;
- (v) treating said second slurry under conditions effective to partially solubilize said matrix and reduce the level of said cesium present in particulate form to less than 10% of the originally bound metal, where said treating of the second slurry includes adding a non-radioactive isotope of cesium to the solubilizing acidic medium in an amount sufficient to effectively displace radioactive cesium from the dust matrix;
- (vi) separating said second slurry into a second particulate fraction and a second leachate fraction; and
- (vii) removing said radioactive cesium from the first and second leachate fractions.

**DESIGN PATENTS**

GRANTED October 29, 1996

**ERRATA**

For  
CLASS

D1-110

See  
PATENT NO.

D374997



## DESIGNS

OCTOBER 29, 1996

374,967

### DINOSAUR SHAPED FOOD PRODUCT

Dean J. Champagne, Grosse Pointe Farms, Mich., assignor to  
Variety Foods Inc., Warren, Mich.

Filed Oct. 13, 1993, Ser. No. 14,132

Term of patent 14 years

U.S. Cl. D1—110



374,969

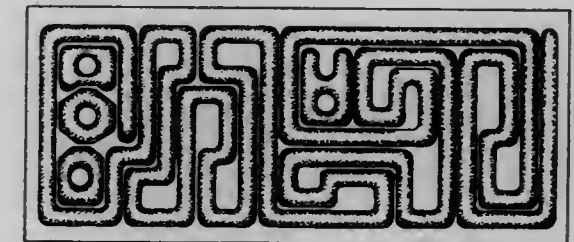
### COMBINED FOOD PRODUCT AND SUPPORT BOARD THEREFOR

Timothy J. Gluszek, Eden Prairie, and Craig E. Zimmerman,  
Waconia, both of Minn., assignors to General Mills, Inc.,  
Minneapolis, Minn.

Filed Dec. 4, 1995, Ser. No. 47,441

Term of patent 14 years

U.S. Cl. D1—125



374,968

### TEABAG WITH CHRISTMAS TREE SHAPE

Karen A. Tillquist, 484 Country School Rd., West Dundee, Ill.  
60118

Filed Jan. 25, 1996, Ser. No. 49,464

Term of patent 14 years

U.S. Cl. D1—115



374,970

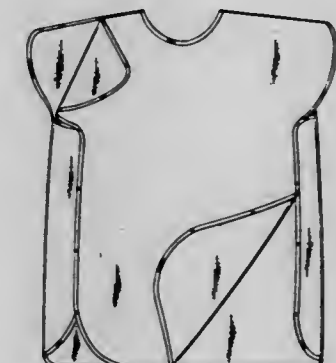
### PATIENT GARMENT

Joyce V. Jagger, P.O. Box 1927, Binghamton, N.Y. 13902

Filed Mar. 27, 1995, Ser. No. 36,724

Term of patent 14 years

U.S. Cl. D2—720



374,971

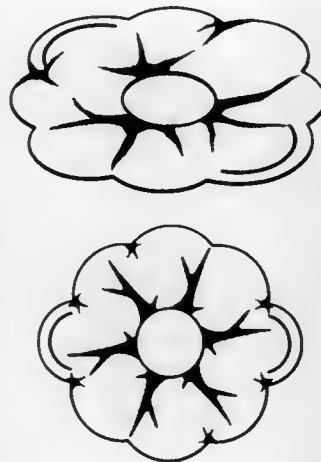
**PROTECTIVE GARMENT FOR SHOULDERS**

Kelly R. Park, 8790 Blue Jay Ln., Salt Lake City, Utah 84121

Filed Oct. 26, 1994, Ser. No. 30,292

Term of patent 14 years

U.S. Cl. D2—823



374,973

**EMBELLISHED FEATHERED HEAD BAND**

Robert P. Gruters, and Karen R. Gruters, both of 42 Banks

Rd., Simsbury, Conn. 06070

Division of Ser. No. 27,693, Aug. 29, 1994, Pat. No. Des.

368,983. This application Oct. 26, 1995, Ser. No. 45,686

Term of patent 14 years

U.S. Cl. D2—866



374,972

**COMBINED HELMET COVER AND VISOR**

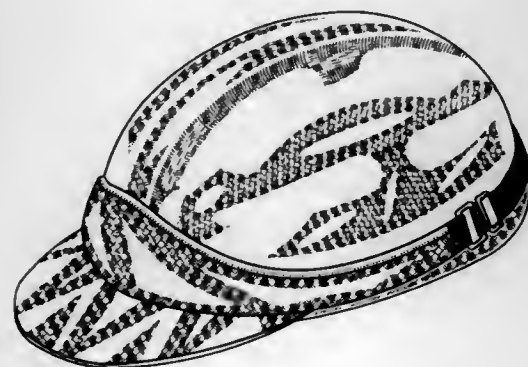
Michael J. Nelson, and Susan R. Nelson, both of 7905 Sylvan

Oak Way, Citrus Heights, Calif. 95610

Filed May 16, 1995, Ser. No. 38,846

Term of patent 14 years

U.S. Cl. D2—866



374,974

**ANTI-SKID HEEL ATTACHMENT**

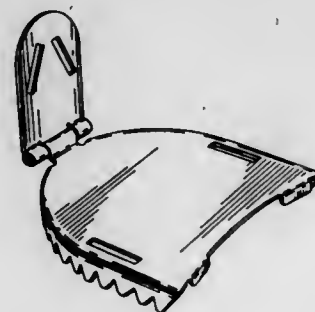
François Candela, 820, rue Papineau, McMasterville, Québec,

Canada

Filed Nov. 3, 1995, Ser. No. 45,960

Term of patent 14 years

U.S. Cl. D2—962



374,975

**BEVERAGE CARRIER**

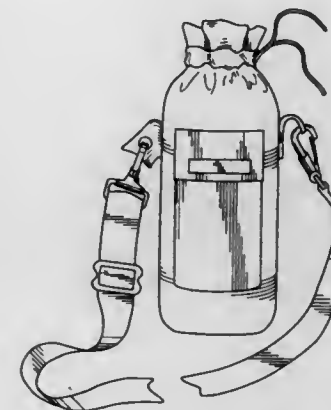
Mayra Vargas, and Epifania Feliciano, both of P.O. Box 3301, Kim M. Cook, 306 E. 83 St., Apt. 2C, New York, N.Y. 10028

New Britain, Conn. 06050

Filed Jan. 23, 1995, Ser. No. 33,851

Term of patent 14 years

U.S. Cl. D3—202



374,977

**SHOULDER STRAP FOR SECURING A PURSE**

Kim M. Cook, 306 E. 83 St., Apt. 2C, New York, N.Y. 10028

Filed Oct. 6, 1994, Ser. No. 28,075

Term of patent 14 years

U.S. Cl. D3—215



374,976

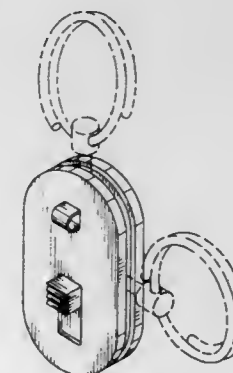
**TRACK TYPE KEY HOLDER**

Sumner MacDonald, 44 Ballou Blvd., Bristol, R.I. 02809

Filed Oct. 2, 1995, Ser. No. 44,836

Term of patent 14 years

U.S. Cl. D3—207



374,978

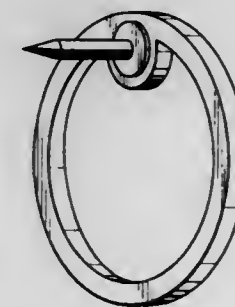
**APPAREL ATTACHED EYEGLASSES HOLDER**

Allan W. Ferdi, 2207 Zollinger Rd., Columbus, Ohio 43221

Filed Jul. 3, 1995, Ser. No. 41,042

Term of patent 14 years

U.S. Cl. D3—215





374,979

**HARNESS BACK PACK**

Linda K. Roberson, and Keith J. Mackey, both of P.O. Box 1569, Candler, N.C. 28715

Filed Jul. 15, 1994, Ser. No. 26,014

Term of patent 14 years

U.S. Cl. D3—217



374,981

**BLADE SCABBARD**

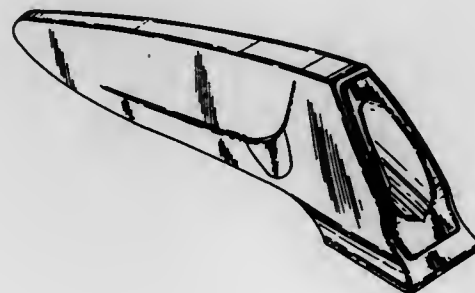
Mike J. Hainsworth, Knaresborough, and Peter Viner, Wetherby, both of Great Britain, assignors to McPherson's Limited, Australia

Filed Apr. 3, 1995, Ser. No. 37,061

Claims priority, application Australia, Oct. 4, 1994, 3293/94

Term of patent 14 years

U.S. Cl. D3—220



374,980

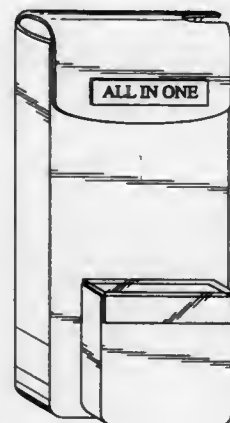
**CELLULAR PHONE AND PAGER CASE**

Rodney A. Moya, and Rebecca Moya, both of 12211 Niagara Ct., Brighton, Colo. 80601

Filed May 22, 1995, Ser. No. 39,127

Term of patent 14 years

U.S. Cl. D3—218



374,982

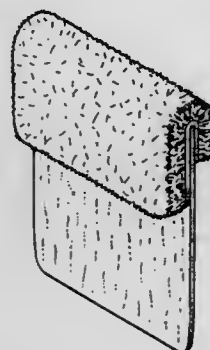
**FLY CADDY**

Joseph A. Hamilton, Highlands Ranch, Colo., assignor to Fur Reel, Inc., Highlands Ranch, Colo.

Filed Jun. 21, 1995, Ser. No. 40,551

Term of patent 14 years

U.S. Cl. D3—221



374,983

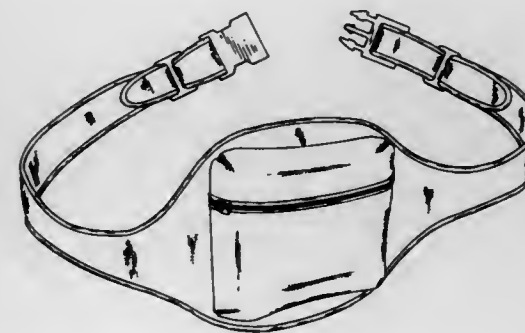
**BELT BAG**

Alex Brucki, Flat 12, 705 Park Street, Brunswick, Victoria 3056, Australia

Filed Mar. 10, 1995, Ser. No. 36,126

Term of patent 14 years

U.S. Cl. D3—226



374,985

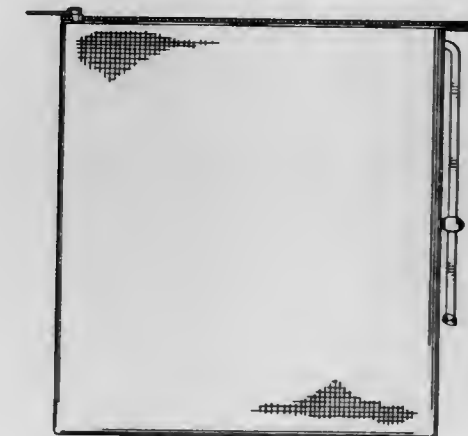
**TOILETRY BAG**

Valerie Hoyt, 4919 NE. 73rd, Portland, Oreg. 97218

Filed Jul. 27, 1994, Ser. No. 26,420

Term of patent 14 years

U.S. Cl. D3—246



374,986

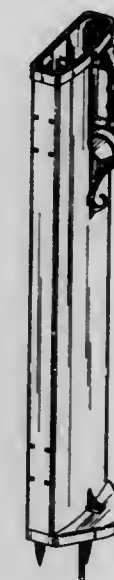
**GOLF CLUB CARRIER**

Claude Dages, 5216 St. Gabriel La., Louisville, Ky. 40291

Filed Mar. 4, 1996, Ser. No. 51,131

Term of patent 14 years

U.S. Cl. D3—259



374,984

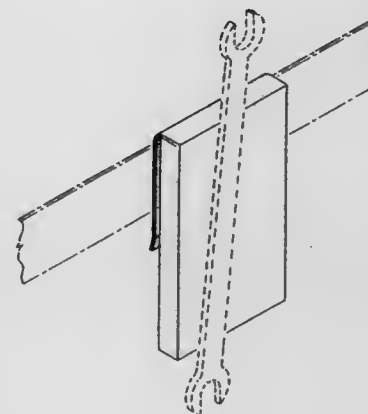
**MAGNETIC TOOL HOLDER**

James P. Scott, 4516 Lakevalley Dr., Hoover, Ala. 35244

Filed May 1, 1995, Ser. No. 38,213

Term of patent 14 years

U.S. Cl. D3—228



374,987

## FLIGHT BAG

Cheryl A. Hughes, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.

Filed Dec. 7, 1994, Ser. No. 31,866

Term of patent 14 years

U.S. Cl. D3—279



374,989

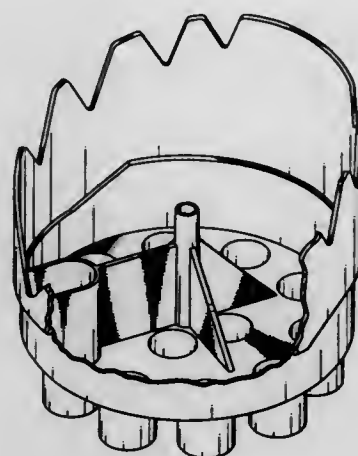
## GOLF CLUB BAG TOP

Jimmy A. LaPlante, Sr., 732 - 18th Ave., Clarkston, Wash. 99403

Filed Dec. 29, 1995, Ser. No. 48,462

Term of patent 14 years

U.S. Cl. D3—320



374,990

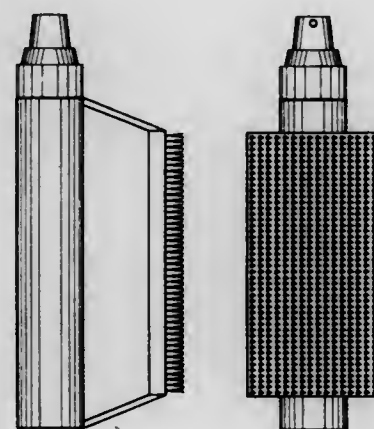
## GOLF CLUB SCRUBBER WITH SPRAY NOZZLE

Jim A. Torkelson, 2175 Mountain Springs Rd., Auburn, Calif. 95602

Filed Jun. 17, 1993, Ser. No. 9,675

Term of patent 14 years

U.S. Cl. D4—114



374,988

## TOOL CADDY

George Hillinger, 129 N. Le Dour Rd., Beverly Hills, Calif. 90211

Filed Jun. 5, 1995, Ser. No. 39,740

Term of patent 14 years

U.S. Cl. D3—294



374,991

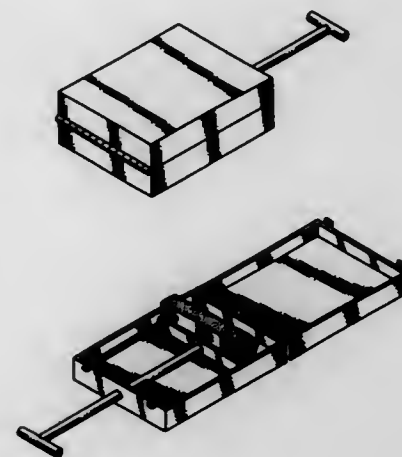
## COMBINED GRILL SCRUBBER AND CONTAINER THEREFOR

Dale E. Trapp, 6 Invermere Place, St. Albert, Alberta, Canada

Filed Dec. 16, 1993, Ser. No. 16,380

Term of patent 14 years

U.S. Cl. D4—116



374,993

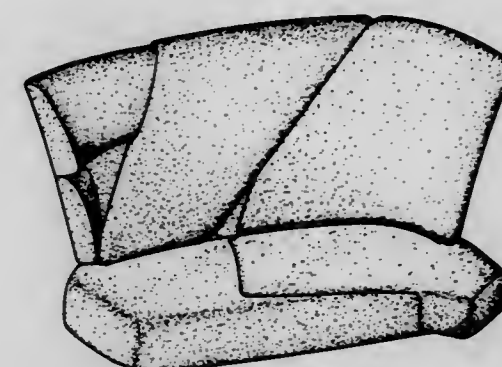
## VEHICLE SEAT

Selji Emoto, Huntington Beach, Calif., assignor to Isuzu Motors Limited, Japan

Division of Ser. No. 780,745, Oct. 21, 1991, Pat. No. Des. 355,777. This application Dec. 29, 1994, Ser. No. 34,943

Term of patent 14 years

U.S. Cl. D6—356



374,994

## CHAIR

Gerald R. Loader, Slough, United Kingdom, assignor to Button Fronts (London) Limited, Berkshire, United Kingdom

Filed Aug. 31, 1995, Ser. No. 43,454

Claims priority, application United Kingdom, Mar. 6, 1995, 2045854

Term of patent 14 years

U.S. Cl. D6—359



374,992

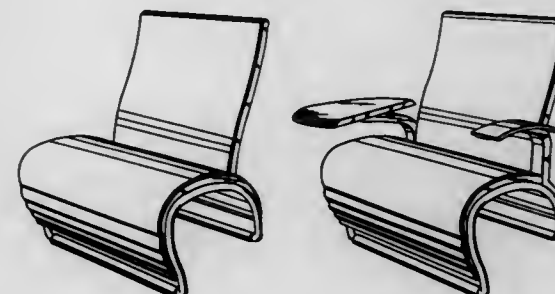
## CHAIR

Bruce Burdick; Susan K. Burdick; Cameron Imani, and Johnson Chow, all of San Francisco, Calif., assignors to The Burdick Group, Inc., San Francisco, Calif.

Filed Jul. 3, 1995, Ser. No. 41,396

Term of patent 14 years

U.S. Cl. D6—334



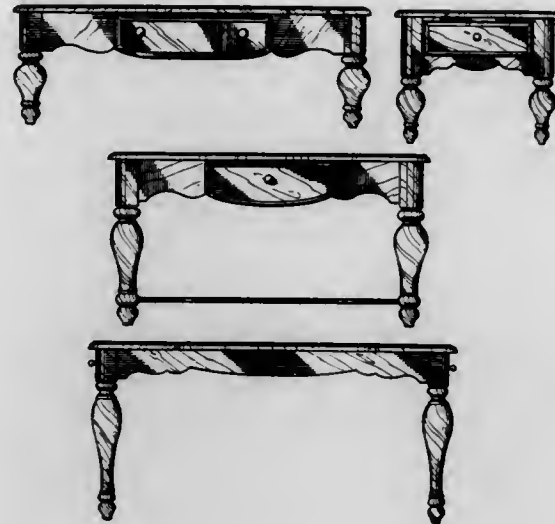


374,995  
CHAIR

Anna Graham, LaSalle, and Daniel Hofgartner, Windsor, both of Canada, assignors to Peter Anthony Design Ltd., Canada  
Filed Nov. 27, 1995, Ser. No. 47,039  
Term of patent 14 years  
U.S. Cl. D6—380

374,997  
TABLE

Sidney A. Lenger, Kernsville, N.C., assignor to Schottenstein Stores Corporation, Columbus, Ohio  
Filed Jun. 29, 1995, Ser. No. 40,910  
Term of patent 14 years  
U.S. Cl. D6—436

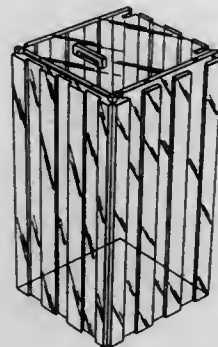
374,996  
WORK BENCH

Zbigniew Noniewicz, Kempenich, Germany, assignor to Wolfcraft GmbH, Weibern, Germany  
Filed Sep. 19, 1994, Ser. No. 28,565  
Term of patent 14 years  
U.S. Cl. D6—400



## 374,998

INTERCONNECTIBLE STORAGE UNIT  
Steven Ko, 1385 Milan Pl., Monterey Park, Calif. 91754  
Filed Jan. 11, 1995, Ser. No. 34,412  
Term of patent 14 years  
U.S. Cl. D6—440



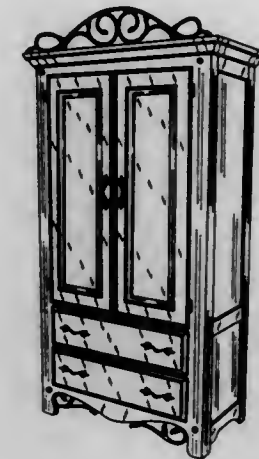
## 374,999

## CHEST ON CHEST DRESSER WITH MIRROR

H. Thomas Keller, and Scott Risdon, both of High Point, N.C., assignors to Vaughan Furniture Company, Inc., Galax, Va.  
Division of Ser. No. 30,024, Oct. 20, 1994. This application  
Oct. 5, 1995, Ser. No. 46,573  
Term of patent 14 years  
U.S. Cl. D6—444

375,001  
ARMOIRE

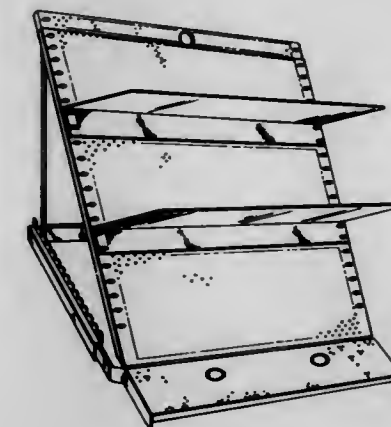
H. Thomas Keller, and Scott Risdon, both of High Point, N.C., assignors to Vaughan Furniture Company, Inc., Galax, Va.  
Division of Ser. No. 30,024, Oct. 20, 1994. This application  
Sep. 29, 1995, Ser. No. 44,781  
Term of patent 14 years  
U.S. Cl. D6—445



## 375,002

## LIFT RACK WITH DIVIDER SYSTEM

Jerome F. Soso, Apple Valley, Minn., assignor to Stein Industries, Inc., Minneapolis, Minn.  
Filed Jun. 29, 1995, Ser. No. 40,852  
Term of patent 14 years  
U.S. Cl. D6—449



## 375,000

## CABINET

Michael J. Paus, High Point, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.  
Filed Mar. 17, 1995, Ser. No. 36,353  
Term of patent 14 years  
U.S. Cl. D6—445



375,003

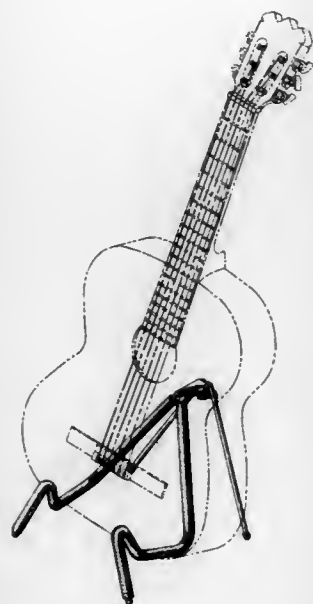
**FOLDABLE STAND FOR ONE GUITAR**

James P. Nordstrom, Jr., Jersey City, N.J., assignor to James Nordstrom, Jersey City, N.J.

Filed Dec. 12, 1995, Ser. No. 47,743

Term of patent 14 years

U.S. Cl. D6—466



375,005

**COCKTAIL TABLE**

Sidney A. Lenger, Kernsville, N.C., assignor to Schottenstein Stores Corporation, Columbus, Ohio

Filed Oct. 25, 1995, Ser. No. 45,635

Term of patent 14 years

U.S. Cl. D6—480



375,006

**DOUBLE CORRUGATED CARDBOARD TABLE**

Anette Hakansson, Tequesta, Fla., assignor to Handi Mate, Inc., Palm Beach, Fla.

Filed Nov. 7, 1994, Ser. No. 30,762

Term of patent 14 years

U.S. Cl. D6—484

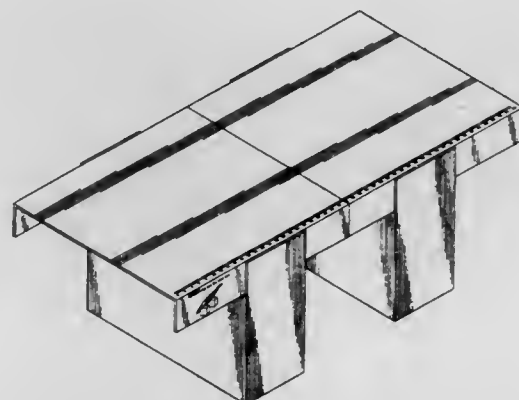
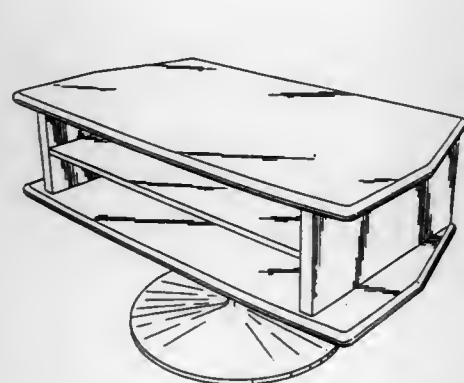
375,004  
TABLE

Anders Josefsson, PR Data i Molndal AB Box 73, S-430 30 Frillesas, Sweden

Filed Mar. 31, 1995, Ser. No. 36,990

Term of patent 14 years

U.S. Cl. D6—477



375,007

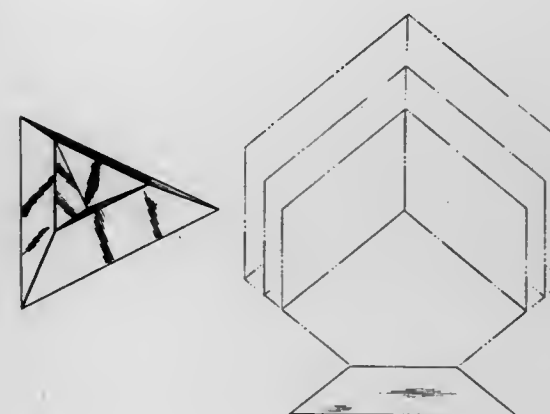
**CUBE STAND**

Kenneth D. Erickson, Anoka, Minn., assignor to Team Vision, Inc., Anoka, Minn.

Filed Oct. 13, 1994, Ser. No. 29,693

Term of patent 14 years

U.S. Cl. D6—495



375,009

COMBINED SEAT BACK AND SEAT FOR A CHAIR  
Roger L. Webb, London, England, assignor to Pelvic Posture Limited, Eversley, United Kingdom

Filed Sep. 6, 1995, Ser. No. 43,510

Claims priority, application United Kingdom, Mar. 6, 1995, 2045843; Mar. 6, 1995, 2045844; Jun. 16, 1995, 2048209

Term of patent 14 years

U.S. Cl. D6—500



375,008

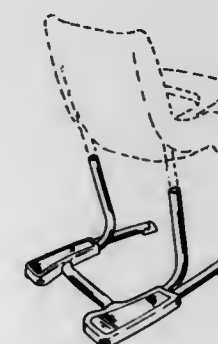
**CHAIR BASE**

Richard E. Cone, Athens, Ohio, assignor to Cosco, Inc., Columbus, Ind.

Filed Jan. 2, 1996, Ser. No. 48,827

Term of patent 14 years

U.S. Cl. D6—495



375,010

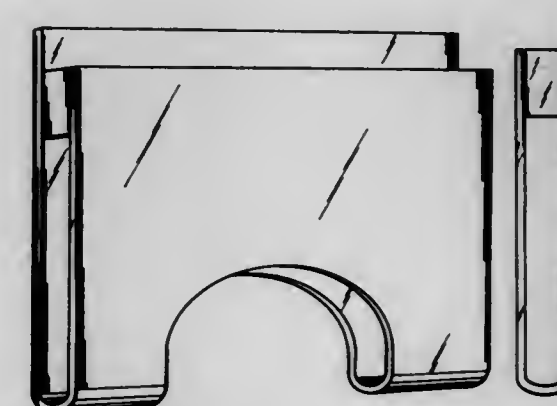
**DISPOSABLE GLOVE DISPENSER**

Harry Karnes, 7460 W. Mossy Cup, Boise, Id. 83709

Filed Oct. 20, 1995, Ser. No. 46,676

Term of patent 14 years

U.S. Cl. D6—515





375,011

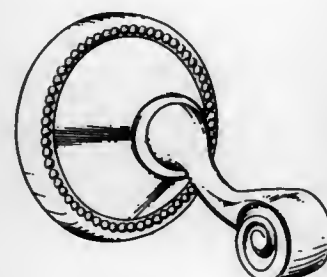
## TOWEL RACK SUPPORT ARM

Wen-Shian Lee, No. 9, Lane 394, Fu-Yuan Street, Taipei, Taiwan

Filed Dec. 8, 1995, Ser. No. 47,601

Term of patent 14 years

U.S. Cl. D6—550



375,013

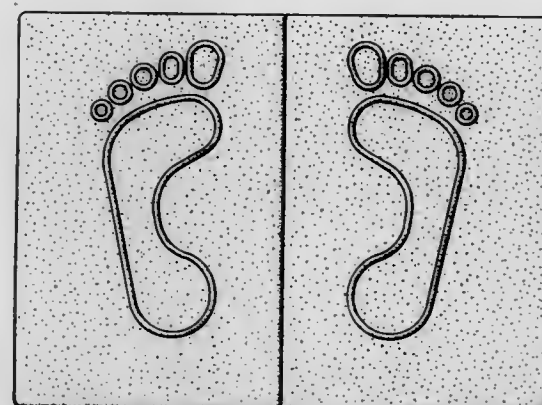
## LOCKER ROOM FOOT MAT

Stanley Wong, 3223 Douglas Road, Burnaby, B.C., Canada

Filed Mar. 17, 1995, Ser. No. 36,404

Term of patent 14 years

U.S. Cl. D6—583



375,012

## SHELF

Winfried Scholl, Dusseldorf, Germany, assignor to Hewi Heinrich Wilke GmbH, Arolsen, Germany

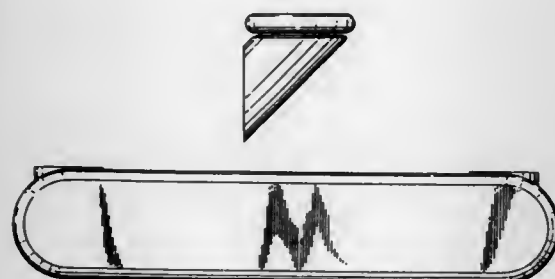
Division of Ser. No. 662,806, Feb. 27, 1991, Pat. No. Des.

358,732. This application Jun. 23, 1993, Ser. No. 9,881

Claims priority, application Germany, Aug. 27, 1990, M9005636.1

Term of patent 14 years

U.S. Cl. D6—574



375,014

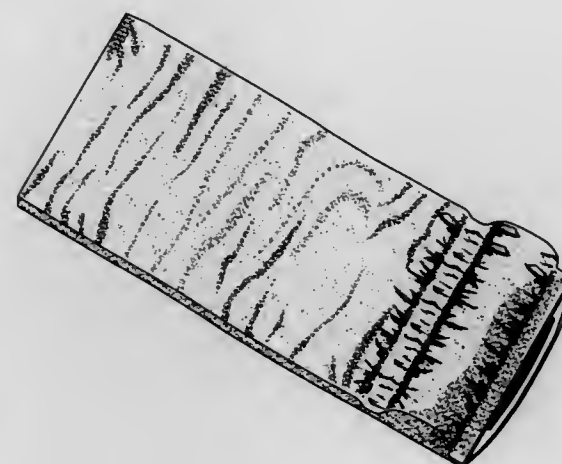
## SLIP COVER FOR SLEEPING MATS

Becki B. Connally, 1508 Oak Cliff Ct., Mobile, Ala. 36609

Filed Mar. 28, 1995, Ser. No. 36,815

Term of patent 14 years

U.S. Cl. D6—610



375,015

## CASE FOR AN OPTICAL DISC

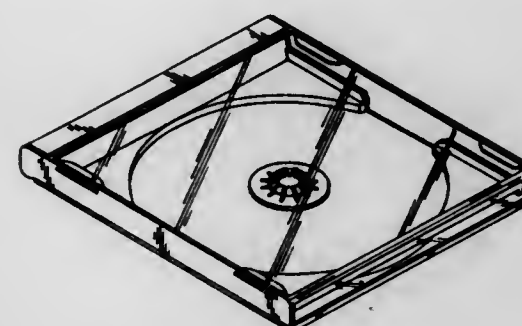
Shinkichi Kobayashi, and Kazuyoshi Sagimoto, both of Tokyo, Japan, assignors to Sony Computer Entertainment Inc., Tokyo, Japan

Filed Jan. 19, 1995, Ser. No. 33,771

Claims priority, application Japan, Jul. 19, 1994, 6-21391

Term of patent 14 years

U.S. Cl. D6—632



375,017

## ELECTRIC TOASTER

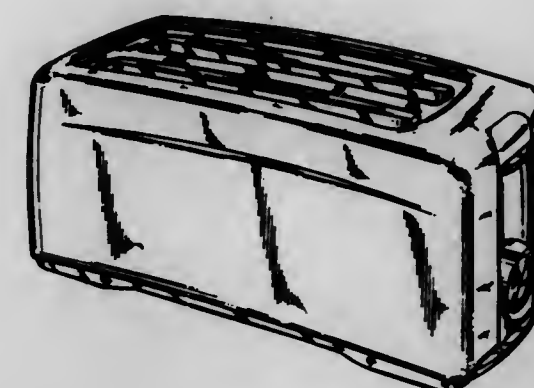
Jean-Louis Barrault, Boulogne, France, assignor to Moulinex S.A., Paris, France

Filed Nov. 24, 1995, Ser. No. 47,005

Claims priority, application France, May 24, 1995, 95 2992

Term of patent 14 years

U.S. Cl. D7—330



375,016

## THERMAL COFFEE POT

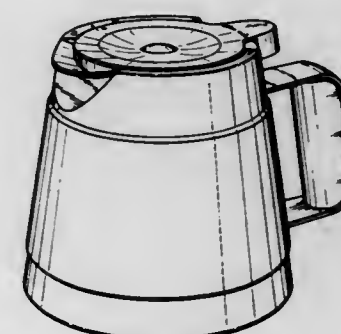
Roland Ullmann, Offenbach, Germany, assignor to Braun AG, Kronberg, Germany

Filed Aug. 22, 1995, Ser. No. 42,984

Claims priority, application Germany, Mar. 28, 1995, DM/032-543

Term of patent 14 years

U.S. Cl. D7—319



375,018

## CAP FOR DRINK CONTAINER

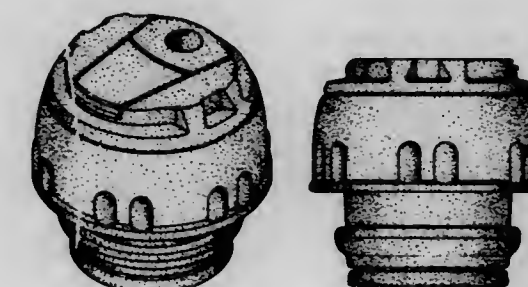
Toru Goto; Seichi Ito; Kunio Hatsumoto, and Takashi Kato, all of Tokyo, Japan, assignors to Nippon Sanso Corporation, Tokyo, Japan

Filed Sep. 30, 1995, Ser. No. 44,225

Claims priority, application Japan, Jul. 14, 1995, 7-20538

Term of patent 14 years

U.S. Cl. D7—392.1



375,019

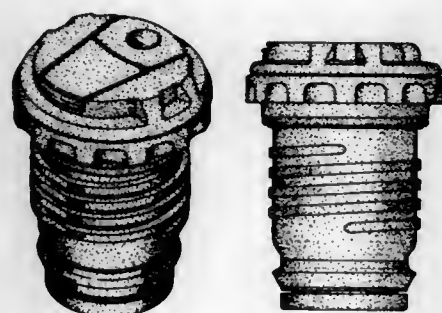
## CAP FOR DRINK CONTAINER

Toru Goto; Seichi Ito; Kunio Hatsumoto, and Yasuhiro Murakami, all of Tokyo, Japan, assignors to Nippon Sanso Corporation, Tokyo, Japan

Filed Sep. 20, 1995, Ser. No. 44,226

Claims priority, application Japan, Jul. 14, 1995, 7-20537  
Term of patent 14 years

U.S. Cl. D7—392.1



375,021

## FRUIT/VEGETABLE NETTING DISPLAY HAMMOCK

Christopher J. McArdle, Alta Loma, Calif., assignor to Prodyne Enterprises, Inc., Ontario, Calif.

Filed Nov. 22, 1995, Ser. No. 46,972

Term of patent 14 years

U.S. Cl. D7—601



375,020

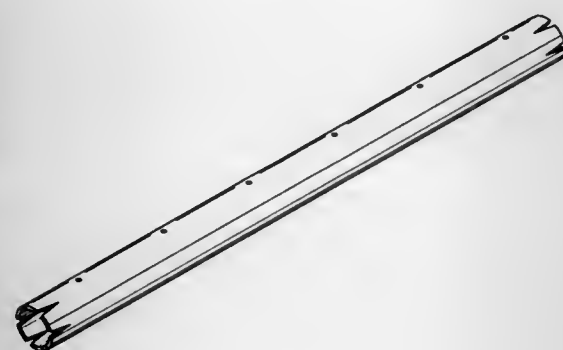
## HOLDER FOR FOOD SMOKING MATERIALS

Leslie R. Cothorn, 4547 Baton Rouge Dr., Hermitage, Tenn. 37076

Filed May 20, 1994, Ser. No. 23,274

Term of patent 14 years

U.S. Cl. D7—402



375,022

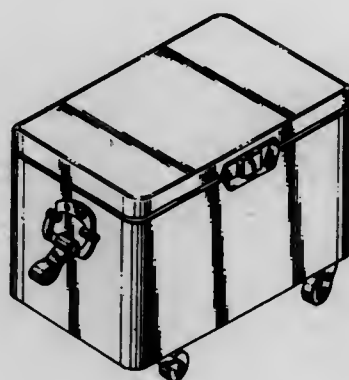
## COOLER ON WHEELS

Dale G. Smith, 3316 Hanover Dr., Rockford, Ill. 61101

Filed Oct. 23, 1995, Ser. No. 45,555

Term of patent 14 years

U.S. Cl. D7—605



375,023

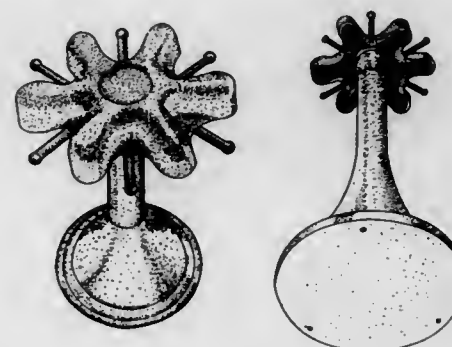
## ROTATABLE KITCHEN TOOL RACK

Milton L. Cohen, Hewlett Bay Park, and Jeff Siegel, Great Neck, both of N.Y., assignors to Lifetime Hoan Corporation, Westbury, N.Y.

Filed Sep. 11, 1995, Ser. No. 43,713

Term of patent 14 years

U.S. Cl. D7—641



375,025

## SKI POLE COCKTAIL PICK

David C. Barton, 1857 Tulip Dr., Sarasota, Fla. 34239

Filed Jan. 16, 1996, Ser. No. 48,933

Term of patent 14 years

U.S. Cl. D7—684



375,024

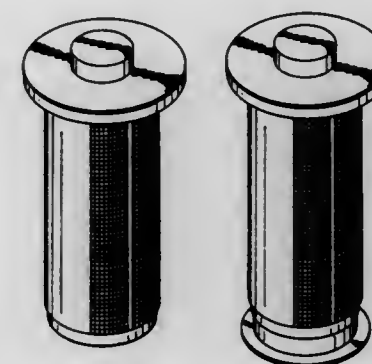
## JUICING ADAPTER FOR BLENDERS

J. Steve Pursley, 3525 Sage Rd., #1114, Houston, Tex. 77056

Filed May 18, 1995, Ser. No. 38,985

Term of patent 14 years

U.S. Cl. D7—665



375,026

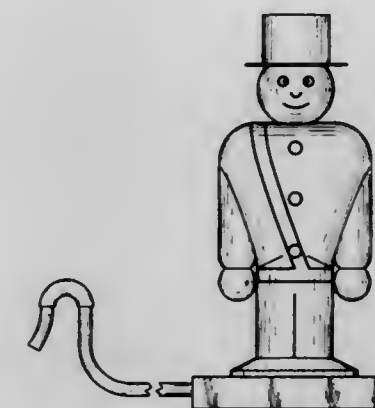
## FRESH CUT CHRISTMAS TREE STAND WATERER

Dennis L. Ronald, 446 Verla Dr., Windber, Pa. 15963

Filed Oct. 16, 1995, Ser. No. 45,280

Term of patent 14 years

U.S. Cl. D8—1



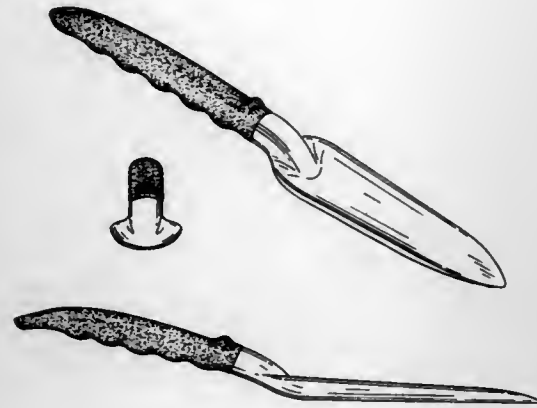


375,027

**HAND TRANSPLANTER**

Kenneth J. Spear, Vienna; Frank G. Czerwinski, Parkersburg, both of W. Va., and Steven F. Brooker, Marietta, Ohio, assignors to O. Ames Co., Parkersburg, W. Va.  
Filed Oct. 23, 1995, Ser. No. 45,516  
Term of patent 14 years

U.S. Cl. D8—10

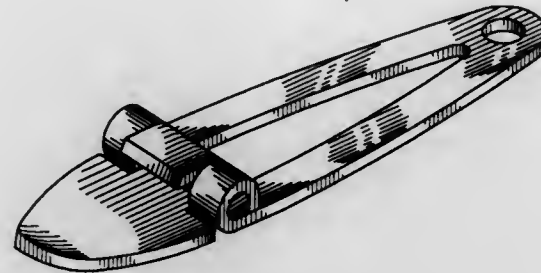


375,029

**FOLDING SAFETY CAN OPENER**

Roger Totten, 10372C W. Florida Ave., Lakewood, Colo. 80232  
Filed May 31, 1995, Ser. No. 39,584  
Term of patent 14 years

U.S. Cl. D8—41



375,028

**TOOL FOR CLEANOUT PLUGS**

Walter A. Moses, 507 Olgilvie, Houston, Tex. 77017  
Filed May 1, 1995, Ser. No. 38,273  
Term of patent 14 years

U.S. Cl. D8—29



375,030

**MASONRY SCOOP**

Ga'bor Nagy-Bozsoky, 11640 SW. 80th Rd., Miami, Fla. 33156  
Filed Jul. 17, 1995, Ser. No. 41,475  
Term of patent 14 years

U.S. Cl. D8—45



375,031

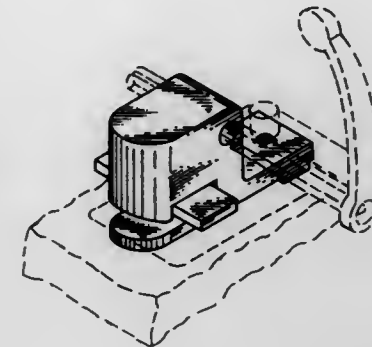
**HEAVY DUTY CLAMP FOR COMPUTER PAPER****MARGIN STRIPPER**

James F. Cottone, 2001 Jefferson Davis Hwy., Arlington, Va. 22202

Filed May 17, 1994, Ser. No. 22,985

Term of patent 14 years

U.S. Cl. D8—72



375,033

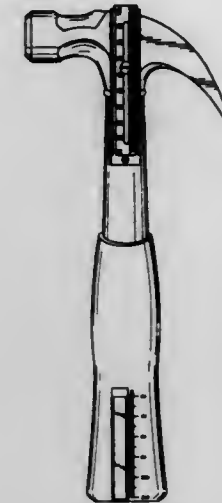
**ROOF TILER'S HAMMER**

Shane Edwards, Lot 11, Mulgoa Road, Penrith, NSW 2750, Australia

Filed Mar. 20, 1995, Ser. No. 36,393

Term of patent 14 years

U.S. Cl. D8—75



375,032

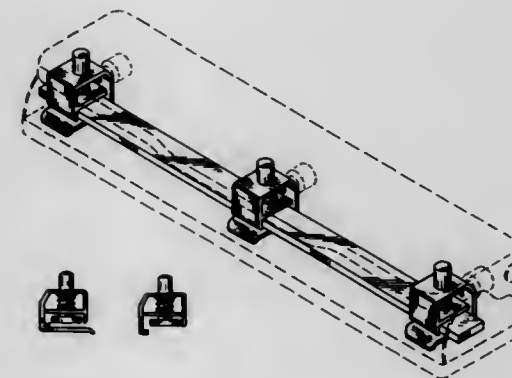
**UNIFIED FOOTPIECE CLAMP FOR COMPUTER PAPER****MARGIN STRIPPER**

James F. Cottone, 2001 Jefferson Davis Hwy., Arlington, Va. 22202

Filed May 17, 1994, Ser. No. 23,043

Term of patent 14 years

U.S. Cl. D8—72



375,034

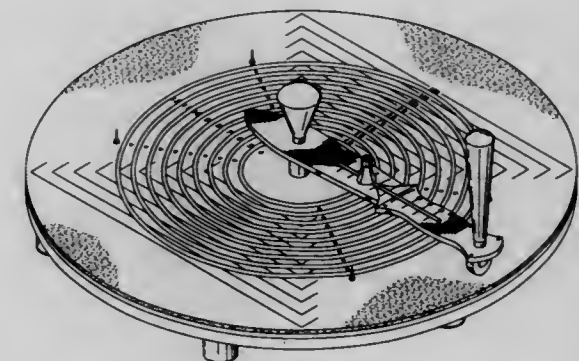
**SANDPAPER AND FIBROUS MATERIAL CUTTER**

David G. Bowser, 200 Vaughn St., Johnstown, Pa. 15906

Filed May 22, 1995, Ser. No. 39,181

Term of patent 14 years

U.S. Cl. D8—98



375,035

**HANDLE FOR KNIVES**

Petra Mangol, Stuttgart, Germany, assignor to J. A. Henckels Cinth Toenders, Box 243, Ardmore, Alberta, Canada  
 Zwillingwerk AG, Solingen, Germany  
 Filed Jun. 21, 1995, Ser. No. 40,560  
 Claims priority, application Germany, Apr. 11, 1995, 95 03 U.S. Cl. D8—339  
 140.5

Term of patent 14 years

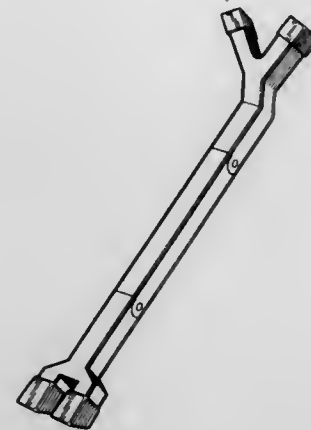
U.S. Cl. D8—107



375,037

**DOOR BRACE**

Thomas P. Trevorrow, R.D. #2 Box 369, Holsopple, Pa. 15935  
 Filed Mar. 15, 1995, Ser. No. 36,193  
 Term of patent 14 years

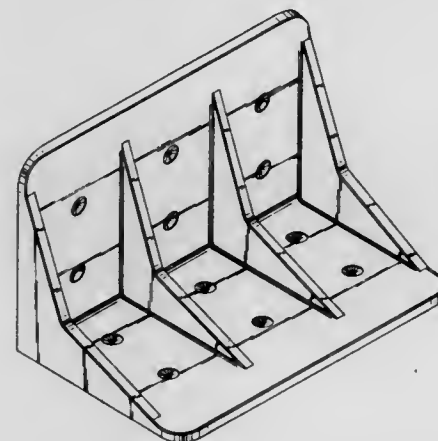


375,038

**ORNAMENTAL BRACKET**

Thomas P. Trevorrow, R.D. #2 Box 369, Holsopple, Pa. 15935  
 Filed Mar. 15, 1995, Ser. No. 36,193  
 Term of patent 14 years

U.S. Cl. D8—354



375,036

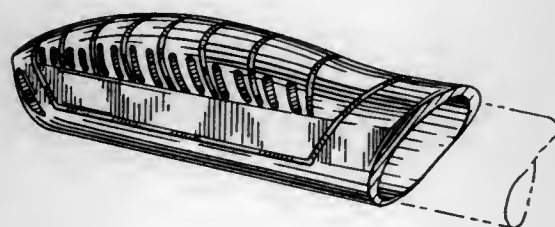
**HANDLE GRIP**

Thomas J. David, Worthington, Ohio; Ernest D. Labarre, Waunakee, and Jerrold N. Austin, Baraboo, both of Wis., assignors to Fiskars Inc., Madison, Wis.

Filed May 17, 1995, Ser. No. 38,974

Term of patent 14 years

U.S. Cl. D8—303

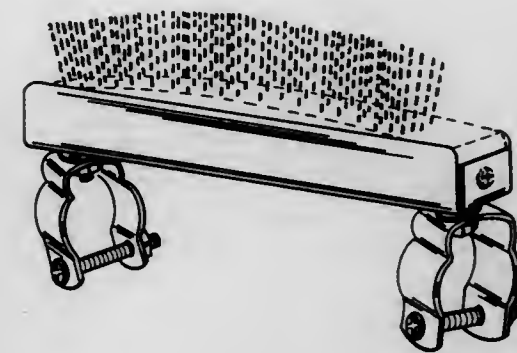


375,039

**BRACKET FOR CLEAT CLEANING BRUSH**

Lewis J. Carroll, 265 N. Cedar St., Massapequa, N.Y. 11748  
 Filed May 19, 1995, Ser. No. 39,040  
 Term of patent 14 years

U.S. Cl. D8—354



375,041

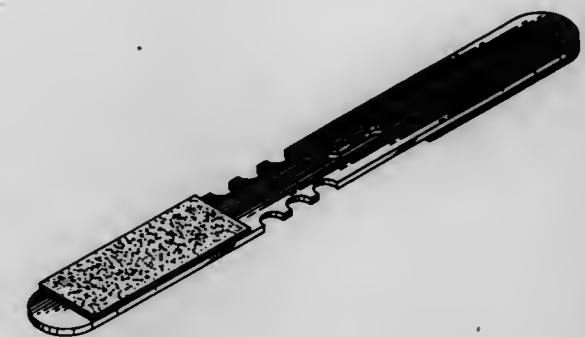
**TIE STRAP**

Guillermo Chavez, 9701 Fontainebleau Blvd., #112, Miami, Fla. 33172, and Sergio Guerra, 5650 NW. 2nd St., Miami, Fla. 33126

Filed Jun. 22, 1995, Ser. No. 40,609

Term of patent 14 years

U.S. Cl. D8—394



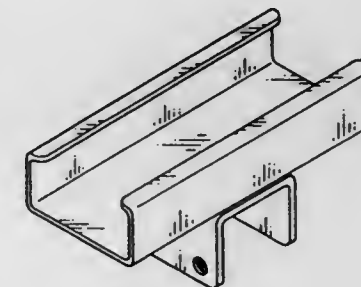
375,040

**JOINT FOR A RACK FRAME**

Muneharu Miyashita, Shizuoka, Japan, assignor to Yazaki Industrial Chemical Co., Ltd., Shizuoka, Japan  
 Filed Aug. 22, 1994, Ser. No. 27,436

Term of patent 14 years

U.S. Cl. D8—382



375,042

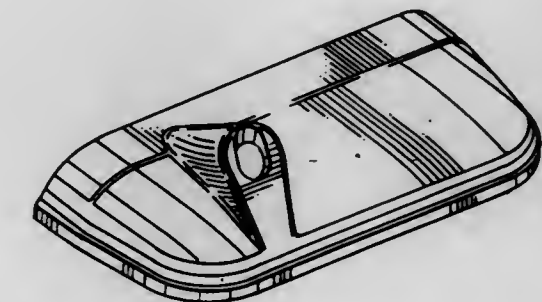
**OUTER SURFACE OF AN OPERATOR HOUSING**

Todd A. Anderson, Albert Lea, and Eric P. Heim, Owatonna, both of Minn., assignors to Truth Hardware Corporation, Owatonna, Minn.

Filed Dec. 19, 1995, Ser. No. 48,062

Term of patent 14 years

U.S. Cl. D8—400



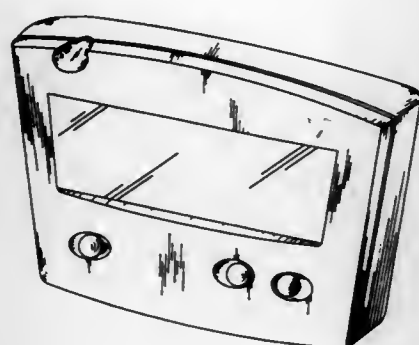


375,043  
PAGER

Mark Biasotti, San Jose, and Charles R. Lewis, Jr., Palo Alto, both of Calif., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jan. 4, 1995, Ser. No. 33,034  
Term of patent 14 years

U.S. Cl. D14—191



375,045  
BAG CLIP WITH PIVOT END

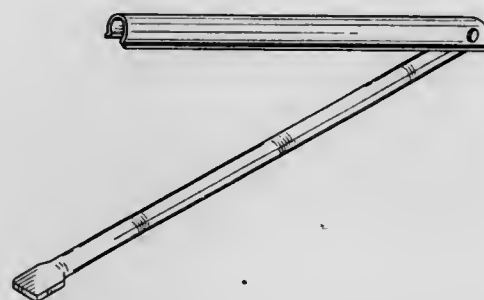
Desna V. Weber, and Thomas B. Oates, both of 2 Old Sound Rd., Joppa, Md. 21085

Filed Jan. 30, 1995, Ser. No. 34,210

The portion of the term of this patent subsequent to Aug. 13, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D9—443



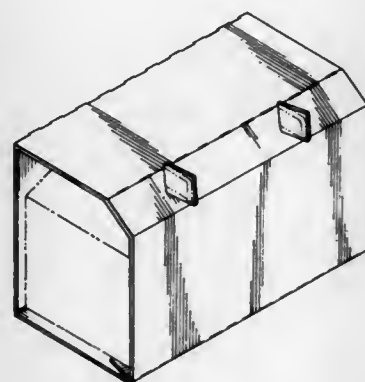
375,044

STACKABLE COMPOSITE PACKAGE

Lonnie Williard, Succasunna; Brian G. Boden, Mendham, both of N.J., and Harry Hajinlian, Congers, N.Y., assignors to Nabisco, Inc., Parsippany, N.J.

Filed Sep. 22, 1994, Ser. No. 28,812  
Term of patent 14 years

U.S. Cl. D9—433



375,046

CONTAINER SPOUT

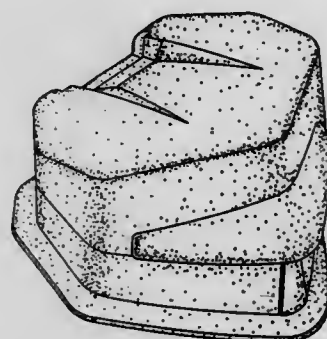
Jean-Marie Hotz, Prêles, Switzerland, assignor to Tetra Laval Holdings and Finance S.A., Pully, Switzerland

Division of Ser. No. 918,229, Jul. 24, 1992, Pat. No. Des. 358,770. This application Feb. 14, 1995, Ser. No. 34,854

Claims priority, application Switzerland, Jan. 24, 1992, 119 526

Term of patent 14 years

U.S. Cl. D9—447



375,047

FRAGRANCE BOTTLE

Ilana V. Jivago, 9454 Wilshire Blvd., 6th Floor, Beverly Hills, Calif. 90212

Filed Oct. 4, 1995, Ser. No. 44,980

Term of patent 14 years

U.S. Cl. D9—521



375,049

COMBINED BOTTLE AND CAP

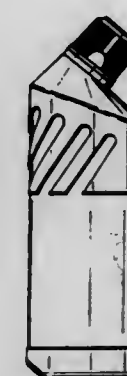
David Vollbrecht, Paris, France, assignor to Reckitt & Colman SA, Massy, France

Filed Dec. 22, 1995, Ser. No. 48,220

Claims priority, application France, Jun. 23, 1995, 95 3493

Term of patent 14 years

U.S. Cl. D9—526



375,048

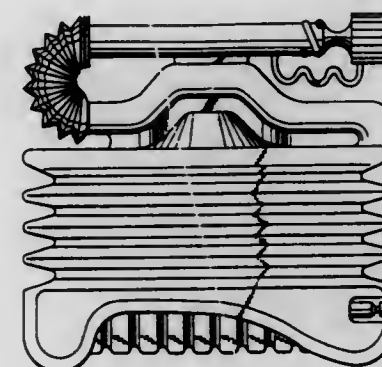
COLLAPSIBLE BOTTLE

Marshall Barrash, Atlanta, and William Credle, Jr., Stone Mtn., both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed May 18, 1995, Ser. No. 39,474

Term of patent 14 years

U.S. Cl. D9—525



375,050

COMBINED PERFUME BOTTLE AND CLOSURE

Khaled Chahed, Paris, France, assignor to Parfums Jean-Jacques Vivier, France

Filed Jul. 12, 1994, Ser. No. 25,834

Term of patent 14 years

U.S. Cl. D9—553



375,051  
BOTTLE

Gregory A. Lathrop, Manchester; Mark D. Gerhart, Westminster; David F. Gnadt, Owings Mills; Kevin J. Markey, Westminster, all of Md.; Frank E. Gonda, Fairfield, Conn., and David S. Laubach, New York, N.Y., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed May 19, 1995, Ser. No. 39,053

The portion of the term of this patent subsequent to Jul. 30, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D9—558

375,052  
BOTTLE

Gregory A. Lathrop, Manchester; Mark D. Gerhart, Westminster; David F. Gnadt, Owings Mills; Kevin J. Markey, Westminster, all of Md.; Frank E. Gonda, Fairfield, Conn., and David S. Laubach, New York, N.Y., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed May 19, 1995, Ser. No. 39,290

The portion of the term of this patent subsequent to Jul. 30, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D9—558



## 375,053

## SQUARE WATCH CASE

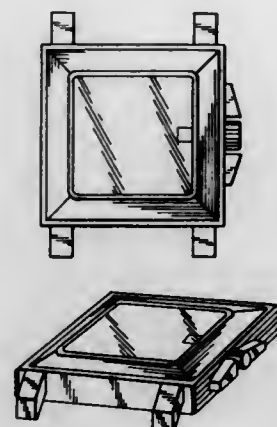
Michel Voegeli, 5, rue Centrale, 1247 Anieres, Switzerland

Filed Jul. 17, 1995, Ser. No. 41,545

Claims priority, application Switzerland, Jan. 16, 1995, 121965

Term of patent 14 years

U.S. Cl. D10—30



## 375,054

## WRIST WATCH

Akemi Tomita, Kawagoe, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed May 31, 1995, Ser. No. 39,621

Term of patent 14 years

U.S. Cl. D10—38



## 375,055

## MEASURING SPOON

Robert R. Reed, 104 Sweetbriar Rd., Greenville, S.C. 29615

Continuation-in-part of Ser. No. 228,227, Apr. 15, 1994, Pat. No. 5,445,023. This application Apr. 10, 1995, Ser. No. 37,311

Term of patent 14 years

U.S. Cl. D10—46.2



## 375,057

## REMOTE CONTROL TRANSMITTER FOR A DOG TRAINING UNIT

Ping H. Heun, Kowloon, Hong Kong, assignor to GSL Rechargeable Products, Ltd., Kowloon, Hong Kong

Filed Apr. 7, 1995, Ser. No. 37,260

Term of patent 14 years

U.S. Cl. D10—104



## 375,056

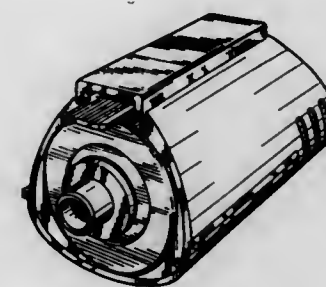
## REPLACEABLE GAS ANALYZER

Peter J. Sewell, Bordon, and Uri Friedlander, London, both of England, assignors to Sensors, Inc., Saline, Mich.

Filed Nov. 30, 1994, Ser. No. 31,603

Term of patent 14 years

U.S. Cl. D10—96



## 375,058

## AUDIBLE SIGNAL FOR ALARM UNITS

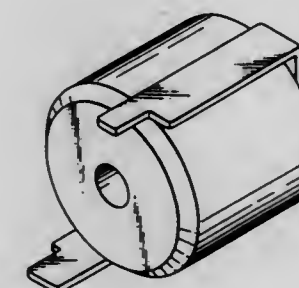
Takahiro Sone, and Naoyuki Kigawa, both of Shizuoka, Japan, assignors to Star Micronics Co., Ltd., Shizuoka-ken, Japan

Filed Jun. 9, 1995, Ser. No. 40,095

Claims priority, application Japan, Dec. 18, 1994, 6-38742

Term of patent 14 years

U.S. Cl. D10—116





375,059

## JEWELRY CHAIN

Ajit S. Bhamra, Union, N.J., assignor to Bhamra Chain Manufacturing Corp., Union, N.J.

Filed Dec. 30, 1994, Ser. No. 32,863  
Term of patent 14 years

U.S. Cl. D11—15



375,061

## MAGNETIC FASTENER

Tamao Morita, Tokyo, Japan, assignor to Tarmo Co. Ltd., Tokyo, Japan

Filed Jan. 27, 1995, Ser. No. 34,087  
Term of patent 14 years

U.S. Cl. D11—220



375,060

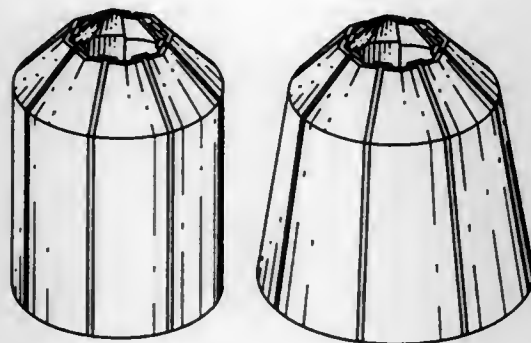
## FLOWER POT COVER

Donald E. Weder, and Joseph G. Stracter, both of Highland, Ill., assignors to Southpac Trust International, Inc., and The Family Trust U/T/A, both of Oklahoma City, Okla.

Continuation-in-part of Ser. No. 808,556, Dec. 16, 1991, Pat. No. Des. 364,114, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, Pat. No. Des. 365,302, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 350,113, which is a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989, abandoned. This application Dec. 4, 1992, Ser. No. 2,285. The portion of the term of this patent subsequent to Sep. 5, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



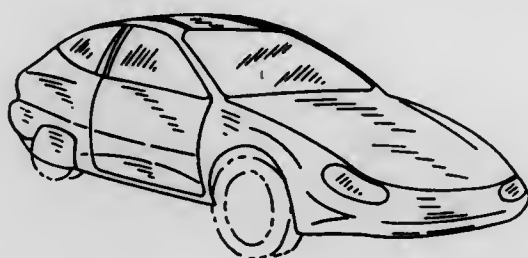
375,062

## CAR BODY

Michael C. Chelky, Santa Barbara, Calif., assignor to Dreisbach Electromotive, Inc., Santa Barbara, Calif.

Filed May 26, 1995, Ser. No. 39,373  
Term of patent 14 years

U.S. Cl. D12—91



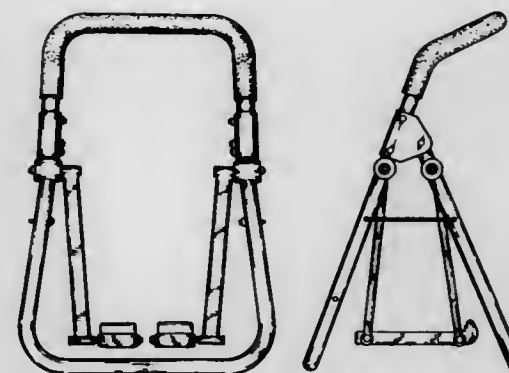
375,063

## DUAL ACTION WALKER

Clive G. Stevens, 7F, No. 291, Ta Tun 4th Street, Taicung City, Taiwan

Filed Sep. 11, 1995, Ser. No. 43,712  
Term of patent 14 years

U.S. Cl. D12—130



375,065

## HITCH BALL

Mark E. Duvernay; Robert F. Mater, Jr., both of Elkhart, Ind., and James L. Mellow, Bloomfield Hills, Mich., assignors to Reese Products, Inc., Elkhart, Ind.

Filed Oct. 24, 1995, Ser. No. 45,594  
Term of patent 14 years

U.S. Cl. D12—162



375,064

## TIRE

Eileen A. McKisson, Richfield, Ohio, assignor to Michelin Recherche et Technique S.A., Granges-Paccot, Switzerland

Filed Sep. 20, 1994, Ser. No. 28,694

Term of patent 14 years

U.S. Cl. D12—146



375,066

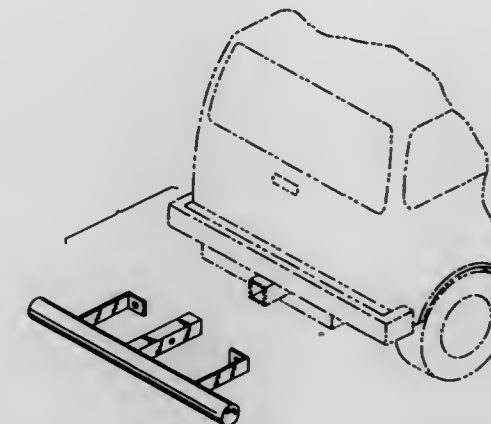
## REAR PUSH BAR

Sergio Tisi, 566 Meryl Dr., Westbury, N.Y. 11590

Filed Jan. 23, 1995, Ser. No. 33,910

Term of patent 14 years

U.S. Cl. D12—169



375,067

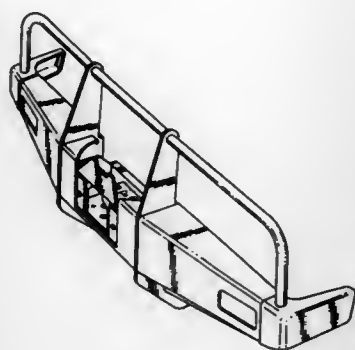
**COMBINED BUMPER AND WINCH CARRIER**

Gary D. Bronstein, Kelowna, Canada, assignor to Airborne International Marketing Inc., Kelowna, Canada

Filed Mar. 27, 1995, Ser. No. 36,723

Term of patent 14 years

U.S. Cl. D12—169



375,069

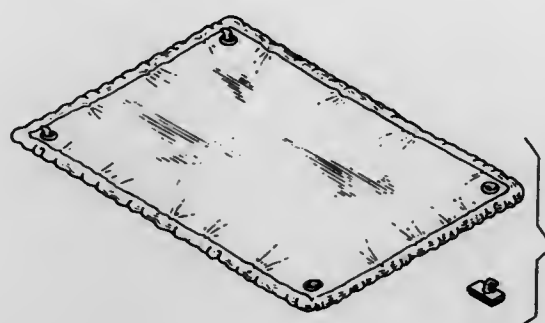
**FLEXIBLE SUNSCREEN FOR VEHICLE WINDOWS**

William M. Yates, and Donna L. Yates, both of 4865 Kennebeck Ave., Norfolk, Va. 23513

Filed Sep. 26, 1995, Ser. No. 44,556

Term of patent 14 years

U.S. Cl. D12—183



375,068

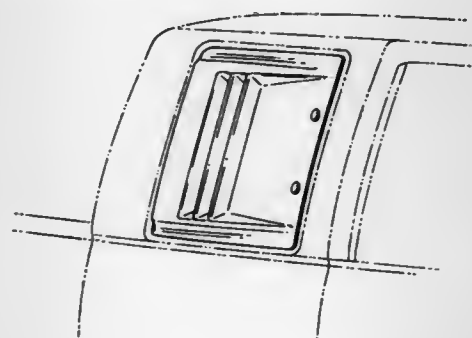
**SIDE WINDOW COVER FOR VEHICLE**

David M. Lund, Andover, Minn., assignor to Lund Industries, Inc., Minneapolis, Minn.

Filed Oct. 21, 1994, Ser. No. 29,831

Term of patent 14 years

U.S. Cl. D12—183



375,070

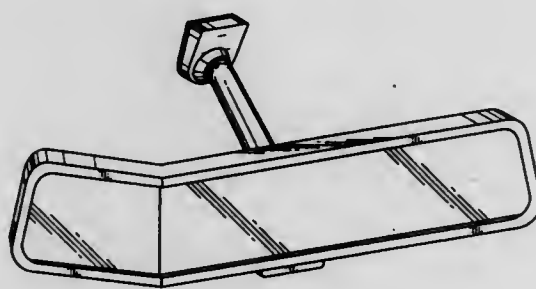
**ANGLED REARVIEW MIRROR**

Donald Yeabower, P.O. Box 5591, Destin, Fla. 32540

Filed Dec. 1, 1995, Ser. No. 47,373

Term of patent 14 years

U.S. Cl. D12—187



375,071

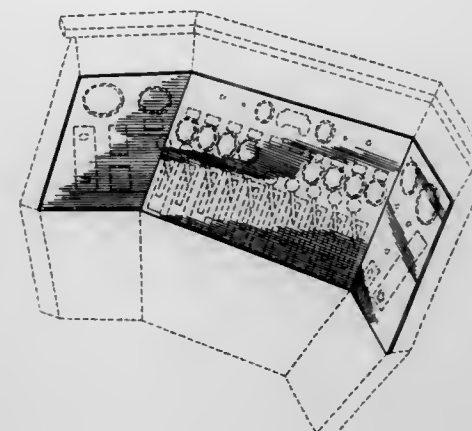
**CONTROL PANEL FOR A FIRE TRUCK**

Peter F. Darley, 607 Jackson, River Forest, Ill. 60305

Filed Sep. 29, 1993, Ser. No. 13,652

Term of patent 14 years

U.S. Cl. D12—192



375,073

**WHEEL**

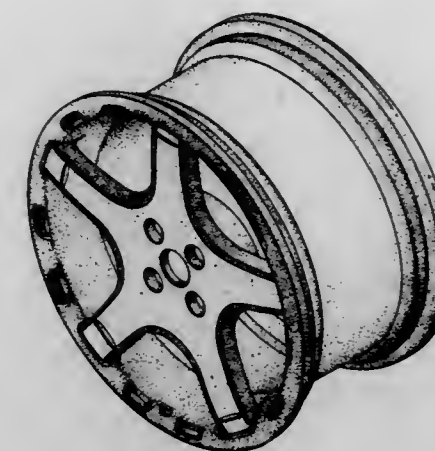
Peter Theiss, Böblingen, Germany, assignor to Steinmetz GmbH, Aachen, Germany

Filed May 19, 1994, Ser. No. 23,176

Claims priority, application Germany, Dec. 21, 1993, M 93 10 061.2

Term of patent 14 years

U.S. Cl. D12—209



375,074

**FRONT FACE OF A LIGHT METAL WHEEL**

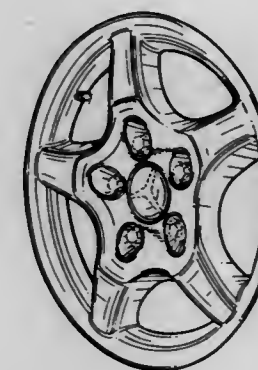
Bruno Sacco, Sindelfingen, and Peter Pfeiffer, Boeblingen, both of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Jan. 13, 1995, Ser. No. 33,463

Claims priority, application Germany, Jul. 13, 1994, M9405303.0

Term of patent 14 years

U.S. Cl. D12—209



375,072

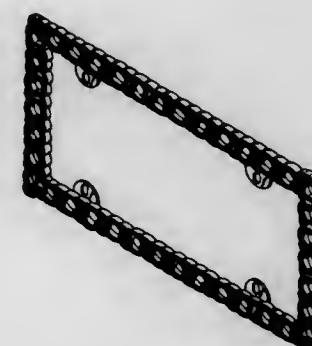
**LICENSE PLATE FRAME**

Ming L. Chiou, No. 165, Chou Kung Street, Yung Kang, Tainan, Taiwan

Filed Sep. 15, 1995, Ser. No. 44,043

Term of patent 14 years

U.S. Cl. D12—193





375,075

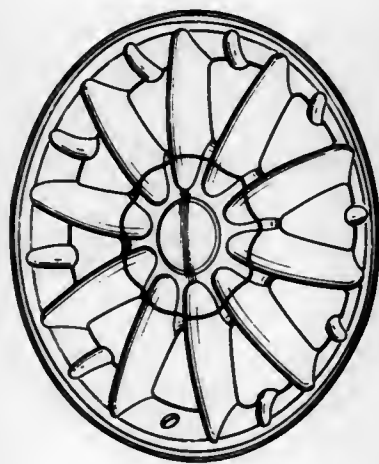
## VEHICLE WHEEL FRONT FACE SEGMENT

Erich O. Kugler, Urbana, Ill., assignor to Chrysler Corporation, Auburn Hills, Mich.

Filed May 8, 1995, Ser. No. 38,546

Term of patent 14 years

U.S. Cl. D12—209



375,077

## HELICOPTER

Rodney S. Taylor, Bedford, and Walter C. Joiner, Arlington, both of Tex., assignors to Bell Helicopter Textron Inc., Fort Worth, Tex.

Filed Jan. 24, 1995, Ser. No. 33,952

Term of patent 14 years

U.S. Cl. D12—327



375,076

## SPOKED WHEEL FOR MOTORVEHICLES

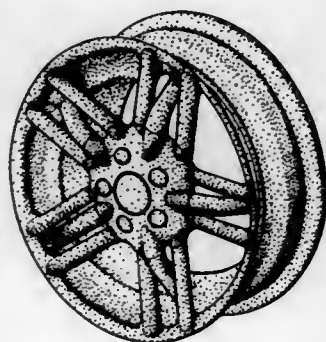
Marco Cattaneo, Pavia, Italy, assignor to MOMO S.P.A., Italy

Filed Aug. 2, 1995, Ser. No. 42,136

Claims priority, application Italy, Feb. 28, 1995, MI9500122

Term of patent 14 years

U.S. Cl. D12—211



375,078

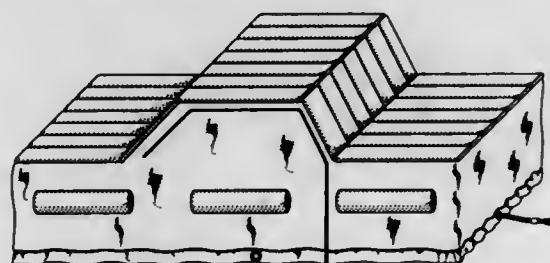
## PORTABLE VEHICLE SHELTER

Russell L. Cobb, 221 S. Ranburn Ave., Azusa, Calif. 91702

Filed Feb. 3, 1994, Ser. No. 18,314

Term of patent 14 years

U.S. Cl. D12—401



375,079

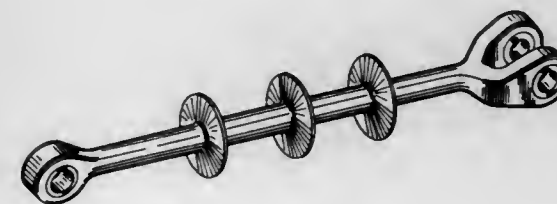
## POWER LINE INSULATOR

Jiri Pazdirek, Schaumburg, Ill., assignor to Mac Lean-Fogg Company, Wheeling, Ill.

Filed Feb. 21, 1995, Ser. No. 36,622

Term of patent 14 years

U.S. Cl. D13—132



375,081

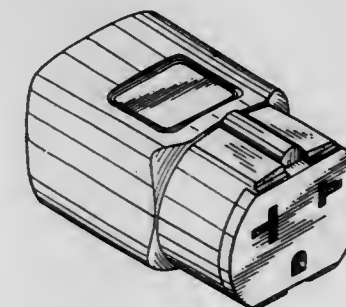
## ELECTRICAL CONNECTOR BODY

John L. Sandor, Wallingford, and William C. Boteler, Bridgeport, both of Conn., assignors to Hubbell Incorporated, Orange, Conn.

Continuation of Ser. No. 39,034, May 19, 1995. This application Nov. 29, 1995, Ser. No. 47,303

Term of patent 14 years

U.S. Cl. D13—143



375,080

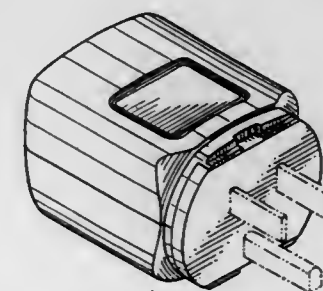
## ELECTRICAL PLUG BODY

John L. Sandor, Wallingford, and William C. Boteler, Bridgeport, both of Conn., assignors to Hubbell Incorporated, Orange, Conn.

Continuation of Ser. No. 39,035, May 19, 1995. This application Nov. 29, 1995, Ser. No. 47,301

Term of patent 14 years

U.S. Cl. D13—141



375,082

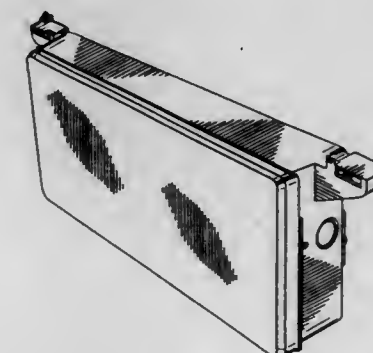
## POST OR STRAND MOUNTED TERMINAL HOUSING

Selim Messelhi, Etobicoke, Canada, assignor to Communications Technology Corporation, Dallas, Tex.

Filed Mar. 24, 1993, Ser. No. 6,303

Term of patent 14 years

U.S. Cl. D13—152



375,083

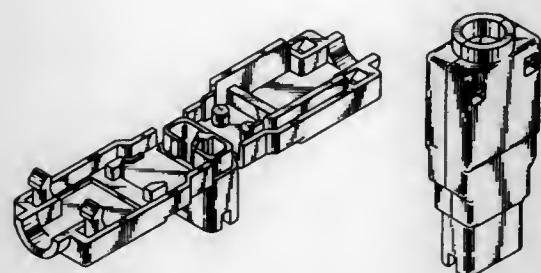
## INSULATING COVER FOR A TERMINAL

Toshinobu Nakamura, Tokyo, Japan, assignor to Shinagawa Shoko Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1995, Ser. No. 47,682

Term of patent 14 years

U.S. Cl. D13—156



375,085

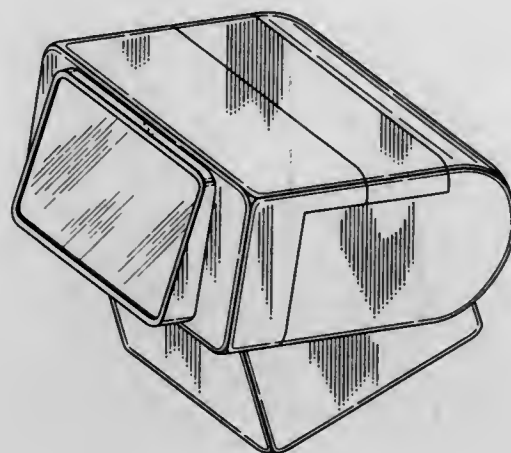
## PRICE VERIFIER

Kevin P. Kellar, and Horng-Jaan Lin, both of Lawrenceville, Ga., assignors to AT&T Global Information Solutions Company, Dayton, Ohio

Filed Oct. 5, 1995, Ser. No. 45,003

Term of patent 14 years

U.S. Cl. D14—105



375,084

## PROCESS MONITORING CONTROLLER

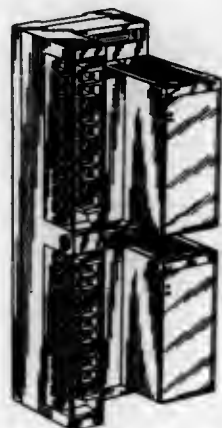
Mikio Hamada, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 9, 1995, Ser. No. 42,406

Claims priority, application Japan, Apr. 7, 1995, 7-9688

Term of patent 14 years

U.S. Cl. D13—162



375,086

## ELECTRONIC COMPUTER

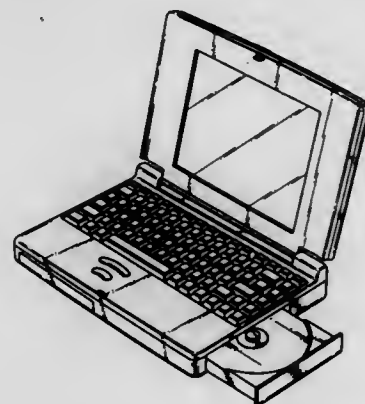
Osamu Kondo, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Apr. 5, 1995, Ser. No. 37,162

Claims priority, application Japan, Oct. 5, 1994, 6-30096  
The portion of the term of this patent subsequent to Jul. 19, 2008, has been disclaimed.

Term of patent 14 years

U.S. Cl. D14—106



375,087

## COMBINED PERSONAL COMPUTER MOUSE AND DIGITIZING STYLUS DEVICE FOR USE WITH A DRAWING BOARD ACCESSORY

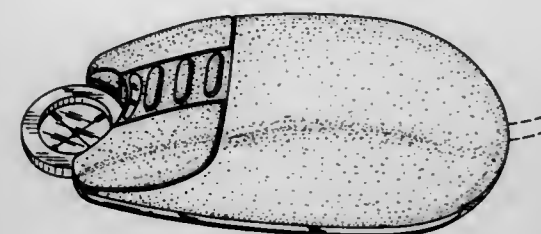
Werner Cordes, Hamburg, and Rolf Falkenberg, Halstenbek, both of Germany, assignors to Aristo Graphic Systeme GmbH & Co. KG, Hamburg, Germany

Filed Jun. 12, 1995, Ser. No. 40,164

Claims priority, application Germany, Dec. 13, 1994, M9409684.8

Term of patent 14 years

U.S. Cl. D14—114



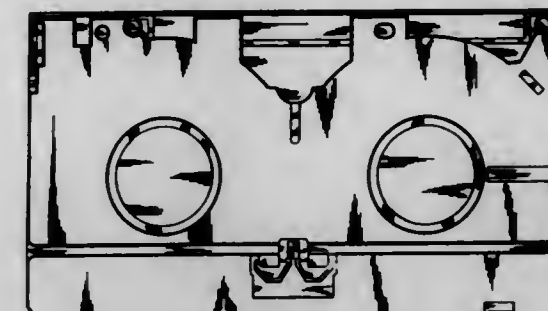
375,089

## VIDEO CASSETTE

Paul J. Gelardi; John A. Gelardi, and David A. Capotosto, all of Cape Porpoise, Me., assignors to LCV Associates, Kennebunkport, Me.

Division of Ser. No. 793,687, Nov. 18, 1991, Pat. No. Des. 360,202. This application Jun. 26, 1995, Ser. No. 40,715

Term of patent 14 years



375,088

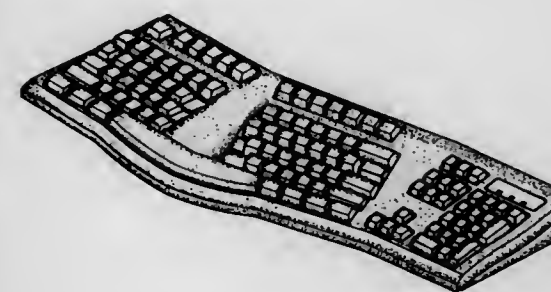
## KEYBOARD

Ching-Cheng Tsai, Taipei Hsien, Taiwan, assignor to Chicony Electronics Co., Ltd., Taipei Hsien, Taiwan

Filed Jul. 20, 1995, Ser. No. 41,642

Term of patent 14 years

U.S. Cl. D14—115



375,090

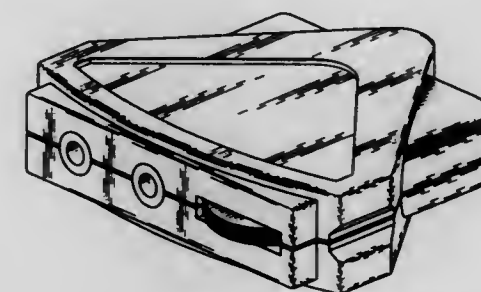
## VIDEO SOUND ADAPTOR

Brooks H. Lambert; Michael W. Hall, and Donald E. Angel, all of San Jose, Calif., assignors to Enhance Cable Technology, San Jose, Calif.

Filed Feb. 12, 1996, Ser. No. 50,246

Term of patent 14 years

U.S. Cl. D14—121





375,091

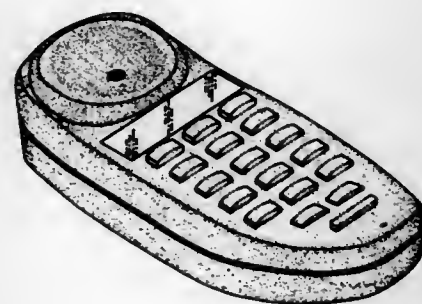
## PORTABLE TELEPHONE HANDSET

George L. Ricardo; William D. Simmons, and Bernie D. Tull, Jr., all of Shreveport, La., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Nov. 30, 1995, Ser. No. 47,266

Term of patent 14 years

U.S. Cl. D14—138



375,093

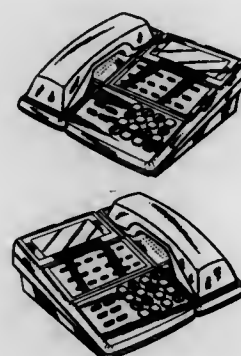
## TELEPHONE

Eric K. Babbitt, Markham, Canada, and John Cuccio, Westport, Conn., assignors to TIE Communications Research Inc., Markham, Canada

Filed Mar. 23, 1995, Ser. No. 36,901

Term of patent 14 years

U.S. Cl. D14—151



375,092

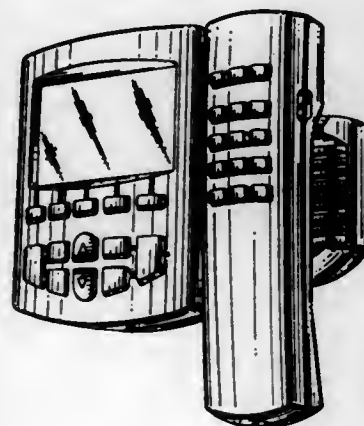
## MOBILE COMMUNICATIONS TERMINAL

Oliver Hilsenrath, Ridgewood, N.J.; John Moon, East Northport, N.Y., and William A. Opet, Wayne, Pa., assignors to Geotek Communications, Inc., Montvale, N.J.

Filed Feb. 17, 1995, Ser. No. 35,235

Term of patent 14 years

U.S. Cl. D14—142



375,094

## TELEPHONE SET

Tadamine Toh, Kawasaki, Japan, assignor to Kitsuko Corporation, Kanagawa, Japan

Filed Apr. 21, 1995, Ser. No. 37,844

Term of patent 14 years

U.S. Cl. D14—151



375,095

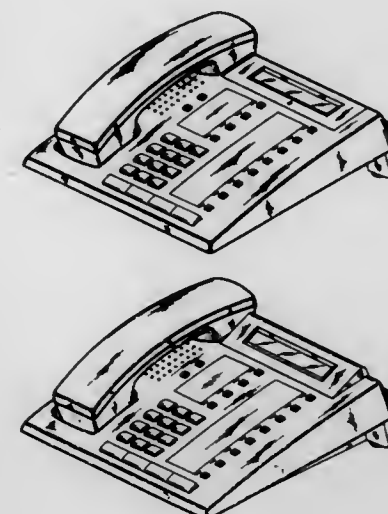
## TELEPHONE

Stefan Hillenmayer; Ulrich Skrypalle, both of Munich, Germany; Wayne E. McKinnon, Georgetown, Tex.; David E. Bryant, Austin, Tex.; Mary E. Kingsbury, Dallas, Tex.; Erich C. Elkins, San Francisco, Calif., and Doug A. Erwin, Austin, Tex., assignors to Siemens Rolm Communications Inc., Santa Clara, Calif.

Filed Jun. 14, 1995, Ser. No. 40,263

Term of patent 14 years

U.S. Cl. D14—151



375,097

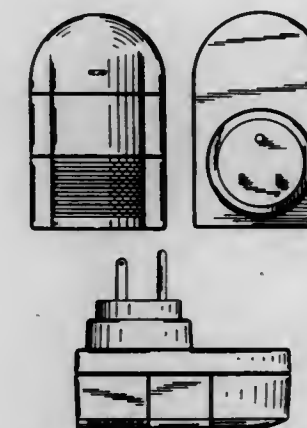
## RADIO COMMUNICATOR

Michael L. Kovens, Baltimore, Md., assignor to Universal Security Instruments, Inc., Owings Mills, Md.

Filed Aug. 14, 1995, Ser. No. 42,673

Term of patent 14 years

U.S. Cl. D14—159



375,096

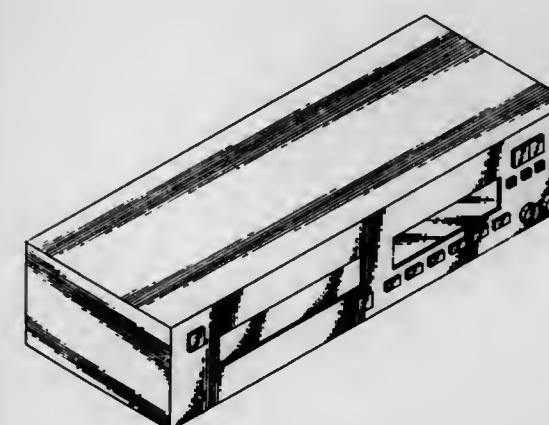
## COMPACT DISC PLAYER WITH MEMORY

Russell W. Michael, 101 W. Bayview Ave., Pleasantville, N.J. 08232

Filed Feb. 7, 1995, Ser. No. 34,545

Term of patent 14 years

U.S. Cl. D14—156



375,098

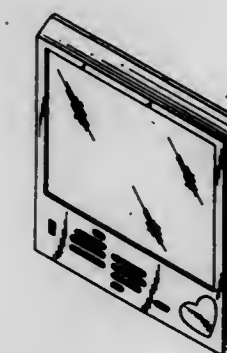
## ELECTRONIC VOICE MESSAGING NOTE PAD

Kamran Moallemi, Del Mar, and Robert L. Warren, Cardiff, both of Calif., assignors to Solana Technology Development Corporation, Solana Beach, Calif.

Filed Jun. 9, 1995, Ser. No. 40,063

Term of patent 14 years

U.S. Cl. D14—168



375,099

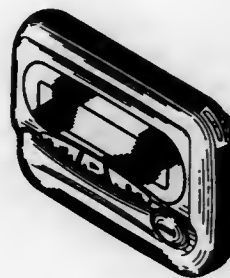
## SELECTIVE CALL RECEIVER

Bee L. Khoo, Johor Bahru, Malaysia, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 23, 1994, Ser. No. 28,873

Term of patent 14 years

U.S. Cl. D14—191



375,101

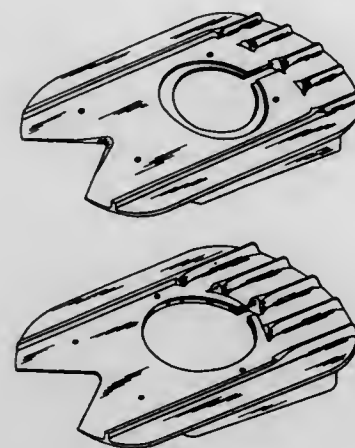
## OUTBOARD MOTOR CAUTION PLATE

Robert O. Icenogle, 1501 33rd St. SE., Ruskin, Fla. 33670

Filed Jan. 5, 1996, Ser. No. 49,010

Term of patent 14 years

U.S. Cl. D15—4



375,102

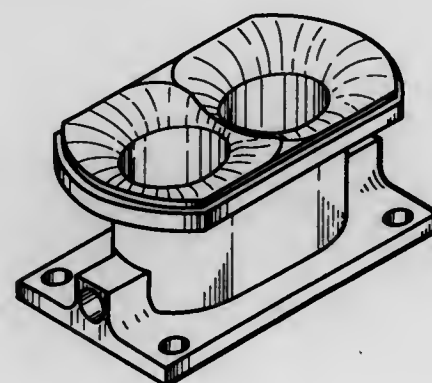
## THROTTLE BODY

William S. DeHimer, 7873 W. Thomas St., Rome, N.Y. 13440

Filed Jun. 9, 1995, Ser. No. 40,082

Term of patent 14 years

U.S. Cl. D15—5



375,100

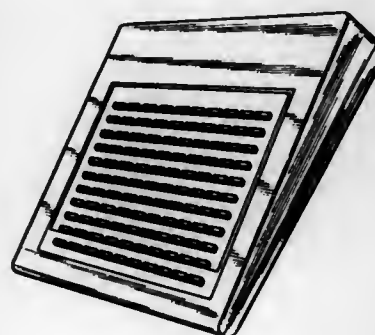
## EXTENSION RINGING CONSOLE APPARATUS FOR A TELEPHONE SET

Tadamine Toh, Kawasaki, Japan, assignor to Nitsuko Corporation, Kanagawa, Japan

Filed Apr. 21, 1995, Ser. No. 37,846

Term of patent 14 years

U.S. Cl. D14—241



375,103

## BACKHOE

Masao Masumoto, and Shizuo Shimoie, both of Sakai, Japan, assignors to Kubota Corporation, Japan

Filed Jul. 17, 1995, Ser. No. 41,485

Claims priority, application Japan, Jan. 18, 1995, 7-979

Term of patent 14 years

U.S. Cl. D15—25



375,105

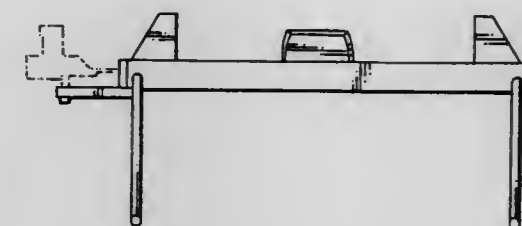
## LOGSPLITTING APPARATUS

Frank R. Simms, P.O. Box 802, 63-B Gonyeau Rd., Milton, Vt. 05468

Filed Sep. 21, 1995, Ser. No. 44,253

Term of patent 14 years

U.S. Cl. D15—127



375,104

## SEWING MACHINE

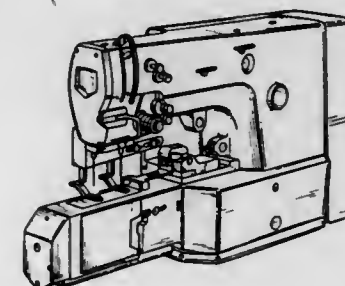
Shoichi Shibuya, Chofu, Japan, assignor to Juki Corporation, Tokyo, Japan

Filed Aug. 14, 1995, Ser. No. 42,675

Claims priority, application Japan, Feb. 16, 1995, 7-3964

Term of patent 14 years

U.S. Cl. D15—69



375,106

## BINOCULARS

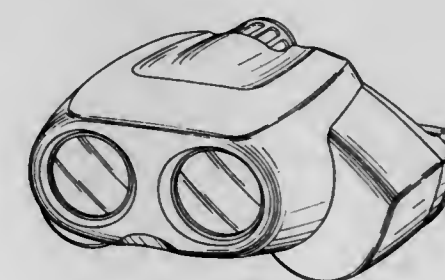
Takashi Matsuda, and Masahiro Koinuma, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 10, 1995, Ser. No. 41,234

Claims priority, application Japan, Jan. 10, 1995, 7-234

Term of patent 14 years

U.S. Cl. D16—133



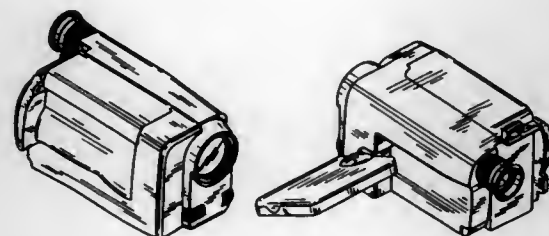


375,107

COMBINED VIDEO TAPE RECORDER AND CAMERA  
Daisuke Ishii, Tokyo, Japan, assignor to Sony Corporation,  
Tokyo, Japan

Filed Mar. 16, 1995, Ser. No. 36,345  
Term of patent 14 years

U.S. Cl. D16—202

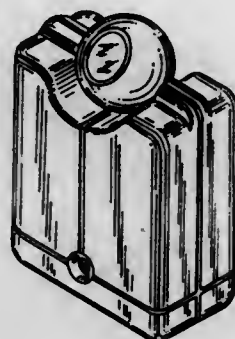


375,109

SERVO-CONTROLLED VIDEO CAMERA  
William M. Hartman, 76 Longwood Rd., Quincy, Mass. 02169  
Filed Nov. 3, 1995, Ser. No. 45,945

Term of patent 14 years

U.S. Cl. D16—202

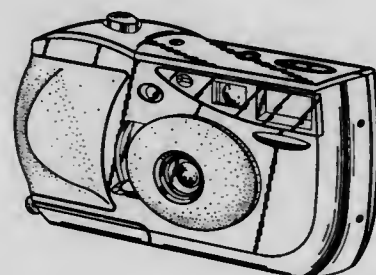


375,110

CAMERA WITH RETRACTABLE LENS COVER  
John K. McBride, Rochester, N.Y.; Robert H. Bruno, Avon,  
Conn., and Mark D. Dziersk, Chicago, Ill., assignors to  
Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 12, 1995, Ser. No. 45,184  
Term of patent 14 years

U.S. Cl. D16—209



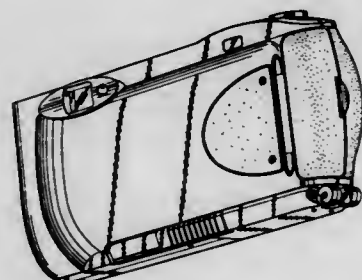
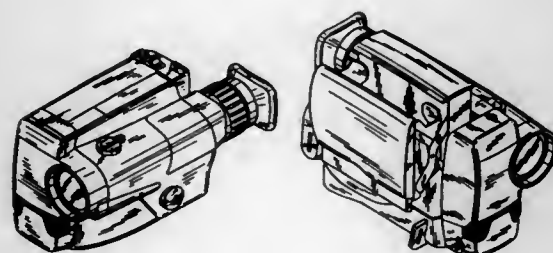
375,108

COMBINED VIDEO TAPE RECORDER AND CAMERA  
Tomohiro Harata, Tokyo, Japan, assignor to Sony Corpora-  
tion, Tokyo, Japan

Continuation-in-part of Ser. No. 34,708, Feb. 10, 1995, aban-  
doned. This application Apr. 5, 1995, Ser. No. 37,157

Term of patent 14 years

U.S. Cl. D16—202



375,111

COMBINED SUNGLASSES AND EYE SHADE  
Linda F. Wielhouwer, 100 Teggerdine, White Lake, Mich. 48386

Filed Oct. 6, 1995, Ser. No. 47,524  
Term of patent 14 years

U.S. Cl. D16—304



375,113

GUITAR BODY

Terence T. D'Arby, 3780 1/4 Multiview St., Los Angeles, Calif. 90069

Filed Apr. 27, 1995, Ser. No. 38,051  
Term of patent 14 years

U.S. Cl. D17—20



375,112

EAR STEMS

James H. Jannard, San Juan Capistrano, Calif., assignor to  
Oakley, Inc., Irvine, Calif.

Division of Ser. No. 530,204, May 30, 1990, Pat. No. Des.  
358,600, which is a continuation-in-part of Ser. No. 436,471,  
Nov. 20, 1989, abandoned. This application May 22, 1995,  
Ser. No. 39,403

Term of patent 14 years

U.S. Cl. D16—335



375,114

ELECTRIC GUITAR BODY

Richard Excellente, P.O. Box 505, Manalapan, N.J. 07726

Filed May 22, 1995, Ser. No. 39,186

Term of patent 14 years

U.S. Cl. D17—20



375,115

**MUSICAL TONE CONTROL APPARATUS**

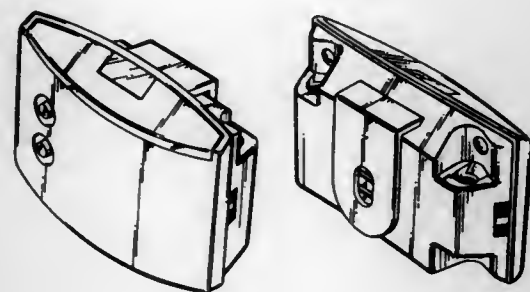
Manabu Kawada, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

Filed Apr. 28, 1995, Ser. No. 38,184

Claims priority, application Japan, Nov. 4, 1994, 6-33663

Term of patent 14 years

U.S. Cl. D17—99



375,117

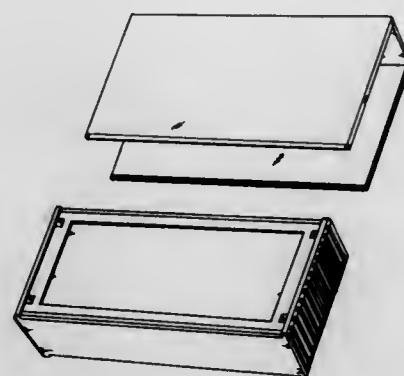
**INK STAMP**

Richard Keohan, Braintree, Mass., assignor to Hope Copinger, Boston, Mass.

Filed Aug. 11, 1995, Ser. No. 42,520

Term of patent 14 years

U.S. Cl. D18—17



375,116

**ELECTRONIC TYPEWRITER HAVING A DISPLAY SCREEN**

Toshimi Chiba, Irvine, Calif., assignor to Canon Business Machines, Inc., Costa Mesa, Calif.

Filed Sep. 7, 1995, Ser. No. 43,561

Term of patent 14 years

U.S. Cl. D18—1



375,118

**CLEANING TONER MAGAZINE**

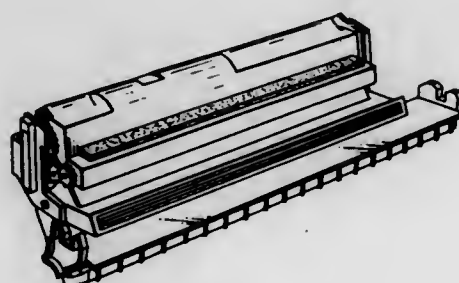
Kazumasa Ishikawa, and Shigemi Kanda, both of Kanagawa, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 22, 1995, Ser. No. 42,991

Claims priority, application Japan, Nov. 21, 1994, 6-35388

Term of patent 14 years

U.S. Cl. D18—43



375,119

**PRINTER**

Thomas E. Pangburn, Lexington, Ky., assignor to Lexmark International, Inc., Greenwich, Conn.

Filed Sep. 11, 1995, Ser. No. 43,740

Term of patent 14 years

U.S. Cl. D18—50



375,121

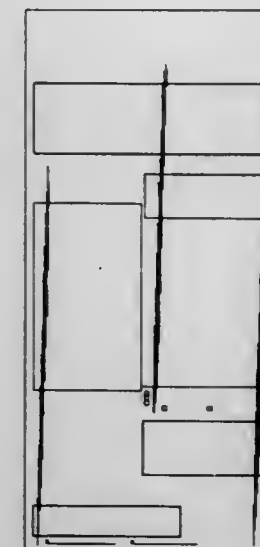
**BUSINESS FORM**

Jeffrey M. Sisilli, North Hollywood, Calif., assignor to The Reynolds and Reynolds Company, Dayton, Ohio

Filed May 4, 1995, Ser. No. 38,374

Term of patent 14 years

U.S. Cl. D19—1



375,120

**INK TANK FOR PRINTER**

Yasuo Kotaki, Machida; Yuji Hamasaki, Sagami-hara; Hideo Saikawa, Machida; Hiroyuki Tokuda, Yokohama; Shosaku Kawashima, Kawasaki; Masanori Takenouchi, Yokohama; Osamu Sato, Kawasaki; Hisashi Yamamoto, Machida; Jun Hinami, Kawasaki, and Toshiaki Sasaki, Abiko, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1995, Ser. No. 35,184

Claims priority, application Japan, Aug. 23, 1994, 6-25196

The portion of the term of this patent subsequent to Aug. 6, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D18—56



375,122

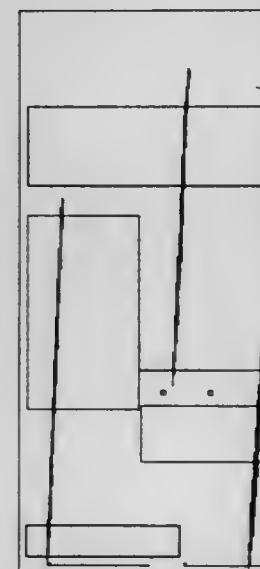
**BUSINESS FORM**

Jeffrey M. Sisilli, North Hollywood, Calif., assignor to The Reynolds and Reynolds Company, Dayton, Ohio

Filed May 4, 1995, Ser. No. 38,383

Term of patent 14 years

U.S. Cl. D19—1





375,123

**SPORTS CARD DISPLAY HOLDER**

Terry D. Strang, 81 Tebeau Ct., Auburn Hills, Mich. 48326

Filed Jul. 15, 1994, Ser. No. 25,973

Term of patent 14 years

U.S. Cl. D19—33



375,124

**BALLPOINT PEN**

Wen-Jui Kuo, 25, Lane 100, Tun-hua S.Rd., Taipei, Taiwan

Filed Dec. 28, 1995, Ser. No. 48,424

Term of patent 14 years

U.S. Cl. D19—50



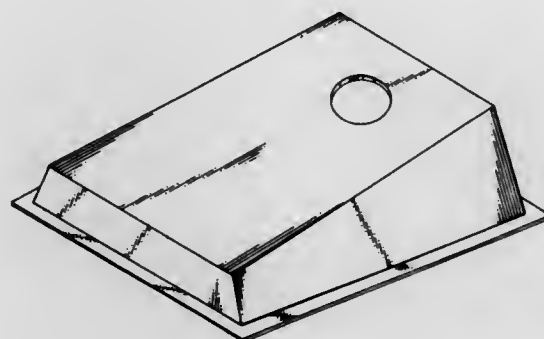
375,125

**BEAN BAG GAME TARGET**Michael D. Mallek, 2217 Virginia St., Midland, Mich. 48642,  
and Donald R. Schmidt, 16319 Whitehead Dr., Linden, Mich. 48451

Filed Aug. 19, 1994, Ser. No. 27,372

Term of patent 14 years

U.S. Cl. D21—5



375,126

**ELECTRONIC GAME HOUSING**

Takashi Ikenaga, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 15, 1995, Ser. No. 44,053

Claims priority, application Japan, Mar. 28, 1995, 7-8202

Term of patent 14 years

U.S. Cl. D21—13



375,127

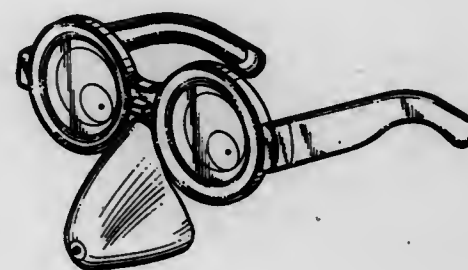
**NOVELTY EYEGLASSES**

Denni F. Rivette, Flat 61, 6th Floor, 61 Hennessy Road, Wanchai, and K. Y. Yeung, Rm. 6, 2/F., Kam Hon Industrial Bldg. 8 Wang Kwun Road, Kowloon Bay, Kowloon, both of Hong Kong

Filed Feb. 13, 1995, Ser. No. 34,788

Term of patent 14 years

U.S. Cl. D21—190



375,129

**TRAINING FOOTBALL**

Peter S. Daicos, 68 Kellett St., Northcote, Victoria, 3070, Australia

Filed Jan. 27, 1995, Ser. No. 34,092

Claims priority, application Australia, Aug. 24, 1994, 2719/94

Term of patent 14 years

U.S. Cl. D21—204



375,130

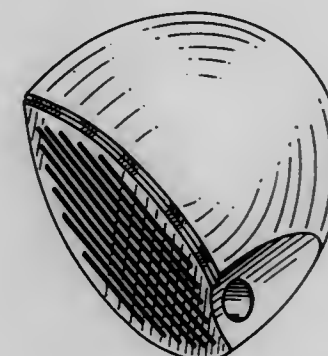
**CLUBHEAD**

Edward A. Hlinka, Carol Stream, Ill.; Dwight J. Niswander, Camarillo, Calif.; Carl E. Schele, Libertyville, Ill.; Edward A. Schield, Granada Hills, Calif., and James L. Shenohar, Lockport, Ill., assignors to Wilson Sporting Goods Co., Chicago, Ill.

Filed Mar. 1, 1995, Ser. No. 35,074

Term of patent 14 years

U.S. Cl. D21—214



375,128

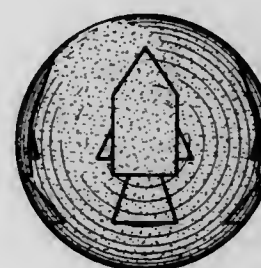
**TOY BALL**

Ryan J. Chernoff, Box 573, Nakusp, British Columbia, Canada

Filed Sep. 22, 1993, Ser. No. 13,340

Term of patent 14 years

U.S. Cl. D21—204



375,131

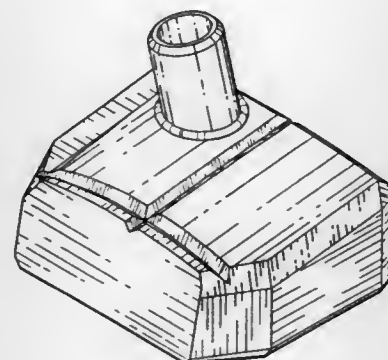
## GOLF PUTTER HEAD

Daniel A. Williams, Evansville, Ind., assignor to Williams Jewellers, Inc., Evansville, Ind.

Filed Sep. 12, 1995, Ser. No. 43,773

Term of patent 14 years

U.S. Cl. D21—219



375,133

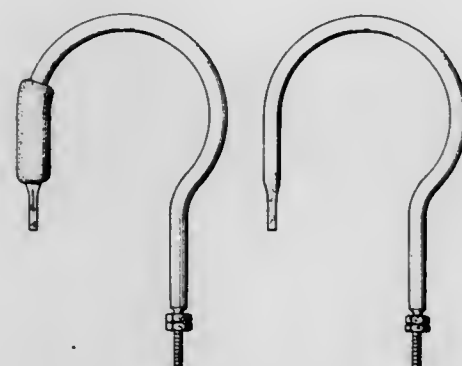
## ROD AND WEDGE PULLER

Gerald G. Newberry, 11819 Sixth St., Milan, Ill. 61264

Filed Feb. 17, 1995, Ser. No. 35,015

Term of patent 14 years

U.S. Cl. D22—108



375,132

## BELT FOR SKI COMPETITION

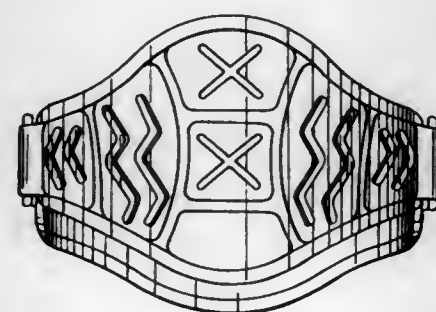
Koji Kato, Tokyo, Japan, assignor to K&K Kogyo Kabushiki Kaisha, Japan

Filed Sep. 14, 1995, Ser. No. 44,006

Claims priority, application Japan, Mar. 16, 1995, 7-7199

Term of patent 14 years

U.S. Cl. D21—238



375,134

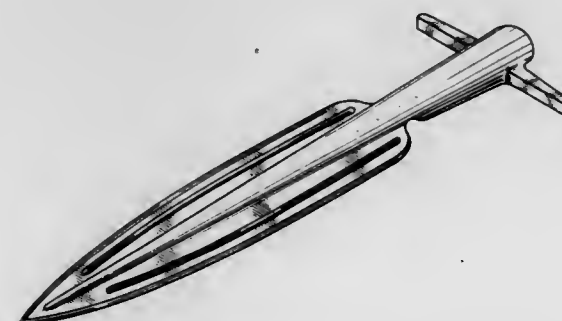
## SPEARHEAD

Lynn C. Thompson, 2747 Seahorse, Ventura, Calif. 93001

Filed May 1, 1995, Ser. No. 38,272

Term of patent 14 years

U.S. Cl. D22—118



375,135

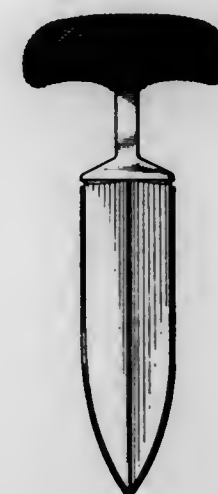
## KNIFE

Lynn C. Thompson, 2747 Seahorse, Ventura, Calif. 93001

Filed Feb. 1, 1996, Ser. No. 49,836

Term of patent 14 years

U.S. Cl. D22—118



375,137

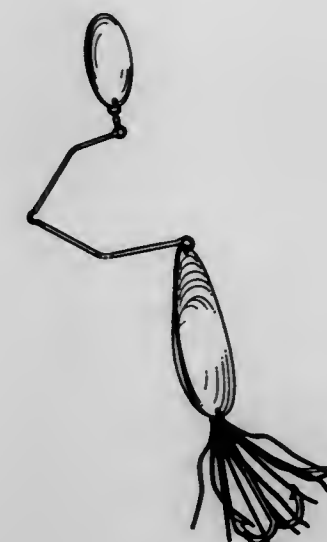
## SPINNER FISHING LURE

Harry Bussard, P.O. Box 13, Stuarts Draft, Va. 24477

Filed Apr. 24, 1995, Ser. No. 38,191

Term of patent 14 years

U.S. Cl. D22—129



375,138

## POND FILTER

James L. Anderson, 1105 Holly La., Burnsville, Minn. 55337

Filed May 22, 1995, Ser. No. 39,183

The portion of the term of this patent subsequent to Jul. 2, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D23—210

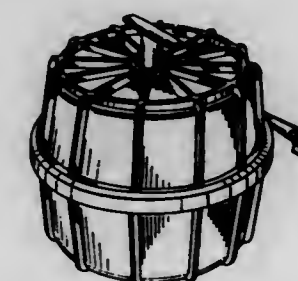
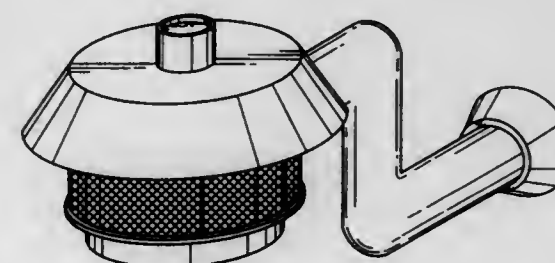
375,136  
INSECT ELIMINATOR STREET LIGHT

Marc Poore, Box 502, Bradshaw, W. Va. 24817

Filed Sep. 11, 1995, Ser. No. 43,694

Term of patent 14 years

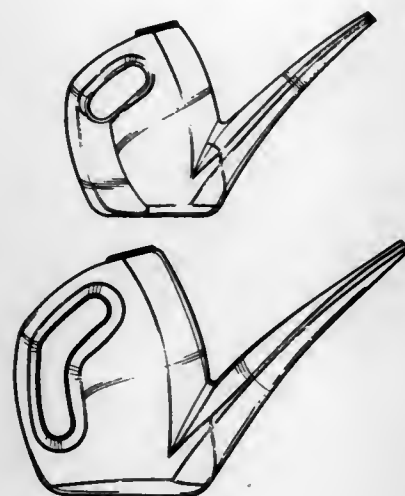
U.S. Cl. D22—123





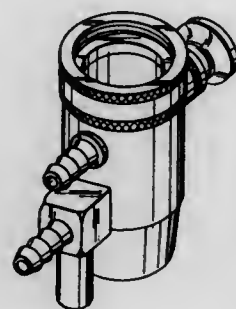
375,139  
WATERING CAN

Christopher S. Thorp, Ithaca, N.Y., assignor to Rubbermaid Specialty Products Inc., Wooster, Ohio  
Filed Feb. 9, 1995, Ser. No. 34,643  
Term of patent 14 years  
U.S. Cl. D23—212



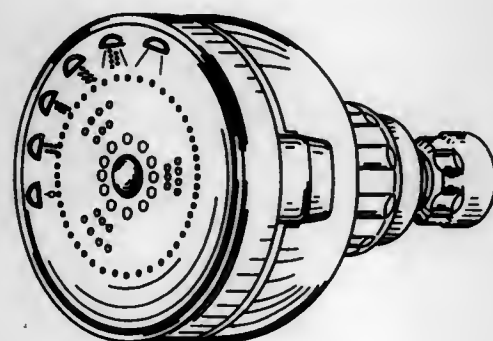
375,141  
DIVERTER VALVE

Jack Valley, Fountain Valley, Calif., assignor to V.A. Butler, Inc., Canoga Park, Calif.  
Filed May 25, 1995, Ser. No. 39,345  
Term of patent 14 years  
U.S. Cl. D23—233



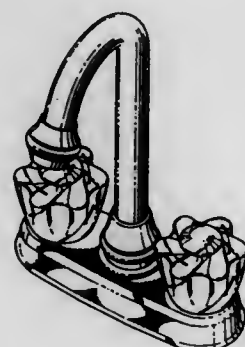
375,140

WALL MOUNT SHOWER HEAD WITH A PUSH BUTTON  
Raymond W. M. Chan, Vancouver, B.C., Canada, assignor to Jing Mei Industrial Limited, Hong Kong  
Filed Jun. 24, 1994, Ser. No. 24,981  
Term of patent 14 years  
U.S. Cl. D23—213



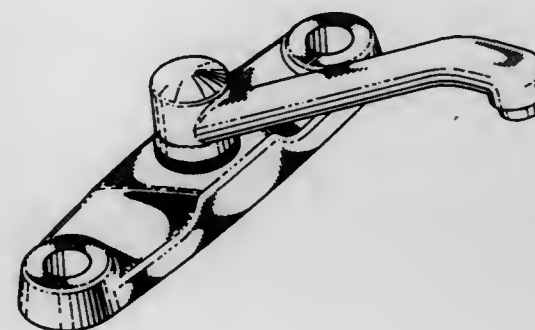
375,142  
FAUCET

Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Castaic, both of Calif., assignors to Emhart Inc., Newark, Del.  
Filed Sep. 22, 1995, Ser. No. 44,381  
Term of patent 14 years  
U.S. Cl. D23—241



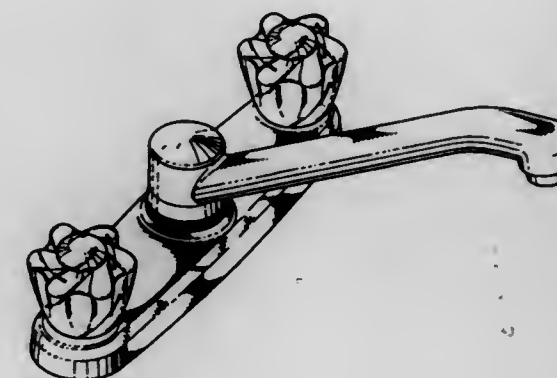
375,143  
FAUCET

Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Castaic, both of Calif., assignors to Emhart Inc., Newark, Del.  
Filed Sep. 22, 1995, Ser. No. 44,304  
Term of patent 14 years  
U.S. Cl. D23—243



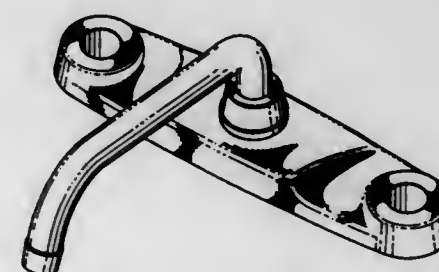
375,145  
FAUCET

Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Castaic, both of Calif., assignors to Emhart Inc., Newark, Del.  
Filed Sep. 22, 1995, Ser. No. 44,386  
Term of patent 14 years  
U.S. Cl. D23—243



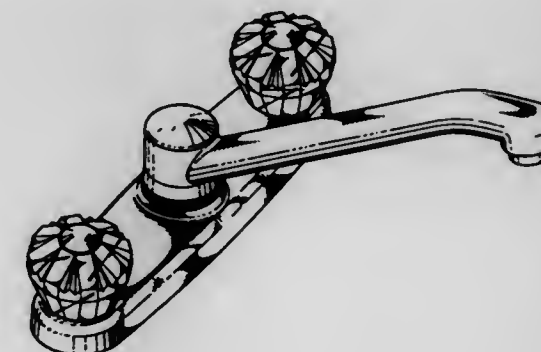
375,144  
FAUCET BODY

Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Castaic, both of Calif., assignors to Emhart Inc., Newark, Del.  
Filed Sep. 22, 1995, Ser. No. 44,344  
Term of patent 14 years  
U.S. Cl. D23—243



375,146  
FAUCET

Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Castaic, both of Calif., assignors to Emhart Inc., Newark, Del.  
Filed Sep. 22, 1995, Ser. No. 44,391  
Term of patent 14 years  
U.S. Cl. D23—243

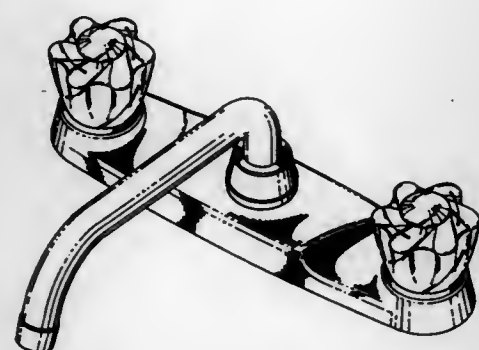


375,147  
FAUCET

Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Tom E. Robbins, San Leandro, Calif., assignor to Kallista, Inc., Castaic, both of Calif., assignors to Emhart, Inc., Newark, San Leandro, Calif.

Filed Sep. 22, 1995, Ser. No. 44,394  
Term of patent 14 years

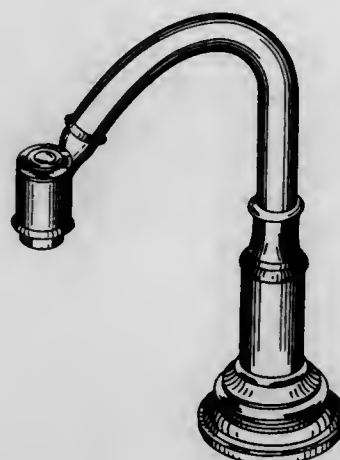
U.S. Cl. D23—243

375,149  
PLUMBING SPOUT

Tom E. Robbins, San Leandro, Calif., assignor to Kallista, Inc., San Leandro, Calif.

Filed Apr. 26, 1995, Ser. No. 38,033  
Term of patent 14 years

U.S. Cl. D23—257

375,150  
GASKET

Lilian E. Wainer, Newark, Del., assignor to W. L. Gore & Associates, Newark, Del.

Filed Jul. 18, 1995, Ser. No. 41,590  
Term of patent 14 years

U.S. Cl. D23—269



## 375,148

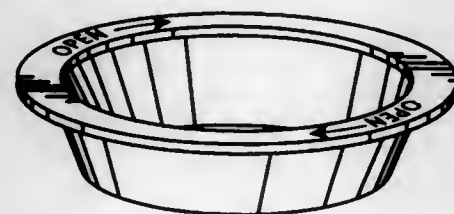
## DIRECTIONAL INDICATOR FOR VALVES

Jerry A. Keller, 201 Dock St., Schuylkill Haven, Pa. 17972

Filed Oct. 24, 1994, Ser. No. 30,211

Term of patent 14 years

U.S. Cl. D23—249

375,151  
BATHTUBS

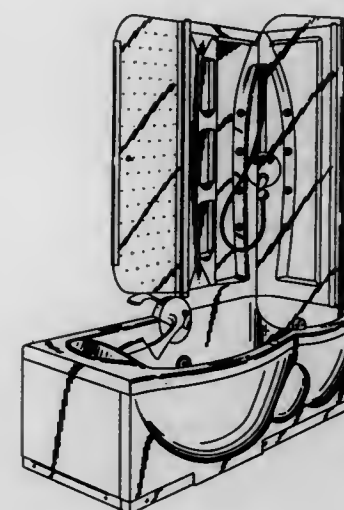
Federico Andronico, Treviso, Italy, assignor to Albatros System S.p.A., Pordenone, Italy

Filed Aug. 16, 1994, Ser. No. 27,201

Claims priority, application Italy, Mar. 10, 1994, PN940000006

Term of patent 14 years

U.S. Cl. D23—277

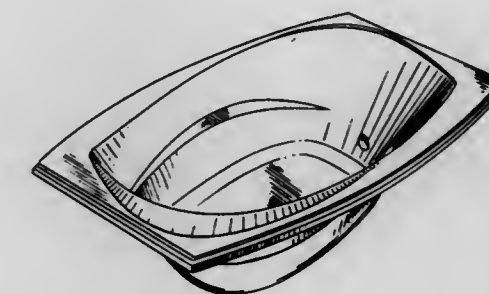
375,153  
BATH TUB

Remo Jacuzzi, Little Rock, Ark., assignor to Jason International, Inc., North Little Rock, Ark.

Filed Apr. 27, 1995, Ser. No. 38,143

Term of patent 14 years

U.S. Cl. D23—280.3



## 375,154

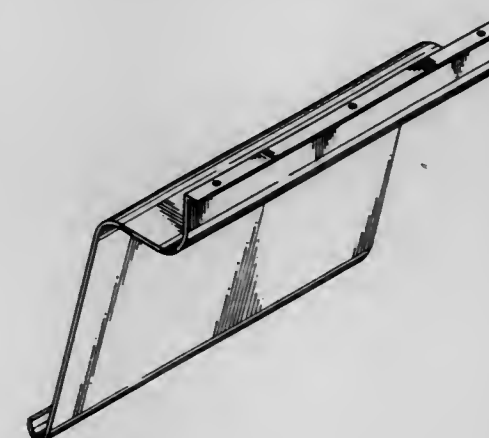
## BARRIER FOR ENCLOSING PLUMBING AND SINK FIXTURES

Thomas W. Trueb, Ellington, and Stephen R. Trueb, Vernon, both of Conn., assignors to Truebro, Inc., Ellington, Conn.

Filed Nov. 7, 1994, Ser. No. 30,725

Term of patent 14 years

U.S. Cl. D23—308

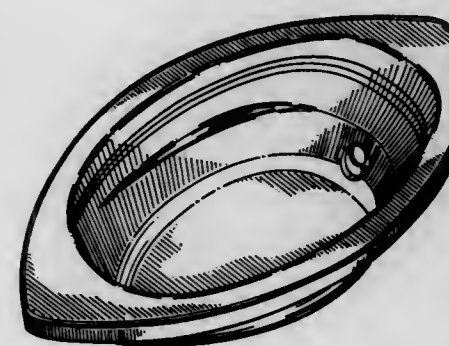
375,152  
BATH TUB

Remo Jacuzzi, Little Rock, Ark., assignor to Jason International, Inc., North Little Rock, Ark.

Filed Apr. 21, 1995, Ser. No. 37,875

Term of patent 14 years

U.S. Cl. D23—277





375,155

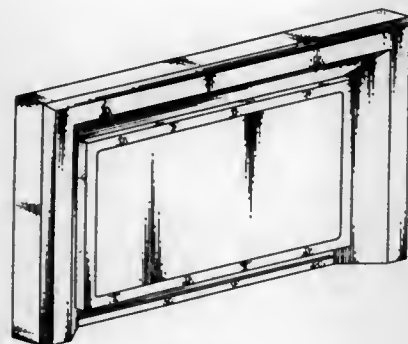
## NATURAL GAS FIREPLACE

George F. Radke, Tsawwassen, Canada, assignor to Citadel Innovations Inc., Burnaby, Canada

Filed Feb. 3, 1995, Ser. No. 34,404

Term of patent 14 years

U.S. Cl. D23—344



375,157

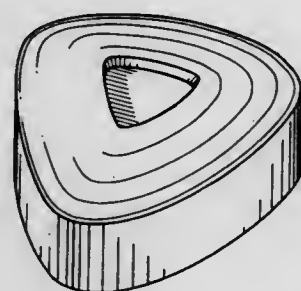
## TABLET

Kenneth A. Kramer, Green Lane, and Ashok V. Katdare, Norristown, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 22, 1992, Ser. No. 2,841

Term of patent 14 years

U.S. Cl. D24—101



375,158

## ANESTHESIA MACHINE AND WORK STATION

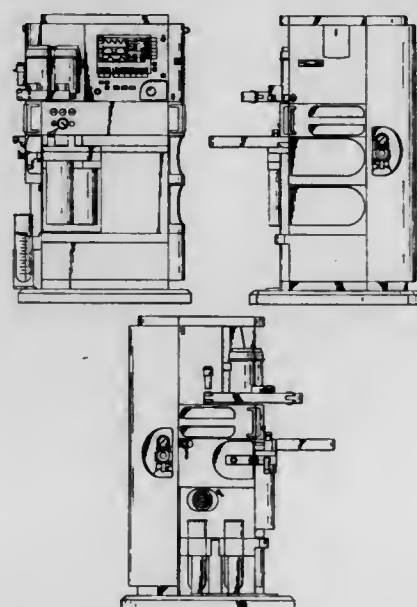
Francesco Milani, Giubiasco, and Carola Bartsch, Bellinzona, both of Switzerland, assignors to Draegerwerk AG, Luebeck, Germany

Filed Feb. 1, 1995, Ser. No. 34,304

Claims priority, application Germany, Sep. 7, 1994, M 9407 107.1

Term of patent 14 years

U.S. Cl. D24—110



375,156

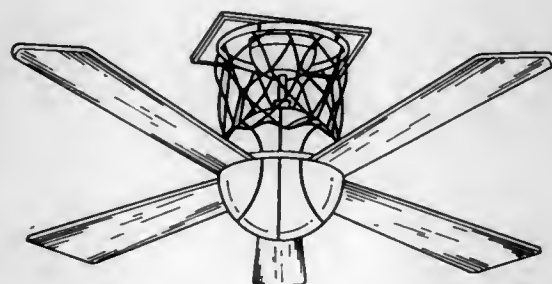
## COMBINED CEILING FAN AND LIGHT

Tsung-Ming Tseng, No. 11-2, Talun Rd., Talun Tsun, Tatsun Hsiang, Changhua Hsien, Taiwan

Filed Aug. 9, 1995, Ser. No. 42,732

Term of patent 14 years

U.S. Cl. D23—377



375,159

## SALIVA EXTRACTOR TUBE

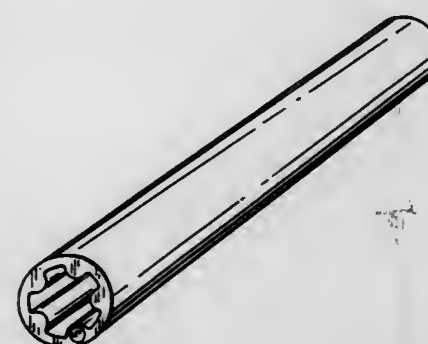
Lars-Gunnar Johansson, Bredaryd, Sweden, assignor to DX Plastic AB, Sweden

Filed Sep. 27, 1995, Ser. No. 44,612

Claims priority, application Sweden, Mar. 27, 1995, SE 95-0641

Term of patent 14 years

U.S. Cl. D24—112



375,161

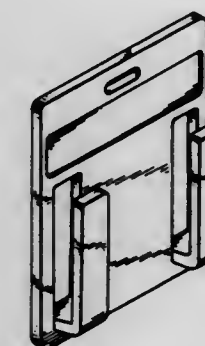
## STETHOSCOPE DIAPHRAGM HOLDER

Patricia E. Hart, 8071 S. Kilpatrick, Chicago, Ill. 60652, assignor to Patricia E. Hart, Chicago, Ill.

Filed May 26, 1994, Ser. No. 23,516

Term of patent 14 years

U.S. Cl. D24—134



375,160

## TUBING CONNECTOR HANDLE

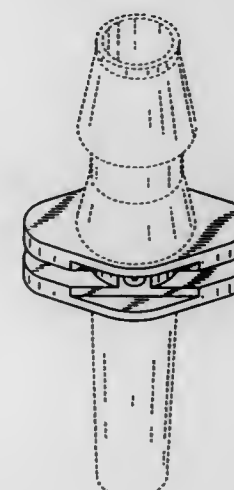
Richard K. Sampson, 3350 Eastbrook Dr., Fort Collins, Colo. 80521, and Bruce A. Williams, 2025 Tunis Cir., Fort Collins, Colo. 80526

Continuation-in-part of Ser. No. 470,931, Jan. 26, 1990, Pat. No. Des. 339,417. This application Sep. 10, 1993, Ser. No. 12,795

The portion of the term of this patent subsequent to Sep. 14, 2007, has been disclaimed.

Term of patent 14 years

U.S. Cl. D24—129



375,162

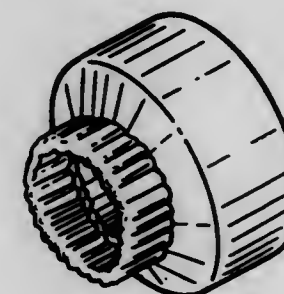
## STETHOSCOPE COVER

Karen A. Gilbert, 2301 Bartholomew St., New Orleans, La. 70117

Filed Dec. 21, 1994, Ser. No. 32,581

Term of patent 14 years

U.S. Cl. D24—134



375,163

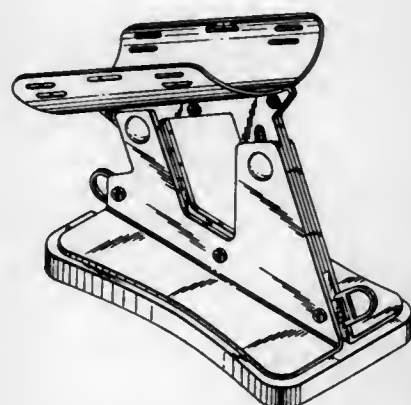
**PORTABLE UPPER LIMB SUPPORT**

Walda B. Lipson, White Plains, and Carl Yuridin, Port Washington, both of N.Y., assignors to Equip For Independence, Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 903,548, Jun. 23, 1992, Pat. No. Des. 361,383. This application Nov. 4, 1994, Ser. No. 30,707

Term of patent 14 years

U.S. Cl. D24—183



375,165

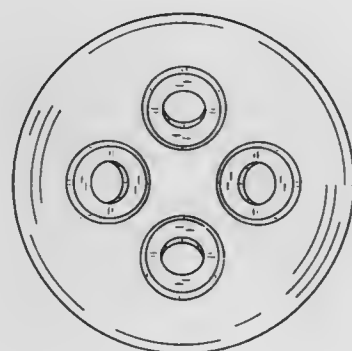
**ELLIPSIODAL VERTICAL JET MOUND**

Galvin Bartlett; Michael P. Leonhardt; W. James Clark, and Stephen Macey, all of c/o Sundance Spas 13951 Monte Vista Ave., Chino, Calif. 91710

Filed Sep. 9, 1992, Ser. No. 943,192

Term of patent 14 years

U.S. Cl. D24—204



375,164

**FOOT ORTHOSIS**

Constance V. Wasserman, Palm Harbor, and Clarence E. Hess, Safety Harbor, both of Fla., assignors to Restorative Care Of America Incorporated, Clearwater, Fla.

Filed Apr. 3, 1995, Ser. No. 37,006

Term of patent 14 years

U.S. Cl. D24—192



375,166

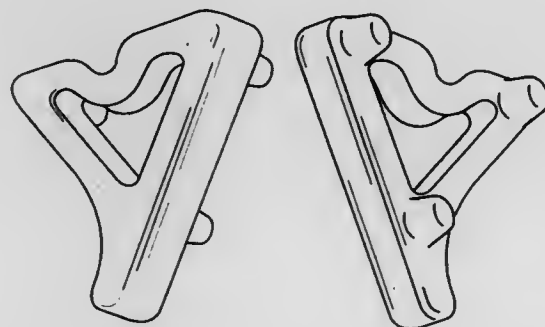
**MASSAGE TOOL**

Bonnie L. Goulding-Thompson, 1219 N. Wahsatch, Colorado Springs, Colo. 80903, and Michael Thompson, Colorado Springs, Colo., assignors to Bonnie L. Goulding-Thompson, Colorado Springs, Colo.

Filed May 15, 1995, Ser. No. 39,271

Term of patent 14 years

U.S. Cl. D24—214



375,167

**MASSAGER**

Joe A. Taylor, P.O. Box 178 S. J. & E. Rd., Auberry, Calif. 93602

Filed Jan. 18, 1996, Ser. No. 49,145

Term of patent 14 years

U.S. Cl. D24—200



375,169

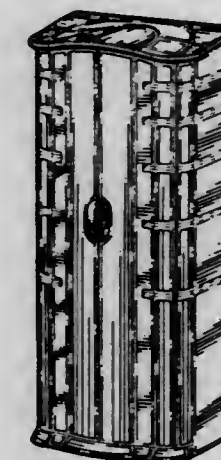
**UPRIGHT SHED**

David L. Hunt, and David K. Memke, both of Cincinnati, Ohio, assignors to Rubbermaid Specialty Products Inc., Wooster, Ohio

Filed Jun. 6, 1995, Ser. No. 39,852

Term of patent 14 years

U.S. Cl. D25—16



375,170

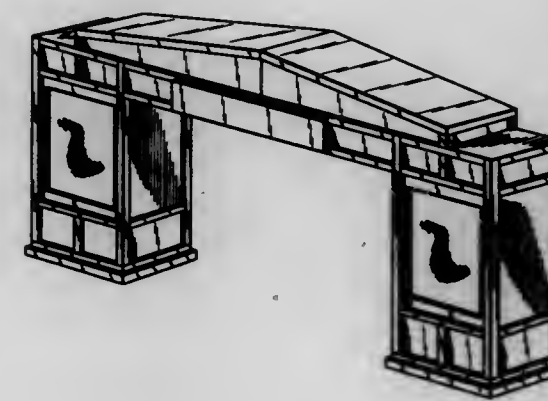
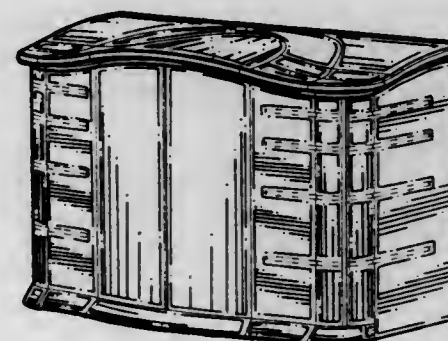
**ENTRY DISPLAY UNIT**

Deborah H. Rose, Littitz, Pa.; James D. Adams, Seattle, Wash., and Steven Thole, Madison, Wis., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Apr. 27, 1995, Ser. No. 38,055

Term of patent 14 years

U.S. Cl. D25—59





375,171

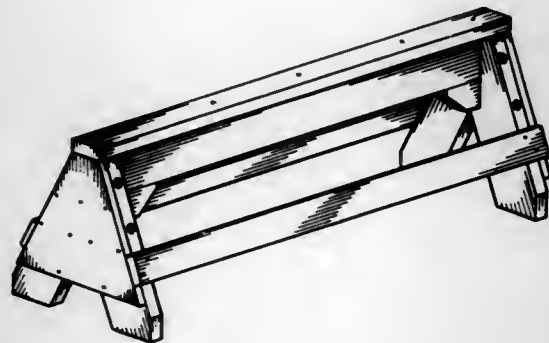
**SUPPORT STAND FOR HOLDING HEAVY OBJECTS**

Clifford A. Moffitt, and Marilyn R. Amerine, both of 435 N. Pine St., Susanville, Calif. 96130

Filed Jan. 25, 1996, Ser. No. 49,451

Term of patent 14 years

U.S. Cl. D25—67



375,173

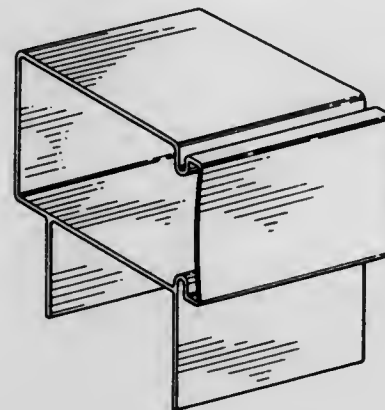
**FACIA GABLE EXTRUSION FOR A BUILDING STRUCTURE**

Vittorio De Zen, Woodbridge, Canada, assignor to Royal Building Systems (CDN) Limited, Weston, Canada

Filed Apr. 24, 1995, Ser. No. 38,156

Term of patent 14 years

U.S. Cl. D25—124



375,172

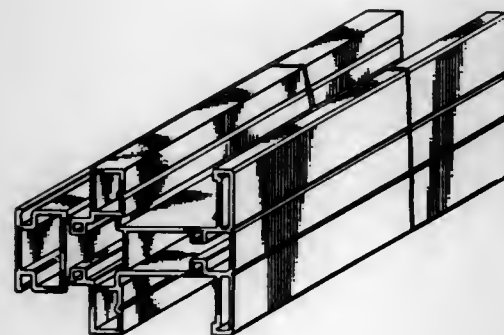
**SLIDER WINDOW TRANSOM ELEMENT**

Tony DiGiorgio, Woodbridge, Canada, assignor to Dominion Plastics Inc., Woodbridge, Canada

Filed Dec. 22, 1995, Ser. No. 48,255

Term of patent 14 years

U.S. Cl. D25—122



375,174

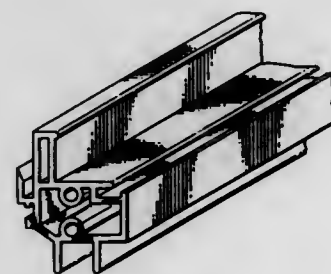
**WINDOW MULLION**

Tony DiGiorgio, Woodbridge, Canada, assignor to Dominion Plastics Inc., Woodbridge, Canada

Filed Oct. 19, 1995, Ser. No. 45,422

Term of patent 14 years

U.S. Cl. D25—124



375,175

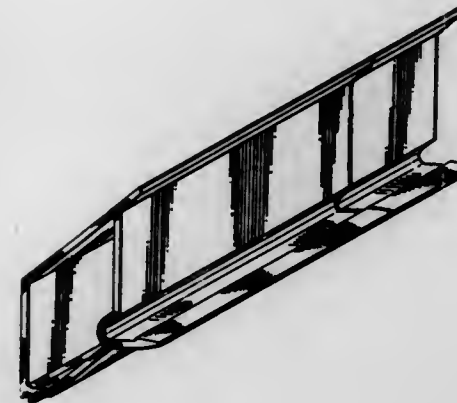
**WINDOW LOCKING ELEMENT**

Tony DiGiorgio, Woodbridge, Canada, assignor to Dominion Plastics Inc., Woodbridge, Canada

Filed Dec. 22, 1995, Ser. No. 48,254

Term of patent 14 years

U.S. Cl. D25—124



375,177

**REFLECTOR-TYPE FLUORESCENT LAMP**

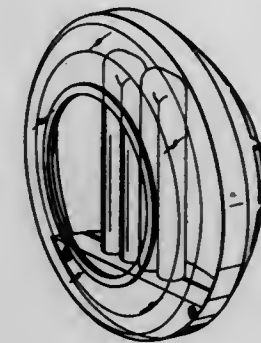
Guenter Franck, Ebenhausen, Germany, assignor to Osram GmbH, Munich, Germany

Division of Ser. No. 32,217, Dec. 14, 1994, Pat. No. Des. 369,869. This application Nov. 8, 1995, Ser. No. 46,173

Claims priority, application Germany, Jul. 14, 1994, M 9405652.8

Term of patent 14 years

U.S. Cl. D26—3



375,176

**HORIZONTAL SLIDER STILE**

Tony DiGiorgio, Woodbridge, Canada, assignor to Dominion Plastics Inc., Woodbridge, Canada

Filed Dec. 22, 1995, Ser. No. 48,285

Term of patent 14 years

U.S. Cl. D25—124



375,178

**CHILI RISTRA-SHAPED CANDLE**

Earle R. Vickery, Los Lunas, N.M., assignor to Vickery Design, Inc., Los Lunas, N.M.

Filed Feb. 16, 1995, Ser. No. 34,944

Term of patent 14 years

U.S. Cl. D26—6



375,179

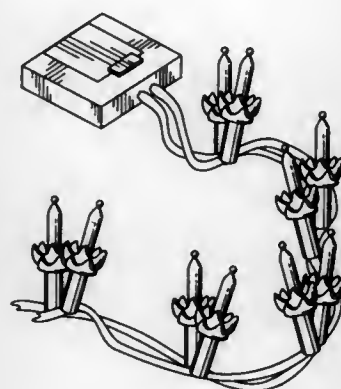
**BATTERY POWERED DECORATIVE LIGHTSET**

Delores A. Wisdom, P.O. Box 1092, Bronson, Fla. 32621

Filed Dec. 15, 1994, Ser. No. 32,290

Term of patent 14 years

U.S. Cl. D26—25



375,180

**LINEAR STROBE WARNING LIGHT FIXTURE**

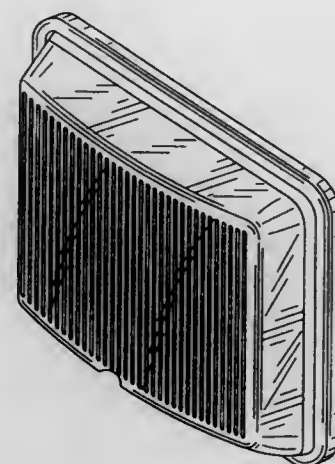
Harold W. Lyons, Killingworth, Conn., assignor to Whelen

Engineering Company, Inc., Chester, Conn.

Filed Apr. 5, 1995, Ser. No. 37,168

Term of patent 14 years

U.S. Cl. D26—28

**LIST OF PATENTEEES**

TO WHOM

**PATENTS WERE ISSUED ON THE 29th DAY OF OCTOBER, 1996**

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A/S Fjeldhammer Brug: See—  
Johansen, Torc; and Svindal, Hakon, 5,569,352, Cl. 156-499.000.
- Aardema, James A., to Caterpillar Inc. Hydraulic circuit having dual electrohydraulic control valves. 5,568,759, Cl. 91-461.000.
- Aavid Engineering, Inc.: See—  
Lavochkin, Ronald B., 5,570,271, Cl. 361-704.000.
- AB Volvo: See—  
Dagh, Ingemar; and Bodin, Jan-Olof, 5,568,846, Cl. 188-218.0XL.
- ABB Management AG: See—  
Brunner, Philipp; and Tresch, Rudolf, 5,568,722, Cl. 60-39.330.
- Ziegler, Georg, 5,568,793, Cl. 122-460.000.
- ABB Power T&D Company, Inc.: See—  
Freeman, Willie B.; Johnson, David S.; and Meyer, Jeffrey R., 5,569,891, Cl. 200-17.00R.
- ABB Research Ltd.: See—  
Griffin, Timothy; and Senior, Peter, 5,569,020, Cl. 431-7.000.
- Abbott Laboratories: See—  
Hofstetter, John M.; O'Neil, John A.; and Grabenkort, Richard W., 5,569,193, Cl. 604-89.000.
- Stuk, Timothy L.; Haight, Anthony R.; Morton, Howard E.; Robbins, Timothy A.; Scarpetti, David; and Tien, Jien-Heh J., 5,569,777, Cl. 560-24.000.
- Abbott, Ronald G.; and Randolph, Bruce B., to Phillips Petroleum Company. Isoparaffin-olefin alkylation. 5,569,807, Cl. 585-724.000.
- ABC Techcorp: See—  
Green, Thomas S., 5,568,885, Cl. 222-318.000.
- Takacs, Gregory W., 5,568,882, Cl. 222-61.000.
- Abe, Fumihiko: See—  
Jin, Dongzhi; Numanami, Masae; Abe, Fumihiko; and Miyazawa, Kazuhiro, 5,570,010, Cl. 324-67.000.
- Abidin, Michael R.; and Lehmbeck, Steven P., to Bloom, Leonard. Guarded surgical scalpel. 5,569,281, Cl. 606-167.000.
- Abileah, Adiel; and Xu, Gang, to OIS Optical Imaging Systems, Inc. Normally white twisted nematic LCD with retardation films on opposite sides of liquid crystal material for improved viewing zone. 5,570,214, Cl. 359-73.000.
- Abraham, Frederic C. Anchoring system. 5,569,007, Cl. 411-82.000.
- Abraham, Loren; Pilla, Michael F.; and Bright, Jason, to Andersen Corporation. Integrated method and apparatus for selecting, ordering and manufacturing art glass panels. 5,570,292, Cl. 364-473.010.
- Abramson, Bella; Barrera, Jose D.; Pamaran, Zosimo D.; and Pham, Anthony D., to W. W. Henry Company, The. Stain resistant grout. 5,569,696, Cl. 524-487.000.
- Abusleme, Julio A.; and Gavezotti, Piero, to Ausimont, S.p.A. (co)polymerization process in suspension for preparing hydrogen containing thermoplastic fluoropolymers. 5,569,728, Cl. 526-231.000.
- ABX: See—  
Le Comte, Roger; Couderc, Guilhem; and Champseix, Henri, 5,569,861, Cl. 73-864.220.
- Acharya, Jagat R.: See—  
Goldman, Mark E.; Aubert, Michel A.; Shenderovich, Alexander M.; and Acharya, Jagat R., 5,569,003, Cl. 409-132.000.
- Achelpohl, Fritz; and Feldkämper, Richard, to Windmoller & Holscher. Method and apparatus for manufacturing a sack bottom. 5,569,145, Cl. 493-240.000.
- ACI Australia Limited: See—  
Burton, Peter J.; and Deale, Brent P., 5,569,542, Cl. 428-529.000.
- Acme Electric Corporation: See—  
Tsenter, Boris, 5,569,554, Cl. 429-57.000.
- Acquaviva, Sebastiano, to United Technologies Motor Systems, Inc. Brushless electric motor control providing reduced motor torque oscillation. 5,569,989, Cl. 318-254.000.
- Acquaviva, Thomas, to Xerox Corporation. Two up high speed printing system. 5,570,172, Cl. 355-323.000.
- Actel Corporation: See—  
El-Avat, Khaled A.; Kaptanoglu, Sinan; Chan, King W.; Plants, William C.; and Lien, Jung-Cheun, 5,570,041, Cl. 326-41.000.
- Adachi, Hiroki: See—  
Takemura, Yasuhiko; and Adachi, Hiroki, 5,569,935, Cl. 257-51.000.
- Adachi, Hiroshi: See—  
Aruga, Tamotsu; Sasaki, Masaomi; Shimada, Tomoyuki; and Adachi, Hiroshi, 5,569,800, Cl. 585-26.000.
- Adachi, Kenji: See—  
Umamoto, Teruo; Ishihara, Sumi; and Adachi, Kenji, 5,569,771, Cl. 549-44.000.
- Adam, Gérard: See—  
Guillaumet, Gérard; Viaud, Marie-Claude; Renard, Pierre; Adam, Gérard; Caignard, Daniel-Henri; Guardiola-Lemaitre, Béatrice; and Rettori, Marie-Claire, 5,569,669, Cl. 514-432.000.
- Adam, Günter: See—  
Schreier, Peter H.; Stenzel, Klaus; Adam, Günter; and Maiss, Edgar, 5,569,823, Cl. 800-205.000.
- Adamopoulos, Eleftherios; Lee, Kang-Wook; O'Toole, Terrence R.; Purushothaman, Sampath; Shaw, Jane M.; Viehbeck, Alfred; and Walker, George F., to International Business Machines Corporation. Adhesive layer in multi-level packaging and organic material as a metal diffusion barrier. 5,569,739, Cl. 528-353.000.
- Adams, James E.; Lynn, John D.; and Nadarajah, Ravindran, to Beloit Technologies, Inc. Methods for preparing pulpwood for digestion. 5,568,896, Cl. 241-24.290.
- Adams, Randall E.: See—  
Bootman, Matthew W.; and Adams, Randall E., 5,569,683, Cl. 523-102.000.
- Adas, James O.; Schroeder, Fred W.; and Steil, Fred, to D-M-E Company. Insulator for thermoplastic molding nozzle assembly. 5,569,475, Cl. 425-549.000.
- Adir et Compagnie: See—  
Fauhere, Jean-Luc; Thureau, Christophe; Vilaine, Jean-Paul; and Janiak, Philip, 5,569,647, Cl. 514-11.000.
- Guillaumet, Gérard; Viaud, Marie-Claude; Renard, Pierre; Adam, Gérard; Caignard, Daniel-Henri; Guardiola-Lemaitre, Béatrice; and Rettori, Marie-Claire, 5,569,669, Cl. 514-432.000.
- Adriaenssens, Frank C. M., to VCST, naamloze vennootschap. Transmission unit for motor vehicles. 5,568,853, Cl. 192-85.0AA.
- Adrian, Sorin, to Medele, Inc. Acoustic catheter with magnetic drive. 5,569,179, Cl. 604-22.000.
- Advanced Cardiovascular Systems, Inc.: See—  
Lam, Sharon S., 5,569,295, Cl. 606-198.000.
- Muni, Ketan P.; Bagoisan, Celso J.; and Thornton, Troy L., 5,569,196, Cl. 604-96.000.
- Advanced Micro Devices: See—  
McMinn, Brian D.; and Horne, Stephen C., 5,570,294, Cl. 364-481.000.
- Advanced Micro Devices, Inc.: See—  
Sharpe-Geisler, Bradley A., 5,570,046, Cl. 326-101.000.
- Advanced Television Test Center, Inc.: See—  
Rhodes, Charles W., 5,570,088, Cl. 341-50.000.
- Aeby, Francois: See—  
Balfour, Alan R.; and Aebly, Francois, 5,569,035, Cl. 433-165.000.
- AER Energy Resources Inc.: See—  
Pedicini, Christopher S.; Thibault, William C.; Turner, Chris A.; and Tinker, Lawrence A., 5,569,551, Cl. 429-27.000.
- Aerospaiale Societe Nationale Industrielle: See—  
Belunova, Ludmila V.; Gribkov, Vladimir N.; Chernyak, André I.; Mizyurina, Galina T.; Mordovin, Oleg A.; and Mukhanova, Elena E., 5,569,423, Cl. 264-60.000.
- Lund, Glenn, 5,570,230, Cl. 359-529.000.
- Semenova, Elena V.; Tjurin, Vladimir M.; Solntsev, Stanislav S.; and Bersenev, Alexei Y., 5,569,427, Cl. 264-129.000.
- Aertbelien, Jozef: See—  
Dooms, Philip; Aertbelien, Jozef; and Van Havenbergh, Jan, 5,569,530, Cl. 428-323.000.
- AG Technology Co., Ltd.: See—  
Hayashi, Ichiro, 5,569,518, Cl. 428-141.000.
- AGCO Corporation: See—  
Kluver, Leroy; and Line, Donald E., 5,568,716, Cl. 53-399.000.
- Agency of Industrial Science & Technology, Ministry of International Trade & Industry: See—  
Tomie, Toshihisa, 5,569,916, Cl. 250-287.000.
- AGFA-Gevaert, N.V.: See—  
Dewanckele, Jean-Marie; Vercruysse, Geert; and Büscher, Ralf, 5,569,576, Cl. 430-502.000.
- Dooms, Philip; Aertbelien, Jozef; and Van Havenbergh, Jan, 5,569,530, Cl. 428-323.000.
- Leblans, Paul; Neyens, Lodewijk; Struyce, Luc; and Willems, Peter, 5,569,926, Cl. 250-484.400.
- Tavernier, Serge; Op de Beeck, Werner; Van Wunsel, Danny; and Vervoort, Michel, 5,569,567, Cl. 430-110.000.
- Van den Bergen, Patrick; Joos, Frans; De Niel, Marc; and Vertinden, Bartholomeus, 5,568,693, Cl. 34-620.000.
- Agha, Mohamed: See—  
Sandell, Patrick; and Agha, Mohamed, 5,570,341, Cl. 369-291.000.
- Aguado, Morton M., to Northrop Grumman Corporation. Retrasmited GPS interferometric system. 5,570,097, Cl. 342-357.000.

PI 1



- Ahlberg, Björn G. D.; Falk, Johan; and Mölne, Anders, to Ericsson Inc. Cellular telephone and associated method for opening a voice channel with a source telephone without establishing voice communications therewith. 5,570,413, Cl. 379-59.000.
- Ahn, Hyung S.; and Choi, Won T., to Goldstar Co., Ltd. Semiconductor laser and method for manufacturing the same. 5,570,385, Cl. 372-43.000.
- Aihara, Masami: See—  
Sasaki, Makoto; Fukui, Hirofumi; Aihara, Masami; Fukuda, Koichi; Kasama, Yasuhiko; and Ohmi, Tadahi, 5,570,031, Cl. 324-750.000.
- Air Products and Chemicals, Inc.: See—  
Carolan, Michael F.; and Dyer, Paul N., 5,569,633, Cl. 502-4.000.  
Carroll, W. Eamon; Renz, Walter L.; Nordquist, Andrew F.; and Pinschmidt, Robert K., Jr., 5,569,725, Cl. 525-454.000.  
Karwacki, Eugene J.; Varn, Aron D.; Withers, Howard P., Jr.; and Woytek, Andrew J., 5,569,151, Cl. 588-249.000.
- Aircraft Modular Products, Inc.: See—  
Ofeson, Michael; and Soderman, Daryl, 5,568,960, Cl. 297-344.220.
- Aisin Seiki Kabushiki Kaisha: See—  
Enomoto, Naoyasu; and Ando, Masamoto, 5,568,962, Cl. 303-3.000.  
Tateishi, Yosuke, 5,568,823, Cl. 137-202.000.
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- Ajot, Christine, legal representative: See—  
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Shoda, Masahiro; and Akagawa, Keiichi, 5,569,938, Cl. 257-82.000.
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Kilström, Lars G.; Lindquist, Nils T.; and Tuvin, Lars G., 5,568,943, Cl. 285-7.000.
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Chia, Chok J.; Alagaratnam, Manian; Low, Qwai H.; and Lim, Seng-Sooi, 5,568,683, Cl. 29-832.000.
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Lee, John Y.; and Burt, Edward A., 5,569,746, Cl. 534-11.000.  
Lin, Kaung-Far, 5,569,642, Cl. 507-103.000.  
Sabahi, Mahmood; and Hurst, Matthew L., 5,569,779, Cl. 560-190.000.
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- Albers, Thomas M.: See—  
Wood, Paul B.; Albers, Thomas M.; and Preston, Stephen B., 5,570,107, Cl. 345-145.000.
- Albert Einstein College of Medicine of Yeshiva University: See—  
Lewis, Michael E.; Apfel, Stuart C.; and Kessler, John A., 5,569,648, Cl. 514-12.000.
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Tamminmäki, Markku; Albrecht-Olsen, Peter; Kristensen, Gert; and Törmä, Pertti, 5,569,264, Cl. 606-104.000.
- Alcan International Limited: See—  
Innes, Robert A.; and Smith, Gary J., 5,569,491, Cl. 427-284.000.
- Alcan-Tech Co., Inc.: See—  
Maeda, Kazuo; Tokumasu, Noboru; and Yuyama, Yoshiaki, 5,569,499, Cl. 427-539.000.
- Alcatel N.V.: See—  
Merino Gonzalez, Jose L.; Cabello, Carmen maria L., deceased, 5,570,377, Cl. 371-37.100.  
Sotom, Michel, 5,570,218, Cl. 359-117.000.  
Walker, Michael; and Matt, Hans-Jürgen, 5,570,423, Cl. 379-410.000.  
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- Ali, Syed F.: See—  
Silverman, Ian R.; Cohen, Daniel H.; Lyga, John W.; Szczepanski, Steven W.; and Ali, Syed F., 5,569,664, Cl. 514-317.000.
- Alko Group Ltd.: See—  
Timonen, Maritta; Rha, ChoKyun; Vaara, Timo; Bagley, Lindsey; Bosdet, Sarah; Lindley, Michael; Lahtinen, Tarja; Turunen, Marja; and Vaara, Martti, 5,569,483, Cl. 426-658.000.
- Allen, Charles E., Jr.: See—  
Desautels, Thomas; Allen, Charles E., Jr.; Palmeri, Frank A.; and Huber, Jon M., 5,569,115, Cl. 477-110.000.
- Allen, Gary R.: See—  
Scott, Curtis E.; Secen, Cynthia A.; Parham, Thomas G.; Allen, Gary R.; Bateman, Robert L., Jr.; and Mathews, Paul G., 5,569,979, Cl. 313-636.000.
- Aller, Leo B.: See—  
Miller, James G.; Wax, Michael J.; Wormsbecher, Richard F.; Aller, Leo B.; Durham, Donald R.; and Chmurny, Alan B., 5,569,634, Cl. 502-64.000.
- AlliedSignal Inc.: See—  
Cordova, David S.; Weedon, Gene C.; Hofer, Robert C. W.; Boone, Mark B.; Kirkland, Kevin M.; Weber, Charles P., Jr.; and LaCasse, Gregory J., 5,568,657, Cl. 2-167.000.  
Katariya, Devinder N.; Rich, Ronald J.; Stenard, Steven C.; and Wilson, Bruce D., 5,569,019, Cl. 415-200.000.  
Knepper, Jeffrey A.; Flackett, Dale R.; and Asirvatham, Edward T., 5,569,750, Cl. 524-731.000.  
Tung, Hsueh S., 5,569,794, Cl. 570-168.000.  
Woydick, Mark C.; and Palmer, William L., 5,568,941, Cl. 280-806.000.
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Fraser, Donald J., 5,568,833, Cl. 164-128.000.
- Allison, Malcolm M. Force measuring device. 5,569,866, Cl. 73-862.626.
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- Almonte, Ralph, to Comtec Information Systems, Inc. Thermal print head with auxiliary printer head guard. 5,570,123, Cl. 347-200.000.
- Almquist, Thomas A.; and Smalley, Dennis R., to 3D Systems, Inc. Thermal stereolithography. 5,569,349, Cl. 156-242.000.
- Aloka Co., Ltd.: See—  
Murashita, Masaru; Kawada, Hiroyuki; and Matsunaka, Toshiyuki, 5,568,812, Cl. 128-660.040.
- Alpha Industrie Design GmbH: See—  
Erhard-Hollmann, Joachim, 5,569,147, Cl. 493-423.000.
- Alps Electric Co., Ltd.: See—  
Shiga, Sadakazu; Komatsu, Masaru; and Numata, Minoru, 5,570,110, Cl. 345-156.000.
- Altera Corporation: See—  
Lytle, Craig S.; and Faria, Donald F., 5,570,040, Cl. 326-41.000.
- Althoff, Arnold G.: See—  
Brenot, Stephen E.; and Althoff, Arnold G., 5,569,419, Cl. 264-37.000.
- Altman, Gary: See—  
Raynes, John W.; and Altman, Gary, 5,568,815, Cl. 128-672.000.
- Alumet Manufacturing Inc.: See—  
Peterson, Wallace H., 5,568,714, Cl. 52-786.130.
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- AM International, Inc.: See—  
Buschhaus, Michael C.; Wamsley, Richard D.; and Curtis, Thomas, 5,568,917, Cl. 270-58.010.
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Yoshii, Yuuzi; Kaneshima, Yasuo; Nitta, Masayoshi; and Amano, Tatsuhiro, 5,569,703, Cl. 524-558.000.
- American Commodities, Inc.: See—  
Lieberman, Mark, 5,569,713, Cl. 525-146.000.
- American Cyanamid Company: See—  
Wissner, Allan; and Trova, Michael P., 5,569,762, Cl. 546-146.000.
- American Maize-Products Company: See—  
Qi, Z. Helena; Hedges, Allan; and Sanchez, Eduardo, 5,569,756, Cl. 536-127.000.
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Barnhart, Gary A.; and Gill, David P., 5,569,017, Cl. 415-177.000.
- Amici, Robert M.: See—  
LaFleur, Edward E.; Work, William J.; Amici, Robert M.; Bortnick, Newman M.; and Holy, Norman L., 5,569,710, Cl. 525-57.000.
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- Ammann, Larry P.: See—  
Cave, Ellis K.; Ammann, Larry P.; and Zimmer, Christopher P., 5,570,419, Cl. 379-216.000.
- Ammermann, Eberhard: See—  
Wagner, Oliver; Eicken, Karl; Ammermann, Eberhard; and Lorenz, Gisela, 5,569,765, Cl. 546-304.000.
- Amoco Corporation: See—  
Devanathan, Narasimhan; Klomans, Peter J.; VanderHeyden, William B.; and Buttkie, Robert D., 5,569,434, Cl. 422-140.000.  
Pelletier, Dale A.; and Weisburg, William G., 5,569,586, Cl. 435-6.000.  
Singer, Leonard S.; and Orient, David T., 5,569,417, Cl. 264-29.100.
- Amos, Charles W., Jr.: See—  
Emenaker, Ralph R.; and Amos, Charles W., Jr., 5,569,231, Cl. 604-385.100.
- Amour, William E. Method and apparatus for recycling waste composite material. 5,569,424, Cl. 264-115.000.
- Amtec Products, Incorporated: See—  
Rinkus, Ronald J., 5,568,808, Cl. 128-206.110.
- Analog Devices, Incorporated: See—  
Cummins, Timothy J., 5,570,090, Cl. 341-144.000.  
Gilbert, Barrie, 5,570,055, Cl. 327-350.000.  
Yallup, Kevin; and Creighton, Oliver, 5,569,621, Cl. 437-62.000.
- Analytical Control Systems, Inc.: See—  
Speck, Roy E., 5,569,590, Cl. 435-13.000.
- Ancey, Pascal: See—  
Gschwind, Michel; and Ancey, Pascal, 5,568,977, Cl. 374-45.000.
- Andersen Corporation: See—  
Abraham, Loren; Pilla, Michael F.; and Bright, Jason, 5,570,292, Cl. 364-473.010.
- Anderson, Keven C.; and Kuhns, Craig R. Endoscopic sleeve. 5,569,159, Cl. 600-114.000.
- Ando, Masamoto: See—  
Enomoto, Naoyasu; and Ando, Masamoto, 5,568,962, Cl. 303-3.000.
- Andoh, Noboru: See—  
Ikuta, Yuzo; Tashiro, Satoshi; Hatano, Yoshiyuki; Fujita, Tadasu; Andoh, Noboru; Asakawa, Sachio; Kobayashi, Haruto; and Minami, Takeshi, 5,569,594, Cl. 435-134.000.
- Andoh, Yuzi; Katabe, Masaki; and Suenaga, Hiromi, to Sharp Kabushiki Kaisha. Microwave fryer. 5,568,765, Cl. 99-403.000.
- Andre, Maxime, to Hutchinson. Method of coupling tubes or pipes, and couplings or the like obtained by implementing the method. 5,568,949, Cl. 285-284.000.
- Andrew Corporation: See—  
Nelson, Robert N.; and Nelson, Chad N., 5,569,053, Cl. 439-668.000.
- Andrews, Edward A. Hair shaving device with curved razor blade strip. 5,568,688, Cl. 30-29.500.
- Andrews, Jeffrey F., to Minnesota Mining and Manufacturing Company. Topical antimicrobial composition and method. 5,569,461, Cl. 424-405.000.
- Andrews, John R.; Mizes, Howard A.; Kuhman, Daniel E.; and Herloski, Robert P., to Xerox Corporation. Low surface energy coating to maintain clean surfaces of optical components in a document reproduction machine. 5,570,161, Cl. 355-215.000.
- Anelva Corporation: See—  
Osada, Tomoaki; and Shirai, Yasuyuki, 5,569,350, Cl. 156-345.000.
- Angelucci, Francesco: See—  
Mongelli, Nicola; Angelucci, Francesco; Pesenti, Enrico; Suarato, Antonino; and Biasoli, Giovanni, 5,569,720, Cl. 525-329.400.
- Änger, Leif: See—  
Chudi, Peter; Jönsson, Åke; and Änger, Leif, 5,568,681, Cl. 29-598.000.
- Angué, Eric: See—  
Stoll, Kurt; Wagner, Albrecht; and Angué, Eric, 5,568,982, Cl. 384-55.000.
- Anhäuser, Dieter: See—  
Müller, Walter; and Anhäuser, Dieter, 5,569,484, Cl. 427-2.140.
- Anjanappa, Muniswamappa; and Miller, Warren G., to University of Maryland-Baltimore County. Method of using and apparatus for use with exercise machines to achieve programmable variable resistance. 5,569,120, Cl. 482-4.000.
- Anjoh, Ichiro: See—  
Kumazawa, Tetsuo; Kitano, Makoto; Yaguchi, Akihiro; Kohno, Ryuji; Tanaka, Naotaka; Yoneda, Nae; and Anjoh, Ichiro, 5,569,960, Cl. 257-738.000.
- Ansems, Johannes P. M.: See—  
Sikkens, Marten; and Ansems, Johannes P. M., 5,568,967, Cl. 362-328.000.
- ANT Nachrichtentechnik GmbH: See—  
Goeckler, Heinz, 5,570,137, Cl. 348-726.000.
- Anticancer Incorporated: See—  
Monosov, Ann; and Fu, Xinyu, 5,569,812, Cl. 800-2.000.
- Antranikian, Garabed, to Degussa Aktiengesellschaft. Keratinase from fervidobacterium pennavorans DSM 7003. 5,569,599, Cl. 435-220.000.
- Aoki, Shubei: See—  
Sakai, Kouichi; Aoki, Shubei; Murata, Shigenori; Oumi, Hayato; and Suzuki, Hiroshi, 5,569,105, Cl. 474-110.000.
- Aoyagi, Akihiko; and Ruiz, Oscar J., to International Business Machines Corporation. Transducer suspension system. 5,570,249, Cl. 360-104.000.
- Apfel, Stuart C.: See—  
Lewis, Michael E.; Apfel, Stuart C.; and Kessler, John A., 5,569,648, Cl. 514-12.000.
- Apollo Environmental Systems Corp.: See—  
Nivens, Jerry W., 5,568,736, Cl. 62-513.000.
- Apple Computer, Inc.: See—  
Heyl, Lawrence F.; and Kannapell, Henry N., 5,570,296, Cl. 364-514.000.
- Jenson, Scott A., 5,570,109, Cl. 345-146.000.  
McFarland, Max, 5,570,462, Cl. 395-136.000.  
Sirkin, Eric R.; and Curry, Joseph J., 5,570,141, Cl. 348-832.000.
- Appleton Electric Company: See—  
Mosebach, Garry M., 5,569,042, Cl. 439-237.000.
- Applied Concepts, Inc.: See—  
Aker, John L.; Gammethaler, Robert S.; and Mead, Alan B., 5,570,093, Cl. 342-104.000.
- Applied Research, Inc.: See—  
Jarand, Mark L., 5,569,318, Cl. 106-36.000.
- AptarGroup, Inc.: See—  
Knickerbocker, Michael G., 5,568,886, Cl. 222-321.900.
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- Araki, Hirofumi: See—  
Nabeyama, Yoshio; and Araki, Hirofumi, 5,570,227, Cl. 359-341.000.
- Araya, Toshinori; and Suyama, Akio, to Yamaha Corporation. Sound effector capable of imparting plural sound effects like distortion and other effects. 5,570,424, Cl. 381-61.000.
- Arch Develop.: See—  
Lee, Raphael C., 5,569,678, Cl. 514-654.000.
- Archimedes Surgical, Inc.: See—  
Kieturakis, Maciej J., 5,569,183, Cl. 604-51.000.
- Arco Chemical Technology, L.P.: See—  
Guo, Shao-Hua, 5,569,714, Cl. 525-162.000.  
Yang, Lau S.; and Klang, Jeffrey A., 5,569,737, Cl. 528-274.000.
- Arii, Mitsuzo; Jinnai, Kuniki; Ohwada, Hisashi; and Kawabata, Yasumari, to Mitsubishi Gas Chemical Company, Inc. Design and manufacture of an optimized waveguide-type multiple branched star coupler. 5,570,442, Cl. 385-46.000.
- Aritake, Hirokazu: See—  
Kato, Masayuki; Aritake, Hirokazu; Ishimoto, Manabu; Sato, Noriko; and Nakashima, Masato, 5,570,208, Cl. 359-23.000.
- Arizona Board of Regents acting on behalf of Arizona State University: See—  
Pettit, George R.; and Singh, Sheo B., 5,569,786, Cl. 568-646.000.
- Arion, Inc.: See—  
Frankosky, John C., 5,569,488, Cl. 427-96.000.
- Armament Systems and Procedures, Inc.: See—  
Parsons, Kevin L., 5,568,741, Cl. 70-456.000.
- Armington, Richard S.; and L'Esperance, Leroy D., to Lucent Technologies Inc. Method and apparatus for locating the position of lasing gaps for precise alignment and placement of optoelectric components. 5,570,184, Cl. 356-375.000.
- Armour, Duncan R.; Box, Philip C.; and Shah, Pritom, to Glaxo Group Limited. Benzodiazepinones. 5,569,654, Cl. 514-221.000.
- Armstrong, Brian S. R. Three dimensional tracking by array doppler radar. 5,570,094, Cl. 342-107.000.
- Armstrong World Industries, Inc.: See—  
Fidler, Carlelee; and Simonton, Thomas C., 5,569,513, Cl. 428-35.600.
- Armo Technology Trust: See—  
Arnoldy, Roman F., 5,569,395, Cl. 219-76.140.
- Arnegger, Richard E.; Gunnewijk, Antonius G. M.; and Maurer, Thomas, to Ricana AG. Saw blade for parting cuts made in an oscillating or rotary manner. 5,569,257, Cl. 606-82.000.
- Arnoldy, Roman F., to Armo Technology Trust. Deep coat faced plate and method. 5,569,395, Cl. 219-76.140.
- Arpadi, Harry S. Tooth brushing timer. 5,570,325, Cl. 368-10.000.
- Arthur Cox & Sons, Inc.: See—  
Ryczek, William F., 5,568,673, Cl. 16-244.000.
- Aruga, Tamotsu; Sasaki, Masaomi; Shimada, Tomoyuki; and Adachi, Hiroshi, to Ricoh Company, Ltd. Electrophotographic photoconductor, pyrene-ring-containing olefin compound for use in the same, intermediate for synthesizing the olefin compound, and method of synthesizing the olefin compound. 5,569,800, Cl. 585-26.000.
- Arwine, Joan B.: See—  
Stacey, Scott A.; and Arwine, Joan B., 5,570,289, Cl. 364-424.050.



Asaba, Tetsuo: See—  
Kataoka, Yuzo; Asaba, Tetsuo; Makino, Kenji; Yuzurihara, Hiroshi; Fujita, Kei; Kamei, Seiji; Akino, Yutaka; Yuge, Yutaka; Shimotsusa, Mineo; and Kuwabara, Hideshi, 5,569,614, Cl. 437-39.000.

Asada, Tadashi: See—  
Inoue, Toshio; and Asada, Tadashi, 5,570,080, Cl. 340-571.000.

Asahi Glass Company Ltd.: See—  
Miyasaka, Seichi; and Watanabe, Hiroyuki, 5,569,537, Cl. 428-425.500.

Asahi Kasei Kogyo Kabushiki Kaisha: See—  
Takahashi, Gensho; and Kurihara, Masaaki, 5,569,573, Cl. 430-138.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: See—  
Mogamiya, Makoto, 5,570,231, Cl. 359-640.000.

Ojima, Satoshi; and Uchida, Shoji, 5,569,246, Cl. 606-61.000.

Shono, Tetsuji, 5,570,153, Cl. 396-531.000.

Yoneyama, Shuji; and Suzuki, Shinya, 5,570,150, Cl. 396-324.000.

Yoneyama, Shuji, 5,570,235, Cl. 359-692.000.

Asaka, Shunichi; and Ishikawa, Shigeki. Method and apparatus for avoiding obstacles by a robot. 5,570,285, Cl. 364-424.020.

Asakawa, Koji: See—  
Uchida, Naoshi; Kohanawa, Akihiko; Miura, Masao; Oyama, Jun; and Asakawa, Koji, 5,569,894, Cl. 218-27.000.

Asami, Goro; Kato, Tsuyoshi; and Konishi, Hideo, to Nifco Inc. Two-piece clip. 5,568,675, Cl. 24-453.000.

Asaoka, Sachio: See—  
Ikuta, Yuzo; Tashiro, Satoshi; Hatano, Yoshiyuki; Fujita, Tadasu; Andoh, Noboru; Asaoka, Sachio; Kobayashi, Haruto; and Minami, Takeshi, 5,569,594, Cl. 435-134.000.

Ascend Corporation: See—  
Prichard, D. Wayne; and Guthrie, Joe C., 5,570,323, Cl. 367-118.000.

ASCOM Business Systems AG: See—  
Simon, Rainer, 5,570,354, Cl. 370-26.000.

Asea Brown Boveri AB: See—  
Chudi, Peter; Jönsson, Åke; and Ånger, Leif, 5,568,681, Cl. 29-598.000.

Lundquist, Jan; and Stenström, Lennart, 5,570,264, Cl. 361-127.000.

Ash Grove Cement Company: See—  
Hansen, Eric R.; and Tutt, James R., 5,569,030, Cl. 432-103.000.

Ashby, Matthew; and Rine, Jasper, to University of California. The Regents of the. Methods for drug screening. 5,569,588, Cl. 435-6.000.

Ashi, Yoshihiro: See—  
Murakami, Masaru; Oguri, Yozo; Ashi, Yoshihiro; Tanaka, Katsuyoshi; Kozaki, Takahiko; Takase, Akihiko; and Miyagi, Morihito, 5,570,368, Cl. 370-94.200.

Ashihara, Yoshihiro: See—  
Hirakawa, Toshikage; Tanimoto, Tetsuji; Makino, Yoshihiko; Ninomiya, Tadashi; Hora, Naofumi; Ashihara, Yoshihiro; Sudo, Yukio; and Mori, Toshihiro, 5,569,589, Cl. 435-7.900.

Asirvatham, Edward T.: See—  
Knepper, Jeffrey A.; Flackett, Dale R.; and Asirvatham, Edward T., 5,569,750, Cl. 524-731.000.

Aske, Donald W.; and Johnson, Jeffrey W., to B. F. Goodrich Company, The. Viscous material testing system. 5,569,858, Cl. 73-789.000.

Asta Medica Aktiengesellschaft: See—  
Weischer, Carl-Heinrich; Ulrich, Heinz; and Wessel, Klaus, 5,569,670, Cl. 514-440.000.

Astec International, Ltd.: See—  
Cross, David A., 5,570,278, Cl. 363-20.000.

Astier, Jean-Pierre; Bertone, Christian; and Rocher, Jean-Philippe, to Societe Europeenne de Propulsion. Method of making parts out of an alumina matrix composite material. 5,569,422, Cl. 264-60.000.

Asulab S.A.: See—  
Mignot, Jean-Pierre, 5,569,853, Cl. 73-602.000.

AT&T Corp.: See—  
Fils, Robert W.; and Marchman, Herschel M., 5,570,441, Cl. 385-43.000.

Mizrahi, Victor, 5,570,440, Cl. 385-37.000.

ATI Systems, Inc.: See—  
Wiles, Gregory R., 5,570,183, Cl. 356-371.000.

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Bernissas, Nikolaos, 5,570,321, Cl. 367-38.000.

Atlas Copco Tools AB: See—  
Holmin, Mats C., 5,569,118, Cl. 477-178.000.

Atohaas C.V.: See—  
Verzaro, Francis; and Ferry, Didier, 5,569,497, Cl. 427-489.000.

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Riganonti, Marco; and Stanco, Donato, 5,569,498, Cl. 427-495.000.

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Kisiel, Peter, 5,568,908, Cl. 248-419.000.

Aubert, Michel A.: See—  
Goldman, Mark E.; Aubert, Michel A.; Shenderovich, Alexander M.; and Acharya, Jagat R., 5,569,003, Cl. 409-132.000.

Augenlicht, Leonard H., to Montefiore Medical Center. Method for distinguishing or monitoring the state of premalignant or malignant transformed human colonic tissue. 5,569,584, Cl. 435-6.000.

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Abusleme, Julio A.; and Gavezotti, Piero, 5,569,728, Cl. 526-231.000.

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Garrison, Mark S.; Duffy, John A.; and Teal, Janice J., 5,569,651, Cl. 514-159.000.

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Galvagni, John; and Randall, Sara P. E., 5,569,880, Cl. 174-52.400.

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Axis USA, Inc.: See—  
Cardini, Giuseppe; and Faraoni, Alessandro, 5,569,439, Cl. 427-385.500.

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Glemser, Oskar; and Axmann, Peter, 5,569,562, Cl. 429-223.000.

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Ayres, John, to Nu-Tech & Engineering, Inc. Method of forming a sand base article using a decomposable binder and the article formed thereby. 5,569,514, Cl. 428-35.700.

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Gorman, Charles E., Jr.; Ciccolella, Michael; Smith, Robert C.; Guy, Thomas D.; and Azarbarzin, Kurt, 5,569,206, Cl. 604-167.000.

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Aske, Donald W.; and Johnson, Jeffrey W., 5,569,858, Cl. 73-789.000.

Goodall, Brian L.; Benedikt, George M.; McIntosh, Lester H., III; Barnes, Dennis A.; and Rhodes, Larry F., 5,569,730, Cl. 526-282.000.

Rauchohorst, Richard L., III, 5,569,850, Cl. 73-170.260.

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Minor, David M.; and Roseveare, Ronald N., 5,570,400, Cl. 376-253.000.

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Goodwin, Joseph J.; Caplan, Barry I.; and Babbitt, Bruce P., 5,569,585, Cl. 435-6.000.

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LaCount, Dale F.; and Watson, George B., 5,568,835, Cl. 165-140.000.

Topolski, Mark J., 5,569,396, Cl. 219-76.140.

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Badavas, Paul C.: See—  
Hansen, Peter D.; and Badavas, Paul C., 5,570,282, Cl. 364-148.000.

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Bader, Armin: See—  
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Badique, Eric, to U.S. Philips Corporation. Circuit arrangement for recognizing a human face. 5,570,434, Cl. 382-279.000.

Badorrek, Hal C. Three-dimensional moving target system. 5,568,927, Cl. 273-366.000.

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Hooper, Herbert H.; Pacetti, Stephen; Soane, David S.; and Bae, Young C., 5,569,364, Cl. 204-455.000.

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Muni, Ketan P.; Bagoisan, Celso J.; and Thornton, Troy L., 5,569,196, Cl. 604-96.000.

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Bailey, William R.; Garay, Antonio A.; and Rosborough, Keith A., to Labinal Components and Systems, Inc. Electrical connectors. 5,569,039, Cl. 439-76.100.

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Roselli, Leonard; Wolf, Daniel J.; Balukin, Gregory S.; and Pfaff, John, 5,570,284, Cl. 364-424.010.

Balzer, Peter L., to International Business Machines Corporation. Automated mask alignment for UV projection exposure system. 5,569,570, Cl. 430-22.000.

Bambeck, Gregory S.: See—  
Leffler, Charles E.; and Bambeck, Gregory S., 5,569,369, Cl. 204-620.000.

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Eberhardt, John E.; and Bane, Ronald L., 5,570,066, Cl. 331-34.000.

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Gentry, Jeffery S.; Womble, Karen M.; Banerjee, Chandra K.; Blakley, Richard L.; Barnes, Russell D.; Calleson, Donald A.; and Ridings, Henry T., 5,568,819, Cl. 131-342.000.

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Bantien, Frank: See—  
Marek, Jiri; Bantien, Frank; Muenzel, Horst; and Offenberg, Michael, 5,569,852, Cl. 73-514.320.

Bantle, Johannes-August: See—  
Mauch, Ernst; Weldle, Helmut; Bantle, Johannes-August; and Epp, Erwin, 5,568,696, Cl. 42-49.020.

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Rephaeli, Ada; Nudelman, Abraham; and Shklai, Matityahu, 5,569,675, Cl. 514-547.000.

Barber, John, III. Method and apparatus for recycling oil-soaked boom and pads. 5,569,331, Cl. 134-40.000.

Barclay, David A.; Lewis, Duane J.; Decker, Lewis B., Jr.; and Carradine, William R., to Condea Vista Company. Process for growing crystals. 5,569,325, Cl. 117-18.000.

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Bridgell, Raj; Goren, David; Katz, Joseph; and Bard, Simon, 5,569,901, Cl. 235-470.000.

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Barker, Andrew J., to Zeneca Limited. Tricyclic derivatives. 5,569,658, Cl. 514-250.000.

Barmag AG: See—  
Teich, Udo; and Deters, Ludger A., 5,568,720, Cl. 57-281.000.

Barnes, Dennis A.: See—  
Goodall, Brian L.; Benedikt, George M.; McIntosh, Lester H., III; Barnes, Dennis A.; and Rhodes, Larry F., 5,569,730, Cl. 526-282.000.

Barnes, Russell D.: See—  
Gentry, Jeffery S.; Womble, Karen M.; Banerjee, Chandra K.; Blakley, Richard L.; Barnes, Russell D.; Calleson, Donald A.; and Ridings, Henry T., 5,568,819, Cl. 131-342.000.

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Barnhorst, Jeff A.; Garst, Roger H.; Gordon, Ronald H.; and Zehler, Eugene R., to Henkel Corporation. Stamping lubricants. 5,569,406, Cl. 508-431.000.

Baron, David L.: See—  
Buday, Gene; Baron, David L.; and Martin, Jonathan D., 5,568,802, Cl. 126-21.00A.

Baron, Hal. Combination outdoor daytime/nighttime advertising billboard. 5,570,138, Cl. 348-744.000.

Barr, Bryan M.: See—  
Fulmer, Mark; Constant, Brent R.; Ison, Ira C.; and Barr, Bryan M., 5,569,442, Cl. 423-311.000.

Barrera, Jose D.: See—  
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Barrett, Robert C.; Olyha, Robert S., Jr.; and Rutledge, Joseph D., to International Business Machines Corporation. Graphical user interface cursor positioning device having a negative inertia transfer function. 5,570,111, Cl. 345-157.000.

Barrus, John W., to Mitsubishi Electric Information Technology Center America, Inc. System for unencumbered measurement and reporting of body posture. 5,570,301, Cl. 364-559.000.

Barsdorf, Gary K.; and Schoeman, Deon D., to Barsdorf, Gary Keith. Body surfing device. 5,569,057, Cl. 441-65.000.

Barsdorf, Gary Keith: See—  
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Bartlett, Ian M.: See—  
Bishop, Peter W. D.; and Bartlett, Ian M., 5,570,343, Cl. 370-16.000.

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Klopp, Ingo; Böttcher, Peter; Frick, Ulrich; and Schiller, Otto, 5,569,758, Cl. 540-122.000.

Martin, Friedrich-Georg; Hibst, Hartmut; and Tenten, Andreas, 5,569,636, Cl. 502-311.000.

Merkle, Hans R.; and Fretschner, Erich, 5,569,769, Cl. 548-373.100.

Schaefer, Bernd; and Troetsch-Schaller, Irene, 5,569,774, Cl. 549-548.000.

Wagner, Oliver; Eicken, Karl; Ammermann, Eberhard; and Lorenz, Gisela, 5,569,765, Cl. 546-304.000.

BASF Corporation: See—  
Grandhee, Sunitha, 5,569,715, Cl. 525-7.000.

BASF Magnetics GmbH: See—  
Jachow, Harald; Körner, Reinhard; Veitch, Ronald J.; Schwab, Ekkehard; Jakusch, Helmut; Höppner, Bernd; Lehnert, Rudi; and Ohlinger, Manfred, 5,569,409, Cl. 252-62.560.

Steininger, Helmut; Green, Alan; Munch, Michel; and Heilmann, Peter, 5,569,522, Cl. 428-195.000.

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Bateman, Robert L., Jr.: See—  
Scott, Curtis E.; Secen, Cynthia A.; Parham, Thomas G.; Allen, Gary R.; Bateman, Robert L., Jr.; and Mathews, Paul G., 5,569,979, Cl. 313-636.000.

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Nielsen, Charles R.; Bates, Charles A.; Rooke, Matthew W.; Hansen, Fred R.; Petersen, Paul T.; Le, Me V.; and Lew, Eugene K., 5,570,241, Cl. 360-46.000.

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Josowicz, Mira A.; and Exarhos, Gregory J., 5,569,736, Cl. 528-223.000.

Miller, Steven D., 5,569,927, Cl. 250-484.500.

Bauer, Anton, to Huber & Bauer GmbH. Apparatus for internal high-pressure forming. 5,568,742, Cl. 72-61.000.

Baumann, Ernst: See—  
Rheinheimer, Joachim; Vogelbacher, Uwe J.; Baumann, Ernst; König, Hartmann; Gerber, Matthias; Westphalen, Karl-Otto; and Walter, Helmut, 5,569,640, Cl. 504-288.000.

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Martinson, Laura A.; Brauker, James H.; Johnson, Robert C.; and Loudovaris, Thomas, 5,569,462, Cl. 424-424.000.

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LaFreniere, Brian R.; Cardwell, Dick L.; and Spillson, George A., 5,569,148, Cl. 493-462.000.

Bayan, Jaime A.: See—  
Chillara, Satya N.; and Bayan, Jaime A., 5,569,956, Cl. 257-668.000.

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Baade, Wolfgang; Königshofen, Heinrich; and Kaszas, Gabor, 5,569,723, Cl. 525-357.000.

Blum, Harald; and Petzoldt, Joachim, 5,569,707, Cl. 524-591.000.

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Hendricks, Udo-Winfried; and Heinen, Ralf, 5,569,724, Cl. 525-432.000.

Jäger, Horst; and Wolff, Joachim, 5,569,747, Cl. 534-630.000.

Scholl, Thomas; and Weidenhaupt, Hermann-Josef, 5,569,721, Cl. 525-332.700.

Schreier, Peter H.; Stenzel, Klaus; Adam, Günter; and Maiss, Edgar, 5,569,823, Cl. 800-205.000.

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Jacobs, Patricia B.; and Yonek, Kenneth P., 5,569,706, Cl. 524-591.000.

Sommer, Ronald G., 5,569,608, Cl. 436-518.000.

Bayer, Forrest L.: See—  
Fine, David H.; Fraim, Freeman W.; MacDonald, Stephen J.; Malaspina, Alex; Bayer, Forrest L.; and van Buren Myers, Dirck, 5,569,606, Cl. 436-43.000.

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Baylor College of Medicine: See—  
Donehower, Lawrence A.; Bradley, Allan; Butel, Janet S.; and Slagle, Betty, 5,569,824, Cl. 800-2.000.



- Beahm, James G.: See—  
Napiorkowski, John J.; Kroll, Thomas W.; Brower, Boyd G.; Crane, Robert A.; Butler, Walter K., III; Cote, Mark P.; Beahm, James G.; and Mickelson, Nils P., 5,570,422, Cl. 379-399.000.
- Beal, Merle: See—  
Baker, Geoffrey H.; and Beal, Merle, 5,569,672, Cl. 514-460.000.
- Beamer, John V., to Hoosier Group, L.L.C. Method and apparatus for adding a double liner to a trench. 5,568,995, Cl. 405-119.000.
- Bechtold, Karl: See—  
Avar, Lajos; Bechtold, Karl; and Wolf, Rainer, 5,569,539, Cl. 428-457.000.
- Beck, Jeffrey S.; Valyocik, Ernest W.; and Venkat, Chaya R., to Mobil Oil Corporation. Catalytic conversion of aromatic compounds. 5,569,805, Cl. 585-446.000.
- Beckenstein, Michael S. Marking device for breast surgery. 5,569,237, Cl. 606-1.000.
- Becker, Dieter; Dransmann, Gerhard; and Graumann, Jürgen, to Felix Schoeller Jr. Foto-und Spezial-papiere GmbH & Co. KG. Ink jet printing material. 5,569,529, Cl. 428-331.000.
- Beckman Instruments, Inc.: See—  
Chen, Fu-Tai A.; Liu, Ming-Sun; and Evangelista, Ramon A., 5,569,366, Cl. 204-452.000.
- Beco Engineering Company: See—  
Lerner, Bernard J., 5,569,436, Cl. 422-170.000.
- Becton Dickinson and Company: See—  
Chanoch, Lawrence H., 5,569,214, Cl. 604-246.000.
- Peckham, Allison A.; Watts, Lennox O.; Gertsek, Marina; Smith, Kevin R.; Taubenheim, Don D.; and Pistulka, Ronald J., 5,569,286, Cl. 606-181.000.
- Raynes, John W.; and Altman, Gary, 5,568,815, Cl. 128-672.000.
- Bedingfield, Ralph A.: See—  
Cho, Chahoe P.; and Bedingfield, Ralph A., 5,569,111, Cl. 475-149.000.
- Beecham Group p.l.c.: See—  
Baker, Geoffrey H.; and Beal, Merle, 5,569,672, Cl. 514-460.000.
- Beeley, Nigel R. A.: See—  
Porter, John R.; Morphy, John R.; Millican, Thomas A.; and Beeley, Nigel R. A., 5,569,665, Cl. 514-433.000.
- Beestman, George B., to Du Pont de Nemours, E. I., and Company. Dry flowable agricultural compositions of glyphosate and sulfonylurea herbicides made without drying of the final product. 5,569,639, Cl. 504-128.000.
- Beier, Sybille; Elger, Walter; Nishino, Yukishige; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Dihydrospiroenone as an antiandrogen. 5,569,652, Cl. 514-173.000.
- Belcourt, Ronald H., Jr.: See—  
Colligan, Francis D.; Carpentiere, Richard P.; Belcourt, Ronald H., Jr.; and Giordano, Giuseppe, 5,568,746, Cl. 72-416.000.
- Belef, William M.: See—  
Jang, Yue-Teh; and Belef, William M., 5,569,276, Cl. 606-159.000.
- Bell Communications Research, Inc.: See—  
Bress, James R.; and Schwartz, Barry K., 5,570,420, Cl. 379-220.000.
- Bell, J. Ellis: See—  
Watanabe, Kyoichi A.; Pankiewicz, Krzysztof W.; Goldstein, Barry M.; and Bell, J. Ellis, 5,569,650, Cl. 514-433.000.
- Bell, Weldon K.; Brown, Stephen H.; and Trewella, Jeffrey C., to Mobil Oil Corporation. Multistage indirect propylene hydration process for the production of diisopropyl ether and isopropanol. 5,569,789, Cl. 568-697.000.
- Bellavista, Patrice. Earthquake resistant mounts for buildings and constructions. 5,568,705, Cl. 52-167.100.
- Beller, Matthias; and Forstinger, Klaus, to Hoechst AG. Process for the preparation of 4-fluoroalkoxycinnamitriles. 5,569,776, Cl. 558-373.000.
- Bellio, Stephen; and Eidelman, Gerald P., to E.B.T., Inc. Electronic transmission control for human powered vehicle. 5,569,104, Cl. 474-70.000.
- Bellmore, Harold, Jr.: See—  
Proto, George R.; Colligan, Francis D.; and Bellmore, Harold, Jr., 5,569,302, Cl. 606-228.000.
- Bellotti, Enrico: See—  
Eberhardt, John E.; and Bellotti, Enrico, 5,570,065, Cl. 330-296.000.
- Bellsouth Corporation: See—  
Hooshari, Alireza, 5,570,410, Cl. 379-32.000.
- Beloit Technologies, Inc.: See—  
Adams, James E.; Lynn, John D.; and Nadarajah, Ravindran, 5,568,896, Cl. 241-24.290.
- Belongia, David C.; and Kruepke, Annette T., to West Bend Company, The. Automatic breadmaker with interior lamp. 5,568,764, Cl. 99-341.000.
- Belt, Steven; Schindler, Jeffrey; and Stobert, Norman, to Zenith Data Systems Corporation. Computer for use with a port replicator. 5,569,052, Cl. 439-638.000.
- Belunova, Ludmila V.; Gribkov, Vladimir N.; Chernykh, André I.; Mizurina, Galina T.; Mordovin, Oleg A.; and Mukhanova, Elena E., to Aerospatiale Societe Nationale Industrielle; and VIAM - All Russian Institut of Aviation Materials. Process for the manufacture of a silica fiber based heat insulating material. 5,569,423, Cl. 264-60.000.
- Bendel, Klaus; Uhlmer, Jürgen; and Eiser, Armin. Leak-proof ABS/TCS pump assembly with non-return valve. 5,569,025, Cl. 417-434.000.
- Benedikt, George M.: See—  
Goodall, Brian L.; Benedikt, George M.; McIntosh, Lester H., III; Barnes, Dennis A.; and Rhodes, Larry F., 5,569,730, Cl. 526-282.000.
- Benefield, Weldon. Truck hub carrier. 5,568,956, Cl. 294-15.000.
- Benguigui, Daniel R. Case for storage and application of pasty products. 5,568,989, Cl. 401-59.000.
- Ben-haim, Shlomo, to Biosense, Inc. Apparatus and method for intrabody mapping. 5,568,809, Cl. 128-656.000.
- Bennett, Alan; Labavitch, John M.; Powell, Ann; and Stotz, Henrik, to University of California, Regents of the. Plant inhibitors of fungal polygalacturonases and their use to control fungal disease. 5,569,830, Cl. 800-205.000.
- Bennett, Allen C.; Del Mar, Bruce E.; and Schnabel, Maria B., to Del Mar Avionics. Method and apparatus for multimedia presentations. 5,568,963, Cl. 353-122.000.
- Bennett, Thomas B., III: See—  
Mullet, Willis; Bennett, Thomas B., III; and Dague, Roger L., 5,568,672, Cl. 16-94.00R.
- Beno, Joseph M., Jr.: See—  
Sanborn, Timothy P.; Beno, Joseph M., Jr.; and Flynn, Roy W., 5,569,687, Cl. 523-414.000.
- Benson, Miriam M.: See—  
Hutchison, Joel P., 5,568,774, Cl. 108-51.300.
- Benson, Peter: See—  
Ovshinsky, Stanford R.; Corrigan, Dennis A.; Benson, Peter; and Fierro, Cristian A., 5,569,563, Cl. 429-223.000.
- Berg, Charles J., Jr.: See—  
Fisher, Daniella J.; Osborn, Thomas W., III; Seymour, Mark D.; Kingry, Gary W.; Berg, Charles J., Jr.; Cook, Charles D.; Gilbert, Steven R.; and Toms, Douglas, 5,569,230, Cl. 604-385.100.
- Berg, Lonny L.: See—  
Yeh, Tangshun; Hurst, Allan T.; Chen, Huang-Joung; Berg, Lonny L.; and Witcraft, William F., 5,569,617, Cl. 437-48.000.
- Berg, Todd A., to SCIMED Life Systems, Inc. Elastic guide catheter transition element. 5,569,218, Cl. 604-282.000.
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Kessous-Elbaz, Allégria; Michaud, Jean; and Berrada, Fouad, 5,569,827, Cl. 800-2.000.
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Semenova, Elena V.; Tjurin, Vladimir M.; Solntsev, Stanislav S.; and Bersenev, Alexei Y., 5,569,427, Cl. 264-129.000.
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Guilloud, Jean-Claude; Trouchet, Daniel; Lapautre, Michel; and Lepretre, Marc, 5,568,847, Cl. 188-313.000.
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Astier, Jean-Pierre; Bertone, Christian; and Rocher, Jean-Philippe, 5,569,422, Cl. 264-60.000.
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Ritter, Michael W.; Bettendorff, John; Flammer, George H., III; and Galloway, Brett D., 5,570,084, Cl. 340-825.050.
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Gadducci, Paolo; Moloney, David; and Betti, Giorgio, 5,570,380, Cl. 371-57.100.
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Santoro, Mark R.; Tavrow, Lee S.; and Bewick, Gary W., 5,570,319, Cl. 365-230.030.
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Baker, Gregg S.; and Hafeli, Paul B., 5,569,251, Cl. 606-69.000.
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Tettamanti, Michele; and Biagioli, Marcello, 5,569,526, Cl. 428-225.000.
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Mongelli, Nicola; Angelucci, Francesco; Pesenti, Enrico; Suarato, Antonino; and Biasoli, Giovanni, 5,569,720, Cl. 525-329.400.
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Baumgartner, Hans; Bieker, Dieter; and Iraschko, Johann, 5,568,845, Cl. 188-71.900.
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Kenney, Martin J.; and Billings, John K., 5,569,835, Cl. 73-1.001.
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Shlyankovich, Mark, 5,569,459, Cl. 424-195.100.
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Tamminmäki, Markku; Albrecht-Olsen, Peter; Kristensen, Gert; and Törmälä, Pertti, 5,569,264, Cl. 606-104.000.
- Biomeasure, Inc.: See—  
Coy, David H.; and Taylor, John E., 5,569,741, Cl. 530-311.000.
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Breen, Bernard P.; Bionda, John P., Jr.; Gabrielson, James E.; and Hallo, Anthony, 5,568,777, Cl. 110-261.000.
- Biosense, Inc.: See—  
Ben-haim, Shlomo, 5,568,809, Cl. 128-656.000.
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Quirk, Richard; Bird, David A.; Shulver, Ian N. W.; and McIntosh, Robin M., 5,569,312, Cl. 65-134.600.
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Waterhouse, Judith A.; Van Remoortel, Christopher J.; and Caproni, Roy H., 5,569,527, Cl. 428-261.000.
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Gentry, Jeffery S.; Womble, Karen M.; Banerjee, Chandra K.; Blakely, Richard L.; Barnes, Russell D.; Calleson, Donald A.; and Ridings, Henry T., 5,568,819, Cl. 131-342.000.
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Snowden, Roger L.; and Blanc, Pierre-Alain, 5,569,660, Cl. 514-277.000.
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- Blonas, Costas: See—  
Quinn, Duncan R.; Gallagher, Brian W.; Blonas, Costas; and Nicolosi, Joseph A., 5,569,925, Cl. 250-370.060.
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Abidin, Michael R.; and Lehmebeck, Steven P., 5,569,281, Cl. 606-167.000.
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Elliott, Byron D., 5,569,265, Cl. 606-123.000.
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Williams, R. Sanders; and Li, Kang, 5,569,754, Cl. 536-23.500.
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Dagh, Ingemar; and Bodin, Jan-Olof, 5,568,846, Cl. 188-218.0XL.
- Boehringer Ingelheim KG: See—  
Schneider, Heinrich; and Christmann, Albrecht, 5,569,760, Cl. 540-495.000.
- Boehringer Mannheim GmbH: See—  
Simon, Thomas; Kaiser, Ingo; and Carstensen, Carsten, 5,569,607, Cl. 436-46.000.
- Boeing Company, The: See—  
Cundiff, Thomas R., 5,569,508, Cl. 428-117.000.
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Rench, Frederick A., 5,568,877, Cl. 220-441.000.
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Kuhn, Wolfgang; Buchholz, Norbert; and Schulte, Reiner, 5,570,452, Cl. 392-484.000.
- Boniwell, Jeremy M.: See—  
Bird, Colin R.; Boniwell, Jeremy M.; Grierson, Donald; Ray, John A.; and Schuch, Wolfgang W., 5,569,829, Cl. 800-205.000.
- Bonkohara, Manabu: See—  
Saito, Masaru; and Bonkohara, Manabu, 5,570,274, Cl. 361-784.000.
- Bonneau, David: See—  
Nevel, Avishai; Lawson, John B.; Gordon, Kendall W., Jr.; and Bonneau, David, 5,570,188, Cl. 356-385.000.
- Bonner, M. Jeffrey: See—  
Farris, Robert A.; and Bonner, M. Jeffrey, 5,569,253, Cl. 606-74.000.
- Bonutti, Peter M. Apparatus for anchoring a suture. 5,569,305, Cl. 606-232.000.
- Boon, Choong S., to Matsushita Electric Industrial Co., Ltd. Apparatus for further compressing and recording encoded digital video data streams. 5,570,197, Cl. 386-46.000.
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Cordova, David S.; Weedon, Gene C.; Hofer, Robert C. W.; Boone, Mark B.; Kirkland, Kevin M.; Weber, Charles P., Jr.; and LaCasse, Gregory J., 5,568,657, Cl. 2-167.000.
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Doshi, Anil G.; Kos, Frank T.; and Salkar, Dattaram C., 5,569,693, Cl. 524-317.000.
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Barthe, Jean; and Bordy, Jean-Marc, 5,569,699, Cl. 524-496.000.
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Weissman, Yitzhak; Herman, Rami; Bornstein, Aharon; and Tugendhaft, Israel, 5,569,923, Cl. 250-341.200.
- Bortnick, Newman M.: See—  
LaFleur, Edward E.; Work, William J.; Amici, Robert M.; Bortnick, Newman M.; and Holy, Norman L., 5,569,710, Cl. 525-57.000.
- Bosdet, Sarah: See—  
Timonen, Maritta; Rha, ChoKyun; Vaara, Timo; Bagley, Lindsey; Bosdet, Sarah; Lindley, Michael; Lahtinen, Tarja; Turunen, Marja; and Vaara, Martti, 5,569,483, Cl. 426-658.000.
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Clarke, Richard H., 5,569,922, Cl. 250-339.120.
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Klopp, Ingo; Böttcher, Peter; Frick, Ulrich; and Schiller, Otto, 5,569,758, Cl. 540-122.000.
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Grimsley, Nigel H.; Hohn, Barbara; Hohn, Thomas; Davies, Jeffrey W.; and Boulton, Margaret I., 5,569,597, Cl. 435-172.300.
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Lal, Brij B.; Bourez, Allen J.; and Shinohara, Tadashi, 5,569,533, Cl. 428-332.000.
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Ribier, Alain; Nguyen, Quang L.; Simonnet, Jean-Thierry; and Boussouira, Boudiaf, 5,569,663, Cl. 514-315.000.
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- Box, Philip C.: See—



- Armour, Duncan R.; Box, Philip C.; and Shah, Pritom, 5,569,654, Cl. 514-221.000.
- Boyd, Donald B.; Lifer, Sherry L.; Marshall, Winston S.; Palkowitz, Alan D.; Pfeifer, William; Reel, Jon K.; Simon, Richard L.; Steinberg, Mitchell I.; Thrasher, K. Jeff; Vasudevan, Venkatraghavan; and Whitesitt, Celia A., to Eli Lilly and Company, Angiotensin II antagonists, 5,569,768, Cl. 548-253.000.
- Boysen, Robert L.: See—  
Paeglis, Arnis U.; Boysen, Robert L.; Lynn, Timothy R.; and Collins, Jeffrey D., 5,569,516, Cl. 428-58.000.
- Bracco International B.V.: See—  
Ogan, Marc; Tomasella, Frank P.; and Tu, Jan-I, 5,569,446, Cl. 424-1490.
- Bracken, Allen T.: See—  
Sumner, Wayne A.; Bracken, Allen T.; Griffith, David W.; Jones, David E.; and Rich, Edward L., 5,570,252, Cl. 360-133.000.
- Bradley, Allan: See—  
Donehower, Lawrence A.; Bradley, Allan; Butel, Janet S.; and Slagle, Betty, 5,569,824, Cl. 800-2.000.
- Bradley, John R.: See—  
Schroeder, Thaddeus; Lequesne, Bruno P. B.; Butler, Raymond O., Jr.; Marks, Anthony L.; Perry, Thomas A.; and Bradley, John R., 5,570,016, Cl. 324-207.250.
- Brake, Loren D.: See—  
Kourtakos, Konstantinos; Bergna, Horacio E.; Sonnichsen, George C.; Corbin, David R.; and Brake, Loren D., 5,569,785, Cl. 564-474.000.
- Brandely, Jose: See—  
Ajtó, Hubert, deceased; Ajtó, by Laure, legal representative; Ajtó, by Alexandra, legal representative; Ajtó, by Vincent, legal representative; Russmann, Colette; Brandely, Jose; Garnier, Dominique; and Gonzalez, Pierre, 5,569,839, Cl. 73-38.000.
- Brandes, Wilhelm: See—  
Dutzmann, Stefan; Dehne, Heinz-Wilhelm; Kuck, Karl-Heinz; Brandes, Wilhelm; and Krämer, Wolfgang, 5,569,656, Cl. 514-231.200.
- Braude, Ofer: See—  
Levy, Uri; Braude, Ofer; Rozenberg, Ytzhak; and Zimmerman, Yotam, 5,568,859, Cl. 200-43.010.
- Brauker, James H.: See—  
Martinson, Laura A.; Brauker, James H.; Johnson, Robert C.; and Loudovaris, Thomas, 5,569,462, Cl. 424-424.000.
- Braun, Edward R.: See—  
Goodman, Seth D.; Eriksson, Larry J.; Melton, Douglas E.; and Braun, Edward R., 5,570,425, Cl. 381-71.000.
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- Brawner, Jon M.; Carides, James J.; Rich, Benny R.; and Estep, William F., Jr., to Dittler Brothers Incorporated, Card with integrated overprinting, 5,569,512, Cl. 428-29.000.
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- Breier, Andreas: See—  
Gatzmanga, Heinz; and Breier, Andreas, 5,569,859, Cl. 73-861.220.
- Brenot, Stephen E.; and Althoff, Arnold G., to Brenot, Stephen E.; Althoff, Arnold G.; and Schneider, Randy M., Continuous flow process of mold-making or die-making using a reusable mixture substance to make selected finished products, 5,569,419, Cl. 264-37.000.
- Brentin, Robert P.: See—  
Nolan, Stephen J.; Sonnenschein, Mark F.; Carriere, Craig J.; Landes, Brian G.; and Brentin, Robert P., 5,569,428, Cl. 264-210.700.
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- Bridgelall, Raj; Goren, David; Katz, Joseph; and Bard, Simon, to Symbol Technologies, Inc., Symbol scanning system and method having adaptive pattern generation, 5,569,901, Cl. 235-470.000.
- Bridgestone Corporation: See—  
Fukushima, Masaharu; and Nagai, Yuichi, 5,569,341, Cl. 152-527.000.
- Bright, Jason: See—  
Abraham, Loren; Pilla, Michael F.; and Bright, Jason, 5,570,292, Cl. 364-473.010.
- Bright, Stephen A.; to Electra Form, Inc., Apparatus for forming a recyclable lined container, 5,569,473, Cl. 425-523.000.
- Brim, Karen: See—  
Kaprielian, Mark; Brim, Karen; and Kenyon, Lewis, 5,570,345, Cl. 370-16.000.
- Bristol, Brent L.: See—  
Tseng, Wu-Yang; Bristol, Brent L.; Hetico, Rolf R.; and Glynn, Christopher C., 5,568,931, Cl. 277-53.000.
- British Technology Group Limited: See—  
Betts, Walter B.; and Hawkes, Jeremy J., 5,569,367, Cl. 204-547.000.
- Brittain, Glenn: See—  
Bathrick, Leeland M.; Chizek, Michael W.; and Brittain, Glenn, 5,568,661, Cl. 5-618.000.
- Britz, Klaus: See—  
Lindner, Ernst; Trittler, Guido W.; and Britz, Klaus, 5,568,724, Cl. 60-204.000.
- BRK Brands, Inc.: See—  
Swieboda, Michael A., 5,570,077, Cl. 340-331.000.
- Brochand, Max, to Pomagalski S.A., Detachable grip for coupling cars or chairs of a gondola lift or chairlift, 5,568,771, Cl. 104-206.000.
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- Brooks Automation, Inc.: See—  
Hofmeister, Christopher, 5,569,014, Cl. 414-744.300.
- Brower, Boyd G.: See—  
Napiorkowski, John J.; Kroll, Thomas W.; Brower, Boyd G.; Crane, Robert A.; Butler, Walter K., III; Cote, Mark P.; Beahm, James G.; and Mickelson, Nils P., 5,570,422, Cl. 379-399.000.
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- Brown, Dana H.; Christensen, Thomas C.; Cunningham, Earl A.; and Rogelstad, Wayne A., to International Business Machines Corporation, Self servo writing file, 5,570,247, Cl. 360-75.000.
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- Brown, Geoffrey J. E., Relating to gaseous fuel burner assemblies and to appliances incorporating such burner assemblies, 5,568,803, Cl. 126-21.00A.
- Brown, Louis R.: See—  
Blackburn, Brian K.; Brown, Louis R.; Mazur, Joseph E.; and Gentry, Scott B., 5,568,939, Cl. 280-806.000.
- Brown, Stephen H.: See—  
Bell, Weldon K.; Brown, Stephen H.; and Trewella, Jeffrey C., 5,569,789, Cl. 568-697.000.
- Brown, Stephen J., to Raya Systems, Inc., Apparatus for electrically determining injection doses in syringes, 5,569,212, Cl. 604-207.000.
- Brown, William, to Stretto Di Messina S.p.A., Structure to interconnect two branches of a suspension bridge framework in correspondence of a pier supporting the catenary, 5,568,667, Cl. 14-20.000.
- Brugger, James M.: See—  
Buffaloe, George W., IV; Ogawa, Francis T.; and Brugger, James M., 5,570,026, Cl. 324-445.000.
- Bruker Analytische Messtechnik GmbH: See—  
Müller, Wolfgang, 5,570,073, Cl. 335-299.000.
- Bruna, Pascal, to Valois S.A., Portable device for projecting measured quantities of a fluid substance by means of a puff of compressed air, 5,568,884, Cl. 222-189.090.
- Bruner, David A., to Ericsson GE Mobile Communications Inc., Key assembly and keyboard comprising key retraction and stabilization means, 5,569,889, Cl. 200-5.00A.
- Brunner, Marcus: See—  
Vogt-Birnbrich, Bettina; Patzschke, Hans-Peter; Lenhard, Werner; Döbert, Jürgen; Brunner, Marcus; and Schubert, Walter, 5,569,705, Cl. 524-591.000.
- Brunner, Philipp; and Tresch, Rudolf, to ABB Management AG, Emission probe for the removal of exhaust gas from the combustion chamber of a gas turbine, 5,568,722, Cl. 60-39.330.
- Brunswick Technologies, Inc.: See—  
Grimmes, Martin S., 5,569,344, Cl. 156-90.000.
- Brutscher, David T.; and Leet, Leroy R., Sr., to Credo Tool Company, Template used in installing door locks, 5,569,001, Cl. 408-115.00R.
- Bryan, Graham W.: See—  
Green, David T.; Castro, Salvatore; Ratcliff, Keith; Bryan, Graham W.; and Nolan, Paul, 5,569,283, Cl. 606-170.000.
- Brzezinski, Philip S.; and Dvorachek, Thomas J., to Timex Corporation, Method and apparatus for synchronizing data transfer rate from a cathode ray tube video monitor to a portable information device, 5,570,297, Cl. 364-514.00R.
- Buchanan, Douglas A.: See—  
Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C.; Clearfield, Howard M.; Doany, Fuad E.; Flagello, Donis G.; Hovel, Harold J.; Latulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushothaman, Sampath; Scherpereel, Christopher M.; Seeger, David E.; and Shaw, Jane M., 5,569,501, Cl. 427-577.000.
- Buchholz, Norbert: See—  
Kuhn, Wolfgang; Buchholz, Norbert; and Schulte, Reiner, 5,570,452, Cl. 392-484.000.
- Büchler, Christian, to Deutsche Thomson-Brandt GmbH, Optical scanning device with coarse and fine scanning control, 5,570,328, Cl. 369-13.000.
- Buck Knives, Inc.: See—  
Seber, Brett P., 5,568,888, Cl. 224-232.000.
- Buday, Gene; Baron, David L.; and Martin, Jonathan D., Vertical oven, 5,568,802, Cl. 126-21.00A.
- Buehler, Charles H., to Organic Resource Management Inc., Storage and disposal of organic waste, 5,568,996, Cl. 405-129.000.
- Buell, Kenneth B.; and Carlin, Edward P., to Procter & Gamble Company, The Disposable pull-on pant, 5,569,234, Cl. 604-396.000.
- Buet, Michael P.: See—  
Pervai, Steve I.; and Buet, Michael P., 5,569,328, Cl. 118-696.000.
- Buffaloe, George W., IV; Ogawa, Francis T.; and Brugger, James M., to COBE Laboratories, Inc., Altered fluid conductivity monitor, 5,570,026, Cl. 324-445.000.

- Bühler, Ulrich, to Hoechst Mitsubishi Kasei Co., Monoazo dyestuffs which are free from ionic groups, their preparation and their use, 5,569,751, Cl. 534-850.000.
- Bull S.A.: See—  
Nguyen, VanPhuong, 5,570,359, Cl. 370-60.000.
- Buller, James P.: See—  
Linn, Jack H.; Lowry, Robert K.; Rouse, George V.; and Buller, James F., 5,569,620, Cl. 437-62.000.
- Bureau of Engraving and Printing: See—  
Moynihan, John T., 5,569,701, Cl. 524-539.000.
- Burgess, Robert K., Ceiling-mounted device for stabilizing a workpiece, 5,568,954, Cl. 292-338.000.
- Burke, Dennis W., Method for implanting a prosthetic device into a bone, 5,569,255, Cl. 606-79.000.
- Burke, Sherald M., legal representative: See—  
Burke, William K., deceased; Roberts, Charles R.; and Schwam, Freely R., 5,568,723, Cl. 60-203.100.
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Wagner, Franz M.; and Heimer, Drew D., 5,569,557, Cl. 429-99.000.
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Titone, Milo A.; and Herzog, Fred D., 5,569,273, Cl. 606-151.000.
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Hansen, Eric R.; and Tutt, James R., 5,569,030, Cl. 432-103.000.
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Guillaumet, Gérard; Viaud, Marie-Claude; Renard, Pierre; Adam, Gérard; Caignard, Daniel-Henri; Guardiola-Lemaître, Béatrice; and Retoré, Marie-Claire, 5,569,669, Cl. 514-432.000.
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Gentry, Jeffery S.; Womble, Karen M.; Banerjee, Chandra K.; Blakley, Richard L.; Barnes, Russell D.; Calleson, Donald A.; and Ridings, Henry T., 5,568,819, Cl. 131-342.000.
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Goldiner, Arthur; and Camplese, Linda, 5,569,036, Cl. 433-168.100.
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Blum, Dieter W., 5,570,017, Cl. 324-232.000.
- Canada, Her Majesty the Queen in right of as represented by the Minister of Transport Canada: See—  
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Joseph, Anthony L. P.; Overall, John C. K.; Runciman, Christopher; and Wright, Colin, 5,568,804, Cl. 126-39.00K.
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Killian, Gary; Chapman, David; Cancel, Aida; and Henault, Margaret A., 5,569,581, Cl. 435-4.000.
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Arai, Takashi; and Nakano, Hirofumi, 5,570,156, Cl. 396-51.000.
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- Konishi, Kazuki, 5,570,157, Cl. 396-232.000.
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Yokomizo, Yoshikazu, 5,570,461, Cl. 395-135.000.  
Yokota, Masayuki, 5,570,201, Cl. 358-404.000.  
Yoshinaga, Kenji, 5,570,206, Cl. 358-497.000.  
Canon Sales Co., Inc.: See—  
Maeda, Kazuo; Tokumasu, Noboru; and Yuyama, Yoshiaki, 5,569,499, Cl. 427-539.000.  
Cansell, François; Hotier, Gérard; Marteau, Philippe; and Zanier, Nathalie, to Institut Français Du Pétrole. Method for regulating a process for the separation of isomers of aromatic hydrocarbons having from 8 to 10 carbon atoms, 5,569,808, Cl. 585-800.000.  
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Caplan, Barry I.: See—  
Goodwin, Joseph J.; Caplan, Barry I.; and Babbitt, Bruce P., 5,569,585, Cl. 435-6.000.  
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Newman, Steve, 5,570,143, Cl. 351-176.000.  
Caproni, Roy H.: See—  
Waterhouse, Judith A.; Van Remoortel, Christopher J.; and Caproni, Roy H., 5,569,527, Cl. 428-261.000.  
CarboMedics, Inc.: See—  
Cox, Kenneth W., 5,569,329, Cl. 118-716.000.  
Cardini, Giuseppe; and Faraoni, Alessandro, to Axis USA, Inc. Heatless resin coating system and method, 5,569,439, Cl. 427-385.500.  
Cardiovascular Dynamics, Inc.: See—  
Crocker, Michael; Henson, Michael; and Chum, Muny, 5,569,184, Cl. 604-53.000.  
Crocker, Michael, 5,569,215, Cl. 604-264.000.  
Cardiovascular Imaging Systems, Inc.: See—  
Jang, Yue-Teh; and Belef, William M., 5,569,276, Cl. 606-159.000.  
Cardwell, Dick L.: See—  
LaFreniere, Brian R.; Cardwell, Dick L.; and Spillson, George A., 5,569,148, Cl. 493-462.000.  
Carey, James T.: See—  
Avery, Noyes L.; Axelrod, Joan C.; Carey, James T.; Hiebert, John; and Horodysky, Andrew G., 5,569,407, Cl. 508-454.000.  
Carides, James J.: See—  
Brawner, Jon M.; Carides, James J.; Rich, Benny R.; and Estep, William F., Jr., 5,569,512, Cl. 428-29.000.  
Carle & Montanari S.p.A.: See—  
Ceroni, Renzo, 5,569,472, Cl. 425-404.000.  
Carlin, Edward P.: See—  
Buell, Kenneth B.; and Carlin, Edward P., 5,569,234, Cl. 604-396.000.  
Roe, Donald C.; Goulait, David J. K.; Rodriguez, Sheila S.; Carlin, Edward P.; Dreier, Kimberly A.; Jasper, Carolyn M.; and Daniels, Dean J., 5,569,232, Cl. 604-385.200.  
Carlos, Mark C.: See—  
Manning, William R.; Carlos, Mark C.; and Nacewicz, Stanley J., 5,570,257, Cl. 361-76.000.  
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Carlson, Glenn T.: See—  
Vaughn, William J.; Umber, Ray E.; St. Clair, William E.; Estes, Larry D.; and Carlson, Glenn T., 5,569,256, Cl. 606-80.000.  
Carmichael, Wayne W.: See—  
Rinehart, Kenneth L.; Carmichael, Wayne W.; and Namikoshi, Michio, 5,569,757, Cl. 536-17.400.  
Carnegie Mellon University: See—  
Reed, Michael L.; and Weiss, Lee E., 5,569,272, Cl. 606-151.000.  
Waggoner, Alan S.; Ernst, Lauren A.; and Mujumdar, Ratnakar B., 5,569,766, Cl. 548-150.000.  
Carney, William P. Guide tool for surgical devices, 5,569,262, Cl. 606-96.000.  
Carolan, Michael F.; and Dyer, Paul N., to Air Products and Chemicals, Inc. Ion transport membranes with catalyzed dense layer, 5,569,633, Cl. 502-4.000.  
Caron, Paul R.: See—  
Gallant, Stuart L.; Caron, Paul R.; and Palmer, Walter E., 5,568,814, Cl. 128-672.000.  
Carpentiere, Richard P.: See—  
Colligan, Francis D.; Carpentiere, Richard P.; Belcourt, Ronald H., Jr.; and Giordano, Giuseppe, 5,568,746, Cl. 72-416.000.  
Carradine, William R.: See—  
Barclay, David A.; Lewis, Duane J.; Decker, Lewis B., Jr.; and Carradine, William R., 5,569,325, Cl. 117-18.000.

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Carriere, Craig J.: See—  
Nolan, Stephen J.; Sonnenschein, Mark F.; Carriere, Craig J.; Landes, Brian G.; and Brentin, Robert P., 5,569,428, Cl. 264-210.700.  
Carr, W. Eamon; Renz, Walter L.; Nordquist, Andrew F.; and Pinschmidt, Robert K., Jr., to Air Products and Chemicals, Inc. N-vinyl-n-acyl urea resins, 5,569,725, Cl. 525-454.000.  
Carson, Bradley C. Shower door shelf, 5,568,772, Cl. 108-42.000.  
Carson, Kenneth: See—  
Gagne, Robert J.; Plein, William J., II; and Carson, Kenneth, 5,568,713, Cl. 52-785.100.  
Carstensen, Carsten: See—  
Simon, Thomas; Kaiser, Ingo; and Carstensen, Carsten, 5,569,607, Cl. 436-46.000.  
Caruso, Joseph R.: See—  
Oyie, George; and Caruso, Joseph R., 5,569,978, Cl. 313-631.000.  
Casey, Shawn E., to Western Digital Corporation. Disk drive head disk assembly actuator mount mechanism, 5,570,250, Cl. 360-106.000.  
Castleman, Neal J., to Ergo Mechanical Systems, Incorporated. Universal power-supply connection system for multiple electronic devices, 5,570,002, Cl. 323-283.000.  
Castro, Salvatore: See—  
Green, David T.; Castro, Salvatore; Ratcliff, Keith; Bryan, Graham W.; and Nolan, Paul, 5,569,283, Cl. 606-170.000.  
Young, Wayne P.; Pereira, Darryl S.; Castro, Salvatore; Kolesa, Michael S.; Mastri, Dominick L.; and Viola, Frank J., 5,569,284, Cl. 606-180.000.  
Cataneo, Ralph J.; and Tannebaum, Robert J., to Innvision Services, Inc. Apparatus for dispensing two flowable substances in a user selectable ratio, 5,568,883, Cl. 222-136.000.  
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Aardema, James A., 5,568,759, Cl. 91-461.000.  
Carlson, Douglas A.; and Creger, Todd D., 5,568,748, Cl. 74-336.00R.  
Maes, Richard J., 5,568,851, Cl. 192-9.000.  
Manning, Noah D., 5,568,762, Cl. 92-143.000.  
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Grembowicz, Conrad G.; Ferguson, Alan L.; Samson, Wade D.; and Schmidt, Keith R., 5,568,992, Cl. 404-101.000.  
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Chim, W. K.: See—  
Phang, J. C. H.; Chim, W. K.; Chan, D. S. H.; and Liu, Y. Y., 5,569,920, Cl. 250-310.000.  
Cegla, Ulrich. Therapeutic device for improving breathing, 5,569,122, Cl. 482-13.000.  
Celcor, Inc.: See—  
Goodwin, Joseph J.; Caplan, Barry I.; and Babbitt, Bruce P., 5,569,585, Cl. 435-6.000.  
Celltech Limited: See—  
Porter, John R.; Morphy, John R.; Millican, Thomas A.; and Beoley, Nigel R. A., 5,569,665, Cl. 514-357.000.  
Center for Advanced Fiberoptic Applications: See—  
Then, Alan M.; Shank, Steven M.; Soave, Robert J.; and Tasker, G. William, 5,569,355, Cl. 156-643.100.  
Center for Innovative Technology: See—  
Dennis, Douglas E., 5,569,595, Cl. 435-135.000.  
Cephalon, Inc.: See—  
Lewis, Michael E.; Apfel, Stuart C.; and Kessler, John A., 5,569,648, Cl. 514-12.000.  
Ceram Optec Industries Inc.: See—  
Dobele, Frieder; Graham, William G.; Dowling, Denis P.; O'Brien, Terence P.; Kornas, Volkhard; and Morrow, Thomas, 5,570,175, Cl. 356-72.000.  
Ceroni, Renzo, to Carle & Montanari S.p.A. Continuously-operating chilling cabinet for treating a mass contained in molds, 5,569,472, Cl. 425-404.000.  
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De Coninck, Valere L. M. P.; and van der Schueren, Freddy M. L., 5,569,480, Cl. 426-573.000.  
Certenais, Joël, to Thomson-CSF. Portable station for measuring and adjusting the magnetic signature of a naval ship, 5,570,023, Cl. 324-345.000.  
Champex, Henri: See—  
Le Comte, Roger; Couderc, Guilhem; and Champex, Henri, 5,569,861, Cl. 73-864.220.  
Chan, D. S. H.: See—  
Phang, J. C. H.; Chim, W. K.; Chan, D. S. H.; and Liu, Y. Y., 5,569,920, Cl. 250-310.000.  
Chan, Ken Tze-Kin; Enichen, William A.; Hartley, John G.; and Sturans, Maris A., to International Business Machines Corporation. Registration and alignment technique for X-ray mask fabrication, 5,570,405, Cl. 378-35.000.  
Chan, King W.: See—  
El-Avat, Khaled A.; Kaptanoglu, Sinan; Chan, King W.; Plants, William C.; and Lien, Jung-Cheun, 5,570,041, Cl. 326-41.000.  
Chang, Ciuter: See—  
Nepela, Daniel A.; Chang, Ciuter; Hsia, Yiao-Tee; and Bhadra, Rajendra, 5,568,981, Cl. 384-12.000.  
Chang, Joseph J.: See—  
Kovalic, Gerald J.; and Chang, Joseph J., 5,569,202, Cl. 604-110.000.

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Chang, Ronald: See—  
Ross, James B.; and Chang, Ronald, 5,569,235, Cl. 604-403.000.  
Chanoch, Lawrence H., to Becton Dickinson and Company. Dose setting knob adapter for medication delivery pen, 5,569,214, Cl. 604-246.000.  
Chapko, Louis B.; Westerhof, Donald E.; and Ertl, David S., to Pioneer Hi-Bred International, Inc. Inbred maize line phap8, 5,569,818, Cl. 800-200.000.  
Chapkovich, John S., to United Technologies Corporation. Hybrid panel fastener and a retention mechanism for use in combination therewith for composite articles, 5,569,008, Cl. 411-383.000.  
Chapman, David: See—  
Killian, Gary; Chapman, David; Cancel, Aida; and Henault, Margaret A., 5,569,581, Cl. 435-4.000.  
Chapman, Michael A., to Pioneer Hi-Bred International, Inc. Inbred corn line ph44, 5,569,822, Cl. 800-200.000.  
Charles, Eugene: See—  
Lynch, Patrick J.; and Charles, Eugene, 5,568,786, Cl. 116-303.000.  
Chatterji, Jiten: See—  
Totten, Patty L.; King, Bobby J.; and Chatterji, Jiten, 5,569,324, Cl. 106-696.000.  
Cheil Industries, Inc.: See—  
Choi, Kil Y.; Won, Jong C.; Hong, Young T.; Woo, Sang S.; and Don, Youn S., 5,569,738, Cl. 528-170.000.  
Chemische Fabrik Stockhausen GmbH: See—  
Peppmüller, Reinmar; Goossens, Bernhard; and Winck, Karl, 5,569,408, Cl. 508-462.000.  
Chen, Chao-hu, to Kalloy Industrial Co., Ltd. Seat adjusting device, 5,568,958, Cl. 297-215.150.  
Chen, Ching-Ti. Ting actuating device for clock mechanism, 5,570,327, Cl. 368-272.000.  
Chen, Chung-Chin: See—  
Lin, Mao-Chao; and Wang, Jia-Yin, 5,570,391, Cl. 375-265.000.  
Chen, Fu-Tai A.; Liu, Ming-Sun; and Evangelista, Ramon A., to Beckman Instruments, Inc. Fluorescent labelled carbohydrates and their analysis, 5,569,366, Cl. 204-452.000.  
Chen, Genhui: See—  
Webster, John M.; Li, Jianxiong; and Chen, Genhui, 5,569,668, Cl. 514-419.000.  
Chen, Harvey R.: See—  
Chen, Wu-Chi; and Chen, Harvey R., 5,569,799, Cl. 570-261.000.  
Chen, Ho S.; Jin, Sungho; and McCormack, Mark T., to Lucent Technologies Inc. Lead-free low melting solder with improved mechanical properties, 5,569,433, Cl. 420-557.000.  
Chen, Huang-Joung: See—  
Yeh, Tangshun; Hurst, Allan T.; Chen, Huang-Joung; Berg, Lonny L.; and Wilcraft, William F., 5,569,617, Cl. 437-48.000.  
Chen, Kuan-Chou; and Shyr, Duen-Jyh, to Industrial Technology Research Institute. Liftable roller conveyor, 5,568,857, Cl. 198-592.000.  
Chen, Long-Hsiung. Simplified safety syringe with retractable self-biased needle and minimized plunger, 5,569,203, Cl. 604-110.000.  
Chen, Mao-Sung: See—  
Wu, Jui-Kuang; Chen, Mao-Sung; and Wu, Meng-Tsang, 5,570,418, Cl. 379-164.000.  
Chen, Tseng-Cheng. Pulling exerciser, 5,569,135, Cl. 482-125.000.  
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Cheney, Paul S., II; Mastrototaro, John J.; Schnabel, Nannette M.; Lord, Peter C.; Van Antwerp, William P.; and Clark, Raymond D., to MiniMed Inc. Transcutaneous sensor insertion set, 5,568,806, Cl. 128-635.000.  
Chernoch, Joseph P.: See—  
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Chernyak, André I.: See—  
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Schneider, Heinrich; and Christmann, Albrecht, 5,569,760, Cl. 540-495.000.
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Willis, Tucker; and Cinquemani, James, Jr., 5,568,784, Cl. 116-173.000.
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Runas, Michael E., 5,570,320, Cl. 365-230.030.
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Baumgarten, Joachim; and Eggenhaus, Georg, 5,569,081, Cl. 460-112.000.
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Cheney, Paul S., II; Mastrototaro, John J.; Schnabel, Nannette M.; Lord, Peter C.; Van Antwerp, William P.; and Clark, Raymond D., 5,568,806, Cl. 128-635.000.
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Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C.; Clearfield, Howard M.; Doany, Fuad E.; Flagello, Donis G.; Hovel, Harold J.; Latulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushothaman, Sampath; Scherperleel, Christopher M.; Seeger, David E.; and Shaw, Jane M., 5,569,501, Cl. 427-577.000.
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Haselhorst, Ronald; and Lillegard, Tom, 5,569,222, Cl. 604-283.000.
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Menta, William J.; and Yager, Michael, 5,569,351, Cl. 156-353.000.
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Ferrante, Joseph M.; Van Hoeck, James E.; Coates, Bradley J.; and Whiteside, Leo A., 5,569,259, Cl. 606-87.000.
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Egraz, Jean-Bernard; Mongoin, Jacques; Ravet, Georges; and Suau, Jean-Marc, 5,569,702, Cl. 524-547.000.
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Buffaloe, George W., IV; Ogawa, Francis T.; and Brugger, James M., 5,570,026, Cl. 324-445.000.
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Fine, David H.; Fraim, Freeman W.; MacDonald, Stephen J.; Malaspina, Alex; Bayer, Forrest L.; and van Buren Myers, Dirck, 5,569,606, Cl. 436-43.000.
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Menzin, Marvin; Burt, Donald E.; and Cofek, Henry R., 5,568,780, Cl. 112-470.180.
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Frisina, Ferruccio; and Coffa, Salvatore, 5,569,612, Cl. 437-31.000.
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Depperman, Warren B., 5,568,893, Cl. 228-44.500.
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Atkins, Glen G.; Cohen, Michael S.; Mauritz, Karl H.; and Shaffer, James M., 5,570,032, Cl. 324-760.000.
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Lorentzen, John F.; Colburn, Todd B.; and Mortvedt, Ray, 5,568,921, Cl. 273-73.00A.
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Wigler, Michael; and Lisitsyn, Nikolai, 5,569,753, Cl. 536-24.300.
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Lord, Peter C.; and Coleman, Fredric C., 5,569,186, Cl. 604-67.000.
- Colgate-Palmolive Co.: See—  
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Struthers, Barry W.; and Collee, Pierre E., 5,568,838, Cl. 175-246.000.
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Proto, George R.; Colligan, Francis D.; and Bellmore, Harold, Jr., 5,569,302, Cl. 606-228.000.
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Madaffari, Peter L.; and Collins, James S., 5,570,428, Cl. 381-191.000.
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Paeglis, Arnis U.; Boysen, Robert L.; Lynn, Timothy R.; and Collins, Jeffrey D., 5,569,516, Cl. 428-58.000.
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Kirkpatrick, Allan T., 5,569,078, Cl. 454-292.000.
- Combustion Engineering, Inc.: See—  
Baversten, Bengt I., 5,570,402, Cl. 376-287.000.
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Barthe, Jean; and Bordy, Jean-Marc, 5,569,699, Cl. 524-496.000.
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Sowerby, Brian D., 5,569,844, Cl. 73-61.750.
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Dao, Giang H., 5,570,463, Cl. 395-143.000.
- Rossi, Marikku J., 5,570,389, Cl. 375-220.000.
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Almonte, Ralph, 5,570,123, Cl. 347-200.000.
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Kroll, Jeffrey R., 5,570,416, Cl. 379-114.000.

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Nielsen, Charles R.; Bates, Charles A.; Rooke, Matthew W.; Hansen, Fred R.; Petersen, Paul T.; Le, Me V.; and Lew, Eugene K., 5,570,241, Cl. 360-46.000.
- Wiselogle, Mark, 5,570,244, Cl. 360-60.000.
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Hinchee, Maud A.; and Connor-Ward, Dannette, 5,569,834, Cl. 800-205.000.
- Conroy, Harlan D. Receiver hitch spooled wire dispenser. 5,568,900, Cl. 242-557.000.
- Conservatoire National des Arts et Metiers and Electricite de France (Service National): See—  
Fauvarque, Jean-François, 5,569,559, Cl. 429-192.000.
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Frisina, Ferruccio; and Coffa, Salvatore, 5,569,612, Cl. 437-31.000.
- Constantz, Brent R.: See—  
Fulmer, Mark; Constantz, Brent R.; Ison, Ira C.; and Barr, Bryan M., 5,569,442, Cl. 423-311.000.
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Smith, Charles L., 5,569,152, Cl. 588-256.000.
- Cook, Charles D.: See—  
Fisher, Daniella J.; Osborn, Thomas W., III; Seymour, Mark D.; Kingry, Gary W.; Berg, Charles J., Jr.; Cook, Charles D.; Gilbert, Steven R.; and Toms, Douglas, 5,569,230, Cl. 604-385.100.
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- Coombs, Paul G.: See—  
Phillips, Roger W.; Fisher, Shari P.; and Coombs, Paul G., 5,569,535, Cl. 428-403.000.
- Cooney, Charles L.: See—  
Sasisekharan, Ramnath; Lohse, Daniel L.; Cooney, Charles L.; Linhardt, Robert J.; and Langer, Robert S., 5,569,600, Cl. 435-220.000.
- Cooper, Guy F., to United States of America, Navy. System for the removal and disposal of airborne contaminants from an outdoor paint booth. 5,569,073, Cl. 454-54.000.
- Cooper, Robert; Janazzi, Peter; Nichols, Lawrence R.; and Parker, Thomas, to David Textron, Inc. Closure for an air bag assembly. 5,569,959, Cl. 280-728.300.
- Corbalis, Charles M.: See—  
Klausmeier, Daniel E.; and Corbalis, Charles M., 5,570,360, Cl. 370-60.000.
- Corbin, David R.: See—  
Kourtakos, Konstantinos; Bergna, Horacio E.; Sonnichsen, George C.; Corbin, David R.; and Brake, Loren D., 5,569,785, Cl. 564-474.000.
- Cordis Corporation: See—  
Solar, Ronald J., 5,569,199, Cl. 604-96.000.
- Cordis Webster, Inc.: See—  
Webster, Wilton W., Jr., 5,569,220, Cl. 604-282.000.
- Cordoba, Michael V.: See—  
Hardee, Kim G.; and Cordoba, Michael V., 5,570,005, Cl. 323-314.000.
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Legendre, Dominique, 5,568,761, Cl. 92-46.000.
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Holton, Timothy A.; Cornish, Edwina C.; Kovacic, Filippa; Tanaka, Yoshikazu; and Lester, Diane R., 5,569,832, Cl. 800-205.000.
- Corrigan, Dennis A.: See—  
Ovshinsky, Stanford R.; Corrigan, Dennis A.; Benson, Peter; and Fierro, Cristian A., 5,569,563, Cl. 429-223.000.
- Cortijo, Jesus D.: See—  
Fernandez, Manuel F.; and Cortijo, Jesus D., 5,570,450, Cl. 385-135.000.
- CorTrak Medical Inc.: See—  
Racchini, Joel R., 5,569,198, Cl. 604-96.000.
- Cote, Mark P.: See—  
Napiorkowski, John J.; Kroll, Thomas W.; Brower, Boyd G.; Crane, Robert A.; Butler, Walter K., III; Cote, Mark P.; Beahm, James G.; and Mickelson, Nils P., 5,570,422, Cl. 379-399.000.
- Cottrell, Paul R.: See—  
Frey, Stanley J.; Cottrell, Paul R.; and Hamm, David A., 5,569,790, Cl. 568-699.000.
- Couderc, Guilhem: See—  
Le Comte, Roger; Couderc, Guilhem; and Champséix, Henri, 5,569,861, Cl. 73-864.220.
- Courtaulds Aerospace, Inc.: See—  
Knox, Gary; Dang, Nguyen T.; Frost, John S.; and Shofner, Stan, 5,568,988, Cl. 401-40.000.
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- Cowie, William D.: See—  
Mannava, Seetharamiah; and Cowie, William D., 5,569,018, Cl. 415-200.000.
- Cox, Christopher R.: See—  
Searle, Jeffrey G.; and Cox, Christopher R., 5,570,098, Cl. 342-374.000.
- Cox, Kenneth W., to CarboMedics, Inc. Fluidized bed with uniform heat distribution and multiple port nozzle. 5,569,329, Cl. 118-716.000.
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- Cramer, Bernhard M., to Schneider (Europe) A.G. Aspiration catheter arrangement. 5,569,204, Cl. 604-164.000.
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Napiorkowski, John J.; Kroll, Thomas W.; Brower, Boyd G.; Crane, Robert A.; Butler, Walter K., III; Cote, Mark P.; Beahm, James G.; and Mickelson, Nils P., 5,570,422, Cl. 379-399.000.
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Brutscher, David T.; and Leet, Leroy R., Sr., 5,569,001, Cl. 408-115.00R.
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Carlson, Douglas A.; and Cregger, Todd D., 5,568,748, Cl. 74-336.00R.
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- Creighton, Oliver: See—  
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 Duffy, John A.: See—  
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 Evans, Anthony C.; Tsukada, Takeshi; Soury, Shukri J.; and Dupon, Ryan W., 5,569,495, Cl. 427-446.000.  
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 Breen, Bernard P.; Bionda, John P., Jr.; Gabrielson, James E.; and Hallo, Anthony, 5,568,777, Cl. 110-261.000.  
 Durham, Donald R.: See—  
 Miller, James G.; Wax, Michael J.; Wormsbecher, Richard F.; Aller, Leo B.; Durham, Donald R.; and Churny, Alan B., 5,569,634, Cl. 502-64.000.  
 Durham, Timothy J.: See—  
 Nicastro, Neil D.; and Durham, Timothy J., 5,569,084, Cl. 463-20.000.  
 Durr Industries, Inc.: See—  
 Crompton, David W.; Still, Gregory M.; and Gore, Anthony R., 5,568,692, Cl. 34-270.000.  
 Durst, Johann: See—  
 Schild, Robin; Kozak, Milan; and Durst, Johann, 5,569,330, Cl. 134-1.000.  
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 Brzezinski, Philip S.; and Dvorachek, Thomas J., 5,570,297, Cl. 364-514.000.  
 Dyer, Paul N.: See—  
 Worthington, Michael S.; and Dyer, Paul N., 5,569,633, Cl. 502-4.000.  
 Dyna Logic Corporation: See—  
 Vora, Madhukar B.; and West, Burnell G., 5,570,059, Cl. 327-415.000.  
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 Dystar Japan Ltd.: See—  
 Hihara, Toshio; and Himeno, Kiyoshi, 5,569,309, Cl. 8-639.000.  
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 Bellio, Stephen; and Eidelman, Gerald P., 5,569,104, Cl. 474-70.000.  
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 E-Systems, Inc.: See—  
 Franke, Ernest A., 5,570,069, Cl. 333-115.000.  
 Eagan, Chris S. Hand-held lighted micro-inspection mirror. 5,568,965, Cl. 362-135.000.  
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 Eastman Kodak Company: See—  
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 Furlani, Edward P., 5,570,329, Cl. 369-13.000.  
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 Ebel, Steven J.: See—  
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 Eby, William H., to Stine Seed Farm Inc. Soybean cultivar 003394768. 5,569,814, Cl. 800-200.000.  
 Eby, William H., to Stine Seed Farm Inc. Soybean cultivar 1572432. 5,569,815, Cl. 800-200.000.  
 Eda, Susumu: See—  
 Norizuki, Reiko; Hyodo, Ryuji; Tanaka, Kenji; Sekihata, Osamu; Hatta, Hiroyuki; Eda, Susumu; and Oomuro, Katsumi, 5,570,361, Cl. 370-60.100.  
 Eddy, Zonell. Skylight shade. 5,568,832, Cl. 160-374.000.  
 Edge Scientific Instrument Company LLC: See—  
 Greenberg, Gary, 5,570,228, Cl. 359-389.000.  
 Edwards, Stuart D., to Vidacare, Inc. Thin layer ablation apparatus. 5,569,241, Cl. 606-41.000.  
 Edwards, Stuart D.: See—  
 Lax, Ronald G.; Fanton, Gary S.; and Edwards, Stuart D., 5,569,242, Cl. 606-42.000.  
 Edwards, William E., to SGS-Thomson Microelectronics, Inc. Circuit for limiting the current in a power transistor. 5,570,060, Cl. 327-541.000.  
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 Egan, Philip D.; and Specht, Paul, to Tensar Corporation. The. Retaining wall block system. 5,568,999, Cl. 405-262.000.  
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 Baumgarten, Joachim; and Eggenhaus, Georg, 5,569,081, Cl. 460-112.000.  
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 Ehnholm, Gösta J.; Pekonen, Seppo T.; and Virtanen, Juha P., to Picker Nordstar Inc. Power supply for MRI magnets. 5,570,022, Cl. 324-319.000.  
 Eichelberger, Mitchell P.: See—  
 Wang, James E.; Rosendale, David; Kurkov, Victor P.; Theard, Leslie P.; Ching, Ta Y.; Compton, Lewis R.; Palmgren, Tor H. G.; and Eichelberger, Mitchell P., 5,569,712, Cl. 525-123.000.  
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 Braun, Max; Rudolph, Werner; and Eichholz, Kerstin, 5,569,782, Cl. 562-863.000.  
 Eicken, Karl: See—  
 Wagner, Oliver; Eicken, Karl; Ammermann, Eberhard; and Lorenz, Gisela, 5,569,765, Cl. 546-304.000.  
 Eidelman, Gerald P.: See—  
 Bellio, Stephen; and Eidelman, Gerald P., 5,569,104, Cl. 474-70.000.  
 Einaudi, Luis E.; and Dominguez, Carlos. Fuel combustion enhancer. 5,568,800, Cl. 123-546.000.  
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 Splittstoesser, Clair D.; Crockett, Brian C.; and Eisenbart, Ronald J., 5,569,106, Cl. 474-125.000.  
 Eisenberg, John A., to Spectrian, Inc. RF power amplifier with signal predistortion for improved linearity. 5,570,063, Cl. 330-149.000.  
 Eiser, Armin: See—  
 Bendel, Klaus; Uhlmer, Jürgen; and Eiser, Armin, 5,569,025, Cl. 417-434.000.  
 Ektelon: See—  
 Lorentzen, John F.; Colburn, Todd B.; and Mortvedt, Ray, 5,568,921, Cl. 273-73.00A.  
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 ELCOR Corporation: See—  
 Campbell, Roy E.; Wilkinson, John D.; and Hudson, Hank M., 5,568,737, Cl. 62-621.000.  
 Electra Form, Inc.: See—  
 Bright, Stephen A., 5,569,473, Cl. 425-523.000.  
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 Goldstein, Jonathan R.; Gektin, Inna; Givon, Menachem; and Yarchi, Yachin, 5,569,555, Cl. 429-49.000.  
 Electricite de France - Service National: See—  
 Leclerc, Olivier, 5,569,729, Cl. 526-256.000.  
 Electro Scientific Industries, Inc.: See—  
 Sun, Yunlong; and Swenson, Ed, 5,569,398, Cl. 219-121.680.  
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 Hansen, Craig N., 5,569,170, Cl. 601-150.000.  
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 Chu, Hye-Yong; and Park, Pyong-Woon, 5,569,933, Cl. 257-17.000.  
 Oh, Moon K.; Han, Mi S.; Kim, Seung H.; and Kim, Young S., 5,570,125, Cl. 348-6.000.  
 Electrostatics, Inc.: See—  
 Testone, Anthony Q., 5,570,266, Cl. 361-229.000.  
 Electrovert Ltd.: See—  
 Gileta, John H., 5,568,894, Cl. 228-219.000.  
 Elf Aquitaine: See—  
 Lambotte, Benoit; Spinner, Bernard; Timoney, Charles; and Prodocimi, Jacques, 5,569,534, Cl. 428-402.000.  
 Elf Atochem North America, Inc.: See—  
 Distaso, John, 5,569,410, Cl. 510-202.000.  
 Elger, Walter: See—  
 Beier, Sybille; Elger, Walter; Nishino, Yukishige; and Wiechert, Rudolf, 5,569,652, Cl. 514-173.000.  
 Eli Lilly and Company: See—  
 Basinski, Margaret B.; DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Schoner, Brigitte E.; Shields, James E.; and Smiley, David L., 5,569,744, Cl. 530-324.000.  
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 Hoard, David W.; and Luke, Wayne D., 5,569,772, Cl. 549-52.000.  
 Sawyer, J. Scott, 5,569,764, Cl. 546-268.400.  
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 Elliott, Byron D., to Board of Regents, The University Of Texas System. Obstetric bonnet for assisting childbirth. 5,569,265, Cl. 606-123.000.  
 Elliott, M. Scott: See—  
 Marik, Gregory C.; Lackey, Jennifer J.; and Elliott, M. Scott, 5,569,261, Cl. 606-88.000.  
 Ellis, William J.: See—  
 Smith, Gerald F.; and Ellis, William J., 5,569,373, Cl. 210-90.000.  
 Elmore, J. Charles: See—  
 Ebling, Wendell V.; Elmore, J. Charles; and Swindle, Carl A., 5,569,161, Cl. 600-121.000.  
 Ema, Taiji; Itabashi, Kazuo; and Mizutani, Kazuhiro, to Fujitsu Limited. SRAM semiconductor device. 5,570,311, Cl. 365-154.000.  
 Emenaker, Ralph R.; and Amos, Charles W., Jr., to Procter & Gamble Company. The. Trisection sanitary napkin. 5,569,231, Cl. 604-385.100.  
 Emhart Glass Machinery Investments Inc.: See—  
 Meyer, Willi, 5,569,313, Cl. 65-359.000.  
 Emhart Inc.: See—  
 Hahn, Ernst-Ludwig; and Schütz, Harald, 5,568,906, Cl. 248-74.100.  
 Millington, Maurice E., 5,569,005, Cl. 411-34.000.  
 Emoto, Susumu: See—  
 Hashimoto, Milton, 5,569,377, Cl. 210-238.000.  
 Endo, Kenji; Suzuki, Hidekazu; Oguma, Tsuru; and Goto, Masayoshi, to Wakamoto Pharmaceutical Co., Ltd. Stable aqueous dispersions containing liposomes. 5,569,464, Cl. 424-450.000.  
 Endo, Masayuki: See—  
 Yano, Kousaku; Murakami, Tomoyasu; Endo, Masayuki; and Nomura, Noboru, 5,569,628, Cl. 437-245.000.  
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 Yamanashi, Makoto; Jinno, Keishi; Watanabe, Tamio; Endo, Takayoshi; and Yagi, Sakai, 5,569,055, Cl. 439-752.000.  
 Endo, Yasuhiro: See—  
 Yokono, Hiroshi; Yokono, Haruki; Mikano, Masahiro; Narushima, Ryouichi; Iida, Takuya; and Endo, Yasuhiro, 5,569,545, Cl. 428-626.000.  
 Endress & Hauser Flowtec AG: See—  
 Gatzmanga, Heinz; and Breier, Andreas, 5,569,859, Cl. 73-861.220.  
 Energy Mines & Resources-Canada: See—  
 Mikhail, Shaheer; and Turcotte, Anne-Marie, 5,569,314, Cl. 75-434.000.  
 Energy Systems Associates: See—  
 Breen, Bernard P.; Bionda, John P., Jr.; Gabrielson, James E.; and Hallo, Anthony, 5,568,777, Cl. 110-261.000.  
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 Enichen, William A.: See—  
 Chan, Ken Tze-Kin; Enichen, William A.; Hartley, John G.; and Sturans, Maris A., 5,570,405, Cl. 378-35.000.  
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 Enviro-Pac Inc., dba FiberCell Corporation: See—  
 Ervay, Loren D.; Lewandowski, Brownslaw L.; and Vincent, Warren G., 5,569,519, Cl. 428-156.000.  
 Enviro Products Ltd.: See—  
 Le Blanc, Frank X., 5,569,426, Cl. 264-122.000.  
 EP Technologies, Inc.: See—  
 Houser, Russell A.; Jackson, Jerome; and Thompson, Russell B., 5,569,221, Cl. 604-282.000.  
 Epp, Erwin: See—  
 Mauch, Ernst; Weldke, Helmut; Bantle, Johannes-August; and Epp, Erwin, 5,568,696, Cl. 42-49.020.  
 Eppley, Barry L.: See—  
 Sarver, David R.; Eppley, Barry L.; D'Alessio, Keith R.; Pietrzak, William S.; and Sander, Thomas W., 5,569,250, Cl. 606-69.000.  
 Epsilon Chemicals Ltd.: See—  
 O'Carroll, Lynda C.; O'Carroll, Colin D.; Jones, Alan; Matlock, Marilyn T.; and McLeod, Roderick D., 5,569,385, Cl. 210-727.000.  
 Equidyne Systems, Inc.: See—  
 Parsons, James S., 5,569,189, Cl. 604-68.000.  
 Erdal, Apo C.; Nguyen, Trung; and Yue, Kwok M., to LSI Logic Corporation. Hierarchical clock distribution system and method. 5,570,045, Cl. 326-93.000.  
 Ergo Mechanical Systems, Incorporated: See—  
 Castelman, Neal J., 5,570,002, Cl. 323-283.000.  
 Erhard-Hollmann, Joachim, to Alpha Industrie Design GmbH. Method and device to produce corrugated strip packaging parts. 5,569,147, Cl. 493-423.000.  
 Erickson, Bruce L.; and Stull, Alan H. Variable resistance device. 5,570,076, Cl. 338-163.000.  
 Erickson, Lars; and Thomsen, Peter. Device for permanent connection between an abdominal wall and an abdominal cavity. 5,569,194, Cl. 604-93.000.  
 Ericsson GE Mobile Communications Inc.: See—  
 Bruner, David A., 5,569,889, Cl. 200-5.00A.  
 Dent, Paul W., 5,570,062, Cl. 330-51.000.  
 Ericsson Inc.: See—  
 Ahlberg, Björn G. D.; Falk, Johan; and Mölne, Anders, 5,570,413, Cl. 379-59.000.  
 Erikson, Carl E.: See—  
 Penney, Carl M.; Chernoch, Joseph P.; and Erikson, Carl E., 5,569,399, Cl. 219-121.690.  
 Eriksson, Larry J.: See—  
 Goodman, Seth D.; Eriksson, Larry J.; Melton, Douglas E.; and Braun, Edward R., 5,570,425, Cl. 381-71.000.  
 Ernie Ball, Inc.: See—  
 Gimpel, Dudley D., 5,569,872, Cl. 84-728.000.  
 Ernst, Lauren A.: See—  
 Waggoner, Alan S.; Ernst, Lauren A.; and Mujumdar, Ratnakar B., 5,569,766, Cl. 548-150.000.  
 Ertl, David S.: See—  
 Chapko, Louis B.; Westerhof, Donald E.; and Ertl, David S., 5,569,818, Cl. 800-200.000.  
 Ervasti, Kimmo A., to LK-Products Oy. Supporting of a helix resonator. 5,570,071, Cl. 333-219.000.



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- Blöbaum, Frank, 5,569,900, Cl. 235-463.000.
- ESCO LTD: See—
- Hinaga, Yasushi, 5,569,837, Cl. 73-19.010.
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- Meisser, Claudio; and Honegger, Rolf, 5,569,402, Cl. 219-400.000.
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- Esplin, Ernest I.: See—
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- ESSEF Corporation: See—
- LeBreton, Edward T., 5,568,878, Cl. 220-465.000.
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- Day, Robert C. L., 5,569,354, Cl. 156-584.000.
- Esser, Herbert: See—
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- Brawner, Jon M.; Carides, James J.; Rich, Benny R.; and Estep, William F., Jr., 5,569,512, Cl. 428-29.000.
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- Ethicon Endo-Surgery, Inc.: See—
- Privitera, Salvatore; and Schwemmer, Richard F., 5,569,291, Cl. 606-185.000.
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- Mormann, Werner; and Irie, Christoph, 5,569,727, Cl. 525-528.000.
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- Chen, Fu-Tai A.; Liu, Ming-Sun; and Evangelista, Ramon A., 5,569,366, Cl. 204-452.000.
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- Foxborn Company, The: See—
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Fontana, Flavio; and Franco, Pierluigi, 5,570,438, Cl. 385-24.000.
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Francœur, Normand, Sr.; Francœur, Normand, Jr.; and Francœur, Marc-André, 5,569,521, Cl. 428-171.000.
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Dachniwskyj, Roman J.; Dean, David E.; Ebben, Thomas G.; Frederick, Perry S.; Jenders, Donald J.; Radziun, Michael J.; and Sue, Peter L., 5,570,021, Cl. 324-318.000.
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Forte, Paulino; and Frey, Stanley J., 5,569,788, Cl. 568-697.000.
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Harada, Akinori, 5,570,225, Cl. 359-326.000.
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Ohata, Yoshiyuki; Suematsu, Hideki; and Ikemoto, Manabu, 5,569,347, Cl. 156-235.000.
- Fujii, Kazuhito; and Ono, Takeo, to Canon Kabushiki Kaisha. Optical device with an asymmetric dual quantum well structure. 5,569,934, Cl. 257-21.000.
- Fujii, Naoko, legal representative & heir, Ayako Fujii, Natsuko Fujii, Eiko Fujii, heirs: See—  
Kishimoto, Atsunori; Fujii, Takashi, deceased; Ohshita, Kazutaka; Yamamoto, Kazumi; Fujii, Yasuhiko; and Toda, Tetsuro, 5,569,695, Cl. 524-435.000.
- Fujii, Takashi, deceased (by Naoko Fujii, legal representative & heir, Ayako Fujii, Natsuko Fujii, Eiko Fujii, heirs): See—  
Kishimoto, Atsunori; Fujii, Takashi, deceased; Ohshita, Kazutaka; Yamamoto, Kazumi; Fujii, Yasuhiko; and Toda, Tetsuro, 5,569,695, Cl. 524-435.000.
- Fujii, Yasuhiko: See—  
Kishimoto, Atsunori; Fujii, Takashi, deceased; Ohshita, Kazutaka; Yamamoto, Kazumi; Fujii, Yasuhiko; and Toda, Tetsuro, 5,569,695, Cl. 524-435.000.
- Fujii, Yasuo, to Fujitsu Limited. Synchronous digital hierarchy transmission device and method for exchanging synchronous digital hierarchy transmission device units. 5,570,344, Cl. 370-16.000.
- Fujino, Naohiko: See—  
Ohmori, Masashi; Tanaka, Hiroshi; Nishimoto, Akira; Sasai, Hiroshi; Fujino, Naohiko; and Kotoh, Satoru, 5,568,821, Cl. 134-61.000.
- Fujio, Masayuki: See—  
Ishida, Fumiaki; Fujio, Masayuki; Kobayashi, Kazuo; and Hasegawa, Kengo, 5,569,023, Cl. 417-326.000.
- Fujirebio Inc.: See—  
Hiraoka, Toshikage; Tanimoto, Tetsuji; Makino, Yoshihiko; Ninomiya, Tadashi; Hora, Naofumi; Ashihara, Yoshihiro; Sudo, Yukio; and Mori, Toshihiro, 5,569,589, Cl. 435-7.900.
- Fujisawa Pharmaceutical Co., Ltd.: See—  
Ohki, Hidenori; Tomishima, Masaki; Yamada, Akira; and Takasugi, Hisashi, 5,569,646, Cl. 514-11.000.
- Fujita, Kei: See—  
Kataoka, Yuzo; Asaba, Tetsuo; Makino, Kenji; Yuzurihara, Hiroshi; Fujita, Kei; Kamei, Seiji; Akino, Yutaka; Yuge, Yutaka; Shimotsusa, Mineo; and Kuwabara, Hideshi, 5,569,614, Cl. 437-39.000.
- Fujita, Masayuki, to NEC Corporation. Light amplification device. 5,570,221, Cl. 359-161.000.
- Fujita, Naoko: See—  
Takekawa, Takahiko; Fujita, Naoko; Yokoyama, Toshiharu; and Maki, Takao, 5,569,803, Cl. 585-269.000.
- Fujita, Tadasu: See—  
Ikuta, Yuzo; Tashiro, Satoshi; Hatano, Yoshiyuki; Fujita, Tadasu; Andoh, Noboru; Asaka, Sachio; Kobayashi, Haruo; and Minami, Takeshi, 5,569,594, Cl. 435-134.000.
- Fujitsu Limited: See—  
Ema, Taiji; Itabashi, Kazuo; and Mizutani, Kazuhiro, 5,570,311, Cl. 365-154.000.
- Fujii, Yasuo, 5,570,344, Cl. 370-16.000.
- Hanaoka, Kazutaka; Yoshida, Hidefumi; Nakamura, Kimiaki; Tsuda, Hideaki; and Chida, Hideo, 5,570,211, Cl. 359-53.000.
- Ito, Akihiko; and Gotoh, Yukio, 5,570,277, Cl. 363-19.000.
- Kaku, Takashi; and Hira, Kyoko, 5,570,390, Cl. 375-222.000.
- Kato, Masayuki; Aritake, Hirokazu; Ishimoto, Manabu; Sato, Noriko; and Nakashima, Masato, 5,570,208, Cl. 359-23.000.
- Kikkawa, Toshihide; and Ohori, Tatsuya, 5,569,953, Cl. 257-607.000.

- Korikawa, Masayuki; Shinohara, Toru; Iwatsubo, Masahito; Yokoyama, Saori; Ohmori, Hideki; Watanabe, Takasi; and Ohsugi, Tsuneo, 5,570,269, Cl. 361-685.000.
- Mattison, Rodney A., 5,570,243, Cl. 360-51.000.
- Nabeyama, Yoshio; and Araki, Hirofumi, 5,570,227, Cl. 359-341.000.
- Nishimura, Takashi, 5,570,362, Cl. 370-60.100.
- Norizuki, Reiko; Hyodo, Ryuji; Tanaka, Kenji; Sekihata, Osamu; Hata, Hiroyuki; Eda, Susumu; and Oomuro, Katsumi, 5,570,361, Cl. 370-60.100.
- Ohkawa, Masanori; and Yamazaki, Kozo, 5,569,905, Cl. 250-205.000.
- Sugawara, Hideo, 5,570,064, Cl. 330-282.000.
- Tsurumaki, Shinzo, 5,570,394, Cl. 375-340.000.
- Yoneda, Yoshiyuki; Tsuji, Kazuto; Kasai, Junichi; and Sakoda, Hideharu, 5,569,625, Cl. 437-217.000.
- Yoshida, Hidefumi; Hanaoka, Kazutaka; Nakamura, Kimiaki; Tsuda, Hideaki; and Yamada, Fumiaki, 5,570,210, Cl. 359-51.000.
- Fujiwa, Takaaki; and Isobe, Tomohisa, to Daicel Chemical Industries, Ltd. Process for producing a composition comprising epoxy compounds having hydroxyl group. 5,569,773, Cl. 549-525.000.
- Fujiwara, Tetsuo: See—  
Kochiyama, Jiro; Kaya, Nobuyuki; Fujiwara, Tetsuo; Yasui, Hidemi; and Yashiro, Hiroyuki, 5,570,102, Cl. 343-880.000.
- Fukamachi, Masanobu, to Kabushiki Kaisha Daikin Seisakusho. Viscous fluid torsional vibration dampening device having an elastic slider configured to provide friction dampening. 5,569,086, Cl. 464-24.000.
- Fukatsu, Yoshiaki; Nakahara, Shinji; Yamada, Youichi; Yamamoto, Hideji; Hida, Tatsuya; and Wada, Mizuho, to Sakai Chemical Industry Co., Ltd. Fine acicular  $\alpha$ -ferrite oxide and production thereof. 5,569,445, Cl. 423-633.000.
- Fukaya, Takayuki: See—  
Kawata, Tsunehiro; Kojima, Katsuhiko; Kazama, Youichiro; Fukaya, Takayuki; and Tsujimura, Toshihiko, 5,569,334, Cl. 148-287.000.
- Fukuchi, Masakazu; Haneda, Satoshi; and Morita, Shizuo, to Konica Corporation. Color image forming apparatus in which pre-transfer image exposure is performed on full color toner image on photoreceptor after fourth color toner image of Y,M,C, and BK color toner images is formed but before transferring full color toner image. 5,570,194, Cl. 358-300.000.
- Fukuda, Koichi: See—  
Sasaki, Makoto; Fukui, Hirofumi; Aihara, Masami; Fukuda, Koichi; Kasama, Yasuhiko; and Ohmi, Tadashi, 5,570,031, Cl. 324-750.000.
- Fukuhara, Noboru: See—  
Hata, Masahiko; Fukuhara, Noboru; Takata, Hiroaki; and Inui, Katsumi, 5,569,954, Cl. 257-627.000.
- Fukui, Eiji: See—  
Teramachi, Masayoshi; Kinoshita, Kinichi; Takakura, Yoshio; Fukui, Eiji; and Kamiyanagita, Tadashi, 5,569,605, Cl. 435-290.200.
- Fukui, Hirofumi: See—  
Sasaki, Makoto; Fukui, Hirofumi; Aihara, Masami; Fukuda, Koichi; Kasama, Yasuhiko; and Ohmi, Tadashi, 5,570,031, Cl. 324-750.000.
- Fukui, Isao; Takahashi, Masamitsu; Ihara, Kazumori, deceased (by Seiko Ihara, executor); Murakami, Hiroshi; Tanaka, Tetsuhiko; Miyaura, Shinobu; Kuroda, Shinichi; Hiraishi, Masahiro; and Inoue, Koji, to Shimadzu Corporation; and Mazda Motor Corporation. Exhaust gas catalytic purifier construction. 5,569,455, Cl. 422-174.000.
- Fukui, Yutaka: See—  
Siga, Masao; Fukui, Yutaka; Kuriyama, Mitsuo; Maeno, Yoshimi; Suwa, Masateru; Kaneko, Ryoichi; Onoda, Takeshi; Kajiura, Hidefumi; Watanabe, Yasuo; Takahashi, Shintaro; and Tan, Toshimi, 5,569,338, Cl. 148-335.000.
- Fukushima, Hiroshi, to NSK Ltd. Toroidal type continuously variable transmission. 5,569,112, Cl. 476-40.000.
- Fukushima, Masafumi: See—  
Yamamura, Michio; Iwanami, Kunio; Taguchi, Tatsuhisa; and Fukushima, Masafumi, 5,569,028, Cl. 418-55.300.
- Fukushima, Masaharu; and Nagai, Yuichi, to Bridgestone Corporation. Pneumatic radial tire with side cut resistance. 5,569,341, Cl. 152-527.000.
- Fukushima, Nobuo, to Canon Kabushiki Kaisha. Data erasing device erasing designated data. 5,570,245, Cl. 360-66.000.
- Fukushima, Tsunoru; Onishi, Hiroshi; and Yamashita, Haruo, to Matsushita Electric Industrial Co., Ltd. Method for interpolating missing pixels and an apparatus employing the method. 5,570,436, Cl. 382-300.000.
- Fukuta, Atsushi: See—  
Kitaichi, Satoshi; Nakamura, Chiaki; Tanaka, Michio; and Fukuta, Atsushi, 5,569,474, Cl. 425-547.000.
- Fukuzawa, Yasushi, to Research Development Corporation of Japan. Electric discharge machining method for insulating material using electroconductive layer formed thereon. 5,569,394, Cl. 219-69.170.
- Fuller, Clyde R.: See—  
Delaney, Joseph B.; Henderson, Timothy S.; Fuller, Clyde R.; and Mercer, Betty S., 5,569,944, Cl. 257-198.000.
- Fulmer, Mark; Constantz, Brent R.; Ison, Ira C.; and Barr, Bryan M., to Norian Corporation. Reactive tricalcium phosphate compositions and uses. 5,569,442, Cl. 423-311.000.
- Funk, Kelly. Method of inserting tubing into live wells. 5,568,837, Cl. 166-383.000.
- Furlani, Edward P., to Eastman Kodak Company. System for selectively inverting a magnetic bias field for magneto-optic recording. 5,570,329, Cl. 369-13.000.
- Furukawa Electric Co., Ltd., The: See—  
Jin, Dongzhi; Numanani, Masae; Abe, Fumihiko; and Miyazawa, Kazuhiro, 5,570,010, Cl. 324-67.000.
- Furukawa, Tatsuya: See—  
Nakazawa, Masaaki; Ito, Hideo; Nakamoto, Koji; Kura, Yasuhito; Kitano, Seiji; Yabe, Hisao; and Furukawa, Tatsuya, 5,569,157, Cl. 600-107.000.
- Furukawa, Yukio: See—  
Yokoyama, Kazuaki; Suzuki, Norio; Inoue, Kenichi; and Furukawa, Yukio, 5,569,919, Cl. 250-309.000.
- Furusawa, Satoshi: See—  
Oishi, Tetsuya; Suzuki, Jin; Ohkawa, Kouhei; Furusawa, Satoshi; Ono, Hiroshi; and Sugazaki, Kazuo, 5,569,726, Cl. 525-472.000.
- Furuta, Mitsuhiro: See—  
Kuroyama, Yutaka; and Furuta, Mitsuhiro, 5,569,862, Cl. 75-238.000.
- Fusco, Jose M.; Ramos, Jose Geraldo P.; Vieira, Valmor N.; and Guerra, Eduardo Cardoso de Melo, to Petroleo Brasileiro S.A. - Petrobras. System to separate suspensions of catalyst particles and reacted mixture of hydrocarbons. 5,569,435, Cl. 422-147.000.
- Fuse, Takeshi, to Fuji Xerox Co., Ltd. Controller for a recording apparatus. 5,570,464, Cl. 395-105.000.
- G.D. Società per Azioni: See—  
Ghini, Marco; Di Stefano, Giuseppe; and Neri, Armando, 5,569,931, Cl. 250-559.450.
- Neri, Armando; Santin, Giancarlo; and Squarzone, Giovanni, 5,568,818, Cl. 131-84.400.
- Gabbart, Tom: See—  
Johnson, J. Edward; and Gabbart, Tom, 5,568,875, Cl. 211-113.000.
- Gabriele, Valentino, to J.C. Pardo & Sons. Idle bearing mount for mounting of inclined agitators. 5,568,976, Cl. 366-312.000.
- Gabrielson, James E.: See—  
Breen, Bernard P.; Bionda, John P., Jr.; Gabrielson, James E.; and Hallo, Anthony, 5,568,777, Cl. 110-261.000.
- Gadducci, Paolo; Moloney, David; and Betti, Giorgio, to SGS-Thomson Microelectronics, S.r.l. Survival sequence register for variable threshold qualification for recording channels. 5,570,380, Cl. 371-57.100.
- Gagne, Robert J.; Plein, William J., II; and Carson, Kenneth, to Stanley Works, The. Mirror door and method of making same. 5,568,713, Cl. 52-785.100.
- Galen, Larry A. Lid Lifter. 5,568,750, Cl. 81-3.490.
- Gallagher, Brian W.: See—  
Quinn, Duncan R.; Gallagher, Brian W.; Bionas, Costas; and Nicolosi, Joseph A., 5,569,925, Cl. 250-370.060.
- Galland, Jean-Michel: See—  
Bergougnan, Michel; Galland, Jean-Michel; and Perdreux, Sylvain, 5,569,793, Cl. 570-167.000.
- Gallant, Stuart L.; Caron, Paul R.; and Palmer, Walter E., to Protocol Systems, Inc. Ambulatory patient monitoring system. 5,568,814, Cl. 128-672.000.
- Gallo, Robert C.: See—  
Lunardi-Iskandar, Yanto; and Gallo, Robert C., 5,569,602, Cl. 435-240.100.
- Galloway, Brett D.: See—  
Ritter, Michael W.; Bettendorff, John; Flammer, George H., III; and Galloway, Brett D., 5,570,084, Cl. 340-825.050.
- Galvagni, John; and Randall, Sara P. E., to AVX Corporation. Surface mountable electronic component and method of making same. 5,569,880, Cl. 174-52.400.
- Gambale, Charles E., to Logan Instruments, Inc. Laminectomy rongeurs. 5,569,258, Cl. 606-83.000.
- Gammethaler, Robert S.: See—  
Aker, John L.; Gammethaler, Robert S.; and Mead, Alan B., 5,570,093, Cl. 342-104.000.
- Garay, Antonio A.: See—  
Bailey, William R.; Garay, Antonio A.; and Rosborough, Keith A., 5,569,039, Cl. 439-76.100.
- Gardner, William A. Method and apparatus for intracranial noise suppression. 5,570,426, Cl. 381-71.000.
- Garnier, Dominique: See—  
Ajoy, Hubert, deceased; Ajoy, Laure, legal representative; Ajoy, by Alexandra, legal representative; Ajoy, by Vincent, legal representative; Russmann, Colette; Brandely, Jose; Garnier, Dominique; and Gonzalez, Pierre, 5,569,839, Cl. 73-38.000.
- Garrett, Scott M.; and Vasthi, Dipti V., to Motorola, Inc. Battery pack having under-voltage and over-voltage protection. 5,569,550, Cl. 429-7.000.
- Garrigus, Darryl F., to Boeing Company, The. Ceramic fabric reinforced fiber/microparticle ceramic composite. 5,569,343, Cl. 156-89.000.
- Garrison, Mark S.; Duffy, John A.; and Teal, Janice J., to Avon Products, Inc. Gentle anti-acne composition. 5,569,651, Cl. 514-159.000.
- Garst, Roger H.: See—  
Barnhorst, Jeff A.; Garst, Roger H.; Gordon, Ronald H.; and Zehler, Eugene R., 5,569,406, Cl. 508-431.000.
- Gasser, Oswald: See—  
Guggenberger, Rainer; Wanek, Erich; and Gasser, Oswald, 5,569,691, Cl. 524-261.000.
- Gasworth, Steven M.: See—  
DeVre, Michael W.; and Gasworth, Steven M., 5,569,487, Cl. 427-81.000.
- Gates, Louis E., Jr.; and Port, Richard M., to Hughes Aircraft Company. Orthogonal grid circuit interconnect method. 5,568,682, Cl. 29-831.000.
- Gates, William Henry: See—  
Stannan, Patrick J. G., 5,568,901, Cl. 244-63.000.
- Gatzmanga, Heinz; and Breier, Andreas, to Endress & Hauser Flowtec AG. Vortex flow sensor with a drag body. 5,569,859, Cl. 73-861.220.
- Gavezoni, Piero: See—



- Abusleme, Julio A.; and Gavezotti, Piero, 5,569,728, Cl. 526-231.000.  
Gavrilov, Nikolai V.; and Nikulin, Sergey P. Ion emitter based on cold cathode discharge. 5,569,976, Cl. 313-359.100.  
GC Corporation: See—  
Moy, Peter K.; and Watanabe, Kiyoshi, 5,569,037, Cl. 433-173.000.  
Gear Chain Industrial B.V.: See—  
Cadée, Theodorus P.; and Van Rooij, Jacobus H., 5,569,108, Cl. 475-1.000.  
GEC Alsthom Stein Industrie: See—  
Suranti, Sylvestre; Morin, Jean-Xavier; and Maillot, Frédéric, 5,568,776, Cl. 110-245.000.  
GEC Alsthom T & D SA: See—  
Thurles, Edmond, 5,569,840, Cl. 73-40.000.  
Gehring, Manfred: See—  
Gerhing, Manfred; and Schollmeyer, Hermann, 5,568,706, Cl. 52-198.000.  
Geibach, Rolf V.; and Tipton, Craig D., to Lubrizol Corporation, The. Additive combinations for lubricants and functional fluids. 5,569,644, Cl. 508-438.000.  
Geil, Frederick G., to Northrop Grumman Corporation. Underwater sound localization system. 5,570,324, Cl. 367-124.000.  
Gektin, Inna: See—  
Goldstein, Jonathan R.; Gektin, Inna; Givon, Menachem; and Yarchi, Yachin, 5,569,555, Cl. 429-49.000.  
Gelardi, John A.: See—  
Gelardi, Paul J.; Gelardi, John A.; and Capotosto, David A., 5,568,898, Cl. 242-344.000.  
Gelardi, Paul J.; Gelardi, John A.; and Capotosto, David A., to LCV Associates. Wrap around label. 5,568,898, Cl. 242-344.000.  
Gemplus Card International: See—  
Gloton, Jean-Pierre; Laroche, Damien; Turin, Joël; and Fallah, Michel, 5,569,879, Cl. 174-52.200.  
Genda, Kyoji: See—  
Saito, Takahiko; Nakanishi, Akira; Obayashi, Shunzi; Genda, Kyoji; and Toshikage, Hideki, 5,570,147, Cl. 396-429.000.  
General Electric Company: See—  
Dachniwskyj, Roman L.; Dean, David E.; Ebben, Thomas G.; Frederick, Perry S.; Jenders, Donald J.; Radziun, Michael J.; and Sue, Peter L., 5,570,021, Cl. 324-318.000.  
DeVre, Michael W.; and Gasworth, Steven M., 5,569,487, Cl. 427-81.000.  
Deitrich, Thomas L.; and Saunders, Rowland F., 5,568,813, Cl. 128-661.010.  
Dynys, Frederick W.; and Parham, Thomas G., 5,569,970, Cl. 313-112.000.  
Ferrigno, Stephen J.; and Fairbourn, David C., 5,569,546, Cl. 428-668.000.  
Gluntz, Douglas M., 5,570,401, Cl. 376-283.000.  
Gui, John Y., 5,569,809, Cl. 588-204.000.  
Hamers, Timothy F.; Murphy, Lawrence E.; and Vohnoutka, Wayne R., 5,568,810, Cl. 128-660.010.  
Hoban, Patrick J.; and Plaza, Michael C., 5,569,841, Cl. 73-47.000.  
Jenkins, Thomas E.; and Jubenville, Duane, 5,568,712, Cl. 52-782.100.  
Larsen, Einar V., 5,570,007, Cl. 323-209.000.  
Mannava, Seetharamaiah; and Cowie, William D., 5,569,018, Cl. 415-200.000.  
Penney, Carl M.; Chernoch, Joseph P.; and Erikson, Carl E., 5,569,399, Cl. 219-121.690.  
Scott, Curtis E.; Secen, Cynthia A.; Parham, Thomas G.; Allen, Gary R.; Bateman, Robert L., Jr.; and Mathews, Paul G., 5,569,979, Cl. 313-636.000.  
Steigerwald, Robert L.; Yerman, Alexander J.; and Roshen, Waseem A., 5,570,074, Cl. 336-83.000.  
Stein, Judith, 5,569,689, Cl. 524-188.000.  
Sue, Chen-Youn; Koch, Robert; Pace, John E.; and Prince, Gregory R., 5,569,709, Cl. 525-52.000.  
Tomlinson, Harold W., Jr.; Feldman, Sandra P.; and Shu, Emily Y., 5,569,911, Cl. 250-227.240.  
Tseng, Wu-Yang; Bristol, Brent L.; Hetico, Rolf R.; and Glynn, Christopher C., 5,568,931, Cl. 277-53.000.  
General Engineering (Netherlands) B.V.: See—  
Lindstrom, Martin, 5,568,938, Cl. 280-743.200.  
General Motors Corporation: See—  
Badenoch, Scott W.; Shal, David A.; and Stacey, Scott A., 5,570,288, Cl. 364-424.050.  
Gill, Prem P.; Chrenka, Paul W.; and Whitehead, David W., 5,569,425, Cl. 264-121.000.  
Schroeder, Thaddeus; Lequesne, Bruno P. B.; Butler, Raymond O., Jr.; Marks, Anthony L.; Perry, Thomas A.; and Bradley, John R., 5,570,016, Cl. 324-207.250.  
Stacey, Scott A.; and Arwine, Joan B., 5,570,289, Cl. 364-424.050.  
General Signal Corporation: See—  
Blakely, Robert; and Schutte, Marlin, 5,568,975, Cl. 366-285.000.  
Schutte, Marlin, 5,568,985, Cl. 384-478.000.  
Genetics Institute, Inc.: See—  
Trinchieri, Giorgio; Perussia, Bice; Clark, Steven C.; Wong, Gordon G.; Hewick, Rodney; Kobayashi, Michiko; and Wolf, Stanley F., 5,569,454, Cl. 424-85.200.  
GenPharm International: See—  
Lonberg, Nils; and Kay, Robert M., 5,569,825, Cl. 800-2.000.  
Gentry, Jeffery S.; Womble, Karen M.; Banerjee, Chandra K.; Blakley, Richard L.; Barnes, Russell D.; Calleson, Donald A.; and Ridings, Henry T., to R. J. Reynolds Tobacco Company. Cigarette filter. 5,568,819, Cl. 131-342.000.  
Gentry, Scott B.: See—  
Blackburn, Brian K.; Brown, Louis R.; Mazur, Joseph E.; and Gentry, Scott B., 5,568,939, Cl. 280-806.000.  
Georgia Tech Research Corporation: See—  
Taylor, David G.; and Shouse, Kenneth R., 5,569,994, Cl. 318-700.000.  
Gerard, Jesse: See—  
Soderstrom, Dean J.; Gerard, Jesse; and Spaulding, Stephen S., 5,570,469, Cl. 588-18.000.  
Gerber, Matthias: See—  
Rheinheimer, Joachim; Vogelbacher, Uwe J.; Baumann, Ernst; König, Hartmann; Gerber, Matthias; Westphalen, Karl-Otto; and Walter, Helmut, 5,569,640, Cl. 504-288.000.  
Gerhing, Manfred; and Schollmeyer, Hermann, to Gehring, Manfred. Ridge and/or edge covering and process for the production of a ridge and/or edge covering. 5,568,706, Cl. 52-198.000.  
Gerlier, André, to Mars Incorporated. Intermediate storage apparatus. 5,569,015, Cl. 414-790.700.  
Gerson, Ira A.; Jasiuk, Mark A.; and Hartman, Matthew A., to Motorola, Inc. Method for generating a spectral noise weighting filter for use in a speech coder. 5,570,453, Cl. 395-2.280.  
Gertsek, Marina: See—  
Peckham, Allison A.; Watts, Lennox O.; Gertsek, Marina; Smith, Kevin R.; Taubenheim, Don D.; and Pistulka, Ronald J., 5,569,286, Cl. 606-181.000.  
Gestermann, Fritz: See—  
Dummersdorf, Hans-Ulrich; Waldman, Helmut; Härle, Helmut; Minz, Franz-Rudolf; and Gestermann, Fritz, 5,569,024, Cl. 417-420.000.  
Gevens, Alan S.; and Le, Jian, to Sam Technology, Inc. EEG deblurring method and system for improved spatial detail. 5,568,816, Cl. 128-731.000.  
Ghini, Marco; Di Stefano, Giuseppe; and Neri, Armando, to G.D. Societa' per Azioni. Method and apparatus for detecting filing state at an open end of a cigarette. 5,569,931, Cl. 250-559.450.  
GHM Industries: See—  
Petit, Theodore E., Jr.; and Ivel, Leonard L., 5,569,885, Cl. 174-178.000.  
Gibbons, Robert R.; and Halls, Kenneth F. Quick set and release clamping device. 5,568,916, Cl. 269-174.000.  
Gibson, David M., to X-Ray Optical Systems, Inc. High intensity, small diameter x-ray beam, capillary optic system. 5,570,408, Cl. 378-145.000.  
Gieser, Michael: See—  
Detmers, Andreas; and Gieser, Michael, 5,568,919, Cl. 271-183.000.  
Gilbert, Barrie, to Analog Devices, Inc. Demodulating logarithmic amplifier. 5,570,055, Cl. 327-350.000.  
Gilbert, Steven R.: See—  
Fisher, Daniela J.; Osborn, Thomas W., III; Seymour, Mark D.; Kingry, Gary W.; Berg, Charles J., Jr.; Cook, Charles D.; Gilbert, Steven R.; and Toms, Douglas, 5,569,230, Cl. 604-385.100.  
Gileta, John H., to Electrovert Ltd. Applying flux to a solder wave for wave soldering an element. 5,568,894, Cl. 228-219.000.  
Gill, David P.: See—  
Barnhart, Gary A.; and Gill, David P., 5,569,017, Cl. 415-177.000.  
Gill, Manzur, to National Semiconductor Corporation. EEPROM devices with smaller cell size. 5,570,314, Cl. 365-185.100.  
Gill, Prem P.; Chrenka, Paul W.; and Whitehead, David W., to General Motors Corporation. Method and apparatus for making fiber-filled cushion. 5,569,425, Cl. 264-121.000.  
Gillard, Hervé, P. R.; and Prejean-Lefevre, Véronique H. M. P., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "Sneema". Process and apparatus for automatically characterizing, optimizing and checking a crack detection analysis method. 5,570,431, Cl. 382-149.000.  
Gilliland, Linda L.; and Downs, Mary R. Insulated heating container. 5,569,401, Cl. 219-386.000.  
Gimpel, Dudley D., to Ernie Ball, Inc. Musical pick-up device with isolated noise cancellation coil. 5,569,872, Cl. 84-728.000.  
Giordano, Giuseppe: See—  
Colligan, Francis D.; Carpentiere, Richard P.; Belcourt, Ronald H., Jr.; and Giordano, Giuseppe, 5,568,746, Cl. 72-416.000.  
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Frater, Norman K.; Giorgi, Alan P.; and Ruiz, Oscar J., 5,570,261, Cl. 360-104.000.  
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Goldstein, Jonathan R.; Gektin, Inna; Givon, Menachem; and Yarchi, Yachin, 5,569,555, Cl. 429-49.000.  
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Fleury, Richard L., 5,569,225, Cl. 604-323.000.  
Glacier Cross, Inc.: See—  
Chitwood, Ralph, 5,569,175, Cl. 602-32.000.

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Goldstar Co., Ltd.: See—  
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Choi, Seong C., 5,569,939, Cl. 257-94.000.  
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Kho, Tae H., 5,570,393, Cl. 375-333.000.  
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Gollihue, Charles; and Gollihue, Brenda, 5,568,887, Cl. 224-661.000.  
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Gomez, Rodolfo A., to RMG Services Pty. Ltd. Electrochemical system for recovery of metals from their compounds. 5,569,370, Cl. 205-560.000.  
Gonzalez, Pierre: See—  
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Gorab, Glenn N. Antifoam beverage stirrer or straw. 5,568,973, Cl. 366-129.000.  
Gord, John C.: See—  
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Gordon, Kendall W., Jr.: See—  
Nevel, Avishai; Lawson, John B.; Gordon, Kendall W., Jr.; and Bonneau, David, 5,570,188, Cl. 356-385.000.  
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Barnhorst, Jeff A.; Garst, Roger H.; Gordon, Ronald H.; and Zehler, Eugene R., 5,569,406, Cl. 508-431.000.  
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Gorecki, Michael J.: See—  
Granger, Richard N.; Scirica, Paul A.; and Gorecki, Michael J., 5,569,301, Cl. 606-224.000.  
Goren, David: See—  
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Gorman, Patrick R.: See—  
Hayes, Stephen J.; and Gorman, Patrick R., 5,568,854, Cl. 194-318.000.  
Gosebruch, Harald: See—  
Colley, Robert G.; and Gosebruch, Harald, 5,568,856, Cl. 198-347.200.  
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Endo, Kenji; Suzuki, Hidekazu; Oguma, Touru; and Goto, Masayoshi, 5,569,464, Cl. 424-450.000.  
Goto, Takashi; and Terakado, Shingo, to Sanyo Electric Co., Ltd. Stencil mask. 5,569,569, Cl. 430-5.000.  
Gotoh, Yukio: See—  
Ito, Akihiko; and Gotoh, Yukio, 5,570,277, Cl. 363-19.000.  
Gottlieb, Saul: See—  
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Goulait, David J. K.: See—  
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Marshall, David J.; Gouldson, Stanley; Olk, Olaf; and Maiorca, Robert, 5,568,685, Cl. 29-809.000.  
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Hofstetter, John M.; O'Neil, John A.; and Grabenkort, Richard W., 5,569,193, Cl. 604-89.000.  
Grace, James W.; and DiPietro, David M. Precision integrated resistors. 5,569,951, Cl. 257-536.000.  
Grady, M. Sean: See—  
Howard, Matthew A., III; Grady, M. Sean; and Winn, H. Richard, 5,569,267, Cl. 606-130.000.  
Graebing, Didier: See—  
Lambia, Morand; and Graebing, Didier, 5,569,717, Cl. 525-193.000.  
Graetzel, Michael: See—  
Exnar, Ivan; Graetzel, Michael; and Randin, Jean-Paul, 5,569,561, Cl. 429-218.000.  
Graham, Richard A. Inflatable cervical traction and exercising device. 5,569,176, Cl. 602-32.000.  
Graham, William G.: See—  
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Becker, Dieter; Dransmann, Gerhard; and Graumann, Jürgen, 5,569,529, Cl. 428-331.000.
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Shug, Austio L.; and Gravenstein, Stefan, 5,569,457, Cl. 424-278.100.
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Tubman, Louis; and Gravereaux, Daniel W., 5,569,038, Cl. 434-308.000.
- Graves, Jan D., to Norwalk Wastewater Equipment Company. Flow augmenting devices for a wastewater treatment plant. 5,569,376, Cl. 210-195.400.
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- Great Southern Co. Proprietary Limited: See—  
Elliman, Andrew P., 5,569,140, Cl. 482-140.000.
- Green, Alan: See—  
Steininger, Helmut; Green, Alan; Munch, Michel; and Heilmann, Peter, 5,569,522, Cl. 428-195.000.
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Marshall, Todd C., 5,569,346, Cl. 156-94.000.
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Wang, Leao; and Wu, Peter, 5,569,130, Cl. 482-96.000.
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Sauer, Jude S.; Oravec, Michael G.; Greenwald, Roger J.; and Kobalinsky, Alexander I., 5,569,160, Cl. 600-114.000.
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McLaughlin, Michael D.; Signa, John C.; Greicar, Richard K.; and Taylor, John M., 5,570,108, Cl. 345-146.000.
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Tripp, Cynthia A.; Selkirk, Murray E.; and Grieve, Robert B., 5,569,603, Cl. 435-240.100.
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Sumner, Wayne A.; Bracken, Allen T.; Griffith, David W.; Jones, David E.; and Rich, Edward L., 5,570,252, Cl. 360-133.000.
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Polinsky, Mark A.; Grillo, John M.; and Duncan, Scott M., 5,570,013, Cl. 324-174.000.
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Kirt, Thomas J., 5,569,059, Cl. 451-5.000.
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Janssen, Rupert; Froewis, Markus; Groeschel, Friedrich; and Guillon, Luc, 5,569,010, Cl. 411-441.000.
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Neber, Fritz, 5,568,850, Cl. 198-347.100.
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Carriere, Claude; Groussin, Bernard; Larat, Christian; and Pocholle, Jean-Paul, 5,570,387, Cl. 372-50.000.
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Klima, Rudolph F.; Rossi, Joseph D.; and Gruber, Bert, 5,569,319, Cl. 106-243.000.
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Bastoli, Catia; Lombi, Roberto; Del Tredici, Gianfranco; and Guanella, Italo, 5,569,692, Cl. 524-47.000.
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Guillaumet, Gérard; Viaud, Marie-Claude; Renard, Pierre; Adam, Gérard; Caignard, Daniel-Henri; Guardiola-Lemaître, Béatrice; and Rettori, Marie-Claire, 5,569,669, Cl. 514-432.000.
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Fusco, Jose M.; Ramos, Jose Geraldo F.; Vieira, Valmor N.; and Guerra, Eduardo Cardoso de Melo, 5,569,435, Cl. 422-147.000.
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Glatfelter, Troy; Hoffman, Kevin; Yang, Chi C.; and Guha, Subhendu, 5,569,332, Cl. 136-249.000.
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Janssen, Rupert; Froewis, Markus; Groeschel, Friedrich; and Guillon, Luc, 5,569,010, Cl. 411-441.000.
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- Gunnewijk, Antonius G. M.: See—  
Arnegger, Richard E.; Gunnewijk, Antonius G. M.; and Maurer, Thomas, 5,569,257, Cl. 606-82.000.
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Prichard, D. Wayne; and Guthrie, Joe C., 5,570,323, Cl. 367-118.000.
- Guy, Thomas D.: See—  
Gorman, Charles E., Jr.; Ciccollella, Michael; Smith, Robert C.; Guy, Thomas D.; and Azarbarzin, Kurt, 5,569,206, Cl. 604-167.000.
- H & M Enterprises, Inc.: See—  
Herren, Gerald R., 5,568,950, Cl. 289-17.000.
- H.C. Starck, GmbH & Co. KG: See—  
Glemser, Oskar; and Axmann, Peter, 5,569,562, Cl. 429-223.000.
- H.G. Weber Co., Inc.: See—  
Kristola, Jay L., 5,568,980, Cl. 383-126.000.
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Nore, Pentti; Honkanen, Erkki; Bäckström, Reijo; Wikberg, Tom; Haikala, Heimo; and Haarala, Jorma, 5,569,657, Cl. 514-247.000.
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- Habetler, Thomas G.: See—  
Schoen, Randy; and Habetler, Thomas G., 5,570,256, Cl. 361-31.000.
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Baker, Gregg S.; and Hafeli, Paul B., 5,569,251, Cl. 606-69.000.

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McGuire, Kevin P.; and Hagerman, Richard E., 5,569,983, Cl. 315-297.000.
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Dill, Gary R.; and Hahnen, Kevin F., 5,569,299, Cl. 606-205.000.
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Nore, Pentti; Honkanen, Erkki; Bäckström, Reijo; Wikberg, Tom; Haikala, Heimo; and Haarala, Jorma, 5,569,657, Cl. 514-247.000.
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Montoya, Robert K.; and Zaslo, John J., 5,570,036, Cl. 326-16.000.
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Totten, Patty L.; King, Bobby J.; and Chatterji, Jiten, 5,569,324, Cl. 106-696.000.
- Hallo, Anthony: See—  
Breen, Bernard P.; Bionda, John P., Jr.; Gabrielson, James E.; and Hallo, Anthony, 5,568,777, Cl. 110-261.000.
- Halls, Kenneth F.: See—  
Gibbons, Robert R.; and Halls, Kenneth F., 5,568,916, Cl. 269-174.000.
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Diaz, Michael; Halm, Roland L.; McIntyre, Michael A.; and Wilding, Oliver K., 5,569,775, Cl. 556-466.000.
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- Hamm, David A.: See—  
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Pesante, Eduardo; Hammond, Terry; and DeBoer, Gordon, 5,570,407, Cl. 378-58.000.
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Lee, Kwang-Hyung; Han, Joon-Hee; and Lee, Young-Jin, 5,569,532, Cl. 428-327.000.
- Han, Mi S.: See—  
Oh, Moon K.; Han, Mi S.; Kim, Seung H.; and Kim, Young S., 5,570,125, Cl. 348-6.000.
- Hanaoka, Kazutaka; Yoshida, Hidefumi; Nakamura, Kimiaki; Tsuda, Hideaki; and Chida, Hideo, to Fujitsu Limited. Color liquid crystal display device using birefringence. 5,570,211, Cl. 359-53.000.
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Yoshida, Hidefumi; Hanaoka, Kazutaka; Nakamura, Kimiaki; Tsuda, Hideaki; and Yamada, Fumiaki, 5,570,210, Cl. 359-51.000.
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Isoda, Satoru; Hanazato, Yoshio; Ueyama, Satoshi; Kawakubo, Hiroaki; and Nishikawa, Satoshi, 5,570,457, Cl. 395-25.000.
- Haneda, Satoshi: See—  
Fukuchi, Masakazu; Haneda, Satoshi; and Morita, Shizuo, 5,570,194, Cl. 358-300.000.
- Hansen, Craig N., to Electromed, Inc. Pulsator. 5,569,170, Cl. 601-150.000.
- Hansen, Eric R.; and Tutt, James R., to Cadence Environmental Energy, Inc.; and Ash Grove Cement Company. Method for improved manufacture of cement in long kilns. 5,569,030, Cl. 432-103.000.
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- Harada Kogyo Kabushiki Kaisha: See—  
Tetsuka, Kiyoshi, 5,570,103, Cl. 343-903.000.
- Haralick, Robert M.: See—  
Sheehan, Florence H.; Haralick, Robert M.; and Lee, Chang-Kyu, 5,570,430, Cl. 382-128.000.
- Haratani, Susumu: See—  
Tomimaga, Junji; Haratani, Susumu; Inaba, Ryo; and Kuwahara, Tsuneo, 5,569,517, Cl. 428-64.100.
- Harbor Medical Devices, Inc.: See—  
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- Harding, Kelly M.: See—  
Harding, Raymond W.; and Harding, Kelly M., 5,568,698, Cl. 43-53.500.
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- Härig, Thomas, to Linotype-Hell AG. Optical positioning system for at least one picture element. 5,570,223, Cl. 359-204.000.
- Harkin, Gerard F.: See—  
Bird, Neil C.; and Harkin, Gerard F., 5,569,908, Cl. 250-208.100.
- Härle, Helmut: See—  
Dummersdorf, Hans-Ulrich; Waldman, Helmut; Härle, Helmut; Minz, Franz-Rudolf; and Gestermann, Fritz, 5,569,024, Cl. 417-420.000.
- Harlock, Robert: See—  
Keller, Rex W.; Harlock, Robert; Hooley, Robert W.; and Harper, Patrick, 5,568,868, Cl. 206-724.000.
- Harmuth, Harald; Heindl, Roland; and Deutsch, Josef, to Veitsch-Radex Aktiengesellschaft für Feuerfeste Erzeugnisse. Refractory ceramic mass and its use. 5,569,631, Cl. 501-112.000.
- Harper, Patrick: See—  
Keller, Rex W.; Harlock, Robert; Hooley, Robert W.; and Harper, Patrick, 5,568,868, Cl. 206-724.000.
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- Harris Corporation: See—  
Linn, Jack H.; Lowry, Robert K.; Rouse, George V.; and Buller, James F., 5,569,620, Cl. 437-62.000.
- McLean, Thomas R., 5,569,957, Cl. 257-691.000.
- Pesante, Eduardo; Hammond, Terry; and DeBoer, Gordon, 5,570,407, Cl. 378-58.000.
- Young, William R.; and Chester, David B., 5,570,392, Cl. 375-308.000.
- Harris, David B.: See—  
Naedel, Richard G.; Harris, David B.; and Uehling, Mark, 5,570,270, Cl. 361-687.000.
- Harris, Robert S., to Stant Manufacturing Inc. Fuel-delivery control system. 5,568,828, Cl. 141-348.000.
- Harris Semiconductor GmbH: See—  
Allmeier, Franz; Maier, Theodor; Goesser, Gerhard; Preslar, Donald; and Murphy, Philip, 5,570,259, Cl. 361-86.000.
- Harrison, John W. Transmission with a continuously variable adjustable ratio. 5,569,113, Cl. 476-58.000.
- Harrod, Jimmie A., to Moore Business Forms, Inc. Forming an envelope around inserts. 5,568,717, Cl. 53-429.000.
- Hart, Charles C.; and Tangherlini, Vincent C. Multiport trocar. 5,569,205, Cl. 604-167.000.
- Hart, Rickey D.; and Rice, John T., to Innovative Devices, Inc. Surgical grasping and suturing device and method. 5,569,269, Cl. 606-144.000.
- Hart, Steven C., to Xerox Corporation. Donor rolls with modular commutation. 5,570,169, Cl. 355-259.000.
- Hartley, John G.: See—  
Chan, Ken Tze-Kin; Enichen, William A.; Hartley, John G.; and Sturans, Maris A., 5,570,405, Cl. 378-35.000.
- Hartman, Matthew A.: See—  
Gerson, Ira A.; Jasiuk, Mark A.; and Hartman, Matthew A., 5,570,453, Cl. 395-2.280.
- Hartwig, Charles D., to Wahl Clipper Corporation. Kneader massager having dwell feature. 5,569,168, Cl. 601-133.000.
- Harty, Robert D. Compact device for controlling runoff of fluid. 5,568,817, Cl. 128-849.000.
- Hase, Takahiro: See—  
Nihei, Ryo; Sasaki, Yasuo; and Hase, Takahiro, 5,570,187, Cl. 356-376.000.
- Hasebe, Kazunori, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 5,569,577, Cl. 430-523.000.
- Hasegawa, Kengo: See—  
Ishida, Fumiaki; Fujio, Masayuki; Kobayashi, Kazuo; and Hasegawa, Kengo, 5,569,023, Cl. 417-326.000.
- Hasegawa, Masaru: See—  
Kouno, Hisao; Takahashi, Shyouichi; Higashide, Kazuhiro; Komiyama, Nakaji; Suda, Osamu; and Hasegawa, Masaru, 5,569,749, Cl. 534-653.000.



- Hasegawa, Yusuke; Nishimura, Yoichi; Komoriya, Isao; Akazaki, Shusuke; and Kimura, Eisuke, to Honda Giken Kogyo Kabushiki Kaisha. Air-fuel ratio estimator for internal combustion engine. 5,569,847, Cl. 73-117.300.
- Haselhorst, Ronald; and Lillegard, Tom, to Clintec Nutrition Company. Adapter for a variety of tubes having various diameters and a method of using the adapter. 5,569,222, Cl. 604-283.000.
- Hashimoto, Milton; to Hashimoto, Milton; Emoto, Susumu; Matsuura, Masuichi; Tamanaha, Michael J.; and McKenzie, Christopher P. Spray painting equipment. 5,569,377, Cl. 210-238.000.
- Hashimoto, Yoshikazu: See—  
Sasaki, Nobuyoshi; Yokokawa, Tetsuya; Hashimoto, Yoshikazu; Ohta, Yoshiro; and Sekiguchi, Hideo, 5,569,320, Cl. 106-287.260.
- Hashimoto, Yui: See—  
Miyoshi, Akira; and Hashimoto, Yui, 5,570,309, Cl. 364-746.200.
- Hasimoto, Milton: See—  
Hashimoto, Milton, 5,569,377, Cl. 210-238.000.
- Hata, Masahiko; Fukuhara, Noboru; Takata, Hiroaki; and Inui, Katsumi, to Sumitomo Chemical Company Limited. Epitaxial  $\text{In}_x\text{Ga}_{1-x}\text{As}$  having a slanted crystallographic plane azimuth. 5,569,954, Cl. 257-627.000.
- Hatano, Yoshiyuki: See—  
Ikuta, Yuzo; Tashiro, Satoshi; Hatano, Yoshiyuki; Fujita, Tadasu; Andoh, Noboru; Asakura, Sachio; Kobayashi, Haruto; and Minami, Takeshi, 5,569,594, Cl. 435-134.000.
- Hatta, Hiroyuki: See—  
Norizuki, Reiko; Hyodo, Ryuji; Tanaka, Kenji; Sekihata, Osamu; Hatta, Hiroyuki; Eda, Susumu; and Oomuro, Katsumi, 5,570,361, Cl. 370-60.100.
- Hattori, Yutaka: See—  
Katayama, Masayuki; Mizutani, Atsushi; Hattori, Yutaka; and Ito, Nobue, 5,569,486, Cl. 427-66.000.
- Hatzidakis, George: See—  
Tavernarakis, Nectarios; Hatzidakis, George; and Krambovitis, Elias, 5,569,582, Cl. 435-5.000.
- Haug, Audun. Pressure actuated gripping apparatus and method. 5,568,957, Cl. 294-119.300.
- Hawkes, Jeremy J.: See—  
Betts, Walter B.; and Hawkes, Jeremy J., 5,569,367, Cl. 204-547.000.
- Hayakawa, Kimiaki: See—  
Kosasa, Hideaki; Takahashi, Yuji; Hayakawa, Kimiaki; Kusumoto, Toshihiko; Yamaguchi, Yoshimasu; Ohta, Hiroshi; Yamanaka, Yuji; and Sakakibara, Koza, 5,569,012, Cl. 412-33.000.
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- Hayashi, Ichiro, to AG Technology Co., Ltd. Glass substrate for a magnetic disk with roughened edges. 5,569,518, Cl. 428-141.000.
- Hayashi, Masaharu: See—  
Tanaka, Yasuyuki; Shibata, Kazuhiko; Ikeda, Kenichi; Nishida, Yuji; Hayashi, Masaharu; Nakade, Shinichi; Kuga, Akihito; and Kanamaru, Eiji, 5,569,740, Cl. 528-502.00F.
- Hayashi, Masatake, to Sony Corporation. Discharge chamber and method of manufacturing the same. 5,570,104, Cl. 345-60.000.
- Hayashi, Nobuyuki: See—  
Shiga, Tsutomu; Hayashi, Nobuyuki; and Ohmi, Masanori, 5,569,892, Cl. 200-19.00R.
- Hayashi, Sachio; Miyazuchi, Isamu; and Oyama, Motofumi, to Nippon Zeon Co., Ltd. Vulcanizable partially hydrogenated nitrile rubber composition containing partially hydrogenated unsaturated nitrile-conjugated diene copolymer sulfur vulcanizer and tellurium dithiocarbamate vulcanization promoter. 5,569,719, Cl. 525-329.300.
- Hayashi, Yoshinori: See—  
Endo, Osamu; Hayashi, Yoshinori; Ichimiya, Koji; and Ohsawa, Takayuki, 5,570,224, Cl. 359-212.000.
- Hayes, Stephen J.; and Gorman, Patrick R., to Protel, Inc. Coin discrimination method. 5,568,854, Cl. 194-318.000.
- Hayes Wheels International, Inc.: See—  
Wei, Daniel C.; and Prieto, Romulo A., 5,569,496, Cl. 427-450.000.
- Hazen, Hallie W. Utility marking device. 5,568,785, Cl. 116-209.000.
- He, Xiao-Shu: See—  
Lee, Kan S.; He, Xiao-Shu; and Weinberger, Daniel R., 5,569,447, Cl. 424-1.850.
- Health Research Inc.: See—  
Greenberg, Steven J.; and Evans, Mary J., 5,569,583, Cl. 435-5.000.
- Heartport, Inc.: See—  
Rapacki, Alan R.; and Stevens, John H., 5,569,274, Cl. 606-158.000.
- Heath, Mark A.; Pruett, D. Christopher; and Nguyen, Bang C., to Seagate Technology, Inc. Method for reducing rotational latency in a disc drive. 5,570,332, Cl. 369-50.000.
- Heath, Michael C.: See—  
Margolis, Donald L.; Jolly, Mark R.; Schroeder, Warren R.; Heath, Michael C.; and Ivers, Douglas E., 5,570,286, Cl. 364-424.050.
- Heath, William F., Jr.: See—  
Basinski, Margaret B.; DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Schoner, Brigitte E.; Shields, James E.; and Smiley, David L., 5,569,744, Cl. 530-324.000.
- DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Shields, James E.; and Smiley, David L., 5,569,743, Cl. 530-324.000.
- Heckler & Koch GmbH: See—  
Mauch, Ernst; Weldie, Helmut; Bantle, Johannes-August; and Epp, Erwin, 5,568,696, Cl. 42-49.020.
- Hedges, Allan: See—  
Qi, Z. Helena; Hedges, Allan; and Sanchez, Eduardo, 5,569,756, Cl. 536-127.000.
- Heed, Björn. Combustion device. 5,569,031, Cl. 431-170.000.
- Heeger, Alan: See—  
Wudl, Fred; and Heeger, Alan, 5,569,708, Cl. 524-607.000.
- Hefe, Josef, to Kufner Textilwerk GmbH. Method for the raster-pattern coating of fabrics with hot melt adhesive. 5,569,348, Cl. 156-239.000.
- Heidelberg Harris, Inc.: See—  
Jackson, Dale H., 5,568,767, Cl. 101-226.000.
- Heidelberg Druckmaschinen AG: See—  
Detmers, Andreas; and Gieser, Michael, 5,568,919, Cl. 271-183.000.
- Jackson, Dale H., 5,568,767, Cl. 101-226.000.
- Heidenfelder, Hans-Dieter: See—  
Boll, Wolf; Knörzer, Günther; and Heidenfelder, Hans-Dieter, 5,569,999, Cl. 320-35.000.
- Heilmann, Marlo S.; and Uber, Arthur E., III, to Medrad, Inc. Sterility assurance for contrast delivery system. 5,569,181, Cl. 604-30.000.
- Heilmann, Peter: See—  
Steininger, Helmut; Green, Alan; Munch, Michel; and Heilmann, Peter, 5,569,522, Cl. 428-195.000.
- Heimer, Drew D.: See—  
Wagner, Franz M.; and Heimer, Drew D., 5,569,557, Cl. 429-99.000.
- Hein, Bernd: See—  
Haage, Manfred; Seibold, Guenter; Plocher, Bernd; Hein, Bernd; and Weber, Wilfried, 5,569,091, Cl. 470-12.000.
- Hein, Todd J., to Orthopaedic Innovations, Inc. Adjustable provisional articulating device. 5,569,263, Cl. 606-102.000.
- Heindl, Roland: See—  
Harmuth, Harald; Heindl, Roland; and Deutsch, Josef, 5,569,631, Cl. 501-112.000.
- Heinen, Ralf: See—  
Hendricks, Udo-Winfried; and Heinen, Ralf, 5,569,724, Cl. 525-432.000.
- Heinrich, David B.; and Spencer, Jack D., to Nestec, Ltd. Machine and method for making hardened confections having complementary parts joined in a unit. 5,568,729, Cl. 62-75.000.
- Heinrichs, Jean-Pierre: See—  
Häfele, Ulrich; Vögele, Michael; and Heinrichs, Jean-Pierre, 5,570,129, Cl. 348-223.000.
- Helmus, Michael N.; and Forman, Michael R., to Schneider (USA) Inc. Drug delivery guidewire. 5,569,197, Cl. 604-96.000.
- Helmus, Michael N.; Tolko, M. Joshua; and Raleigh, Carol L., to Harbor Medical Devices, Inc. Medical device polymer. 5,569,463, Cl. 424-426.000.
- Hemink, Gertjan: See—  
Tanaka, Tomoharu; and Hemink, Gertjan, 5,570,315, Cl. 365-185.220.
- Hemmi, Gregory W.: See—  
Sessler, Jonathan L.; Hemmi, Gregory W.; and Mody, Tarak D., 5,569,759, Cl. 540-472.000.
- Henault, Margaret A.: See—  
Killian, Gary; Chapman, David; Cancel, Aida; and Henault, Margaret A., 5,569,581, Cl. 435-4.000.
- Henderson, Timothy S.: See—  
Delaney, Joseph B.; Henderson, Timothy S.; Fuller, Clyde R.; and Mercer, Betty S., 5,569,944, Cl. 257-198.000.
- Hendricks, Udo-Winfried; and Heinen, Ralf, to Bayer Aktiengesellschaft. N-menthylol derivatives of polycondensation products, their preparation and use. 5,569,724, Cl. 525-432.000.
- Hendrickson, Thomas C.: See—  
Steltenkamp, Robert J.; Puckhaber, John H., Jr.; Colodney, Daniel; and Hendrickson, Thomas C., 5,569,411, Cl. 510-383.000.
- Henkel Corporation: See—  
Barnhorst, Jeff A.; Garst, Roger H.; Gordon, Ronald H.; and Zehler, Eugene R., 5,569,406, Cl. 508-431.000.
- Klima, Rudolph F.; Rossi, Joseph D.; and Gruber, Bert, 5,569,319, Cl. 106-243.000.
- Henkel Kommanditgesellschaft auf Aktien: See—  
Kuhn, Peter; Loeffelholz, Frido; Wedel, Peter; and Wegemund, Bernd, 5,569,694, Cl. 524-399.000.
- Schulz, Paul; Esser, Herbert; and Eskuchen, Rainer, 5,569,752, Cl. 536-18.600.
- Uphues, Guenter; Ploog, Uwe; Schick, Renate; Schwark, Hans-Juergen; and Witt, Sandra, 5,569,767, Cl. 548-352.100.
- Henley, Francois J., to Photon Dynamics, Inc. Method for testing an electronic device using voltage imaging. 5,570,011, Cl. 324-158.100.
- Henley, Julian L. Power assisted suction lipectomy device. 5,569,178, Cl. 604-22.000.
- Hennessey, James: See—  
Groeskopf, Glenn; Hennessey, James; and Treleven, Carl W., 5,568,866, Cl. 206-466.000.
- Henry, Manus P.; Mattar, Wade M.; Clarke, David W.; and Yang, Janice, to Foxboro Company, The. Self-validating sensors. 5,570,300, Cl. 364-551.010.
- Henson, Michael: See—  
Crockier, Michael; Henson, Michael; and Chum, Muny, 5,569,184, Cl. 604-53.000.
- Hentschel, Dietmar: See—  
Liang, Cheng-Chung; Singh, Ajit; Chiu, Ming-Yee; Ezrielev, Jay; Fister, Richard; and Hentschel, Dietmar, 5,570,404, Cl. 378-8.000.

- Her Majesty in right of Canada as represented by the Department of Fisheries and Oceans: See—  
Dessureault, Jean-Guy, 5,570,303, Cl. 364-562.000.
- Herberts Gesellschaft Mit Beschränkter Haftung: See—  
Vogt-Birnbrich, Bettina; Patzschke, Hans-Peter; Lenhard, Werner; Döbert, Jürgen; Brunner, Marcus; and Schubert, Walter, 5,569,705, Cl. 524-591.000.
- Herberts GmbH: See—  
Saarweber, Dietrich; and Siever, Friedrich L., 5,569,384, Cl. 210-651.000.
- Schreiber, Peter; Goecke, Stefanie; and Windmann, Reinhard, 5,569,685, Cl. 523-406.000.
- Herloski, Robert P.: See—  
Andrews, John R.; Mizes, Howard A.; Kuhman, Daniel E.; and Herloski, Robert P., 5,570,161, Cl. 355-215.000.
- Herman, Rami: See—  
Weissman, Yitzhak; Herman, Rami; Bornstein, Aharon; and Tugendhaft, Israel, 5,569,923, Cl. 250-341.200.
- Herman, Richard M.: See—  
Seif-Naraghi, Amir; Dilli, David L.; D'Luzansky, Stephen C.; and Herman, Richard M., 5,569,129, Cl. 482-69.000.
- Herren, Gerald R., to H & M Enterprises, Inc. Hand held balloon tying device. 5,568,950, Cl. 289-17.000.
- Herzog, Fred D.: See—  
Titone, Milo A.; and Herzog, Fred D., 5,569,273, Cl. 606-151.000.
- Heska Corporation: See—  
Tripp, Cynthia A.; Selkirk, Murray E.; and Grieve, Robert B., 5,569,603, Cl. 435-240.100.
- Hetico, Rolf R.: See—  
Tseng, Wu-Yang; Bristol, Brent L.; Hetico, Rolf R.; and Glynn, Christopher C., 5,568,931, Cl. 277-53.000.
- Hewick, Rodney: See—  
Trinchieri, Giorgio; Perussia, Bice; Clark, Steven C.; Wong, Gordon G.; Hewick, Rodney; Kobayashi, Michiko; and Wolf, Stanley F., 5,569,454, Cl. 424-85.200.
- Heyl, Lawrence F.; and Kannapell, Henry N., to Apple Computer, Inc. System and method for synchronized presentation of video and audio signals. 5,570,296, Cl. 364-514.00R.
- HGZ Maschinenbau AG: See—  
Künzler, Bernhard, 5,568,763, Cl. 99-280.000.
- Hibino, Hideo; Sakamoto, Hiroshi; and Yasukawa, Seiichi, to Nikon Corporation. Flash control apparatus. 5,570,148, Cl. 396-182.000.
- Hibst, Hartmut: See—  
Martin, Friedrich-Georg; Hibst, Hartmut; and Tenten, Andreas, 5,569,636, Cl. 502-311.000.
- Hickory Springs Manufacturing Company: See—  
Walmsley, Graham D., 5,569,682, Cl. 521-107.000.
- Hida, Tatsuya: See—  
Fukatsu, Yoshiaki; Nakahara, Shinji; Yamada, Youichi; Yamamoto, Hideji; Hida, Tatsuya; and Wada, Mizuho, 5,569,445, Cl. 423-633.000.
- Hieb, Bradley J.: See—  
Robichaux, Jerry D.; and Hieb, Bradley J., 5,568,795, Cl. 123-198.00F.
- Hiebert, John: See—  
Avery, Noyes L.; Axelrod, Joan C.; Carey, James T.; Hiebert, John; and Horodysky, Andrew G., 5,569,407, Cl. 508-454.000.
- Higashi, Takeo: See—  
Akatsu, Masamichi; Higashi, Takeo; Makita, Hiromitsu; Susa, Tomoo; and Mizuno, Toshiya, 5,569,524, Cl. 428-215.000.
- Higashide, Kazuhiro: See—  
Kouno, Hisao; Takahashi, Shyouichi; Higashide, Kazuhiro; Koriyama, Nakaji; Suda, Osamu; and Hasegawa, Masaru, 5,569,749, Cl. 534-653.000.
- Higuchi, Haruhiko: See—  
Hanaoka, Tadashi; and Higuchi, Haruhiko, 5,570,086, Cl. 340-825.540.
- Hihara, Toshio; and Himeno, Kiyoshi, to Dystar Japan Ltd. Disperse dye compositions. 5,569,309, Cl. 8-639.000.
- Hilgen, Wallace L., to Kloor-Flo Company. HVAC heat transfer fluid recycling. 5,569,389, Cl. 210-805.000.
- Hill, Raymond L., to Lotus Cars Limited. Suspension testing apparatus and method. 5,569,836, Cl. 73-11.070.
- Hilmerason, Anders, to Tetra Laval Holdings & Finance S.A. Apparatus for sterilizing a continuous packaging material web. 5,569,438, Cl. 422-293.000.
- Hilt Aktiengesellschaft: See—  
Janssen, Rupert; Froewis, Markus; Groeschel, Friedrich; and Guillon, Luc, 5,569,010, Cl. 411-441.000.
- Kleine, Werner, 5,569,002, Cl. 408-204.000.
- Popp, Franz; and Sedlmeier, Andreas, 5,568,711, Cl. 52-704.000.
- Himeno, Kiyoshi: See—  
Hihara, Toshio; and Himeno, Kiyoshi, 5,569,309, Cl. 8-639.000.
- Hinaga, Yasushi, to ESCO LTD. Detector apparatus of desorption gas and method therefore. 5,569,837, Cl. 73-19.010.
- Hinchee, Maud A.; and Connor-Ward, Dianne, to Monsanto Company. Method for soybean transformation and regeneration. 5,569,834, Cl. 800-205.000.
- Hinnant, Wayne M., Sr. Eyeglass holder. 5,568,872, Cl. 211-13.000.
- Hiraishi, Masahiro: See—  
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- Hirano, Sayoko, to Kabushiki Kaisha Kawai Gakki Seisakusho. Keyboard electronic musical instrument having partial pedal effect circuitry. 5,569,870, Cl. 84-615.000.
- Hirao, Kyoko: See—  
Kaku, Takashi; and Hirao, Kyoko, 5,570,390, Cl. 375-222.000.
- Hiraoka, Toshikage; Tanimoto, Tetsuji; Makino, Yoshihiko; Ninomiya, Tadashi; Hora, Naofumi; Ashihara, Yoshihiro; Sudo, Yukio; and Mori, Toshihiro, to Fuji Photo Film Co., Ltd.; and Fujiirebio Inc. Immunoassay element and process and immunoassay. 5,569,589, Cl. 435-7.900.
- Hirasawa, Masahide, to Canon Kabushiki Kaisha. Lens drive controlling apparatus. 5,570,236, Cl. 359-697.000.
- Hirata, Masaru, to NEC Corporation. Overcurrent preventing circuit. 5,570,255, Cl. 361-18.000.
- Hirata, Susumu: See—  
Inui, Tetsuya; Ishii, Yorishige; Ohta, Kenji; Kimura, Kazuhiro; and Hirata, Susumu, 5,570,336, Cl. 364-126.000.
- Hirohashi, Seiji: See—  
Matsuki, Yuji; and Hirohashi, Seiji, 5,568,844, Cl. 188-68.000.
- Hirose, Keiji; and Ogawa, Keiichi, to Dai Nippon Printing Co., Ltd. Thermal transfer sheet. 5,569,540, Cl. 428-500.000.
- Hirose, Mifune: See—  
Sakaki, Mamoru; Suzuki, Eiichi; Kashiwazaki, Akio; and Hirose, Mifune, 5,570,120, Cl. 347-105.000.
- Hirose, Shinji; Nita, Makoto; and Obata, Ryuichi, to Canon Kabushiki Kaisha. Method for assembling structural frame members of an image forming apparatus. 5,570,159, Cl. 355-200.000.
- Hirotsuka, Motochiko: See—  
Kishimoto, Atsumori; Fujii, Takashi, deceased; Ohshita, Kazutaka; Yamamoto, Kazumi; Fujii, Yasuhiko; and Toda, Tetsuro, 5,569,695, Cl. 524-435.000.
- Hirotsuka, Motochiko: See—  
Naga, Mitsuo; Kiriha, Shuitsu; Tokugawa, Yoshinori; Tsuda, Fumiaki; Saito, Toshiaki; and Hirotsuka, Motochiko, 5,569,482, Cl. 426-656.000.
- Hitachi Automotive Engineering Co., Ltd.: See—  
Ichimaru, Masahiro; and Watanabe, Izumi, 5,569,851, Cl. 73-204.150.
- Hitachi Cable, Ltd.: See—  
Imoto, Katsuyuki; and Koya, Kazuo, 5,570,448, Cl. 385-126.000.
- Hitachi Chemical Company, Ltd.: See—  
Takita, Takao; Sakai, Takeshi; and Shimazaki, Takeshi, 5,569,321, Cl. 106-1.050.
- Hitachi, Ltd.: See—  
Ichimaru, Masahiro; and Watanabe, Izumi, 5,569,851, Cl. 73-204.150.
- Ido, Tatem; and Sano, Hirohisa, 5,570,439, Cl. 385-37.000.
- Ishida, Fumiaki; Fujio, Masayuki; Kobayashi, Kazuo; and Hasegawa, Kengo, 5,569,023, Cl. 417-326.000.
- Kokami, Yasuhiko; and Kondo, Satoshi, 5,569,988, Cl. 318-254.000.
- Kumazawa, Tetsuo; Kitano, Makoto; Yaguchi, Akihiro; Kohno, Ryuji; Tanaka, Naotaka; Yoneda, Nae; and Anjoh, Ichiro, 5,569,960, Cl. 257-738.000.
- Matsumoto, Kenji; Itoh, Shigeyuki; Sano, Kenji; Kobayashi, Jun; Mori, Koji; and Okada, Kenji, 5,570,220, Cl. 359-146.000.
- Mori, Shigeru; and Imagawa, Yasuharu, 5,569,060, Cl. 451-5.000.
- Murakami, Masaru; Oguri, Yozo; Ashi, Yoshihiro; Tanaka, Katsuyoshi; Kozaki, Takahiko; Takase, Akihiko; and Miyagi, Morihito, 5,570,368, Cl. 370-94.200.
- Siga, Masao; Fukui, Yutaka; Kuriyama, Mitsuo; Maeno, Yoshimi; Suwa, Masateru; Kaneko, Ryoichi; Onoda, Takeshi; Kajiura, Hidefumi; Watanabe, Yasuo; Takahashi, Shintaro; and Tan, Toshimi, 5,569,338, Cl. 148-335.000.
- Tabuchi, Kenji; and Sasaki, Yasushi, 5,568,794, Cl. 123-195.00E.
- Hitachi Maxell, Ltd.: See—  
Ohiwa, Tsunemi; and Yamamoto, Yoshinori, 5,569,531, Cl. 428-323.000.
- Hitachi Metals, Ltd.: See—  
Kawata, Tsunehiro; Kojima, Katsuhiko; Kazama, Youichiro; Fukaya, Takayuki; and Tsumimura, Toshihiko, 5,569,334, Cl. 148-287.000.
- Hitachi Micro Systems, Inc.: See—  
Takla, Ashraf K., 5,570,053, Cl. 327-292.000.
- Takla, Ashraf K., 5,570,054, Cl. 327-292.000.
- Hitz, Jürgen: See—  
May, Guntram; and Hitz, Jürgen, 5,570,443, Cl. 385-75.000.
- HMT Technology Corporation: See—  
Lal, Brij B.; Bourez, Allen J.; and Shinohara, Tadashi, 5,569,533, Cl. 428-332.000.
- Ho, Thomas Y.: See—  
Chiang, David; Lee, Napoleon W.; Ho, Thomas Y.; and Kucharski, Nicholas, Jr., 5,570,051, Cl. 327-203.000.
- Hong, Peter Y.; and Yeager, David A. Making a fractured powder metal connecting rod. 5,568,891, Cl. 225-93.000.
- Hoard, David W.; and Luke, Wayne D., to Eli Lilly and Company. Process for the synthesis of benzo[b]thiophenes. 5,569,772, Cl. 549-52.000.
- Hoban, Patrick J.; and Plaza, Michael C., to General Electric Company. Cylinder combustion gas leakage testing. 5,569,841, Cl. 73-47.000.
- Hoch, Robert: See—  
Moy, David; and Hoch, Robert, 5,569,635, Cl. 502-185.000.
- Hodge, Robert J., Jr.: See—



- Walter, Jerry L.; Hodge, Robert J., Jr.; and Jones, Stephen M., 5,569,883, Cl. 174-84.00R.
- Hoechst AG: See—  
Beller, Matthias; and Forstinger, Klaus, 5,569,776, Cl. 558-373.000.
- Hoechst Aktiengesellschaft: See—  
Deckers, Gregor; and Horn, Gerhardt, 5,569,792, Cl. 568-881.000.  
Profé, Hans Jürgen; and Rabe, Norbert, 5,569,865, Cl. 73-861.520.  
Reiber, Uwe; and Russ, Werner H., 5,569,748, Cl. 534-642.000.  
Willms, Lothar; Lacchein, Stephen; Schlegel, Günter; and Kehne, Heinz, 5,569,761, Cl. 544-213.000.
- Hoechst Mitsubishi Kasei Co.: See—  
Bühler, Ulrich, 5,569,751, Cl. 534-850.000.
- Hoechst-Roussel Pharmaceuticals, Inc.: See—  
Glamkowski, Edward J.; and Chiang, Yulin, 5,569,653, Cl. 514-217.000.
- Hoel, Steven B. Surgical instrument for suturing, 5,569,271, Cl. 606-148.000.
- Hofer, Bernd: See—  
Müller, Andreas; Klar, Manfred; and Hofer, Bernd, 5,570,014, Cl. 324-206.000.
- Hofer, Robert C. W.: See—  
Cordova, David S.; Weedon, Gene C.; Hofer, Robert C. W.; Boone, Mark B.; Kirkland, Kevin M.; Weber, Charles P., Jr.; and LaCasse, Gregory J., 5,568,657, Cl. 2-167.000.
- Hoffbeck, Loren J., to Pioneer Hi-Bred International, Inc. Inbred corn line PHT11, 5,569,821, Cl. 800-200.000.
- Hoffman, James A.: See—  
DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffman, James A.; Shields, James E.; and Smiley, David L., 5,569,743, Cl. 530-324.000.
- Hoffman, Kevin: See—  
Glatfelter, Troy; Hoffman, Kevin; Yang, Chi C.; and Guha, Subhendu, 5,569,332, Cl. 136-249.000.
- Hoffman, Kirk D.; Ferrantelli, Joe; and Huizenger, Robert, to Coin Mechanisms, Inc. Coin detector and identifier apparatus and method, 5,568,855, Cl. 194-318.000.
- Hoffmann, James A.: See—  
Basinski, Margaret B.; DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffman, James A.; Schoner, Brigitte E.; Shields, James E.; and Smiley, David L., 5,569,744, Cl. 530-324.000.
- Hofmeister, Christopher, to Brooks Automation, Inc. Frog-leg robot having walking-beams, 5,569,014, Cl. 414-744.300.
- Hofstetter, John M.; O'Neil, John A.; and Grabenkort, Richard W., to Abbott Laboratories. Syringe system accommodating separately storable prefilled containers for two constituents, 5,569,193, Cl. 604-89.000.
- Hohn, Barbara: See—  
Grimsley, Nigel H.; Hohn, Barbara; Hohn, Thomas; Davies, Jeffrey W.; and Boulton, Margaret L., 5,569,597, Cl. 435-172.300.
- Hohn, Thomas: See—  
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- Holden, Brian D., to Integrated Telecom Technology, Inc. Method and apparatus for queueing data cells in an ATM switch fabric architecture, 5,570,348, Cl. 370-17.000.
- Hollenbeck, Robert E.: See—  
Fifer, Larry D.; Hollenbeck, Robert E.; Kozlowski, Mark F.; Leone, Richard E.; and Patridge, Clifford H., 5,568,979, Cl. 383-8.000.
- Hollenberg, Walter: See—  
Blahut, Donald E.; Hollenberg, Walter; and Szurkowski, Edward S., 5,570,126, Cl. 348-7.000.
- Holloway, Leon F., Jr.; and Davis, Jesse L., Jr. Tool holder, 5,568,889, Cl. 224-661.000.
- Holm, Robert E., to Intel Corporation. Transform based scalable audio compression algorithms and low cost audio multi-point conferencing systems, 5,570,363, Cl. 370-62.000.
- Holmin, Mats C., to Atlas Copco Tools AB. Torque responsive release clutch mechanism, 5,569,118, Cl. 477-178.000.
- Holstrom, Stephen L. Lost article tracking system, 5,570,081, Cl. 340-573.000.
- Holten, William S. Portable forearm exercising device, 5,569,136, Cl. 482-126.000.
- Holton, Timothy A.; Cornish, Edwina C.; Kovacic, Filipa; Tanaka, Yoshikazu; and Lester, Diane R., to International Flower Developments Pty. Ltd. Genetic sequences encoding flavonoid pathway enzymes and uses therefor, 5,569,832, Cl. 800-205.000.
- Holtzlag, Antonius H., to Philips Electronics North America Corporation. Method and controller for detecting arc instabilities in gas discharge lamps, 5,569,984, Cl. 315-307.000.
- Holy, Norman L.: See—  
LaFleur, Edward E.; Work, William J.; Amici, Robert M.; Bortnick, Newman M.; and Holy, Norman L., 5,569,710, Cl. 525-57.000.
- Home Access Health Corporation: See—  
Wandell, Michael; Quattrocchi, Richard A.; and Frank, Allan, 5,569,223, Cl. 604-290.000.
- Hon Industries, Inc.: See—  
Nichols, Robert K., 5,569,505, Cl. 428-57.000.
- Honbo, Tsunao, to Canon Kabushiki Kaisha. Image forming apparatus which detects scanning light through slitted shield plate, 5,570,195, Cl. 358-302.000.
- Honda, Atsushi: See—  
Kono, Katsumi; Nakamura, Shinya; and Honda, Atsushi, 5,569,117, Cl. 477-169.000.
- Honda Giken Kogyo Kabushiki Kaisha: See—  
Akazaki, Shusuke; and Nishimura, Yoichi, 5,568,799, Cl. 123-480.000.  
Hasegawa, Yusuke; Nishimura, Yoichi; Komoriya, Isao; Akazaki, Shusuke; and Kimura, Eisuke, 5,569,847, Cl. 73-117.300.  
Matsuda, Takahiro; and Teshima, Daihei, 5,569,114, Cl. 477-45.000.  
Nagata, Tadaaki; Kouchi, Takao; and Itani, Yoshinobu, 5,568,840, Cl. 180-190.000.  
Yamada, Hajime; and Nakajima, Ryoji, 5,568,726, Cl. 60-323.000.
- Honegger, Rolf: See—  
Meisser, Claudio; and Honegger, Rolf, 5,569,402, Cl. 219-400.000.
- Honeywell Inc.: See—  
Olsen, David E., 5,569,890, Cl. 200-16.00A.  
Yeh, Tangshun; Hurst, Allan T.; Chen, Huang-Joung; Berg, Lonny L.; and Witcraft, William F., 5,569,617, Cl. 437-48.000.
- Hong, Gary, to United Microelectronics Corporation. Stepped floating gate EPROM device, 5,569,945, Cl. 257-316.000.
- Hong, Gary, to United Microelectronics Corporation. Flash memory cell with self-aligned tunnel dielectric area above LDD structure, 5,569,946, Cl. 257-316.000.
- Hong, Jin-Hua: See—  
Tsai, Ching-Hong; Guo, Fang-Diahn; Hong, Jin-Hua; and Wu, Cheng-Wen, 5,570,375, Cl. 371-22.300.
- Hong, Sung W.: See—  
Ferrandino, Mark P.; Hong, Sung W.; and McKenzie, George T., 5,569,697, Cl. 524-492.000.
- Hong, Young T.: See—  
Choi, Kil Y.; Won, Jong C.; Hong, Young T.; Woo, Sang S.; and Don, Youn S., 5,569,738, Cl. 528-170.000.
- Hong, Young-pyo, to Samsung Electronics Co., Ltd. Multilingual display device and method thereof, 5,570,134, Cl. 348-467.000.
- Honkanen, Erkki: See—  
Nore, Pentti; Honkanen, Erkki; Bäckström, Reijo; Wikberg, Tom; Haikala, Heimo; and Haara, Jorma, 5,569,657, Cl. 514-247.000.
- Hook, Kevin J.: See—  
Muranyi, Mark J.; Polluto, Dennis C.; Cyman, T. F.; Hook, Kevin J.; Christy, Orrin D.; and Mathis, Mark A., 5,570,170, Cl. 355-260.000.
- Hooley, Robert W.: See—  
Keller, Rex W.; Harlock, Robert; Hooley, Robert W.; and Harper, Patrick, 5,568,868, Cl. 206-724.000.
- Hooper, Herbert H.; Pacetti, Stephen; Soane, David S.; and Bae, Young C., to Soane Biosciences, Inc. Separation media for electrophoresis, 5,569,364, Cl. 204-455.000.
- Hooshari, Alireza, to Bellsouth Corporation. Dynamic resource allocation process for a service control point in an advanced intelligent network system, 5,570,410, Cl. 379-32.000.
- Hoosier Group, L.L.C.: See—  
Beamer, John V., 5,568,995, Cl. 405-119.000.
- Hoover Universal, Inc.: See—  
Weber, James L.; and Nae, Vasile, 5,568,959, Cl. 297-238.000.
- Hopkins, Charles D.; Livingston, Ronald R.; and Toole, William R., Jr., to United States of America, Energy. Hydraulic pump with in-ground filtration and monitoring capability, 5,569,021, Cl. 417-63.000.
- Höppner, Bernd: See—  
Jachow, Harald; Körner, Reinhard; Veitch, Ronald J.; Schwab, Ekkehard; Jakusch, Helmut; Höppner, Bernd; Lehnert, Rudi; and Ohlinger, Manfred, 5,569,409, Cl. 252-62.560.
- Hora, Naofumi: See—  
Hiraoka, Toshikage; Tanimoto, Tetsuji; Makino, Yoshihiko; Ninomiya, Tadashi; Hora, Naofumi; Ashihara, Yoshihiro; Sudo, Yukio; and Mori, Toshihiro, 5,569,589, Cl. 435-7.900.
- Horiba, Ltd.: See—  
Komatani, Shintaro, 5,570,406, Cl. 378-44.000.
- Horie, Kazuyuki: See—  
Oda, Kouichi; Horie, Kazuyuki; and Ino, Masao, 5,569,311, Cl. 55-493.000.
- Horii, Hiroyuki; Date, Nobuaki; Mimura, Toshihiko; Tojo, Akihiko; Kawamura, Hideaki; Murata, Yoshitaka; Takaiwa, Kan; Suzuki, Takashi; Ozaki, Seiichi; Taira, Junzo; and Nagasawa, Kenichi, to Canon Kabushiki Kaisha. Detachable memory with starting block address selected in accordance with detected television programming standard, 5,570,130, Cl. 348-233.000.
- Horn, Gerhardt: See—  
Deckers, Gregor; and Horn, Gerhardt, 5,569,792, Cl. 568-881.000.
- Horne, Stephen C.: See—  
McMinn, Brian D.; and Horne, Stephen C., 5,570,294, Cl. 364-481.000.
- Horodysky, Andrew G.: See—  
Avery, Noyes L.; Axelrod, Joan C.; Carey, James T.; Hiebert, John; and Horodysky, Andrew G., 5,569,407, Cl. 508-454.000.
- Horst, Sheldon; and Martin, Eugene, to Foodcraft Equipment Company. Apparatus for cutting wings from poultry, 5,569,069, Cl. 452-169.000.
- Hoshi, Hidenori: See—  
Tanaka, Yasuyuki; and Hoshi, Hidenori, 5,570,199, Cl. 386-95.000.
- Hoshi, Masamichi: See—  
Tanaka, Akira; and Hoshi, Masamichi, 5,568,932, Cl. 277-180.000.
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- Hosoda, Masayuki, to Kabushiki Kaisha Top. Endoscopic instrument for ligating varix, 5,569,268, Cl. 606-140.000.
- Hotier, Gérard: See—

- Cansell, François; Hotier, Gérard; Marteau, Philippe; and Zanier, Nathalie, 5,569,808, Cl. 585-800.000.
- Houser, Russell A.; Jackson, Jerome; and Thompson, Russell B., to EP Technologies, Inc. Catheter component bond and method, 5,569,221, Cl. 604-282.000.
- Hovel, Harold J.: See—  
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- Howard, Matthew A., III; Grady, M. Sean; and Winn, H. Richard, to University of Washington. Device and methods for parieto-occipital placement of ventricular catheters, 5,569,267, Cl. 606-130.000.
- HR Smith (Technical Developments) Limited: See—  
Smith, Henry R., 5,570,265, Cl. 361-218.000.
- Hsia, Yiao-Tee: See—  
Nepela, Daniel A.; Chang, Ciuter; Hsia, Yiao-Tee; and Bhadra, Rajendra, 5,568,981, Cl. 384-12.000.
- Hsu, Fu-Yu. Electrical connector, 5,569,045, Cl. 439-342.000.
- Hsu, Hsi-Yen: See—  
Kuo, Pinc-Sci; Chu, Shiao-Jung; Dai, Chu-Chang; Hsu, Hsi-Yen; Lin, Ching-Tang; and Lin, Yi-Yun, 5,569,770, Cl. 548-543.000.
- Huang, Shun-Feng. Christmas lamp socket, 5,569,044, Cl. 439-340.000.
- Huber & Bauer GmbH: See—  
Bauer, Anton, 5,568,742, Cl. 72-61.000.
- Huber, Jon M.: See—  
Desautels, Thomas; Allen, Charles E., Jr.; Palmeri, Frank A.; and Huber, Jon M., 5,569,115, Cl. 477-110.000.
- Hudson, Hank M.: See—  
Campbell, Roy E.; Wilkinson, John D.; and Hudson, Hank M., 5,568,737, Cl. 62-621.000.
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Kleemiss, Wolfgang; and Feld, Marcel, 5,569,781, Cl. 562-506.000.  
Lüken, Hans-Gerd; Fischer, Lothar; Droste, Wilhelm; and Nowitzki, Bernd, 5,569,802, Cl. 585-269.000.
- Hughes Aircraft Company: See—  
Gates, Louis E., Jr.; and Port, Richard M., 5,568,682, Cl. 29-831.000.  
Granger, Diana D.; and Miller, Leroy J., 5,569,493, Cl. 427-306.000.  
Quan, Clifton, 5,570,068, Cl. 333-33.000.
- Hughes Danbury Optical Systems, Inc.: See—  
Kohlin-Nitschelm, Margaret, 5,570,092, Cl. 342-1.000.
- Hughes Electronics: See—  
Liu, Weimin, 5,570,454, Cl. 395-2.320.
- Hughes-JVC Technology Corporation: See—  
Ruiz, Javier A.; and Sterling, Rodney D., 5,570,213, Cl. 359-72.000.
- Hughes, Robert: See—  
Sewemberger, Richard F.; Privitera, Salvatore; and Hughes, Robert, 5,569,292, Cl. 606-185.000.
- Huijsing, Johan H.: See—  
Fonderie, Maarten J.; Huijsing, Johan H.; and Toy, Edmond, 5,570,052, Cl. 327-205.000.
- Huizenger, Robert: See—  
Hoffman, Kirk D.; Ferrantelli, Joe; and Huizenger, Robert, 5,568,855, Cl. 194-318.000.
- Hull, Charles W., to 3D Systems, Inc. Method and apparatus for production of three-dimensional objects by stereolithography, 5,569,431, Cl. 264-401.000.
- Hulls Aktiengesellschaft: See—  
Steffen, Klaus-Dieter, 5,569,780, Cl. 560-192.000.
- Humphrey, Bruce H. Augmented polymeric hypodermic devices, 5,569,213, Cl. 604-239.000.
- Hundt, Michael J.: See—  
Siegel, Harry M.; Lao, Tom Q.; Kelappan, Krishnan; and Hundt, Michael J., 5,570,273, Cl. 361-773.000.
- Hung, Wang-Ho. Multifunctional computer desk, 5,568,773, Cl. 108-50.000.
- Hunt, Mitchell. Stabilizing bracket for adjustable meter setter, 5,568,945, Cl. 285-30.000.
- Hunter, Joe M.; and Kincaid, Derek S., to Shell Oil Company. Mannich base curing agents, 5,569,536, Cl. 428-413.000.
- Huovila, Jyrki; Nyberg, Petri; and Odell, Michael, to Valmet Corporation. Multi-layer headbox, 5,569,360, Cl. 162-343.000.
- Hurley, Rupert B., Jr. Descent, travel, and protection apparatus, method of making and using same, 5,568,902, Cl. 244-138.00R.
- Hurst, Allan T.: See—  
Yeh, Tangshun; Hurst, Allan T.; Chen, Huang-Joung; Berg, Lonny L.; and Witcraft, William F., 5,569,617, Cl. 437-48.000.
- Hurst, Matthew L.: See—  
Sabahi, Mahmood; and Hurst, Matthew L., 5,569,779, Cl. 560-190.000.
- Hurwitz, Steven, to Sony Corporation; and Materials Research Corporation. Method and apparatus for cooling a sputtering target, 5,569,361, Cl. 204-192.120.
- Hutchinson: See—  
Andre, Maxime, 5,568,949, Cl. 285-284.000.
- Hutchinson, Albert L.: See—  
Capasso, Federico; Cho, Alfred Y.; Faist, Jerome; Hutchinson, Albert L.; Sirtori, Carlo; and Sivo, Deborah L., 5,570,386, Cl. 372-46.000.
- Hutchinson, Ted F.; Lutz, Dale R.; MacDougall, Trevor W.; and Onstott, James R., to Minnesota Mining and Manufacturing Company. Holder for annealing fiber optic coils, 5,570,449, Cl. 385-134.000.
- Hutchison, Joel P., to Benson, Miriam M. Pallets of corrugated sheet material with interlocking components, 5,568,774, Cl. 108-51.300.
- Hyodo, Ryuji: See—  
Norizuki, Reiko; Hyodo, Ryuji; Tanaka, Kenji; Sekihata, Osamu; Hata, Hiroyuki; Eda, Susumu; and Omuro, Katsumi, 5,570,361, Cl. 370-60.100.
- Hyperion Catalysts, Int'l., Inc.: See—  
Moy, David; and Hoch, Robert, 5,569,635, Cl. 502-185.000.
- Hyundai Electronics Industries Co., Ltd.: See—  
Kim, Jae K., 5,569,948, Cl. 257-382.000.
- Hyundai Motor Company: See—  
Jang, Jae-Duk, 5,569,116, Cl. 477-130.000.
- I.S.M., Inc.: See—  
Smith, Charles S.; and Williamson, Jay D., 5,568,710, Cl. 52-426.000.
- Ianazzi, Peter: See—  
Cooper, Robert; Ianazzi, Peter; Nichols, Lawrence R.; and Parker, Thomas, 5,569,959, Cl. 280-728.300.
- Icanberry, Mark: See—  
Veneziano, Michael; and Icanberry, Mark, 5,568,700, Cl. 47-43.000.
- Ichikawa, Seigo: See—  
Morikawa, Kenji; Obinata, Hiroshi; Omata, Kazuo; Sato, Toshihiko; Nakajima, Yoshihiko; and Ichikawa, Seigo, 5,570,468, Cl. 588-1.000.
- Ichimaru, Masahiro; and Watanabe, Izumi, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Meter for measuring air flow by resistance heating, 5,569,851, Cl. 73-204.150.
- Ichimiya, Koji: See—  
Endo, Osamu; Hayashi, Yoshinori; Ichimiya, Koji; and Ohsawa, Takayuki, 5,570,224, Cl. 359-212.000.
- ICON Health & Fitness, Inc.: See—  
Dalebout, William T., 5,569,128, Cl. 482-57.000.
- Idemitsu Petrochemical Co., Ltd.: See—  
Okamoto, Kohei; Inoue, Kyoichi; and Kutuno, Takayoshi, 5,569,716, Cl. 525-192.000.
- Ido, Kihiei; and Ohta, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Method and system using encoded periodic digital sum variation (DSV) as pilot signal and controlling tracking error using crosstalk from the pilot signal, 5,570,248, Cl. 360-77.140.
- Ido, Tatemu; and Sano, Hirohisa, to Hitachi, Ltd. Optical waveguide device and optical transmission system, 5,570,439, Cl. 385-37.000.
- Ieki, Hideharu: See—  
Koike, Jun; and Ieki, Hideharu, 5,569,548, Cl. 428-699.000.
- Iga, Atsushi: See—  
Itoh, Masahiro; Iga, Atsushi; and Okinaka, Hideyuki, 5,569,414, Cl. 252-518.000.
- Iga, Naoto, to NEC Corporation. Path trace byte collecting circuit for synchronous optical networks, 5,570,371, Cl. 370-99.000.
- Igarashi, Hiroshi; Mochizuki, Azuma; Kajima, Yoshitaka; Ohara, Toshiya; Inoue, Hideki; and Tohyama, Shigeki, to Namco Limited. Gun game machine having a sliding gun barrel cover for simulating the impact of a fired gun, 5,569,085, Cl. 463-49.000.
- Ihara, Kazunori, deceased (by Seiko Ihara, executor): See—  
Fukui, Isao; Takahashi, Masamitsu; Ihara, Kazunori, deceased; Murakami, Hiroshi; Tanaka, Tetsuhiro; Miyaura, Shinobu; Kuroda, Shinichi; Hiraishi, Masahiro; and Inoue, Koji, 5,569,455, Cl. 422-174.000.
- Ihara, Seiko, executor: See—  
Fukui, Isao; Takahashi, Masamitsu; Ihara, Kazunori, deceased; Murakami, Hiroshi; Tanaka, Tetsuhiro; Miyaura, Shinobu; Kuroda, Shinichi; Hiraishi, Masahiro; and Inoue, Koji, 5,569,455, Cl. 422-174.000.
- Iida, Takuya: See—  
Yokono, Hitoshi; Yokono, Haruki; Mikamo, Masahiro; Narushima, Ryouichi; Iida, Takuya; and Endo, Yasuhiro, 5,569,545, Cl. 428-626.000.
- Ikebe, Kimihiro, to Kabushiki Kaisha Toshiba. Semiconductor device, 5,569,964, Cl. 257-780.000.
- Ikedo, Kenichi: See—  
Tanaka, Yasuyuki; Shibata, Kazuhiko; Ikeda, Kenichi; Nishida, Yuji; Hayashi, Masaharu; Nakade, Shinichi; Kuga, Akihito; and Kanamaru, Eiji, 5,569,740, Cl. 528-502.00F.
- Ikegami, Shiro: See—  
Imura, Akitoshi; Saito, Toru; and Ikegami, Shiro, 5,569,490, Cl. 427-212.000.
- Ikemoto, Manabu: See—  
Obata, Yoshiyuki; Suematsu, Hideki; and Ikemoto, Manabu, 5,569,347, Cl. 156-235.000.
- Ikuta, Yuzo; Tashiro, Satoshi; Hatano, Yoshiyuki; Fujita, Tadasu; Andoh, Noboru; Asaoka, Sachio; Kobayashi, Haruto; and Minami, Takeshi, to Nissin Oil Mills, Ltd., The; and Chiyoda Corporation. Transesterification with lipase immobilized on a polymer containing epoxy and tertiary amino groups, 5,569,594, Cl. 435-134.000.
- ILC Technology, Inc.: See—  
Oyie, George; and Caruso, Joseph R., 5,569,978, Cl. 313-631.000.
- Imagawa, Yasuharu: See—  
Mori, Shigeru; and Imagawa, Yasuharu, 5,569,060, Cl. 451-5.000.
- Imai, Kiyotaka, to NEC Corporation. Method of manufacturing a bipolar transistor operating at low temperature, 5,569,611, Cl. 437-31.000.
- Imai, Yuji, to Nikon Corporation. Substrate height position detecting apparatus wherein a stop plate transmits a pattern of oblique light beams which are reflected by the substrate, 5,569,930, Cl. 250-559.400.



- Imamura, Masaya; Ogata, Hiromi; and Sawase, Kensuke, to Rohm Co., Ltd. Combined read and print head. 5,570,122, Cl. 347-171.000.
- Imoto, Katsuyuki; and Koya, Kazuo, to Hitachi Cable, Ltd.; and Shin-Etsu Chemical Co., Ltd. Rare earth element-doped multiple-core optical fiber, method for fabricating the same, and optical amplifier using the same. 5,570,448, Cl. 385-126.000.
- Imoto, Kazunobu: See—
- Shirai, Koichi; Imoto, Kazunobu; Narita, Satoshi; Kamikubo, Yoshinori; and Hamashima, Mitsuhiro, 5,569,638, Cl. 503-227.000.
- Imperial Chemical Industries: See—
- Bird, Colin R.; Boniwell, Jeremy M.; Grierson, Donald; Ray, John A.; and Schuch, Wolfgang W., 5,569,829, Cl. 800-205.000.
- Imra Europe SA: See—
- Gschwind, Michel; and Ancey, Pascal, 5,568,977, Cl. 374-45.000.
- Imura, Akio; Saito, Toru; and Ikegami, Shiro, to Osaka Cement Co., Ltd. Tetracalcium phosphate-based materials and processes for their preparation. 5,569,490, Cl. 427-212.000.
- Inaba, Ryo: See—
- Tominaga, Junji; Haratani, Susumu; Inaba, Ryo; and Kuwahara, Tsuneo, 5,569,517, Cl. 428-64.100.
- Inagawa, Masako: See—
- Ohya, Kazumasa; Inagawa, Masako; and Miyauchi, Masahiro, 5,568,679, Cl. 29-25.350.
- Inaguma, Yoshiyuki: See—
- Jung, Hyung J.; Kim, Hyun J.; Kim, Kyong Y.; Yoon, Seok J.; Yoon, Sang O.; Nakamura, Tetsuro; Itoh, Mitsuru; and Inaguma, Yoshiyuki, 5,569,632, Cl. 501-136.000.
- Inao, Takeshi: See—
- Aizawa, Tatsuhiko; and Inao, Takeshi, 5,569,860, Cl. 73-863.000.
- InControl Solutions, Inc.: See—
- Franz, Patrick J., 5,568,987, Cl. 400-490.000.
- Indiana Mills and Manufacturing, Inc.: See—
- Freeman, Keith H., 5,568,676, Cl. 24-641.000.
- Indigo N.V.: See—
- Landa, Benzion; Niv, Yehuda; Plotkin, Michael; and Forgacs, Peter, 5,570,193, Cl. 356-442.000.
- Industrial Technology Research Institute: See—
- Chen, Kuan-Chou; and Shyr, Duen-Jyh, 5,568,857, Cl. 198-592.000.
- Kuo, Pine-Sci; Chu, Shiao-Jung; Dai, Cho-Chang; Hsu, Hsi-Yen; Lin, Ching-Tang; and Lin, Yi-Yun, 5,569,770, Cl. 548-543.000.
- Lin, Hung-Sheng, 5,570,370, Cl. 370-95.300.
- Infectech, Inc.: See—
- Ollar, Robert A., 5,569,592, Cl. 435-32.000.
- Ing. C. Olivetti & C., S.p.A.: See—
- Foschi, Vanni, 5,570,290, Cl. 364-464.020.
- Innavision Services, Inc.: See—
- Cataneo, Ralph J.; and Tannebaum, Robert J., 5,568,883, Cl. 222-136.000.
- Innes, Robert A.; and Smith, Gary J., to Alcan International Limited. Method and apparatus for coating strip article up to strip edge. 5,569,491, Cl. 427-284.000.
- Innovative Devices, Inc.: See—
- Hart, Ricky D.; and Rice, John T., 5,569,269, Cl. 606-144.000.
- Ino, Masao: See—
- Oda, Kouichi; Horie, Kazuyuki; and Ino, Masao, 5,569,311, Cl. 55-493.000.
- Inorganic Coatings, Inc.: See—
- Schaffer, Parke, Jr.; Laughlin, Thomas; and Mann, David M., 5,569,543, Cl. 428-552.000.
- Inoue, Hideki: See—
- Igarashi, Hiroshi; Mochizuki, Azuma; Kajima, Yoshitaka; Ohara, Toshiya; Inoue, Hideki; and Tohyama, Shigeki, 5,569,085, Cl. 463-49.000.
- Inoue, Kenichi: See—
- Yokoyama, Kazushi; Suzuki, Norio; Inoue, Kenichi; and Furukawa, Yukito, 5,569,919, Cl. 250-309.000.
- Inoue, Koji: See—
- Fukui, Isao; Takahashi, Masamitsu; Ihara, Kazumori, deceased; Murakami, Hiroshi; Tanaka, Tetsuhiro; Miyaura, Shinobu; Kuroda, Shinichi; Hiraiishi, Masahiro; and Inoue, Koji, 5,569,455, Cl. 422-174.000.
- Inoue, Kyoichi: See—
- Okamoto, Kohei; Inoue, Kyoichi; and Kutano, Takayoshi, 5,569,716, Cl. 525-192.000.
- Inoue, Sadayuki; Ishimoto, Junko; Nakamura, Takahiko; and Kumano, Makoto, to Mitsubishi Denki Kabushiki Kaisha. Error-correcting apparatus. 5,570,378, Cl. 371-37.100.
- Inoue, Toru: See—
- Kusumoto, Yasuhiro; Omata, Makoto; Kanesawa, Yoshio; Uehara, Yasuhiro; and Inoue, Toru, 5,570,171, Cl. 355-285.000.
- Inoue, Toshio; and Asada, Tadashi, to Inoue, Toshio. Theft prevention tab device having alarm mechanism housed therein. 5,570,080, Cl. 340-571.000.
- Institut Francais Du Pétrole: See—
- Ajot, Hubert, deceased; Ajot, by Laure, legal representative; Ajot, by Alexandra, legal representative; Ajot, by Vincent, legal representative; Russmann, Colette; Brandely, Jose; Garnier, Dominique; and Gonzalez, Pierre, 5,569,839, Cl. 73-38.000.
- Cameron, Charles; Nocca, Jean-Luc; Sarrazin, Patrick; and Forestiere, Alain, 5,569,806, Cl. 585-668.000.
- Cansell, François; Hotier, Gérard; Marteau, Philippe; and Zanier, Nathalie, 5,569,808, Cl. 585-800.000.
- Institut National de la Recherche Agronomique: See—
- Vincenz, Michel; Dorlhac, François; Chupeau, Yves; Morot-Gaudry, Jean-François; and Caboche, Michel, 5,569,833, Cl. 800-205.000.
- Institute of Molecular Biology & Technology: See—
- Tavernarakis, Nectarios; Hatzidakis, George; and Krambovitis, Elias, 5,569,582, Cl. 435-5.000.
- Instrumentarium Oy: See—
- Weckström, Kurt, 5,570,179, Cl. 356-311.000.
- Integrated Telecom Technology, Inc.: See—
- Holden, Brian D., 5,570,348, Cl. 370-17.000.
- Intel Corporation: See—
- Conary, James, 5,570,050, Cl. 327-143.000.
- Holm, Robert E., 5,570,363, Cl. 370-62.000.
- Needham, Wayne; Qian, Qi-De; and Maloney, Tim, 5,570,034, Cl. 324-763.000.
- Rosen, Eitan; and Milstein, Yakov, 5,570,317, Cl. 365-200.000.
- Soo, Paul J., 5,570,306, Cl. 364-715.110.
- Inter Tooling Services B.V.: See—
- van Manen, Dirk; and Albers, Hendrikus J. T., 5,569,476, Cl. 425-556.000.
- Interferometrics, Inc.: See—
- Knight, Curtis A.; and Webber, John C., 5,570,096, Cl. 342-357.000.
- International Business Machine Corporation: See—
- Berry, Richard E., 5,570,281, Cl. 364-146.000.
- International Business Machines Corporation: See—
- Adamopoulos, Eleftherios; Lee, Kang-Wook; O'Toole, Terrence R.; Purushothaman, Sampath; Shaw, Jane M.; Viehbeck, Alfred; and Walker, George F., 5,569,739, Cl. 528-353.000.
- Aoyagi, Akihiko; and Ruiz, Oscar J., 5,570,249, Cl. 360-104.000.
- Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C.; Clearfield, Howard M.; Doany, Foad E.; Flagello, Donis G.; Hovel, Harold J.; Latulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushothaman, Sampath; Scherperel, Christopher M.; Seeger, David E.; and Shaw, Jane M., 5,569,501, Cl. 427-577.000.
- Baker, Murray C.; Cheung, Roger Y. M.; Bhattacharya, Partha P.; Kobo, Roberto M.; Kolbe, Eduardo M.; and Naghshineh, Mahmoud, 5,570,366, Cl. 370-85.130.
- Balzer, Peter L., 5,569,570, Cl. 430-22.000.
- Barrett, Robert C.; Olyha, Robert S., Jr.; and Rutledge, Joseph D., 5,570,111, Cl. 345-157.000.
- Brown, Dana H.; Christensen, Thomas C.; Cunningham, Earl A.; and Rogelstad, Wayne A., 5,570,247, Cl. 360-75.000.
- Chan, Ken Tze-Kin; Enichen, William A.; Hartley, John G.; and Sturans, Maris A., 5,570,405, Cl. 378-35.000.
- Dang, Chi-Hung, 5,570,337, Cl. 369-192.000.
- Finney, Damon W.; Jenkins, Michael O.; and Rayfield, Michael J., 5,570,356, Cl. 370-85.900.
- Frater, Norman K.; Giorgi, Alan P.; and Ruiz, Oscar J., 5,570,261, Cl. 360-104.000.
- Haas, Lee C., 5,570,089, Cl. 341-102.000.
- Jahnes, Christopher V.; Kaufman, James H.; Metin, Serhat; Mirzamaani, Mohammad T.; and Wu, Anthony W., 5,569,506, Cl. 428-65.300.
- Lewis, David A.; and Narayan, Chandrasekhar, 5,569,950, Cl. 257-467.000.
- Lynch, Robert C.; Myers, Kevin H.; Smith, Ronald A.; Talley, William L.; and Veals, Edward R., 5,569,895, Cl. 235-1.00R.
- Oechsle, Rainer, 5,570,466, Cl. 395-200.150.
- Ramanujam, Gopalan, 5,570,460, Cl. 395-124.000.
- Selker, Edwin J., 5,570,268, Cl. 361-683.000.
- Zetts, John M., 5,570,113, Cl. 345-173.000.
- Zimmerman, Steven M., 5,569,973, Cl. 313-309.000.
- International Flower Developments Pty. Ltd.: See—
- Holton, Timothy A.; Cornish, Edwina C.; Kovacic, Filipa; Tanaka, Yoshikazu; and Lester, Diane R., 5,569,832, Cl. 800-205.000.
- International Rectifier Corporation: See—
- Nadd, Bruno C., 5,569,982, Cl. 315-209.00T.
- InterVoice Limited Partnership: See—
- Cave, Ellis K.; Ammann, Larry P.; and Zimmer, Christopher P., 5,570,419, Cl. 379-216.000.
- Inui, Katsumi: See—
- Hata, Masahiko; Fukuhara, Noboru; Takata, Hiroaki; and Inui, Katsumi, 5,569,954, Cl. 257-627.000.
- Inui, Tetsuya; Ishii, Yorisige; Ohta, Kenji; Kimura, Kazuhiro; and Hirata, Susumu, to Sharp Kabushiki Kaisha. Information recording and reproducing apparatus having a slider format of single crystal silicon body and cantilever. 5,570,336, Cl. 364-126.000.
- Iomega Corporation: See—
- Sumner, Wayne A.; Bracken, Allen T.; Griffith, David W.; Jones, David R.; and Rich, Edward L., 5,570,252, Cl. 360-133.000.
- Iraschko, Johann: See—
- Baumgartner, Hans; Bieker, Dieter; and Iraschko, Johann, 5,568,845, Cl. 188-71.900.
- Irie, Christoph: See—
- Mormann, Werner; and Irie, Christoph, 5,569,727, Cl. 525-528.000.
- Isenberg, David S.; and Tuonenoksa, Mark L., to Lucent Technologies Inc. System and method of capturing encoded data transmitted over a communications network in a video system. 5,570,295, Cl. 364-514.00R.
- Ishida Co., Ltd.: See—

- Naito, Kazufumi; Nakamura, Yoshihiro; and Konishi, Hiroyuki, 5,569,887, Cl. 177-184.000.
- Ishida, Fumiaki; Fujio, Masayuki; Kobayashi, Kazuo; and Hasegawa, Kengo, to Hitachi, Ltd. Vortex blower. 5,569,023, Cl. 417-326.000.
- Ishida, Tatsuki: See—
- Thoma, Kiyokazu; Yoshimoto, Kazunari; Sugita, Ryuji; and Ishida, Tatsuki, 5,569,523, Cl. 428-213.000.
- Ishida, Yoshihiko; and Tani, Makoto, to NGK Insulators, Ltd. Apparatus and method for transmitting and receiving ultrasonic waves having an acoustic-electric, ultrasonic transducer. 5,569,854, Cl. 73-628.000.
- Ishihara, Sumi: See—
- Umemoto, Tervu; Ishihara, Sumi; and Adachi, Kenji, 5,569,771, Cl. 549-44.000.
- Ishihara, Toshinobu: See—
- Watanabe, Satoshi; Shimada, Junji; Ohsawa, Youichi; Takemura, Katsuya; Ishihara, Toshinobu; and Maruyama, Kazumasa, 5,569,784, Cl. 564-430.000.
- Ishii, Yorisige: See—
- Inui, Tetsuya; Ishii, Yorisige; Ohta, Kenji; Kimura, Kazuhiro; and Hirata, Susumu, 5,570,336, Cl. 364-126.000.
- Ishikawa, Masayoshi; and Fitzhenry, Edward T. Jr., to YKK Corporation of America. Solarium structure. 5,568,707, Cl. 52-200.000.
- Ishikawa, Shigeki: See—
- Asaka, Shunichi; and Ishikawa, Shigeki, 5,570,285, Cl. 364-424.020.
- Ishimoto, Junko: See—
- Inoue, Sadayuki; Ishimoto, Junko; Nakamura, Takahiko; and Kumano, Makoto, 5,570,378, Cl. 371-37.100.
- Ishimoto, Manabu: See—
- Kato, Masayuki; Aritake, Hirokazu; Ishimoto, Manabu; Sato, Noriko; and Nakashima, Masato, 5,570,208, Cl. 359-23.000.
- Ishizuka, Koh; and Kaneda, Yasushi, to Canon Kabushiki Kaisha. Optical displacement sensor. 5,569,913, Cl. 250-237.000.
- Isobe, Tomohisa: See—
- Fujiwara, Takaki; and Isobe, Tomohisa, 5,569,773, Cl. 549-525.000.
- Isoda, Satoru; Hanazato, Yoshio; Ueyama, Satoshi; Kawakubo, Hiroaki; and Nishikawa, Satoshi, to Mitsubishi Denki Kabushiki Kaisha. Visual information processing device. 5,570,457, Cl. 395-25.000.
- Ison, Ira C.: See—
- Fulmer, Mark; Constantz, Brent R.; Ison, Ira C.; and Barr, Bryan M., 5,569,442, Cl. 423-311.000.
- Isshiki, Masao; Kiguchi, Yukio; Sato, Takashi; and Kageyama, Yasuhiro, to Kabushiki Kaisha Toshiba. Air conditioning apparatus and method of controlling same. 5,568,732, Cl. 62-129.000.
- Itabashi, Kazuo: See—
- Erna, Taiji; Itabashi, Kazuo; and Mizutani, Kazuhiro, 5,570,311, Cl. 365-154.000.
- Itani, Yoshinobu: See—
- Nagata, Tadaaki; Kouchi, Takao; and Itani, Yoshinobu, 5,568,840, Cl. 180-190.000.
- Ito, Akihiko; and Gotoh, Yukio, to Fujitsu Limited. Switching power supply apparatus. 5,570,277, Cl. 363-19.000.
- Ito, Hidekazu; Morimoto, Ryoichi; and Miura, Hidemitsu, to Kuraray Engineering Co., Ltd. Tank transportation system and production utilizing the same. 5,568,770, Cl. 104-88.010.
- Ito, Hideo: See—
- Nakazawa, Masaaki; Ito, Hideo; Nakamoto, Koji; Kura, Yasuhiro; Kitano, Seiji; Yabe, Hisao; and Furukawa, Tatsuya, 5,569,157, Cl. 600-107.000.
- Ito, Nobue: See—
- Katayama, Masayuki; Mizutani, Atsushi; Hattori, Yutaka; and Ito, Nobue, 5,569,486, Cl. 427-66.000.
- Itoh, Masahiro; Iga, Atsushi; and Okinaka, Hideyuki, to Matsushita Electric Industrial Co., Ltd. Method of manufacturing zinc oxide sintered compact body. 5,569,414, Cl. 252-518.000.
- Itoh, Mitsuru: See—
- Jung, Hyung J.; Kim, Hyun J.; Kim, Kyong Y.; Yoon, Seok J.; Yoon, Sang O.; Nakamura, Tetsuro; Itoh, Mitsuru; and Inaguma, Yoshiyuki, 5,569,632, Cl. 501-136.000.
- Itoh, Shigeyuki: See—
- Matsumoto, Kenji; Itoh, Shigeyuki; Sano, Kenji; Kobayashi, Jun; Mori, Koji; and Okada, Kenji, 5,570,220, Cl. 359-146.000.
- Itoh, Shinichi: See—
- Ohno, Tadayoshi; Yamaguchi, Takashi; and Itoh, Shinichi, 5,570,124, Cl. 347-221.000.
- ITT Corporation: See—
- Jackowski, Keith T., 5,568,946, Cl. 285-38.000.
- IVAC Corporation: See—
- Minami, Don S.; and Nason, Kevin S., 5,568,912, Cl. 251-205.000.
- Ivel, Leonard L.: See—
- Petit, Theodore E., Jr.; and Ivel, Leonard L., 5,569,885, Cl. 174-178.000.
- Ivers, Douglas E.: See—
- Margolis, Donald L.; Jolly, Mark R.; Schroeder, Warren R.; Heath, Michael C.; and Ivers, Douglas E., 5,570,286, Cl. 364-424.050.
- Iwakiri, Tsuneaki; and Shimaoka, Gorou, to Mitsubishi Gas Chemical Company, Inc. Thermoplastic resin composition for profile extrusion. 5,569,700, Cl. 524-504.000.
- Iwamasa, Robert T.: See—
- Makati, Ashok C.; Kan, Charles S.; Iwamasa, Robert T.; and Lee, Do L., 5,569,686, Cl. 523-409.000.
- Iwamoto, Shigeru: See—
- Nakazato, Morikuni; Muramatsu, Takahiro; and Iwamoto, Shigeru, 5,569,405, Cl. 508-192.000.
- Iwanami, Kunio: See—
- Yamamura, Michio; Iwanami, Kunio; Taguchi, Tatsuhisa; and Fukushima, Masafumi, 5,569,028, Cl. 418-55.300.
- Iwasa, Shoichi; and Naganuma, Takeshi, to Nippon Steel Corporation. Insulated-gate field-effect transistor in a semiconductor device in which source/drain electrodes are defined by formation of silicide on a gate electrode and a field-effect transistor. 5,569,947, Cl. 257-336.000.
- Iwata, Fujio: See—
- Toda, Toshiki; Takahashi, Susumu; and Iwata, Fujio, 5,570,338, Cl. 369-275.100.
- Iwatsubo, Masahito: See—
- Korikawa, Masayuki; Shinohara, Toru; Iwatsubo, Masahito; Yokoyama, Saori; Ohmori, Hideki; Watanabe, Takasi; and Ohsugi, Tsuneo, 5,570,269, Cl. 361-685.000.
- J.C. Pardo & Sons: See—
- Gabriele, Valentino, 5,568,976, Cl. 366-312.000.
- J.L. Behmer Corporation: See—
- Fenley, Thomas D., 5,570,001, Cl. 322-36.000.
- J. M. Voith GmbH: See—
- Ruhl, Friedhelm, 5,569,326, Cl. 118-205.000.
- Jachow, Harald; Körner, Reinhard; Veitch, Ronald J.; Schwab, Ekkehard; Jakusch, Helmut; Höppner, Bernd; Lehnert, Rudi; and Ohlinger, Manfred, to BASF Magnetics GmbH. Finely divided acicular magnetic modified chromium dioxide. 5,569,409, Cl. 252-62.560.
- Jackowski, Keith T., to ITT Corporation. Squeeze-to-release quick connector with snap-in retainer. 5,568,946, Cl. 285-38.000.
- Jackson, A.I. Golf club shaft and laminar structural element and method for its manufacture. 5,569,099, Cl. 473-319.000.
- Jackson, Andrew, to LaRoche Industries, Inc. Chlorination of halogenated carbon compounds for purification purposes. 5,569,798, Cl. 570-178.000.
- Jackson, Dale H., to Heidelberger Druckmaschinen AG; and Heidelberg Harris, Inc. Method and device for maintaining print to cut register. 5,568,767, Cl. 101-226.000.
- Jackson, Jerome: See—
- Houser, Russell A.; Jackson, Jerome; and Thompson, Russell B., 5,569,221, Cl. 604-282.000.
- Jacob, Stanley W., to Russell A. Krueger Pharmaceuticals, Inc. Pharmacologic management of snoring. 5,569,679, Cl. 514-711.000.
- Jacobs, Patricia B.; and Yonek, Kenneth P., to Bayer Corporation. Aqueous polyurea dispersions with improved hardness and solvent resistance. 5,569,706, Cl. 524-591.000.
- Jacobs-Cook, Alan J., to Lucas Industries public limited company. Differential pressure transducer wherein a bridge connects two pressure diaphragms. 5,569,856, Cl. 73-702.000.
- Jacobson, Howard W., to Du Pont de Nemours, E. I., and Company. Electroconductive material and process. 5,569,413, Cl. 252-518.000.
- Jacobson, Howard W.: See—
- Feist, Thomas P.; and Jacobson, Howard W., 5,569,412, Cl. 252-518.000.
- Jaeger Industrial Co., Ltd.: See—
- Wong, Ron, 5,569,906, Cl. 250-205.000.
- Jäger, Arnold. Hollow plastic pin with varying wall thickness. 5,569,093, Cl. 473-118.000.
- Jäger, Horst; and Wolff, Joachim, to Bayer Aktiengesellschaft. Reactive disazo dyestuffs which contain two heterocyclic reactive groups. 5,569,747, Cl. 534-630.000.
- Jahnes, Christopher V.; Kaufman, James H.; Metin, Serhat; Mirzamaani, Mohammad T.; and Wu, Anthony W., to International Business Machines Corporation. Magnetic recording disk and disk drive with improved head-disk interface. 5,569,506, Cl. 428-65.300.
- Jakusch, Helmut: See—
- Jachow, Harald; Körner, Reinhard; Veitch, Ronald J.; Schwab, Ekkehard; Jakusch, Helmut; Höppner, Bernd; Lehnert, Rudi; and Ohlinger, Manfred, 5,569,409, Cl. 252-62.560.
- James, Anthony; Lee, Harry; Pepper, John R.; and Russell, Thomas A., to Smith & Nephew Richards Inc. Cannulated modular intramedullary nail. 5,569,249, Cl. 606-62.000.
- James River Corporation of Virginia: See—
- Cameron, John H., 5,569,358, Cl. 162-117.000.
- James River Paper Company, Inc.: See—
- Joiner, John R., 5,569,359, Cl. 162-206.000.
- Jang, Jae-Duk, to Hyundai Motor Company. Electronic and hydraulic system of five speed automatic transmission. 5,569,116, Cl. 477-130.000.
- Jang, Yue-Teh; and Belef, William M., to Cardiovascular Imaging Systems, Inc. Intravascular catheter having combined imaging abrasion head. 5,569,276, Cl. 606-159.000.
- Janiak, Philip: See—
- Fauchere, Jean-Luc; Thuisseau, Christophe; Vilaine, Jean-Paul; and Janiak, Philip, 5,569,647, Cl. 514-11.000.
- Jansen, Martin; Letschert, Hans-Peter; and Speer, Dietrich, to Degussa Aktiengesellschaft. Process for using tantalum (V) nitride as a pigment and the colored products produced thereby. 5,569,322, Cl. 106-401.000.
- Janssen, Adrian P.; and Donaldson, Alan, to Northern Telecom Limited. Method of optically coupling optical fibres to injection lasers. 5,570,444, Cl. 385-90.000.
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O'Carroll, Lynda C.; O'Carroll, Colm D.; Jones, Alan; Matlock, Marilyn T.; and McLeod, Roderick D., 5,569,385, Cl. 210-727.000.  
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Hirano, Sayoko, 5,569,870, Cl. 84-615.000.  
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Okada, Toshikazu, 5,569,109, Cl. 475-28.000.  
Tsurumaki, Naoya; and Sakuragi, Shunichi, 5,569,397, Cl. 219-121.510.  
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Matsuki, Yuji; and Hirohashi, Seiji, 5,568,844, Cl. 188-68.000.  
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Suzuki, Yasuo, 5,569,009, Cl. 411-413.000.  
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Hosoda, Masayuki, 5,569,268, Cl. 606-140.000.  
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Ikebe, Kimihiro, 5,569,964, Cl. 257-780.000.  
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Makino, Eiichi; and Koyanagi, Masaru, 5,570,038, Cl. 326-33.000.  
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Miyoshi, Motosuke; and Okumura, Katsuya, 5,569,392, Cl. 216-60.000.  
Ohno, Tadayoshi; Yamaguchi, Takashi; and Itoh, Shinichi, 5,570,124, Cl. 347-221.000.  
Sakamaki, Kazuo, 5,570,399, Cl. 376-260.000.  
Soned, Kouichi, 5,570,145, Cl. 396-547.000.  
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Yamazaki, Masahiko; and Yaoi, Yoshiaki, 5,570,403, Cl. 378-5.000.  
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Schomburg, Werner; Rapp, Richard; and Kadel, Klaus, 5,569,855, Cl. 73-700.000.  
Kaga, Yosimitu: See—  
Nitta, Tomio; Mifune, Hideo; Seki, Masato; Kaga, Yosimitu; and Serizawa, Noriyuki, 5,568,805, Cl. 126-262.000.  
Kageyama, Yasuhiro: See—  
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Vander Ark, John D., Jr.; and Kaiser, Danny K., 5,569,383, Cl. 210-408.000.  
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Kaiser, Ulrich, to Texas Instruments Incorporated. Method and apparatus for wireless chemical supplying. 5,569,187, Cl. 604-67.000.  
Kajima, Yoshitaka: See—

- Igarashi, Hiroshi; Mochizuki, Azuma; Kajima, Yoshitaka; Ohara, Toshiya; Inoue, Hideki; and Tohyama, Shigeki, 5,569,085, Cl. 463-49.000.  
Kajimoto, Masashi: See—  
Yamamoto, Mikio; Tachibana, Hidekiyo; Kajimoto, Masashi; and Toyoda, Yutaka, 5,570,164, Cl. 355-245.000.  
Kajiwara, Hidefumi: See—  
Siga, Masao; Fukui, Yutaka; Kuriyama, Mitsuo; Maeno, Yoshimi; Suwa, Masateru; Kaneko, Ryoichi; Onoda, Takeshi; Kajiwara, Hidefumi; Watanabe, Yasuo; Takahashi, Shintaro; and Tan, Toshimi, 5,569,338, Cl. 148-335.000.  
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Umeno, Akira; Nonaka, Kiyoshi; and Kakizaki, Takao, 5,570,458, Cl. 395-88.000.  
Kaku, Takashi; and Hirao, Kyoko, to Fujitsu Limited. Timing generation device and data transmission device having the timing generation device. 5,570,390, Cl. 375-222.000.  
Kaldenbach, Robert: See—  
Paterson, John; Kaldenbach, Robert; and Unsworth, John, 5,568,801, Cl. 123-598.000.  
Kallio Industrial Co., Ltd.: See—  
Chen, Chao-hu, 5,568,958, Cl. 297-215.150.  
Kam, Chi S., to Digital Equipment Corporation. Delivering and fetching font information. 5,570,459, Cl. 395-110.000.  
Kamani, Sanjay; and Salmon, John K., to Otis Elevator Company. Ultrasonic elevator door safety system. 5,569,888, Cl. 187-317.000.  
Kamei, Seiji: See—  
Kataoka, Yuzo; Asaba, Tetsuo; Makino, Kenji; Yuzurihara, Hiroshi; Fujita, Kei; Kamei, Seiji; Akino, Yutaka; Yuge, Yutaka; Shimotsusa, Mineo; and Kuwabara, Hideshi, 5,569,614, Cl. 437-39.000.  
Kamerling, William H. Ophthalmic template. 5,569,280, Cl. 606-166.000.  
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Shinohara, Keiji; Sato, Junichi; Kamide, Yukihiro; and Yanagida, Toshiharu, 5,569,627, Cl. 437-228.000.  
Kamikubo, Yoshinori: See—  
Shira, Koichi; Imoto, Kazunobu; Narita, Satoshi; Kamikubo, Yoshinori; and Hamashima, Mitsuhiko, 5,569,638, Cl. 503-227.000.  
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Teramachi, Masayoshi; Kinoshita, Kinichi; Takakuwa, Yoshito; Fukui, Eiji; and Kamiyanagita, Tadashi, 5,569,605, Cl. 435-290.200.  
Kamizawa, Koh: See—  
Shishido, Shinji; and Kamizawa, Koh, 5,570,202, Cl. 358-405.000.  
Suzuki, Kazuhiro; Yokose, Taro; Yoshinari, Toshiaki; Koshi, Yutaka; and Kamizawa, Koh, 5,570,203, Cl. 358-432.000.  
Kan, Charles S.: See—  
Makati, Ashok C.; Kan, Charles S.; Iwamasa, Robert T.; and Lee, Do I., 5,569,686, Cl. 523-409.000.  
Kanai, Takeo; and Kusunoki, Kiyoshi, to Kabushiki Kaisha Toshiba. Over-voltage protection circuit. 5,570,260, Cl. 361-91.000.  
Kanamaru, Eiji: See—  
Tanaka, Yasuyuki; Shibata, Kazuhiko; Ikeda, Kenichi; Nishida, Yuji; Hayashi, Masaharu; Nakade, Shinichi; Kuga, Akihiro; and Kanamaru, Eiji, 5,569,740, Cl. 528-502.00F.  
Kanamori, Tatsuru, to Olympus Optical Co., Ltd. Real image mode variable magnification finder optical system. 5,570,229, Cl. 359-431.000.  
Kaneyama, Satoshi; Ogawa, Noriyoshi; and Tajima, Jun, to Mitsubishi Gas Chemical Company, Inc. Photoreceptor for electrophotography with low free chlorine content polycarbonate resin in organic photoconductive layer. 5,569,566, Cl. 430-58.000.  
Kanazawa, Akihiro: See—  
Shibutani, Makoto; Yasugi, Toshiharu; and Kanazawa, Akihiro, 5,570,219, Cl. 359-125.000.  
Kaneada, Yasushi: See—  
Ishizuka, Koh; and Kaneada, Yasushi, 5,569,913, Cl. 250-237.00G.  
Kaneko, Kiyoshi: See—  
Tokio, Masaki; Tanaka, Atsushi; Yoshimura, Yuichiro; Kaneko, Kiyoshi; Yanagisawa, Ryoze; and Kobayashi, Katsuyuki, 5,570,299, Cl. 364-560.000.  
Kaneko, Ryoichi: See—  
Siga, Masao; Fukui, Yutaka; Kuriyama, Mitsuo; Maeno, Yoshimi; Suwa, Masateru; Kaneko, Ryoichi; Onoda, Takeshi; Kajiwara, Hidefumi; Watanabe, Yasuo; Takahashi, Shintaro; and Tan, Toshimi, 5,569,338, Cl. 148-335.000.  
Kanesawa, Yoshio: See—  
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Kanesima, Yasuo: See—  
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Kannapell, Henry N.: See—  
Heyl, Lawrence F.; and Kannapell, Henry N., 5,570,296, Cl. 364-514.00R.  
Kao Corporation: See—  
Tanaka, Yasuyuki; Shibata, Kazuhiko; Ikeda, Kenichi; Nishida, Yuji; Hayashi, Masaharu; Nakade, Shinichi; Kuga, Akihiro; and Kanamaru, Eiji, 5,569,740, Cl. 528-502.00F.  
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El-Avat, Khaled A.; Kapunoglu, Sinan; Chan, King W.; Plants, William C.; and Lien, Jung-Chewn, 5,570,041, Cl. 326-41.000.

Kaptein, Marvin. Rodeo roping practice steer. 5,568,926, Cl. 273-359.000.  
Karambelas, Randy C.; Esplin, Ernest I.; Smith, Terry A.; Gordon, Mike C.; and Skidmore, Stephen H., to Tektronix, Inc. Print head maintenance method and apparatus with retractable wiper. 5,570,117, Cl. 347-33.000.  
Karlsrud, Chris, to Speedfam Corporation. Polishing pad conditioning. 5,569,062, Cl. 451-285.000.  
Karron, Bill. Golf tees. 5,569,102, Cl. 473-401.000.  
Karwacki, Eugene J.; Varn, Arron D.; Withers, Howard P., Jr.; and Woytek, Andrew J., to Air Products and Chemicals, Inc. Handling and delivery system for dangerous gases. 5,569,151, Cl. 588-249.000.

Kasai, Junichi: See—  
Yoneda, Yoshiyuki; Tsuji, Kazuto; Kasai, Junichi; and Sakoda, Hideharu, 5,569,625, Cl. 437-217.000.

Kasama, Yasuhiko: See—  
Sasaki, Makoto; Fukui, Hirofumi; Aihara, Masami; Fukuda, Koichi; Kasama, Yasuhiko; and Ohmi, Tadahiro, 5,570,031, Cl. 324-750.000.  
Kasanami, Tohru; Nakamura, Takeshi; Okano, Keiichi; and Morishita, Yoshiko, to Murata Manufacturing Co., Ltd. Vibrator and vibratory gyroscope using the same. 5,569,969, Cl. 310-345.000.

Kasco Corporation: See—  
Yoshida, Daisaku; and Yamano, Katsumi, 5,569,337, Cl. 148-325.000.

Kashiwazaki, Akio: See—  
Sakaki, Mamoru; Suzuki, Eiichi; Kashiwazaki, Akio; and Hirose, Mifune, 5,570,120, Cl. 347-105.000.

Kasmak, James W., Jr. Machine and method of making a filter. 5,569,489, Cl. 427-202.000.

Kassardjian, Vasken; and Wilson, Patrick J., to Don De Cristo Concrete Accessories, Inc. Protective cover for covering an end of a concrete reinforcing bar. 5,568,708, Cl. 52-301.000.

Kaszas, Gabor: See—  
Baade, Wolfgang; Königshofen, Heinrich; and Kaszas, Gabor, 5,569,723, Cl. 525-357.000.

Katabe, Masaki: See—  
Andoh, Yuzi; Katabe, Masaki; and Suenaga, Hiromi, 5,568,765, Cl. 99-403.000.

Katano, Yuji: See—  
Wakabayashi, Hiroshi; Katano, Yuji; and Kato, Minoru, 5,570,158, Cl. 396-51.000.

Kataoka, Yuzo; Asaba, Tetsuo; Makino, Kenji; Yuzurihara, Hiroshi; Fujita, Kei; Kamei, Seiji; Akino, Yutaka; Yuge, Yutaka; Shimotsusa, Mineo; and Kuwabara, Hideshi, to Canon Kabushiki Kaisha. Method of forming metal pattern including a Schottky diode. 5,569,614, Cl. 437-39.000.

Katariya, Devinder N.; Rich, Ronald J.; Stenard, Steven C.; and Wilson, Bruce D., to AlliedSignal Inc. Tear-away composite fan stator vane. 5,569,019, Cl. 415-200.000.

Katayama, Masayuki; Mizutani, Atsushi; Hanori, Yutaka; and Ito, Nobue, to Nippondenso Co., Ltd. and Research Development Corporation of Japan. Electroluminescence element and process for fabricating same. 5,569,486, Cl. 427-66.000.

Katayama, Ryuichi, to NEC Corporation. Head device for magneto-optical disk. 5,570,333, Cl. 369-110.000.

Kato, Masayuki; Aritake, Hirokazu; Ishimoto, Manabu; Sato, Noriko; and Nakashima, Masato, to Fujitsu Limited. Stereoscopic display method of hologram and its forming method and stereoscopic display apparatus. 5,570,208, Cl. 359-23.000.

Kato, Minoru: See—  
Wakabayashi, Hiroshi; Miyamoto, Hidenori; Kato, Minoru; Soshi, Isao; and Omi, Junichi, 5,570,149, Cl. 396-85.000.

Wakabayashi, Hiroshi; Katano, Yuji; and Kato, Minoru, 5,570,158, Cl. 396-51.000.

Kato, Tsutomu: See—  
Saito, Asao; Koizumi, Ryoichi; and Kato, Tsutomu, 5,570,119, Cl. 347-59.000.

Kato, Tsuyoshi: See—  
Asami, Goro; Kato, Tsuyoshi; and Konishi, Hideo, 5,568,675, Cl. 24-453.000.

Katoh, Jiro: See—  
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Katsuren, Roy I. Supplemental card indicia identifies like cards. 5,568,924, Cl. 273-292.000.

Katz, Joseph: See—  
Bridgell, Raj; Goren, David; Katz, Joseph; and Bard, Simon, 5,569,901, Cl. 235-470.000.

Kauffmann, Myriam, to L'Oreal. Aqueous cosmetic or dermo-pharmaceutical composition containing in suspension hydrated spheroids of a hydrophilic lipidic substance. 5,569,465, Cl. 424-450.000.

Kaufman, James H.: See—  
Jahnes, Christopher V.; Kaufman, James H.; Metin, Serhat; Mirzamaani, Mohammad T.; and Wu, Anthony W., 5,569,506, Cl. 428-65.300.

Kawabata, Yasunari: See—  
Arii, Mitsuzo; Jinnai, Kuniaki; Ohwada, Hisashi; and Kawabata, Yasunari, 5,570,442, Cl. 385-46.000.

Kawabata, Yasutomo: See—  
Kusaka, Yasushi; Yamada, Eiji; and Kawabata, Yasutomo, 5,569,995, Cl. 318-717.000.

Kawada, Hiroyuki: See—  
Murashita, Masaru; Kawada, Hiroyuki; and Matsunaka, Toshiyuki, 5,568,812, Cl. 128-660.040.



Kawahara, Norihiro, to Canon Kabushiki Kaisha. Digital video camera with frequency converter and digital modulator for color-difference signals. 5,570,128, Cl. 348-222.000.

Kawai, Junji: See—  
Ogawa, Tatsuo; and Kawai, Junji, 5,570,070, Cl. 333-187.000.

Kawai, Tomoaki; and Sato, Hiroaki, to Canon Kabushiki Kaisha. Image processor. 5,570,115, Cl. 345-199.000.

Kawakami, Tetsuji; Wakita, Katsuya; Kawamura, Tatsuro; Ozaki, Yusuke; Minemoto, Hisashi; and Sonoda, Nobuo, to Matsushita Electric Industrial Co., Ltd. Hologram recording material. 5,569,565, Cl. 430-1.000.

Kawakubo, Hiroaki: See—  
Isoda, Satoru; Hanazato, Yoshio; Ueyama, Satoshi; Kawakubo, Hiroaki; and Nishikawa, Satoshi, 5,570,457, Cl. 395-25.000.

Kawamonzon, Yoshiaki, to Kabushiki Kaisha Toshiba. Hydrazone compound and the use thereof. 5,569,763, Cl. 546-256.000.

Kawamura, Hideaki: See—  
Horii, Hiroyuki; Date, Nobuaki; Mimura, Toshihiko; Tojo, Akihiko; Kawamura, Hideaki; Murata, Yoshitaka; Takaiwa, Kan; Suzuki, Takashi; Ozaki, Seichi; Taira, Junzo; and Nagasawa, Kenichi, 5,570,130, Cl. 348-233.000.

Kawamura, Tatsuro: See—  
Kawakami, Tetsuji; Wakita, Katsuya; Kawamura, Tatsuro; Ozaki, Yusuke; Minemoto, Hisashi; and Sonoda, Nobuo, 5,569,565, Cl. 430-1.000.

Kawasaki, Masashi: See—  
Koinuma, Hideomi; Kawasaki, Masashi; and Sumiya, Masamoto, 5,569,502, Cl. 427-600.000.

Kawasaki, Minoru, to Tokai Rubber Industries, Ltd. Resin hose connecting structure. 5,568,944, Cl. 285-21.100.

Kawasaki Teitoku Co., Ltd.: See—  
Takahashi, Yasunori, 5,569,333, Cl. 148-105.000.

Takahashi, Yasunori, 5,569,335, Cl. 148-302.000.

Takahashi, Yasunori, 5,569,336, Cl. 148-302.000.

Kawata, Tsunehiro; Kojo, Katsuhiko; Kazama, Youichiro; Fukaya, Takayuki; and Tsujimura, Toshihiko, to Hitachi Metals, Ltd. Stainless steel member for semiconductor fabrication equipment and surface treatment method therefor. 5,569,334, Cl. 148-287.000.

Kawate, Katsuyuki: See—  
Sato, Shuichi; Sumiya, Hitoshi; Kawate, Katsuyuki; and Katoh, Jiro, 5,569,921, Cl. 250-339.010.

Kay, Robert M.: See—  
Lomborg, Nils; and Kay, Robert M., 5,569,825, Cl. 800-2.000.

Kaya, Akimasa, to Fuji Photo Film Co., Ltd. Photo film cassette. 5,570,152, Cl. 396-515.000.

Kaya, Nobuyuki: See—  
Kochiyama, Jiro; Kaya, Nobuyuki; Fujiwara, Teruo; Yasui, Hidemi; and Yashiro, Hiroyuki, 5,570,102, Cl. 343-880.000.

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Kaye, Perry. Personal computer lottery game. 5,569,082, Cl. 463-17.000.

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Keefe, Peter D.: See—  
Rogers, Candies M., 5,569,229, Cl. 604-385.100.

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Willms, Lothar; Lacchein, Stephen; Schlegel, Günter; and Kehne, Heinz, 5,569,761, Cl. 544-213.000.

Keith, Arlie L. Charging batteries of electric vehicles. 5,569,993, Cl. 318-560.000.

Kelappan, Krishnan: See—  
Siegel, Harry M.; Lao, Tom Q.; Kelappan, Krishnan; and Hundt, Michael J., 5,570,273, Cl. 361-773.000.

Kell, Douglas B.; and Woodward, Andrew M., to University College of Wales Aberystwyth. Analytical or monitoring apparatus and method. 5,569,591, Cl. 435-29.000.

Keller, Rex W.; Harlock, Robert; Hooley, Robert W.; and Harper, Patrick, to Precision Connector Designs, Inc. Gull-wing IC carrier system. 5,568,868, Cl. 206-724.000.

Kelsey, Inc.: See—  
Dowlatsahi, Kambiz; and Rhodes, Charles K., 5,569,240, Cl. 606-15.000.

Kenney, Martin J.; and Billings, John K., to Ultrasonic Arrays, Inc. Reference wire compensation method and apparatus. 5,569,835, Cl. 73-1.003.

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Lu, Minhua; and Yuan, Haiji, 5,570,216, Cl. 359-101.000.

Kenyon, Lewis: See—  
Kaprielian, Mark; Brim, Karen; and Kenyon, Lewis, 5,570,345, Cl. 370-16.000.

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Kerlin, Harold W.: See—  
Paauz, William V.; and Kerlin, Harold W., 5,569,047, Cl. 439-353.000.

Keskitalo, Ilkka; Rikkinen, Kari; and Ojanperä, Tero, to Nokia Telecommunications Oy; and Nokia Mobile Phones Ltd. Method of transmitting and receiving power control messages in a CDMA cellular radio system. 5,570,353, Cl. 370-18.000.

Kessler, John A.: See—  
Lewis, Michael E.; Apfel, Stuart C.; and Kessler, John A., 5,569,648, Cl. 514-12.000.

Kessous-Elbaz, Allégria; Michaud, Jean; and Berrada, Fouad, to Université de Montréal. Transgenic mouse for the neuronal expression of HIV gp160. 5,569,827, Cl. 800-2.000.

Keystone Retaining Wall Systems, Inc.: See—  
Dawson, William B., 5,568,994, Cl. 404-7.000.

Kho, Tae H., to Goldstar Co., Ltd. Digital audio signal demodulator. 5,570,393, Cl. 375-333.000.

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Zodrow, Rudolf, 5,569,353, Cl. 156-566.000.

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Usui, Masahiro; Kida, Hiroshi; Shikama, Shinsuke; and Kondo, Mitsushige, 5,570,209, Cl. 359-41.000.

Kido, Toshinori: See—  
Kimura, Yoshihisa; Kido, Toshinori; and Shimizu, Takashi, 5,569,541, Cl. 428-520.000.

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Isshiki, Masao; Kiguchi, Yukio; Sato, Takashi; and Kageyama, Yasuhiro, 5,568,732, Cl. 62-129.000.

Kikkawa, Toshihide; and Ohori, Tatsuya, to Fujitsu Limited. Semiconductor device having an isolation region enriched in oxygen. 5,569,953, Cl. 257-607.000.

Kikuchi, Naohiko: See—  
Terakawa, Katsumi; Muraoka, Kiyoshige; Ueda, Minoru; Kikuchi, Naohiko; and Matsuo, Toshiro, 5,569,690, Cl. 524-251.000.

Kilius, Linas R.: See—  
Purser, Kenneth H.; Kilius, Linas R.; Litherland, Albert E.; Rucklidge, John C.; and Zhao, Xiaolei, 5,569,915, Cl. 250-281.000.

Killian, Gary; Chapman, David; Cancel, Aida; and Henault, Margaret A., to Penn State Research Foundation, The. Alteration and prediction of male fertility using seminal plasma and its components. 5,569,581, Cl. 435-4.000.

Kilström, Lars G.; Lindquist, Nils T.; and Tuvin, Lars G., to Aktiebolaget Electrolux. Telescopic tube connection for a vacuum cleaner. 5,568,943, Cl. 285-7.000.

Kim, Bum J.: See—  
Park, Soon J.; Lee, Young M.; Won, Teug Y.; Kwon, Soon C.; Lee, Seung J.; Kim, Jung H.; and Kim, Bum J., 5,569,598, Cl. 435-212.000.

Kim, Dae Jin, to LG Electronics Inc. HDTV receiver. 5,570,136, Cl. 348-725.000.

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Kim, Joo-In. Method and apparatus for an improved waterproof glove liner. 5,568,656, Cl. 2-164.000.

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Park, Soon J.; Lee, Young M.; Won, Teug Y.; Kwon, Soon C.; Lee, Seung J.; Kim, Jung H.; and Kim, Bum J., 5,569,598, Cl. 435-212.000.

Kim, Kyong Y.: See—  
Jung, Hyung J.; Kim, Hyun J.; Kim, Kyong Y.; Yoon, Seok J.; Yoon, Sang O.; Nakamura, Tetsuro; Itoh, Mitsuru; and Inaguma, Yoshiyuki, 5,569,632, Cl. 501-136.000.

Kim, Sang B.: See—  
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Kim, Seung H.: See—  
Oh, Moon K.; Han, Mi S.; Kim, Seung H.; and Kim, Young S., 5,570,125, Cl. 348-6.000.

Kim, Young S.: See—  
Oh, Moon K.; Han, Mi S.; Kim, Seung H.; and Kim, Young S., 5,570,125, Cl. 348-6.000.

Kimberly-Clark Corporation: See—  
Fox, Donald G.; Rentmeester, Tammy J.; and Nielsen, Steven J., 5,569,177, Cl. 604-15.000.

Nohr, Ronald S.; and MacDonald, John G., 5,569,732, Cl. 528-27.000.

Kimoto Co., Ltd.: See—  
Kimura, Yoshihisa; Kido, Toshinori; and Shimizu, Takashi, 5,569,541, Cl. 428-520.000.

Kimura, Eisuke: See—  
Hasegawa, Yusuke; Nishimura, Yoichi; Komoriya, Isao; Akazaki, Shusuke; and Kimura, Eisuke, 5,569,847, Cl. 73-117.300.

Kimura, Kazuhiro: See—  
Inui, Tetsuya; Ishii, Yoritshige; Ohta, Kenji; Kimura, Kazuhiro; and Hirata, Susumu, 5,570,336, Cl. 364-126.000.

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Yamamoto, Sanehiro; Kimura, Toshio; Nakagawa, Takasi; and Toyota, Akinori, 5,569,711, Cl. 525-66.000.

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Kincaid, Derek S.: See—  
Hunter, Joe M.; and Kincaid, Derek S., 5,569,536, Cl. 428-413.000.

King, Bobby J.: See—  
Totten, Patty L.; King, Bobby J.; and Chatterji, Jiten, 5,569,324, Cl. 106-696.000.

King, George, to Siemens Stromberg-Carlson. Method of establishing a relay contact arrangement. 5,570,072, Cl. 335-154.000.

King, Paul: See—  
Stretton, Alton O.; and King, Paul, 5,570,415, Cl. 379-110.000.

King, Randolph C.: See—  
Grenkowitz, Robert W.; and King, Randolph C., 5,569,846, Cl. 73-116.000.

Kingry, Gary W.: See—  
Fisher, Daniella J.; Osborn, Thomas W., III; Seymour, Mark D.; Kingry, Gary W.; Berg, Charles J., Jr.; Cook, Charles D.; Gilbert, Steven R.; and Toms, Douglas, 5,569,230, Cl. 604-385.100.

Kinney, John H.: See—  
Nathel, Howard; Kinney, John H.; and Otis, Linda L., 5,570,182, Cl. 356-345.000.

Kinoshita, Hirotsugu; Nomura, Souichi; and Mishima, Masaru, to Nippon Oil Co., Ltd. Grease composition for constant velocity joint. 5,569,643, Cl. 508-155.000.

Kinoshita, Kinichi: See—  
Teramachi, Masayoshi; Kinoshita, Kinichi; Takakuwa, Yoshihiro; Fukui, Eiji; and Kamiyanagita, Tadashi, 5,569,605, Cl. 435-290.200.

Kinoshita, Michitaka: See—  
Yokoyama, Kazuaki; Kinoshita, Michitaka; Ohashi, Yukio; and Suzuki, Yasuhiro, 5,569,882, Cl. 174-76.000.

Kip, Ruloff F., Jr.: See—  
Evans, Glen A.; and Kip, Ruloff F., Jr., 5,569,013, Cl. 414-458.000.

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Naga, Mitsuo; Kirihara, Shuutsu; Tokugawa, Yoshinori; Tsuda, Fumiaki; Saito, Toshiaki; and Hirotsuka, Motohiko, 5,569,482, Cl. 426-656.000.

Kirkland, Kevin M.: See—  
Cordova, David S.; Weedon, Gene C.; Hofer, Robert C. W.; Boone, Mark B.; Kirkland, Kevin M.; Weber, Charles P., Jr.; and LaCasse, Gregory J., 5,568,657, Cl. 2-167.000.

Kirkpatrick, Allan T., to Colorado State University Research Foundation. Air diffuser having fixed and variable outlet ports. 5,569,078, Cl. 454-292.000.

Kirt, Thomas J., to Grinders Clearing House. System for driving a centerless grinder regulating wheel. 5,569,059, Cl. 451-5.000.

Kishimoto, Atsunori; Fujii, Takashi, deceased (by Naoko Fujii, legal representative & heir, Ayako Fujii, Natsuko Fujii, Eriko Fujii, heirs); Ohshita, Kazutaka; Yamamoto, Kazumi; Fujii, Yasuhiko; and Toda, Tetsuro, to Toda Kogyo Corp.; and Hirotani Co. Ltd. Self-fusion type damping material. 5,569,695, Cl. 524-435.000.

Kisel, Peter, to Atoma International Inc. Six-way manual seat adjustment assembly. 5,568,908, Cl. 248-419.000.

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Yumi, Hideo, 5,569,877, Cl. 174-35.000.

Kitagawa, Sumiko; Shinkai, Masahiro; and Namba, Kenryo, to TDK Corporation. Optical recording medium. 5,569,504, Cl. 428-64.100.

Kitachi, Satoshi; Nakamura, Chiaki; Tanaka, Michio; and Fukuta, Atushi, to Daibo Industrial Co., Ltd. Mold for injection molding of plastics using thin film electric heater. 5,569,474, Cl. 425-547.000.

Kitajima, Masao: See—  
Tezuka, Shigeru; Tsuruta, Hikaru; Koizumi, Teruaki; and Kitajima, Masao, 5,569,287, Cl. 606-182.000.

Kitano, Makoto: See—  
Kumazawa, Tetsuo; Kitano, Makoto; Yaguchi, Akihiro; Kohno, Ryuji; Tanaka, Naotaka; Yoneda, Na; and Anjoh, Ichiro, 5,569,960, Cl. 257-738.000.

Kitano, Seiji: See—  
Nakazawa, Masaaki; Ito, Hideo; Nakamoto, Koji; Kura, Yasuhiro; Kitano, Seiji; Yabe, Hisao; and Furukawa, Tatsuya, 5,569,157, Cl. 600-107.000.

Klang, Jeffrey A.: See—  
Yang, Lau S.; and Klang, Jeffrey A., 5,569,737, Cl. 528-274.000.

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Müller, Andreas; Klar, Manfred; and Hofer, Bernd, 5,570,014, Cl. 324-206.000.

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Klavens, Jo; Rongved, Pål; and Strande, Per, to Nycomed Imaging AS. Gaseous microparticles as ultrasound contrast agents. 5,569,449, Cl. 424-9.510.

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Hilgren, Wallace L., 5,569,389, Cl. 210-805.000.

Klein, Jean-Paul: See—

Blanchard, Philippe; and Klein, Jean-Paul, 5,569,444, Cl. 423-594.000.

Klein, Lon, to New Vision Golf Corp. Golf putter having tapered shaft and large grip. 5,569,098, Cl. 473-300.000.

Kleine, Werner, to Hilti Aktiengesellschaft. Hollow annular drill bit with hollow cylindrical carrier member. 5,569,002, Cl. 408-204.000.

Kleinhaus, Matthias: See—  
König, Axel; Wärmacher, Herbert; and Kleinhaus, Matthias, 5,569,315, Cl. 95-290.000.

Klima, Rudolph F.; Rossi, Joseph D.; and Gruber, Bert, to Henkel Corporation. Sulfonated oleochemical derivatives as a new class of lubricating/rheological flow modifying compounds for the paper industry. 5,569,319, Cl. 106-243.000.

Klinger, Thomas: See—  
Spilger, Gerhard; Klinger, Thomas; and Stellwag, Dieter, 5,570,254, Cl. 361-18.000.

Klomans, Peter J.: See—  
Devanathan, Narasimhan; Klomans, Peter J.; VanderHeyden, William B.; and Buttk, Robert D., 5,569,434, Cl. 422-140.000.

Klopp, Ingo; Bötcher, Peter; Frick, Ulrich; and Schiller, Otto, to BASF Aktiengesellschaft. Preparation of metal-free phthalocyanines. 5,569,758, Cl. 540-122.000.

Kluth, Erhard L. E.; and Varnham, Malcolm P., to Sensor Dynamics, Ltd. Apparatus for the remote measurement of physical parameters. 5,570,437, Cl. 385-12.000.

Kluver, Leroy; and Line, Donald E., to AGCO Corporation. Round bale wrapping. 5,568,716, Cl. 53-399.000.

KMK Karl Magerle Lizenz AG: See—  
Schwyn, Bernhard A., 5,569,144, Cl. 493-302.000.

Knepper, Jeffrey A.; Flackett, Dale R.; and Asirvatham, Edward T., to AlliedSignal Inc. RTV silicone compositions using aminohydrocarbyl-substituted ketoximinostilanes. 5,569,750, Cl. 524-731.000.

Knickerbocker, Michael G., to Apsara Group, Inc. Combined turret and closure seal. 5,568,886, Cl. 222-321.900.

Knight, Curtis A.; and Webber, John C., to Interferometrics, Inc. Method and system for tracking satellites to locate unknown transmitting accurately. 5,570,096, Cl. 342-357.000.

Knittel, George H.: See—  
Drouilhet, Paul R., Jr.; Knittel, George H.; and Orlando, Vincent A., 5,570,095, Cl. 342-357.000.

Knoll, Inc.: See—  
Rizzi, John J.; and Mrotz, Walter C., III, 5,568,775, Cl. 108-64.000.

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Baumgartner, Hans; Bieker, Dieter; and Iraschko, Johann, 5,568,845, Cl. 188-71.900.

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Knox, Gary; Dang, Nguyen T.; Frost, John S.; and Shofner, Stan, to Courtaulds Aerospace, Inc. Multi-part dispenser. 5,568,988, Cl. 401-40.000.

Ko, Byeong D.: See—  
Jung, Gil Y.; Lee, Kyeong S.; Park, Gong S.; Ko, Byeong D.; and Park, Hun G., 5,569,391, Cl. 216-33.000.

Kobata, Yusaku: See—  
Yamada, Mitsuo; and Kobata, Yusaku, 5,569,704, Cl. 524-591.000.

Kobayashi, Haruto: See—  
Ikuta, Yuzo; Tashiro, Satoshi; Hatano, Yoshiyuki; Fujita, Tadasu; Andoh, Noboru; Asakura, Sachio; Kobayashi, Haruto; and Minami, Takeshi, 5,569,594, Cl. 435-134.000.

Kobayashi, Jun: See—  
Matsumoto, Kenji; Itoh, Shigeyuki; Sano, Kenji; Kobayashi, Jun; Mori, Koji; and Okada, Kenji, 5,570,220, Cl. 359-146.000.

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Kobayashi, Kazuo: See—  
Ishida, Fumiaki; Fujio, Masayuki; Kobayashi, Kazuo; and Hasegawa, Kengo, 5,569,023, Cl. 417-326.000.

Kobayashi, Michiko: See—  
Trinchieri, Giorgio; Perussia, Bice; Clark, Steven C.; Wong, Gordon G.; Hewick, Rodney; Kobayashi, Michiko; and Wolf, Stanley F., 5,569,454, Cl. 424-85.200.

Kobilansky, Alexander I.: See—  
Sauer, Jude S.; Oravecz, Michael G.; Greenwald, Roger J.; and Kobilansky, Alexander I., 5,569,160, Cl. 600-114.000.

Kobo, Roberto M.: See—  
Baker, Murray C.; Cheung, Roger Y. M.; Bhattacharya, Partha P.; Kobo, Roberto M.; Kolbe, Eduardo M.; and Naghshtineh, Mahmoud, 5,570,366, Cl. 370-85.130.

Koch, Robert: See—  
Sue, Chen-Youn; Koch, Robert; Pace, John E.; and Prince, Gregory R., 5,569,709, Cl. 525-52.000.

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- Koehler, Raymond; and Donaldson, James E., to Delmarva Laboratories, Inc. Anesthesia machine. 5,568,910, Cl. 251-83.000.
- Koenig, Eldo C.; and Koenig, Evan F. Squirrel-resistant bird feeder. 5,568,789, Cl. 119-57.900.
- Koenig, Evan F. See—  
Koenig, Eldo C.; and Koenig, Evan F., 5,568,789, Cl. 119-57.900.
- Koenit & Bauer Aktiengesellschaft. See—  
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- Koga, Yoshiro; and Kunugi, Masanao, to Seiko Epson Corporation. Development process. 5,570,168, Cl. 355-253.000.
- Kohanawa, Akihiko. See—  
Uchida, Naoshi; Kohanawa, Akihiko; Miura, Masao; Oyama, Jun; and Asakawa, Koji, 5,569,894, Cl. 218-27.000.
- Kohdaka, Takayuki. See—  
Noro, Masao; and Kohdaka, Takayuki, 5,570,091, Cl. 341-161.000.
- Kohin-Nitschelm, Margaret, to Hughes Danbury Optical Systems, Inc. Reduction of scatter from material discontinuities. 5,570,092, Cl. 342-1.000.
- Kohno, Ryuji. See—  
Kumazawa, Tetsuo; Kitano, Makoto; Yaguchi, Akihiro; Kohno, Ryuji; Tanaka, Naotaka; Yoneda, Nae; and Anjoh, Ichiro, 5,569,960, Cl. 257-738.000.
- Kohtoku, Yasuhiko. See—  
Waku, Yoshiharu; Ohtsubo, Hideki; and Kohtoku, Yasuhiko, 5,569,547, Cl. 428-688.000.
- Koike, Jun; and Ieki, Hideharu, to Murata Manufacturing Co., Ltd. Zinc oxide piezoelectric crystal film on sapphire plane. 5,569,548, Cl. 428-699.000.
- Koike, Tadao, to Ricoh Company, Ltd. Method of controlling toner density detection. 5,570,165, Cl. 355-246.000.
- Koinuma, Hideomi; Kawasaki, Masashi; and Sumiya, Masatomo, to Semiconductor Energy Laboratory Co., Ltd. Film formation apparatus and method for forming a film. 5,569,502, Cl. 427-600.000.
- Koizumi, Ryoichi. See—  
Saito, Asao; Koizumi, Ryoichi; and Kato, Tsutomu, 5,570,119, Cl. 347-59.000.
- Koizumi, Teruaki. See—  
Tezuka, Shigeru; Tsuruta, Hikaru; Koizumi, Teruaki; and Kitajima, Masao, 5,569,287, Cl. 606-182.000.
- Kojima, Akio, to Matsushita Electric Industrial Co., Ltd. Image controller. 5,570,432, Cl. 382-254.000.
- Kojo, Katsuhiko. See—  
Kawata, Tsunehiro; Kojo, Katsuhiko; Kazama, Youichiro; Fukaya, Takayuki; and Tsujimura, Toshihiko, 5,569,334, Cl. 148-287.000.
- Kokami, Yasuhiko; and Kondo, Satoshi, to Hitachi, Ltd. Brushless motor drive circuit including a linear amplifier for sending and output signal based upon the detected back electromotive force voltage. 5,569,988, Cl. 318-254.000.
- Kokko, Marko. See—  
Alatalo, Hannu; and Kokko, Marko, 5,570,358, Cl. 370-58.200.
- Kolbe, Eduardo M. See—  
Baker, Murray C.; Cheung, Roger Y. M.; Bhattacharya, Partha P.; Kobo, Roberto M.; Kolbe, Eduardo M.; and Naghsineh, Mahmoud, 5,570,366, Cl. 370-85.130.
- Kolesa, Michael S. See—  
Young, Wayne P.; Pereira, Darryl S.; Castro, Salvatore; Kolesa, Michael S.; Mastri, Dominick L.; and Viola, Frank J., 5,569,284, Cl. 606-180.000.
- Komatani, Shintaro, to Horiba, Ltd. X-ray analyzer system and method of increasing response time. 5,570,406, Cl. 378-44.000.
- Komatsu, Masaru. See—  
Shiga, Sadakazu; Komatsu, Masaru; and Numata, Minoru, 5,570,110, Cl. 345-156.000.
- Komeya, Inc. See—  
Takahashi, Yasunori, 5,569,333, Cl. 148-105.000.
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- Takahashi, Yasunori, 5,569,336, Cl. 148-302.000.
- Komi, Shuji, to Fuji Photo Optical Co. Ltd. Structure of end portion of side-looking type electronic endoscope. 5,569,162, Cl. 600-130.000.
- Komiyama, Nakaji. See—  
Kouno, Hisao; Takahashi, Shyouichi; Higashide, Kazuhiro; Komiyama, Nakaji; Suda, Osamu; and Hasegawa, Masaru, 5,569,749, Cl. 534-653.000.
- Komoriya, Isao. See—  
Hasegawa, Yosuke; Nishimura, Yoichi; Komoriya, Isao; Akazaki, Shusuke; and Kimura, Eisuke, 5,569,847, Cl. 73-117.300.
- Komorowski, Jerzy P. See—  
Gould, Ronald W.; and Komorowski, Jerzy P., 5,569,342, Cl. 156-64.000.
- Kondo, Mitsushige. See—  
Usui, Masahiro; Kida, Hiroshi; Shikama, Shinsuke; and Kondo, Mitsushige, 5,570,209, Cl. 359-41.000.
- Kondo, Satoshi. See—  
Kokami, Yasuhiko; and Kondo, Satoshi, 5,569,988, Cl. 318-254.000.
- Konica Corporation. See—  
Fukuchi, Masakazu; Haneda, Satoshi; and Morita, Shizuo, 5,570,194, Cl. 358-300.000.
- Kurimoto, Tetsuya; and Uesugi, Ryuji, 5,570,154, Cl. 396-568.000.
- Miwa, Tadashi; Matsuoka, Isao; Matsunaga, Sakaho; and Miyamoto, Takayuki, 5,570,160, Cl. 355-200.000.
- Yamashita, Hirobumi, 5,569,575, Cl. 430-399.000.
- König, Axel; Würmseher, Herbert; and Kleinhaus, Matthias, to Santrade Ltd. Process and device for cleaning the waste air of systems for the solidification of melts. 5,569,315, Cl. 95-290.000.
- König, Hartmann. See—  
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- Königshofen, Heinrich. See—  
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- Konishi, Hideo. See—  
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- Konishi, Kazuki, to Canon Kabushiki Kaisha. Visual axis detection apparatus. 5,570,157, Cl. 396-232.000.
- Kono, Katsumi; Nakamura, Shinya; and Honda, Atsushi, to Toyota Jidosha Kabushiki Kaisha. Slip control apparatus for motor vehicle lock-up clutch. 5,569,117, Cl. 477-169.000.
- Konzal, Daryl R., to Paper Machinery Corporation. Cup bottom finishing station for a cup making machine. 5,569,143, Cl. 493-109.000.
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- Körner, Reinhard. See—  
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- Kos, Frank T. See—  
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- Kosasa, Hideaki; Takahashi, Yuji; Hayakawa, Kimiaki; Kusumoto, Toshihiko; Yamaguchi, Yoshimasu; Ohta, Hiroshi; Yamanaka, Yuji; and Sakakibara, Kozo, to Canon Kabushiki Kaisha. Book binding apparatus. 5,569,012, Cl. 412-33.000.
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- Koyo Seiko Co., Ltd. See—  
Matsuoka, Hirofumi; and Nishimoto, Mitsuhiro, 5,569,991, Cl. 318-286.000.
- Kozak, Milan. See—  
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- Kozaki, Takahiko. See—  
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- Kozlowski, Mark F. See—  
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- Krambovitis, Elias. See—  
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- Krämer, Wolfgang. See—  
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- Krantz, Kermit T.; and Jones, Charles R., Jr., to V-Lite Corporation. Lightweight video cassette cartridge. 5,568,899, Cl. 242-347.200.
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- Kriesel, Marshall S., to Science Incorporated. Fluid delivery apparatus. 5,569,236, Cl. 604-403.000.
- Krimmer, Erwin; Lorenz, Richard; Miehle, Tilman; and Schumacher, Steffen, to Robert Bosch GmbH. Coil former with injection-molded encapsulation. 5,570,075, Cl. 336-96.000.
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- Kristola, Jay L., to H.G. Weber Co., Inc. Quasi-heat seal SOS bag. 5,568,980, Cl. 383-126.000.
- Kroll, Jeffrey R., to ComTel Debit Card Limited, L.L.C. Call center management system. 5,570,416, Cl. 379-114.000.
- Kroll, Thomas W. See—  
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- Kruepke, Annette T. See—  
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- Kruger, Petrus B. See—  
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- KSP Inc. See—  
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- Kubista, Thomas T., to Unisys Corporation. Redundant synchronized clock controller. 5,570,397, Cl. 375-356.000.
- Kubo, Tetsujiro, to Yugen Kaisha Kubo Technic Office. Method of controlling the growth of microorganism in a liquid with tourmaline crystals. 5,569,388, Cl. 210-764.000.
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- Kuck, Karl-Heinz. See—  
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- Kufner Textilwerk GmbH. See—  
Hefe, Josef, 5,569,348, Cl. 156-239.000.
- Kuga, Akihito. See—  
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- Kuhm, Peter; Loeffelholz, Frido; Wedel, Peter; and Wegemund, Bernd, to Henkel Kommanditgesellschaft auf Aktien. Garnet-containing stabilizer mixtures for polymers. 5,569,694, Cl. 524-399.000.
- Kuhman, Daniel E. See—  
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- Kuhn, Lowell L.; Placek, James F.; and Roepeke, Gary P., to Labconco Corporation. Vortex evaporator. 5,569,357, Cl. 159-16.100.
- Kuhn, Wolfgang; Buchholz, Norbert; and Schulte, Reiner, to Böllhoff Verfahrenstechnik GmbH & Co., KG. Fluid heater with main housing and surrounding auxiliary housing defining a pressure resistant compartment therebetween. 5,570,452, Cl. 392-484.000.
- Kuhns, Craig R. See—  
Anderson, Keven C.; and Kuhns, Craig R., 5,569,159, Cl. 600-114.000.
- Kulite Semiconductor Products, Inc. See—  
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- Shor, Joseph S.; and Kurtz, Anthony D., 5,569,932, Cl. 257-3.000.
- Kulkarni, Subodh K. See—  
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- Kumano, Makoto. See—  
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- Kumar, Virendra. See—  
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- Kumashiro, Toshiaki, to Ricoh Company, Ltd. Image reader with flare prevention using light shield plates. 5,570,204, Cl. 358-471.000.
- Kumazawa, Tetsuo; Kitano, Makoto; Yaguchi, Akihiro; Kohno, Ryuji; Tanaka, Naotaka; Yoneda, Nae; and Anjoh, Ichiro, to Hitachi, Ltd. Electronic component, electronic component assembly and electronic component unit. 5,569,960, Cl. 257-738.000.
- Kump, William H. See—  
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- Kuntz, James, to Spokane Industries, Inc. Upflow clarifier. 5,569,381, Cl. 210-321.600.
- Kunugi, Masanao. See—  
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- Kuo, Pine-Sci; Chu, Shiao-Jung; Dai, Chu-Chang; Hsu, Hsi-Yen; Lin, Ching-Tang; and Lin, Yi-Yun, to Industrial Technology Research Institute. Method for the production of N-Vinyl-2-Pyrrolidone by gas-phase dehydration reaction at atmospheric pressure. 5,569,770, Cl. 548-543.000.
- Kura, Yasuhito. See—  
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- Kurimoto, Tetsuya; and Uesugi, Ryuji, to Konica Corporation. Automatic developing apparatus, using solid processing agent dissolved in water, for developing a photosensitive material. 5,570,154, Cl. 396-568.000.
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- Kurkov, Victor P. See—  
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- Kuroda, Yuka. See—  
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- Kurtz, Anthony D. See—  
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- Kusumoto, Toshihiko: See—  
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Okamoto, Kohei; Inoue, Kyoichi; and Kutuno, Takayoshi, 5,569,716, Cl. 525-192.000.
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- Kuwahara, Tsuneo: See—  
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- Kuwano, Kenji: See—  
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- Kwik Wrench Pty Ltd.: See—  
Alford, Larry A. G., 5,568,752, Cl. 81-126.000.
- Kwon, Soon C.: See—  
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Bennett, Alan; Labavitch, John M.; Powell, Ann; and Stotz, Henrik, 5,569,830, Cl. 800-205.000.
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Kuhn, Lowell L.; Placek, James F.; and Roepke, Gary P., 5,569,357, Cl. 159-16.100.
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Bailey, William R.; Garay, Antonio A.; and Rosborough, Keith A., 5,569,039, Cl. 439-76.100.
- Labor Savings Machine Co., Ltd.: See—  
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- Lacchein, Stephen: See—  
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- LaFleur, Edward E.; Work, William J.; Amici, Robert M.; Bortnick, Newman M.; and Holy, Norman L., to Rohm and Haas Company. Polymeric blends. 5,569,710, Cl. 525-57.000.
- LaFreniere, Brian R.; Cardwell, Dick L.; and Spillson, George A., to Bay Corrugated Container, Inc. Method and apparatus for manufacturing pallet spacers. 5,569,148, Cl. 493-462.000.
- Lagrange, Alain: See—  
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DeRoche, Thomas J.; Melancon, Valerie S.; and Lyle, Matthew M., 5,569,068, Cl. 452-127.000.
- Lake Shove, Inc.: See—  
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- Lal, Brij B.; Bourez, Allen J.; and Shinohara, Tadashi, to HMT Technology Corporation. Thin-film medium with sublayer. 5,569,533, Cl. 428-332.000.
- Lam, Peter K. F.; and Chivers, Nigel B. Directional vent register. 5,569,077, Cl. 454-290.000.
- LAM Research Corporation: See—  
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- Lam, Sharon S., to Advanced Cardiovascular Systems, Inc. Expandable stents and method for making same. 5,569,295, Cl. 606-198.000.
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- Landa, Ksenia: See—  
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- Landmark Graphics Corporation: See—  
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- Landolt, Oliver, to CSEM Centre Suisse d'Electronique et de Microtechnique SA - Recherche et Développement. Analog circuit implementing a fuzzy logic controller. 5,570,456, Cl. 395-3.000.
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- Legendre, Dominique, to Corea S.A. Pneumatic Jack. 5,568,761, Cl. 92-46.000.
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Abidin, Michael R.; and Lehmbeck, Steven P., 5,569,281, Cl. 606-167.000.
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- Lenhard, Werner: See—  
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Haselhorst, Ronald; and Lillegard, Tom, 5,569,222, Cl. 604-283.000.  
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Kilström, Lars G.; Lindquist, Nils T.; and Tuvin, Lars G., 5,568,943, Cl. 285-7.000.  
Lindstrom, Martin, to General Engineering (Netherlands) BV. Air-bag arrangement. 5,568,938, Cl. 280-743.200.  
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Häring, Thomas, 5,570,223, Cl. 359-204.000.  
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Lisitsyn, Nikolai: See—  
Wigler, Michael; and Lisitsyn, Nikolai, 5,569,753, Cl. 536-24.300.  
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Litton Systems, Inc.: See—  
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Chen, Fu-Tai A.; Liu, Ming-Sun; and Evangelista, Ramon A., 5,569,366, Cl. 204-452.000.  
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Hopkins, Charles D.; Livingston, Ronald R.; and Toole, William R., Jr., 5,569,021, Cl. 417-63.000.  
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Luke, Wayne D.: See—  
Hoard, David W.; and Luke, Wayne D., 5,569,772, Cl. 549-52.000.  
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Luther Medical Products, Inc.: See—  
Luther, Ronald B., 5,569,217, Cl. 604-280.000.  
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DeRoche, Thomas J.; Melancon, Valerie S.; and Lyle, Matthew M., 5,569,068, Cl. 452-127.000.  
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- Macaluso, Anthony G. Golf practice net. 5,569,094, Cl. 473-197.000.
- MacDonald, John G.: See—  
Nohr, Ronald S.; and MacDonald, John G., 5,569,732, Cl. 528-27.000.
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- MacDougall, Trevor W.: See—  
Hutchinson, Ted F.; Lutz, Dale R.; MacDougall, Trevor W.; and Onstott, James R., 5,570,449, Cl. 385-134.000.
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Meyn, Cornelis, 5,569,067, Cl. 452-106.000.
- Maciejewski, Wendell C., to United States of America, Navy. Method for making a vibration damper of an electrorheological material. 5,569,432, Cl. 264-439.000.
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- Madden, Jennifer M. Convertible bed-chair assembly. 5,568,658, Cl. 5-174.000.
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- Maeda, Tatsuya: See—  
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- Maeno, Yoshimi: See—  
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- Maes, Richard J., to Caterpillar Inc. Transmission activating and neutralizing system. 5,568,851, Cl. 192-9.000.
- Mag-Tek, Inc.: See—  
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- Magee, Jack C.; and Thompson, George. Vehicle storage cabinet. 5,568,890, Cl. 224-539.000.
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- Maier, Theodor: See—  
Allmeier, Franz; Maier, Theodor; Goers, Gerhard; Preslar, Donald; and Murphy, Philip, 5,570,259, Cl. 361-86.000.
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Suraniti, Sylvester; Morin, Jean-Xavier; and Maillet, Frédéric, 5,568,776, Cl. 110-245.000.
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Yokoyama, Naokato, deceased; Walker, Gordon N.; and Main, Alan J., 5,569,674, Cl. 514-539.000.
- Maiorca, Robert: See—  
Marshall, David J.; Gouldson, Stanley; Olk, Olaf; and Maiorca, Robert, 5,568,685, Cl. 29-809.000.
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- Makhlouf, Joseph M.: See—  
Donnelly, Karen D.; and Makhlouf, Joseph M., 5,569,733, Cl. 528-61.000.
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Takewaki, Takahiko; Fujita, Naoko; Yokoyama, Toshiharu; and Maki, Takao, 5,569,803, Cl. 585-269.000.
- Maki, Tsutomu: See—  
Uesugi, Hitoshi; Maki, Tsutomu; Tomikawa, Kazuyoshi; Maeda, Tatsuya; and Masuda, Yoshimi, 5,570,191, Cl. 356-402.000.
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Hiraoka, Toshikage; Tanimoto, Tetsuji; Makino, Yoshihiko; Ninomiya, Tadashi; Hora, Naofumi; Ashihara, Yoshihiro; Sudo, Yukio; and Mori, Toshihiro, 5,569,589, Cl. 435-7.900.
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Sasaki, Katsuhiko; and Shibata, Yoshinori, 5,568,849, Cl. 192-34.000.
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Kunda, Ramachandra P.; Malamy, Adam C.; and Levitt, Marc, 5,570,376, Cl. 371-25.100.
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Fine, David H.; Fraim, Freeman W.; MacDonald, Stephen J.; Malaspina, Alex; Bayer, Forrest L.; and van Buren Myers, Dirck, 5,569,606, Cl. 436-43.000.
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Dority, John A., Jr.; Earley, William G.; Kumar, Virendra; Mallamo, John P.; Miller, Matthew S.; and Subramanyam, Chakrapani, 5,569,655, Cl. 514-226.800.
- Mallow, William A.; and Young, Robert D., to Southwest Research Institute. Method of immobilizing toxic waste materials and resultant products. 5,569,153, Cl. 588-256.000.
- Maloney, Tim: See—  
Needham, Wayne; Qian, Qi-De; and Maloney, Tim, 5,570,034, Cl. 324-763.000.
- Man-Gill Chemical Company: See—  
Silvestri, Regan L., 5,569,842, Cl. 73-53.050.
- Manchester Plastics: See—  
Sudak, John; and Panziera, Edoardo, 5,569,076, Cl. 454-155.000.
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Satzger, Wilhelm; and Mangold, Edmund, 5,570,186, Cl. 356-376.000.
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Schaffer, Parke, Jr.; Laughlin, Thomas; and Mann, David M., 5,569,543, Cl. 428-552.000.
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- Manning, William R.; Carlos, Mark C.; and Nacewicz, Stanley J., to Texas Instruments Incorporated. Phase sequence wiring protection apparatus. 5,570,257, Cl. 361-76.000.
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- Marcelo, Ruben V. Method and apparatus for determining the exponential powers of "i". 5,569,896, Cl. 235-70.00R.
- Marchman, Herschel M.: See—  
Filas, Robert W.; and Marchman, Herschel M., 5,570,441, Cl. 385-43.000.
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- Marik, Gregory C.; Lackey, Jennifer J.; and Elliott, M. Scott, to Smith & Nephew Richards Inc. Distal femoral cutting guide apparatus with anterior or posterior referencing for use in knee joint replacement surgery. 5,569,261, Cl. 606-88.000.
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- Marin, Ralph: See—  
Marin, Michael L.; and Marin, Ralph, 5,569,296, Cl. 606-198.000.
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- Markandey, Vishal: See—  
Gove, Robert J.; Sampson, Jeffrey B.; and Markandey, Vishal, 5,570,135, Cl. 348-581.000.
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Schroeder, Thaddeus; Lequesne, Bruno P. B.; Butler, Raymond O., Jr.; Marks, Anthony L.; Perry, Thomas A.; and Bradley, John R., 5,570,016, Cl. 324-207.250.
- Mars Incorporated: See—  
Gerlier, André, 5,569,015, Cl. 414-790.700.
- Marshall, David J.; Gouldson, Stanley; Olk, Olaf; and Maiorca, Robert, to Spotless Plastics Pty. Ltd. Manually actuated apparatus for assembling hangers with indexing caps. 5,568,685, Cl. 29-809.000.
- Marshall, Todd C., to Green Island Research, Inc. Method and kit to restore the appearance of a damaged lens. 5,569,346, Cl. 156-94.000.
- Marshall, Winston S.: See—  
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Cansell, François; Hotier, Gérard; Marteanu, Philippe; and Zanier, Nathalie, 5,569,808, Cl. 585-800.000.
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Horst, Sheldon; and Martin, Eugene, 5,569,069, Cl. 452-169.000.
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- Martin, Jonathan D.: See—  
Buday, Gene; Baron, David L.; and Martin, Jonathan D., 5,568,802, Cl. 126-21.00A.
- Martin Marietta Energy Systems, Inc.: See—  
Bates, John B., 5,569,520, Cl. 429-162.000.
- Martinson, Laura A.; Brauker, James H.; Johnson, Robert C.; and Loudovaris, Thomas, to Baxter International Inc. Methods for enhancing vascularization of implant devices. 5,569,462, Cl. 424-424.000.
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Takeda, Hideyuki, 5,569,481, Cl. 426-574.000.
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Bayer, Robert; Lantsman, Alexander D.; and Seiramarco, James A., 5,569,363, Cl. 204-192.320.
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- Matrix Technology Pty. Ltd.: See—  
Webb, Stephen; and Lear, Richard J., 5,568,895, Cl. 241-16.000.
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Hamanaga, Shinji; and Matsukuma, Yoshihiko, 5,569,864, Cl. 84-400.000.
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Murashita, Masaru; Kawada, Hiroyuki; and Matsunaka, Toshiyuki, 5,568,812, Cl. 128-660.040.
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Terakawa, Katsumi; Muraoka, Kiyoshige; Ueda, Minoru; Kikuchi, Naohiko; and Matsuo, Toshiro, 5,569,690, Cl. 524-251.000.
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Miwa, Tadashi; Matsuo, Isao; Matsunaga, Sakaho; and Miyamoto, Takayuki, 5,570,160, Cl. 355-200.000.
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Boon, Choong S., 5,570,197, Cl. 386-46.000.
- Fukushima, Tsumoru; Onishi, Hiroshi; and Yamashita, Haruo, 5,570,436, Cl. 382-300.000.
- Itoh, Masahiro; Iga, Atsushi; and Okinaka, Hideyuki, 5,569,414, Cl. 252-518.000.
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- Tanabe, Kouji; and Nishioka, Naohiro, 5,569,886, Cl. 174-260.000.
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- Matsuura, Masuichi: See—  
Hashimoto, Milton, 5,569,377, Cl. 210-238.000.
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Walker, Michael; and Matt, Hans-Jürgen, 5,570,423, Cl. 379-410.000.
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Henry, Manus P.; Mattar, Wade M.; Clarke, David W.; and Yang, Janice, 5,570,300, Cl. 364-551.010.
- Mathews, Demetrios N.: See—  
Coolbaugh, Thomas S.; Loveless, Frederick C.; and Matthews, Demetrios N., 5,569,718, Cl. 525-314.000.
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- Maurer, Thomas: See—  
Arnegger, Richard E.; Gunnewijk, Antonius G. M.; and Maurer, Thomas, 5,569,257, Cl. 606-82.000.
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Atkins, Glen G.; Cohen, Michael S.; Mauritz, Karl H.; and Shaffer, James M., 5,570,032, Cl. 324-760.000.
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Perling, Jeremy, 5,569,371, Cl. 210-85.000.
- Mazda Motor Corporation: See—  
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Blackburn, Brian K.; Brown, Louis R.; Mazur, Joseph E.; and Gentry, Scott B., 5,568,939, Cl. 280-806.000.
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- McAuley, Brian. Shoe polish applicator. 5,568,990, Cl. 401-206.000.
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Chen, Ho S.; Jin, Sungho; and McCormack, Mark T., 5,569,433, Cl. 420-557.000.
- McCoy, Daniel M.: See—  
Campbell, Douglas C.; Gloner, Gary J.; and McCoy, Daniel M., 5,570,287, Cl. 364-424.050.
- McCready Consumer Products, Inc.: See—  
Nesbitt, Regis J., 5,569,477, Cl. 426-5.000.
- McCusker, Todd J.: See—  
Kahn, Jon B.; and McCusker, Todd J., 5,568,923, Cl. 273-128.00A.
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Caccavo, Frank, Jr.; and McInerney, Michael J., 5,569,596, Cl. 435-168.000.
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Wong, Sui-Ming; Newtoning, Ian M.; Liversidge, Elaine M.; McIntire, Gregory L.; Pitt, Alan R.; and Shaw, Jack M., 5,569,448, Cl. 424-9.450.
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Quirk, Richard; Bird, David A.; Shulver, Ian N. W.; and McIntosh, Robin M., 5,569,312, Cl. 65-134.600.
- McIntyre, Michael A.: See—  
Diaz, Michael; Halm, Roland L.; McIntyre, Michael A.; and Wilding, Oliver K., 5,569,775, Cl. 556-466.000.
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Hashimoto, Milton, 5,569,377, Cl. 210-238.000.
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Byrd, Alan E.; Osborn, Thomas W., III; and McKibben, Gary E., 5,569,228, Cl. 604-385.100.
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Cohen, Richmond R.; Minetola, James A.; and Poccia, John F., 5,569,226, Cl. 604-378.000.
- McNeilab, Inc.: See—  
Reitz, Allen B., 5,569,659, Cl. 514-253.000.
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Aker, John L.; Gammethaler, Robert S.; and Mead, Alan B., 5,570,093, Cl. 342-104.000.
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Adrian, Sorin, 5,569,179, Cl. 604-22.000.
- Mediflex Systems, Inc.: See—  
Raynic, Arthur D.; and Robertson, David L., 5,569,124, Cl. 482-44.000.
- Medrad, Inc.: See—  
Heilman, Marlin S.; and Uber, Arthur E., III, 5,569,181, Cl. 604-30.000.
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Parkola, Walter R., 5,569,294, Cl. 606-194.000.
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Goodman, Seth D.; Eriksson, Larry J.; Melton, Douglas E.; and Braun, Edward R., 5,570,425, Cl. 381-71.000.
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Molitor, Robert P.; Nesbitt, R. Dennis; Stiefel, Joseph F.; and Melvin, Terence, 5,569,100, Cl. 473-384.000.
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Rochefort, Lucien, 5,569,092, Cl. 473-73.000.
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Boll, Wolf; Knörzer, Günther; and Heidenfelder, Hans-Dieter, 5,569,999, Cl. 320-35.000.
- Mercer, Betty S.: See—  
Delaney, Joseph B.; Henderson, Timothy S.; Fuller, Clyde R.; and Mercer, Betty S., 5,569,944, Cl. 257-198.000.
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Kurz, Thekla; Stossel, Sieglinde; and Spiller, Andrea, 5,569,460, Cl. 424-401.000.
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Woelpper, William R.; Young, Richard L.; and Stoker, Ronald L., 5,569,208, Cl. 604-183.000.
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- Messmer, Mark J.: See—  
Stelplugg, Richard G.; and Messmer, Mark J., 5,569,820, Cl. 800-200.000.
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Llorens, Joseph R., 5,570,037, Cl. 326-30.000.

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Stringwell, Roderick W.; and Van Vooren, Gregory P., 5,568,860, Cl. 200-242.000.
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Jahnes, Christopher V.; Kaufman, James H.; Metin, Serhat; Mirzamaani, Mohammad T.; and Wu, Anthony W., 5,569,506, Cl. 428-65.300.
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Ritter, Michael W.; Bettendorff, John; Flammer, George H., III; and Galloway, Brett D., 5,570,084, Cl. 340-825.050.
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- Meyer, Jeffry R.: See—  
Freeman, Willie B.; Johnson, David S.; and Meyer, Jeffry R., 5,569,891, Cl. 200-17.000.
- Meyer, Willi, to Emhart Glass Machinery Investments Inc. Mould mechanism. 5,569,313, Cl. 65-359.000.
- Meyers, Lawrence R.: See—  
Fisher, Richard G.; and Meyers, Lawrence R., 5,569,898, Cl. 235-448.000.
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Dukes, Michael A.; and Michael, Gerald T., 5,570,035, Cl. 324-763.000.
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- Michalos, Peter. Eyedrop applicator. 5,569,224, Cl. 604-300.000.
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Kessous-Elbaz, Allégria; Michaud, Jean; and Berrada, Fouad, 5,569,827, Cl. 800-2.000.
- Michelson, Manfred G. Film cleaning system and method for photographic film. 5,568,822, Cl. 134-64.00P.
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Atkins, Glen G.; Cohen, Michael S.; Mauritz, Karl H.; and Shaffer, James M., 5,570,032, Cl. 324-760.000.
- Microvena Corporation: See—  
Kotula, Frank; and Claude, Timothy, 5,569,275, Cl. 606-159.000.
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Carlson, Glenn T.; Vaughn, William J.; and Umber, Ray E., 5,569,254, Cl. 606-79.000.
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Krimmer, Erwin; Lorenz, Richard; Miehle, Tilman; and Schumacher, Steffen, 5,570,075, Cl. 336-96.000.
- Mifune, Hideo: See—  
Nitta, Tomio; Mifune, Hideo; Seki, Masato; Kaga, Yosimitu; and Serizawa, Noriyuki, 5,568,805, Cl. 126-262.000.
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- Mikamo, Masahiro: See—  
Yokono, Hitoshi; Yokono, Haruki; Mikamo, Masahiro; Narushima, Ryouichi; Iida, Takuya; and Endo, Yasuhiro, 5,569,545, Cl. 428-626.000.
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Fioretti, Philip R., 5,569,083, Cl. 463-19.000.
- Miller, Donna R.; and Miller, Kenneth B. Decorative light-supporting apparatus for holding connected strings of lights. 5,568,966, Cl. 362-252.000.
- Miller, Ivo A.: See—  
Lenz, Eric H.; Calvisi, Michael L.; Miller, Ivo A.; and Frazier, Robert A., 5,569,356, Cl. 156-643.100.
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Miller, Donna R.; and Miller, Kenneth B., 5,568,966, Cl. 362-252.000.
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Granger, Diana D.; and Miller, Leroy J., 5,569,493, Cl. 427-306.000.
- Miller, Mark D.: See—  
Parker, Jeffery R.; and Miller, Mark D., 5,568,964, Cl. 362-32.000.
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Dority, John A., Jr.; Earley, William G.; Kumar, Virendra; Mallamo, John P.; Miller, Matthew S.; and Subramanyam, Chakrapani, 5,569,655, Cl. 514-226.800.
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Egan, Philip D.; and Miller, Robert A., 5,568,998, Cl. 405-262.000.
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Anjanappa, Muniswamappa; and Miller, Warren G., 5,569,120, Cl. 482-4.000.
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Porter, John R.; Morphy, John R.; Millican, Thomas A.; and Beeley, Nigel R. A., 5,569,665, Cl. 514-357.000.
- Milligan, Charles A.: See—  
Leonhardt, Michael L.; and Milligan, Charles A., 5,570,242, Cl. 360-48.000.
- Milliken Research Corporation: See—  
Callaway, Brian; and Moore, Morris D., III, 5,569,430, Cl. 264-258.000.
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- Milstain, Yakov: See—  
Rosen, Eitan; and Milstain, Yakov, 5,570,317, Cl. 365-200.000.
- MIM Industries, Inc.: See—  
Conley, Ralph F., Jr., 5,568,937, Cl. 280-743.100.
- Mimura, Toshihiko: See—  
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- Minami, Takeshi: See—  
Ikuta, Yuzo; Tashiro, Satoshi; Hatano, Yoshiyuki; Fujita, Tadasu; Andoh, Noboru; Asaoka, Sachio; Kobayashi, Haruto; and Minami, Takeshi, 5,569,594, Cl. 435-134.000.
- Minemoto, Hisashi: See—  
Kawakami, Tetsuji; Wakita, Katsuya; Kawamura, Tatsuro; Ozaki, Yusuke; Minemoto, Hisashi; and Sonoda, Nobuo, 5,569,565, Cl. 430-1.000.
- Minetola, James A.: See—  
Cohen, Richmond R.; Minetola, James A.; and Poccia, John F., 5,569,226, Cl. 604-378.000.
- MiniMed Inc.: See—  
Cheney, Paul S., II; Mastrototaro, John J.; Schnabel, Nannette M.; Lord, Peter C.; Van Antwerp, William P.; and Clark, Raymond D., 5,568,806, Cl. 128-635.000.
- Lord, Peter C.; and Coleman, Fredric C., 5,569,186, Cl. 604-67.000.
- Minnesota Mining and Manufacturing Company: See—  
Andrews, Jeffrey F., 5,569,461, Cl. 424-405.000.
- Dahlquist, John C.; and Kulkarni, Subodh K., 5,569,485, Cl. 427-65.000.
- Duan, Daniel C.; Stefely, James S.; Schultz, David W.; and Leach, Chester L., 5,569,450, Cl. 424-45.000.
- Hutchinson, Ted F.; Lutz, Dale R.; MacDougall, Trevor W.; and Onstott, James R., 5,570,449, Cl. 385-134.000.
- Weavers, Mark W., 5,568,863, Cl. 206-387.100.
- Minolta Co., Ltd.: See—  
Nagai, Yoshiro, 5,570,180, Cl. 356-330.000.
- Terauchi, Koichi; and Ono, Tomomi, 5,570,192, Cl. 356-407.000.
- Minor, David M.; and Roseveare, Ronald N., to B&W Fuel Company. On line shipping air delivery system. 5,570,400, Cl. 376-253.000.
- Minz, Franz-Rudolf: See—  
Dummersdorf, Hans-Ulrich; Waldman, Helmut; Härle, Helmut; Minz, Franz-Rudolf; and Gestermann, Fritz, 5,569,024, Cl. 417-420.000.
- Mirzamaani, Mohammad T.: See—  
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- Mishima, Masaru: See—  
Kinoshita, Hirotugu; Nomura, Souichi; and Mishima, Masaru, 5,569,643, Cl. 508-155.000.
- Mistyurik, John D.; Roth, Mark W.; and Small, James R., to Monarch Marking Systems, Inc. Printer. 5,570,121, Cl. 347-171.000.
- Mitchell, Alexander R.; Pagoria, Philip F.; and Schmidt, Robert D., to University of California, The Regents of the. Vicarious nucleophilic substitution to prepare 1,3-diamino-2,4,6-trinitrobenzene or 1,3,5-triamino-2,4,6-trinitrobenzene. 5,569,783, Cl. 74-395.000.
- Mitsubishi Chemical Corporation: See—  
Takewaki, Takahiko; Fujita, Naoko; Yokoyama, Toshiharu; and Maki, Takao, 5,569,803, Cl. 585-269.000.
- Mitsubishi Denki Kabushiki Kaisha: See—  
Endo, Takafumi, 5,569,390, Cl. 250-208.100.
- Ido, Kihei; and Ohta, Masayuki, 5,570,248, Cl. 360-77.140.
- Inoue, Sadyuki; Ishimoto, Junko; Nakamura, Takahiko; and Kumano, Makoto, 5,570,378, Cl. 371-37.100.
- Isoda, Satoru; Hanazato, Yoshio; Ueyama, Satoshi; Kawakubo, Hiroaki; and Nishikawa, Satoshi, 5,570,457, Cl. 395-25.000.
- Matsubara, Toshiyuki, 5,569,903, Cl. 235-492.000.



- Nishida, Satoshi; Matsubara, Masato; and Otani, Akihiro, 5,570,384, Cl. 372-19,000.
- Ohmori, Masashi; Tanaka, Hiroshi; Nishimoto, Akira; Sasai, Hiroshi; Fujino, Naohiko; and Kotoh, Satoru, 5,568,821, Cl. 134-61,000.
- Takahashi, Hideki, 5,569,941, Cl. 257-133,000.
- Takaishi, Tadao; Matsumura, Masami; Marumoto, Tokuo; and Yokotani, Masahiro, 5,570,015, Cl. 324-207,210.
- Toide, Eiichi; and Tsukagoshi, Kazuo, 5,570,140, Cl. 348-744,000.
- Usui, Masahiro; Kida, Hiroshi; Shikama, Shinsuke; and Kondo, Mitsushige, 5,570,209, Cl. 359-41,000.
- Mitsubishi Electric Information Technology Center America, Inc.: See—Barrus, John W., 5,570,301, Cl. 364-559,000.
- Mitsubishi Gas Chemical Company, Inc.: See—Arii, Mitsuzo; Jinnai, Kuniaki; Ohwada, Hisashi; and Kawabata, Yasunari, 5,570,442, Cl. 385-46,000.
- Iwakiri, Tsuneaki; and Shimaoka, Gorou, 5,569,700, Cl. 524-504,000.
- Kanayama, Satoshi; Ogawa, Noriyoshi; and Tajima, Jun, 5,569,566, Cl. 430-58,000.
- Mitsuda, Yasuhiro: See—Yamada, Toshiro; and Mitsuda, Yasuhiro, 5,569,796, Cl. 570-175,000.
- Mitsui Petrochemical Industries, Ltd.: See—Yamamoto, Sanehiro; Kimura, Toshio; Nakagawa, Takasi; and Toyota, Akino, 5,569,711, Cl. 525-66,000.
- Mitsui Toatsu Chemicals, Inc.: See—Oishi, Tetsuya; Suzuki, Jin; Ohkawa, Kouhei; Furusawa, Satoshi; Ono, Hiroshi; and Sugazaki, Kazuo, 5,569,726, Cl. 525-472,000.
- Miura, Hidemitsu: See—Ito, Hidekazu; Morimoto, Ryoichi; and Miura, Hidemitsu, 5,568,770, Cl. 104-88,010.
- Miura, Masao: See—Uchida, Naoshi; Kohanawa, Akihiko; Miura, Masao; Oyama, Jun; and Asakawa, Koji, 5,569,894, Cl. 218-27,000.
- Miwa, Tadashi; Matsuo, Isao; Matsunaga, Sakaho; and Miyamoto, Takayuki, to Konica Corporation, Image forming apparatus having a rotatable photoreceptor, 5,570,160, Cl. 355-200,000.
- Mix, John D.: See—Parker, Jeffrey L.; Sorrells, David F.; and Mix, John D., 5,570,177, Cl. 356-139,060.
- Miyagi, Morihito: See—Murakami, Masaru; Oguri, Yozo; Ashi, Yoshihiro; Tanaka, Katsuyoshi; Kozaki, Takahiko; Takase, Akihiko; and Miyagi, Morihito, 5,570,368, Cl. 370-94,200.
- Miyaguchi, Hisashi, to Matsushita Electric Industrial Co., Ltd. Television receiver incorporating video recording and reproducing apparatus, 5,570,196, Cl. 386-1,000.
- Miyamoto, Hidenori: See—Wakabayashi, Hiroshi; Miyamoto, Hidenori; Kato, Minoru; Soshi, Isao; and Omi, Junichi, 5,570,149, Cl. 396-85,000.
- Miyamoto, Katsuhiko, to Oki Electric Industry Co., Ltd. Clock signal fault detector, 5,570,382, Cl. 371-61,000.
- Miyamoto, Takayuki: See—Miwa, Tadashi; Matsuo, Isao; Matsunaga, Sakaho; and Miyamoto, Takayuki, 5,570,160, Cl. 355-200,000.
- Miyasaka, Seiichi; and Watanabe, Hiroyuki, to Asahi Glass Company Ltd.; and Saint Gobain Vitreage, Laminated glass with polyurethane resin layer and silane coupling agent layer, 5,569,537, Cl. 428-425,500.
- Miyatake, Yoshito: See—Omae, Hideki; Miyatake, Yoshito; and Takahara, Hiroshi, 5,570,215, Cl. 359-73,000.
- Miyauchi, Isamu: See—Hayashi, Sachio; Miyauchi, Isamu; and Oyama, Motofumi, 5,569,719, Cl. 525-329,300.
- Miyauchi, Masahiro: See—Ohta, Kazumasa; Inagawa, Masako; and Miyauchi, Masahiro, 5,568,679, Cl. 29-25,350.
- Miyaura, Shinobu: See—Fukui, Isao; Takahashi, Masamitsu; Ihara, Kazunori, deceased; Murakami, Hiroshi; Tanaka, Tetsuhiro; Miyaura, Shinobu; Kuroda, Shinichi; Hiraishi, Masahiro; and Inoue, Koji, 5,569,455, Cl. 422-174,000.
- Miyazaki, Nagao, to Japan Electronics Industry, Limited, Vehicle stress detecting and measuring method and stress detecting device using said method, 5,569,857, Cl. 73-785,000.
- Miyazawa, Kazuhiro: See—Jin, Dongzhi; Numanami, Masaei; Abe, Fumihiko; and Miyazawa, Kazuhiro, 5,570,010, Cl. 324-67,000.
- Miyoshi, Akira; and Hashimoto, Yuiti, to Matsushita Electric Industrial Co., Ltd. Iterative arithmetic processor, 5,570,309, Cl. 364-746,200.
- Miyoshi, Motosuke; and Okumura, Katsuya, to Kabushiki Kaisha Toshiba, Method and apparatus for repairing defect on plane surface of phase shift mask, 5,569,392, Cl. 216-60,000.
- Mizes, Howard A.: See—Andrews, John R.; Mizes, Howard A.; Kuhman, Daniel E.; and Herloski, Robert P., 5,570,161, Cl. 355-215,000.
- Mizrahi, Victor, to AT&T Corp. Optical waveguiding component comprising a band-pass filter, 5,570,440, Cl. 385-37,000.
- Mizuno, Jiro, to Labor Savings Machine Co., Ltd. Foldable wheelchair, 5,568,933, Cl. 280-42,000.
- Mizuno, Toshiya: See—Akatsu, Masamichi; Higashi, Takeo; Makita, Hiromitsu; Susa, Tomoo; and Mizuno, Toshiya, 5,569,524, Cl. 428-215,000.
- Mizutani, Atsushi: See—Katayama, Masayuki; Mizutani, Atsushi; Hattori, Yutaka; and Ito, Nobuei, 5,569,486, Cl. 427-66,000.
- Mizutani, Hideo; and Ota, Kazuya, to Nikon Corporation, Double-beam light source apparatus, position detecting apparatus and aligning apparatus, 5,569,929, Cl. 250-548,000.
- Mizutani, Kazuhiro: See—Ema, Taiji; Itabashi, Kazuo; and Mizutani, Kazuhiro, 5,570,311, Cl. 365-154,000.
- Mizurina, Galina T.: See—Belunova, Ludmila V.; Gribkov, Vladimir N.; Chernyak, Andre I.; Mizurina, Galina T.; Mordovin, Oleg A.; and Mukhanova, Elena E., 5,569,423, Cl. 264-60,000.
- MKH-Konsult: See—Nilsson, Majvor, 5,569,378, Cl. 210-242,100.
- Mobil Oil Corporation: See—Avery, Noyes L.; Axelrod, Joan C.; Carey, James T.; Hiebert, John; and Horodysky, Andrew G., 5,569,407, Cl. 508-454,000.
- Beck, Jeffrey S.; Valyocik, Ernest W.; and Venkat, Chaya R., 5,569,805, Cl. 585-446,000.
- Bell, Weldon K.; Brown, Stephen H.; and Trewella, Jeffrey C., 5,569,789, Cl. 568-697,000.
- Coolbaugh, Thomas S.; Loveless, Frederick C.; and Matthews, Demetrios N., 5,569,718, Cl. 525-314,000.
- Mobility Research L.L.C.: See—Seif-Naraghi, Amir; Dilli, David L.; D'Luzansky, Stephen C.; and Herman, Richard M., 5,569,129, Cl. 482-69,000.
- Mochizuki, Azuma: See—Igarashi, Hiroshi; Mochizuki, Azuma; Kajima, Yoshitaka; Ohara, Toshiya; Inoue, Hideki; and Tohyama, Shigeki, 5,569,085, Cl. 453-49,000.
- Molmed Medical Devices: See—Ross, James B.; and Chang, Ronald, 5,569,235, Cl. 604-403,000.
- Modi, Pankaj, Vaccine delivery system for immunization, using biodegradable polymer microspheres, 5,569,468, Cl. 424-491,000.
- Mody, Tarak D.: See—Sessler, Jonathan L.; Hemmi, Gregory W.; and Mody, Tarak D., 5,569,759, Cl. 540-472,000.
- Moen, Michael, Multiple draw syringe, 5,569,210, Cl. 604-191,000.
- Mogamiya, Makoto, to Asahi Kogaku Kogyo Kabushiki Kaisha, Image sensor holding apparatus, 5,570,231, Cl. 359-640,000.
- Mokler, Bernhard, to LTG Lufttechnische Gesellschaft M.B.H. Multiple conveyor stacking apparatus, 5,569,016, Cl. 414-793,100.
- Molitor, Robert P.; Nesbitt, R. Dennis; Stiefel, Joseph F.; and Melvin, Terence, to Lisco, Inc. Golf Ball, 5,569,100, Cl. 473-384,000.
- Moll, Richard J. Turning device for transport apparatus, 5,568,920, Cl. 271-225,000.
- Mölne, Anders: See—Ahlberg, Björn G. D.; Falk, Johan; and Mölne, Anders, 5,570,413, Cl. 379-59,000.
- Moloney, David: See—Gadducci, Paolo; Moloney, David; and Betti, Giorgio, 5,570,380, Cl. 371-57,100.
- Monaco, Michael C.: See—Reinhart, Eugene R.; Monaco, Michael C.; and Salisbury, Gary T., 5,569,393, Cl. 219-69,150.
- Monarch Marking Systems, Inc.: See—Mistyurik, John D.; Roth, Mark W.; and Small, James R., 5,570,121, Cl. 347-171,000.
- Mongelli, Nicola; Angelucci, Francesco; Pesenti, Enrico; Suarato, Antonino; and Biasoli, Giovanni, to Farmitalia Carlo Erba S.r.l. Polymer-bound paclitaxel derivatives, 5,569,720, Cl. 525-329,400.
- Mongoin, Jacques: See—Egraz, Jean-Bernard; Mongoin, Jacques; Ravet, Georges; and Suau, Jean-Marc, 5,569,702, Cl. 524-547,000.
- Monosov, Ann; and Fu, Xinyu, to Anticancer Incorporated, Nude mouse model for human neoplastic disease, 5,569,812, Cl. 800-2,000.
- Monsanto Company: See—Hinchee, Maud A.; and Connor-Ward, Dannelle, 5,569,834, Cl. 800-205,000.
- Montefiore Medical Center: See—Augenlicht, Leonard H., 5,569,584, Cl. 435-6,000.
- Montoye, Robert K.; and Zasio, John J., to HAL Computer Systems, Inc. CMOS buffer circuit having power-down feature, 5,570,036, Cl. 326-16,000.
- Moody, Paul E., to United States of America, Navy, BI-modal elastomeric ejector, 5,568,782, Cl. 114-238,000.
- Moonen, Chrit T. W.; and Duyu, Jeff, to United States of America, Health and Human Services, Method for magnetic resonance spectroscopic imaging with multiple spin-echoes, 5,570,019, Cl. 324-309,000.
- Moore Business Forms, Inc.: See—Harrod, Jimmie A., 5,568,717, Cl. 53-429,000.
- Muranyi, Mark J.; Polluto, Dennis C.; Cyman, T. F.; Hook, Kevin J.; Christy, Orrin D.; and Matheis, Mark A., 5,570,170, Cl. 355-260,000.
- Rice, David K., II; and Langan, Joseph W., 5,569,515, Cl. 428-40,500.
- Moore, Danny, Compound miter jig apparatus, 5,568,758, Cl. 83-745,000.
- Moore, Morris D., III: See—Callaway, Brian; and Moore, Morris D., III, 5,569,430, Cl. 264-258,000.
- Mor Research Applications Ltd.: See—Rephaeli, Ada; Nudelman, Abraham; and Shakrai, Matityahu, 5,569,675, Cl. 514-547,000.

- Mordehai, Alex V.: See—Buttrill, Sidney E., Jr.; and Mordehai, Alex V., 5,569,917, Cl. 250-292,000.
- Mordovin, Oleg A.: See—Belunova, Ludmila V.; Gribkov, Vladimir N.; Chernyak, Andre I.; Mizurina, Galina T.; Mordovin, Oleg A.; and Mukhanova, Elena E., 5,569,423, Cl. 264-60,000.
- Morgan, Brian R. Tamper evident security device, 5,568,951, Cl. 292-307,00A.
- Mori, Hiroyuki: See—Ohki, Hiroaki; Nishima, Osamu; Mori, Hiroyuki; and Suzuki, Junya, 5,569,616, Cl. 437-44,000.
- Mori, Koji: See—Matsumoto, Kenji; Itoh, Shigeyuki; Sano, Kenji; Kobayashi, Jun; Mori, Koji; and Okada, Kenji, 5,570,220, Cl. 359-146,000.
- Mori, Shigeru; and Imagawa, Yasuharu, to Hitachi, Ltd. On-line roll grinding apparatus, 5,569,060, Cl. 451-5,000.
- Mori, Toshihiro: See—Hiraoka, Toshikage; Tanimoto, Tetsuji; Makino, Yoshihiko; Ninomiya, Tadashi; Hora, Naofumi; Ashihara, Yoshihiro; Sudo, Yukio; and Mori, Toshihiro, 5,569,589, Cl. 435-7,900.
- Morikawa Industries Corporation: See—Morikawa, Kenji; Obinata, Hiroshi; Omata, Kazuo; Sato, Toshihiko; Nakajima, Yoshihiko; and Ichikawa, Seigo, 5,570,468, Cl. 588-1,000.
- Morikawa, Kenji; Obinata, Hiroshi; Omata, Kazuo; Sato, Toshihiko; Nakajima, Yoshihiko; and Ichikawa, Seigo, to Morikawa Industries Corporation, Method and apparatus for decontaminating substances contaminated with radioactivity, 5,570,468, Cl. 588-1,000.
- Morikawa, Yuko; Yanagisawa, Yoshihiro; and Takimoto, Kiyoshi, to Canon Kabushiki Kaisha, Electron-emitting device and electron beam lithograph machine and image display apparatus making use of it, 5,569,974, Cl. 313-310,000.
- Morimoto, Ryoichi: See—Ito, Hidekazu; Morimoto, Ryoichi; and Miura, Hidemitsu, 5,568,770, Cl. 104-88,010.
- Morin, Jean-Xavier: See—Suraniti, Sylvestre; Morin, Jean-Xavier; and Maillot, Frédéric, 5,568,776, Cl. 110-245,000.
- Morioka, Izuru; and Kuwano, Kenji, to Nihon Micro Coating Co., Ltd. Polishing apparatus, 5,569,063, Cl. 451-296,000.
- Morishima, Masaaki, to NEC Corporation, Method and apparatus for controlling the drive frequency of a LED, 5,570,421, Cl. 379-396,000.
- Morishita, Yoshiko: See—Kasanami, Tohru; Nakamura, Takeshi; Okano, Keiichi; and Morishita, Yoshiko, 5,569,969, Cl. 310-345,000.
- Morita, Shizuo: See—Fukuchi, Masakazu; Haneda, Satoshi; and Morita, Shizuo, 5,570,194, Cl. 358-300,000.
- Mormann, Werner; and Irle, Christoph, to Europäische Wirtschaftsgemeinschaft, Antistropic polymers and method of producing them, 5,569,727, Cl. 525-528,000.
- Morot-Gaudry, Jean-François: See—Vincent, Michel; Dorlhac, François; Chupeau, Yves; Morot-Gaudry, Jean-François; and Caboche, Michel, 5,569,833, Cl. 800-205,000.
- Morphy, John R.: See—Porter, John R.; Morphy, John R.; Millican, Thomas A.; and Beeley, Nigel R. A., 5,569,665, Cl. 514-357,000.
- Morré, D. James; and Morré, Dorothy M., to Purdue Research Foundation, Capsaicinoid compounds as proliferation inhibitors, 5,569,673, Cl. 514-522,000.
- Morré, Dorothy M.: See—Morré, D. James; and Morré, Dorothy M., 5,569,673, Cl. 514-522,000.
- Morris, Donald R.: See—Sawyer, Derrell; and Morris, Donald R., 5,569,065, Cl. 452-3,000.
- Morris, Jerry L.: See—Olsen, Ib I.; and Morris, Jerry L., 5,569,560, Cl. 429-192,000.
- Morris, Kathleen A.: See—Shoolery, John R.; Pasela, Guy E.; De La Torre, Diane L.; Leung, Kenneth M.; and Morris, Kathleen A., 5,570,283, Cl. 364-407,000.
- Morris, Livingston B.: See—Lee, Kyu H.; Morris, Livingston B.; Palmer, David W., deceased, 5,569,928, Cl. 250-494,100.
- Morrison, Matthew M., to Smith & Nephew Richards, Inc. Enhanced variable angle bone bolt, 5,569,247, Cl. 606-61,000.
- Morrison, Michael: See—Dudle, James; Leatherman, Michael; Morrison, Michael; and Schnell, Waldo, 5,570,291, Cl. 364-468,010.
- Morrow, David; and Naumburg, Phillip, to Warrior Lacrosse, Inc. Scooped lacrosse head, 5,568,925, Cl. 273-326,000.
- Morrow, Thomas: See—Dobele, Frieder; Graham, William G.; Dowling, Denis P.; O'Brien, Terence P.; Kornas, Volkhard; and Morrow, Thomas, 5,570,175, Cl. 356-72,000.
- Morton, Howard E.: See—Stuk, Timothy L.; Haight, Anthony R.; Morton, Howard E.; Robbins, Timothy A.; Scarpetti, David; and Tien, Jien-Heh J., 5,569,777, Cl. 560-24,000.
- Morton International, Inc.: See—Spilker, David L.; Parker, Don L.; and Storey, J. Kirk, 5,568,936, Cl. 280-728,200.
- Mortvedt, Ray: See—Lorentzen, John F.; Colburn, Todd B.; and Mortvedt, Ray, 5,568,921, Cl. 273-73,00A.
- Mosaid Technologies Incorporated: See—Schofield, Paul, 5,570,381, Cl. 371-61,000.
- Mosebach, Garry M., to Appleton Electric Company, Light fixture with safety sockets, 5,569,042, Cl. 439-237,000.
- Mostafazadeh, Shahram: See—Chillara, Satya; and Mostafazadeh, Shahram, 5,569,955, Cl. 257-566,000.
- Motor Wheel Corporation: See—Daudi, Anwar R., 5,568,745, Cl. 72-353,400.
- Motorola: See—Bhatnagar, Mohit; Weitzel, Charles E.; and Thero, Christine, 5,569,937, Cl. 257-77,000.
- Motorola, Inc.: See—Bishop, Peter W. D.; and Bartlett, Ian M., 5,570,343, Cl. 370-16,000.
- Eberhardt, John E.; and Bellotti, Enrico, 5,570,065, Cl. 330-296,000.
- Eberhardt, John E.; and Bane, Ronald L., 5,570,066, Cl. 331-34,000.
- Garrett, Scott M.; and Vashi, Dipi V., 5,569,550, Cl. 429-7,000.
- Gerson, Ira A.; Jasiuk, Mark A.; and Hartman, Matthew A., 5,570,453, Cl. 395-2,280.
- Grube, Gary W.; Naddell, Marc C.; and Shaughnessy, Mark L., 5,570,100, Cl. 342-457,000.
- Smith, Roger A., 5,570,310, Cl. 364-748,500.
- Moy, David; and Hoch, Robert, to Hyperion Catalysts, Int'l., Inc. Catalyst support, supported catalysts and methods of making and using the same, 5,569,635, Cl. 502-185,000.
- Moy, Peter K.; and Watanabe, Kiyoshi, to GC Corporation, Implant fixture, 5,569,037, Cl. 433-173,000.
- Moynihan, John T., to Bureau of Engraving and Printing, Soybean oil-based intaglio ink and method for making same, 5,569,701, Cl. 524-539,000.
- Mrotz, Walter C., III: See—Rizzi, John J.; and Mrotz, Walter C., III, 5,568,775, Cl. 108-64,000.
- MTI Precision Products, Inc.: See—Meller, Moshe; and Feldman, Michael, 5,569,034, Cl. 433-105,000.
- MTU Motoren- und Turbinen Union München GmbH: See—Lindner, Ernst; Trittel, Guido W.; and Britz, Klaus, 5,568,724, Cl. 60-204,000.
- MTU Motoren- und Turbinen-Union Munich GmbH: See—Satzger, Wilhelm; and Mangold, Edmund, 5,570,186, Cl. 356-376,000.
- Mu, Hsueh C., to Falcon Industrial Co., Ltd. Multi-step bicycle transmission sprocket assembly, 5,569,107, Cl. 474-160,000.
- Mueller, Richard L.: See—Evans, Michael; and Mueller, Richard L., 5,569,277, Cl. 606-159,000.
- Muenzel, Horst: See—Marek, Jiri; Bantien, Frank; Muenzel, Horst; and Offenberg, Michael, 5,569,852, Cl. 73-514,320.
- Mujumdar, Ratnakar B.: See—Waggoner, Alan S.; Ernst, Lauren A.; and Mujumdar, Ratnakar B., 5,569,766, Cl. 548-150,000.
- Mukhanova, Elena E.: See—Belunova, Ludmila V.; Gribkov, Vladimir N.; Chernyak, Andre I.; Mizurina, Galina T.; Mordovin, Oleg A.; and Mukhanova, Elena E., 5,569,423, Cl. 264-60,000.
- Mulherin, James E.: See—Vaillancourt, John J.; and Mulherin, James E., 5,568,781, Cl. 114-20,200.
- Müller, Andreas; Klar, Manfred; and Hofer, Bernd, to Sonopress Produktionsgesellschaft für Ton- und Informationsträger mbH, Method and apparatus for testing the position of a point on edited magnetic tapes packed in cassettes via a cue tone, 5,570,014, Cl. 324-206,000.
- Müller, Walter; and Anhäuser, Dieter, to LTS Lohmann Therapie-Systeme GmbH & Co. KG, Process for producing a flat active substance administration form, 5,569,484, Cl. 427-2,140.
- Müller, Wolfgang, to Bruker Analytische Messtechnik GmbH, NMR slice coil, 5,570,073, Cl. 335-299,000.
- Mullet, Willis; Bennett, Thomas B., III; and Dague, Roger L., to Wayne-Dalton Corp. Support bracket and track assembly for sectional overhead doors, 5,568,672, Cl. 16-94,00R.
- Munch, Michel: See—Steininger, Helmut; Green, Alan; Munch, Michel; and Heilmann, Peter, 5,569,522, Cl. 428-195,000.
- Münch, Reinhold: See—Broedel, Axel; Springmann, Thomas; Münch, Reinhold; and Bader, Armin, 5,569,838, Cl. 73-23,310.
- Muncy, Ron, Chiropractic brace, 5,569,171, Cl. 602-5,000.
- Muni, Ketan P.; Bagatiosan, Celso J.; and Thornton, Troy L., to Advanced Cardiovascular Systems, Inc. Trackable intravascular catheter, 5,569,196, Cl. 604-96,000.
- Munson, Bruce N.; and Visser, Steven C., to Exertron, Inc. Video game controller for use with an exercise apparatus, 5,568,928, Cl. 463-37,000.
- Murakami, Hiroshi: See—Fukui, Isao; Takahashi, Masamitsu; Ihara, Kazunori, deceased; Murakami, Hiroshi; Tanaka, Tetsuhiro; Miyaura, Shinobu; Kuroda, Shinichi; Hiraishi, Masahiro; and Inoue, Koji, 5,569,455, Cl. 422-174,000.
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- Murakami, Tomoyasu: See—



- Yano, Kousaku; Murakami, Tomoyasu; Endo, Masayuki; and Nomura, Noboru, 5,569,628, Cl. 437-245.000.  
 Muramatsu, Takahiro: See—  
 Nakazato, Morikuni; Muramatsu, Takahiro; and Iwamoto, Shigeru, 5,569,405, Cl. 508-192.000.  
 Muranyi, Mark J.; Polluro, Dennis C.; Cyman, T. F.; Hook, Kevin J.; Christy, Orrin D.; and Matheis, Mark A., to Moore Business Forms, Inc. Electrostatic printing apparatus with a hopper and applicator roller with method of applying toner to and decumpling the applicator roller. 5,570,170, Cl. 355-260.000.  
 Muraoka, Kazuyoshi: See—  
 Makino, Eiichi; Koyanagi, Masaru, and Muraoka, Kazuyoshi, 5,570,047, Cl. 327-80.000.  
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 Muraski, James T., to Jason, Inc. Coated magnetic tape cassette spring. 5,568,914, Cl. 267-158.000.  
 Murata Machinery, Ltd.: See—  
 Chun, Victor L., 5,568,754, Cl. 83-13.000.  
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 Azawa, Tatsuhiko; and Inao, Takeshi, 5,569,860, Cl. 73-863.000.  
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 Koike, Jun; and Ieki, Hidehiko, 5,569,548, Cl. 428-699.000.  
 Murata, Shigenori: See—  
 Sakai, Kouichi; Aoki, Shuhei; Murata, Shigenori; Oumi, Hayato; and Suzuki, Hiroshi, 5,569,105, Cl. 474-110.000.  
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 Murphy, Lawrence E.: See—  
 Hamers, Timothy F.; Murphy, Lawrence E.; and Vohnoutka, Wayne R., 5,568,810, Cl. 128-660.010.  
 Murphy, Philip: See—  
 Allmeier, Franz; Maier, Theodor; Goesser, Gerhard; Preslar, Donald; and Murphy, Philip, 5,570,259, Cl. 361-86.000.  
 Murphy, Scott, to Thomas Jefferson University. Synthetic-based platelet storage media. 5,569,579, Cl. 435-2.000.  
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 Myers, Glen A. Method and apparatus for the cancellation of interference in electrical systems. 5,570,395, Cl. 375-346.000.  
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 Lynch, Robert C.; Myers, Kevin H.; Smith, Ronald A.; Talley, William L.; and Veals, Edward R., 5,569,895, Cl. 235-1.00R.  
 Nabeyama, Yoshio; and Araki, Hirofumi, to Fujitsu Limited. Method and apparatus for preventing occurrence of surge light in optical amplifier/transmitter apparatus. 5,570,227, Cl. 359-341.000.  
 Nacewicz, Stanley J.: See—  
 Manning, William R.; Carlos, Mark C.; and Nacewicz, Stanley J., 5,570,257, Cl. 361-76.000.  
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 Adams, James E.; Lynn, John D.; and Nadarajah, Ravindran, 5,568,896, Cl. 241-24.290.  
 Nadd, Bruno C., to International Rectifier Corporation. Clamping circuit for IGBT in spark plug ignition system. 5,569,982, Cl. 315-209.00T.  
 Naddell, Marc C.: See—  
 Grube, Gary W.; Naddell, Marc C.; and Shaughnessy, Mark L., 5,570,100, Cl. 342-457.000.  
 Nae, Vasile: See—  
 Weber, James L.; and Nae, Vasile, 5,568,959, Cl. 297-238.000.  
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 Naga, Mitsuo; Kiriha, Shuetsu; Tokugawa, Yoshinori; Tsuda, Fumiaki; Saito, Toshiaki; and Hirotsuka, Motohiko, to Fuji Oil Company, Limited. Process for producing edible proteinaceous film. 5,569,482, Cl. 426-656.000.  
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 Fukushima, Masaharu; and Nagai, Yuichi, 5,569,341, Cl. 152-527.000.  
 Nagamine, Satoshi; Maenobu, Kiyoshi; Wakayama, Yorihiro; and Nishimura, Akio, to Matsushita Electric Industrial Co., Ltd. Apparatus and method for defocusing images. 5,570,433, Cl. 382-255.000.  
 Nagano, Hirofumi, to Victor Company of Japan, Ltd. Optical disc and a recording and/or reproducing apparatus having copy-protection function. 5,570,339, Cl. 369-275.300.  
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 Iwasa, Shoichi; and Naganuma, Takeshi, 5,569,947, Cl. 257-336.000.  
 Nagasawa, Kenichi: See—  
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 Nagata, Makio: See—  
 Masada, Yigoro; and Nagata, Makio, 5,569,525, Cl. 428-219.000.  
 Nagata, Tadaaki; Kouchi, Takao; and Itani, Yoshinobu, to Honda Giken Kogyo Kabushiki Kaisha. Step floor for a small snowmobile. 5,568,840, Cl. 180-190.000.  
 Naghshineh, Mahmoud: See—  
 Baker, Murray C.; Cheung, Roger Y. M.; Bhattacharya, Partha P.; Kobo, Roberto M.; Kolbe, Eduardo M.; and Naghshineh, Mahmoud, 5,570,366, Cl. 370-85.130.  
 Nagler, Yaacov. Impact absorbing device. 5,568,913, Cl. 256-13.100.  
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 Nakade, Shinichi: See—  
 Tanaka, Yasuyuki; Shibata, Kazuhiko; Ikeda, Kenichi; Nishida, Yuji; Hayashi, Masaharu; Nakade, Shinichi; Kuga, Akihito; and Kanamaru, Eiji, 5,569,740, Cl. 528-502.00F.  
 Nakagawa, Takasi: See—  
 Yamamoto, Sanehiro; Kimura, Toshio; Nakagawa, Takasi; and Toyota, Akinori, 5,569,711, Cl. 525-66.000.  
 Nakahara, Shinji: See—  
 Fukatsu, Yoshiki; Nakahara, Shinji; Yamada, Youichi; Yamamoto, Hideji; Hida, Tatsuya; and Wada, Mizuho, 5,569,445, Cl. 423-633.000.  
 Nakajima, Ryoji: See—  
 Yamada, Hajime; and Nakajima, Ryoji, 5,568,726, Cl. 60-323.000.  
 Nakajima, Yoshihiko: See—  
 Morikawa, Kenji; Obinata, Hiroshi; Omata, Kazuo; Sato, Toshihiko; Nakajima, Yoshihiko; and Ichikawa, Seigo, 5,570,468, Cl. 588-1.000.  
 Nakajo, Tetsuo: See—  
 Tsuji, Katsuyuki; Oshiro, Kimitaka; and Nakajo, Tetsuo, 5,569,795, Cl. 570-168.000.  
 Nakamoto, Koii: See—  
 Nakazawa, Masaaki; Ito, Hideo; Nakamoto, Koji; Kura, Yasuhito; Kitano, Seiji; Yabe, Hisao; and Furukawa, Tatsuya, 5,569,157, Cl. 600-107.000.  
 Nakamura, Chiaki: See—  
 Kitaichi, Satoshi; Nakamura, Chiaki; Tanaka, Michio; and Fukuta, Atushi, 5,569,474, Cl. 425-547.000.  
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 Nakamura, Kimiaki: See—  
 Hanaoka, Kazutaka; Yoshida, Hidefumi; Nakamura, Kimiaki; Tsuda, Hideaki; and Chida, Hideo, 5,570,211, Cl. 359-53.000.  
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 Nakamura, Masaharu: See—  
 Tanaka, Toshiyuki; and Nakamura, Masaharu, 5,570,293, Cl. 364-468.280.  
 Nakamura, Shinya: See—  
 Kono, Katsumi; Nakamura, Shinya; and Honda, Atsushi, 5,569,117, Cl. 477-169.000.  
 Nakamura, Takahiko: See—  
 Inoue, Sadayuki; Ishimoto, Junko; Nakamura, Takahiko; and Kumano, Makoto, 5,570,378, Cl. 371-37.100.  
 Nakamura, Takeshi: See—  
 Kasanami, Tohru; Nakamura, Takeshi; Okano, Keiichi; and Morishita, Yoshiko, 5,569,969, Cl. 310-345.000.  
 Nakamura, Tetsuro: See—  
 Jung, Hyung J.; Kim, Hyun J.; Kim, Kyong Y.; Yoon, Seok J.; Yoon, Sang O.; Nakamura, Tetsuro; Itoh, Mitsuru; and Inaguma, Yoshiyuki, 5,569,632, Cl. 501-136.000.  
 Nakamura, Yoshihiro: See—  
 Naito, Kazufumi; Nakamura, Yoshihiro; and Konishi, Hiroyuki, 5,569,887, Cl. 177-184.000.  
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 Satake, Kunio; Wakabayashi, Hiroaki; and Nakane, Masami, 5,569,662, Cl. 514-305.000.  
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 Nakano, Hirofumi: See—  
 Arai, Takashi; and Nakano, Hirofumi, 5,570,156, Cl. 396-51.000.  
 Nakano, Junichi: See—  
 Ogata, Takashi; and Nakano, Junichi, 5,570,335, Cl. 369-124.000.  
 Nakashima, Masato: See—  
 Kato, Masayuki; Aritake, Hirokazu; Ishimoto, Manabu; Sato, Noriko; and Nakashima, Masato, 5,570,208, Cl. 359-23.000.  
 Nakashima, Yoshiaki: See—

- Sugita, Yasutoshi; Yoshioka, Kiyoharu; and Nakashima, Yoshiaki, 5,570,205, Cl. 35.8-472.000.  
 Nakata, Junichi: See—  
 Banno, Tutomu; and Nakata, Junichi, 5,570,200, Cl. 386-45.000.  
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 Nakazawa, Masaaki; Ito, Hideo; Nakamoto, Koji; Kura, Yasuhito; Kitano, Seiji; Yabe, Hisao; and Furukawa, Tatsuya, to Olympus Optical Co., Ltd. Endoscope. 5,569,157, Cl. 600-107.000.  
 Namba, Kenryo: See—  
 Kitagawa, Sumiko; Shinkai, Masahiro; and Namba, Kenryo, 5,569,504, Cl. 428-64.100.  
 Namco Limited: See—  
 Igarashi, Hiroshi; Mochizuki, Azuma; Kajima, Yoshitaka; Ohara, Toshiya; Inoue, Hideki; and Tohyama, Shigeki, 5,569,085, Cl. 463-49.000.  
 Namikoshi, Michio: See—  
 Rinehart, Kenneth L.; Carmichael, Wayne W.; and Namikoshi, Michio, 5,569,757, Cl. 536-17.400.  
 Nano Systems L.L.C.: See—  
 Wong, Sui-Ming; Newington, Ian M.; Liversidge, Elaine M.; McIntire, Gregory L.; Pitt, Alan R.; and Shaw, Jack M., 5,569,448, Cl. 424-9.450.  
 Napiorkowski, John J.; Kroll, Thomas W.; Brower, Boyd G.; Crane, Robert A.; Butler, Walter K., III; Cote, Mark P.; Beahn, James G.; and Mickelson, Nils P., to Siccior Puerto Rico, Inc. Telephone network interface device. 5,570,422, Cl. 379-399.000.  
 Narayan, Chandrasekhar: See—  
 Lewis, David A.; and Narayan, Chandrasekhar, 5,569,950, Cl. 257-467.000.  
 Nardi, John C.: See—  
 Swierbut, Wendi M.; and Nardi, John C., 5,569,564, Cl. 424-224.000.  
 Narita, Satoshi: See—  
 Shirai, Koichi; Imoto, Kazunobu; Narita, Satoshi; Kamikubo, Yoshinori; and Hamashima, Mitsuhiro, 5,569,638, Cl. 503-227.000.  
 Narushima, Ryouichi: See—  
 Yokono, Hitoshi; Yokono, Haruki; Mikamo, Masahiro; Narushima, Ryouichi; Iida, Takuya; and Endo, Yasuhiro, 5,569,545, Cl. 428-626.000.  
 Nason, Kevin S.: See—  
 Minami, Don S.; and Nason, Kevin S., 5,568,912, Cl. 251-205.000.  
 Natali, Francis: See—  
 Bustamante, Herman; Natali, Francis; and Magill, David T., 5,570,349, Cl. 370-18.000.  
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 Nathel, Howard; Kinney, John H.; and Otis, Linda L., to University of California, Regents of the. Method for detection of dental caries and periodontal disease using optical imaging. 5,570,182, Cl. 356-345.000.  
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 Gould, Ronald W.; and Komorowski, Jerzy P., 5,569,342, Cl. 156-64.000.  
 National Science Council of R.O.C.: See—  
 Tsai, Ching-Hong; Guo, Fang-Dian; Hong, Jin-Hua; and Wu, Cheng-Wen, 5,570,375, Cl. 371-22.300.  
 National Semiconductor Corporation: See—  
 Chillara, Satya; and Mostafazadeh, Shahram, 5,569,955, Cl. 257-666.000.  
 Chillara, Satya N.; and Bayan, Jaime A., 5,569,956, Cl. 257-668.000.  
 Gill, Manzur, 5,570,314, Cl. 365-185.100.  
 Shacter, Stuart B., 5,570,067, Cl. 331-111.000.  
 National University of Singapore: See—  
 Phang, J. C. H.; Chim, W. K.; Chan, D. S. H.; and Liu, Y. Y., 5,569,920, Cl. 250-310.000.  
 Naumburg, Phillip: See—  
 Morrow, David; and Naumburg, Phillip, 5,568,925, Cl. 273-326.000.  
 Navetta, Michael S. Method and apparatus for removing mercury from mercury-contaminated soils. 5,569,154, Cl. 588-256.000.  
 Neber, Fritz, to Groninger & Co GmbH. Conveying apparatus for elongated objects. 5,568,850, Cl. 198-347.100.  
 NEC Corporation: See—  
 Fujita, Masayuki, 5,570,221, Cl. 359-161.000.  
 Hirata, Masaru, 5,570,255, Cl. 361-18.000.  
 Iga, Naoto, 5,570,371, Cl. 370-99.000.  
 Imai, Kiyotaka, 5,569,611, Cl. 437-31.000.  
 Katayama, Ryueichi, 5,570,333, Cl. 369-110.000.  
 Kusakabe, Atsuhiko, 5,569,942, Cl. 257-186.000.  
 Maruyama, Shigeru, 5,570,058, Cl. 327-404.000.  
 Matsubara, Yoshihisa, 5,569,618, Cl. 437-52.000.  
 Morishima, Masaaki, 5,570,421, Cl. 379-396.000.  
 Ogawa, Sumio, 5,570,318, Cl. 365-200.000.  
 Ohya, Kazumasa; Inagawa, Masako; and Miyauchi, Masahiro, 5,568,679, Cl. 29-25.350.  
 Saito, Masaru; and Bonkohara, Manabu, 5,570,274, Cl. 361-784.000.  
 Sasaki, Eisaku; and Kuroda, Yuka, 5,570,379, Cl. 371-42.000.  
 Shibutani, Makoto; Yasugi, Toshiharu; and Kanazawa, Akihiro, 5,570,219, Cl. 359-125.000.  
 Yoshida, Atsushi, 5,570,365, Cl. 370-85.600.  
 Ned, Alexander A.: See—

- Kurtz, Anthony D.; Shor, Joseph S.; and Ned, Alexander A., 5,569,626, Cl. 437-228.000.  
 Needham, Wayne; Qian, Qi-De; and Maloney, Tim, to Intel Corporation. Using hall effect to monitor current during IDDQ testing of CMOS integrated circuits. 5,570,034, Cl. 324-763.000.  
 Nelson, Chad N.: See—  
 Nelson, Robert N.; and Nelson, Chad N., 5,569,053, Cl. 439-668.000.  
 Nelson, Eric A. Formed wire bullet. 5,569,874, Cl. 102-507.000.  
 Nelson, Robert N.; and Nelson, Chad N., to Andrew Corporation. Connector for connecting an electronic device to a vehicle electrical system. 5,569,053, Cl. 439-668.000.  
 Nepela, Daniel A.; Chang, Ciuter; Hsia, Yiao-Tee; and Bhadra, Rajendra, to Read-Rite Corporation. Negative pressure air bearing slider. 5,568,981, Cl. 384-12.000.  
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 Ghini, Marco; Di Stefano, Giuseppe; and Neri, Armando, 5,569,931, Cl. 250-559.450.  
 Nesbitt, R. Dennis: See—  
 Molitor, Robert P.; Nesbitt, R. Dennis; Stiefel, Joseph F.; and Melvin, Terence, 5,569,100, Cl. 473-384.000.  
 Nesbitt, Regis J., to McCready Consumer Products, Inc. Chewing gum containing vitamins or other active materials. 5,569,477, Cl. 426-5.000.  
 Nestec, Ltd.: See—  
 Heinrich, David B.; and Spencer, Jack D., 5,568,729, Cl. 62-75.000.  
 Nestec S.A.: See—  
 Courtois, Didier; Petiard, Vincent; and Touche, André, 5,569,593, Cl. 435-118.000.  
 Maier, Hanspeter; and Zimmermann, Klaus, 5,569,479, Cl. 426-453.000.  
 Nevel, Avishai; Lawson, John B.; Gordon, Kendall W., Jr.; and Bonneau, David, to Lawson-Hemphill, Inc. System and method for electronically displaying yarn qualities. 5,570,188, Cl. 356-385.000.  
 New Vision Golf Corp.: See—  
 Klein, Lon, 5,569,098, Cl. 473-300.000.  
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 Wong, Sui-Ming; Newington, Ian M.; Liversidge, Elaine M.; McIntire, Gregory L.; Pitt, Alan R.; and Shaw, Jack M., 5,569,448, Cl. 424-9.450.  
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 Newman, Steve, to Capricornia Contact Lens Pty. Ltd. Toric lens with axis mislocation latitude. 5,570,143, Cl. 351-176.000.  
 Neyens, Lodewijk: See—  
 Leblans, Paul; Neyens, Lodewijk; Struye, Luc; and Willems, Peter, 5,569,926, Cl. 250-484.400.  
 NGK Insulators, Ltd.: See—  
 Ishida, Yoshihiko; and Tani, Makoto, 5,569,854, Cl. 73-628.000.  
 NGK Spark Plug Co., Ltd.: See—  
 Ogawa, Tatsuo; and Kawai, Junji, 5,570,070, Cl. 333-187.000.  
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 Heath, Mark A.; Pruett, D. Christopher; and Nguyen, Bang C., 5,570,332, Cl. 369-50.000.  
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 Erdal, Apo C.; Nguyen, Trung; and Yue, Kwok M., 5,570,045, Cl. 326-93.000.  
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 Nicastro, Neil D.; and Durham, Timothy J., to WMS Gaming Inc. Fractional branching reel-type slot machine. 5,569,084, Cl. 463-20.000.  
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 Cooper, Robert; Ianazzi, Peter; Nichols, Lawrence R.; and Parker, Thomas, 5,569,959, Cl. 280-728.300.  
 Nichols, Robert K., to Hon Industries, Inc. Decorative panel construction. 5,569,505, Cl. 428-57.000.  
 Nichols, W. Kirt: See—  
 Twardowski, Zbyslut J.; Nichols, W. Kirt; and Van Stone, John C., 5,569,182, Cl. 604-43.000.  
 Nickisch, Klaus: See—  
 Haffer, Gregor; and Nickisch, Klaus, 5,569,661, Cl. 514-292.000.  
 Nicolosi, Joseph A.: See—  
 Quinn, Duncan R.; Gallagher, Brian W.; Blonias, Costas; and Nicolosi, Joseph A., 5,569,925, Cl. 250-370.060.  
 Nielsen, Charles R.; Bates, Charles A.; Rooke, Matthew W.; Hansen, Fred R.; Petersen, Paul T.; Le, Me V.; and Lew, Eugene K., to Conner Peripherals, Inc. Single channel, multiple head servo writing with embedded head identification. 5,570,241, Cl. 360-46.000.  
 Nielsen, Ruby J.; and Rasmussen, Frank W., to Novo Nordisk A/S. Fungicidally active compounds. 5,569,671, Cl. 514-455.000.  
 Nielsen, Steven J.: See—  
 Fox, Donald G.; Rentmeester, Tammy J.; and Nielsen, Steven J., 5,569,177, Cl. 604-15.000.  
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 Engler, Bernd; Lox, Egbert; and Niemann-Weber, Andreas, 5,569,441, Cl. 423-212.000.



- Niemerg, Hermann; Osburg, Ralf; Berger, Arthur; Nienaber, Bernd; and Strobusch, Manfred, to Krupp Polysius AG. Double layer cooler. 5,568,734, Cl. 62-378.000.
- Niemeyer, Duane J., to Roadmaster Corp. Adjustable tricycle. 5,568,934, Cl. 280-282.000.
- Nienaber, Bernd: See—
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- Nifco Inc.: See—
- Asami, Goro; Kato, Tsuyoshi; and Konishi, Hideo, 5,568,675, Cl. 24-453.000.
- Nihei, Ryo; Sasaki, Yasuo; and Hase, Takahiro, to Fanuc Ltd. Weld-position detector provided with an optical axis adjustment means and used with a robot welding machine. 5,570,187, Cl. 356-376.000.
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- Morioka, Izuru; and Kuwano, Kenji, 5,569,063, Cl. 451-296.000.
- Nikon Corporation: See—
- Hibino, Hideo; Sakamoto, Hiroshi; and Yasukawa, Seiichi, 5,570,148, Cl. 396-182.000.
- Imai, Yuji, 5,569,930, Cl. 250-559.400.
- Mizutani, Hideo; and Ota, Kazuya, 5,569,929, Cl. 250-548.000.
- Sato, Susumu, 5,570,237, Cl. 359-797.000.
- Shibayama, Atsushi, 5,570,155, Cl. 396-82.000.
- Shoda, Masahiro; and Akagawa, Keiichi, 5,569,938, Cl. 257-82.000.
- Terunuma, Hiroshi; Wakabayashi, Hiroshi; and Tsukahara, Daiki, 5,570,151, Cl. 396-52.000.
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- Wakabayashi, Hiroshi; Katano, Yuji; and Kato, Minoru, 5,570,158, Cl. 396-51.000.
- Nikulin, Sergey P.: See—
- Gavrilov, Nikolai V.; and Nikulin, Sergey P., 5,569,976, Cl. 313-359.100.
- Nilsson, Majvor, to MKH-Konsult. Collection and separation apparatus. 5,569,378, Cl. 210-242.100.
- Ninomiya, Tadashi: See—
- Hiraoka, Toshikage; Tanimoto, Tetsuji; Makino, Yoshihiko; Ninomiya, Tadashi; Hora, Naofumi; Ashihara, Yoshihiro; Sudo, Yukio; and Mori, Toshihiro, 5,569,589, Cl. 435-7.900.
- Nippon Denki Ltd.: See—
- Yokono, Hitoshi; Yokono, Haruki; Mikamo, Masahiro; Narushima, Ryouchi; Iida, Takuya; and Endo, Yasuhiro, 5,569,545, Cl. 428-626.000.
- Nippon Leakless Industry Co., Ltd.: See—
- Tanaka, Akira; and Hoshi, Masamichi, 5,568,932, Cl. 277-180.000.
- Nippon Oil Co., Ltd.: See—
- Kinoshita, Hirotsugu; Nomura, Souichi; and Mishima, Masaru, 5,569,643, Cl. 508-155.000.
- Nippon Paint Co., Ltd.: See—
- Yamada, Mitsuo; and Kobata, Yusaku, 5,569,704, Cl. 524-591.000.
- Nippon Shinpan Co., Ltd.: See—
- Masuda, Hidehiro, 5,569,897, Cl. 235-379.000.
- Nippon Steel Corporation: See—
- Iwasa, Shoichi; and Naganuma, Takeshi, 5,569,947, Cl. 257-336.000.
- Nippon Steel Semiconductor Corp.: See—
- Hardee, Kim C.; and Cordoba, Michael V., 5,570,005, Cl. 323-314.000.
- Nippon Telegraph and Telephone Corporation: See—
- Umeno, Akira; Nonaka, Kiyoshi; and Kakizaki, Takao, 5,570,458, Cl. 395-88.000.
- Nippon Zeon Co., Ltd.: See—
- Hayashi, Sachio; Miyauchi, Isamu; and Oyama, Motofumi, 5,569,719, Cl. 525-329.300.
- Yamada, Toshiro; and Mitsuda, Yasuhiro, 5,569,796, Cl. 570-175.000.
- Nippondenso Co. Ltd.: See—
- Oda, Kouichi; Horie, Kazuyuki; and Ino, Masao, 5,569,311, Cl. 55-493.000.
- Nippondenso Co., Ltd.: See—
- Katayama, Masayuki; Mizutani, Atsushi; Hattori, Yutaka; and Ito, Nobuei, 5,569,486, Cl. 427-66.000.
- Shiga, Tsutomu; Hayashi, Nobuyuki; and Ohmi, Masanori, 5,569,892, Cl. 200-19.00R.
- Nishida, Satoshi; Matsubara, Masato; and Otani, Akihiro, to Mitsubishi Denki Kabushiki Kaisha. Laser processing apparatus with beam mode control. 5,570,384, Cl. 372-19.000.
- Nishida, Yuji: See—
- Tanaka, Yasuyuki; Shibata, Kazuhiko; Ikeda, Kenichi; Nishida, Yuji; Hayashi, Masaharu; Nakade, Shinichi; Kuga, Akihito; and Kanamaru, Eiji, 5,569,740, Cl. 528-502.00F.
- Nishikawa, Satoshi: See—
- Isoda, Satoru; Hanazato, Yoshio; Ueyama, Satoshi; Kawakubo, Hiroaki; and Nishikawa, Satoshi, 5,570,457, Cl. 395-25.000.
- Nishima, Osamu: See—
- Ohki, Hiroaki; Nishima, Osamu; Mori, Hiroyuki; and Suzuki, Junya, 5,569,616, Cl. 437-44.000.
- Nishimoto, Akira: See—
- Ohmori, Masashi; Tanaka, Hiroshi; Nishimoto, Akira; Sasai, Hiroshi; Fujino, Naohiko; and Kotoh, Satoru, 5,568,821, Cl. 134-61.000.
- Nishimoto, Mitsuhiro: See—
- Matsuoka, Hirofumi; and Nishimoto, Mitsuhiro, 5,569,991, Cl. 318-286.000.
- Nishimura, Akio: See—
- Nagamine, Satoshi; Maenobu, Kiyoshi; Wakayama, Yorihiro; and Nishimura, Akio, 5,570,433, Cl. 382-255.000.
- Nishimura, Takashi, to Fujitsu Limited. System for transferring variable length cells under ATM. 5,570,362, Cl. 370-60.100.
- Nishimura, Yoichi: See—
- Akazaki, Shusuke; and Nishimura, Yoichi, 5,568,799, Cl. 123-480.000.
- Hasegawa, Yusuke; Nishimura, Yoichi; Komoriya, Isao; Akazaki, Shusuke; and Kimura, Eisuke, 5,569,847, Cl. 73-117.300.
- Nishino, Yukishige: See—
- Beier, Sybille; Elger, Walter; Nishino, Yukishige; and Wiechert, Rudolf, 5,569,652, Cl. 514-173.000.
- Nishioka, Kei, to Rohm Co., Ltd. Muting control circuit. 5,570,427, Cl. 381-94.000.
- Nishioka, Noahiro: See—
- Tanabe, Kouji; and Nishioka, Noahiro, 5,569,886, Cl. 174-260.000.
- Nissan Motor Co., Ltd.: See—
- Kochiyama, Jiro; Kaya, Nobuyuki; Fujiwara, Teruo; Yasui, Hidemi; and Yashiro, Hiroyuki, 5,570,102, Cl. 343-880.000.
- Nissen, Mark K.: See—
- Johnson, Shane R.; Lavoie, Christian; Nissen, Mark K.; and Tiedje, J. Thomas, 5,568,978, Cl. 374-161.000.
- Nisshin Oil Mills, Ltd.: See—
- Ikuta, Yuzo; Tashiro, Satoshi; Hatano, Yoshiyuki; Fujita, Tadasu; Andoh, Noboru; Asaoka, Sachio; Kobayashi, Haruto; and Minami, Takeshi, 5,569,594, Cl. 435-134.000.
- Nita, Makoto: See—
- Hirose, Shinji; Nita, Makoto; and Obata, Ryuichi, 5,570,159, Cl. 355-200.000.
- Nitta, Masayoshi: See—
- Yoshii, Yuuzi; Kaneshima, Yasuo; Nitta, Masayoshi; and Amano, Tatsuhiko, 5,569,703, Cl. 524-558.000.
- Nitta, Tomio; Mifune, Hideo; Seki, Masato; Kaga, Yosimitu; and Serizawa, Noriyuki, to Tokai Corporation. Safety device for use with portable heater. 5,568,805, Cl. 126-262.000.
- Nitto Denko Corporation: See—
- Tanaka, Yasuyuki; Shibata, Kazuhiko; Ikeda, Kenichi; Nishida, Yuji; Hayashi, Masaharu; Nakade, Shinichi; Kuga, Akihito; and Kanamaru, Eiji, 5,569,740, Cl. 528-502.00F.
- Niv, Yehuda: See—
- Landa, Ben Zion; Niv, Yehuda; Plotkin, Michael; and Forgacs, Peter, 5,570,193, Cl. 356-442.000.
- Nivens, Jerry W., to Apollo Environmental Systems Corp. Thermal inter-cooler. 5,568,736, Cl. 62-513.000.
- Nocca, Jean-Luc: See—
- Cameron, Charles; Nocca, Jean-Luc; Sarrazin, Patrick; and Forestiere, Alain, 5,569,806, Cl. 585-668.000.
- Noel, Claude A., to Nortech Fibronic Inc. Apparatus for converting a multimeter to an optical power meter. 5,570,176, Cl. 356-73.100.
- NOF Corporation: See—
- Kuroyama, Yutaka; and Furuta, Mitsuhiro, 5,569,862, Cl. 75-238.000.
- Nohr, Ronald S.; and MacDonald, John G., to Kimberly-Clark Corporation. Antimicrobial siloxane quaternary ammonium salts. 5,569,732, Cl. 528-27.000.
- Nokia Mobile Phones Limited: See—
- Jokinen, Harri, 5,570,369, Cl. 370-95.300.
- Keskitalo, Ilkka; Rikkinen, Kari; and Ojanperä, Tero, 5,570,353, Cl. 370-18.000.
- Nokia Telecommunications Oy: See—
- Alatalo, Hannu; and Kokko, Marko, 5,570,358, Cl. 370-58.200.
- Keskitalo, Ilkka; Rikkinen, Kari; and Ojanperä, Tero, 5,570,353, Cl. 370-18.000.
- Pöyhönen, Petri, 5,570,352, Cl. 370-18.000.
- Nolan, Paul: See—
- Green, David T.; Castro, Salvatore; Ratcliff, Keith; Bryan, Graham W.; and Nolan, Paul, 5,569,283, Cl. 606-170.000.
- Nolan, Stephen J.; Sonnenschein, Mark F.; Carriere, Craig J.; Landes, Brian G.; and Brentin, Robert P., to Dow Chemical Company. The process for the preparation of fibers of syndiotactic vinylaromatic polymers. 5,569,428, Cl. 264-210.700.
- Nomura, Noboru: See—
- Yano, Kousaku; Murakami, Tomoyasu; Endo, Masayuki; and Nomura, Noboru, 5,569,628, Cl. 437-245.000.
- Nomura, Souichi: See—
- Kinoshita, Hirotsugu; Nomura, Souichi; and Mishima, Masaru, 5,569,643, Cl. 508-155.000.
- Nonaka, Kiyoshi: See—
- Umeno, Akira; Nonaka, Kiyoshi; and Kakizaki, Takao, 5,570,458, Cl. 395-88.000.
- Nonvolatile Electronics, Incorporated: See—
- Daughton, James M., 5,569,544, Cl. 428-611.000.
- Nordanger, Synnove. Collapsible hula hoop. 5,569,134, Cl. 482-110.000.
- Nordquist, Andrew F.: See—
- Carroll, W. Eamon; Renz, Walter L.; Nordquist, Andrew F.; and Pinschmidt, Robert K., Jr., 5,569,725, Cl. 525-454.000.
- Nore, Pentti; Honkanen, Erkki; Bäckström, Reijo; Wikberg, Tom; Haikala, Heimo; and Haarala, Jorma, to Orion-yhtymä Oy. (—)[4-(1,4,5,6-tetrahydro-4-methyl-6-oxo-3-pyridazinyl)phenyl]hydrazono]propanedinitrile. 5,569,657, Cl. 514-247.000.
- Norian Corporation: See—
- Fulmer, Mark; Constantz, Brent R.; Ison, Ira C.; and Barr, Bryan M., 5,569,442, Cl. 423-311.000.

- Norizuki, Reiko; Hyodo, Ryui; Tanaka, Kenji; Sekihata, Osamu; Hatta, Hiroyuki; Eda, Susumu; and Oomuro, Katsumi, to Fujitsu Limited. Apparatus and a method for supervising and controlling ATM traffic. 5,570,361, Cl. 370-60.100.
- Noro, Masao; and Kohdaka, Takayuki, to Yamaha Corporation. Analog-to-digital converter. 5,570,091, Cl. 341-161.000.
- Nortech Fibronic Inc.: See—
- Noel, Claude A., 5,570,176, Cl. 356-73.100.
- North American Philips Corporation: See—
- Martin, Brian C.; and West, Jeffrey A., 5,570,044, Cl. 326-84.000.
- Northern Telecom Limited: See—
- Janssen, Adrian P.; and Donaldson, Alan, 5,570,444, Cl. 385-90.000.
- Sapsford, Gary S., 5,568,728, Cl. 62-63.000.
- Searle, Jeffrey G.; and Cox, Christopher R., 5,570,098, Cl. 342-374.000.
- Northrop Grumman Corporation: See—
- Aguado, Morton M., 5,570,097, Cl. 342-357.000.
- Geil, Frederick G., 5,570,324, Cl. 367-124.000.
- Schantz, David L., Jr.; and DeAbreu, Brian A., 5,569,966, Cl. 307-10.100.
- Norwalk Wastewater Equipment Company: See—
- Graves, Jan D., 5,569,376, Cl. 210-195.400.
- Novak, Pavel, to Storz Endoskop GmbH. Tube pump in which tube can be inserted only in one direction. 5,569,026, Cl. 417-477.100.
- Novamont S.p.A.: See—
- Bastoli, Catia; Lombi, Roberto; Del Tredici, Gianfranco; and Guanella, Italo, 5,569,692, Cl. 524-47.000.
- Novo Nordisk A/S: See—
- Nielsen, Remy I.; and Rasmussen, Frank W., 5,569,671, Cl. 514-455.000.
- Nowitzki, Bernd: See—
- Lüken, Hans-Gerd; Fischer, Lothar; Droste, Wilhelm; and Nowitzki, Bernd, 5,569,802, Cl. 585-269.000.
- NSK Ltd.: See—
- Fukushima, Hiroshi, 5,569,112, Cl. 476-40.000.
- Sakai, Kouichi; Aoki, Shuhei; Murata, Shigeori; Oumi, Hayato; and Suzuki, Hiroshi, 5,569,105, Cl. 474-110.000.
- Nu-Tech & Engineering, Inc.: See—
- Ayres, John, 5,569,514, Cl. 428-35.700.
- Nudelman, Abraham: See—
- Rephaeli, Ada; Nudelman, Abraham; and Shaktai, Matityahu, 5,569,675, Cl. 514-547.000.
- Numanami, Masae: See—
- Jin, Dongzhi; Numanami, Masae; Abe, Fumihiko; and Miyazawa, Kazuhiro, 5,570,010, Cl. 324-67.000.
- Numata, Minoru: See—
- Shiga, Sadakazu; Komatsu, Masaru; and Numata, Minoru, 5,570,110, Cl. 345-156.000.
- Nunnally, Stephen C.; Pierce, Perry A.; and Zanger, Peter K., to Pimey Bowes Inc. Method for controlling electro-mechanical devices. 5,570,280, Cl. 364-140.000.
- Nunokawa, Hiroyuki: See—
- Toyota, Mitsuru; Takada, Hajime; Ohkubo, Katsuhiro; and Nunokawa, Hiroyuki, 5,568,733, Cl. 62-228.400.
- Nyberg, Petri: See—
- Huovila, Jyrki; Nyberg, Petri; and Odell, Michael, 5,569,360, Cl. 162-343.000.
- Nycomed Imaging AS: See—
- Klaveness, Jo; Rongved, Pål; and Strande, Per, 5,569,449, Cl. 424-9.510.
- Nye, LeRoy M.; Till, Henry R.; and Larson, James R., to Xerox Corporation. Color printer using liquid developer. 5,570,173, Cl. 355-326.00R.
- O&K Orenstein & Koppel Aktiengesellschaft: See—
- Weissbach, Thomas, 5,568,841, Cl. 180-311.000.
- Obata, Ryuichi: See—
- Hirose, Shinji; Nita, Makoto; and Obata, Ryuichi, 5,570,159, Cl. 355-200.000.
- Obata, Yoshiyuki; Suematsu, Hideki; and Ikemoto, Manabu, to Fujicopian Co., Ltd. Thermal transfer material. 5,569,347, Cl. 156-235.000.
- Obayashi, Shunji: See—
- Saito, Takahiko; Nakanishi, Akira; Obayashi, Shunji; Genda, Kyoji; and Toshikage, Hideki, 5,570,147, Cl. 396-429.000.
- Obinata, Hiroshi: See—
- Morikawa, Kenji; Obinata, Hiroshi; Omata, Kazuo; Sato, Toshihiko; Nakajima, Yoshihiko; and Ichikawa, Seigo, 5,570,468, Cl. 588-1.000.
- O'Brien, Terence P.: See—
- Dobele, Frieder; Graham, William G.; Dowling, Denis P.; O'Brien, Terence P.; Korns, Volkhard; and Morrow, Thomas, 5,570,175, Cl. 356-72.000.
- O'Carroll, Colm D.: See—
- O'Carroll, Lynda C.; O'Carroll, Colm D.; Jones, Alan; Matlock, Marilyn T.; and McLeod, Roderick D., 5,569,385, Cl. 210-727.000.
- O'Carroll, Lynda C.; O'Carroll, Colm D.; Jones, Alan; Matlock, Marilyn T.; and McLeod, Roderick D., to Epsilon Chemicals Ltd. Food processing effluent rendering process and apparatus. 5,569,385, Cl. 210-727.000.
- Ochi, Keiichi, to Ricoh Company, Ltd. Method of processing digital audio signals of different sampling rates. 5,570,308, Cl. 364-724.100.
- Oda, Kouichi; Horie, Kazuyuki; and Ino, Masao, to Toyoda Boshoku Corporation; and Nippondenso Co. Ltd. Air cleaner. 5,569,311, Cl. 55-493.000.
- Odell, Michael: See—
- Huovila, Jyrki; Nyberg, Petri; and Odell, Michael, 5,569,360, Cl. 162-343.000.
- Oechsle, Rainer, to International Business Machines Corporation. Multiple path trees and lan segments for routing in a network of bridge-connected lan segments. 5,570,466, Cl. 395-200.150.
- Offenberg, Michael: See—
- Marck, Jiri; Bantien, Frank; Muenzel, Horst; and Offenberg, Michael, 5,569,852, Cl. 73-514.320.
- Ogan, Marc; Tomasella, Frank P.; and Tu, Jan-I, to Bracco International B.V. Radiohalogenation of proteins using trihalophenyl derivatives. 5,569,446, Cl. 424-1.490.
- Ogata, Hiromi: See—
- Imamura, Masaya; Ogata, Hiromi; and Sawase, Kensuke, 5,570,122, Cl. 347-171.000.
- Ogata, Takashi; and Nakano, Junichi, to Olympus Optical Co., Ltd. Reproducing waveform correction circuit for optical information recording/reproducing system. 5,570,335, Cl. 369-124.000.
- Ogawa, Francis T.: See—
- Buffaloe, George W., IV; Ogawa, Francis T.; and Brugger, James M., 5,570,026, Cl. 324-445.000.
- Ogawa, Keiichi: See—
- Hirose, Keiji; and Ogawa, Keiichi, 5,569,540, Cl. 428-500.000.
- Ogawa, Kenya: See—
- Ohzeki, Yukihiko; Ojima, Masaki; Sakazawa, Katsuhiro; and Ogawa, Kenya, 5,570,166, Cl. 355-251.000.
- Ogawa, Noriyoshi: See—
- Kanayama, Satoshi; Ogawa, Noriyoshi; and Tajima, Jun, 5,569,566, Cl. 430-58.000.
- Ogawa, Sumio, to NEC Corporation. Semiconductor memory device incorporating redundancy memory cells. 5,570,318, Cl. 365-200.000.
- Ogawa, Tatsuo; and Kawai, Junji, to NGK Spark Plug Co., Ltd. Method of adjusting a frequency response in a ladder-type electric filter. 5,570,070, Cl. 333-187.000.
- Oguma, Tsuru: See—
- Endo, Kenji; Suzuki, Hidekazu; Oguma, Tsuru; and Goto, Masayoshi, 5,569,464, Cl. 424-450.000.
- Oguri, Yozo: See—
- Murakami, Masaru; Oguri, Yozo; Ashi, Yoshihiro; Tanaka, Katsuyoshi; Kozaki, Takahiko; Takase, Akihiko; and Miyagi, Morihito, 5,570,368, Cl. 370-94.200.
- Oguro, Masao. Medicine for the treatment of tumor. 5,569,471, Cl. 424-649.000.
- Oh, Moon K.; Han, Mi S.; Kim, Seung H.; and Kim, Young S., to Electronics and Telecommunications Research Institute. Method of controlling television broadcasting call in asynchronous transfer mode switching system. 5,570,125, Cl. 348-6.000.
- Ohara, Toshiya: See—
- Igarashi, Hiroshi; Mochizuki, Azuma; Kajima, Yoshitaka; Ohara, Toshiya; Inoue, Hideki; and Tohyama, Shigeki, 5,569,085, Cl. 463-49.000.
- Ohashi, Yukio: See—
- Yokoyama, Kazuaki; Kinoshita, Michitaka; Ohashi, Yukio; and Suzuki, Yasuhiro, 5,569,882, Cl. 174-76.000.
- Ohiwa, Tsunemi; and Yamamoto, Yoshinori, to Hitachi Maxell, Ltd. Ink ribbon. 5,569,531, Cl. 428-323.000.
- Ohkawa, Kouhei: See—
- Oishi, Tetsuya; Suzuki, Jin; Ohkawa, Kouhei; Furusawa, Satoshi; Ono, Hiroshi; and Sugazaki, Kazuo, 5,569,726, Cl. 525-472.000.
- Ohkawa, Masanori; and Yamazaki, Kozo, to Fujitsu Limited. Laser beam scanning apparatus having arrangement for maintaining intensity level of detected signal irrespective of direction of label to be read. 5,569,905, Cl. 250-205.000.
- Ohki, Hidenori; Tomishima, Masaki; Yamada, Akira; and Takasugi, Hisashi, to Fujisawa Pharmaceutical Co., Ltd. Polypeptide compound and a process for preparation thereof. 5,569,646, Cl. 514-11.000.
- Ohki, Hiroaki; Nishima, Osamu; Mori, Hiroyuki; and Suzuki, Junya, to Sony Corporation. Process for forming an output circuit device for a charge transfer element having tripartite diffusion layer. 5,569,616, Cl. 437-44.000.
- Ohkubo, Katsuhiro: See—
- Toyota, Mitsuru; Takada, Hajime; Ohkubo, Katsuhiro; and Nunokawa, Hiroyuki, 5,568,733, Cl. 62-228.400.
- Ohlinger, Manfred: See—
- Jachow, Harald; Körner, Reinhard; Veitch, Ronald J.; Schwab, Ekkehard; Jakusch, Helmut; Höppner, Bernd; Lehnert, Rudi; and Ohlinger, Manfred, 5,569,409, Cl. 252-62.560.
- Ohmi, Masanori: See—
- Shiga, Tsutomu; Hayashi, Nobuyuki; and Ohmi, Masanori, 5,569,892, Cl. 200-19.00R.
- Ohmi, Tadashi: See—
- Sasaki, Makoto; Fukui, Hirofumi; Aihara, Masami; Fukuda, Koichi; Kasama, Yasuhiko; and Ohmi, Tadashi, 5,570,031, Cl. 324-750.000.
- Ohmori, Hideki: See—
- Korikawa, Masayuki; Shinohara, Toru; Iwatsubo, Masahito; Yokoyama, Saori; Ohmori, Hideki; Watanabe, Takasi; and Ohsugi, Tsuneo, 5,570,269, Cl. 361-685.000.
- Ohmori, Masashi; Tanaka, Hiroshi; Nishimoto, Akira; Sasai, Hiroshi; Fujino, Naohiko; and Kotoh, Satoru, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor cleaning apparatus and wafer cassette. 5,568,821, Cl. 134-61.000.
- Ohno, Tadayoshi; Yamaguchi, Takashi; and Itoh, Shinichi, to Kabushiki Kaisha Toshiba. Portable storage medium and apparatus for processing the same. 5,570,124, Cl. 347-221.000.



- Ohori, Tatsuya: *See—*  
Kikkawa, Toshihide; and Ohori, Tatsuya, 5,569,953, Cl. 257-607.000.
- Ohsawa, Takayuki: *See—*  
Endo, Osamu; Hayashi, Yoshinori; Ichimiya, Koji; and Ohsawa, Takayuki, 5,570,224, Cl. 359-212.000.
- Ohsawa, Youichi: *See—*  
Watanabe, Satoshi; Shimada, Junji; Ohsawa, Youichi; Takemura, Katsuya; Ishihara, Toshinobu; and Maruyama, Kazumasa, 5,569,784, Cl. 564-430.000.
- Ohshita, Kazutaka: *See—*  
Kishimoto, Atsunori; Fujii, Takashi, deceased; Ohshita, Kazutaka; Yamamoto, Kazumi; Fujii, Yasuhiko; and Toda, Tetsuro, 5,569,695, Cl. 524-435.000.
- Ohsugi, Tsuneo: *See—*  
Korikawa, Masayuki; Shinohara, Toru; Iwatsubo, Masahito; Yokoyama, Saori; Ohmori, Hideki; Watanabe, Takasi; and Ohsugi, Tsuneo, 5,570,269, Cl. 361-685.000.
- Ohta, Hiroshi: *See—*  
Kosasa, Hideaki; Takahashi, Yuji; Hayakawa, Kimiaki; Kusumoto, Toshihiko; Yamaguchi, Yoshimasa; Ohta, Hiroshi; Yamanaka, Yuji; and Sakakibara, Kozo, 5,569,012, Cl. 412-33.000.
- Ohta, Hiroshi: *See—*  
Yamaguchi, Yoshimasa; Takahashi, Yuji; Hayakawa, Kimiaki; Kusumoto, Toshihiko; Kosasa, Hideaki; Ohta, Hiroshi; Yamanaka, Yuji; and Sakakibara, Kozo, 5,569,011, Cl. 412-9.000.
- Ohta, Kenji: *See—*  
Inui, Tetsuya; Ishii, Yorishige; Ohta, Kenji; Kimura, Kazuhiro; and Hirata, Susumu, 5,570,336, Cl. 364-126.000.
- Ohta, Masayuki: *See—*  
Ido, Kibei; and Ohta, Masayuki, 5,570,248, Cl. 360-77.140.
- Ohta, Yoshiro: *See—*  
Sasaki, Nobuyoshi; Yokokawa, Tetsuya; Hashimoto, Yoshikazu; Ohta, Yoshiro; and Sekiguchi, Hideo, 5,569,320, Cl. 106-287.260.
- Ohtsubo, Hideki: *See—*  
Waku, Yoshiharu; Ohtsubo, Hideki; and Kohtoku, Yasuhiko, 5,569,547, Cl. 428-688.000.
- Ohwada, Hisashi: *See—*  
Arii, Mitsuzo; Jinnai, Kuniaki; Ohwada, Hisashi; and Kawabata, Yasunari, 5,570,442, Cl. 385-46.000.
- Ohya, Kazumasa: *See—*  
Inagawa, Masako; and Miyauchi, Masahiro, to NEC Corporation. Method of manufacturing laminated piezoelectric actuator having cavity, 5,568,679, Cl. 29-25.350.
- Ohzeki, Yukihiko; Ojima, Masaki; Sakaizawa, Katsuhiro; and Ogawa, Kenya, to Canon Kabushiki Kaisha. Developing apparatus that applies voltage to developer layer thickness regulating member, 5,570,166, Cl. 355-251.000.
- Ohzeki, Yukihiko: *See—*  
Sakaizawa, Katsuhiro; Satoh, Yasushi; Ohzeki, Yukihiko; and Chigono, Yasunori, 5,570,451, Cl. 355-202.000.
- Oikawa, Masaharu: *See—*  
Tokoro, Hisao; Tsurugai, Kazuo; Shioya, Satoru; and Oikawa, Masaharu, 5,569,681, Cl. 521-88.000.
- OIS Optical Imaging Systems, Inc.: *See—*  
Abileah, Adiel; and Xu, Gang, 5,570,214, Cl. 359-73.000.
- Oishi, Tetsuya; Suzuki, Jin; Ohkawa, Kouhei; Furusawa, Satoshi; Ono, Hiroshi; and Sugazaki, Kazuo, to Mitsui Toatsu Chemicals, Inc. Diguanamines and preparation process, derivatives and use thereof, 5,569,726, Cl. 525-472.000.
- Oiye, George; and Caruso, Joseph R., to ILC Technology, Inc. Flash lamp with O-ring electrode seals, 5,569,978, Cl. 313-631.000.
- Ojanperä, Tero: *See—*  
Keskitalo, Ilkka; Rikkinen, Kari; and Ojanperä, Tero, 5,570,353, Cl. 370-18.000.
- Ojima, Masaki: *See—*  
Ohzeki, Yukihiko; Ojima, Masaki; Sakaizawa, Katsuhiro; and Ogawa, Kenya, 5,570,166, Cl. 355-251.000.
- Ojima, Satoshi; and Uchida, Shoji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Fixing instrument for spinal fusion members, 5,569,246, Cl. 606-61.000.
- Okada, Fujio: *See—*  
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- Okada, Kenji: *See—*  
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Porter, Clyde R.; and Stringer, Calvin R., 5,568,843, Cl. 188-67.000.
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Sue, Chen-Youn; Koch, Robert; Pace, John E.; and Prince, Gregory R., 5,569,709, Cl. 525-52.000.
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Walter, Jeryle L.; Hodge, Robert J., Jr.; and Jones, Stephen M., 5,569,883, Cl. 174-84.00R.
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Hooper, Herbert H.; Pacetti, Stephen; Soane, David S.; and Bae, Young C., 5,569,364, Cl. 204-455.000.
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Groe, John B., 5,570,056, Cl. 327-359.000.
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Dummermuth, Paul, 5,569,119, Cl. 477-204.000.
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- Fusco, Jose M.; Ramos, Jose Geraldo F.; Vieira, Valmor N.; and Guerra, Eduardo Cardoso de Melo, 5,569,435, Cl. 422-147.000.
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- Pezzani, Robert, to SGS-Thomson Microelectronics S.A. AC switch triggered at a predetermined half-period. 5,569,940, Cl. 257-121.000.
- Pfaff, John: See—
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- Meier, Ernst-August; and Schirmer, Stefan, 5,569,066, Cl. 452-93.000.
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- Stans, Louis J.; and Lynch, Christopher F., 5,570,027, Cl. 324-523.000.
- Photon Dynamics, Inc.: See—
- Henley, Francois J., 5,570,011, Cl. 324-158.100.
- Phytpharm (NA) N.V.: See—
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- Picker International, Inc.: See—
- Plummer, Steven J., 5,569,924, Cl. 250-363.050.
- Picker Nordstar Inc.: See—
- Ehnholm, Gösta J.; Pekonen, Seppo T.; and Virtanen, Juha P., 5,570,022, Cl. 324-319.000.
- Pierce, Perry A.: See—
- Nunnally, Stephen C.; Pierce, Perry A.; and Zanger, Peter K., 5,570,280, Cl. 364-140.000.
- Pietrzak, William S.: See—
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- Pileski, Michael J.: See—
- Wood, Robert J.; and Pileski, Michael J., 5,569,902, Cl. 235-472.000.
- Pilkington Glass Limited: See—
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- Pioneer Electronic Corporation: See—
- Akashi, Nobuhiko, 5,570,331, Cl. 369-47.000.
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- Chapko, Louis B.; Westerhof, Donald E.; and Ertl, David S., 5,569,818, Cl. 800-200.000.
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- Pirelli Cavi S.p.A.: See—
- Fontana, Flavio; and Franco, Pierluigi, 5,570,438, Cl. 385-24.000.
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- Nunnally, Stephen C.; Pierce, Perry A.; and Zanger, Peter K., 5,570,280, Cl. 364-140.000.
- Paradis, Jason P.; and Supron, Steven A., 5,569,327, Cl. 118-253.000.
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- Plants, William C.: See—
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- Plotkin, Michael: See—
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- Port, Richard M.: See—
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- Powell, Ann: See—
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- Pöschl, Günter, 5,569,029, Cl. 431-116.000.
- Prawnto Shrimp Machine Company of Texas, Inc.: See—
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- Keller, Rex W.; Harlock, Robert; Hooley, Robert W.; and Harper, Patrick, 5,568,868, Cl. 206-724.000.
- Prejean-Lefevre, Veronique H. M. P.: See—
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- Preslar, Donald: See—
- Allmeier, Franz; Maier, Theodor; Goesser, Gerhard; Preslar, Donald; and Murphy, Philip, 5,570,259, Cl. 361-86.000.
- Presstek, Inc.: See—
- Wolfe, David; and Zerillo, Samuel D., 5,568,768, Cl. 101-425.000.
- Preston, Stephen B.: See—
- Wood, Paul B.; Albers, Thomas M.; and Preston, Stephen B., 5,570,107, Cl. 345-145.000.
- Previti-Kelly, Rosemary A.: See—



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- Schwemmer, Richard F.; Privitera, Salvatore; and Hughes, Robert, 5,569,292, Cl. 606-185,000.
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- Buell, Kenneth B.; and Carlin, Edward P., 5,569,234, Cl. 604-396,000.
- Byrd, Alan E.; Osborn, Thomas W., III; and McKibben, Gary E., 5,569,228, Cl. 604-385,100.
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- Profé, Hans Jürgen; and Rabe, Norbert, to Hoechst Aktiengesellschaft. Gas flow through injector jet. 5,569,865, Cl. 73-861,520.
- Proner Comatel: See—
- Raimond, Gérard, 5,569,056, Cl. 439-876,000.
- Proprietary Technology, Inc.: See—
- Bartholomew, Donald D., 5,568,948, Cl. 285-242,000.
- Prodocimi, Jacques: See—
- Lambotte, Benoît; Spinner, Bernard; Timoney, Charles; and Prodocimi, Jacques, 5,569,534, Cl. 428-402,000.
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- Proctor, Charles W., 5,568,719, Cl. 57-225,000.
- Protel, Inc.: See—
- Hayes, Stephen J.; and Gorman, Patrick R., 5,568,854, Cl. 194-318,000.
- Proto, George R.; Colligan, Francis D.; and Bellmore, Harold, Jr., to United States Surgical Corporation. Tipped multifilament surgical suture. 5,569,302, Cl. 606-228,000.
- Protocol Systems, Inc.: See—
- Gallant, Stuart L.; Caron, Paul R.; and Palmer, Walter E., 5,568,814, Cl. 128-672,000.
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- PSI Telecommunications, Inc.: See—
- Suarez, Wilson E., 5,568,686, Cl. 29-861,000.
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- Puckhaber, John H., Jr.: See—
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- Naedel, Richard G.; Harris, David B.; and Uehling, Mark, 5,570,270, Cl. 361-687,000.
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- Morré, D. James; and Morré, Dorothy M., 5,569,673, Cl. 514-522,000.
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- Purushothaman, Sampath: See—
- Adamopoulos, Eleftherios; Lee, Kang-Wook; O'Toole, Terrence R.; Purushothaman, Sampath; Shaw, Jane M.; Viehbeck, Alfred; and Walker, George F., 5,569,739, Cl. 528-353,000.
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- Qi, Z. Helena; Hodges, Allan; and Sanchez, Eduardo, to American Maize-Products Company. Purification of chemically modified cyclodextrins. 5,569,756, Cl. 536-127,000.
- Qian, Qi-De: See—
- Needham, Wayne; Qian, Qi-De; and Maloney, Tim, 5,570,034, Cl. 324-763,000.
- Quan, Clifton, to Hughes Aircraft Company. Coaxial-to-coplanar-waveguide transmission line connector using integrated slabline transition. 5,570,068, Cl. 333-33,000.
- Quattrocchi, Richard A.: See—
- Wandell, Michael; Quattrocchi, Richard A.; and Frank, Allan, 5,569,223, Cl. 604-290,000.
- Quenzi, Philip J.: See—
- Capra, Lawrence; and Quenzi, Philip J., 5,568,694, Cl. 37-231,000.
- Quick-Tag, Inc.: See—
- Goldman, Mark E.; Aubert, Michel A.; Shenderovich, Alexander M.; and Acharya, Jagat R., 5,569,003, Cl. 409-132,000.
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- Quinton Instrument Company: See—
- Gisselberg, Margo L.; and Layman-Spillar, Lynn M., 5,569,207, Cl. 504-175,000.
- Quirk, Richard; Bird, David A.; Shulver, Ian N. W.; and McIntosh, Robin M., to Pilkington Glass Limited. Method for reducing  $\text{NO}_x$  emissions from a regenerative glass furnace. 5,569,312, Cl. 65-134,600.
- R. J. Reynolds Tobacco Company: See—
- Gentry, Jeffery S.; Womble, Karen M.; Banerjee, Chandra K.; Blakley, Richard L.; Barnes, Russell D.; Calleson, Donald A.; and Ridings, Henry T., 5,568,819, Cl. 131-342,000.
- R. P. Scherer Corporation: See—
- Tanner, Keith; and Shelley, Rickey S., 5,569,466, Cl. 424-452,000.
- Rabe, Norbert: See—
- Profé, Hans Jürgen; and Rabe, Norbert, 5,569,865, Cl. 73-861,520.
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- Raburn, Richard W.; and Wickis, Fred T., Jr., to Span-America Medical Systems, Inc. Wheelchair cushion and cover. 5,568,660, Cl. 5-652,100.
- Racchini, Joel R., to CorTrak Medical Inc. Microporous catheter. 5,569,198, Cl. 604-96,000.
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- McLaughlin, Michael D.; Signa, John C.; Greicar, Richard K.; and Taylor, John M., 5,570,108, Cl. 345-146,000.
- Radziun, Michael J.: See—
- Dachniewski, Roman I.; Dean, David E.; Ebben, Thomas G.; Frederick, Perry S.; Jenders, Donald J.; Radziun, Michael J.; and Sue, Peter L., 5,570,021, Cl. 324-318,000.
- Raimond, Gérard, to Proner Comatel. Electrical connection device and process for the production thereof. 5,569,056, Cl. 439-876,000.
- Raimondi, Bruno: See—
- Raimondi, Rinaldo, 5,570,239, Cl. 359-873,000.
- Raimondi, Enrico: See—
- Raimondi, Rinaldo, 5,570,239, Cl. 359-873,000.
- Raimondi, Rinaldo, to Raimondi, Enrico; Raimondi-Stauble, Olgo; and Raimondi, Bruno. Directional screen for a lighting fixture and method of making same. 5,570,239, Cl. 359-873,000.
- Raimondi-Stauble, Olgo: See—
- Raimondi, Rinaldo, 5,570,239, Cl. 359-873,000.
- Rainin, Edgar A. Surgical abrading device. 5,569,279, Cl. 606-166,000.
- Raleigh, Carol L.: See—
- Helmus, Michael N.; Tolkoff, M. Joshua; and Raleigh, Carol L., 5,569,463, Cl. 424-426,000.
- Ramacher, Kenneth F.: See—
- Worthington, Michael S.; Ramacher, Kenneth F.; and Doyle, Edward M., 5,569,980, Cl. 315-39,300.
- Ramanujam, Gopalan, to International Business Machines Corporation. System and method for volume rendering of finite element models. 5,570,460, Cl. 395-124,000.
- Ramos, Jose Geraldo F.: See—
- Fusco, Jose M.; Ramos, Jose Geraldo F.; Vieira, Valmor N.; and Guerra, Eduardo Cardoso de Melo, 5,569,435, Cl. 422-147,000.
- Randall, Sara P. E.: See—
- Galvagni, John; and Randall, Sara P. E., 5,569,880, Cl. 174-52,400.
- Randcastle Extrusion Systems, Inc.: See—
- Luker, Keith, 5,569,429, Cl. 264-211,210.
- Randin, Jean-Paul: See—
- Exnar, Ivan; Graetzel, Michael; and Randin, Jean-Paul, 5,569,561, Cl. 429-218,000.
- Randolph, Bruce B.: See—
- Abbott, Ronald G.; and Randolph, Bruce B., 5,569,807, Cl. 585-724,000.
- Ranpak Corp.: See—
- Lencoski, Michael J., 5,568,867, Cl. 206-584,000.
- Simmons, James A., 5,569,146, Cl. 493-352,000.
- Rao, Purushothama; Uhlemann, Thomas F.; and Kump, William H., to GNB Technologies, Inc. Lead-acid battery having a fluid compartment for reducing convection-induced heat transfer. 5,569,552, Cl. 429-72,000.

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- Wang, Zhouhang, 5,569,918, Cl. 250-306,000.
- Rhodes, Charles K.: See—
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- Frouin, Laurent; and Pennavaire, Maryse, 5,569,323, Cl. 106-633,000.
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- Amegger, Richard E.; Gunnewijk, Antonius G. M.; and Maurer, Thomas, 5,569,257, Cl. 606-82,000.
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Erwin, Herzer; and Josef, Götz, 5,569,986, Cl. 318-66.000.
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Kesitalo, Ilkka; Rikkinen, Kari; and Ojanperä, Tero, 5,570,353, Cl. 370-18.000.
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- Rine, Jasper: See—  
Ashby, Matthew; and Rine, Jasper, 5,569,588, Cl. 435-6.000.
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Gleadall, Jeffrey, 5,569,064, Cl. 451-558.000.
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Rabin, Steven B.; Small, Hamish; and Riviello, John M., 5,569,365, Cl. 204-450.000.
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Kirby, Dean A.; and Rivier, Jean E. F., 5,569,742, Cl. 530-317.000.
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Tedesco, Jack, 5,569,899, Cl. 235-462.000.
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Gomez, Rodolfo A., 5,569,370, Cl. 205-560.000.
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Stuk, Timothy L.; Haight, Anthony R.; Morton, Howard E.; Robbins, Timothy A.; Scarpetti, David; and Tien, Jien-Heh J., 5,569,777, Cl. 560-24.000.
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Burke, William K., deceased; Roberts, Charles R.; and Schwam, Freely R., 5,568,723, Cl. 60-203.100.
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Rayne, Arthur D.; and Robertson, David L., 5,569,124, Cl. 482-44.000.
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- Rocher, Jean-Philippe: See—  
Astier, Jean-Pierre; Bertone, Christian; and Rocher, Jean-Philippe, 5,569,422, Cl. 264-60.000.
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Desautels, Thomas; Allen, Charles E., Jr.; Palmeri, Frank A.; and Huber, Jon M., 5,569,115, Cl. 477-110.000.
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- Rodriguez, Sheila S.: See—  
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Kuhn, Lowell L.; Ptacek, James F.; and Roepke, Gary P., 5,569,357, Cl. 159-16.100.
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Brown, Dana H.; Christensen, Thomas C.; Cunningham, Earl A.; and Rogelstad, Wayne A., 5,570,247, Cl. 360-75.000.
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Imamura, Masaya; Ogata, Hiromi; and Sawase, Kensuke, 5,570,122, Cl. 347-171.000.
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Klavness, Jo; Rongved, Pål; and Strande, Per, 5,569,449, Cl. 424-9.510.
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Ball, Wilfried; Rönnberg, Peter; and Pelz, Peter, 5,569,027, Cl. 418-35.000.
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Nielsen, Charles R.; Bates, Charles A.; Rooke, Matthew W.; Hansen, Fred R.; Petersen, Paul T.; Le, Me V.; and Lew, Eugene K., 5,570,241, Cl. 360-46.000.
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Bailey, William R.; Garay, Antonio A.; and Rosborough, Keith A., 5,569,039, Cl. 439-76.100.
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Francisco, Manuel A.; and Rose, Kenneth D., 5,569,404, Cl. 508-547.000.
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Minor, David M.; and Roseveare, Ronald N., 5,570,400, Cl. 376-253.000.
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Steigerwald, Robert L.; Yerman, Alexander J.; and Roshen, Waseem A., 5,570,074, Cl. 336-83.000.
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Butcher, Kenneth R.; and Rossi, Giulio A., 5,569,845, Cl. 73-64.440.
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Klima, Rudolph F.; Rossi, Joseph D.; and Gruber, Bert, 5,569,319, Cl. 106-243.000.
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McMullen, Michael D.; Roth, Bradley A.; and Townsend, Rod, 5,569,828, Cl. 800-205.000.
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Misturik, John D.; Roth, Mark W.; and Small, James R., 5,570,121, Cl. 347-171.000.
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Linn, Jack H.; Lowry, Robert K.; Rouse, George V.; and Buller, James F., 5,569,620, Cl. 437-62.000.
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Levy, Uri; Braude, Ofer; Rozenberg, Ytzhak; and Zimmerman, Yotam, 5,568,859, Cl. 200-43.010.
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Bogani, Carlo; and Rubbi, Maria-Teresa, 5,569,909, Cl. 250-208.200.
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Purser, Kenneth H.; Kilious, Linas R.; Litherland, Albert E.; Rucklidge, John C.; and Zhao, Xiaolei, 5,569,915, Cl. 250-281.000.

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Braun, Max; Rudolph, Werner; and Eichholz, Kerstin, 5,569,782, Cl. 562-863.000.
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- Ruiz, Oscar J.: See—  
Aoyagi, Akihiko; and Ruiz, Oscar J., 5,570,249, Cl. 360-104.000.
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- Runas, Michael E., to Cirrus Logic, Inc. Dual bank memory system with output multiplexing and methods using the same. 5,570,320, Cl. 365-230.030.
- Runcieman, Christopher: See—  
Joseph, Anthony L. P.; Overall, John C. K.; Runcieman, Christopher; and Wright, Colin, 5,568,804, Cl. 126-39.00K.
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Devine, William D.; and Ruschak, Kenneth J., 5,569,492, Cl. 427-286.000.
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Reiher, Uwe; and Russ, Werner H., 5,569,748, Cl. 534-642.000.
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Jacob, Stanley W., 5,569,679, Cl. 514-711.000.
- Russell, Thomas A.: See—  
James, Anthony; Lee, Harry; Pepper, John R.; and Russell, Thomas A., 5,569,249, Cl. 606-62.000.
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Ajot, Hubert, deceased; Ajot, by Laure, legal representative; Ajot, by Alexandra, legal representative; Ajot, by Vincent, legal representative; Russmann, Colette; Brandely, Jose; Garnier, Dominique; and Gonzalez, Pierre, 5,569,839, Cl. 73-38.000.
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Barrett, Robert C.; Olyha, Robert S., Jr.; and Rutledge, Joseph D., 5,570,111, Cl. 345-157.000.
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Ryden, David M.; and Ryden, David W., Jr., 5,569,079, Cl. 460-16.000.
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Tsurumaki, Naoya; and Sakuragi, Shunichi, 5,569,397, Cl. 219-121.510.
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Kirby, Dean A.; and Rivier, Jean E. F., 5,569,742, Cl. 530-317.000.
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Doshi, Anil G.; Kos, Frank T.; and Salkar, Dattaram C., 5,569,693, Cl. 524-317.000.
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Tsuiji, Osamu, 5,569,810, Cl. 588-227.000.
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Gove, Robert J.; Sampsel, Jeffrey B.; and Markandey, Vishal, 5,570,135, Cl. 348-581.000.
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Lim, Ik-Cheol; Cho, Su-Yeon; and Yoo, Seung-Joon, 5,569,571, Cl. 430-25.000.
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Chung, Dae S., 5,568,727, Cl. 60-421.000.
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Lattner, James R.; and Sanchez, Leonel E., 5,569,804, Cl. 585-361.000.
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Sarver, David R.; Eppley, Barry L.; D'Alessio, Keith R.; Pietrzak, William S.; and Sander, Thomas W., 5,569,250, Cl. 606-69.000.
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Avar, Lajos; Bechtold, Karl; and Wolf, Rainer, 5,569,539, Cl. 428-457.000.
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Littecke, Peter; and Thelin, Anders, 5,569,000, Cl. 407-114.000.
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Takahashi, Yasunori, 5,569,333, Cl. 148-105.000.  
Takahashi, Yasunori, 5,569,335, Cl. 148-302.000.  
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Tatebe, Yu; and Sannohe, Shuutsu, 5,569,049, Cl. 439-394.000.
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Ido, Tatem; and Sano, Hirohisa, 5,570,439, Cl. 385-37.000.
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Matsumoto, Kenji; Itoh, Shigeyuki; Sano, Kenji; Kobayashi, Jun; Mori, Koji; and Okada, Kenji, 5,570,220, Cl. 359-146.000.
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Malinowski, Frank R.; and Young, James B., 5,570,178, Cl. 356-218.000.
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Neri, Armando; Santin, Giancarlo; and Squarzon, Giovanni, 5,568,818, Cl. 131-84.400.
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König, Axel; Würmscher, Herbert; and Kleinhans, Matthias, 5,569,315, Cl. 95-290.000.
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Goto, Takashi; and Terakado, Shingo, 5,569,569, Cl. 430-5.000.  
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Cameron, Charles; Nocca, Jean-Luc; Sarrazin, Patrick; and Forestiere, Alain, 5,569,806, Cl. 585-668.000.
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Ohmori, Masashi; Tanaka, Hiroshi; Nishimoto, Akira; Sasai, Hiroshi; Fujino, Naohiko; and Kotoh, Satoru, 5,568,821, Cl. 134-61.000.
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Aruga, Tamotsu; Sasaki, Masao; Shimada, Tomoyuki; and Adachi, Hiroshi, 5,569,800, Cl. 585-26.000.
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Stretton, Alton O.; and King, Paul, 5,570,415, Cl. 379-110.000.
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Kobayashi, Katsuyuki; Tanaka, Atsushi; Yoshimura, Yuichiro; Yanagisawa, Ryo; Tokioka, Masaki; and Sato, Hajime, 5,570,302, Cl. 364-561.000.
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Kawai, Tomoaki; and Sato, Hiroaki, 5,570,115, Cl. 345-199.000.
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Shinohara, Keiji; Sato, Junichi; Kamide, Yukihiko; and Yanagida, Toshiharu, 5,569,627, Cl. 437-228.000.
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Kato, Masayuki; Aritake, Hirokazu; Ishimoto, Manabu; Sato, Noriko; and Nakashima, Masato, 5,570,208, Cl. 359-23.000.
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Isshiki, Masao; Kiguchi, Yukio; Sato, Takashi; and Kageyama, Yasuhiro, 5,568,732, Cl. 62-129.000.
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Morikawa, Kenji; Obinata, Hiroshi; Omata, Kazuo; Sato, Toshihiko; Nakajima, Yoshihiko; and Ichikawa, Seigo, 5,570,468, Cl. 588-1.000.
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Deitrich, Thomas L.; and Saunders, Rowland F., 5,568,813, Cl. 128-661.010.
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Imamura, Masaya; Ogata, Hiromi; and Sawase, Kensuke, 5,570,122, Cl. 347-171.000.
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- Sawyer, J. Scott, to Eli Lilly and Company. N-benzyl dihydroindole LTD<sub>4</sub> antagonists, 5,569,764, Cl. 546-268.400.
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Stuk, Timothy L.; Haight, Anthony R.; Morton, Howard E.; Robbins, Timothy A.; Scarpetti, David; and Tien, Jien-Heh J., 5,569,777, Cl. 560-24.000.
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Ottremba, Carsten; Schaich, Guenther; and Beyer, Joachim, 5,568,766, Cl. 100-35.000.
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- Schäty, Harald: See—  
Hahn, Ernst-Ludwig; and Schäty, Harald, 5,568,906, Cl. 248-74.100.
- Scherer, Paul T.: See—  
Habermehl, G. Lyle; and Scherer, Paul T., 5,568,753, Cl. 81-434.000.
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Beier, Sybille; Elger, Walter; Nishino, Yukishige; and Wiechert, Rudolf, 5,569,652, Cl. 514-173.000.
- Haffer, Gregor; and Nickisch, Klaus, 5,569,661, Cl. 514-292.000.
- Scherpereel, Christopher M.: See—  
Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C.; Clearfield, Howard M.; Doany, Fuad E.; Flagello, Donis G.; Hovel, Harold J.; Latulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushothaman, Sampath; Scherpereel, Christopher M.; Seeger, David E.; and Shaw, Jane M., 5,569,501, Cl. 427-577.000.
- Scheuermann, Walter, to LOI Thermprocess GmbH. Method of annealing metal parts, 5,569,339, Cl. 148-634.000.
- Schick, Renate: See—  
Uphues, Guenter; Ploog, Uwe; Schick, Renate; Schwark, Hans-Juergen; and Witt, Sandra, 5,569,767, Cl. 548-352.100.
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- Schiller, Otto: See—  
Klopp, Ingo; Bötcher, Peter; Frick, Ulrich; and Schiller, Otto, 5,569,758, Cl. 540-122.000.
- Schindler, Jeffrey: See—  
Belt, Steven; Schindler, Jeffrey; and Stobert, Norman, 5,569,052, Cl. 439-638.000.
- Schirmer, Stefan: See—  
Meier, Ernst-August; and Schirmer, Stefan, 5,569,066, Cl. 452-93.000.
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Willms, Lothar; Lacchein, Stephen; Schlegel, Günter; and Kehne, Heinz, 5,569,761, Cl. 544-213.000.
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Mahgerefteh, Nasser; and Schleicher, Israel D., 5,570,082, Cl. 340-604.000.

- Schloss, Charles M., to Schloss Engineered Equipment, Inc. Grit collector for waste water treatment facility, 5,569,379, Cl. 210-257.100.
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Schloss, Charles M., 5,569,379, Cl. 210-257.100.
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Grembowicz, Conrad G.; Ferguson, Alan L.; Samson, Wade D.; and Schmidt, Keith R., 5,568,992, Cl. 404-101.000.
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Mitchell, Alexander R.; Pagoria, Philip F.; and Schmidt, Robert D., 5,569,783, Cl. 74-395.000.
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Bennett, Allen C.; Del Mar, Bruce E.; and Schnabel, Marna B., 5,568,963, Cl. 353-122.000.
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Cheney, Paul S., II; Mastrototaro, John J.; Schnabel, Nannette M.; Lord, Peter C.; Van Antwerp, William P.; and Clark, Raymond D., 5,568,806, Cl. 128-635.000.
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Cramer, Bernhard M., 5,569,204, Cl. 604-164.000.
- Schneider, Heinrich; and Christmann, Albrecht, to Boehringer Ingelheim KG. Process for preparing nevirapine, 5,569,760, Cl. 540-495.000.
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Helmus, Michael N.; and Forman, Michael R., 5,569,197, Cl. 604-96.000.
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Makower, Joshua; and Stern, Brett, 5,569,297, Cl. 606-201.000.
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Frank, Karl-Heinz; Schneider, Johann; and Wöhrn, Volker, 5,568,702, Cl. 49-153.000.
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- Schneider, Randy M.: See—  
Brenot, Stephen E.; and Althoff, Arnold G., 5,569,419, Cl. 264-37.000.
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Dudle, James; Leatherman, Michael; Morrison, Michael; and Schnell, Waldo, 5,570,291, Cl. 364-468.010.
- Schnell, William J. Resposable scissors, 5,569,298, Cl. 606-205.000.
- Schoeman, Deon D.: See—  
Bardsort, Gary K.; and Schoeman, Deon D., 5,569,057, Cl. 441-65.000.
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Gerhing, Manfred; and Schollmeyer, Hermann, 5,568,706, Cl. 52-198.000.
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- Schoner, Brigitte E.: See—  
Basinski, Margaret B.; DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Schoner, Brigitte E.; Shields, James E.; and Smiley, David L., 5,569,744, Cl. 530-324.000.
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- Schroeder, Fred W.: See—  
Adas, James O.; Schroeder, Fred W.; and Steil, Fred, 5,569,475, Cl. 425-549.000.
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Margolis, Donald L.; Jolly, Mark R.; Schroeder, Warren R.; Heath, Michael C.; and Ivers, Douglas E., 5,570,286, Cl. 364-424.050.
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Alary, Jean-Paul D.; Desautry, Michel A. A.; Sandelis, Denis J. M.; and Schroer, Pierre M. V. E., 5,568,721, Cl. 60-39.030.
- Schubert, Walter: See—  
Vogt-Birnbrich, Bettina; Patzschke, Hans-Peter; Lenhard, Werner; Döbert, Jürgen; Brunner, Marcus; and Schubert, Walter, 5,569,705, Cl. 524-591.000.
- Schuch, Wolfgang W.: See—  
Bird, Colin R.; Boniwell, Jeremy M.; Grierson, Donald; Ray, John A.; and Schuch, Wolfgang W., 5,569,829, Cl. 800-205.000.
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Kuhn, Wolfgang; Buchholz, Norbert; and Schulte, Reiner, 5,570,452, Cl. 392-484.000.
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Duan, Daniel C.; Stefely, James S.; Schultz, David W.; and Leach, Chester L., 5,569,450, Cl. 424-45.000.
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- Schumacher, Steffen: See—  
Krimmer, Erwin; Lorenz, Richard; Miehle, Tilman; and Schumacher, Steffen, 5,570,075, Cl. 336-96.000.
- Schumann, Bobby R.: See—  
Metier, T. Thomas; and Schumann, Bobby R., 5,569,071, Cl. 452-185.000.
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- Schutte, Marlin: See—  
Blakely, Robert; and Schutte, Marlin, 5,568,975, Cl. 366-285.000.
- Schutz, Udo. Reusable barrel of synthetic resin, 5,568,876, Cl. 220-254.000.
- Schwab, Ekkehard: See—  
Jachow, Harald; Körner, Reinhard; Veitch, Ronald J.; Schwab, Ekkehard; Jakusch, Helmut; Höppner, Bernd; Lehnert, Rudi; and Ohlinger, Manfred, 5,569,409, Cl. 252-62.560.
- Schwam, Freely R.: See—  
Burke, William K.; deceased; Roberts, Charles R.; and Schwam, Freely R., 5,568,723, Cl. 60-203.100.
- Schwark, Hans-Juergen: See—  
Uphues, Guenter; Ploog, Uwe; Schick, Renate; Schwark, Hans-Juergen; and Witt, Sandra, 5,569,767, Cl. 548-352.100.
- Schwartz, Barry K.: See—  
Bress, James R.; and Schwartz, Barry K., 5,570,420, Cl. 379-220.000.
- Schwartz, Steven S. Net-handle seine, 5,568,697, Cl. 43-14.000.
- Schweckendiek, Jürgen: See—  
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- Schweinfest, Clifford W.; and Papas, Takis S., to United States of America, Health and Human Services. Colon mucosa gene having down regulated expression in colon adenomas and adenocarcinomas, 5,569,755, Cl. 536-23.500.
- Schwemmer, Richard F.: See—  
Privitera, Salvatore; and Schwemmer, Richard F., 5,569,291, Cl. 606-185.000.
- Schwyn, Bernhard A., to KMK Karl Magerle Lizenz AG. Process for the production of tube bodies for packaging tubes, 5,569,144, Cl. 493-302.000.
- Science Incorporated: See—  
Kriesel, Marshall S., 5,569,236, Cl. 604-403.000.
- Scientific Optics, Inc.: See—  
Lieberman, David M., 5,570,142, Cl. 351-160.00R.
- SCIMED Life Systems, Inc.: See—  
Berg, Todd A., 5,569,218, Cl. 604-282.000.
- Burns, Matthew M., 5,569,201, Cl. 604-96.000.
- Scirica, Paul A.: See—  
Francis, William J.; and Scirica, Paul A., 5,569,163, Cl. 600-133.000.
- Granger, Richard N.; Scirica, Paul A.; and Gorecki, Michael J., 5,569,301, Cl. 606-224.000.
- Scott, Curtis E.; Secen, Cynthia A.; Parham, Thomas G.; Allen, Gary R.; Bateman, Robert L., Jr.; and Mathews, Paul G., to General Electric Company. UV absorbing fused quartz and its use for lamp envelopes, 5,569,979, Cl. 313-636.000.
- Schwemmer, Richard F.; Privitera, Salvatore; and Hughes, Robert, to Ethicon Endo-Surgery, Inc. Surgical penetration instrument with transparent blades and tip cover, 5,569,292, Cl. 606-185.000.
- Seagate Technology, Inc.: See—  
Dunfield, John C., 5,569,990, Cl. 318-254.000.
- Heath, Mark A.; Pruett, D. Christopher; and Nguyen, Bang C., 5,570,332, Cl. 369-50.000.
- Smith, Robert F., 5,570,398, Cl. 375-376.000.
- Searle, Jeffrey G.; and Cox, Christopher R., to Northern Telecom Limited. Base station antenna arrangement, 5,570,098, Cl. 342-374.000.
- Seber, Brett P., to Buck Knives, Inc. Composite molded knife sheath, 5,568,888, Cl. 224-232.000.
- Secajo, Ltd.: See—  
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- Secen, Cynthia A.: See—  
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- Sedita, Jay R., to Texas Instruments Incorporated. End lock magazine for semiconductor devices, 5,569,149, Cl. 493-466.000.
- Sedlmeier, Andreas: See—  
Popp, Franz; and Sedlmeier, Andreas, 5,568,711, Cl. 52-704.000.
- Seeger, David E.: See—  
Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C.; Clearfield, Howard M.; Doany, Fuad E.; Flagello, Donis G.; Hovel, Harold J.; Latulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushothaman, Sampath; Scherpereel, Christopher M.; Seeger, David E.; and Shaw, Jane M., 5,569,501, Cl. 427-577.000.
- Seibert, Gilbert E. Gaming table cloth, 5,568,666, Cl. 8-149.100.
- Seibold, Guenter: See—  
Haage, Manfred; Seibold, Guenter; Plocher, Bernd; Hein, Bernd; and Weber, Wilfried, 5,569,091, Cl. 470-12.000.



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- Seiko Epson Corporation: See—  
Koga, Yoshiro; and Kunugi, Masanao, 5,570,168, Cl. 355-253.000.
- Seiko Instruments Inc.: See—  
Shibata, Kimio, 5,570,004, Cl. 323-303.000.
- Shimoda, Sadashi, 5,570,061, Cl. 327-545.000.
- Seirmarco, James A.: See—  
Bayer, Robert; Lantsman, Alexander D.; and Seirmarco, James A., 5,569,363, Cl. 204-192.320.
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Lauritsen, Dan D.; and Seitz, Galen, 5,570,025, Cl. 324-433.000.
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- Sekiguchi, Hideo: See—  
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- Sekihata, Osamu: See—  
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- Sekiya, Tokio: See—  
Okami, Takehide; and Sekiya, Tokio, 5,569,684, Cl. 523-209.000.
- Selec Corporation: See—  
Butcher, Kenneth R.; and Rossi, Giulio A., 5,569,845, Cl. 73-64.440.
- Selker, Edwin J., to International Business Machines Corporation. Storable wrist rest for portable computers. 5,570,268, Cl. 361-683.000.
- Selkirk, Murray E.: See—  
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- Sellier, Bruno. Torque generator device, application thereof to physical exercise apparatus, and variable speed motor drive therefor. 5,569,121, Cl. 482-5.000.
- Semenova, Elena V.; Tjurin, Vladimir M.; Solntsev, Stanislav S.; and Beresnev, Alexei Y., to Aerospatiale Societe Nationale Industrielle; and VIAM - All Russian Institut of Aviation Materials. High temperature coating on ceramic substrate and non-firing process for obtaining same. 5,569,427, Cl. 264-129.000.
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- Koyama, Jun, 5,570,105, Cl. 345-98.000.
- Takemura, Yasuhiko; and Adachi, Hiroki, 5,569,935, Cl. 257-51.000.
- Yamazaki, Shunpei; and Takemura, Yasuhiko, 5,569,615, Cl. 437-43.000.
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- Semiconductor Process Laboratory Co., Ltd.: See—  
Maeda, Kazuo; Tokumasa, Noboru; and Yuyama, Yoshiaki, 5,569,499, Cl. 427-539.000.
- Senior, Peter: See—  
Griffin, Timothy; and Senior, Peter, 5,569,020, Cl. 431-7.000.
- Sensor Dynamics, Ltd.: See—  
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- Serizawa, Noriyuki: See—  
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- Sessler, Jonathan L.; Hemmi, Gregory W.; and Mody, Tarak D., to Board of Regents, University of Texas System. Water soluble texaphyrin metal complex preparation. 5,569,759, Cl. 540-472.000.
- Sevenson Environmental Services, Inc.: See—  
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- Seymour, Brian T., to Takata Inc. Driver air bag cover with integral horn and redundant switches. 5,569,893, Cl. 200-61.540.
- Seymour, Mark D.: See—  
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- SGS-Thomson Microelectronics, Inc.: See—  
Edwards, William E., 5,570,060, Cl. 327-541.000.
- Lysinger, Mark A., 5,570,316, Cl. 365-196.000.
- Ma, Herman H., 5,570,042, Cl. 326-63.000.
- Siegel, Harry M.; Lao, Tom Q.; Kelappan, Krishnan; and Hundt, Michael J., 5,570,273, Cl. 361-773.000.
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Pezzani, Robert, 5,569,940, Cl. 257-121.000.
- Salbreux, Jean-Claude, 5,569,609, Cl. 437-8.000.
- SGS-Thomson Microelectronics, S.r.l.: See—  
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- Palara, Sergio, 5,570,057, Cl. 327-365.000.
- Shacter, Stuart B., to National Semiconductor Corporation. Micropower RC oscillator having hysteresis produced by switching current sources to a transistor. 5,570,067, Cl. 331-111.000.
- Shaffer, James M.: See—  
Atkins, Glen G.; Cohen, Michael S.; Mauritz, Karl H.; and Shaffer, James M., 5,570,032, Cl. 324-760.000.
- Shaffer, Shmuel, to Siemens Rolm Communications Inc. Multimedia communications with system-dependent adaptive delays. 5,570,372, Cl. 370-108.000.
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Armour, Duncan R.; Box, Philip C.; and Shah, Pritom, 5,569,654, Cl. 514-221.000.
- Shaklai, Matityahu: See—  
Rephaeli, Ada; Nudelman, Abraham; and Shaklai, Matityahu, 5,569,675, Cl. 514-547.000.
- Shal, David A.: See—  
Badenoch, Scott W.; Shal, David A.; and Stacey, Scott A., 5,570,288, Cl. 364-424.050.
- Shank, Steven M.: See—  
Then, Alan M.; Shank, Steven M.; Soave, Robert J.; and Tasker, G. William, 5,569,355, Cl. 156-643.100.
- Shantzis, Mark D. Door and chute for separated waste control. 5,568,871, Cl. 209-703.000.
- Sharp, Everett H. System, method and apparatus for monitoring tire inflation pressure in a vehicle tire and wheel assembly. 5,569,848, Cl. 73-146.200.
- Sharp Kabushiki Kaisha: See—  
Andoh, Yuzi; Katabe, Masaki; and Suenaga, Hiromi, 5,568,765, Cl. 99-403.000.
- Inui, Tetsuya; Ishii, Yorishige; Ohta, Kenji; Kimura, Kazuhiro; and Hirata, Susumu, 5,570,336, Cl. 364-126.000.
- Sharpe-Geisler, Bradley A., to Advanced Micro Devices, Inc. Lead frame with noisy and quiet  $V_{GS}$  and  $V_{DD}$  leads. 5,570,046, Cl. 326-101.000.
- Shaughnessy, Mark L.: See—  
Grube, Gary W.; Naddell, Marc C.; and Shaughnessy, Mark L., 5,570,100, Cl. 342-457.000.
- Shaw, Jack M.: See—  
Wong, Sui-Ming; Newington, Ian M.; Liversidge, Elaine M.; McIntire, Gregory L.; Pitt, Alan R.; and Shaw, Jack M., 5,569,448, Cl. 424-9.450.
- Shaw, Jane M.: See—  
Adamopoulos, Eleftherios; Lee, Kang-Wook; O'Toole, Terrence R.; Purushothaman, Sampath; Shaw, Jane M.; Viehbeck, Alfred; and Walker, George F., 5,569,739, Cl. 528-353.000.
- Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C.; Clearfield, Howard M.; Doany, Fuad E.; Flagello, Donis G.; Hovel, Harold J.; Latulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushothaman, Sampath; Scherpereel, Christopher M.; Seeger, David E.; and Shaw, Jane M., 5,569,501, Cl. 427-577.000.
- Sheehan, Florence H.; Haralick, Robert M.; and Lee, Chang-Kyu, to University of Washington. Method for determining the contour of an in vivo organ using multiple image frames of the organ. 5,570,430, Cl. 382-128.000.
- Shei, Sun-Sheng; and Fang, Ta-Ming. Energy delivery system controllable to continuously deliver laser energy in performing photorefractive keratotomy. 5,569,238, Cl. 606-4.000.
- Shell Oil Company: See—  
Hunter, Joe M.; and Kincaid, Derek S., 5,569,536, Cl. 428-413.000.
- Shelley, Rickey S.: See—  
Tanner, Keith; and Shelley, Rickey S., 5,569,466, Cl. 424-452.000.
- Shenderovich, Alexander M.: See—  
Goldman, Mark E.; Aubert, Michel A.; Shenderovich, Alexander M.; and Acharya, Jagat R., 5,569,003, Cl. 409-132.000.
- Sherman, Lizbeth B.: See—  
Amidon, Gordon L.; Sherman, Lizbeth B.; and Crison, John R., 5,569,452, Cl. 424-78.100.
- Shibata, Hironori, to Olympus Optical Co., Ltd. Compact wide-angle variable focal length lens system. 5,570,234, Cl. 359-690.000.
- Shibata, Hironori: See—  
Mihara, Shinichi; and Shibata, Hironori, 5,570,233, Cl. 359-687.000.
- Shibata, Kazuhiko: See—  
Tanaka, Yasuyuki; Shibata, Kazuhiko; Ikeda, Kenichi; Nishida, Yuji; Hayashi, Masaharu; Nakade, Shinichi; Kuga, Akihito; and Kanamaru, Eiji, 5,569,740, Cl. 528-502.00F.
- Shibata, Kimio, to Seiko Instruments Inc. Supply voltage regulator and an electronic apparatus. 5,570,004, Cl. 323-303.000.
- Shibata, Norio: See—  
Suzuki, Akihiro; Shibata, Norio; Takahashi, Shinsuke; and Tomaru, Mikio, 5,569,494, Cl. 427-358.000.
- Shibata, Yoshinori: See—  
Sasaki, Katsuhiko; and Shibata, Yoshinori, 5,568,849, Cl. 192-34.000.
- Shibayama, Atsushi, to Nikon Corporation. Focusing lens position controlling apparatus for a variable focal length lens. 5,570,155, Cl. 396-82.000.
- Shibutani, Makoto; Yasugi, Toshiharu; and Kanazawa, Akihiro, to NEC Corporation. Optical transmitter for subcarrier frequency multiplexed optical transmission system. 5,570,219, Cl. 359-125.000.
- Shields, James E.: See—  
Basinski, Margret B.; DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Schoner, Brigitte E.; Shields, James E.; and Smiley, David L., 5,569,744, Cl. 530-324.000.
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- Shiga, Tsutomu; Hayashi, Nobuyuki; and Ohmi, Masanori, to Nippondenso Co., Ltd. Magnet switch for starter. 5,569,892, Cl. 200-19.00R.
- Shikama, Shinsuke: See—  
Usui, Masahiro; Kida, Hiroshi; Shikama, Shinsuke; and Kondo, Mitsushige, 5,570,209, Cl. 359-41.000.
- Shimada, Junji: See—  
Watanabe, Satoshi; Shimada, Junji; Ohsawa, Youichi; Takemura, Katsuya; Ishihara, Toshinobu; and Maruyama, Kazumasa, 5,569,784, Cl. 564-430.000.
- Shimada, Tomoyuki: See—  
Aruga, Tamotsu; Sasaki, Masaomi; Shimada, Tomoyuki; and Adachi, Hiroshi, 5,569,800, Cl. 585-26.000.
- Shimadzu Corporation: See—  
Fukui, Isao; Takahashi, Masamitsu; Ihara, Kazunori, deceased; Murakami, Hiroshi; Tanaka, Tetsuhiro; Miyaura, Shinobu; Kuroda, Shinichi; Hiraishi, Masahiro; and Inoue, Koji, 5,569,455, Cl. 422-174.000.
- Yamaguchi, Shojiro; and Takemoto, Hajime, 5,570,409, Cl. 378-196.000.
- Shimaoka, Gorou: See—  
Iwakiri, Tsuneaki; and Shimaoka, Gorou, 5,569,700, Cl. 524-504.000.
- Shimazaki, Takeshi: See—  
Takita, Takao; Sakai, Takeshi; and Shimazaki, Takeshi, 5,569,321, Cl. 106-1.050.
- Shimizu, Takashi: See—  
Kimura, Yoshihisa; Kido, Toshinori; and Shimizu, Takashi, 5,569,541, Cl. 428-520.000.
- Shimoda, Sadashi, to Seiko Instruments Inc. Switching circuit. 5,570,061, Cl. 327-545.000.
- Shimotsusa, Mineo: See—  
Kataoka, Yuzo; Asaba, Tetsuo; Makino, Kenji; Yuzurihara, Hiroshi; Fujita, Kei; Kamei, Seiji; Akino, Yutaka; Yuge, Yutaka; Shimotsusa, Mineo; and Kuwabara, Hideshi, 5,569,614, Cl. 437-39.000.
- Shin-Etsu Chemical Co., Ltd.: See—  
Imoto, Katsuyuki; and Koya, Kazuo, 5,570,448, Cl. 385-126.000.
- Meguriya, Noriyuki; and Yoshida, Takeo, 5,569,688, Cl. 524-188.000.
- Watanabe, Satoshi; Shimada, Junji; Ohsawa, Youichi; Takemura, Katsuya; Ishihara, Toshinobu; and Maruyama, Kazumasa, 5,569,784, Cl. 564-430.000.
- Shinkai, Masahiro: See—  
Kitagawa, Sumiko; Shinkai, Masahiro; and Namba, Kenryo, 5,569,504, Cl. 428-64.100.
- Shinohara, Keiji; Sato, Junichi; Kamide, Yukihiko; and Yanagida, Toshiharu, to Sony Corporation. Process for etching copper containing metallic film and for forming copper containing metallic wiring. 5,569,627, Cl. 437-228.000.
- Shinohara, Tadashi: See—  
Lal, Brij B.; Bourez, Allen J.; and Shinohara, Tadashi, 5,569,533, Cl. 428-332.000.
- Shinohara, Toru: See—  
Korikawa, Masayuki; Shinohara, Toru; Iwatsubo, Masahito; Yokoyama, Saori; Ohmori, Hideki; Watanabe, Takasi; and Ohsugi, Tsuneo, 5,570,269, Cl. 361-685.000.
- Shinoura, Osamu; Koyanagi, Tsutomu; Chihara, Hiroshi; Yoshida, Makoto; and Chou, Tsutomu, to TDK Corporation. Thin film magnetic device with plural valves of magnetostriiction. 5,570,251, Cl. 360-126.000.
- Shintomi Golf Co., Ltd.: See—  
Yoshida, Daisaku; and Yamano, Katsumi, 5,569,337, Cl. 148-325.000.
- Shioya, Satoru: See—  
Tokoro, Hisao; Tsurugai, Kazuo; Shioya, Satoru; and Oikawa, Masaharu, 5,569,681, Cl. 521-88.000.
- Shirai, Koichi; Imoto, Kazumobu; Narita, Satoshi; Kamikubo, Yoshinori; and Hamashima, Mitsuhito, to Dai Nippon Printing Co., Ltd. Roll-type heat transfer image-receiving sheet. 5,569,638, Cl. 503-227.000.
- Shirai, Yasuyuki: See—  
Osada, Tomoaki; and Shirai, Yasuyuki, 5,569,350, Cl. 156-345.000.
- Shishido, Shinji; and Kamizawa, Koh, to Fuji Xerox Co., Ltd. Image transmission apparatus in which pixel data are rearranged using sequence numbers for respective frames. 5,570,202, Cl. 358-405.000.
- Shlyankovich, Mark, to Bio-Virus Research Incorporated. Pharmaceutical compositions for the management of premenstrual syndrome and alleviation of menopausal disorders. 5,569,459, Cl. 424-195.100.
- Shoda, Masahiro; and Akagawa, Keiichi, to Nikon Corporation. Imaging Apparatus with light pulses. 5,569,938, Cl. 257-82.000.
- Shofner, Stan: See—  
Knox, Gary; Dang, Nguyen T.; Frost, John S.; and Shofner, Stan, 5,568,988, Cl. 401-40.000.
- Shono, Tetsuji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Lens mounting structure. 5,570,153, Cl. 396-531.000.
- Shoolery, John R.; Pasela, Guy E.; De La Torre, Diane L.; Leung, Kenneth M.; and Morris, Kathleen A., to TravelNet, Inc. Corporate travel controller. 5,570,283, Cl. 364-407.000.
- Shor, Joseph S.; and Kurtz, Anthony D., to Kulite Semiconductor Products, Inc. Porous silicon carbide (SiC) semiconductor device. 5,569,932, Cl. 257-3.000.
- Shor, Joseph S.: See—  
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- Shouse, Kenneth R.: See—  
Taylor, David G.; and Shouse, Kenneth R., 5,569,994, Cl. 318-700.000.
- Showa Denko K. K.: See—  
Tsuji, Katsuyuki; Oshiro, Kimitaka; and Nakajo, Tetsuo, 5,569,795, Cl. 570-168.000.
- Showalter, Jerry M., to Tampa G Manufacturing Co. Retaining latch for golfcart hinged windshields. 5,568,953, Cl. 292-194.000.
- Shu, Emily Y.: See—  
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- Shug, Austin L.; and Gravenstein, Stefan. Method of stimulating antibody formation. 5,569,457, Cl. 424-278.100.
- Shulver, Ian N. W.: See—  
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- Shur, David H., to Lucent Technologies Inc. Packet network transit delay measurement system. 5,570,346, Cl. 370-17.000.
- Shvabsky, Oleg: See—  
Lekhgolts, Victor; and Shvabsky, Oleg, 5,569,211, Cl. 604-195.000.
- Shyr, Duen-Jyh: See—  
Chen, Kuan-Chou; and Shyr, Duen-Jyh, 5,568,857, Cl. 198-592.000.
- SI.B.E.R.s.r.l.: See—  
Lamberti, Silvano, 5,568,861, Cl. 200-302.003.
- Sicher, Alan, to Telefonaktiebolaget LM Ericsson. Call priority in a mobile radiotelephone system. 5,570,411, Cl. 379-57.000.
- Siczek, Bernard, to Fischer Imaging Corporation. Magnetic resonance imaging device useful for guiding a medical instrument. 5,569,266, Cl. 606-130.000.
- Siddle, Bruce K., to PPCT Management Systems, Inc. Composite telescoping baton. 5,568,922, Cl. 273-84.00R.
- Siecor Puerto Rico, Inc.: See—  
Napiorkowski, John J.; Kroll, Thomas W.; Brower, Boyd G.; Crane, Robert A.; Butler, Walter K., III; Cote, Mark P.; Beahm, James G.; and Mickelson, Nils P., 5,570,422, Cl. 379-399.000.
- Siegel, Harry M.; Lao, Tom Q.; Kelappan, Krishnan; and Hundt, Michael J., to SGS-Thomson Microelectronics, Inc. Surface mountable integrated circuit package with low-profile detachable module. 5,570,273, Cl. 361-773.000.
- Siemens Aktiengesellschaft: See—  
Allmeier, Franz; Maier, Theodor; Goesser, Gerhard; Preslar, Donald; and Murphy, Philip, 5,570,259, Cl. 361-86.000.
- Bogani, Carlo; and Rubbi, Maria-Teresa, 5,569,909, Cl. 250-208.200.
- Fischperer, Rolf, 5,569,987, Cl. 318-135.000.
- Lange, Gerhard, 5,569,972, Cl. 313-231.110.
- Siemens Automotive Corporation: See—  
Lorraine, Jack R., 5,568,798, Cl. 123-456.000.
- Siemens Corporate Research: See—  
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- Siemens Energy & Automation, Inc.: See—  
Doerwald, Bruno C., 5,570,262, Cl. 361-93.000.
- Schoen, Randy; and Habetler, Thomas G., 5,570,256, Cl. 361-31.000.
- Siemens Rolm Communications Inc.: See—  
Shaffer, Shmuel, 5,570,372, Cl. 370-108.000.
- Siemens Stromberg-Carlson: See—  
King, George, 5,570,072, Cl. 335-154.000.
- Siever, Friedrich L.: See—  
Saarweber, Dietrich; and Siever, Friedrich L., 5,569,384, Cl. 210-651.000.
- Siga, Masao; Fukui, Yutaka; Kuriyama, Mitsuo; Maeno, Yoshimi; Suwa, Masateru; Kaneko, Ryoichi; Onoda, Takeshi; Kajiwaru, Hidefumi; Watanabe, Yasuo; Takahashi, Shintaro; and Tan, Toshimi, to Hitachi, Ltd. Steam turbine rotor shaft thereof and heat resisting steel. 5,569,338, Cl. 148-335.000.
- Signa, John C.: See—  
McLaughlin, Michael D.; Signa, John C.; Greicar, Richard K.; and Taylor, John M., 5,570,108, Cl. 345-146.000.
- Signorelli, Richard L. Universal joint construction. 5,569,089, Cl. 464-112.000.
- Sihn, Sang C. Golf ball marker. 5,569,103, Cl. 473-406.000.
- Sikkens, Marten; and Ansems, Johannes P. M., to U.S. Philips Corporation. Electric lamp with reflector. 5,568,967, Cl. 362-328.000.
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- Smith, Charles S.; and Williamson, Jay D., to I.S.M., Inc. Concrete forming system with expanded metal tie, 5,568,710, Cl. 52-426.000.
- Smith, Clayton E., II. Bicycle cable keeper, 5,568,905, Cl. 248-65.000.
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- Smith, Henry R., to HR Smith (Technical Developments) Limited. Static dischargers for aircraft, 5,570,265, Cl. 361-218.000.
- Smith, Jeffrey P. Controlled volume meat apportioner, 5,569,070, Cl. 452-174.000.
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- Smith, Michael G., to University of California; and Los Alamos National Laboratory. Synthesis of  $\text{Bi}_{1-x}\text{Pb}_x\text{Sr}_2\text{Ca}_2\text{Cu}_3\text{O}_x$  superconductor, 5,569,641, Cl. 505-433.000.
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- Smith, Robert F., to Seagate Technology, Inc. Method and apparatus for dynamic pole-zero reconfiguration for use with hard disc drive servos, electronic filters and other circuits, 5,570,398, Cl. 375-376.000.
- Smith, Robert G., to Canada, Her Majesty the Queen in right of as represented by the Minister of Transport Canada. Catch basin structure for interception of contaminants having detachable parts, 5,569,372, Cl. 210-85.000.
- Smith, Roger A., to Motorola Inc. Method and data processor for finding a logarithm of a number, 5,570,310, Cl. 364-748.500.
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- Snellman, Jorma, to Valmet Corporation. Center roll in the press of a paper machine, 5,569,142, Cl. 492-56.000.
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Bergougnan, Michel; Galland, Jean-Michel; and Perdrieux, Sylvain, 5,569,793, Cl. 570-167.000.
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- Societe de Conseils de Recherches et d'Applications (S.C.R.A.S.): See—  
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- Soga, Mitsuhide, to Fuji Xerox Co., Ltd. Method and device for restoring ink jet performance of ink jet recording apparatus, 5,570,116, Cl. 347-30.000.
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- Solar, Ronald J., to Cordis Corporation. Dilatation catheter with eccentric balloon, 5,569,199, Cl. 604-96.000.
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Lambra, Morand; and Graebing, Didier, 5,569,717, Cl. 525-193.000.
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Braun, Max; Rudolph, Werner; and Eichholz, Kerstin, 5,569,782, Cl. 562-863.000.
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- Sommers, James A., to Teledyne Industries, Inc. Process for the reduction of carbochlorination residue, 5,569,440, Cl. 423-79.000.
- Sone, Takuro, to Yamaha Corporation. Karaoke apparatus connectable to external MIDI apparatus with data merge, 5,569,869, Cl. 84-609.000.
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Müller, Andreas; Klar, Manfred; and Hofer, Bernd, 5,570,016, Cl. 324-206.000.
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Bayer, Robert; Lantsman, Alexander D.; and Seimarcio, James A., 5,569,363, Cl. 204-192.320.
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- Hurwitz, Steven, 5,569,361, Cl. 204-192.120.
- Kosaka, Katsuki, 5,570,342, Cl. 369-291.000.
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- Okawa, Sumihiro, 5,570,330, Cl. 369-44.320.
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Stiehl, Hans-Henrich; Schwöckendiek, Jürgen; and Bestenorg, Herbert, 5,569,437, Cl. 422-186.070.
- Sorenson, Brian K.: See—  
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- Sorrells, David F.: See—  
Parker, Jeffrey L.; Sorrells, David F.; and Mix, John D., 5,570,177, Cl. 356-139.060.
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- Sotom, Michel, to Alcatel N.V. Optical switching matrix, 5,570,218, Cl. 359-117.000.
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- Souri, Shukri J.: See—  
Evans, Anthony C.; Tsukada, Takeshi; Sour, Shukri J.; and Dupon, Ryan W., 5,569,495, Cl. 427-446.000.
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Mallow, William A.; and Young, Robert D., 5,569,153, Cl. 588-256.000.
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Griesemer, Patrick J., 5,569,910, Cl. 250-221.000.
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Raburn, Richard W.; and Wickis, Fred T., Jr., 5,568,660, Cl. 5-652.100.
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Soderstrom, Dean J.; Gerard, Jesse; and Spaulding, Stephen S., 5,570,469, Cl. 588-18.000.
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- Specht, Paul: See—  
Egan, Philip D.; and Specht, Paul, 5,568,999, Cl. 405-262.000.
- Speck, Roy E., to Analytical Control Systems, Inc. Initial screen for abnormal platelet condition, 5,569,590, Cl. 435-13.000.
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- Speedfam Corporation: See—  
Karlusud, Chris, 5,569,062, Cl. 451-285.000.
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Jansen, Martin; Letschert, Hans-Peter; and Speer, Dietrich, 5,569,322, Cl. 106-401.000.
- Spencer, Jack D.: See—  
Heinrich, David B.; and Spencer, Jack D., 5,568,729, Cl. 62-75.000.
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- Spilger, Gerhard; Klinger, Thomas; and Stellwag, Dieter, to Robert Bosch GmbH. Method and device for preventing excessive currents in a welding converter, 5,570,254, Cl. 361-18.000.
- Spilker, David L.; Parker, Don L.; and Storey, J. Kirk, to Morton International, Inc. Airbag module case for side impact airbag module, 5,568,936, Cl. 280-728.200.
- Spiller, Andrea: See—  
Kurz, Thekla; Stossel, Siegfried; and Spiller, Andrea, 5,569,460, Cl. 424-401.000.
- Spillson, George A.: See—  
LaFreniere, Brian R.; Cardwell, Dick L.; and Spillson, George A., 5,569,148, Cl. 493-462.000.
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Lambotte, Benoit; Spinner, Bernard; Timonzy, Charles; and Prodocimi, Jacques, 5,569,534, Cl. 428-402.000.
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Kuntz, James, 5,569,381, Cl. 210-321.600.
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Marshall, David J.; Gouldson, Stanley; Oik, Olaf; and Maiorca, Robert, 5,568,685, Cl. 29-809.000.
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Palmer, William R., 5,568,796, Cl. 123-204.000.
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Broedel, Axel; Springmann, Thomas; Münch, Reinhold; and Bader, Armin, 5,569,838, Cl. 73-23.310.
- Squarzon, Giovanni: See—  
Neri, Armando; Santin, Giancarlo; and Squarzon, Giovanni, 5,568,818, Cl. 131-84.400.
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Dail, James E.; Li, Chia-Chang; Magill, Peter D.; Sriram, Kotikalapudi; and Whitaker, Norman A., Jr., 5,570,355, Cl. 370-60.100.
- Staab, Craig C., to VLSI Technology, Inc. Spring probe BGA (ball grid array) contactor with device stop and method therefor, 5,570,033, Cl. 324-761.000.
- Stacey, Scott A.; and Arwine, Joan B., to General Motors Corporation. Vehicle suspension control with wheel and body demand force phase determination, 5,570,289, Cl. 364-424.050.
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Badenoch, Scott W.; Shal, David A.; and Stacey, Scott A., 5,570,288, Cl. 364-424.050.
- Stanco, Donato: See—  
Rigamonti, Marco; and Stanco, Donato, 5,569,498, Cl. 427-495.000.
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Bustamante, Herman; Natali, Francis; and Magill, David T., 5,570,349, Cl. 370-18.000.
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Flaughter, David; Pernice, Glenn; Sullivan, Stephen F.; and Wood, Raymond B., 5,569,316, Cl. 96-135.000.
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Gagne, Robert J.; Plein, William J., II; and Carson, Kenneth, 5,568,713, Cl. 52-785.100.
- Stans, Louis J.; and Lynch, Christopher F., to Photocircuits Corporation. Printed circuit board test apparatus and method, 5,570,027, Cl. 324-523.000.
- Stant Manufacturing Inc.: See—  
Harris, Robert S., 5,568,828, Cl. 141-348.000.
- Starbro Communications, Inc.: See—  
Stern, Geoffrey S., 5,570,414, Cl. 379-67.000.
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Syler, Rodney R.; Faber, Rolf E.; and Lindahl, D. Kent, 5,568,687, Cl. 29-890.140.
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Weissman, Yitzhak; Herman, Rami; Bornstein, Aharon; and Tugendhaft, Israel, 5,569,923, Cl. 250-341.200.
- St. Clair, William E.: See—  
Vaughn, William J.; Umber, Ray E.; St. Clair, William E.; Estes, Larry D.; and Carlson, Glenn T., 5,569,256, Cl. 606-80.000.
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Schild, Robin; Kozak, Milan; and Durst, Johann, 5,569,330, Cl. 134-1.000.
- Steckler, Richard D. Simulated decorative architectural columns and method of making the same, 5,568,709, Cl. 52-309.800.
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Duan, Daniel C.; Stefely, James S.; Schultz, David W.; and Leach, Chester L., 5,569,450, Cl. 424-45.000.
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- Steigerwald, Michael L., to Lucent Technologies Inc. Antireflector black matrix for display devices comprising three layers of zinc oxide, molybdenum, and zinc oxide, 5,570,212, Cl. 359-67.000.
- Steigerwald, Robert L.; Yerman, Alexander J.; and Roshen, Waseem A., to General Electric Company. Very low leakage inductance, single-laminate transformer, 5,570,074, Cl. 336-83.000.
- Steil, Fred: See—  
Adas, James O.; Schroeder, Fred W.; and Steil, Fred, 5,569,475, Cl. 425-549.000.
- Stein, Judith, to General Electric Company. Addition-curable silicone adhesive compositions, 5,569,689, Cl. 524-188.000.
- Steinberg, Mitchell I.: See—  
Boyd, Donald B.; Lifer, Sherry L.; Marshall, Winston S.; Palkowitz, Alan D.; Pfeifer, William; Reel, Jon K.; Simon, Richard L.; Steinberg, Mitchell I.; Thrasher, K. Jeff; Vasudevan, Venkatraghavan; and Whitesitt, Celia A., 5,569,768, Cl. 548-253.000.



- Steingard, Michael A.: See—  
 Padden, John; and Steingard, Michael A., 5,569,172, Cl. 602-20.000.  
 Steininger, Helmut; Green, Alan; Munch, Michel; and Heilmann, Peter, to BASF Magnetics GmbH. Anticopying film. 5,569,522, Cl. 428-195.000.  
 Stellweg, Dieter: See—  
 Spilger, Gerhard; Klinger, Thomas; and Stellweg, Dieter, 5,570,254, Cl. 361-18.000.  
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 Katariya, Devinder N.; Rich, Ronald J.; Stenard, Steven C.; and Wilson, Bruce D., 5,569,019, Cl. 415-200.000.  
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 Lundquist, Jan; and Stenström, Lennart, 5,570,264, Cl. 361-127.000.  
 Stentco, Inc.: See—  
 Marin, Michael L.; and Marin, Ralph, 5,569,296, Cl. 606-198.000.  
 Stenzel, Klaus: See—  
 Schreier, Peter H.; Stenzel, Klaus; Adam, Günter; and Maiss, Edgar, 5,569,823, Cl. 800-205.000.  
 Sterling, Rodney D.: See—  
 Ruiz, Javier A.; and Sterling, Rodney D., 5,570,213, Cl. 359-72.000.  
 Sterling Winthrop Inc.: See—  
 Dority, John A., Jr.; Earley, William G.; Kumar, Virendra; Mallam, John P.; Miller, Matthew S.; and Subramanyam, Chakrapani, 5,569,655, Cl. 514-226.800.  
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 Makower, Joshua; and Stern, Brett, 5,569,297, Cl. 606-201.000.  
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 Ruegg, Erwin, 5,568,952, Cl. 292-318.000.  
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 Novak, Pavel, 5,569,026, Cl. 417-477.100.  
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 Strande, Per: See—  
 Klavness, Jo; Rongved, Pål; and Strande, Per, 5,569,449, Cl. 424-9.510.  
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 Klausmeier, Daniel E.; and Corbalis, Charles M., 5,570,360, Cl. 370-60.000.  
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 Ström, Joakim: See—  
 Zheng, Wenxin; and Ström, Joakim, 5,570,446, Cl. 385-98.000.  
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 Erickson, Bruce L.; and Snell, Alan H., 5,570,076, Cl. 338-163.000.  
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 Chan, Ken Tze-Kin; Enichen, William A.; Hartley, John G.; and Sturans, Maris A., 5,570,405, Cl. 378-35.000.  
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 Suarez, Wilson E., to PSI Telecommunications, Inc. Tool for assembling wire connectors. 5,568,686, Cl. 29-861.000.  
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 Egraz, Jean-Bernard; Mongoin, Jacques; Ravet, Georges; and Suau, Jean-Marc, 5,569,702, Cl. 524-547.000.  
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 Dority, John A., Jr.; Earley, William G.; Kumar, Virendra; Mallam, John P.; Miller, Matthew S.; and Subramanyam, Chakrapani, 5,569,655, Cl. 514-226.800.  
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 Kouno, Hisao; Takahashi, Shyouichi; Higashide, Kazuhiro; Komiyama, Nakaji; Suda, Osamu; and Hasegawa, Masaru, 5,569,749, Cl. 534-653.000.  
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 Schierling, Bernhard; Till, Ralf; and Sudau, Jörg, 5,569,088, Cl. 464-64.000.  
 Sudo, Yukio: See—  
 Hiraoka, Toshikage; Tanimoto, Tetsuji; Makino, Yoshihiko; Ninomiya, Tadashi; Hora, Naofumi; Ashihara, Yoshihiro; Sudo, Yukio; and Mori, Toshihiro, 5,569,589, Cl. 435-7.900.  
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 Suematsu, Hideki: See—  
 Obata, Yoshiyuki; Suematsu, Hideki; and Ikemoto, Manabu, 5,569,347, Cl. 156-235.000.  
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 Andoh, Yuzi; Katabe, Masaki; and Suenaga, Hiromi, 5,568,765, Cl. 99-403.000.  
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 Sugawara, Hideo, to Fujitsu Limited. Automatic gain control amplifier for use in radio transmitter-receiver. 5,570,064, Cl. 330-282.000.  
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 Oishi, Tetsuya; Suzuki, Jin; Ohkawa, Kouhei; Furusawa, Satoshi; Ono, Hiroshi; and Sugazaki, Kazuo, 5,569,726, Cl. 525-472.000.  
 Sugita, Ryuji: See—  
 Thoma, Kiyokazu; Yoshimoto, Kazunari; Sugita, Ryuji; and Ishida, Tatsuki, 5,569,523, Cl. 428-213.000.  
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 Sullivan, Stephen F.: See—  
 Flaughner, David; Perrine, Glenn; Sullivan, Stephen F.; and Wood, Raymond B., 5,569,316, Cl. 96-135.000.  
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 Vogel, Rudolf; Bertold, Klaus; and Evren, Hüsni, 5,568,826, Cl. 139-25.000.  
 Sumida, Tatsuya, to Sumitomo Wiring Systems, Ltd. Combination connector. 5,569,040, Cl. 439-157.000.  
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- Hata, Masahiko; Fukuhara, Noboru; Takata, Hiroaki; and Inui, Katsumi, 5,569,954, Cl. 257-627.000.  
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 Sato, Shuichi; Sumiya, Hitoshi; Kawate, Katsuyuki; and Katoh, Jiro, 5,569,921, Cl. 250-339.010.  
 Yasuo, Hiroyuki; and Deguchi, Hiroshige, 5,570,181, Cl. 356-336.000.  
 Sumitomo Rubber Industries, Ltd.: See—  
 Tanaka, Yasuyuki; Shibata, Kazuhiko; Ikeda, Kenichi; Nishida, Yuji; Hayashi, Masaharu; Nakade, Shinichi; Kuga, Akhito; and Kanamaru, Eiji, 5,569,740, Cl. 528-502.00F.  
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 Sumida, Tatsuya, 5,569,040, Cl. 439-157.000.  
 Suniya, Hitoshi: See—  
 Sato, Shuichi; Sumiya, Hitoshi; Kawate, Katsuyuki; and Katoh, Jiro, 5,569,921, Cl. 250-339.010.  
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 Koinuma, Hideomi; Kawasaki, Masashi; and Sumiya, Masatomo, 5,569,502, Cl. 427-600.000.  
 Summers, Richard: See—  
 Walters, William; and Summers, Richard, 5,569,873, Cl. 102-476.000.  
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 Kunda, Ramachandra P.; Malamy, Adam C.; and Levitt, Marc, 5,570,376, Cl. 371-25.100.  
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 Paradis, Jason P.; and Supron, Steven A., 5,569,327, Cl. 118-253.000.  
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 Susa, Tomoo: See—  
 Akatsu, Masamichi; Higashi, Takeo; Makita, Hiromitsu; Susa, Tomoo; and Mizuno, Toshiya, 5,569,524, Cl. 428-215.000.  
 Suwa, Masateru: See—  
 Siga, Masao; Fukui, Yutaka; Kuriyama, Mitsuo; Maeno, Yoshimi; Suwa, Masateru; Kaneko, Ryoichi; Onoda, Takeshi; Kajiwara, Hidefumi; Watanabe, Yasuo; Takahashi, Shintaro; and Tan, Toshimi, 5,569,338, Cl. 148-335.000.  
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 Araya, Toshinori; and Suyama, Akio, 5,570,424, Cl. 381-61.000.  
 Suzuka, Shinya: See—  
 Yoneyama, Shuji; and Suzuka, Shinya, 5,570,150, Cl. 396-324.000.  
 Suzuki, Akihiro; Norio; Takahashi, Shinsuke; and Tomaru, Mikio, to Fuji Photo Film Co., Ltd. Method for high-speed application of a coating while adjusting the coat thickness. 5,569,494, Cl. 427-358.000.  
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 Sakaki, Mamoru; Suzuki, Eiichi; Kashiwazaki, Akio; and Hirose, Mifune, 5,570,120, Cl. 347-105.000.  
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 Endo, Kenji; Suzuki, Hidekazu; Oguma, Toru; and Goto, Masayoshi, 5,569,464, Cl. 424-450.000.  
 Suzuki, Hiroshi: See—  
 Sakai, Kouichi; Aoki, Shuhei; Murata, Shigenori; Oumi, Hayato; and Suzuki, Hiroshi, 5,569,105, Cl. 474-110.000.  
 Suzuki, Jin: See—  
 Oishi, Tetsuya; Suzuki, Jin; Ohkawa, Kouhei; Furusawa, Satoshi; Ono, Hiroshi; and Sugazaki, Kazuo, 5,569,726, Cl. 525-472.000.  
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 Ohki, Hiroaki; Nishima, Osamu; Mori, Hiroyuki; and Suzuki, Junya, 5,569,616, Cl. 437-44.000.  
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 Suzuki, Noriyuki; and Yokoyama, Haruhiko, to Matsushita Electric Industrial Co., Ltd. Dot pattern-examining apparatus. 5,570,298, Cl. 364-525.000.  
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 Hori, Hiroyuki; Date, Nobuaki; Mimura, Toshihiko; Tojo, Akihiko; Kawamura, Hideaki; Murata, Yoshitaka; Takaiwa, Kan; Suzuki, Takashi; Ozaki, Seiichi; Taira, Junzo; and Nagasawa, Kenichi, 5,570,130, Cl. 348-233.000.  
 Suzuki, Yasuhiro: See—  
 Yokoyama, Kazuaki; Kinoshita, Michitaka; Ohashi, Yukio; and Suzuki, Yasuhiro, 5,569,882, Cl. 174-76.000.  
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 Svindal, Hakon: See—  
 Johansen, Tore; and Svindal, Hakon, 5,569,352, Cl. 156-499.000.  
 Swanson, John; and Wright, Lawrence. Towel warmer. 5,569,403, Cl. 219-400.000.  
 Swenson, Ed: See—  
 Sun, Yunlong; and Swenson, Ed, 5,569,398, Cl. 219-121.680.  
 Swieboda, Michael A., to BRK Brands, Inc. Ambient condition detector with high intensity strobe light. 5,570,077, Cl. 340-331.000.  
 Swierbut, Wendi M.; and Nardi, John C., to Eveready Battery Company, Inc. Alkaline cell having a cathode including a titanate additive. 5,569,564, Cl. 424-224.000.  
 Swindle, Carl A.: See—  
 Ebling, Wendell V.; Elmore, J. Charles; and Swindle, Carl A., 5,569,161, Cl. 600-121.000.  
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 Sylvester, Garrett S.: See—  
 Sperlazzo, Thomas M.; Sylvester, Garrett S.; and Trezza, Jack F., 5,570,028, Cl. 324-528.000.  
 Symbiosis Corporation: See—  
 Dill, Gary R.; and Hahnen, Kevin F., 5,569,299, Cl. 606-205.000.  
 Hahnen, Kevin F., 5,569,244, Cl. 606-46.000.  
 Kortenbach, Juergen A.; McBrayer, Michael S.; Slater, Charles R.; and Gottlieb, Saul, 5,569,243, Cl. 606-46.000.  
 Symbol Technologies, Inc.: See—  
 Bridgell, Raj; Goren, David; Katz, Joseph; and Bard, Simon, 5,569,901, Cl. 235-470.000.  
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 Silverman, Ian R.; Cohen, Daniel H.; Lyga, John W.; Szczepanski, Steven W.; and Ali, Syed F., 5,569,664, Cl. 514-317.000.  
 Szurkowski, Edward S.: See—  
 Blahut, Donald E.; Hollenberg, Walter; and Szurkowski, Edward S., 5,570,126, Cl. 348-7.000.  
 Tabuchi, Kenji; and Sasaki, Yasushi, to Hitachi, Ltd. Electric circuit device provided on components necessary for controlling engine of vehicle. 5,568,794, Cl. 123-195.00E.  
 Tachibana, Hidekiyo: See—  
 Yamamoto, Mikio; Tachibana, Hidekiyo; Kajimoto, Masashi; and Toyoda, Yutaka, 5,570,164, Cl. 355-245.000.  
 Taguchi, Tatsuhisa: See—  
 Yamamura, Michio; Iwanami, Kunio; Taguchi, Tatsuhisa; and Fukushima, Masafumi, 5,569,028, Cl. 418-55.300.  
 Tailored Lighting Inc.: See—  
 McGuire, Kevin P.; and Hagerman, Richard E., 5,569,983, Cl. 315-297.000.  
 Taira, Junzo: See—  
 Hori, Hiroyuki; Date, Nobuaki; Mimura, Toshihiko; Tojo, Akihiko; Kawamura, Hideaki; Murata, Yoshitaka; Takaiwa, Kan; Suzuki, Takashi; Ozaki, Seiichi; Taira, Junzo; and Nagasawa, Kenichi, 5,570,130, Cl. 348-233.000.  
 Tajima, Jun: See—  
 Kanayama, Satoshi; Ogawa, Noriyoshi; and Tajima, Jun, 5,569,566, Cl. 430-58.000.  
 Takabatake, Hideo: See—  
 Harada, Jiro; Tomita, Tsutomu; and Takabatake, Hideo, 5,568,674, Cl. 24-429.000.  
 Takacs, Gregory W., to ABC Techcorp. Precise volume fluid dispenser. 5,568,882, Cl. 222-61.000.  
 Takada, Hajime: See—  
 Toyota, Mitsuru; Takada, Hajime; Ohkubo, Katsuhiro; and Nunokawa, Hiroyuki, 5,568,733, Cl. 62-228.400.  
 Takagishi, Takashi: See—  
 Endo, Takayoshi; and Takagishi, Takashi, 5,569,051, Cl. 439-587.000.  
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 Onae, Hideki; Miyatake, Yoshito; and Takahara, Hiroshi, 5,570,215, Cl. 359-73.000.  
 Takahashi, Gensho; and Kurihara, Masaaki, to Asahi Kasei Kogyo Kabushiki Kaisha. Lithographic printing original plates and platemaking process using the same. 5,569,573, Cl. 430-138.000.  
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 Takahashi, Masamitsu: See—  
 Fukui, Isao; Takahashi, Masamitsu; Ihara, Kazuhiro, deceased; Murakami, Hiroshi; Tanaka, Tetsuhiro; Miyaura, Shinobu; Kuroda, Shinichi; Hiraishi, Masahiro; and Inoue, Koji, 5,569,455, Cl. 422-174.000.  
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 Takahashi, Shinsuke: See—  
 Suzuki, Akihiro; Shibata, Norio; Takahashi, Shinsuke; and Tomaru, Mikio, 5,569,494, Cl. 427-358.000.  
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 Siga, Masao; Fukui, Yutaka; Kuriyama, Mitsuo; Maeno, Yoshimi; Suwa, Masateru; Kaneko, Ryoichi; Onoda, Takeshi; Kajiwara, Hidefumi; Watanabe, Yasuo; Takahashi, Shintaro; and Tan, Toshimi, 5,569,338, Cl. 148-335.000.  
 Takahashi, Shyouichi: See—



- Kouno, Hisao; Takahashi, Shyouchi; Higashide, Kazuhiro; Koriyama, Nakaji; Suda, Osamu; and Hasegawa, Masaru. 5,569,749, Cl. 534-653.000.
- Takahashi, Susumu: See—
- Toda, Toshiaki; Takahashi, Susumu; and Iwata, Fujio. 5,570,338, Cl. 369-275.100.
- Takahashi, Yasunori, to Kawasaki Teitoku Co., Ltd.; Komeya, Inc.; and Sanei Kasei Co., Ltd. Process for producing a material for a permanent magnet. 5,569,333, Cl. 148-105.000.
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- Takahashi, Yuji: See—
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- Takaiwa, Kan: See—
- Horii, Hiroyuki; Date, Nobuaki; Mimura, Toshihiko; Tojo, Akihiko; Kawamura, Hideaki; Murata, Yoshitaka; Takaiwa, Kan; Suzuki, Takashi; Ozaki, Seiichi; Taira, Junzo; and Nagasawa, Kenichi. 5,570,130, Cl. 348-233.000.
- Takakuwa, Yoshito: See—
- Teramachi, Masayoshi; Kinoshita, Kinichi; Takakuwa, Yoshito; Fukui, Eiji; and Kamiyanagita, Tadashi. 5,569,605, Cl. 435-290.200.
- Takase, Akihiko: See—
- Murakami, Masaru; Oguri, Yozo; Ashi, Yoshihiro; Tanaka, Katsuyoshi; Kozaki, Takahiko; Takase, Akihiko; and Miyagi, Morihito. 5,570,368, Cl. 370-94.200.
- Takasugi, Hisashi: See—
- Ohki, Hidenori; Tomishima, Masaki; Yamada, Akira; and Takasugi, Hisashi. 5,569,646, Cl. 514-11.000.
- Takata, Hiroaki: See—
- Hata, Masahiko; Fukuhara, Noboru; Takata, Hiroaki; and Inui, Katsumi. 5,569,954, Cl. 257-627.000.
- Takata Inc.: See—
- Seymour, Brian T. 5,569,893, Cl. 200-61.540.
- Takayama, Toru: See—
- Zhang, Hongyong; Takayama, Toru; and Takemura, Yasuhiko. 5,569,610, Cl. 437-21.000.
- Zhang, Hongyong; Uochi, Hideki; Takayama, Toru; Takemura, Yasuhiko; and Yamamoto, Mutsuo. 5,569,936, Cl. 257-66.000.
- Takeda, Hideyuki, to Maruha Corporation. Process for producing flake style food. 5,569,481, Cl. 426-574.000.
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- Yamaguchi, Shojiro; and Takemoto, Hajime. 5,570,409, Cl. 378-196.000.
- Takemura, Katsuya: See—
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- Takemura, Yasuhiko; and Adachi, Hiroki, to Semiconductor Energy Laboratory Co., Ltd. Semiconductor device and process for fabricating the same. 5,569,935, Cl. 257-51.000.
- Takemura, Yasuhiko: See—
- Yamazaki, Shunpei; and Takemura, Yasuhiko. 5,569,615, Cl. 437-43.000.
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- Takeuchi, Esther S.: See—
- Smesko, Sally A.; Takeuchi, Esther S.; and Ebel, Steven J. 5,569,553, Cl. 429-90.000.
- Takewaki, Takahiko; Fujita, Naoko; Yokoyama, Toshiharu; and Maki, Takao, to Mitsubishi Chemical Corporation. Method for producing a cycloolefin. 5,569,803, Cl. 585-269.000.
- Takimoto, Kiyoshi: See—
- Morikawa, Yuko; Yanagisawa, Yoshihiro; and Takimoto, Kiyoshi. 5,569,974, Cl. 313-310.000.
- Takita Patent & Engineering: See—
- Okami, Takehide; and Sekiya, Tokio. 5,569,684, Cl. 523-209.000.
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- Tangherlini, Vincent C.: See—
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- Ishida, Yoshihiko; and Tani, Makoto. 5,569,854, Cl. 73-628.000.
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- Taylor, John M.: See—
- McLaughlin, Michael D.; Signa, John C.; Greicar, Richard K.; and Taylor, John M. 5,570,108, Cl. 345-146.000.
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- Vaux, Jean-Luc; and Vincent, Benoit. 5,569,097, Cl. 473-292.000.
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- Tazartes, Daniel A.: See—
- Mark, John G.; and Tazartes, Daniel A. 5,570,304, Cl. 364-571.030.
- TDK Corporation: See—
- Kitagawa, Sumiko; Shinkai, Masahiro; and Namba, Kenryo. 5,569,504, Cl. 428-64.100.
- Shinoura, Osamu; Koyanagi, Tsutomu; Chihara, Hiroshi; Yoshida, Makoto; and Chou, Tsutomu. 5,570,251, Cl. 360-126.000.
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- Garrison, Mark S.; Duffy, John A.; and Teal, Janice J. 5,569,651, Cl. 514-159.000.
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- Black, William H., Jr. 5,568,862, Cl. 206-338.000.
- Teich, Udo; and Deters, Ludger A., to Barmag AG. Apparatus for servicing a multi-position yarn winding machine. 5,568,720, Cl. 57-281.000.
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- Karambelas, Randy C.; Esplin, Ernest I.; Smith, Terry A.; Gordon, Mike C.; and Skidmore, Stephen H. 5,570,117, Cl. 347-33.000.
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- Kaprielian, Mark; Brim, Karen; and Kenyon, Lewis. 5,570,345, Cl. 370-16.000.
- Teledyne Industries, Inc.: See—
- Sommers, James A. 5,569,440, Cl. 423-79.000.
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- Zheng, Wenxin; and Ström, Joakim. 5,570,446, Cl. 385-98.000.
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- Sawyer, Francois. 5,570,467, Cl. 455-33.100.
- Sicher, Alan. 5,570,411, Cl. 379-57.000.
- Telefonica De España, S.A.: See—
- Fernandez, Manuel F.; and Cortijo, Jesus D. 5,570,450, Cl. 385-135.000.
- Temper Corporation: See—
- Rode, John E. 5,569,967, Cl. 310-103.000.
- TenEyck, John D.; Clere, Thomas M.; Olson, James; and Waisala, Steven, to Unifrax Corporation. High temperature stable continuous filament glass ceramic fibers. 5,569,629, Cl. 501-35.000.
- Tenneco Plastics Company: See—
- Fifer, Larry D.; Hollenbeck, Robert E.; Kozlowski, Mark F.; Leone, Richard E.; and Patridge, Clifford H. 5,568,979, Cl. 383-8.000.
- Tensar Corporation, The: See—
- Egan, Philip D.; and Miller, Robert A. 5,568,998, Cl. 405-262.000.
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- Tenten, Andreas: See—
- Martin, Friedrich-Georg; Hibst, Hartmut; and Tenten, Andreas. 5,569,636, Cl. 502-311.000.
- Teradyne, Inc.: See—
- Brown, Benjamin J.; and Reichert, Peter A. 5,570,383, Cl. 371-62.000.
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- Terauchi, Koichi; and Ono, Tomomi, to Minolta Co., Ltd. Sample optical properties measuring device with predictive estimation of measurement range by using preliminary and main light emission. 5,570,192, Cl. 356-407.000.
- Terawaki, Fumikazu; and Warashina, Fumikazu, to Fanuc Ltd. Visual sensor coordinate system setting jig and setting method. 5,570,190, Cl. 356-400.000.
- Terumo Kabushiki Kaisha: See—
- Umeno, Akihiko; and Kugo, Takahiro. 5,569,200, Cl. 604-96.000.
- Terunuma, Hiroshi; Wakabayashi, Hiroshi; and Tsukahara, Daiki, to Nikon Corporation. Camera which operates a shutter according to a photographer's wink and the vibration level. 5,570,151, Cl. 396-52.000.
- Teshima, Daihei: See—
- Matsuda, Takahiro; and Teshima, Daihei. 5,569,114, Cl. 477-45.000.
- Testec, Inc.: See—
- Utech, Klaus. 5,568,870, Cl. 209-573.000.
- Testo GmbH & Co.: See—
- Broedel, Axel; Springmann, Thomas; Münch, Reinhold; and Bader, Armin. 5,569,838, Cl. 73-23.310.
- Testone, Anthony Q., to Electrostatics, Inc. Static bar with indicator light. 5,570,266, Cl. 361-229.000.
- Tetra Laval Holdings & Finance S.A.: See—
- Hilmerston, Anders. 5,569,438, Cl. 422-293.000.
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- Tettamanti, Michele; and Biagioli, Marcello, to Oronzio De Nora S.A. Anode structure for cathodic protection of steel-reinforced concrete and relevant method of use. 5,569,526, Cl. 428-225.000.
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- Goetz, Laszlo. 5,570,008, Cl. 323-315.000.
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- Cho, Chih-Chen. 5,569,538, Cl. 428-427.000.
- Delaney, Joseph B.; Henderson, Timothy S.; Fuller, Clyde R.; and Mercer, Betty S. 5,569,944, Cl. 257-198.000.
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- Gove, Robert J.; Sampson, Jeffrey B.; and Markandey, Vishal. 5,570,135, Cl. 348-581.000.
- Kaiser, Ulrich. 5,569,187, Cl. 604-67.000.
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- Manning, William R.; Carlos, Mark C.; and Nacewicz, Stanley J. 5,570,257, Cl. 361-76.000.
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- Sedita, Jay R. 5,569,149, Cl. 493-466.000.
- Taylor, Robert H.; and Levine, Jules D. 5,569,975, Cl. 313-310.000.
- Textron, Inc.: See—
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- Thal, Raymond. Knotless suture anchor assembly. 5,569,306, Cl. 606-232.000.
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- Therakos, Inc.: See—
- Lee, Kyu H.; Morris, Livingston B.; Palmer, David W., deceased. 5,569,928, Cl. 250-494.100.
- Thermedics, Inc.: See—
- Bootman, Matthew W.; and Adams, Randall E. 5,569,683, Cl. 523-102.000.
- Thero, Christine: See—
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- Thibault, William C.: See—
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- Thomas Jefferson University: See—
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Houser, Russell A.; Jackson, Jerome; and Thompson, Russell B., 5,569,221, Cl. 604-282,000.  
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Ericson, Lars; and Thomsons, Peter, 5,569,194, Cl. 604-93,000.  
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Certenais, Joël, 5,570,023, Cl. 324-345,000.  
Martin, Jean-Marc, 5,570,101, Cl. 343-814,000.  
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Carrière, Claude; Groussin, Bernard; Larat, Christian; and Pocholle, Jean-Paul, 5,570,387, Cl. 372-50,000.  
Masson, Thierry; and Ferrant, Richard, 5,570,313, Cl. 365-174,000.  
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Muni, Ketan P.; Bagaoisan, Celso J.; and Thornton, Troy L., 5,569,196, Cl. 604-96,000.  
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Bowne, William C.; and Thorsby, Gary L., 5,569,387, Cl. 210-754,000.  
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Thurieu, Christophe: *See*—  
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Madaffari, Peter L.; and Collins, James S., 5,570,428, Cl. 381-191,000.  
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Johnson, Shane R.; Lavoie, Christian; Nissen, Mark K.; and Tiedje, J. Thomas, 5,568,978, Cl. 374-161,000.  
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Leung, Chun S., 5,569,868, Cl. 84-600,000.  
Till, Henry R.: *See*—  
Nye, LeRoy M.; Till, Henry R.; and Larson, James R., 5,570,173, Cl. 355-326,000.  
Till, Ralf: *See*—  
Schierling, Bernhard; Till, Ralf; and Sudau, Jörg, 5,569,088, Cl. 464-64,000.  
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Brzezinski, Philip S.; and Dvorachek, Thomas J., 5,570,297, Cl. 364-514,000.  
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Timonen, Maritta; Rha, ChoKyun; Vaara, Timo; Bagley, Lindsey; Bosdet, Sarah; Lindley, Michael; Lahtinen, Tarja; Turunen, Marja; and Vaara, Martti, to Alko Group Ltd. Degraded polysaccharide derivatives. 5,569,483, Cl. 426-658,000.  
Timoney, Charles: *See*—  
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Geibach, Rolf V.; and Tipton, Craig D., 5,569,644, Cl. 508-438,000.  
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Semenova, Elena V.; Tjurin, Vladimir M.; Solntsev, Stanislav S.; and Bersenev, Alexei Y., 5,569,427, Cl. 264-129,000.  
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Nitta, Tomio; Mifune, Hideo; Seki, Masato; Kaga, Yosimitu; and Serizawa, Noriyuki, 5,568,805, Cl. 126-262,000.  
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Tanaka, Toshiyuki; and Nakamura, Masaharu, 5,570,293, Cl. 364-468,280.  
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Helmus, Michael N.; Tolkoff, M. Joshua; and Raleigh, Carol L., 5,569,463, Cl. 424-426,000.  
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Ogan, Marc; Tomasella, Frank P.; and Tu, Jan-I, 5,569,446, Cl. 424-1,490.  
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Uesugi, Hitoshi; Maki, Tsutomu; Tomikawa, Kazuyoshi; Maeda, Tatsuya; and Masuda, Yoshimi, 5,570,191, Cl. 356-402,000.  
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Ohki, Hidenori; Tomishima, Masaki; Yamada, Akira; and Takasugi, Hisashi, 5,569,646, Cl. 514-11,000.  
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Harada, Jiro; Tomita, Tsutomu; and Takabatake, Hideo, 5,568,674, Cl. 24-429,000.  
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Umemoto, Tetsuo; and Tomizawa, Ginjiro, 5,569,778, Cl. 560-121,000.  
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Toms, Douglas: *See*—  
Fisher, Daniella J.; Osborn, Thomas W., III; Seymour, Mark D.; Kingry, Gary W.; Berg, Charles J., Jr.; Cook, Charles D.; Gilbert, Steven R.; and Toms, Douglas, 5,569,230, Cl. 604-385,100.  
Toole, William R., Jr.: *See*—  
Hopkins, Charles D.; Livingston, Ronald R.; and Toole, William R., Jr., 5,569,021, Cl. 417-63,000.  
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Toda, Toshiki; Takahashi, Susumu; and Iwata, Fujio, 5,570,338, Cl. 369-275,100.  
Torisawa, Nobuyuki; and Yamada, Toshihiko, to Fuji Photo Film Co., Ltd. Sheet feeding apparatus. 5,568,918, Cl. 271-91,000.  
Tormälä, Pertti: *See*—  
Tamminmäki, Markku; Albrecht-Olsen, Peter; Kristensen, Gert; and Tormälä, Pertti, 5,569,264, Cl. 606-104,000.  
Torrington Company, The: *See*—  
Polinsky, Mark A.; Grillo, John M.; and Duncan, Scott M., 5,570,013, Cl. 324-174,000.  
Toshikage, Hideki: *See*—

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Touche, André: *See*—  
Courtois, Didier; Petiard, Vincent; and Touche, André, 5,569,593, Cl. 435-118,000.  
Townsend, Rod: *See*—  
McMullen, Michael D.; Roth, Bradley A.; and Townsend, Rod, 5,569,828, Cl. 800-205,000.  
Toy, Edmond: *See*—  
Fonderie, Maarten J.; Huijsing, Johan H.; and Toy, Edmond, 5,570,052, Cl. 327-205,000.  
Toyota Boshoku Corporation: *See*—  
Oda, Kouichi; Horie, Kazuyuki; and Ino, Masao, 5,569,311, Cl. 55-493,000.  
Toyota, Yutaka: *See*—  
Yamamoto, Mikio; Tachibana, Hidekiyo; Kajimoto, Masashi; and Toyota, Yutaka, 5,570,164, Cl. 355-245,000.  
Toyota, Akinori: *See*—  
Yamamoto, Saneshiro; Kimura, Toshio; Nakagawa, Takasi; and Toyota, Akinori, 5,569,711, Cl. 525-66,000.  
Toyota Jidosha Kabushiki Kaisha: *See*—  
Kono, Katsumi; Nakamura, Shinya; and Honda, Atsushi, 5,569,117, Cl. 477-167,000.  
Kusaka, Yasushi; Yamada, Eiji; and Kawabata, Yasutomo, 5,569,995, Cl. 318-717,000.  
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Tran, Su Q.: *See*—  
Alvarado, Edmundo; Eshraghi, Soheil A.; and Tran, Su Q., 5,569,006, Cl. 411-43,000.  
TravelNet, Inc.: *See*—  
Shoolery, John R.; Pasela, Guy E.; De La Torre, Diane L.; Leung, Kenneth M.; and Morris, Kathleen A., 5,570,283, Cl. 364-407,000.  
Treleven, Carl W.: *See*—  
Grosskopf, Glenn; Hennessey, James; and Treleven, Carl W., 5,568,866, Cl. 206-466,000.  
Tresch, Rudolf: *See*—  
Brunner, Philipp; and Tresch, Rudolf, 5,568,722, Cl. 60-39,330.  
Trewella, Jeffrey C.: *See*—  
Bell, Weldon K.; Brown, Stephen H.; and Trewella, Jeffrey C., 5,569,789, Cl. 568-697,000.  
Trezza, Jack F.: *See*—  
Sperlazzo, Thomas M.; Sylvester, Garrett S.; and Trezza, Jack F., 5,570,028, Cl. 324-528,000.  
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Lindner, Ernst; Tritler, Guido W.; and Britz, Klaus, 5,568,724, Cl. 60-204,000.  
Troetsch-Schaller, Irene: *See*—  
Schaefer, Bernd; and Troetsch-Schaller, Irene, 5,569,774, Cl. 549-548,000.  
Trouchel, Daniel: *See*—  
Guilloud, Jean-Claude; Trouchet, Daniel; Lapautre, Michel; and Lepretre, Marc, 5,568,847, Cl. 188-313,000.  
Trova, Michael P.: *See*—  
Wissner, Allan; and Trova, Michael P., 5,569,762, Cl. 546-146,000.  
TRW Inc.: *See*—  
Urbach, Brian A., 5,568,930, Cl. 277-29,000.  
TRW Vehicle Safety Systems Inc.: *See*—  
Blackburn, Brian K.; Brown, Louis R.; Mazur, Joseph E.; and Gentry, Scott B., 5,568,939, Cl. 280-806,000.  
Lane, Wendell C., Jr., 5,568,940, Cl. 280-806,000.  
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Tsoi, Edmund K. M.: *See*—  
Chin, Albert K.; and Tsoi, Edmund K. M., 5,569,165, Cl. 600-204,000.  
TSRL, Inc.: *See*—  
Amidon, Gordon L.; Sherman, Lizbeth B.; and Crison, John R., 5,569,452, Cl. 424-78,100.  
Tsuda, Fumiaki: *See*—  
Naga, Mitsuo; Kiriha, Shuitsu; Tokugawa, Yoshinori; Tsuda, Fumiaki; Saito, Toshiaki; and Hirotsuka, Motohiko, 5,569,482, Cl. 426-656,000.  
Tsuda, Hideaki: *See*—  
Hanaoka, Kazutaka; Yoshida, Hidefumi; Nakamura, Kimiaki; Tsuda, Hideaki; and Chida, Hideo, 5,570,211, Cl. 359-53,000.  
Yoshida, Hidefumi; Hanaoka, Kazutaka; Nakamura, Kimiaki; Tsuda, Hideaki; and Yamada, Fumiaki, 5,570,210, Cl. 359-51,000.  
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Tsuiji, Kazuto: *See*—  
Yoneda, Yoshiyuki; Tsuiji, Kazuto; Kasai, Junichi; and Sakoda, Hideharu, 5,569,625, Cl. 437-217,000.  
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Tsujimura, Toshihiko: *See*—  
Kawata, Tsunehiro; Kojo, Katsuhiko; Kazama, Youichiro; Fukaya, Takayuki; and Tsujimura, Toshihiko, 5,569,334, Cl. 148-287,000.  
Tsukada, Takeshi: *See*—  
Evans, Anthony C.; Tsukada, Takeshi; Souri, Shukri J.; and Dupon, Ryan W., 5,569,495, Cl. 427-446,000.  
Tsukagoshi, Kazuo: *See*—  
Toide, Eiichi; and Tsukagoshi, Kazuo, 5,570,140, Cl. 348-744,000.  
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Terunuma, Hiroshi; Wakabayashi, Hiroshi; and Tsukahara, Daiki, 5,570,151, Cl. 396-52,000.  
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Tsurugai, Kazuo: *See*—  
Tokoro, Hisao; Tsurugai, Kazuo; Shioya, Satoru; and Oikawa, Masaharu, 5,569,681, Cl. 521-88,000.  
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Tsurumaki, Shinzo, to Fujitsu Limited. Signal transmission system. 5,570,394, Cl. 375-340,000.  
Tsuruta, Hikaru: *See*—  
Tezuka, Shigeru; Tsuruta, Hikaru; Koizumi, Teruaki; and Kitajima, Masao, 5,569,287, Cl. 606-182,000.  
Tu, Jan-I: *See*—  
Ogan, Marc; Tomasella, Frank P.; and Tu, Jan-I, 5,569,446, Cl. 424-1,490.  
Tubman, Louis; and Graveriaux, Daniel W. Acoustical prompt recording system and method. 5,569,038, Cl. 434-308,000.  
Tugendhaft, Israel: *See*—  
Weissman, Yitzhak; Herman, Rami; Bornstein, Aharon; and Tugendhaft, Israel, 5,569,923, Cl. 250-341,200.  
Tulane Educational Fund, The Administrators of the: *See*—  
Coy, David H.; and Taylor, John E., 5,569,741, Cl. 530-311,000.  
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Tuomenoksa, Mark L.: *See*—  
Isenberg, David S.; and Tuomenoksa, Mark L., 5,570,295, Cl. 364-514,000.  
Turcotte, Anne-Marie: *See*—  
Mikhail, Shaheer; and Turcotte, Anne-Marie, 5,569,314, Cl. 75-434,000.  
Turin, Joël: *See*—  
Gloton, Jean-Pierre; Laroche, Damien; Turin, Joël; and Fallah, Michel, 5,569,879, Cl. 174-52,200.  
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Turner, Chris A.: *See*—  
Pedicini, Christopher S.; Thibault, William C.; Turner, Chris A.; and Tinker, Lawrence A., 5,569,551, Cl. 429-27,000.  
Turunen, Marja: *See*—  
Timonen, Maritta; Rha, ChoKyun; Vaara, Timo; Bagley, Lindsey; Bosdet, Sarah; Lindley, Michael; Lahtinen, Tarja; Turunen, Marja; and Vaara, Martti, 5,569,483, Cl. 426-658,000.  
Tutt, James R.: *See*—  
Hansen, Eric R.; and Tutt, James R., 5,569,030, Cl. 432-103,000.  
Tuvim, Yuri: *See*—  
Giuliano, Mary-Louise; and Tuvim, Yuri, 5,568,955, Cl. 294-1,300.  
Tuvim, Lars G.: *See*—  
Kilström, Lars G.; Lindquist, Nils T.; and Tuvim, Lars G., 5,568,943, Cl. 285-7,000.  
TV Interactive Data Corporation: *See*—  
Redford, Peter M., 5,569,549, Cl. 429-1,000.  
Tverberg, Lois A.: *See*—  
Russo, Andrew F.; Lanigan, Thomas M.; and Tverberg, Lois A., 5,569,604, Cl. 435-240,200.  
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Ube Industries, Ltd.: *See*—  
Waku, Yoshiharu; Ohtsubo, Hideki; and Kohoku, Yasuhiko, 5,569,547, Cl. 428-688,000.  
Uber, Arthur E., III: *See*—



- Heilman, Martin S.; and Uber, Arthur E., III, 5,569,181, Cl. 604-30.000.  
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 Uchida, Shoji: See—  
 Ojima, Satoshi; and Uchida, Shoji, 5,569,246, Cl. 606-61.000.  
 Uchikawa, Akira, to Unisia Jecs Corporation. Apparatus and method for controlling the air-fuel ratio of an internal combustion engine. 5,568,725, Cl. 60-274.000.  
 Ueda, Minoru: See—  
 Terakawa, Katsumi; Muraoka, Kiyoshige; Ueda, Minoru; Kikuchi, Naohiko; and Matsuo, Toshiro, 5,569,690, Cl. 524-251.000.  
 Uehara, Yasuhiro: See—  
 Kusumoto, Yasuhiro; Omata, Makoto; Kanesawa, Yoshio; Uehara, Yasuhiro; and Inoue, Toru, 5,570,171, Cl. 355-285.000.  
 Uehling, Mark: See—  
 Naedel, Richard G.; Harris, David B.; and Uehling, Mark, 5,570,270, Cl. 361-687.000.  
 Uen, Samuel. Excerciser. 5,569,137, Cl. 482-126.000.  
 Uesugi, Hitoshi; Maki, Tsutomu; Tomikawa, Kazuyoshi; Maeda, Tatsuya; and Masuda, Yoshimi, to Yazaki Corporation. Identification of connector terminals. 5,570,191, Cl. 356-402.000.  
 Uesugi, Ryuji: See—  
 Kurimoto, Tetsuya; and Uesugi, Ryuji, 5,570,154, Cl. 396-568.000.  
 Ueyama, Satoshi: See—  
 Isoda, Satoru; Hanazato, Yoshio; Ueyama, Satoshi; Kawakubo, Hiroaki; and Nishikawa, Satoshi, 5,570,457, Cl. 395-25.000.  
 Uhlemann, Thomas F.: See—  
 Rao, Purushothama; Uhlemann, Thomas F.; and Kump, William H., 5,569,552, Cl. 429-72.000.  
 Uhlmer, Jürgen: See—  
 Bendel, Klaus; Uhlmer, Jürgen; and Eiser, Armin, 5,569,025, Cl. 417-434.000.  
 Ulrich, Fritzler. Traction device. 5,569,340, Cl. 152-225.000.  
 Ulrich, Heinrich C. Apparatus for inducing bloodlessness at the extremities of a patient. 5,569,304, Cl. 606-201.000.  
 Ulrich, Heinz: See—  
 Weischer, Carl-Heinrich; Ulrich, Heinz; and Wessel, Klaus, 5,569,670, Cl. 514-440.000.  
 Ultrasonic Arrays, Inc.: See—  
 Kenney, Martin J.; and Billings, John K., 5,569,835, Cl. 73-1.00J.  
 Ulubabov, Raphael S.: See—  
 Turkenich, Alexander M.; Lapshin, Yevgeny S.; Ulubabov, Raphael S.; Dudnik, Vladimir I.; and Dahl, Jens, 5,568,869, Cl. 209-212.000.  
 Umber, Ray E.: See—  
 Carlson, Glenn T.; Vaughn, William J.; and Umber, Ray E., 5,569,254, Cl. 606-79.000.  
 Vaughn, William J.; Umber, Ray E.; St. Clair, William E.; Estes, Larry D.; and Carlson, Glenn T., 5,569,256, Cl. 606-80.000.  
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 Umemo, Akira; Nonaka, Kiyoshi; and Kakizaki, Takao, to Nippon Telegraph and Telephone Corporation. Manipulator tracking apparatus and method for accurately tracking a path for sensors in low reliability conditions. 5,570,458, Cl. 395-88.000.  
 Unifrax Corporation: See—  
 TenEyck, John D.; Clere, Thomas M.; Olson, James; and Waisala, Steven, 5,569,629, Cl. 501-35.000.  
 Uniroyal Chemical Company, Inc.: See—  
 Ferrandino, Mark P.; Hong, Sung W.; and McKenzie, George T., 5,569,697, Cl. 524-492.000.  
 Unisia Jecs Corporation: See—  
 Uchikawa, Akira, 5,568,725, Cl. 60-274.000.  
 Unisys Corporation: See—  
 Kubista, Thomas T., 5,570,397, Cl. 375-356.000.  
 United Memories, Inc.: See—  
 Hardee, Kim C.; and Cordoba, Michael V., 5,570,005, Cl. 323-314.000.  
 United Microelectronics Corporation: See—  
 Fu, Chien-Chih, 5,570,312, Cl. 365-154.000.  
 Hong, Gary, 5,569,945, Cl. 257-316.000.  
 Hong, Gary, 5,569,946, Cl. 257-316.000.  
 Yang, Ming-Tzong, 5,569,962, Cl. 257-756.000.  
 Yang, Sheng-Hsing, 5,569,613, Cl. 437-33.000.  
 United Solar Systems Corporation: See—  
 Glatfelter, Troy; Hoffman, Kevin; Yang, Chi C.; and Guba, Subhendu, 5,569,332, Cl. 136-249.000.  
 United States of America: See—  
 Agriculture: See—  
 McMullen, Michael D.; Roth, Bradley A.; and Townsend, Rod, 5,569,828, Cl. 800-205.000.  
 Army: See—  
 Dukes, Michael A.; and Michael, Gerald T., 5,570,035, Cl. 324-763.000.  
 Kosica, Thomas E.; and Zhao, Jian H., 5,569,943, Cl. 257-192.000.  
 Walters, William; and Summers, Richard, 5,569,873, Cl. 102-476.000.  
 Young, Ronald J., 5,569,580, Cl. 435-2.000.  
 Commerce: See—  
 Potzick, James E., 5,568,993, Cl. 403-128.000.  
 Energy: See—  
 Hopkins, Charles D.; Livingston, Ronald R.; and Toole, William R., Jr., 5,569,021, Cl. 417-63.000.  
 Salmon, Joseph T., 5,570,189, Cl. 356-399.000.  
 Health and Human Services: See—  
 Gressel, Michael, 5,569,074, Cl. 454-56.000.  
 Lunardi-Iskandar, Yanto; and Gallo, Robert C., 5,569,602, Cl. 435-240.100.  
 Moonen, Chrit T. W.; and Duyn, Jeff, 5,570,019, Cl. 324-309.000.  
 Schweinfest, Clifford W.; and Papas, Takis S., 5,569,755, Cl. 536-23.500.  
 Navy: See—  
 Cho, Chahee P.; and Bedingfield, Ralph A., 5,569,111, Cl. 475-149.000.  
 Cooper, Guy F., 5,569,073, Cl. 454-54.000.  
 Maciejewski, Wendell C., 5,569,432, Cl. 264-439.000.  
 Moody, Paul E., 5,568,782, Cl. 114-238.000.  
 Vaillancourt, John J.; and Mulherin, James E., 5,568,781, Cl. 114-20.200.  
 United States of America represented by the Secretary Department of Health and Human Services, The: See—  
 Lee, Kan S.; He, Xiao-Shu; and Weinberger, Daniel R., 5,569,447, Cl. 424-1.850.  
 U.S. Philips Corporation: See—  
 Bönert, Peter, 5,570,020, Cl. 324-309.000.  
 Badique, Eric, 5,570,434, Cl. 382-279.000.  
 Bergmans, Johannes W. M.; and Wong-Lam, Ho W., 5,570,396, Cl. 375-355.000.  
 Bird, Neil C.; and Harkin, Gerard F., 5,569,908, Cl. 250-208.100.  
 De With, Peter H. N.; and Van Gestel, Wilhelmus J., 5,570,132, Cl. 348-408.000.  
 Dekker, Ronald; Maas, Henricus G. R.; Gravesteijn, Dirk J.; and Versleijen, Martinus P. J. G., 5,569,952, Cl. 257-579.000.  
 Rijns, Johannes J. F., 5,570,048, Cl. 327-94.000.  
 Sikkens, Marten; and Ansems, Johannes P. M., 5,568,967, Cl. 362-328.000.  
 Turk, Everardus T. G.; Van Engelen, Gerard; and Van Der Linde, Jannis P., 5,569,912, Cl. 250-231.140.  
 Zimmermann, Andreas, 5,570,003, Cl. 323-284.000.  
 United States Surgical Corporation: See—  
 Colligan, Francis D.; Carpentiere, Richard P.; Belcourt, Ronald H., Jr.; and Giordano, Giuseppe, 5,568,746, Cl. 72-416.000.  
 Francis, William J.; and Scirica, Paul A., 5,569,163, Cl. 600-133.000.  
 Gorman, Charles E., Jr.; Ciccolella, Michael; Smith, Robert C.; Guy, Thomas D.; and Azarbarzin, Kurt, 5,569,206, Cl. 604-167.000.  
 Granger, Richard N.; Scirica, Paul A.; and Gorecki, Michael J., 5,569,301, Cl. 606-224.000.  
 Green, David T.; Castro, Salvatore; Ratcliff, Keith; Bryan, Graham W.; and Nolan, Paul, 5,569,283, Cl. 606-170.000.  
 Proto, George R.; Colligan, Francis D.; and Bellmore, Harold, Jr., 5,569,302, Cl. 606-228.000.  
 Sauer, Jude S.; Oravec, Michael G.; Greenwald, Roger J.; and Kobiansky, Alexander I., 5,569,160, Cl. 600-114.000.  
 Young, Wayne P.; Pereira, Darryl S.; Castro, Salvatore; Kolesa, Michael S.; Mastri, Dominick L.; and Viola, Frank J., 5,569,284, Cl. 606-180.000.  
 U.S. West Technologies, Inc.: See—  
 LeBlanc, Frederick W., 5,570,412, Cl. 379-58.000.  
 United Technologies Corporation: See—  
 Chapkovich, John S., 5,569,008, Cl. 411-383.000.  
 United Technologies Motor Systems, Inc.: See—  
 Acquaviva, Sebastiano, 5,569,989, Cl. 318-254.000.  
 Univ. of Penna, Trustees of the: See—  
 Wu, Gary D., 5,569,680, Cl. 514-786.000.  
 Université de Montreal: See—  
 Kessous-Elbaz, Allégria; Michaud, Jean; and Berrada, Fouad, 5,569,827, Cl. 800-2.000.  
 University College of Wales Aberystwyth: See—  
 Kell, Douglas B.; and Woodward, Andrew M., 5,569,591, Cl. 435-29.000.  
 University of Arizona, The Arizona Board of Regents on behalf of the: See—  
 DellaPenna, Dean, 5,569,831, Cl. 800-205.000.  
 University of California: See—  
 Smith, Michael G., 5,569,641, Cl. 505-433.000.  
 University of California, The Regents of the: See—  
 Ashby, Matthew; and Rine, Jasper, 5,569,588, Cl. 435-6.000.  
 Bennett, Alan; Labavitch, John M.; Powell, Ann; and Stotz, Henrik, 5,569,830, Cl. 800-205.000.  
 Guglielmi, Guido; and Ji, Cheng, 5,569,245, Cl. 606-49.000.  
 Mitchell, Alexander R.; Pagoria, Philip F.; and Schmidt, Robert D., 5,569,783, Cl. 74-395.000.  
 Nathel, Howard; Kinney, John H.; and Otis, Linda L., 5,570,182, Cl. 356-345.000.  
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 University of Florida Research Foundation, Inc.: See—

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 University of Maryland-Baltimore County: See—  
 Anjanappa, Muniswamappa; and Miller, Warren G., 5,569,120, Cl. 482-4.000.  
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 Twardowski, Zbyslut J.; Nichols, W. Kirt; and Van Stone, John C., 5,569,182, Cl. 604-43.000.  
 University of Oklahoma, The Board of Regents of the: See—  
 Caccavo, Frank, Jr.; and McInerney, Michael J., 5,569,596, Cl. 435-168.000.  
 University of Rochester, The: See—  
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 University of Washington: See—  
 Howard, Matthew A., III; Grady, M. Sean; and Winn, H. Richard, 5,569,267, Cl. 606-130.000.  
 Sheehan, Florence H.; Haralick, Robert M.; and Lee, Chang-Kyu, 5,570,430, Cl. 382-128.000.  
 Unsworth, John: See—  
 Paterson, John; Kaldenbach, Robert; and Unsworth, John, 5,568,801, Cl. 123-598.000.  
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 Forte, Paulino; and Frey, Stanley J., 5,569,788, Cl. 568-697.000.  
 Frey, Stanley J.; Cottrell, Paul R.; and Hamm, David A., 5,569,790, Cl. 568-699.000.  
 Hammerman, John I.; and Pujado, Peter R., 5,569,791, Cl. 568-803.000.  
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 V-Lite Corporation: See—  
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 Snellman, Jorma, 5,569,142, Cl. 492-56.000.  
 Valois S.A.: See—  
 Bruna, Pascal, 5,568,884, Cl. 222-189.090.  
 Valyocsik, Ernest W.: See—  
 Beck, Jeffrey S.; Valyocsik, Ernest W.; and Venkat, Chaya R., 5,569,805, Cl. 585-446.000.  
 van de Wiele, N. V. Michel: See—  
 Debaes, Johnny; and Dejaegere, Ferdi, 5,568,827, Cl. 139-450.000.  
 Van Antwerp, William P.: See—  
 Cheney, Paul S., II; Mastrototaro, John J.; Schnabel, Nannette M.; Lord, Peter C.; Van Antwerp, William P.; and Clark, Raymond D., 5,568,806, Cl. 128-635.000.  
 van Buren Myers, Dirk: See—  
 Fine, David H.; Frain, Freeman W.; MacDonald, Stephen J.; Malaspina, Alex; Bayer, Forrest L.; and van Buren Myers, Dirk, 5,569,606, Cl. 436-43.000.  
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 Van der Burg, René C.: See—  
 Van der Loo, Leonardus L.H.; and Van der Burg, René C., 5,569,528, Cl. 428-298.000.  
 VanderHeyden, William B.: See—  
 Devanathan, Narasimhan; Klomans, Peter J.; VanderHeyden, William B.; and Buttk, Robert D., 5,569,434, Cl. 422-140.000.  
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 Allison, Anthony C.; de Vos Albrecht, Carl F.; Kruger, Petrus B.; and van der Merwe, Marthinus J., 5,569,649, Cl. 514-25.000.  
 van der Schueren, Freddy M. L.: See—  
 De Coninck, Valere L. M. P.; and van der Schueren, Freddy M. L., 5,569,480, Cl. 426-573.000.  
 van der Wal, Gillis P., to Duphar International Research B.V. Automatic injector. 5,569,192, Cl. 604-84.000.  
 Van Engelen, Gerard: See—  
 Turk, Everardus T. G.; Van Engelen, Gerard; and Van Der Linde, Jannis P., 5,569,912, Cl. 250-231.140.  
 Van Gestel, Wilhelmus J.: See—  
 De With, Peter H. N.; and Van Gestel, Wilhelmus J., 5,570,132, Cl. 348-408.000.  
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 Dooms, Philip; Aertbelien, Jozef; and Van Havenbergh, Jan, 5,569,530, Cl. 428-323.000.  
 Van Hoeck, James E.: See—  
 Ferrante, Joseph M.; Van Hoeck, James E.; Coates, Bradley J.; and Whiteside, Leo A., 5,569,259, Cl. 606-87.000.  
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 Van Remoortel, Christopher J.: See—  
 Waterhouse, Judith A.; Van Remoortel, Christopher J.; and Caproni, Roy H., 5,569,527, Cl. 428-261.000.  
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 Cadée, Theodorus P.; and Van Rooij, Jacobus H., 5,569,108, Cl. 475-1.000.  
 Van Sickler, Gary: See—  
 Lasky, Edwin G.; and Van Sickler, Gary, 5,569,368, Cl. 204-600.000.  
 Van Stone, John C.: See—  
 Twardowski, Zbyslut J.; Nichols, W. Kirt; and Van Stone, John C., 5,569,182, Cl. 604-43.000.  
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 Van Vooren, Gregory P.: See—  
 Stringwell, Roderick W.; and Van Vooren, Gregory P., 5,568,860, Cl. 200-242.000.  
 Van Wunsel, Danny: See—  
 Tavernier, Serge; Op de Beeck, Werner; Van Wunsel, Danny; and Vervoort, Michel, 5,569,567, Cl. 430-110.000.  
 Vapco Engineering: See—  
 Plocus, Van G.; and Forsha, Chris, 5,568,974, Cl. 366-151.100.  
 Varian Associates, Inc.: See—  
 Buttrill, Sidney E., Jr.; and Mordehai, Alex V., 5,569,917, Cl. 250-292.000.  
 Variot, Patrick, to LSI Logic Corporation. Apparatus for encapsulating an integrated circuit package. 5,570,272, Cl. 361-723.000.  
 Varn, Arron D.: See—  
 Karwacki, Eugene J.; Varn, Arron D.; Withers, Howard P., Jr.; and Woytek, Andrew J., 5,569,151, Cl. 588-249.000.  
 Varn, Harold T., to Restorative Care of America Incorporated. Foot orthosis with detachable sole plate. 5,569,173, Cl. 602-27.000.  
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 Varnham, Malcolm P.: See—  
 Kluth, Erhard L. E.; and Varnham, Malcolm P., 5,570,437, Cl. 385-12.000.  
 Vashi, Dipti V.: See—  
 Garrett, Scott M.; and Vashi, Dipti V., 5,569,550, Cl. 429-7.000.  
 Vasudevan, Venkatraghavan: See—  
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 Vaughn, William J.; Umber, Ray E.; St. Clair, William E.; Estes, Larry D.; and Carlson, Glenn T., to Midas Rex Pneumatic Tools, Inc. Surgical resection tool with a double quick release. 5,569,256, Cl. 606-80.000.  
 Vaughn, William J.: See—



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- Venkat, Chaya R.: *See—*
- Beck, Jeffrey S.; Vallyosik, Ernest W.; and Venkat, Chaya R., 5,569,805, Cl. 585-446.000.
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- Dewanckele, Jean-Marie; Vercruyse, Geert; and Büscher, Ralf, 5,569,576, Cl. 430-502.000.
- Verlinden, Bartholomeus: *See—*
- Van den Bergen, Patrick; Joos, Frans; De Niel, Marc; and Verlinden, Bartholomeus, 5,568,693, Cl. 34-620.000.
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- Dekker, Ronald; Maas, Henricus G. R.; Gravesteyn, Dirk J.; and Versleijen, Martinus P. J. G., 5,569,952, Cl. 257-579.000.
- Vervoort, Michel: *See—*
- Tavernier, Serge; Op de Beeck, Werner; Van Wunsel, Danny; and Vervoort, Michel, 5,569,567, Cl. 430-110.000.
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- Veux, Jean-Luc; and Vincent, Benoît, to Taylor Made Golf Company, Inc. Balanced golf club, 5,569,097, Cl. 473-292.000.
- VIAM - All Russian Institut of Aviation Materials: *See—*
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- Vianco, George W.: *See—*
- Laing, John R.; and Vianco, George W., 5,569,572, Cl. 430-137.000.
- Viaud, Marie-Claude: *See—*
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- Vickers, Incorporated: *See—*
- Thompson, James R., 5,568,858, Cl. 198-781.060.
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- Nagano, Hirofumi, 5,570,339, Cl. 369-275.300.
- Vidacare, Inc.: *See—*
- Edwards, Stuart D., 5,569,241, Cl. 606-41.000.
- Viehbeck, Alfred: *See—*
- Adamopoulos, Eleftherios; Lee, Kang-Wook; O'Toole, Terrence R.; Purushothaman, Sampath; Shaw, Jane M.; Viehbeck, Alfred; and Walker, George F., 5,569,739, Cl. 528-353.000.
- Vieira, Valmor N.: *See—*
- Fusco, Jose M.; Ramos, Jose Geraldo F.; Vieira, Valmor N.; and Guerra, Eduardo Cardoso de Melo, 5,569,435, Cl. 422-147.000.
- Vilaine, Jean-Paul: *See—*
- Fauchere, Jean-Luc; Thuriereau, Christophe; Vilaine, Jean-Paul; and Janiak, Philip, 5,569,647, Cl. 514-11.000.
- Vincent, Benoît: *See—*
- Veux, Jean-Luc; and Vincent, Benoît, 5,569,097, Cl. 473-292.000.
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- Ervay, Loren D.; Lewandowski, Brownslaus L.; and Vincent, Warren G., 5,569,519, Cl. 428-156.000.
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- Olstad, Bjørn, 5,568,811, Cl. 128-660.070.
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- Young, Wayne P.; Pereira, Darryl S.; Castro, Salvatore; Kolesa, Michael S.; Mastri, Dominick L.; and Viola, Frank J., 5,569,284, Cl. 606-180.000.
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- Ehnholm, Gösta J.; Pekonen, Seppo T.; and Virtanen, Juha P., 5,570,022, Cl. 324-319.000.
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- Visser, Steven C.: *See—*
- Munson, Bruce N.; and Visser, Steven C., 5,568,928, Cl. 463-37.000.
- Viswanathan, Venkatraman, to Landmark Graphics Corporation. Method and apparatus for creating horizons from 3-D seismic data, 5,570,106, Cl. 345-133.000.
- Vittone, Larry W. Squat exercise apparatus, 5,569,133, Cl. 482-98.000.
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- Staab, Craig C., 5,570,033, Cl. 324-761.000.
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- Vögele, Michael: *See—*
- Häfele, Ulrich; Vögele, Michael; and Heinrichs, Jean-Pierre, 5,570,129, Cl. 348-223.000.
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- Hammers, Timothy F.; Murphy, Lawrence E.; and Vohnoutka, Wayne R., 5,568,810, Cl. 128-660.010.
- Volzer, Johannes, to Festo KG. Fluid power cylinder with position indicator, 5,568,760, Cl. 92-5.00R.
- Vora, Madhukar B.; and West, Burnell G., to Dyna Logic Corporation. BiCMOS multiplexers and crossbar switches, 5,570,059, Cl. 327-415.000.
- W. L. Gore & Associates, Inc.: *See—*
- Goodwin, Brent I.; and Masley, Francis J., 5,569,507, Cl. 428-76.000.
- Lloyd, Brian K., 5,569,050, Cl. 439-465.000.
- W. R. Grace & Co.-Conn.: *See—*
- Miller, James G.; Wax, Michael J.; Wormsbecher, Richard F.; Aller, Leo B.; Durham, Donald R.; and Chmurny, Alan B., 5,569,634, Cl. 502-64.000.
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- Abramson, Bella; Barrera, Jose D.; Pamaran, Zosimo D.; and Pham, Anthony D., 5,569,696, Cl. 524-487.000.
- Wada, Mizuho: *See—*
- Fukatsu, Yoshiki; Nakahara, Shinji; Yamada, Youichi; Yamamoto, Hideji; Hida, Tatsuya; and Wada, Mizuho, 5,569,445, Cl. 423-633.000.
- Wadsworth, LeGrande D. Fingered fabric insect swatter, 5,568,699, Cl. 43-137.000.
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- Wagner, Oliver; Eicken, Karl; Ammermann, Eberhard; and Lorenz, Gisela, to BASF Aktiengesellschaft. 2-anilino-pyridine pesticides, 5,569,765, Cl. 546-304.000.
- Wahl Clipper Corporation: *See—*
- Hartwig, Charles D., 5,569,168, Cl. 601-133.000.
- Waisala, Steven: *See—*
- TenEyck, John D.; Clere, Thomas M.; Olson, James; and Waisala, Steven, 5,569,629, Cl. 501-35.000.
- Wakabayashi, Hiroaki: *See—*
- Satake, Kunio; Wakabayashi, Hiroaki; and Nakane, Masami, 5,569,662, Cl. 514-305.000.
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- Terunuma, Hiroshi; Wakabayashi, Hiroshi; and Tsukahara, Daiki, 5,570,151, Cl. 396-52.000.
- Wakamoto Pharmaceutical Co., Ltd.: *See—*
- Endo, Kenji; Suzuki, Hidekazu; Oguma, Tsuru; and Goto, Masayoshi, 5,569,464, Cl. 424-450.000.
- Wakayama, Yorihiro: *See—*
- Nagamine, Satoshi; Maenobu, Kiyoshi; Wakayama, Yorihiro; and Nishimura, Akio, 5,570,433, Cl. 382-255.000.
- Wakita, Katsuya: *See—*
- Kawakami, Tetsuji; Wakita, Katsuya; Kawamura, Tatsuro; Ozaki, Yusuke; Minemoto, Hisashi; and Sonoda, Nobuo, 5,569,565, Cl. 430-1.000.
- Waku, Yoshiharu; Ohtsubo, Hideki; and Kohtoku, Yasuhiko, to Ube Industries, Ltd. Ceramic composite material, 5,569,547, Cl. 428-688.000.
- Waldman, Helmut: *See—*

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- Walker, George F.: *See—*
- Adamopoulos, Eleftherios; Lee, Kang-Wook; O'Toole, Terrence R.; Purushothaman, Sampath; Shaw, Jane M.; Viehbeck, Alfred; and Walker, George F., 5,569,739, Cl. 528-353.000.
- Walker, Gordon N.: *See—*
- Yokoyama, Naokato, deceased; Walker, Gordon N.; and Main, Alan J., 5,569,674, Cl. 514-539.000.
- Walker, Michael; and Matt, Hans-Jürgen, to Alcatel N.V. Method of providing adaptive echo cancellation, 5,570,423, Cl. 379-410.000.
- Wallace Computer Services, Inc.: *See—*
- Dudle, James; Leatherman, Michael; Morrison, Michael; and Schnell, Waldo, 5,570,291, Cl. 364-468.010.
- Stevens, Scott A., 5,568,942, Cl. 283-56.000.
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- Viski, Peter; and Waller, David P., 5,569,574, Cl. 430-203.000.
- Walmsley, Graham D., to Hickory Springs Manufacturing Company. Fire-retardant polyurethane foams and method of producing, 5,569,682, Cl. 521-107.000.
- Walsh, Karen M.: *See—*
- Takeuchi, Esther S.; and Walsh, Karen M., 5,569,558, Cl. 429-122.000.
- Walter, Helmut: *See—*
- Rheinheimer, Joachim; Vogelbacher, Uwe J.; Baumann, Ernst; König, Hartmann; Gerber, Matthias; Westphalen, Karl-Otto; and Walter, Helmut, 5,569,640, Cl. 504-288.000.
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- Wamsley, Richard D.: *See—*
- Buschhaus, Michael C.; Wamsley, Richard D.; and Curtis, Thomas, 5,568,917, Cl. 270-58.010.
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Petschel, Klaus; and Weinzierl, Uwe, 5,569,734, Cl. 528-92.000.
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Pelletier, Dale A.; and Weisburg, William G., 5,569,586, Cl. 435-6.000.
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Reed, Michael L.; and Weiss, Lee E., 5,569,272, Cl. 606-151.000.
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Bhatnagar, Mohit; Weitzel, Charles E.; and Thero, Christine, 5,569,937, Cl. 257-77.000.
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Wood, Robert J.; and Pileski, Michael J., 5,569,902, Cl. 235-472.000.
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Mauch, Ernst; Weldle, Helmut; Bantle, Johannes-August; and Epp, Erwin, 5,568,696, Cl. 42-49.020.
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Reid, Michael A., 5,568,836, Cl. 166-65.100.
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Myer, Robert E.; and Wen, Jack C., 5,570,350, Cl. 370-18.000.
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Weischer, Carl-Heinrich; Ulrich, Heinz; and Wessel, Klaus, 5,569,670, Cl. 514-440.000.
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Belongia, David C.; and Kruepe, Annette T., 5,568,764, Cl. 99-341.000.
- West, Burnell G.: See—  
Vora, Madhukar B.; and West, Burnell G., 5,570,059, Cl. 327-415.000.
- West, Jeffrey A.: See—  
Martin, Brian C.; and West, Jeffrey A., 5,570,044, Cl. 326-84.000.
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Chapko, Louis B.; Westerhof, Donald E.; and Ertl, David S., 5,569,818, Cl. 800-200.000.
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Casey, Shawn E., 5,570,250, Cl. 360-106.000.
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Roselli, Leonard; Wolf, Daniel J.; Balukin, Gregory S.; and Pfaff, John, 5,570,284, Cl. 364-424.010.
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Grosskopf, Glenn; Hennessey, James; and Treleven, Carl W., 5,568,866, Cl. 206-466.000.
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Rheinheimer, Joachim; Vogelbacher, Uwe J.; Baumann, Ernst; König, Hartmann; Gerber, Matthias; Westphalen, Karl-Otto; and Walter, Helmut, 5,569,640, Cl. 504-288.000.
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Pauza, William V.; and Kerlin, Harold W., 5,569,047, Cl. 439-353.000.
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Dail, James E.; Li, Chia-Chang; Magill, Peter D.; Sriram, Kotikalapudi; and Whitaker, Norman A., Jr., 5,570,355, Cl. 370-60.100.
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Williams, Gregory E.; White, James A.; Dragomir, Nicholas A.; and Stottsberry, James W., 5,568,704, Cl. 49-362.000.
- White, Richard M.: See—  
Lal, Amit; and White, Richard M., 5,569,968, Cl. 310-322.000.
- Whitehead, David W.: See—  
Gill, Prem P.; Chrenka, Paul W.; and Whitehead, David W., 5,569,425, Cl. 264-121.000.
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Ferrante, Joseph M.; Van Hoeck, James E.; Coates, Bradley J.; and Whiteside, Leo A., 5,569,259, Cl. 606-87.000.
- Whitesitt, Celia A.: See—  
Boyd, Donald B.; Lifer, Sherry L.; Marshall, Winston S.; Palkowitz, Alan D.; Pfeiffer, William; Reel, Jon K.; Simon, Richard L.; Steinberg, Mitchell J.; Thrasher, K. Jeff; Vasudevan, Venkatraghavan; and Whitesitt, Celia A., 5,569,768, Cl. 548-253.000.
- Whitmoyer, David I.: See—  
Schulman, Joseph H.; Gord, John C.; Strojnik, Primoz; Whitmoyer, David I.; and Wolfe, James H., 5,569,307, Cl. 607-56.000.
- Wickis, Fred T., Jr.: See—  
Raburn, Richard W.; and Wickis, Fred T., Jr., 5,568,660, Cl. 5-652.100.
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Ebel, James A.; and Widman, Michael F., 5,568,715, Cl. 53-54.000.
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Beier, Sybille; Elger, Walter; Nishino, Yukishige; and Wiechert, Rudolf, 5,569,652, Cl. 514-173.000.
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Nore, Pentti; Honkanen, Erkki; Bäckström, Reijo; Wikberg, Tom; Haikala, Heimo; and Haarala, Jorma, 5,569,657, Cl. 514-247.000.
- Wilding, Oliver K.: See—  
Diaz, Michael; Halm, Roland L.; McIntyre, Michael A.; and Wilding, Oliver K., 5,569,775, Cl. 556-466.000.
- Wiles, Gregory R., to ATI Systems, Inc. Apparatus for measuring optical characteristics of a surface in two dimensions using a moving light source. 5,570,183, Cl. 356-371.000.
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Oppelt, Klaus, 5,568,743, Cl. 72-121.000.
- Wilkinson, John D.: See—  
Campbell, Roy E.; Wilkinson, John D.; and Hudson, Hank M., 5,568,737, Cl. 62-621.000.
- Willems, Peter: See—  
Leblans, Paul; Neyens, Lodewijk; Struye, Luc; and Willems, Peter, 5,569,926, Cl. 250-484.000.
- Williams, Bruce L.: See—  
Wolfe, Jimmy V.; and Williams, Bruce L., 5,568,907, Cl. 248-118.000.
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Brock, J. Kurt; Stratemeyer, Darren R.; and Williams, Eugene L., 5,568,904, Cl. 244-169.000.
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- Williams International Corporation: See—  
Williams, Gregg G., 5,568,984, Cl. 384-475.000.
- Williams, Joe L.: See—  
Pena, Jesus S.; Williams, Julia M.; and Williams, Joe L., 5,568,903, Cl. 244-140.000.
- Williams, Julia M.: See—  
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Smith, Charles S.; and Williamson, Jay D., 5,568,710, Cl. 52-426.000.
- Willis, Tucker; and Cinquemani, James, Jr. Flag support system. 5,568,784, Cl. 116-173.000.
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- Wilson, Bruce D.: See—  
Katariya, Devinder N.; Rich, Ronald J.; Stenard, Steven C.; and Wilson, Bruce D., 5,569,019, Cl. 415-200.000.
- Wilson, David A.; and Crump, Druce K., to Dow Chemical Company, The. Method for removing hydrogen sulfide from a gas using polyamino disuccinic acid. 5,569,443, Cl. 423-576.600.
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Smesko, Sally A.; Takeuchi, Esther S.; and Ebel, Steven J., 5,569,553, Cl. 429-90.000.
- Takeuchi, Esther S.; and Walsh, Karen M., 5,569,558, Cl. 429-122.000.
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Kassardjian, Vasken; and Wilson, Patrick J., 5,568,708, Cl. 52-301.000.
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- Winbond Electronics Corporation: See—  
Wu, Jui-Kuang; Chen, Mao-Sung; and Wu, Meng-Tsang, 5,570,418, Cl. 379-164.000.
- Winck, Karl: See—  
Peppmüller, Reinmar; Goossens, Bernhard; and Winck, Karl, 5,569,408, Cl. 508-462.000.
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Schreiber, Peter; Goecke, Stefanie; and Windmann, Reinhard, 5,569,685, Cl. 523-406.000.
- Windmoller & Holscher: See—  
Achelpohl, Fritz; and Feldkämper, Richard, 5,569,145, Cl. 493-240.000.
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Howard, Matthew A., III; Grady, M. Sean; and Winn, H. Richard, 5,569,267, Cl. 606-130.000.
- Winters, Thomas F., Jr.: See—  
Justin, Daniel F.; and Winters, Thomas F., Jr., 5,569,252, Cl. 606-73.000.
- Wiseloge, Mark, to Conner Peripherals, Inc. Method and apparatus for controlling assertion of a write inhibit signal using separate threshold values for each of a plurality of recording surfaces. 5,570,244, Cl. 360-60.000.
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Yeh, Tangshun; Hurst, Allan T.; Chen, Huang-Joung; Berg, Lonny L.; and Witcraft, William F., 5,569,617, Cl. 437-48.000.
- Withers, Howard P., Jr.: See—  
Karwacki, Eugene J.; Varn, Arron D.; Withers, Howard P., Jr.; and Woytek, Andrew J., 5,569,151, Cl. 588-249.000.
- Withgott, M. Margaret: See—  
Bloomberg, Dan S.; and Withgott, M. Margaret, 5,570,435, Cl. 382-283.000.
- Witt, Sandra: See—  
Uphues, Guenter; Ploog, Uwe; Schick, Renate; Schwark, Hans-Juergen; and Witt, Sandra, 5,569,767, Cl. 548-352.100.
- WMS Gaming Inc.: See—  
Nicastro, Neil D.; and Durham, Timothy J., 5,569,084, Cl. 463-20.000.
- Woelppel, William R.; Young, Richard L.; and Stoker, Ronald L., to Merit Medical Systems, Inc. System for managing delivery of contrast media. 5,569,208, Cl. 604-183.000.
- Wöhrn, Volker: See—  
Frank, Karl-Heinz; Schneider, Johann; and Wöhrn, Volker, 5,568,702, Cl. 49-153.000.
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Wheaton, James A.; Wold, Erling; Strawn, John; and Warwick, Steven, 5,569,871, Cl. 84-625.000.
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Roselli, Leonard; Wolf, Daniel J.; Balukin, Gregory S.; and Pfaff, John, 5,570,284, Cl. 364-424.010.
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Avar, Lajos; Bechtold, Karl; and Wolf, Rainer, 5,569,539, Cl. 428-457.000.
- Wolf, Stanley F.: See—  
Trinchieri, Giorgio; Perussia, Bice; Clark, Steven C.; Woog, Gordon G.; Hewick, Rodney; Kobayashi, Michiko; and Wolf, Stanley F., 5,569,454, Cl. 424-85.200.
- Wolfe, David; and Zerillo, Samuel D., to Presstek, Inc. Cleaning apparatus for offset plates. 5,568,768, Cl. 101-425.000.
- Wolfe, James H.: See—  
Schulman, Joseph H.; Gord, John C.; Strojnik, Primoz; Whitmoyer, David I.; and Wolfe, James H., 5,569,307, Cl. 607-56.000.
- Wolfe, Jimmy V.; and Williams, Bruce L. Dynamic wrist rest. 5,568,907, Cl. 248-118.000.
- Wolff, Joachim: See—  
Jäger, Horst; and Wolff, Joachim, 5,569,747, Cl. 534-630.000.
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Gentry, Jeffrey S.; Womble, Karen M.; Banerjee, Chandra K.; Blakley, Richard L.; Barnes, Russell D.; Calleson, Donald A.; and Ridings, Henry T., 5,568,819, Cl. 131-342.000.
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Choi, Kil Y.; Won, Jong C.; Hong, Young T.; Woo, Sang S.; and Don, Youn S., 5,569,738, Cl. 528-170.000.
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Park, Soon J.; Lee, Young M.; Won, Teug Y.; Kwon, Soon C.; Lee, Seung J.; Kim, Jung H.; and Kim, Bum J., 5,569,598, Cl. 435-212.000.
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Trinchieri, Giorgio; Perussia, Bice; Clark, Steven C.; Wong, Gordon G.; Hewick, Rodney; Kobayashi, Michiko; and Wolf, Stanley F., 5,569,454, Cl. 424-85.200.
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Bergmans, Johannes W. M.; and Wong-Lam, Ho W., 5,570,396, Cl. 375-355.000.
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Choi, Kil Y.; Won, Jong C.; Hong, Young T.; Woo, Sang S.; and Don, Youn S., 5,569,738, Cl. 528-170.000.
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Flaughner, David; Perrine, Glenn; Sullivan, Stephen F.; and Wood, Raymond B., 5,569,316, Cl. 96-135.000.
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- Woodward, Andrew M.: See—  
Kell, Douglas B.; and Woodward, Andrew M., 5,569,591, Cl. 435-29.000.
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- Work, William J.: See—  
LaFleur, Edward E.; Work, William J.; Amici, Robert M.; Bortnick, Newman M.; and Holy, Norman L., 5,569,710, Cl. 525-57.000.
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Liu, Su-Yi, 5,570,447, Cl. 385-125.000.
- Wormsbecher, Richard F.: See—  
Miller, James G.; Wax, Michael J.; Wormsbecher, Richard F.; Aller, Leo B.; Durham, Donald R.; and Chmurny, Alan B., 5,569,634, Cl. 502-64.000.
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- Wright, James A., to Pioneer Hi-Bred International, Inc. Inbred maize line PHJ33. 5,569,817, Cl. 800-200.000.
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- Wu, Anthony W.: See—  
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- Wu, Cheng-Wen: See—  
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- Wu, Gary D., to Univ. of Penna. Trustees of the. Method of treating inflammatory bowel disease with tributyrin. 5,569,680, Cl. 514-786.000.
- Wu, Jui-Kuang; Chen, Mao-Sung; and Wu, Meng-Tsang, to Winbond Electronics Corporation. Device for detecting operation state of telephone hook switch. 5,570,418, Cl. 379-164.000.
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Gibson, David M., 5,570,408, Cl. 378-145.000.
- Xerox Corporation: See—  
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- Andrews, John R.; Mizes, Howard A.; Kuhman, Daniel E.; and Herloski, Robert P., 5,570,161, Cl. 355-215.000.
- Bloomberg, Dan S.; and Withgott, M. Margaret, 5,570,435, Cl. 382-283.000.
- Hart, Steven C., 5,570,169, Cl. 355-259.000.
- Laing, John R.; and Vianco, George W., 5,569,572, Cl. 430-137.000.
- Loce, Robert P., 5,570,174, Cl. 355-328.000.
- Nye, LeRoy M.; Till, Henry R.; and Larson, James R., 5,570,173, Cl. 355-326.000.
- Pane, Sharon G., 5,569,150, Cl. 493-480.000.
- Rezanka, Ivan; Lin, John W.; Fague, Gary R.; and Dudek, Lesley P., 5,570,118, Cl. 347-43.000.
- Xilinx, Inc.: See—  
Chiang, David; Lee, Napoleon W.; Ho, Thomas Y.; and Kucharewski, Nicholas, Jr., 5,570,051, Cl. 327-205.000.
- Xintec Corporation: See—  
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- Yabe, Hisao: See—  
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- Yager, Michael: See—  
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- Yamada, Eiji: See—  
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- Yamada, Fumiaki: See—  
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- Yamada, Hajime; and Nakajima, Ryoji, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust pipe structure for a motorcycle. 5,568,726, Cl. 60-323.000.
- Yamada, Mitsuo; and Kobata, Yusaku, to Nippon Paint Co., Ltd. Curing agent and a cationic electrodeposition coating composition. 5,569,704, Cl. 524-591.000.
- Yamada, Toshihiko: See—  
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- Yamada, Toshiro; and Mitsuda, Yasuhiro, to Nippon Zeon Co., Ltd. Process for producing fluorinated saturated hydrocarbon. 5,569,796, Cl. 570-175.000.
- Yamada, Youichi: See—  
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- Yamaguchi, Takashi: See—  
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- Yamaguchi, Yoshimasu; Takahashi, Yuji; Hayakawa, Kimiaki; Kusumoto, Toshihiko; Kosasa, Hideaki; Ohta, Hiroshi; Yamanaka, Yuji; and Sakakibara, Kozo, to Canon Kabushiki Kaisha. Book Binding apparatus. 5,569,011, Cl. 412-9.000.
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- Yamaha Corporation: See—  
Araya, Tashinori; and Suyama, Akio, 5,570,424, Cl. 381-61.000.
- Hamanaga, Shinji; and Matsukuma, Yoshihiko, 5,569,864, Cl. 84-400.000.
- Noro, Masao; and Kohdaka, Takayuki, 5,570,091, Cl. 341-161.000.
- Sone, Takuro, 5,569,869, Cl. 84-609.000.
- Wheaton, James A.; Wold, Erling; Strawn, John; and Warwick, Steven, 5,569,871, Cl. 84-625.000.
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- Yamamoto, Kazumi: See—  
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- Yamamoto, Kozo, to Kabushiki Kaisha Daikin Seisakusho. Torsional vibration dampening device having multiple slider mechanisms to provide multiple dampening force levels. 5,569,087, Cl. 464-24.000.
- Yamamoto, Masahiro: See—  
Sonobe, Toshimitsu; and Yamamoto, Masahiro, 5,569,041, Cl. 439-157.000.
- Yamamoto, Mikio; Tachibana, Hidekiyo; Kajimoto, Masashi; and Toyoda, Yutaka, to Fuji Xerox Co., Ltd. Toner scraper for a developing apparatus. 5,570,164, Cl. 355-245.000.
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- Yamamoto, Sanehiro; Kimura, Toshio; Nakagawa, Takasi; and Toyota, Akinori, to Mitsui Petrochemical Industries, Ltd. Cycloolefin resin composition. 5,569,711, Cl. 525-66.000.
- Yamamoto, Yoshiharu: See—  
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- Yamamoto, Yoshinori: See—  
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- Yamano, Katsumi: See—  
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- Yamashita, Hirobumi, to Konica Corporation. Processing method of a silver halide photographic material. 5,569,575, Cl. 430-399.000.
- Yamauchi, Shin, to Kabushiki Kaisha Toshiba. Charging device and image forming apparatus having the same. 5,570,163, Cl. 355-221.000.
- Yamazaki, Kozo: See—  
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- Yamazaki, Masahiko; and Yaoi, Yoshiaki, to Kabushiki Kaisha Toshiba. X-ray CT imaging apparatus with varied energy level detection capability. 5,570,403, Cl. 378-5.000.
- Yamazaki, Shunpei; and Takemura, Yasuhiko, to Semiconductor Energy Laboratory Co., Ltd. Method for forming a flash memory by forming shallow and deep regions adjacent the gate. 5,569,615, Cl. 437-43.000.
- Yanagida, Toshiharu: See—  
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- Yanagisawa, Ryoze: See—  
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- Yanagisawa, Yoshihiro: See—  
Morikawa, Yuko; Yanagisawa, Yoshihiro; and Takimoto, Kiyoshi, 5,569,974, Cl. 313-310.000.
- Yang, Chi C.: See—  
Glatfelter, Troy; Hoffman, Kevin; Yang, Chi C.; and Guha, Subhendu, 5,569,332, Cl. 136-249.000.
- Yang, Janice: See—  
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- Yang, Lau S.; and Klang, Jeffrey A., to Arco Chemical Technology, L.P. Process for making a polyetherester by insertion of a carboxylic acid into a polyether. 5,569,737, Cl. 528-274.000.
- Yang, Ming-Tzong, to United Microelectronics Corporation. Split polysilicon SRAM cell. 5,569,962, Cl. 257-756.000.
- Yang, Sheng-Hsing, to United Microelectronics Corp. Method of making bipolar junction transistor. 5,569,613, Cl. 437-33.000.
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- Yaoi, Yoshiaki: See—  
Yamazaki, Masahiko; and Yaoi, Yoshiaki, 5,570,403, Cl. 378-5.000.
- Yarchi, Yachin: See—  
Goldstein, Jonathan R.; Gektin, Inna; Givon, Menachem; and Yarchi, Yachin, 5,569,555, Cl. 429-49.000.
- Yashiro, Hiroyuki: See—  
Kochiyama, Jiro; Kaya, Nobuyuki; Fujiwara, Teruo; Yasui, Hidemi; and Yashiro, Hiroyuki, 5,570,102, Cl. 343-880.000.
- Yasugi, Toshiharu: See—  
Shibutani, Makoto; Yasugi, Toshiharu; and Kanazawa, Akihiro, 5,570,219, Cl. 359-125.000.
- Yasui, Hidemi: See—  
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- Yasukawa, Seiichi: See—  
Hibino, Hideo; Sakamoto, Hiroshi; and Yasukawa, Seiichi, 5,570,148, Cl. 396-182.000.
- Yasuo, Hiroyuki; and Deguchi, Hiroshige, to Sumitomo Electric Industries Ltd. Method of detecting impurities in molten resin utilizing scattering light and the shadows of the impurities. 5,570,181, Cl. 356-336.000.
- Yau, Chi W.; and Zorian, Yervant, to Lucent Technologies Inc. Built-in self-test control network. 5,570,374, Cl. 371-22.500.
- Yazaki Corporation: See—  
Endo, Takayoshi; and Takagishi, Takashi, 5,569,051, Cl. 439-587.000.
- Uesugi, Hitoshi; Maki, Tsutomu; Tomikawa, Kazuyoshi; Maeda, Tatsuya; and Masuda, Yoshimi, 5,570,191, Cl. 356-402.000.
- Yagi, Sakai; and Watanabe, Tamio, 5,569,054, Cl. 439-752.000.
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- Yokoyama, Kazuaki; Kinoshita, Michitaka; Ohashi, Yukio; and Suzuki, Yasuhiro, 5,569,882, Cl. 174-76.000.
- Yeager, David A.: See—  
Hoag, Peter Y.; and Yeager, David A., 5,568,891, Cl. 225-93.000.

- Yeh, Tangshun; Hurst, Allan T.; Chen, Huang-Joung; Berg, Lonny L.; and Witcraft, William F., to Honeywell Inc. Method of making integrated spacer for magnetoresistive RAM. 5,569,617, Cl. 437-48.000.
- Yerman, Alexander J.: See—  
Steigerwald, Robert L.; Yerman, Alexander J.; and Roshen, Waseem A., 5,570,074, Cl. 336-83.000.
- YKK Corporation: See—  
Harada, Jiro; Tomita, Tsutomu; and Takabatake, Hideo, 5,568,674, Cl. 24-429.000.
- YKK Corporation of America: See—  
Ishikawa, Masayoshi; and Fitzhenry, Edward T., Jr., 5,568,707, Cl. 52-200.000.
- Yokokawa, Tetsuya: See—  
Sasaki, Nobuyoshi; Yokokawa, Tetsuya; Hashimoto, Yoshikazu; Ohta, Yoshiro; and Sekiguchi, Hideo, 5,569,320, Cl. 106-287.260.
- Yokomizo, Yoshikazu, to Canon Kabushiki Kaisha. Image processing using information of one frame in binarizing a succeeding frame. 5,570,461, Cl. 395-135.000.
- Yokono, Haruki: See—  
Yokono, Hitoshi; Yokono, Haruki; Mikamo, Masahiro; Narushima, Ryouichi; Iida, Takuya; and Endo, Yasuhiro, 5,569,545, Cl. 428-626.000.
- Yokono, Hitoshi; Yokono, Haruki; Mikamo, Masahiro; Narushima, Ryouichi; Iida, Takuya; and Endo, Yasuhiro, to Nippon Denki Ltd. Copper clad laminate, multilayer printed circuit board and their processing method. 5,569,545, Cl. 428-626.000.
- Yokose, Taro: See—  
Suzuki, Kazuhiro; Yokose, Taro; Yoshinari, Toshiaki; Koshi, Yutaka; and Kamizawa, Koh, 5,570,203, Cl. 358-432.000.
- Yokota, Masayuki, to Canon Kabushiki Kaisha. Data controlling apparatus. 5,570,201, Cl. 358-404.000.
- Yokotani, Masahiro: See—  
Takaishi, Tadao; Matsumura, Masami; Marumoto, Tokuo; and Yokotani, Masahiro, 5,570,015, Cl. 324-207.210.
- Yokoyama, Haruhiko: See—  
Suzuki, Noriyuki; and Yokoyama, Haruhiko, 5,570,298, Cl. 364-525.000.
- Yokoyama, Kazuaki; Kinoshita, Michitaka; Ohashi, Yukio; and Suzuki, Yasuhiro, to Yazaki Corporation. Waterproof protective cover. 5,569,882, Cl. 174-76.000.
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- Yokoyama, Rina, administrator: See—  
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- Yokoyama, Saori: See—  
Korikawa, Masayuki; Shinohara, Toru; Iwatsubo, Masahito; Yokoyama, Saori; Ohmori, Hideki; Watanabe, Takasi; and Ohsugi, Tsuneo, 5,570,269, Cl. 361-685.000.
- Yokoyama, Toshiharu: See—  
Takewaki, Takahiko; Fujita, Naoko; Yokoyama, Toshiharu; and Maki, Takao, 5,569,803, Cl. 585-269.000.
- Yon, Carmen M.: See—  
Rastelli, Henry; Yon, Carmen M.; and Frey, Stanley J., 5,569,787, Cl. 568-697.000.
- Yoneda, Nae: See—  
Kumazawa, Tetsuo; Kitano, Makoto; Yaguchi, Akihiro; Kohno, Ryuji; Tanaka, Naotaka; Yoneda, Nae; and Anjoh, Ichiro, 5,569,960, Cl. 257-738.000.
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- Yonek, Kenneth P.: See—  
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- Yoneyama, Shuji; and Suzuka, Shinya, to Asahi Kogaku Kogyo Kabushiki Kaisha. Stereo photographing system. 5,570,150, Cl. 396-324.000.
- Yoneyama, Shuji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Compact zoom lens. 5,570,235, Cl. 359-692.000.
- Yoo, Seung-Joon: See—  
Lim, Ik-Cheol; Cho, Su-Yeon; and Yoo, Seung-Joon, 5,569,571, Cl. 430-25.000.
- Yoon, InBae. Safety penetrating instrument. 5,569,288, Cl. 606-185.000.
- Yoon, InBae. Safety penetrating instrument with penetrating member and cannula moving during penetration and triggered safety member protrusion. 5,569,289, Cl. 606-185.000.
- Yoon, InBae. Retractable safety penetrating instrument for portal sleeve introduction. 5,569,293, Cl. 606-185.000.
- Yoon, Sang O.: See—  
Jung, Hyung J.; Kim, Hyun J.; Kim, Kyong Y.; Yoon, Seok J.; Yoon, Sang O.; Nakamura, Tetsuro; Itoh, Mitsuru; and Inaguma, Yoshiyuki, 5,569,632, Cl. 501-136.000.
- Yoon, Seok J.: See—  
Jung, Hyung J.; Kim, Hyun J.; Kim, Kyong Y.; Yoon, Seok J.; Yoon, Sang O.; Nakamura, Tetsuro; Itoh, Mitsuru; and Inaguma, Yoshiyuki, 5,569,632, Cl. 501-136.000.
- Yoshida, Atsushi, to NEC Corporation. Lan bridge using gate circuits for protecting high-priority packets from low-priority packet transmissions. 5,570,365, Cl. 370-85.600.
- Yoshida, Daisaku; and Yamano, Katsumi, to Shintomi Golf Co., Ltd.; and Kasco Corporation. Golf-club head. 5,569,337, Cl. 148-325.000.
- Yoshida, Hidefumi; Hanaoka, Kazutaka; Nakamura, Kimiaki; Tsuda, Hideaki; and Yamada, Fumiaki, to Fujitsu Limited. Liquid crystal display device with directional backlight and image production capability in the light scattering mode. 5,570,210, Cl. 359-51.000.
- Yoshida, Hidefumi: See—  
Hanaoka, Kazutaka; Yoshida, Hidefumi; Nakamura, Kimiaki; Tsuda, Hideaki; and Chida, Hideo, 5,570,211, Cl. 359-53.000.
- Yoshida, Makoto: See—  
Shinoura, Osamu; Koyanagi, Tsutomu; Chihara, Hiroshi; Yoshida, Makoto; and Chou, Tsutomu, 5,570,251, Cl. 360-126.000.
- Yoshida, Takeo: See—  
Meguriya, Noriyuki; and Yoshida, Takeo, 5,569,688, Cl. 524-188.000.
- Yoshii, Yuuzi; Kaneshima, Yasuo; Nitta, Masayoshi; and Amano, Tatsuhiko, to Sumitomo Chemical Company, Limited. Adhesives. 5,569,703, Cl. 524-558.000.
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- Yoshimoto, Kazunari: See—  
Thoma, Kiyokazu; Yoshimoto, Kazunari; Sugita, Ryuji; and Ishida, Tatsuki, 5,569,523, Cl. 428-213.000.
- Yoshimura, Yuichiro: See—  
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- Yoshinaga, Jay K., to Rockwell International Corporation. Temperature compensations seal. 5,568,929, Cl. 277-26.000.
- Yoshinaga, Kenji, to Canon Kabushiki Kaisha. Image reading apparatus. 5,570,206, Cl. 358-497.000.
- Yoshinari, Toshiaki: See—  
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- Yoshioka, Kiyoharu: See—  
Sugita, Yasutoshi; Yoshioka, Kiyoharu; and Nakashima, Yoshiaki, 5,570,205, Cl. 358-472.000.
- Yost, Karl W.: See—  
Pal, Dhuraj; and Yost, Karl W., 5,569,155, Cl. 588-256.000.
- Young Band Co., Ltd.: See—  
Lin, Hwei-Kan, 5,568,664, Cl. 5-652.000.
- Young, James B.: See—  
Malinowski, Frank R.; and Young, James B., 5,570,178, Cl. 356-218.000.
- Young, Richard L.: See—  
Woelpper, William R.; Young, Richard L.; and Stoker, Ronald L., 5,569,208, Cl. 604-183.000.
- Young, Robert D.: See—  
Mallow, William A.; and Young, Robert D., 5,569,153, Cl. 588-256.000.
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- Young, Wayne P.; Pereira, Darryl S.; Castro, Salvatore; Kolesa, Michael S.; Mastri, Dominick L.; and Viola, Frank J., to United States Surgical Corporation. Morcellator. 5,569,284, Cl. 606-180.000.
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- Yu, Jack. Convertible light assembly. 5,568,969, Cl. 362-404.000.
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Chou, Marilyn M.; Yu, King J. J.; and Yu, Ken T., 5,570,445, Cl. 385-92.000.
- Yu, King J. J.: See—  
Chou, Marilyn M.; Yu, King J. J.; and Yu, Ken T., 5,570,445, Cl. 385-92.000.
- Yuan, Haiji: See—  
Lu, Minhua; and Yuan, Haiji, 5,570,216, Cl. 359-101.000.
- Yue, Kwok M.: See—  
Erdal, Apo C.; Nguyen, Trung; and Yue, Kwok M., 5,570,045, Cl. 326-93.000.
- Yuge, Yutaka: See—  
Kataoka, Yuzo; Asaba, Tetsuo; Makino, Kenji; Yuzurihara, Hiroshi; Fujita, Kei; Kamei, Seiji; Akino, Yutaka; Yuge, Yutaka; Shimotsusa, Mineo; and Kuwabara, Hideshi, 5,569,614, Cl. 437-39.000.
- Yugen Kaisha Frontier Engineering: See—  
Kayama, Hiroshi, 5,568,690, Cl. 33-565.000.
- Yugen Kaisha Kubo Technic Office: See—  
Kubo, Tetsujiro, 5,569,388, Cl. 210-764.000.
- Yumi, Hideo, to Kitagawa Industries Co., Ltd. Sewn material and method for shielding against electromagnetic waves. 5,569,877, Cl. 174-35.0GC.
- Yuyama, Yoshiaki: See—  
Maeda, Kazuo; Tokumasu, Noboru; and Yuyama, Yoshiaki, 5,569,499, Cl. 427-539.000.
- Yuzurihara, Hiroshi: See—

- Kataoka, Yuzo; Asaba, Tetsuo; Makino, Kenji; Yuzurihara, Hiroshi; Fujita, Kei; Kamei, Seiji; Akino, Yutaka; Yuge, Yutaka; Shimotsusa, Mineo; and Kuwabara, Hideshi, 5,569,614, Cl. 437-39.000.
- Zaghloul, Hatim: *See—*  
Fattouche, Michel; and Zaghloul, Hatim, 5,570,305, Cl. 364-715.020.
- Zanger, Peter K.: *See—*  
Nunnally, Stephen C.; Pierce, Perry A.; and Zanger, Peter K., 5,570,280, Cl. 364-140.000.
- Zanier, Nathalie: *See—*  
Cansell, François; Hotier, Gérard; Marteau, Philippe; and Zanier, Nathalie, 5,569,808, Cl. 585-800.000.
- Zasio, John J.: *See—*  
Montoye, Robert K.; and Zasio, John J., 5,570,036, Cl. 326-16.000.
- Zaxis Inc.: *See—*  
Leffler, Charles E.; and Bambeck, Gregory S., 5,569,369, Cl. 204-620.000.
- Zebco Division of Brunswick Corporation: *See—*  
Forslund, Robert L., 5,568,787, Cl. 116-307.000.
- Zehler, Eugene R.: *See—*  
Barnhorst, Jeff A.; Garst, Roger H.; Gordon, Ronald H.; and Zehler, Eugene R., 5,569,406, Cl. 508-431.000.
- Zeneca Limited: *See—*  
Barker, Andrew J., 5,569,658, Cl. 514-250.000.  
LeRette, Raymond J., 5,569,813, Cl. 800-200.000.  
Metz, Grant L., 5,569,826, Cl. 800-200.000.  
Stelpflug, Richard G.; and Messmer, Mark J., 5,569,820, Cl. 800-200.000.
- Zenith Data Systems Corporation: *See—*  
Belt, Steven; Schindler, Jeffrey; and Stobert, Norman, 5,569,052, Cl. 439-638.000.
- Zenith Electronics Corporation: *See—*  
Bestler, Caitlin B.; and Rabii, Khosro M., 5,570,347, Cl. 370-17.000.
- Zerillo, Samuel D.: *See—*  
Wolfe, David; and Zerillo, Samuel D., 5,568,768, Cl. 101-425.000.
- Zetts, John M., to International Business Machines Corporation. Computer based pen system and method for automatically cancelling unwanted gestures and preventing anomalous signals as inputs to such system. 5,570,113, Cl. 345-173.000.
- Zhang, Hongyong; Takayama, Toru; and Takemura, Yasuhiko, to Semiconductor Energy Laboratory Co., Ltd. Method of manufacturing multiple polysilicon TFTs with varying degrees of crystallinity. 5,569,610, Cl. 437-21.000.
- Zhang, Hongyong; Uochi, Hideki; Takayama, Toru; Takemura, Yasuhiko; and Yamamoto, Mutsuo, to Semiconductor Energy Laboratory Co., Ltd. Semiconductor device employing crystallization catalyst. 5,569,936, Cl. 257-66.000.
- Zhang, Zhe: *See—*  
Cuk, Slobodan; and Zhang, Zhe, 5,570,276, Cl. 363-16.000.
- Zhao, Jian H.: *See—*  
Koscica, Thomas E.; and Zhao, Jian H., 5,569,943, Cl. 257-192.000.
- Zhao, Xiaolei: *See—*  
Purser, Kenneth H.; Kilus, Linas R.; Litherland, Albert E.; Rucklidge, John C.; and Zhao, Xiaolei, 5,569,915, Cl. 250-281.000.
- Zheng, Wenxin; and Ström, Joakim, to Telefoanaktiebolaget LM Ericsson. Alignment and control in splicing optical fibers. 5,570,446, Cl. 385-98.000.
- Ziegler, Georg, to ABB Management AG. Steam generator. 5,568,793, Cl. 122-460.000.
- Zielinski, Stanley J. Door assembly for shielded room. 5,569,878, Cl. 174-35.00R.
- Zimmer, Christopher P.: *See—*  
Cave, Ellis K.; Ammann, Larry P.; and Zimmer, Christopher P., 5,570,419, Cl. 379-216.000.
- Zimmerman, Steven M., to International Business Machines Corporation. Integrated microelectronic device. 5,569,973, Cl. 313-309.000.
- Zimmerman, Yotam: *See—*  
Levy, Uri; Braude, Ofer; Rozenberg, Ytzhak; and Zimmerman, Yotam, 5,568,859, Cl. 200-43.010.
- Zimmermann, Andreas, to U.S. Philips Corporation. Switching device with a feeding circuit for DC power supply to a subscriber's terminal unit. 5,570,003, Cl. 323-284.000.
- Zimmermann, Klaus: *See—*  
Maier, Hanspeter; and Zimmermann, Klaus, 5,569,479, Cl. 426-453.000.
- Zodrow, Rudolf, to KHS ETI-TEC Maschinenbau GmbH. Labelling machine and apparatus for the automatic loading of the main magazine of a labelling machine, and a supply magazine which can be used in such an apparatus. 5,569,353, Cl. 156-566.000.
- Zorian, Yervant: *See—*  
Yau, Chi W.; and Zorian, Yervant, 5,570,374, Cl. 371-22.500.
- 3D Systems, Inc.: *See—*  
Almqvist, Thomas A.; and Smalley, Dennis R., 5,569,349, Cl. 156-242.000.
- Hull, Charles W., 5,569,431, Cl. 264-401.000.

## LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 29th DAY OF OCTOBER, 1996

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Arvidson, Lawrence C.; and Horeck, Robert S., to Hypro Corporation. Apparatus and method for controlling the introduction of chemical foamant into a water stream in fire-fighting equipment. Re. 35,362, Cl. 169-13.000.
- Chamberlain Group, Inc., The: *See—*  
Heitschel, Carl; Willmott, Colin; and Schindler, Wayne, Re. 35,364, Cl. 364-400.000.
- Charlot, Lincoln H., Jr.: *See—*  
Hogan, Dennis L.; Lynch, John L.; and Charlot, Lincoln H., Jr., Re. 35,361, Cl. 24-704.100.
- Colavin, Osvaldo, to SGS-Thomson Microelectronics S.A. Squaring circuit for binary numbers. Re. 35,365, Cl. 364-753.000.
- Garcia, Rod A.: *See—*  
Mooney, Gerry; Garcia, Rod A.; Tarquini, Michael E.; and Kosin, John A., Re. 35,368, Cl. 521-88.000.
- Hall, David B., to Litton Systems, Inc. Apparatus and method for optical signal source stabilization. Re. 35,366, Cl. 385-15.000.
- Heitschel, Carl; Willmott, Colin; and Schindler, Wayne, to Chamberlain Group, Inc., The. Coding system for multiple transmitters and a single receiver for a garage door opener. Re. 35,364, Cl. 364-400.000.
- Hogan, Dennis L.; Lynch, John L.; and Charlot, Lincoln H., Jr., to Security Tag Systems, Inc. Expulsion of detrimental substance from theft-deterrent device. Re. 35,361, Cl. 24-704.100.
- Horeck, Robert S.: *See—*  
Arvidson, Lawrence C.; and Horeck, Robert S., Re. 35,362, Cl. 169-13.000.
- Hypro Corporation: *See—*  
Arvidson, Lawrence C.; and Horeck, Robert S., Re. 35,362, Cl. 169-13.000.
- J. M. Huber Corporation: *See—*  
Mooney, Gerry; Garcia, Rod A.; Tarquini, Michael E.; and Kosin, John A., Re. 35,368, Cl. 521-88.000.
- Kosin, John A.: *See—*  
Mooney, Gerry; Garcia, Rod A.; Tarquini, Michael E.; and Kosin, John A., Re. 35,368, Cl. 521-88.000.
- Litton Systems, Inc.: *See—*  
Hall, David B., Re. 35,366, Cl. 385-15.000.
- Lynch, John L.: *See—*  
Hogan, Dennis L.; Lynch, John L.; and Charlot, Lincoln H., Jr., Re. 35,361, Cl. 24-704.100.
- Mooney, Gerry; Garcia, Rod A.; Tarquini, Michael E.; and Kosin, John A., to J. M. Huber Corporation. Endothermic blowing agents for surface migration of components in foamed products, compositions and applications. Re. 35,368, Cl. 521-88.000.
- Nagase, Fumio, to TEAC Corporation. Disk drive apparatus having a spindle permitting a thinner disk drive. Re. 35,363, Cl. 360-99.080.
- Schindler, Wayne: *See—*  
Heitschel, Carl; Willmott, Colin; and Schindler, Wayne, Re. 35,364, Cl. 364-400.000.
- Security Tag Systems, Inc.: *See—*  
Hogan, Dennis L.; Lynch, John L.; and Charlot, Lincoln H., Jr., Re. 35,361, Cl. 24-704.100.
- SGS-Thomson Microelectronics S.A.: *See—*  
Colavin, Osvaldo, Re. 35,365, Cl. 364-753.000.
- Shoher, Itzhak; and Whiteman, Aharon. Material for reinforcing dental structures. Re. 35,367, Cl. 428-212.000.
- Tarquini, Michael E.: *See—*  
Mooney, Gerry; Garcia, Rod A.; Tarquini, Michael E.; and Kosin, John A., Re. 35,368, Cl. 521-88.000.
- TEAC Corporation: *See—*  
Nagase, Fumio, Re. 35,363, Cl. 360-99.080.
- Whiteman, Aharon: *See—*  
Shoher, Itzhak; and Whiteman, Aharon, Re. 35,367, Cl. 428-212.000.
- Willmott, Colin: *See—*  
Heitschel, Carl; Willmott, Colin; and Schindler, Wayne, Re. 35,364, Cl. 364-400.000.

## LIST OF REEXAMINATION PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

- Anderson, Charles B.; and Kenrick, Charles R., to Builder's Pride, Inc. Dryer duct and vent assembly including a flexible duct portions. B1 5,121,948, Cl. 285-168.000.
- Bankers Trust Company: *See—*  
Lemelson, Jerome H., B1 4,831,230, Cl. 219-121.120.
- Builder's Pride, Inc.: *See—*  
Anderson, Charles B.; and Kenrick, Charles R., B1 5,121,948, Cl. 285-168.000.
- Causton, Robert J.: *See—*  
James, William B.; Causton, Robert J.; and Fulmer, John J., B1 5,080,712, Cl. 75-229.000.
- Children's Hospital Medical Center: *See—*  
Clark, Leland C., Jr., B1 3,911,138, Cl. 514-746.000.
- Chronology Corporation: *See—*  
Lewis, Lawrence E.; and Meredith, Michael S., B1 5,381,524, Cl. 395-161.000.
- Clark, Leland C., Jr., to Children's Hospital Medical Center. Artificial blood and method for supporting oxygen transport in animals. B1 3,911,138, Cl. 514-746.000.
- Cogswell, Frederic N.; Hezzell, David J.; and Williams, Peter J., to Kawasaki Chemical Holding Co., Inc. Fibre-reinforced compositions and methods for producing such compositions. B1 5,213,889, Cl. 428-332.000.
- Dabbs, John W. T.: *See—*  
Gibson, William A.; Talmage, John E., Jr.; and Dabbs, John W. T., B1 4,731,508, Cl. 178-18.000.
- Elographics, Inc.: *See—*  
Gibson, William A.; Talmage, John E., Jr.; and Dabbs, John W. T., B1 4,731,508, Cl. 178-18.000.
- Ernst, James; Williamson, Steven; Rogers, George; and Musto, Dominick, to Symtron Systems, Inc. Fire fighting trainer. B1 4,861,270, Cl. 434-226.000.
- Fuji Kogyo Kabushiki Kaisha: *See—*  
Nakajima, Junichi, B1 4,691,750, Cl. 144-208.900.
- Fulmer, John J.: *See—*  
James, William B.; Causton, Robert J.; and Fulmer, John J., B1 5,080,712, Cl. 75-229.000.
- Gelblum, Eugene A.: *See—*  
Reilly, David M.; Havrilla, Joseph B.; Gelblum, Eugene A.; and Kazousky, Daniel, B1 5,383,858, Cl. 604-152.000.
- Gibson, William A.; Talmage, John E., Jr.; and Dabbs, John W. T., to Elographics, Inc. Electrographic tough sensor having reduced bow of equipotential field line therein. B1 4,731,508, Cl. 178-18.000.
- Gogswill, Frederic N.; Hezzell, David J.; and Williams, Peter J., to Imperial Chemical Industries Plc, Millbank. Fibre reinforced compositions and methods for producing such compositions. B1 5,019,450, Cl. 428-402.000.
- Havrilla, Joseph B.: *See—*  
Reilly, David M.; Havrilla, Joseph B.; Gelblum, Eugene A.; and Kazousky, Daniel, B1 5,383,858, Cl. 604-152.000.
- Hewlett-Packard Company: *See—*  
Hickman, Mark S., B1 4,963,882, Cl. 347-41.000.
- Hezzell, David J.: *See—*  
Cogswell, Frederic N.; Hezzell, David J.; and Williams, Peter J., B1 5,213,889, Cl. 428-332.000.  
Gogswill, Frederic N.; Hezzell, David J.; and Williams, Peter J., B1 5,019,450, Cl. 428-402.000.
- Hickman, Mark S., to Hewlett-Packard Company. Printing of pixel locations by an ink jet printer using multiple nozzles for each pixel or pixel row. B1 4,963,882, Cl. 347-41.000.
- Hoeganaes Corporation: *See—*  
James, William B.; Causton, Robert J.; and Fulmer, John J., B1 5,080,712, Cl. 75-229.000.
- Imperial Chemical Industries Plc, Millbank: *See—*  
Gogswill, Frederic N.; Hezzell, David J.; and Williams, Peter J., B1 5,019,450, Cl. 428-402.000.
- Intermedics, Inc.: *See—*  
Pless, Benjamin D.; and Sweeney, Michael B., B1 4,880,005, Cl. 607-15.000.
- James, William B.; Causton, Robert J.; and Fulmer, John J., to Hoeganaes Corporation. Optimized double press-double sinter powder metallurgy method. B1 5,080,712, Cl. 75-229.000.
- Kawasaki Chemical Holding Co., Inc.: *See—*



- Cogswell, Frederic N.; Hezzell, David J.; and Williams, Peter J., B1 5,213,889, Cl. 428-332.000.  
 Kazousky, Daniel: See—  
 Reilly, David M.; Havrilla, Joseph B.; Gelblum, Eugene A.; and Kazousky, Daniel, B1 5,383,858, Cl. 604-152.000.  
 Kenrick, Charles R.: See—  
 Anderson, Charles B.; and Kenrick, Charles R., B1 5,121,948, Cl. 285-168.000.  
 Lemelson, Jerome H., to Bankers Trust Company, Surface shaping and finishing apparatus and method, B1 4,831,230, Cl. 219-121.120.  
 Lemelson, Jerome H., Surface shaping and finishing apparatus and method, B1 5,064,989, Cl. 219-121.120.  
 Lewis, Lawrence E.; and Meredith, Michael S., to Chronology Corporation, Automated development of timing diagrams for electrical circuits, B1 5,381,524, Cl. 395-161.000.  
 Medrad, Inc.: See—  
 Reilly, David M.; Havrilla, Joseph B.; Gelblum, Eugene A.; and Kazousky, Daniel, B1 5,383,858, Cl. 604-152.000.  
 Meredith, Michael S.: See—  
 Lewis, Lawrence E.; and Meredith, Michael S., B1 5,381,524, Cl. 395-161.000.  
 Musto, Dominick: See—  
 Ernst, James; Williamson, Steven; Rogers, George; and Musto, Dominick, B1 4,861,270, Cl. 434-226.000.  
 Nakajima, Junichi, to Fuji Kogyo Kabushiki Kaisha, Barking machine, B1 4,691,750, Cl. 144-208.900.  
 Pless, Benjamin D.; and Sweeney, Michael B., to Intermedics, Inc. Pacemaker for detecting and terminating a tachycardia, B1 4,880,005, Cl. 607-15.000.  
 Reilly, David M.; Havrilla, Joseph B.; Gelblum, Eugene A.; and Kazousky, Daniel, to Medrad, Inc. Front-loading medical injector and syringe for use therewith, B1 5,383,858, Cl. 604-152.000.  
 Rogers, George: See—  
 Ernst, James; Williamson, Steven; Rogers, George; and Musto, Dominick, B1 4,861,270, Cl. 434-226.000.  
 Sweeney, Michael B.: See—  
 Pless, Benjamin D.; and Sweeney, Michael B., B1 4,880,005, Cl. 607-15.000.  
 Symtron Systems, Inc.: See—  
 Ernst, James; Williamson, Steven; Rogers, George; and Musto, Dominick, B1 4,861,270, Cl. 434-226.000.  
 Talmage, John E., Jr.: See—  
 Gibson, William A.; Talmage, John E., Jr.; and Dabbs, John W. T., B1 4,731,508, Cl. 178-18.000.  
 Williams, Peter J.: See—  
 Cogswell, Frederic N.; Hezzell, David J.; and Williams, Peter J., B1 5,213,889, Cl. 428-332.000.  
 Gogswill, Frederic N.; Hezzell, David J.; and Williams, Peter J., B1 5,019,450, Cl. 428-402.000.  
 Williamson, Steven: See—  
 Ernst, James; Williamson, Steven; Rogers, George; and Musto, Dominick, B1 4,861,270, Cl. 434-226.000.

## LIST OF DESIGN PATENTEES

- Adams, James D.: See—  
 Rose, Deborah H.; Adams, James D.; and Thole, Steven, 375,170, Cl. D25-59.000.  
 Airborne International Marketing Inc.: See—  
 Bronstein, Gary D., 375,067, Cl. D12-169.000.  
 Albatros System S.p.A.: See—  
 Andronico, Federico, 375,151, Cl. D23-277.000.  
 Amerine, Marilyn R.: See—  
 Moffitt, Clifford A.; and Amerine, Marilyn R., 375,171, Cl. D25-67.000.  
 Anderson, James L., Pond filter, 375,138, Cl. D23-210.000.  
 Anderson, Todd A.; and Heim, Eric P., to Truth Hardware Corporation, Outer surface of an operator housing, 375,042, Cl. D8-400.000.  
 Andronico, Federico, to Albatros System S.p.A. Bathtubs, 375,151, Cl. D23-277.000.  
 Angel, Donald E.: See—  
 Lambert, Brooks H.; Haff, Michael W.; and Angel, Donald E., 375,090, Cl. D14-121.000.  
 Aristo Graphic Systeme GmbH & Co. KG: See—  
 Cordes, Werner; and Falkenberg, Rolf, 375,087, Cl. D14-114.000.  
 Armstrong World Industries, Inc.: See—  
 Rose, Deborah H.; Adams, James D.; and Thole, Steven, 375,170, Cl. D25-59.000.  
 Asahi Kogaku Kogyo Kabushiki Kaisha: See—  
 Matsuda, Takashi; and Koinuma, Masahiro, 375,106, Cl. D16-133.000.  
 AT&T Global Information Solutions Company: See—  
 Kellar, Kevin P.; and Lin, Horng-Jaan, 375,085, Cl. D14-105.000.  
 Austin, Jerrold N.: See—  
 David, Thomas J.; Labarre, Ernest D.; and Austin, Jerrold N., 375,036, Cl. D8-303.000.  
 Babbitt, Eric K.; and Cuccio, John, to TIE Communications Research Inc. Telephone, 375,093, Cl. D14-151.000.  
 Barrash, Marshall; and Credle, William, Jr., to Coca-Cola Company, The, Collapsible bottle, 375,048, Cl. D9-525.000.  
 Barrault, Jean-Louis, to Moulinex S.A. Electric toaster, 375,017, Cl. D7-330.000.  
 Bartlett, Galvin; Leonhardt, Michael P.; Clark, W. James; and Macey, Stephen, Ellipsoidal vertical jet mound, 375,165, Cl. D24-204.000.  
 Barton, David C., Ski pole cocktail pick, 375,025, Cl. D7-684.000.  
 Bartsch, Carola: See—  
 Milani, Francesco; and Bartsch, Carola, 375,158, Cl. D24-110.000.  
 Bell Helicopter Textron Inc.: See—  
 Taylor, Rodney S.; and Joiner, Walter C., 375,077, Cl. D12-327.000.  
 Bhamra, Ajit S., to Bhamra Chain Manufacturing Corp. Jewelry chain, 375,059, Cl. D11-15.000.  
 Bhamra Chain Manufacturing Corp.: See—  
 Bhamra, Ajit S., 375,059, Cl. D11-15.000.  
 Biasotti, Mark; Lewis, Charles R., Jr.; Nuttall, Michael J.; Schaffeld, John H.; and Sosa, Jose A., to Lucent Technologies Inc. Pager, 375,043, Cl. D14-191.000.  
 Boden, Brian G.: See—  
 Willard, Lonnie; Boden, Brian G.; and Hajinlian, Harry, 375,044, Cl. D9-433.000.  
 Boteler, William C.: See—  
 Sandor, John L.; and Boteler, William C., 375,080, Cl. D13-141.000.  
 Sandor, John L.; and Boteler, William C., 375,081, Cl. D13-143.000.  
 Bowser, David G., Sandpaper and fibrous material cutter, 375,034, Cl. D8-98.000.  
 Braun AG: See—  
 Ullmann, Roland, 375,016, Cl. D7-319.000.  
 Bronstein, Gary D., to Airborne International Marketing Inc. Combined bumper and winch carrier, 375,067, Cl. D12-169.000.  
 Brooker, Steven F.: See—  
 Spear, Kenneth J.; Czerwinski, Frank G.; and Brooker, Steven F., 375,027, Cl. D8-10.000.  
 Brucki, Alex, Belt bag, 374,983, Cl. D3-226.000.  
 Bruno, Robert H.: See—  
 McBride, John K.; Bruno, Robert H.; and Dziarski, Mark D., 375,110, Cl. D16-209.000.  
 Bryant, David E.: See—  
 Hillenmayer, Stefan; Skrypalle, Ulrich; McKinnon, Wayne E.; Bryant, David E.; Kingsbury, Mary E.; Elkins, Erich C.; and Erwin, Doug A., 375,095, Cl. D14-151.000.  
 Burdick, Bruce; Burdick, Susan K.; Imani, Cameron; and Chow, Johnson, to Burdick Group, Inc., The, Chair, 374,992, Cl. D6-334.000.  
 Burdick Group, Inc., The: See—  
 Burdick, Bruce; Burdick, Susan K.; Imani, Cameron; and Chow, Johnson, 374,992, Cl. D6-334.000.  
 Burdick, Susan K.: See—  
 Burdick, Bruce; Burdick, Susan K.; Imani, Cameron; and Chow, Johnson, 374,992, Cl. D6-334.000.  
 Bussard, Harry, Spinner fishing lure, 375,137, Cl. D22-129.000.  
 Button Fronts (London) Limited: See—  
 Loader, Gerald R., 374,994, Cl. D6-359.000.  
 Candela, François, Anti-skid heel attachment, 374,974, Cl. D2-962.000.  
 Canon Business Machines, Inc.: See—  
 Chiba, Toshimi, 375,116, Cl. D18-1.000.  
 Canon Kabushiki Kaisha: See—  
 Kotaki, Yasuo; Hamasaki, Yuji; Saikawa, Hideo; Tokuda, Hiroyuki; Kawashima, Shosaku; Takenouchi, Masanori; Sato, Osamu; Yamamoto, Hisashi; Hinami, Jun; and Sasaki, Toshiaki, 375,120, Cl. D18-56.000.  
 Capotosto, David A.: See—  
 Gelardi, Paul J.; Gelardi, John A.; and Capotosto, David A., 375,089, Cl. D14-121.000.  
 Carroll, Lewis J., Bracket for cleat cleaning brush, 375,039, Cl. D8-354.000.  
 Casio Computer Co., Ltd.: See—  
 Tomita, Akemi, 375,054, Cl. D10-38.000.  
 Cattaneo, Marco, to MOMO S.P.A. Spoked wheel for motorvehicles, 375,076, Cl. D12-211.000.  
 Chahed, Khaled, to Parfums Jean-Jacques Vivier, Combined perfume bottle and closure, 375,050, Cl. D9-553.000.  
 Champagne, Dean J., to Variety Foods Inc. Dinosaur shaped food product, 374,967, Cl. D1-110.000.  
 Chan, Raymond W. M., to Jing Mei Industrial Limited, Wall mount shower head with a push button, 375,140, Cl. D23-213.000.  
 Chavez, Guillermo; and Guerra, Sergio, Tie strap, 375,041, Cl. D8-394.000.  
 Cheiky, Michael C., to Dreisbach Electromotive, Inc. Car body, 375,062, Cl. D12-91.000.  
 Chernoff, Ryan J., Toy ball, 375,128, Cl. D21-204.000.  
 Chiba, Toshimi, to Canon Business Machines, Inc. Electronic typewriter having a display screen, 375,116, Cl. D18-1.000.  
 Chicony Electronics Co., Ltd.: See—  
 Tsai, Ching-Cheng, 375,088, Cl. D14-115.000.  
 Chiou, Ming L., License plate frame, 375,072, Cl. D12-193.000.

- Chow, Johnson: See—  
 Burdick, Bruce; Burdick, Susan K.; Imani, Cameron; and Chow, Johnson, 374,992, Cl. D6-334.000.  
 Chrysler Corporation: See—  
 Kugler, Erich O., 375,075, Cl. D12-209.000.  
 Citadel Innovations Inc.: See—  
 Radke, George F., 375,155, Cl. D23-344.000.  
 Clark, W. James: See—  
 Bartlett, Galvin; Leonhardt, Michael P.; Clark, W. James; and Macey, Stephen, 375,165, Cl. D24-204.000.  
 Cobb, Russell L., Portable vehicle shelter, 375,078, Cl. D12-401.000.  
 Coca-Cola Company, The: See—  
 Barrash, Marshall; and Credle, William, Jr., 375,048, Cl. D9-525.000.  
 Cohen, Milton L.; and Siegel, Jeff, to Lifetime Hoan Corporation, Rotatable kitchen tool rack, 375,023, Cl. D7-641.000.  
 Communications Technology Corporation: See—  
 Messelhi, Selim, 375,082, Cl. D13-152.000.  
 Cone, Richard E., to Cosco, Inc. Chair base, 375,008, Cl. D6-495.000.  
 Connally, Becki B., Slip cover for sleeping mats, 375,014, Cl. D6-610.000.  
 Cook, Kim M., Shoulder strap for securing a purse, 374,977, Cl. D3-215.000.  
 Cordes, Werner; and Falkenberg, Rolf, to Aristo Graphic Systeme GmbH & Co. KG, Combined personal computer mouse and digitizing stylus device for use with a drawing board accessory, 375,087, Cl. D14-114.000.  
 Cosco, Inc.: See—  
 Cone, Richard E., 375,008, Cl. D6-495.000.  
 Cothorn, Leslie R., Holder for food smoking materials, 375,020, Cl. D7-402.000.  
 Cottone, James F., Heavy duty clamp for computer paper margin stripper, 375,031, Cl. D8-72.000.  
 Cottone, James F., Unified footpiece clamp for computer paper margin stripper, 375,032, Cl. D8-72.000.  
 Credle, William, Jr.: See—  
 Barrash, Marshall; and Credle, William, Jr., 375,048, Cl. D9-525.000.  
 Cuccio, John: See—  
 Babbitt, Eric K.; and Cuccio, John, 375,093, Cl. D14-151.000.  
 Czerwinski, Frank G.: See—  
 Spear, Kenneth J.; Czerwinski, Frank G.; and Brooker, Steven F., 375,027, Cl. D8-10.000.  
 Dages, Claude, Golf club carrier, 374,986, Cl. D3-259.000.  
 Daicos, Peter S., Training football, 375,129, Cl. D21-204.000.  
 D'Arby, Terence T., Guitar body, 375,113, Cl. D17-20.000.  
 Darley, Peter F., Control panel for a fire truck, 375,071, Cl. D12-192.000.  
 David, Thomas J.; Labarre, Ernest D.; and Austin, Jerrold N., to Fiskars Inc., Handle grip, 375,036, Cl. D8-303.000.  
 DeHimer, William S., Throttle body, 375,102, Cl. D15-5.000.  
 De Zen, Vittorio, to Royal Building Systems (CDN) Limited, Facia gable extrusion for a building structure, 375,173, Cl. D25-124.000.  
 DiGiorgio, Tony, to Dominion Plastics Inc. Slider window transom element, 375,172, Cl. D25-122.000.  
 DiGiorgio, Tony, to Dominion Plastics Inc. Window mullion, 375,174, Cl. D25-124.000.  
 DiGiorgio, Tony, to Dominion Plastics Inc. Window locking element, 375,175, Cl. D25-124.000.  
 DiGiorgio, Tony, to Dominion Plastics Inc. Horizontal slider stile, 375,176, Cl. D25-124.000.  
 Dominion Plastics Inc.: See—  
 DiGiorgio, Tony, 375,172, Cl. D25-122.000.  
 DiGiorgio, Tony, 375,174, Cl. D25-124.000.  
 DiGiorgio, Tony, 375,175, Cl. D25-124.000.  
 DiGiorgio, Tony, 375,176, Cl. D25-124.000.  
 Doughty, Frederic C.; and Mark, Darren M., to Emhart Inc. Faucet, 375,142, Cl. D23-241.000.  
 Doughty, Frederic C.; and Mark, Darren M., to Emhart Inc. Faucet, 375,143, Cl. D23-243.000.  
 Doughty, Frederic C.; and Mark, Darren M., to Emhart Inc. Faucet body, 375,144, Cl. D23-243.000.  
 Doughty, Frederic C.; and Mark, Darren M., to Emhart Inc. Faucet, 375,145, Cl. D23-243.000.  
 Doughty, Frederic C.; and Mark, Darren M., to Emhart Inc. Faucet, 375,146, Cl. D23-243.000.  
 Doughty, Frederic C.; and Mark, Darren M., to Emhart Inc. Faucet, 375,147, Cl. D23-243.000.  
 Draegerwerk AG: See—  
 Milani, Francesco; and Bartsch, Carola, 375,158, Cl. D24-110.000.  
 Dreisbach Electromotive, Inc.: See—  
 Cheiky, Michael C., 375,062, Cl. D12-91.000.  
 Duvernay, Mark E.; Mater, Robert F., Jr.; and Mellow, James L., to Reese Products, Inc. Hitch ball, 375,065, Cl. D12-162.000.  
 DX Plastic AB: See—  
 Johansson, Lars-Gunnar, 375,159, Cl. D24-112.000.  
 Dziarski, Mark D.: See—  
 McBride, John K.; Bruno, Robert H.; and Dziarski, Mark D., 375,110, Cl. D16-209.000.  
 Eastman Kodak Company: See—  
 McBride, John K.; Bruno, Robert H.; and Dziarski, Mark D., 375,110, Cl. D16-209.000.  
 Edwards, Shane, Roof tiler's hammer, 375,033, Cl. D8-75.000.  
 Elkins, Erich C.: See—  
 Hillenmayer, Stefan; Skrypalle, Ulrich; McKinnon, Wayne E.; Bryant, David E.; Kingsbury, Mary E.; Elkins, Erich C.; and Erwin, Doug A., 375,095, Cl. D14-151.000.  
 Emhart Inc.: See—  
 Doughty, Frederic C.; and Mark, Darren M., 375,142, Cl. D23-241.000.  
 Doughty, Frederic C.; and Mark, Darren M., 375,143, Cl. D23-243.000.  
 Doughty, Frederic C.; and Mark, Darren M., 375,144, Cl. D23-243.000.  
 Doughty, Frederic C.; and Mark, Darren M., 375,145, Cl. D23-243.000.  
 Doughty, Frederic C.; and Mark, Darren M., 375,146, Cl. D23-243.000.  
 Doughty, Frederic C.; and Mark, Darren M., 375,147, Cl. D23-243.000.  
 Emoto, Seiji, to Isuzu Motors Limited, Vehicle seat, 374,993, Cl. D6-356.000.  
 Enhance Cable Technology: See—  
 Lambert, Brooks H.; Haff, Michael W.; and Angel, Donald E., 375,090, Cl. D14-121.000.  
 Equip For Independence, Inc.: See—  
 Lipson, Walda B.; and Yurdin, Carl, 375,163, Cl. D24-183.000.  
 Erickson, Kenneth D., to Team Vision, Inc. Cube stand, 375,007, Cl. D6-495.000.  
 Erwin, Doug A.: See—  
 Hillenmayer, Stefan; Skrypalle, Ulrich; McKinnon, Wayne E.; Bryant, David E.; Kingsbury, Mary E.; Elkins, Erich C.; and Erwin, Doug A., 375,095, Cl. D14-151.000.  
 Excellente, Richard, Electric guitar body, 375,114, Cl. D17-20.000.  
 Falkenberg, Rolf: See—  
 Cordes, Werner; and Falkenberg, Rolf, 375,087, Cl. D14-114.000.  
 Feliciano, Epifania: See—  
 Vargas, Mayra; and Feliciano, Epifania, 374,975, Cl. D3-202.000.  
 Ferdi, Allan W., Apparel attached eyeglasses holder, 374,978, Cl. D3-215.000.  
 Fiskars Inc.: See—  
 David, Thomas J.; Labarre, Ernest D.; and Austin, Jerrold N., 375,036, Cl. D8-303.000.  
 Franck, Guenter, to Osram GmbH, Reflector-type fluorescent lamp, 375,177, Cl. D26-3.000.  
 Friedlander, Uri: See—  
 Sewell, Peter J.; and Friedlander, Uri, 375,056, Cl. D10-96.000.  
 Fur Reel, Inc.: See—  
 Hamilton, Joseph A., 374,982, Cl. D3-221.000.  
 Gelardi, John A.: See—  
 Gelardi, Paul J.; Gelardi, John A.; and Capotosto, David A., 375,089, Cl. D14-121.000.  
 Gelardi, Paul J.; Gelardi, John A.; and Capotosto, David A., to LCV Associates, Video cassette, 375,089, Cl. D14-121.000.  
 General Mills, Inc.: See—  
 Gluszak, Timothy J.; and Zimmerman, Craig E., 374,969, Cl. D1-125.000.  
 Geotek Communications, Inc.: See—  
 Hilsenrath, Oliver; Moon, John; and Opet, William A., 375,092, Cl. D14-142.000.  
 Gerhart, Mark D.: See—  
 Lathrop, Gregory A.; Gerhart, Mark D.; Gnadt, David F.; Markey, Kevin J.; Gonda, Frank E.; and Laubach, David S., 375,051, Cl. D9-558.000.  
 Lathrop, Gregory A.; Gerhart, Mark D.; Gnadt, David F.; Markey, Kevin J.; Gonda, Frank E.; and Laubach, David S., 375,052, Cl. D9-558.000.  
 Gilbert, Karen A., Stethoscope cover, 375,162, Cl. D24-134.000.  
 Gluszak, Timothy J.; and Zimmerman, Craig E., to General Mills, Inc. Combined food product and support board therefor, 374,969, Cl. D1-125.000.  
 Gnadt, David F.: See—  
 Lathrop, Gregory A.; Gerhart, Mark D.; Gnadt, David F.; Markey, Kevin J.; Gonda, Frank E.; and Laubach, David S., 375,051, Cl. D9-558.000.  
 Lathrop, Gregory A.; Gerhart, Mark D.; Gnadt, David F.; Markey, Kevin J.; Gonda, Frank E.; and Laubach, David S., 375,052, Cl. D9-558.000.  
 Gonda, Frank E.: See—  
 Lathrop, Gregory A.; Gerhart, Mark D.; Gnadt, David F.; Markey, Kevin J.; Gonda, Frank E.; and Laubach, David S., 375,051, Cl. D9-558.000.  
 Lathrop, Gregory A.; Gerhart, Mark D.; Gnadt, David F.; Markey, Kevin J.; Gonda, Frank E.; and Laubach, David S., 375,052, Cl. D9-558.000.  
 Goto, Toru; Ito, Seichi; Hatsumoto, Kunio; and Kato, Takashi, to Nippon Sanso Corporation, Cap for drink container, 375,018, Cl. D7-392.100.  
 Goto, Toru; Ito, Seichi; Hatsumoto, Kunio; and Murakami, Yasuhiro, to Nippon Sanso Corporation, Cap for drink container, 375,019, Cl. D7-392.100.  
 Goulding-Thompson, Bonnie L.; and Thompson, Michael, to Goulding-Thompson, Bonnie L. Massage tool, 375,166, Cl. D24-214.000.  
 Graham, Anna; and Hofgartner, Daniel, to Peter Anthony Design Ltd. Chair, 374,995, Cl. D6-380.000.  
 Gruters, Karen R.: See—  
 Gruters, Robert P.; and Gruters, Karen R., 374,973, Cl. D2-866.000.  
 Gruters, Robert P.; and Gruters, Karen R., Embellished feathered head band, 374,973, Cl. D2-866.000.  
 GSL Rechargeable Products, Ltd.: See—  
 Heun, Ping H., 375,057, Cl. D10-104.000.  
 Guerra, Sergio: See—  
 Chavez, Guillermo; and Guerra, Sergio, 375,041, Cl. D8-394.000.  
 Haff, Michael W.: See—  
 Lambert, Brooks H.; Haff, Michael W.; and Angel, Donald E., 375,090, Cl. D14-121.000.  
 Hainsworth, Mike J.; and Viner, Peter, to McPherson's Limited, Blade scabbard, 374,981, Cl. D3-220.000.  
 Hajinlian, Harry: See—  
 Willard, Lonnie; Boden, Brian G.; and Hajinlian, Harry, 375,044, Cl. D9-433.000.  
 Hakansson, Anette, to Handi Mate, Inc. Double corrugated cardboard table, 375,006, Cl. D6-484.000.



- Hamada, Mikio, to Kabushiki Kaisha Toshiba. Process monitoring controller. 375,084, Cl. D13-162.000.
- Hamasaki, Yuji: See—  
Kotaki, Yasuo; Hamasaki, Yuji; Saikawa, Hideo; Tokuda, Hiroyuki; Kawashima, Shosaku; Takenouchi, Masanori; Sato, Osamu; Yamamoto, Hisashi; Hinami, Jun; and Sasaki, Toshiaki, 375,120, Cl. D18-56.000.
- Hamilton, Joseph A., to Fur Reel, Inc. Fly caddy. 374,982, Cl. D3-221.000.
- Handi Mate, Inc.: See—  
Hakansson, Anette, 375,006, Cl. D6-484.000.
- Harata, Tomohiro, to Sony Corporation. Combined video tape recorder and camera. 375,108, Cl. D16-202.000.
- Hart, Patricia E., to Hart, Patricia E. Stethoscope diaphragm holder. 375,161, Cl. D24-134.000.
- Hartman, William M. Servo-controlled video camera. 375,109, Cl. D16-202.000.
- Hatsumoto, Kunio: See—  
Goto, Toru; Ito, Seiichi; Hatsumoto, Kunio; and Kato, Takashi, 375,018, Cl. D7-392.100.
- Goto, Toru; Ito, Seiichi; Hatsumoto, Kunio; and Murakami, Yasuhiro, 375,019, Cl. D7-392.100.
- Heim, Eric P.: See—  
Anderson, Todd A.; and Heim, Eric P., 375,042, Cl. D8-400.000.
- Hess, Clarence E.: See—  
Wasserman, Constance V.; and Hess, Clarence E., 375,164, Cl. D24-192.000.
- Heun, Ping H., to GSI Rechargeable Products, Ltd. Remote control transmitter for a dog training unit. 375,057, Cl. D10-104.000.
- Hewi Heinrich Wilke GmbH: See—  
Scholl, Winfried, 375,012, Cl. D6-574.000.
- Hillenmayer, Stefan; Skrypalle, Ulrich; McKinnon, Wayne E.; Bryant, David E.; Kingsbury, Mary E.; Elkins, Erich C.; and Erwin, Doug A., to Siemens Rohn Communications Inc. Telephone. 375,095, Cl. D14-151.000.
- Hillinger, George. Tool caddy. 374,988, Cl. D3-294.000.
- Hilsenrath, Oliver; Moon, John; and Opet, William A., to Geotek Communications, Inc. Mobile communications terminal. 375,092, Cl. D14-142.000.
- Hinami, Jun: See—  
Kotaki, Yasuo; Hamasaki, Yuji; Saikawa, Hideo; Tokuda, Hiroyuki; Kawashima, Shosaku; Takenouchi, Masanori; Sato, Osamu; Yamamoto, Hisashi; Hinami, Jun; and Sasaki, Toshiaki, 375,120, Cl. D18-56.000.
- Hlinka, Edward A.; Niswander, Dwight J.; Scheie, Carl E.; Schield, Edward A.; and Shenoh, James L., to Wilson Sporting Goods Co. Clubhead. 375,130, Cl. D21-214.000.
- Hofgartner, Daniel: See—  
Graham, Anna; and Hofgartner, Daniel, 374,995, Cl. D6-380.000.
- Hope Coppinger: See—  
Keohan, Richard, 375,117, Cl. D18-17.000.
- Hotz, Jean-Marie, to Tetra Laval Holdings and Finance S.A. Container spout. 375,046, Cl. D9-447.000.
- Hoyt, Valerie. Toiletary bag. 374,985, Cl. D3-246.000.
- Hubbell Incorporated: See—  
Sandor, John L.; and Boteler, William C., 375,080, Cl. D13-141.000.
- Sandor, John L.; and Boteler, William C., 375,081, Cl. D13-143.000.
- Hughes, Cheryl A., to Samsonite Corporation. Flight bag. 374,987, Cl. D3-279.000.
- Hunt, David L.; and Memke, David K., to Rubbermaid Specialty Products Inc. Shed. 375,168, Cl. D25-16.000.
- Hunt, David L.; and Memke, David K., to Rubbermaid Specialty Products Inc. Upright shed. 375,169, Cl. D25-16.000.
- Icenogle, Robert O. Outboard motor cavation plate. 375,101, Cl. D15-4.000.
- Ikenaga, Takashi, to Sony Corporation. Electronic game housing. 375,126, Cl. D21-13.000.
- Imani, Cameron: See—  
Burdick, Bruce; Burdick, Susan K.; Imani, Cameron; and Chow, Johnson, 374,992, Cl. D6-334.000.
- Ishii, Daisuke, to Sony Corporation. Combined video tape recorder and camera. 375,107, Cl. D16-202.000.
- Ishikawa, Kazumasa; and Kanda, Shigemi, to Ricoh Company, Ltd. Cleaning toner magazine. 375,118, Cl. D18-43.000.
- Isuzu Motors Limited: See—  
Emoto, Seiji, 374,993, Cl. D6-356.000.
- Ito, Seiichi: See—  
Goto, Toru; Ito, Seiichi; Hatsumoto, Kunio; and Kato, Takashi, 375,018, Cl. D7-392.100.
- Goto, Toru; Ito, Seiichi; Hatsumoto, Kunio; and Murakami, Yasuhiro, 375,019, Cl. D7-392.100.
- J. A. Henckels Zwillingswerk AG: See—  
Mangol, Petra, 375,035, Cl. D8-107.000.
- Jacuzzi, Remo, to Jason International, Inc. Bath tub. 375,152, Cl. D23-277.000.
- Jacuzzi, Remo, to Jason International, Inc. Bath tub. 375,153, Cl. D23-280.300.
- Jagger, Joyce V. Patient garment. 374,970, Cl. D2-720.000.
- Jannard, James H., to Oakley, Inc. Ear stems. 375,112, Cl. D16-335.000.
- Jason International, Inc.: See—  
Jacuzzi, Remo, 375,152, Cl. D23-277.000.
- Jacuzzi, Remo, 375,153, Cl. D23-280.300.
- Jing Mei Industrial Limited: See—  
Chan, Raymond W. M., 375,140, Cl. D23-213.000.
- Jivago, Ilana V. Fragrance bottle. 375,047, Cl. D9-521.000.
- Johansson, Lars-Gunnar, to DX Plastic AB. Saliva extractor tube. 375,159, Cl. D24-112.000.
- Joiner, Walter C.: See—  
Taylor, Rodney S.; and Joiner, Walter C., 375,077, Cl. D12-327.000.
- Josefsson, Anders. Table. 375,004, Cl. D6-477.000.
- Juki Corporation: See—  
Shibuya, Shoichi, 375,104, Cl. D15-69.000.
- K&K Kogyo Kabushiki Kaisha: See—  
Kato, Koji, 375,132, Cl. D21-238.000.
- Kabushiki Kaisha Toshiba: See—  
Hamada, Mikio, 375,084, Cl. D13-162.000.
- Kondo, Osamu, 375,086, Cl. D14-106.000.
- Kallista, Inc.: See—  
Robbins, Tom E., 375,149, Cl. D23-257.000.
- Kanda, Shigemi: See—  
Ishikawa, Kazumasa; and Kanda, Shigemi, 375,118, Cl. D18-43.000.
- Karnes, Harry. Disposable glove dispenser. 375,010, Cl. D6-515.000.
- Katdare, Ashok V.: See—  
Kramer, Kenneth A.; and Katdare, Ashok V., 375,157, Cl. D24-101.000.
- Kato, Koji, to K&K Kogyo Kabushiki Kaisha. Belt for ski competition. 375,132, Cl. D21-238.000.
- Kato, Takashi: See—  
Goto, Toru; Ito, Seiichi; Hatsumoto, Kunio; and Kato, Takashi, 375,018, Cl. D7-392.100.
- Kawada, Manabu, to Yamaha Corporation. Musical tone control apparatus. 375,115, Cl. D17-99.000.
- Kawashima, Shosaku: See—  
Kotaki, Yasuo; Hamasaki, Yuji; Saikawa, Hideo; Tokuda, Hiroyuki; Kawashima, Shosaku; Takenouchi, Masanori; Sato, Osamu; Yamamoto, Hisashi; Hinami, Jun; and Sasaki, Toshiaki, 375,120, Cl. D18-56.000.
- Kellar, Kevin P.; and Lin, Horng-Jaan, to AT&T Global Information Solutions Company. Price verifier. 375,085, Cl. D14-105.000.
- Keller, H. Thomas; and Risdon, Scott, to Vaughan Furniture Company, Inc. Chest on chest dresser with mirror. 374,999, Cl. D6-444.000.
- Keller, H. Thomas; and Risdon, Scott, to Vaughan Furniture Company, Inc. Armoire. 375,001, Cl. D6-445.000.
- Keller, Jerry A. Directional indicator for valves. 375,148, Cl. D23-249.000.
- Keohan, Richard, to Hope Coppinger. Ink stamp. 375,117, Cl. D18-17.000.
- Kho, Bee L., to Motorola, Inc. Selective call receiver. 375,099, Cl. D14-191.000.
- Kigawa, Naoyuki: See—  
Sone, Takahiro; and Kigawa, Naoyuki, 375,058, Cl. D10-116.000.
- Kingsbury, Mary E.: See—  
Hillenmayer, Stefan; Skrypalle, Ulrich; McKinnon, Wayne E.; Bryant, David E.; Kingsbury, Mary E.; Elkins, Erich C.; and Erwin, Doug A., 375,095, Cl. D14-151.000.
- Kitsuko Corporation: See—  
Toh, Tadamine, 375,094, Cl. D14-151.000.
- Ko, Steven. Interconnectable storage unit. 374,998, Cl. D6-440.000.
- Kobayashi, Shinkichi; and Sugimoto, Kazuyoshi, to Sony Computer Entertainment Inc. Case for an optical disc. 375,015, Cl. D6-632.000.
- Koinuma, Masahiro: See—  
Matsuda, Takashi; and Koinuma, Masahiro, 375,106, Cl. D16-133.000.
- Kondo, Osamu, to Kabushiki Kaisha Toshiba. Electronic computer. 375,086, Cl. D14-106.000.
- Kotaki, Yasuo; Hamasaki, Yuji; Saikawa, Hideo; Tokuda, Hiroyuki; Kawashima, Shosaku; Takenouchi, Masanori; Sato, Osamu; Yamamoto, Hisashi; Hinami, Jun; and Sasaki, Toshiaki, to Canon Kabushiki Kaisha. Ink tank for printer. 375,120, Cl. D18-56.000.
- Kovens, Michael L., to Universal Security Instruments, Inc. Radio communicator. 375,097, Cl. D14-159.000.
- Kramer, Kenneth A.; and Katdare, Ashok V., to Merck & Co., Inc. Tablet. 375,157, Cl. D24-101.000.
- Kubota Corporation: See—  
Masumoto, Masao; and Shimoie, Shizuo, 375,103, Cl. D15-25.000.
- Kugler, Erich O., to Chrysler Corporation. Vehicle wheel front face segment. 375,075, Cl. D12-209.000.
- Kuo, Wen-Jui. Ballpoint pen. 375,124, Cl. D19-50.000.
- Labarre, Ernest D.: See—  
David, Thomas J.; Labarre, Ernest D.; and Austin, Jerrold N., 375,036, Cl. D8-303.000.
- Lambert, Brooks H.; Haff, Michael W.; and Angel, Donald E., to Enhance Cable Technology. Video sound adaptor. 375,090, Cl. D14-121.000.
- LaPlante, Jimmy A., Sr. Golf club bag top. 374,989, Cl. D3-320.000.
- Lathrop, Gregory A.; Gerhart, Mark D.; Gnadt, David F.; Markey, Kevin J.; Gonda, Frank E.; and Laubach, David S., to Lever Brothers Company, Division of Conopco, Inc. Bottle. 375,051, Cl. D9-558.000.
- Lathrop, Gregory A.; Gerhart, Mark D.; Gnadt, David F.; Markey, Kevin J.; Gonda, Frank E.; and Laubach, David S., to Lever Brothers Company, Division of Conopco, Inc. Bottle. 375,052, Cl. D9-558.000.
- Laubach, David S.: See—  
Lathrop, Gregory A.; Gerhart, Mark D.; Gnadt, David F.; Markey, Kevin J.; Gonda, Frank E.; and Laubach, David S., 375,051, Cl. D9-558.000.
- Lathrop, Gregory A.; Gerhart, Mark D.; Gnadt, David F.; Markey, Kevin J.; Gonda, Frank E.; and Laubach, David S., 375,052, Cl. D9-558.000.
- LCV Associates: See—  
Gelardi, Paul J.; Gelardi, John A.; and Capotosto, David A., 375,089, Cl. D14-121.000.
- Lee, Wen-Shian. Towel rack support arm. 375,011, Cl. D6-550.000.

- Lenger, Sidney A., to Schottenstein Stores Corporation. Table. 374,997, Cl. D6-436.000.
- Lenger, Sidney A., to Schottenstein Stores Corporation. Cocktail table. 375,005, Cl. D6-480.000.
- Leonhardt, Michael P.: See—  
Bartlett, Galvin; Leonhardt, Michael P.; Clark, W. James; and Macey, Stephen, 375,165, Cl. D24-204.000.
- Lever Brothers Company, Division of Conopco, Inc.: See—  
Lathrop, Gregory A.; Gerhart, Mark D.; Gnadt, David F.; Markey, Kevin J.; Gonda, Frank E.; and Laubach, David S., 375,051, Cl. D9-558.000.
- Lathrop, Gregory A.; Gerhart, Mark D.; Gnadt, David F.; Markey, Kevin J.; Gonda, Frank E.; and Laubach, David S., 375,052, Cl. D9-558.000.
- Lewis, Charles R., Jr.: See—  
Biasotti, Mark; Lewis, Charles R., Jr.; Nuttall, Michael J.; Schaffeld, John H.; and Sosa, Jose A., 375,043, Cl. D14-191.000.
- Lexmark International, Inc.: See—  
Pangburn, Thomas E., 375,119, Cl. D18-50.000.
- Lifetime Hoan Corporation: See—  
Cohen, Milton L.; and Siegel, Jeff, 375,023, Cl. D7-641.000.
- Lin, Horng-Jaan: See—  
Kellar, Kevin P.; and Lin, Horng-Jaan, 375,085, Cl. D14-105.000.
- Lipson, Walda B.; and Yurdin, Carl, to Equip For Independence, Inc. Portable upper limb support. 375,163, Cl. D24-183.000.
- Loader, Gerald R., to Button Fronts (London) Limited. Chair. 374,994, Cl. D6-359.000.
- Lucent Technologies Inc.: See—  
Biasotti, Mark; Lewis, Charles R., Jr.; Nuttall, Michael J.; Schaffeld, John H.; and Sosa, Jose A., 375,043, Cl. D14-191.000.
- Ricardo, George L.; Simmons, William D.; and Tull, Bernie D., Jr., 375,091, Cl. D14-138.000.
- Lund, David M., to Lund Industries, Inc. Side window cover for vehicle. 375,068, Cl. D12-183.000.
- Lund Industries, Inc.: See—  
Lund, David M., 375,068, Cl. D12-183.000.
- Lyons, Harold W., to Whelen Engineering Company, Inc. Linear strobe warning light fixture. 375,180, Cl. D26-28.000.
- MacDonald, Summer. Track type key holder. 374,976, Cl. D3-207.000.
- Macey, Stephen: See—  
Bartlett, Galvin; Leonhardt, Michael P.; Clark, W. James; and Macey, Stephen, 375,165, Cl. D24-204.000.
- Mackey, Keith J.: See—  
Roberson, Linda K.; and Mackey, Keith J., 374,979, Cl. D3-217.000.
- MacLean-Fogg Company: See—  
Pazdirek, Jiri, 375,079, Cl. D13-132.000.
- Mallek, Michael D.; and Schmidt, Donald R. Bean bag game target. 375,125, Cl. D21-5.000.
- Mangol, Petra, to J. A. Henckels Zwillingswerk AG. Handle for knives. 375,035, Cl. D8-107.000.
- Mark, Darren M.: See—  
Doughty, Frederic C.; and Mark, Darren M., 375,142, Cl. D23-241.000.
- Doughty, Frederic C.; and Mark, Darren M., 375,143, Cl. D23-243.000.
- Doughty, Frederic C.; and Mark, Darren M., 375,144, Cl. D23-243.000.
- Doughty, Frederic C.; and Mark, Darren M., 375,145, Cl. D23-243.000.
- Doughty, Frederic C.; and Mark, Darren M., 375,146, Cl. D23-243.000.
- Doughty, Frederic C.; and Mark, Darren M., 375,147, Cl. D23-243.000.
- Markey, Kevin J.: See—  
Lathrop, Gregory A.; Gerhart, Mark D.; Gnadt, David F.; Markey, Kevin J.; Gonda, Frank E.; and Laubach, David S., 375,051, Cl. D9-558.000.
- Lathrop, Gregory A.; Gerhart, Mark D.; Gnadt, David F.; Markey, Kevin J.; Gonda, Frank E.; and Laubach, David S., 375,052, Cl. D9-558.000.
- Masumoto, Masao; and Shimoie, Shizuo, to Kubota Corporation. Backhoe. 375,103, Cl. D15-25.000.
- Mater, Robert F., Jr.: See—  
Duvernay, Mark E.; Mater, Robert F., Jr.; and Mellow, James L., 375,065, Cl. D12-162.000.
- Matsuda, Takashi; and Koinuma, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Binoculars. 375,106, Cl. D16-133.000.
- McArdle, Christopher J., to Prodyne Enterprises, Inc. Fruit/vegetable netting display hammock. 375,021, Cl. D7-601.000.
- McBride, John K.; Bruno, Robert H.; and Dziarski, Mark D., to Eastman Kodak Company. Camera with retractable lens cover. 375,110, Cl. D16-209.000.
- McKinnon, Wayne E.: See—  
Hillenmayer, Stefan; Skrypalle, Ulrich; McKinnon, Wayne E.; Bryant, David E.; Kingsbury, Mary E.; Elkins, Erich C.; and Erwin, Doug A., 375,095, Cl. D14-151.000.
- McKisson, Eileen A., to Michelin Recherche et Technique S.A. Tire. 375,064, Cl. D12-146.000.
- McPherson's Limited: See—  
Hainsworth, Mike J.; and Viner, Peter, 374,981, Cl. D3-220.000.
- Mellow, James L.: See—  
Duvernay, Mark E.; Mater, Robert F., Jr.; and Mellow, James L., 375,065, Cl. D12-162.000.
- Memke, David K.: See—  
Hunt, David L.; and Memke, David K., 375,168, Cl. D25-16.000.
- Hunt, David L.; and Memke, David K., 375,169, Cl. D25-16.000.
- Mercedes-Benz AG: See—  
Sacco, Bruno; and Pfeiffer, Peter, 375,074, Cl. D12-209.000.
- Merck & Co., Inc.: See—  
Kramer, Kenneth A.; and Katdare, Ashok V., 375,157, Cl. D24-101.000.
- Messelhi, Selim, to Communications Technology Corporation. Post or strand mounted terminal housing. 375,082, Cl. D13-152.000.
- Michael, Russell W. Compact disc player with memory. 375,096, Cl. D14-156.000.
- Michelin Recherche et Technique S.A.: See—  
McKisson, Eileen A., 375,064, Cl. D12-146.000.
- Milani, Francesco; and Bartsch, Carola, to Draegerwerk AG. Anesthesia machine and work station. 375,158, Cl. D24-110.000.
- Miyashita, Muneharu, to Yazaki Industrial Chemical Co., Ltd. Joint for a rack frame. 375,040, Cl. D8-382.000.
- Moallemi, Kamran; and Warren, Robert L., to Solana Technology Development Corporation. Electronic voice messaging note pad. 375,098, Cl. D14-168.000.
- Moffitt, Clifford A.; and Amerine, Marilyn R. Support stand for holding heavy objects. 375,171, Cl. D25-67.000.
- MOMO S.P.A.: See—  
Cattaneo, Marco, 375,076, Cl. D12-211.000.
- Moon, John: See—  
Hilsenrath, Oliver; Moon, John; and Opet, William A., 375,092, Cl. D14-142.000.
- Morita, Tamao, to Tarmo Co. Ltd. Magnetic fastener. 375,061, Cl. D11-220.000.
- Moses, Walter A. Tool for cleanout plugs. 375,028, Cl. D8-29.000.
- Motorola, Inc.: See—  
Kho, Bee L., 375,099, Cl. D14-191.000.
- Moulinex S.A.: See—  
Barraut, Jean-Louis, 375,017, Cl. D7-330.000.
- Moya, Rebecca: See—  
Moya, Rodney A.; and Moya, Rebecca, 374,980, Cl. D3-218.000.
- Moya, Rodney A.; and Moya, Rebecca. Cellular phone and pager case. 374,980, Cl. D3-218.000.
- Murakami, Yasuhiro: See—  
Goto, Toru; Ito, Seiichi; Hatsumoto, Kunio; and Murakami, Yasuhiro, 375,019, Cl. D7-392.100.
- Nabisco, Inc.: See—  
Willard, Lonnie; Boden, Brian G.; and Hajinian, Harry, 375,044, Cl. D9-433.000.
- Nagy-Bozsoky, Ga'bor. Masonry scoop. 375,030, Cl. D8-45.000.
- Nakamura, Toshinobu, to Shinagawa Shoko Co., Ltd. Insulating cover for a terminal. 375,083, Cl. D13-156.000.
- Nelson, Michael J.; and Nelson, Susan R. Combined helmet cover and visor. 374,972, Cl. D2-866.000.
- Nelson, Susan R.: See—  
Nelson, Michael J.; and Nelson, Susan R., 374,972, Cl. D2-866.000.
- Newberry, Gerald G. Rod and wedge puller. 375,133, Cl. D22-108.000.
- Nippon Sanso Corporation: See—  
Goto, Toru; Ito, Seiichi; Hatsumoto, Kunio; and Kato, Takashi, 375,018, Cl. D7-392.100.
- Goto, Toru; Ito, Seiichi; Hatsumoto, Kunio; and Murakami, Yasuhiro, 375,019, Cl. D7-392.100.
- Niswander, Dwight J.: See—  
Hlinka, Edward A.; Niswander, Dwight J.; Scheie, Carl E.; Schield, Edward A.; and Shenoh, James L., 375,130, Cl. D21-214.000.
- Nitsuko Corporation: See—  
Toh, Tadamine, 375,100, Cl. D14-241.000.
- Noniewicz, Zbigniew, to Wolfcraft GmbH. Work bench. 374,996, Cl. D6-400.000.
- Nordstrom, James: See—  
Nordstrom, James P., Jr., 375,003, Cl. D6-466.000.
- Nordstrom, James P., Jr., to Nordstrom, James. Foldable stand for one guitar. 375,003, Cl. D6-466.000.
- Nuttall, Michael J.: See—  
Biasotti, Mark; Lewis, Charles R., Jr.; Nuttall, Michael J.; Schaffeld, John H.; and Sosa, Jose A., 375,043, Cl. D14-191.000.
- O. Ames Co.: See—  
Spear, Kenneth J.; Czerwinski, Frank G.; and Brooker, Steven F., 375,027, Cl. D8-10.000.
- Oakley, Inc.: See—  
Jannard, James H., 375,112, Cl. D16-335.000.
- Oates, Thomas B.: See—  
Weber, Desna V.; and Oates, Thomas B., 375,045, Cl. D9-443.000.
- Opet, William A.: See—  
Hilsenrath, Oliver; Moon, John; and Opet, William A., 375,092, Cl. D14-142.000.
- Osram GmbH: See—  
Franck, Guenter, 375,177, Cl. D26-3.000.
- Pangburn, Thomas E., to Lexmark International, Inc. Printer. 375,119, Cl. D18-50.000.
- Parfums Jean-Jacques Vivier: See—  
Chahed, Khaled, 375,050, Cl. D9-553.000.
- Park, Kelly R. Protective garment for shoulders. 374,971, Cl. D2-823.000.
- Paus, Michael J., to Universal Furniture Industries, Inc. Cabinet. 375,000, Cl. D6-445.000.
- Pazdirek, Jiri, to MacLean-Fogg Company. Power line insulator. 375,079, Cl. D13-132.000.
- Pelvic Posture Limited: See—  
Webb, Roger L., 375,009, Cl. D6-500.000.
- Peter Anthony Design Ltd.: See—  
Graham, Anna; and Hofgartner, Daniel, 374,995, Cl. D6-380.000.
- Pfeiffer, Peter: See—



- Sacco, Bruno; and Pfeiffer, Peter, 375,074, Cl. D12-209,000.  
 Poore, Marc, Insect eliminator street light, 375,136, Cl. D22-123,000.  
 Prodyne Enterprises, Inc.: See—  
 McArdle, Christopher J., 375,021, Cl. D7-601,000.  
 Pursley, J. Steve, Juicing adapter for blenders, 375,024, Cl. D7-665,000.  
 Radke, George F., to Citadel Innovations Inc., Natural gas fireplace, 375,155, Cl. D23-344,000.  
 Reckitt & Colman SA: See—  
 Vollborth, David, 375,049, Cl. D9-526,000.  
 Reed, Robert R., Measuring spoon, 375,055, Cl. D10-46,200.  
 Reese Products, Inc.: See—  
 Duvernay, Mark E.; Mater, Robert F., Jr.; and Mellow, James L., 375,065, Cl. D12-162,000.  
 Restorative Care Of America Incorporated: See—  
 Wasserman, Constance V.; and Hess, Clarence E., 375,164, Cl. D24-192,000.  
 Reynolds and Reynolds Company, The: See—  
 Sisilli, Jeffrey M., 375,121, Cl. D19-1,000.  
 Sisilli, Jeffrey M., 375,122, Cl. D19-1,000.  
 Ricardo, George L.; Simmons, William D.; and Tull, Bernie D., Jr., to Lucent Technologies Inc., Portable telephone handset, 375,091, Cl. D14-138,000.  
 Ricoh Company, Ltd.: See—  
 Ishikawa, Kazumasa; and Kanda, Shigemii, 375,118, Cl. D18-43,000.  
 Risdon, Scott: See—  
 Keller, H. Thomas; and Risdon, Scott, 374,999, Cl. D6-444,000.  
 Keller, H. Thomas; and Risdon, Scott, 375,001, Cl. D6-445,000.  
 Rivette, Danni F.; and Yeung, K. Y., Novelty eyeglasses, 375,127, Cl. D21-190,000.  
 Robbins, Tom E., to Kallista, Inc., Plumbing spout, 375,149, Cl. D23-257,000.  
 Roberson, Linda K.; and Mackey, Keith J., Harness back pack, 374,979, Cl. D3-217,000.  
 Ronald, Dennis L., Fresh cut Christmas tree stand waterer, 375,026, Cl. D8-1,000.  
 Rose, Deborah H.; Adams, James D.; and Thole, Steven, to Armstrong World Industries, Inc., Entry display unit, 375,170, Cl. D25-59,000.  
 Royal Building Systems (CDN) Limited: See—  
 De Zen, Vittorio, 375,173, Cl. D25-124,000.  
 Rubbermaid Specialty Products Inc.: See—  
 Hunt, David L.; and Memke, David K., 375,168, Cl. D25-16,000.  
 Hunt, David L.; and Memke, David K., 375,169, Cl. D25-16,000.  
 Thorp, Christopher S., 375,139, Cl. D23-212,000.  
 Sacco, Bruno; and Pfeiffer, Peter, to Mercedes-Benz AG, Front face of a light metal wheel, 375,074, Cl. D12-209,000.  
 Saikawa, Hideo: See—  
 Kotaki, Yasuo; Hamasaki, Yuji; Saikawa, Hideo; Tokuda, Hiroyuki; Kawashima, Shosaku; Takenouchi, Masanori; Sato, Osamu; Yamamoto, Hisashi; Hinami, Jun; and Sasaki, Toshiaki, 375,120, Cl. D18-56,000.  
 Sampson, Richard K.; and Williams, Bruce A., Tubing connector handle, 375,160, Cl. D24-129,000.  
 Samsonite Corporation: See—  
 Hughes, Cheryl A., 374,987, Cl. D3-279,000.  
 Sandor, John L.; and Boteler, William C., to Hubbell Incorporated, Electrical plug body, 375,080, Cl. D13-141,000.  
 Sandor, John L.; and Boteler, William C., to Hubbell Incorporated, Electrical connector body, 375,081, Cl. D13-143,000.  
 Sasaki, Toshiaki: See—  
 Kotaki, Yasuo; Hamasaki, Yuji; Saikawa, Hideo; Tokuda, Hiroyuki; Kawashima, Shosaku; Takenouchi, Masanori; Sato, Osamu; Yamamoto, Hisashi; Hinami, Jun; and Sasaki, Toshiaki, 375,120, Cl. D18-56,000.  
 Sato, Osamu: See—  
 Kotaki, Yasuo; Hamasaki, Yuji; Saikawa, Hideo; Tokuda, Hiroyuki; Kawashima, Shosaku; Takenouchi, Masanori; Sato, Osamu; Yamamoto, Hisashi; Hinami, Jun; and Sasaki, Toshiaki, 375,120, Cl. D18-56,000.  
 Schaffeld, John H.: See—  
 Biasotti, Mark; Lewis, Charles R., Jr.; Nuttall, Michael J.; Schaffeld, John H.; and Sosa, Jose A., 375,043, Cl. D14-191,000.  
 Scheie, Carl E.: See—  
 Hlinka, Edward A.; Niswander, Dwight J.; Scheie, Carl E.; Schield, Edward A.; and Shenoh, James L., 375,130, Cl. D21-214,000.  
 Schield, Edward A.: See—  
 Hlinka, Edward A.; Niswander, Dwight J.; Scheie, Carl E.; Schield, Edward A.; and Shenoh, James L., 375,130, Cl. D21-214,000.  
 Schmidt, Donald R.: See—  
 Mallek, Michael D.; and Schmidt, Donald R., 375,125, Cl. D21-5,000.  
 Scholl, Winfried, to Hewi Heinrich Wilke GmbH, Shelf, 375,012, Cl. D6-574,000.  
 Schottenstein Stores Corporation: See—  
 Lenger, Sidney A., 374,997, Cl. D6-436,000.  
 Lenger, Sidney A., 375,005, Cl. D6-480,000.  
 Scott, James P., Magnetic tool holder, 374,984, Cl. D3-228,000.  
 Sensors, Inc.: See—  
 Sewell, Peter J.; and Friedlander, Uri, 375,056, Cl. D10-96,000.  
 Sewell, Peter J.; and Friedlander, Uri, to Sensors, Inc., Replaceable gas analyzer, 375,056, Cl. D10-96,000.  
 Shenoh, James L.: See—  
 Hlinka, Edward A.; Niswander, Dwight J.; Scheie, Carl E.; Schield, Edward A.; and Shenoh, James L., 375,130, Cl. D21-214,000.  
 Shibuya, Shoichi, to Juki Corporation, Sewing machine, 375,104, Cl. D15-69,000.  
 Shimoie, Shizuo: See—  
 Masumoto, Masao; and Shimoie, Shizuo, 375,103, Cl. D15-25,000.  
 Shinagawa Shoko Co., Ltd.: See—  
 Nakamura, Toshinobu, 375,083, Cl. D13-156,000.  
 Siegel, Jeff: See—  
 Cohen, Milton L.; and Siegel, Jeff, 375,023, Cl. D7-641,000.  
 Siemens Rohn Communications Inc.: See—  
 Hillenmayer, Stefan; Skrypalle, Ulrich; McKinnon, Wayne E.; Bryant, David E.; Kingsbury, Mary E.; Elkins, Erich C.; and Erwin, Doug A., 375,095, Cl. D14-151,000.  
 Simmons, William D.: See—  
 Ricardo, George L.; Simmons, William D.; and Tull, Bernie D., Jr., 375,091, Cl. D14-138,000.  
 Simms, Frank R., Logsplitting apparatus, 375,105, Cl. D15-127,000.  
 Sisilli, Jeffrey M., to Reynolds and Reynolds Company, The, Business form, 375,121, Cl. D19-1,000.  
 Sisilli, Jeffrey M., to Reynolds and Reynolds Company, The, Business form, 375,122, Cl. D19-1,000.  
 Skrypalle, Ulrich: See—  
 Hillenmayer, Stefan; Skrypalle, Ulrich; McKinnon, Wayne E.; Bryant, David E.; Kingsbury, Mary E.; Elkins, Erich C.; and Erwin, Doug A., 375,095, Cl. D14-151,000.  
 Smith, Dale G., Cooler on wheels, 375,022, Cl. D7-605,000.  
 Solana Technology Development Corporation: See—  
 Moallemi, Kamran; and Warren, Robert L., 375,098, Cl. D14-168,000.  
 Sone, Takahiro; and Kigawa, Naoyuki, to Star Micronics Co., Ltd., Audible signal for alarm units, 375,058, Cl. D10-116,000.  
 Sony Computer Entertainment Inc.: See—  
 Kobayashi, Shinkichi; and Sugimoto, Kazuyoshi, 375,015, Cl. D6-632,000.  
 Sony Corporation: See—  
 Harata, Tomohiro, 375,108, Cl. D16-202,000.  
 Ikenaga, Takashi, 375,126, Cl. D21-13,000.  
 Ishii, Daisuke, 375,107, Cl. D16-202,000.  
 Sosa, Jose A.: See—  
 Biasotti, Mark; Lewis, Charles R., Jr.; Nuttall, Michael J.; Schaffeld, John H.; and Sosa, Jose A., 375,043, Cl. D14-191,000.  
 Sosso, Jerome F., to Stein Industries, Inc., Lift rack with divider system, 375,002, Cl. D6-449,000.  
 Southpac Trust International, Inc.: See—  
 Weder, Donald E.; and Straeter, Joseph G., 375,060, Cl. D11-164,000.  
 Spear, Kenneth J.; Czerwinski, Frank G.; and Brooker, Steven F., to O Ames Co., Hand transplanter, 375,027, Cl. D8-10,000.  
 Star Micronics Co., Ltd.: See—  
 Sone, Takahiro; and Kigawa, Naoyuki, 375,058, Cl. D10-116,000.  
 Stein Industries, Inc.: See—  
 Sosso, Jerome F., 375,002, Cl. D6-449,000.  
 Steinmetz GmbH: See—  
 Theiss, Peter, 375,073, Cl. D12-209,000.  
 Stevens, Clive G., Dual action walker, 375,063, Cl. D12-130,000.  
 Straeter, Joseph G.: See—  
 Weder, Donald E.; and Straeter, Joseph G., 375,060, Cl. D11-164,000.  
 Strang, Terry D., Sports card display holder, 375,123, Cl. D19-33,000.  
 Sugimoto, Kazuyoshi: See—  
 Kobayashi, Shinkichi; and Sugimoto, Kazuyoshi, 375,015, Cl. D6-632,000.  
 Takenouchi, Masanori: See—  
 Kotaki, Yasuo; Hamasaki, Yuji; Saikawa, Hideo; Tokuda, Hiroyuki; Kawashima, Shosaku; Takenouchi, Masanori; Sato, Osamu; Yamamoto, Hisashi; Hinami, Jun; and Sasaki, Toshiaki, 375,120, Cl. D18-56,000.  
 Tarmo Co. Ltd.: See—  
 Morita, Tamao, 375,061, Cl. D11-220,000.  
 Taylor, Joe A., Massager, 375,167, Cl. D24-200,000.  
 Taylor, Rodney S.; and Joiner, Walter C., to Bell Helicopter Textron Inc., Helicopter, 375,077, Cl. D12-327,000.  
 Team Vision, Inc.: See—  
 Erickson, Kenneth D., 375,007, Cl. D6-495,000.  
 Tetra Laval Holdings and Finance S.A.: See—  
 Hotz, Jean-Marie, 375,046, Cl. D9-447,000.  
 Theiss, Peter, to Steinmetz GmbH, Wheel, 375,073, Cl. D12-209,000.  
 Thole, Steven: See—  
 Rose, Deborah H.; Adams, James D.; and Thole, Steven, 375,170, Cl. D25-59,000.  
 Thompson, Lynn C., Spearhead, 375,134, Cl. D22-118,000.  
 Thompson, Lynn C., Knife, 375,135, Cl. D22-118,000.  
 Thompson, Michael: See—  
 Goulding-Thompson, Bonnie L.; and Thompson, Michael, 375,166, Cl. D24-214,000.  
 Thorp, Christopher S., to Rubbermaid Specialty Products Inc., Watering can, 375,139, Cl. D23-212,000.  
 TIE Communications Research Inc.: See—  
 Babbitt, Eric K.; and Cuccio, John, 375,093, Cl. D14-151,000.  
 Tillquist, Karen A., Teabag with christmas tree shape, 374,968, Cl. D1-115,000.  
 Tisi, Sergio, Rear push bar, 375,066, Cl. D12-169,000.  
 Toenders, Cinth, Door brace, 375,037, Cl. D8-339,000.  
 Toh, Tadamine, to Nitsuko Corporation, Telephone set, 375,094, Cl. D14-151,000.

- Toh, Tadamine, to Nitsuko Corporation, Extension ringing console apparatus for a telephone set, 375,100, Cl. D14-241,000.  
 Tokuda, Hiroyuki: See—  
 Kotaki, Yasuo; Hamasaki, Yuji; Saikawa, Hideo; Tokuda, Hiroyuki; Kawashima, Shosaku; Takenouchi, Masanori; Sato, Osamu; Yamamoto, Hisashi; Hinami, Jun; and Sasaki, Toshiaki, 375,120, Cl. D18-56,000.  
 Tomita, Akemi, to Casio Computer Co., Ltd., Wrist watch, 375,054, Cl. D10-38,000.  
 Torkelson, Jim A., Golf club scrubber with spray nozzle, 374,990, Cl. D4-114,000.  
 Totten, Roger, Folding safety can opener, 375,029, Cl. D8-41,000.  
 Trapp, Dale E., Combined grill scrubber and container therefor, 374,991, Cl. D4-116,000.  
 Trevorow, Thomas P., Ornamental bracket, 375,038, Cl. D8-354,000.  
 Trueb, Stephen R.: See—  
 Trueb, Thomas W.; and Trueb, Stephen R., 375,154, Cl. D23-308,000.  
 Trueb, Thomas W.; and Trueb, Stephen R., to Truebro, Inc., Barrier for enclosing plumbing and sink fixtures, 375,154, Cl. D23-308,000.  
 Truebro, Inc.: See—  
 Trueb, Thomas W.; and Trueb, Stephen R., 375,154, Cl. D23-308,000.  
 Truth Hardware Corporation: See—  
 Anderson, Todd A.; and Heim, Eric P., 375,042, Cl. D8-400,000.  
 Tsai, Ching-Cheng, to Chicony Electronics Co., Ltd., Keyboard, 375,088, Cl. D14-115,000.  
 Tseng, Tsung-Ming, Combined ceiling fan and light, 375,156, Cl. D23-377,000.  
 Tull, Bernie D., Jr.: See—  
 Ricardo, George L.; Simmons, William D.; and Tull, Bernie D., Jr., 375,091, Cl. D14-138,000.  
 Ullmann, Roland, to Braun AG, Thermal coffee pot, 375,016, Cl. D7-319,000.  
 Universal Furniture Industries, Inc.: See—  
 Paus, Michael J., 375,000, Cl. D6-445,000.  
 Universal Security Instruments, Inc.: See—  
 Kovens, Michael L., 375,097, Cl. D14-159,000.  
 V. A. Butler, Inc.: See—  
 Valley, Jack, 375,141, Cl. D23-233,000.  
 Valley, Jack, to V. A. Butler, Inc., Diverter valve, 375,141, Cl. D23-233,000.  
 Vargas, Mayra; and Feliciano, Epifania, Beverage carrier, 374,975, Cl. D3-202,000.  
 Variety Foods Inc.: See—  
 Champagne, Dean J., 374,967, Cl. D1-110,000.  
 Vaughan Furniture Company, Inc.: See—  
 Keller, H. Thomas; and Risdon, Scott, 374,999, Cl. D6-444,000.  
 Keller, H. Thomas; and Risdon, Scott, 375,001, Cl. D6-445,000.  
 Vickery Design, Inc.: See—  
 Vickery, Earle R.; 375,178, Cl. D26-6,000.  
 Vickery, Earle R., to Vickery Design, Inc., Chili ristra-shaped candle, 375,178, Cl. D26-6,000.  
 Viner, Peter: See—  
 Hainsworth, Mike J.; and Viner, Peter, 374,981, Cl. D3-220,000.  
 Voegli, Michel, Square watch case, 375,053, Cl. D10-30,000.  
 Vollborth, David, to Reckitt & Colman SA, Combined bottle and cap, 375,049, Cl. D9-526,000.  
 W. L. Gore & Associates: See—  
 Wainer, Lilian E., 375,150, Cl. D23-269,000.  
 Wainer, Lilian E., to W. L. Gore & Associates, Gasket, 375,150, Cl. D23-269,000.  
 Warren, Robert L.: See—  
 Moallemi, Kamran; and Warren, Robert L., 375,098, Cl. D14-168,000.  
 Wasserman, Constance V.; and Hess, Clarence E., to Restorative Care Of America Incorporated, Foot orthosis, 375,164, Cl. D24-192,000.  
 Webb, Roger L., to Pelvic Posture Limited, Combined seat back and seat for a chair, 375,009, Cl. D6-500,000.  
 Weber, Desna V.; and Oates, Thomas B., Bag clip with pivot end, 375,045, Cl. D9-443,000.  
 Weder, Donald E.; and Straeter, Joseph G., to Southpac Trust International, Inc., Flower pot cover, 375,060, Cl. D11-164,000.  
 Whelen Engineering Company, Inc.: See—  
 Lyons, Harold W., 375,180, Cl. D26-28,000.  
 Wielhouwer, Linda F., Combined sunglasses and eye shade, 375,111, Cl. D16-304,000.  
 Williams, Bruce A.: See—  
 Sampson, Richard K.; and Williams, Bruce A., 375,160, Cl. D24-129,000.  
 Williams, Daniel A., to Williams Jewelers, Inc., Golf putter head, 375,131, Cl. D21-219,000.  
 Williams Jewelers, Inc.: See—  
 Williams, Daniel A., 375,131, Cl. D21-219,000.  
 Willard, Lonnie; Boden, Brian G.; and Hajinlian, Harry, to Nabisco, Inc., Stackable composite package, 375,044, Cl. D9-433,000.  
 Wilson Sporting Goods Co.: See—  
 Hlinka, Edward A.; Niswander, Dwight J.; Scheie, Carl E.; Schield, Edward A.; and Shenoh, James L., 375,130, Cl. D21-214,000.  
 Wisdom, Delores A., Battery powered decorative lightset, 375,179, Cl. D26-25,000.  
 Wolcraft GmbH: See—  
 Noniewicz, Zbigniew, 374,996, Cl. D6-400,000.  
 Wong, Stanley, Locker room foot mat, 375,013, Cl. D6-583,000.  
 Yamaha Corporation: See—  
 Kawada, Manabu, 375,115, Cl. D17-99,000.  
 Yamamoto, Hisashi: See—  
 Kotaki, Yasuo; Hamasaki, Yuji; Saikawa, Hideo; Tokuda, Hiroyuki; Kawashima, Shosaku; Takenouchi, Masanori; Sato, Osamu; Yamamoto, Hisashi; Hinami, Jun; and Sasaki, Toshiaki, 375,120, Cl. D18-56,000.  
 Yates, Donna L.: See—  
 Yates, William M.; and Yates, Donna L., 375,069, Cl. D12-183,000.  
 Yates, William M.; and Yates, Donna L., Flexible sunscreen for vehicle windows, 375,069, Cl. D12-183,000.  
 Yazaki Industrial Chemical Co., Ltd.: See—  
 Miyasbita, Muneharu, 375,040, Cl. D8-382,000.  
 Yeabower, Donald, Angled rearview mirror, 375,070, Cl. D12-187,000.  
 Yeung, K. Y.: See—  
 Rivette, Danni F.; and Yeung, K. Y., 375,127, Cl. D21-190,000.  
 Yuridin, Carl: See—  
 Lipson, Walda B.; and Yuridin, Carl, 375,163, Cl. D24-183,000.  
 Zimmerman, Craig E.: See—  
 Gluszk, Timothy J.; and Zimmerman, Craig E., 374,969, Cl. D1-125,000.

# LIST OF PLANT PATENTEES

Conard-Pyle Company, The: See—  
 Olij, Huibert W., 9,672, Cl. Plt.-11,000.  
 Drewlow, Lyndon W., to Mikkelsen, Inc. Kalanchoe plant named Chivalry, 9,674, Cl. Plt.-87,150.  
 Drewlow, Lyndon W., to Mikkelsen, Inc. Kalanchoe plant named Merit, 9,675, Cl. Plt.-87,150.  
 Gardner, Leith M.: See—  
 Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G., 9,673, Cl. Plt.-43,100.  
 Hill, Herbert H., Jr., to Twyford International, Inc. Vriesea plant named Werner Rauh, 9,678, Cl. Plt.-88,800.  
 Knaap, Wim V. D. Ficus plant named Curly, 9,679, Cl. Plt.-88,900.  
 Mikkelsen, Inc.: See—  
 Drewlow, Lyndon W., 9,674, Cl. Plt.-87,150.  
 Drewlow, Lyndon W., 9,675, Cl. Plt.-87,150.  
 Oglesby Plant Laboratories, Inc.: See—  
 Osiecki, Marian W., 9,677, Cl. Plt.-88,100.

Olij, Huibert W., to Conard-Pyle Company, The. Hybrid Tea rose plant named 'Olijcroft', 9,672, Cl. Plt.-11,000.  
 Osiecki, Marian W., to Oglesby Plant Laboratories, Inc. Spathiphyllum plant 'S8', 9,677, Cl. Plt.-88,100.  
 Slocum, Perry D. Water lily, plant name: 'Peaches and Cream', 9,676, Cl. Plt.-87,160.  
 Twyford International, Inc.: See—  
 Hill, Herbert H., Jr., 9,678, Cl. Plt.-88,800.  
 Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G. Peach tree 'Zee Diamond', 9,673, Cl. Plt.-43,100.  
 Zaiger, Gary N.: See—  
 Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G., 9,673, Cl. Plt.-43,100.  
 Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G., 9,673, Cl. Plt.-43,100.

# CLASSIFICATION OF PATENTS

ISSUED OCTOBER 29, 1996

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 2	164	5,568,656	153	5,568,702	628	5,569,854	64	5,568,775	CLASS 139	190	5,568,840	
	167	5,568,657		5,568,703	700	5,569,855		5,568,776	CLASS 140	311	5,568,841	
			362	5,568,704	702	5,569,856	245	5,568,777	CLASS 141	6,22	5,568,842	
CLASS 5	174	5,568,658	CLASS 52	167.1	5,568,705	861.22	5,569,859	261	5,568,778	CLASS 142	317	5,568,888
	618	5,568,661		198	5,568,706	861.52	5,569,865		5,568,779	CLASS 143	67	5,568,843
	625	5,568,662		200	5,568,707	862.626	5,569,866	306	5,568,780	CLASS 144	68	5,568,844
	628	5,568,663		301	5,568,708	863	5,569,860	441		CLASS 145	71.9	5,568,845
	652	5,568,664		309.8	5,568,709	864.22	5,569,861	470.18		CLASS 146	218 XL	5,568,846
	652.1	5,568,660		426	5,568,710					CLASS 147	313	5,568,847
	737	5,568,659		704	5,568,711	CLASS 74	336 R	5,568,748	CLASS 148	325	5,569,337	
CLASS 7	105	5,568,665		782.1	5,568,712		395	5,569,749	CLASS 149	335	5,569,338	
				785.1	5,568,713	CLASS 75	229	5,568,750	CLASS 150	634	5,569,339	
CLASS 8	149.1	5,568,666		786.13	5,568,714		238	5,568,751	CLASS 151	18 A	5,568,848	
	639	5,569,309				CLASS 81	434	5,569,314	CLASS 152	9	5,568,851	
CLASS 14	20	5,568,667					3.49	5,568,750	CLASS 153	34	5,568,849	
CLASS 15	143.1	5,568,669				CLASS 83	63	5,568,751	CLASS 154	70.25	5,568,852	
	176.3	5,568,668					126	5,568,752	CLASS 155	85 AA	5,568,853	
	250.48	5,568,670				CLASS 84	177.2	5,568,757	CLASS 156	318	5,568,854	
CLASS 16	18 R	5,568,671					434	5,568,753	CLASS 157	5,568,855		
	94 R	5,568,672				CLASS 85	13	5,568,754	CLASS 158	347.1	5,568,850	
	244	5,568,673					402	5,568,755	CLASS 159	347.2	5,568,856	
CLASS 24	429	5,568,674				CLASS 86	471.2	5,568,756	CLASS 160	592	5,568,857	
	453	5,568,675					745	5,568,758	CLASS 161	781.06	5,568,858	
	641	5,568,676				CLASS 87	312R	5,569,863	CLASS 200	5 A	5,569,889	
	704.1	Re.35,361					400	5,569,864	CLASS 201	16 A	5,569,890	
CLASS 27	17	5,568,677				CLASS 88	470 R	5,569,867	CLASS 202	17 R	5,569,891	
							600	5,569,868	CLASS 203	19 R	5,569,892	
CLASS 28	115	5,568,678				CLASS 89	609	5,569,869	CLASS 204	43.01	5,568,859	
							615	5,569,870	CLASS 205	61.54	5,569,893	
CLASS 29	25.35	5,568,679				CLASS 90	625	5,569,871	CLASS 206	242	5,568,860	
	557	5,568,680					728	5,569,872	CLASS 207	302.003	5,568,861	
	598	5,568,681				CLASS 91	461	5,568,759	CLASS 208	192.12	5,569,361	
	809	5,568,682				CLASS 92	5 R	5,568,760	CLASS 209	192.16	5,569,362	
	831	5,568,683					143	5,568,762	CLASS 210	192.32	5,569,363	
	832	5,568,684				CLASS 93	290	5,569,315	CLASS 211	450	5,569,365	
	840	5,568,685				CLASS 94	135	5,569,316	CLASS 212	452	5,569,366	
	861	5,568,686				CLASS 95	280	5,568,763	CLASS 213	455	5,569,364	
	890.14	5,568,687				CLASS 96	341	5,568,764	CLASS 214	547	5,569,367	
CLASS 30	29.5	5,568,688				CLASS 97	403	5,568,765	CLASS 215	600	5,569,368	
	295	5,568,689				CLASS 98	35	5,568,766	CLASS 216	620	5,569,369	
CLASS 33	565	5,568,690				CLASS 99	203.21	5,568,807	CLASS 285	560	5,569,370	
CLASS 34	98	5,568,691				CLASS 100	206.11	5,568,808	CLASS 286	338	5,568,862	
	270	5,568,692					635	5,568,809	CLASS 287	387.1	5,568,863	
	620	5,568,693				CLASS 101	660.01	5,568,810	CLASS 288	408	5,568,864	
CLASS 35.8	472	5,570,205					660.04	5,568,812	CLASS 289	438	5,568,865	
						CLASS 102	660.04	5,568,812	CLASS 290	466	5,568,866	
CLASS 37	231	5,568,694					660.07	5,568,811	CLASS 291	584	5,568,867	
CLASS 40	124.1	5,568,695				CLASS 103	661.01	5,568,813	CLASS 292	724	5,568,868	
							672	5,568,814	CLASS 293	212	5,568,869	
CLASS 42	49.02	5,568,696				CLASS 104	731	5,568,815	CLASS 294	573	5,568,870	
							849	5,568,817	CLASS 295	703	5,568,871	
CLASS 43	14	5,568,697				CLASS 105	84.4	5,568,818	CLASS 296	85	5,569,371	
	53.5	5,568,698					342	5,568,819	CLASS 297	90	5,569,372	
	137	5,568,699				CLASS 106	315	5,568,820	CLASS 298	136	5,569,373	
CLASS 44	442	5,569,310							CLASS 299	137	5,569,374	
						CLASS 107	1	5,569,330	CLASS 300	195.4	5,569,375	
CLASS 47	43	5,568,700					40	5,569,331	CLASS 301	238	5,569,376	
	48.5	5,568,701				CLASS 108	61	5,568,821	CLASS 302	242.1	5,569,377	
							64 P	5,568,822	CLASS 303	257.1	5,569,379	
									CLASS 304	266	5,569,380	
									CLASS 305	321.6	5,569,381	
									CLASS 306	391	5,569,382	
									CLASS 307	408	5,569,383	
									CLASS 308	651	5,569,384	
									CLASS 309	727	5,569,385	
									CLASS 310	746	5,569,386	
									CLASS 311	754	5,569,387	
									CLASS 312	764	5,569,388	



805	5,569,389	221	5,569,910	CLASS 271	286	5,569,991	CLASS 336	245	5,570,164	
	CLASS 211	227.24	5,569,911	91	5,568,918	5,569,992	83	5,570,074	246	5,570,165
13	5,568,872	231.14	5,569,912	183	5,568,919	5,569,993	96	5,570,075	251	5,570,166
40	5,568,873	260	5,569,914	225	5,568,920	5,569,994	163	5,570,076	253	5,570,167
46	5,568,874	281	5,569,915			5,569,995			259	5,570,168
113	5,568,875	287	5,569,916	CLASS 273			CLASS 338	253	5,570,169	
		292	5,569,917	73 A	5,568,921		163	5,570,076	259	5,570,170
		306	5,569,918	84 R	5,568,922			CLASS 340	285	5,570,171
33	5,569,391	310	5,569,919	128 A	5,568,923			5,570,077	323	5,570,172
60	5,569,392	310	5,569,920	292	5,568,924			5,570,078	326 R	5,570,173
		339.01	5,569,921	326	5,568,925			5,570,079	328	5,570,174
		339.12	5,569,922	359	5,568,926			5,570,080		
27	5,569,894	341.2	5,569,923	366	5,568,927			5,570,081		
		363.05	5,569,924					5,570,082		
		370.06	5,569,925					5,570,083		
69.15	5,569,393	484.4	5,569,926	26	5,568,929			5,570,084		
69.17	5,569,394	484.5	5,569,927	29	5,568,930			5,570,085		
76.14	5,569,395	494.1	5,569,928	53	5,568,931			5,570,086		
		548	5,569,929	180	5,568,932			5,570,087		
121.12	B1 4,831,230	559.4	5,569,930	CLASS 280				5,570,088		
	B1 5,064,989	559.45	5,569,931	42	5,568,933			5,570,089		
121.51	5,569,397			282	5,568,934			5,570,090		
121.68	5,569,398				5,568,935			5,570,091		
121.69	5,569,399			728.2	5,568,936			5,570,092		
233	5,569,400	83	5,568,910	728.3	5,568,937			5,570,093		
386	5,569,401	129.12	5,568,911	743.1	5,568,938			5,570,094		
400	5,569,402	205	5,568,912	743.2	5,568,939			5,570,095		
	5,569,403			806	5,568,940			5,570,096		
					5,568,941			5,570,097		
254	5,568,876	62.56	5,569,409	CLASS 283				5,570,098		
441	5,568,877	518	5,569,412	56	5,568,942			5,570,099		
465	5,568,878		5,569,413					5,570,100		
697	5,568,879		5,569,414					5,570,101		
								5,570,102		
								5,570,103		
131	5,568,880	13.1	5,568,913	CLASS 285				5,570,104		
175	5,568,881			7	5,568,943			5,570,105		
				21.1	5,568,944			5,570,106		
				30	5,568,945			5,570,107		
				38	5,568,946			5,570,108		
61	5,568,882	1	5,569,932	38	5,568,947			5,570,109		
136	5,568,883	21	5,569,933	46	5,568,948			5,570,110		
189.09	5,568,884	51	5,569,934	168	B1 5,121,948			5,570,111		
318	5,568,885	66	5,569,935	242	5,568,949			5,570,112		
321.9	5,568,886	77	5,569,936	284	5,568,950			5,570,113		
		84	5,569,937	17				5,570,114		
		121	5,569,938	CLASS 289				5,570,115		
		133	5,569,939	528	5,568,951			5,570,116		
232	5,568,888	186	5,569,940	694	5,568,952			5,570,117		
539	5,568,890		5,569,941	750	5,568,953			5,570,118		
661	5,568,887	192	5,569,942	760	5,568,954			5,570,119		
	5,568,889	198	5,569,943	307 A	5,568,955			5,570,120		
		316	5,569,944	318	5,568,956			5,570,121		
			5,569,945	338	5,568,957			5,570,122		
			5,569,946					5,570,123		
			5,569,947	CLASS 294				5,570,124		
93	5,568,891	336	5,569,948	1.3	5,568,955			5,570,125		
		382	5,569,949	15	5,568,956			5,570,126		
		397	5,569,950	119.3	5,568,957			5,570,127		
44.5	5,568,893	436	5,569,951					5,570,128		
180.22	5,568,892	579	5,569,952	CLASS 297				5,570,129		
219	5,568,894	607	5,569,953	39	5,568,958			5,570,130		
		627	5,569,954	215.15	5,568,959			5,570,131		
		666	5,569,955	238	5,568,960			5,570,132		
1 R	5,569,895	348.22	5,569,956	344.22	5,568,961			5,570,133		
70 R	5,569,896	362.12	5,569,957					5,570,134		
379	5,569,897		5,569,958	CLASS 303				5,570,135		
448	5,569,898		5,569,959	3	5,568,962			5,570,136		
462	5,569,899		5,569,960	CLASS 307				5,570,137		
463	5,569,900		5,569,961	80	5,569,963			5,570,138		
470	5,569,901		5,569,962	10.1	5,569,964			5,570,139		
472	5,569,902		5,569,963	103	5,569,965			5,570,140		
492	5,569,903		5,569,964	143	5,569,966			5,570,141		
				203				5,570,142		
				322				5,570,143		
				345				5,570,144		
16	5,568,895	23.1	5,568,915	CLASS 310				5,570,145		
24.29	5,568,896	37	5,569,916	103	5,569,967			5,570,146		
				322	5,569,968			5,570,147		
				345	5,569,969			5,570,148		
19	5,568,897	29.1	5,569,917	CLASS 313				5,570,149		
344	5,568,898	36	5,569,918	112	5,569,970			5,570,150		
347.2	5,568,899	37	5,569,919	141	5,569,971			5,570,151		
557	5,568,900	46.4	5,569,920	231.11	5,569,972			5,570,152		
		51	5,569,921	309	5,569,973			5,570,153		
		60	5,569,922	310	5,569,974			5,570,154		
			5,569,923		5,569,975			5,570,155		
63	5,568,901	115	5,569,924	359.1	5,569,976			5,570,156		
138 R	5,568,902	121	5,569,925	466	5,569,977			5,570,157		
140	5,568,903	122	5,569,926	631	5,569,978			5,570,158		
169	5,568,904	129	5,569,927	636	5,569,979			5,570,159		
		210.7	5,569,928					5,570,160		
		211.21	5,569,929	CLASS 315				5,570,161		
		238	5,569,930	39.3	5,569,980			5,570,162		
74.1	5,568,906	258	5,569,931	56	5,569,981			5,570,163		
118	5,568,907	401	5,569,932	209 T	5,569,982			5,570,164		
419	5,568,908	439	5,569,933	297	5,569,983			5,570,165		
519	5,568,909			307	5,569,984			5,570,166		
				397	5,569,985			5,570,167		
								5,570,168		
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119	5,570,263	124	5,570,334	396	5,570,421	128	5,568,993	CLASS 425	5,569,563
127	5,570,264	192	5,570,335	399	5,570,422	7	5,568,994	CLASS 404	5,569,472
218	5,570,265	275.1	5,570,337	410	5,570,423	101	5,568,995	5,569,473	5,569,473
229	5,570,266	275.2	5,570,338					5,569,474	5,569,474
681	5,570,267	275.3	5,570,339					5,569,475	5,569,475
683	5,570,268		5,570,340					5,569,476	5,569,476
685	5,570,269		5,570,341						
687	5,570,270		5,570,342						
704	5,570,271								
723	5,570,272								
773	5,570,273								
784	5,570,274								
32	5,568,964								
103	5,568,971								
125	5,570,275								
135	5,568,965								
252	5,568,966								
328	5,568,967								
376	5,568,968								
345	5,568,969								
404	5,568,972								
407	5,568,970								
16	5,570,276								
19	5,570,277								
20	5,570,278								
127	5,570,279								
126	5,570,336								
140	5,570,290								
146	5,570,281								
148	5,570,282								
400	Re 35,364								
407	5,570,283								
424.01	5,570,284								
424.02	5,570,285								
424.05	5,570,286								
51	5,570,373								
20.1	5,570,374								
22.3	5,570,375								
22.5	5,570,376								
25.1	5,570,377								
468.28	5,570,378								
473.01	5,570,379								
514 R	5,570,380								
525	5,570,297								
351.01	5,570,298								
559	5,570,300								
560	5,570,299								
561	5,570,302								
562	5,570,303								
571.03	5,570,304								
715.02	5,570,305								
715.11	5,570,306								
717	5,570,307								
724.1	5,570,308								
746.2	5,570,309								
748.5	5,570,310								
753	Re 35,365								
154	5,570,311								
	5,570,312								
174	5,570,313								
185.1	5,570,314								
185.22	5,570,315								
196	5,570,316								
200	5,570,317								
	5,570,318								
230.03	5,570,319								
	5,570,320								
129	5,568,973								
151.1	5,568,974								
285	5,568,975								
312	5,568,976								
38	5,570,321								
107	5,570,322								
118	5,570,323								
124	5,570,324								
10	5,570,325								
113	5,570,326								
272	5,570,327								
13	5,570,328								
	5,570,329								
44.32	5,570,330								
47	5,570,331								
50	5,570,332								
110	5,570,333								

587	5,569,051	204	5,569,119	374	5,569,666	642	5,569,748	CLASS 600	61	5,569,246
638	5,569,052			403	5,569,667	653	5,569,749			5,569,247
668	5,569,053	CLASS 482		419	5,569,668	850	5,569,751			5,569,248
752	5,569,054	4	5,569,120	432	5,569,669					5,569,249
	5,569,055	5	5,569,121	440	5,569,670					5,569,250
876	5,569,056	13	5,569,122	455	5,569,671	17.4	5,569,757			5,569,251
		39	5,569,123	460	5,569,672	18.6	5,569,752			5,569,252
65	5,569,057	44	5,569,124	522	5,569,673	23.5	5,569,754			5,569,253
		46	5,569,125	539	5,569,674					5,569,254
24	5,569,058	51	5,569,126	547	5,569,675	24.3	5,569,755			5,569,255
		52	5,569,127	549	5,569,676	127	5,569,756			5,569,256
5	5,569,059	57	5,569,128	570	5,569,677			CLASS 540		5,569,257
	5,569,060	69	5,569,129	654	5,569,678	122	5,569,758			5,569,258
93	5,569,061	77	5,569,130	746	5,569,679	472	5,569,759	CLASS 601		5,569,259
285	5,569,062	96	5,569,131	711	5,569,680	495	5,569,760			5,569,260
296	5,569,063	110	5,569,132							5,569,261
558	5,569,064	125	5,569,133	88	Re.35.368	213	5,569,761	CLASS 602		5,569,262
		126	5,569,134	107	5,569,681					5,569,263
			5,569,135		5,569,682					5,569,264
			5,569,136							5,569,265
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			5,569,138							5,569,267
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			5,569,278							5,569,407
			5,569,279							5,569,408
			5,569,280							5,569,409
			5,569,281							5,569,410
			5,569,282							5,569,411



VOL  
1191

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5

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29

1996

UMI

GEOGRAPHICAL INDEX  
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama.....	1	Kentucky.....	21	Oregon.....	41
Alaska.....	2	Louisiana.....	22	Pennsylvania.....	42
American Samoa.....	3	Maine.....	23	Puerto Rico.....	43
Arizona.....	4	Maryland.....	24	Rhode Island.....	44
Arkansas.....	5	Massachusetts.....	25	South Carolina.....	45
California.....	6	Michigan.....	26	South Dakota.....	46
Canal Zone.....	7	Minnesota.....	27	Tennessee.....	47
Colorado.....	8	Mississippi.....	28	Texas.....	48
Connecticut.....	9	Missouri.....	29	Utah.....	49
Delaware.....	10	Montana.....	30	Vermont.....	50
District of Columbia.....	11	Nebraska.....	31	Virginia.....	51
Florida.....	12	Nevada.....	32	Virgin Islands.....	52
Georgia.....	13	New Hampshire.....	33	Washington.....	53
Guam.....	14	New Jersey.....	34	West Virginia.....	54
Hawaii.....	15	New Mexico.....	35	Wisconsin.....	55
Idaho.....	16	New York.....	36	Wyoming.....	56
Illinois.....	17	North Carolina.....	37	U.S. Air Force.....	57
Indiana.....	18	North Dakota.....	38	U.S. Army.....	58
Iowa.....	19	Ohio.....	39	U.S. Navy.....	59
Kansas.....	20	Oklahoma.....	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01	5,568,785	5,568,951	5,569,307	5,570,045	5,570,398	5,569,273
	5,569,127	5,568,956	5,569,308	5,570,046	5,570,401	5,569,412
	5,569,996	5,568,963	5,569,310	5,570,049	5,570,426	5,569,413
	5,570,275	5,568,966	5,569,349	5,570,051	5,570,435	5,569,488
02	5,569,811	5,568,971	5,569,356	5,570,052	5,570,445	5,569,639
04	5,568,701	5,568,981	5,569,364	5,570,053	5,570,462	5,569,737
	5,568,807	5,568,988	5,569,365	5,570,054	4,880,005	5,569,785
	5,568,868	5,569,003	5,569,366	5,570,056	4,963,882	5,569,797
	5,568,870	5,569,004	5,569,410	5,570,059	5,568,695	5,570,096
	5,568,968	5,569,006	5,569,415	5,570,063	5,568,697	Re 35,361
	5,569,019	5,569,035	5,569,420	5,570,068	5,569,071	5,568,672
	5,569,053	5,569,036	5,569,431	5,570,081	5,569,078	5,568,715
	5,569,062	5,569,037	5,569,442	5,570,082	5,569,266	5,568,796
	5,569,129	5,569,073	5,569,458	5,570,084	5,569,379	5,568,825
	5,569,172	5,569,094	5,569,493	5,570,108	5,569,501	5,568,854
	5,569,375	5,569,096	5,569,495	5,570,109	5,569,603	5,568,871
	5,569,418	5,569,099	5,569,533	5,570,111	5,569,813	5,568,905
	5,569,786	5,569,113	5,569,535	5,570,138	5,570,005	5,568,953
	5,569,831	5,569,126	5,569,549	5,570,141	5,570,026	5,568,960
	5,569,937	5,569,161	5,569,588	5,570,146	5,570,030	5,568,970
	5,570,033	5,569,165	5,569,624	5,570,178	5,570,242	5,569,102
	5,570,034	5,569,176	5,569,649	5,570,182	5,570,243	5,569,166
	5,570,067	5,569,183	5,569,675	5,570,189	5,570,244	5,569,171
	5,570,112	5,569,184	5,569,696	5,570,213	5,568,713	5,569,202
	5,570,307	5,569,186	5,569,708	5,570,228	5,568,746	5,569,219
	5,570,337	5,569,189	5,569,742	5,570,238	5,568,775	5,569,243
	5,570,363	5,569,196	5,569,783	5,570,241	5,569,008	5,569,244
06	Re 35,366	5,569,199	5,569,812	5,570,244	5,569,083	5,569,252
	5,568,665	5,569,205	5,569,825	5,570,249	5,569,089	5,569,278
	5,568,673	5,569,210	5,569,830	5,570,250	5,569,139	5,569,299
	5,568,682	5,569,211	5,569,871	5,570,261	5,569,178	5,569,300
	5,568,683	5,569,212	5,569,872	5,570,268	5,569,206	5,569,346
	5,568,686	5,569,215	5,569,883	5,570,272	5,569,283	5,569,380
	5,568,700	5,569,217	5,569,898	5,570,276	5,569,301	5,569,401
	5,568,708	5,569,220	5,569,899	5,570,283	5,569,302	5,569,466
	5,568,709	5,569,221	5,569,917	5,570,286	5,569,317	5,569,620
	5,568,790	5,569,235	5,569,951	5,570,296	5,569,327	5,569,666
	5,568,802	5,569,241	5,569,955	5,570,304	5,569,432	5,570,000
	5,568,806	5,569,242	5,569,956	5,570,306	5,569,459	5,570,069
	5,568,816	5,569,245	5,569,963	5,570,314	5,569,503	5,570,072
	5,568,822	5,569,251	5,569,968	5,570,319	5,569,584	5,570,079
	5,568,843	5,569,260	5,569,971	5,570,348	5,569,697	5,570,177
	5,568,880	5,569,274	5,569,978	5,570,349	5,569,787	5,570,322
	5,568,881	5,569,276	5,569,990	5,570,356	5,569,888	5,570,388
	5,568,888	5,569,277	5,570,002	5,570,360	5,570,013	5,570,392
	5,568,904	5,569,279	5,570,011	5,570,372	5,570,280	5,570,407
	5,568,912	5,569,285	5,570,036	5,570,376	5,570,297	5,570,447
	5,568,921	5,569,294	5,570,040	5,570,383	5,570,414	5,570,465
	5,568,929	5,569,295	5,570,041	5,570,395	5,568,824	5,568,707

5,568,995	5,569,030	5,569,229	5,569,286	5,569,794	5,570,216
5,568,998	5,569,072	5,569,270	5,569,361	5,569,809	5,570,289
5,568,999	5,569,106	5,569,303	5,569,363	5,569,863	13
5,569,021	5,570,083	5,569,332	5,569,404	5,569,896	40 : 5,568,787
5,569,173	5,568,712	5,569,001	5,569,425	5,569,901	5,569,324
5,569,174	5,569,077	5,569,428	5,569,429	5,569,902	5,569,325
5,569,237	5,569,478	5,569,452	5,569,433	5,569,904	5,569,329
5,569,512	5,569,775	5,569,489	5,569,446	5,569,911	5,569,807
5,569,550	5,569,068	5,569,475	5,569,511	5,569,932	5,570,332
5,569,551	5,569,741	5,569,496	5,569,516	5,569,950	5,568,896
5,569,732	5,569,746	5,569,563	5,569,536	5,569,967	5,568,987
5,569,994	5,569,779	5,569,667	5,569,626	5,569,973	5,569,387
5,570,065	5,568,898	5,569,686	5,569,633	5,569,983	5,569,398
5,570,066	5,569,344	5,569,698	5,569,664	5,569,998	5,569,400
5,570,256	5,570,422	5,569,713	5,569,674	5,570,007	5,569,440
5,570,262	5,570,428	5,569,715	5,569,686	5,570,027	5,569,601
5,569,410	5,568,814	5,569,818	5,569,789	5,570,074	5,569,679
15 : 5,569,377	5,568,913	5,569,846	5,569,805	5,570,099	5,570,055
5,569,849	5,568,976	5,569,893	5,569,825	5,570,117	5,570,050
5,568,755	5,569,933	5,569,918	5,570,028	5,570,139	5,569,082
5,568,777	5,569,120	5,569,977	5,570,035	5,570,142	5,569,124
5,569,835	5,569,288	5,570,016	5,570,126	5,570,144	5,569,824
5,569,874	5,569,290	5,570,060	5,570,131	5,570,161	5,570,460
5,570,032	5,569,293	5,570,114	5,570,184	5,570,169	5,569,944
17 : Re.35,364	5,569,447	5,570,127	5,570,212	5,570,170	
5,568,661	5,569,507	5,570,183	5,570,259	5,570,172	
5,568,666	5,569,580	5,570,214	5,570,295	5,570,173	
5,568,748	5,569,602	5,570,287	5,570,346	5,570,222	
5,568,759	5,569,634	5,570,288	5,570,355	5,570,325	
5,568,808	5,569,676	5,570,362	5,570,367	5,570,329	
5,568,817	5,569,755	5,568,863	5,570,373	5,569,151	
5,568,855	5,569,879	5,568,994	5,570,386	5,569,152	
5,568,866	5,569,886	5,569,079	5,570,404	5,569,179	
5,568,879	5,569,906	5,569,170	5,570,416	5,569,181	
5,568,886	5,569,922	5,569,197	5,570,420	5,569,272	
5,568,889	5,570,019	5,569,198	5,570,440	5,569,319	
5,568,914	5,570,088	5,569,201	5,570,441	5,569,351	
5,568,942	5,570,270	5,569,218	5,570,448	5,569,374	
5,568,992	5,570,324	5,569,236	5,570,481	5,569,407	
5,569,039	5,570,454	5,569,263	5,570,489	5,569,436	
5,569,042	5,568,780	5,569,275	5,570,500	5,569,448	
5,569,080	5,568,792	5,569,282	5,570,513	5,569,454	
5,569,084	5,568,955	5,569,309	5,570,543	5,569,513	
5,569,136	5,569,104	5,569,373	5,570,544	5,569,557	
5,569,155	5,569,163	5,569,419	5,570,668	5,569,579	
5,569,168	5,569,195	5,569,450	5,569,677	5,569,581	
5,569,193	5,569,238	5,569,461	5,569,685	5,569,587	
5,569,222	5,569,239	5,569,485	5,569,689	5,569,592	
5,569,225	5,569,255	5,569,544	5,569,717	5,569,630	
5,569,240	5,569,258	5,569,552	5,569,731	5,569,633	
5,569,298	5,569,335	5,569,617	5,569,786	5,569,648	
5,569,305	5,569,463	5,569,628	5,569,864	5,569,655	
5,569,434	5,569,462	5,569,635	5,569,873	5,569,659	
5,569,462	5,569,483	5,569,682	5,569,883	5,569,677	
5,569,678	5,569,527	5,569,686	5,569,888	5,569,680	
5,569,757	5,569,574	5,569,724	5,569,903	5,569,706	
5,569,777	5,569,585	5,569,747	5,569,922	5,569,710	
5,569,790	5,569,586	5,569,792	5,569,952	5,569,714	
5,569,791	5,569,600	5,569,822	5,569,975	5,569,718	
5,569,878	5,569,635	5,569,826	5,569,988	5,569,725	
5,569,890	5,569,683	5,569,834	5,569,990	5,569,733	
5,570,037	5,569,729	5,569,841	5,569,991	5,569,766	
5,570,077	5,569,745	5,569,865	5,569,996	5,569,791	
5,570,100	5,569,772	5,569,875	5,569,999	5,569,811	
5,570,291	5,568,688	5,569,891	5,569,999	5,569,828	
5,570,341	5,568,828	5,569,909	5,569,999	5,569,833	
5,570,347	5,568,833	5,569,915	5,569,999	5,569,841	
5,570,417	5,568,865	5,569,925	5,569,999	5,569,846	
5,570,453	5,568,928	5,569,939	5,569,999	5,569,855	
5,570,455	5,569,250	5,569,940	5,569,999	5,569,866	
18 : 5,568,671	5,569,590	5,569,941	5,569,999	5,569,872	
5,568,676	5,569,608	5,569,942	5,569,999	5,569,882	
5,568,828	5,569,673	5,569,943	5,569,999	5,569,893	
5,568,833	5,569,743	5,569,944	5,569,999	5,569,902	
5,568,865	5,569,744	5,569,945	5,569,999	5,569,916	
5,568,928	5,569,764	5,569,946	5,569,999	5,569,931	
5,569,250	5,569,768	5,569,947	5,569,999	5,569,944	
5,569,590	5,569,772	5,569,948	5,569,999	5,569,954	
5,569,608	5,569,821	5,569,949	5,569,999	5,569,969	
5,569,673	5,569,822	5,569,950	5,569,999	5,569,980	
5,569,743	5,569,823	5,569,951	5,569,999	5,570,001	
5,569,744	5,569,824	5,569,952	5,569,999	5,570,039	
5,569,756	5,569,825	5,569,953	5,569,999	5,570,266	
5,569,764	5,569,826	5,569,954	5,569,999	5,570,284	
5,569,768	5,569,827	5,569,955	5,569,999	5,570,374	
5,569,772	5,569,828	5,569,956	5,569,999	5,570,374	
5,569,821	5,569,829	5,569,957	5,569,999	5,570,374	
5,569,822	5,569,830	5,569,958	5,569,999	5,570,374	
5,569,823	5,569,831	5,569,959	5,569,999	5,570,374	
5,569,824	5,569,832	5,569,960	5,569,999	5,570,374	
5,569,825	5,569,833	5,569,961	5,569,999	5,570,374	
5,569,826	5,569,834	5,569,962	5,569,999	5,570,374	
5,569,827	5,569,835	5,569,963	5,569,999	5,570,374	
5,569,828	5,569,836	5,569,964	5,569,999	5,570,374	
5,569,829	5,569,837	5,569,965	5,569,999	5,570,374	
5,569,830	5,569,838	5,569,966	5,569,999	5,570,374	
5,569,831	5,569,839	5,569,967	5,569,999	5,570,374	
5,569,832	5,569,840	5,569,968	5,569,999	5,570,374	
5,569,833	5,569,841	5,569,969	5,569,999	5,570,374	
5,569,834	5,569,842	5,569,970	5,569,999	5,570,374	
5,569,835	5,569,843	5,569,971	5,569,999	5,570,374	
5,569,836	5,569,844	5,569,972	5,569,999	5,570,374	
5,569,837	5,569,845	5,569,973	5,569,999	5,570,374	
5,569,838	5,569,846	5,569,974	5,569,999	5,570,374	
5,569,839	5,569,847	5,569,975	5,569,999	5,570,374	
5,569,840	5,569,848	5,569,976	5,569,999	5,570,374	
5,569,841	5,569,849	5,569,977	5,569,999	5,570,374	
5,569,842	5,569,850	5,569,978	5,569,999	5,570,374	
5,569,843	5,569,851	5,569,979	5,569,999	5,570,374	
5,569,844	5,569,852	5,569,980	5,569,999	5,570,374	
5,569,845	5,569,853	5,569,981	5,569,999	5,570,374	
5,569,846	5,569,854	5,569,982	5,569,999	5,570,374	
5,569,847	5,569,855	5,569,983	5,569,999	5,570,374	
5,569,848	5,569,856	5,569,984	5,569,999	5,570,374	
5,569,849	5,569,857	5,569,985	5,569,999	5,570,374	
5,569,850	5,569,858	5,569,986	5,569,999	5,570,374	
5,569,851	5,569,859	5,569,987	5,569,999	5,570,374	
5,569,852	5,569,860	5,569,988	5,569,999	5,570,374	
5,569,853	5,569,861	5,569,989	5,569,999	5,570,374	
5,569,854	5,569,862	5,569,990	5,569,999	5,570,374	
5,569,855	5,569,863	5,569,991	5,569,999	5,570,374	
5,569,856	5,569,864	5,569,992	5,569,999	5,570,374	
5,569,857	5,569,865	5,569,993	5,569,999	5,570,374	
5,569,858	5,569,866	5,569,994	5,569,999	5,570,374	
5,569,859	5,569,867	5,569,995	5,569,999	5,570,374	
5,569,860	5,569,868	5,569,996	5,569,999	5,570,374	
5,569,861	5,569,869	5,569,997	5,569,999	5,570,374	
5,569,862	5,569,870	5,569,998	5,569,999	5,570,374	
5,569,863	5,569,871	5,569,999	5,569,999	5,570,374	
5,569,864	5,569,872	5,569,999	5,569,999	5,570,374	
5,569,865	5,569,873	5,569,999	5,569,999	5,570,374	
5,569,866	5,569,874	5,569,999	5,569,999	5,570,374	
5,569,867	5,569,875	5,569,999	5,569,999	5,570,374	
5,569,868	5,569,876	5,569,999	5,569,999	5,570,374	
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5,569,871	5,569,879	5,569,999	5,569,999	5,570,374	
5,569,872	5,569,880	5,569,999	5,569,999	5,570,374	
5,569,873	5,569,881	5,569,999	5,569,999	5,570,374	
5,569,874	5,569,882	5,569,999	5,569,999	5,570,374	
5,569,875	5,569,883	5,569,999	5,569,999	5,570,374	
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5,569,880	5,569,888	5,569,999	5,569,999	5,570,374	
5,569,881	5,569,889	5,569,999	5,569,999	5,570,374	
5,569,882	5,569,890	5,569,999	5,569,999	5,570,374	
5,569,883	5,569,891	5,569,999	5,569,999	5,570,374	
5,569,884	5,569,892	5,569,999	5,569,999	5,570,374	
5,569,885	5,569,893	5,569,999	5,569,999	5,570,374	
5,569,886	5,569,894	5,569,999	5,569,999	5,570,374	
5,569,887	5,				



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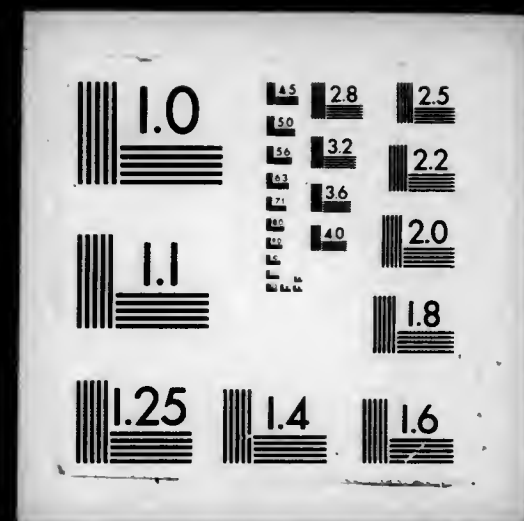
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